

BUYERSGUIDES

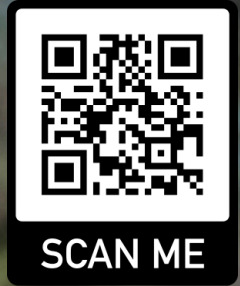
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Arborist Equipment

Comprehensive free MARKET GUIDE to all of the key and less well-known products with specifications.

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BUYERS GUIDES

Arborist Equipment



OTHER ROPES AND HARDWARE.....

Ropes, descenders & Carabiners are in **Rope Equipment**

Specialist hardware, ropes and PPE are in **Water Rescue**

Helmets, med-packs, spine-care & stretchers are in **PPE & CasEvac**

'Black' theatre and tactical rope, hardware & access items are in **'Black' Equipment**

Cases, lighting, Tripods & High Directional are also in **USAR/Extrication**

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Welcome to our **BUYERSGUIDES**. These are free to all as a page-turning pdf or you can download a regular PDF by clicking on the cloud icon. Many of these GUIDES originally appeared in our print magazines so have been updated and **will continue to be updated every month**. The same link that you used this time can be used anytime to see the latest version. New Guides and those appearing in forthcoming magazines will also be incorporated into the relevant **BUYERSGUIDES** building into an amazingly comprehensive guide to the best products on the market. **PART 2 in early 2024 see next page**

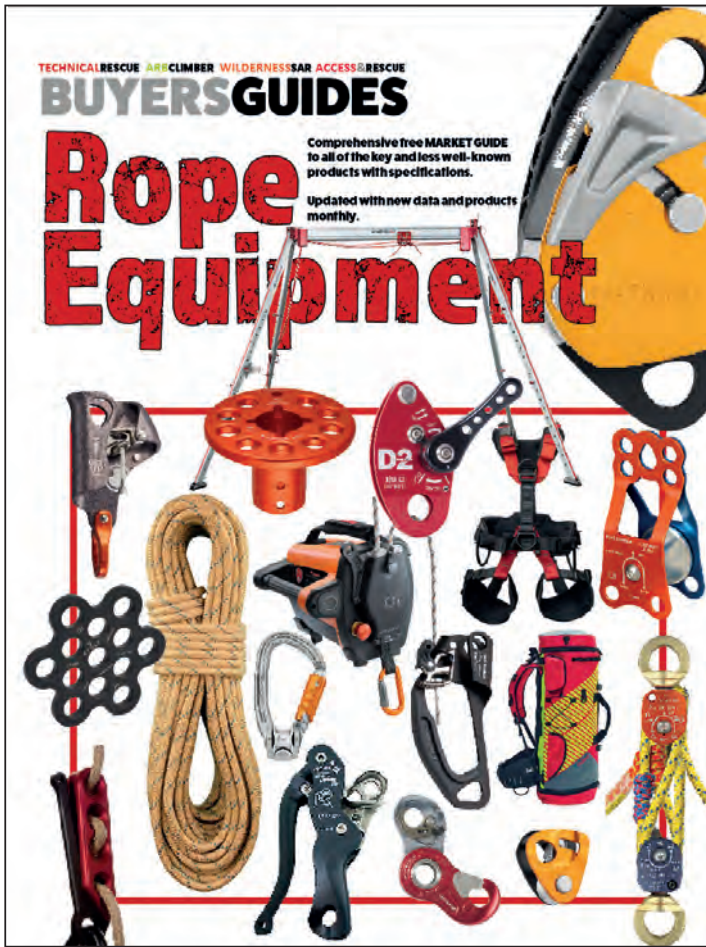
The tabulated data in our GUIDES is non-subjective although the comprehensive introductions do have subjective comment and pick out key and interesting products.

MANUFACTURERS can contact us at any time to update the information on a product(s).
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'BLACK' = not only military and tactical equipment but also film/theatre. This may simply be that the product is black or camouflaged but there are also specialist tactical and theatrical rigging products in here

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ARBORIST EQPT pt2

From Q2 2024 we will begin to add the following product groups to this **BUYERSGUIDE:**

- Chainsaws
- Hand Saws
- Chainsaw PPE inc. boots and trousers
- C'saw/Tool Lanyards
- Friction Savers
- Slings
- Rope and Tackle bags

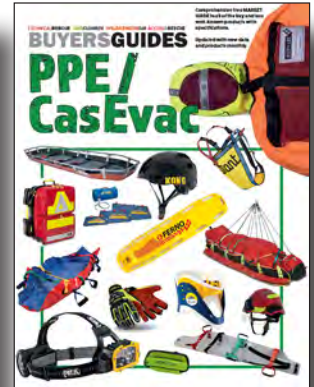
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Q2 2024



Q2/3 2024



Q3 2024

KEY TO TABLES:

Across all of our BUYERS GUIDE tables, some of the data entries are quite complex in appearance and you do need to refer to the individual keys to fully understand the information in the tables. Note that in the print magazine we have tended to round down lbf (pounds force) from KiloNewtons as a straight 2.2lb:1kg conversion but these GUIDES use the actual lbf to KN conversion which is a little higher at almost 225lbf:1kN

Cyan blue is always a variant of the main model shown. data relating specifically to that version will be **highlighted** in cyan blue or any squares or circles may be outlined in cyan blue ■ ■ ■ ● ● ● the cyan blue outline is admittedly difficult to spot on the green square or circle.

□ □ □ ○ ○ ○ An outline square or circle of any colour = an OPTION, not part of the data shown

● ● ◆ a solid circle or diamond indicates that the usage or feature indicated is partial or OK but not ideal. this may be a use for which it is not intended but it cope OK in that role like a descender being used as an ascender. These also appear as an outline if they are an option. ○ ◆

🇺🇸 The main flags shown are the origin of the company listed but there may be a smaller inset flag like this 🇹🇼 Taiwan flag, indicating that the country of manufacture is different.

COSTS are all approximate and rounded up. We include VAT at 20% and State tax at 10% but these can all vary, especially state taxes in the US. £\$€ Prices shown in **burnt orange** are currency conversions only. They do not reflect import costs like shipping, duty and local taxes so are a very rough guide only

Page corners are colour coded to common groups of equipment eg. rope is in **lime green**. Rope hardware including descenders and lowering devices are in **grey**. Pulleys, ascenders, hauling kits and winches are in **red**. Accesories are in **Plum**. Software, slings and bags are in **purple** and safety/PPE is in **green**. & Tools/Machinery are in **Orange**.

ADVERTISERS

We might be biased, but generally speaking, our advertisers represent the very best of equipment supply and production in the very specialist sectors that we serve. The majority of companies advertising in these **BUYERSGUIDES** have been with us in the print-magazines for many years and in some cases many decades- these are not fly-by-night manufacturers and stockists, they are names you can trust. In a world full of cheap options and unknown brands- (especially on Amazon/AliBaba) and where it can be very difficult to spot great Chinese products from blatant Chinese or russian knock-offs, it is vital to know that your safety equipment can be trusted.

RETAIL STOCKISTS							
ARBOGEAR							
ARBORIST SUPPLY CO INC							
ARBORTECH SUPPLY							
ARBSESSION							
CASCADE RESCUE							
CMC							
FOREST&ARB							
GUSTHARTS							
HONEY BROTHERS							
PMI ROPE							
SORBUS INTERNATIONAL							
WESSPUR							

MANUFACTURERS & BULK DISTRIBUTORS	ARBORIST EQUIPMENT	ROPE EQUIPMENT	BLACK EQUIPMENT	WATER RESCUE	USAR/ EXTRICATION	TRAUMA, PPE & CASEVAC IN ARBORIST EQPT PRODUCT CATEGORIES....
ARS ANDERSON RESCUE SOLUTIONS							Pulleys, Bags
AT-HEIGHT UK							Pulleys
BLUEWATER ROPES							Pulleys, Ropes, Prusik Cord
CLIMBING TECHNOLOGY (SKYLOTEC)							Pulleys, Ascenders, PCDs, Descenders, Swivels, Rig Plates, Tool Hooks, Bags
CMC							Swivel Carabiners, Pulleys, Ascenders, PCDs, Descenders, Swivels, Rig Plates, Tool Hooks, Ropes, Bags
EYOLF							Pulleys, Rig Plates, Tool Hooks, Harnesses
EDELRID							Pulleys, Ascenders, PCDs, Descenders, Swivels, Rig Plates, Tool Hooks, Ropes, Bags, Harnesses, Helmets, spikes
FTC TREE							Impact Pulleys, Ropes, Spikes, Bags
HARKEN							Powered Ascenders, Pulley Carabiners, Pulleys, Ascenders
HUSQVARNA							Tool Hooks, Bags, Carabiners
KONG ITALY							Impact Pulleys, Pulleys, Ascenders, PCDs, Descenders, Swivels, Rig Plates, Tool Hooks, Bags, Harnesses, Helmets, Gloves
LYON EQUIPMENT							Bags, Tripods, High Directionals
MARLOW ROPES							Rope
NRS RESCUE							Rafts, Short Boards, Drysuits
PETZL							Pulleys, Ascenders, PCDs, Descenders, Swivels, Rig Plates, Tool Hooks, Bags, Harnesses, Helmets, Gloves, Bags
PMI ROPE							Ropes, Bags, Gloves
ROCK EXOTICA							Pulleys, Ascenders, PCDs, Descenders, Swivels, Rig Plates, Tool Hooks, High Directionals
SINGING ROCK							Pulleys, Ascenders, PCDs, Descenders, Swivels, Rig Plates, Tool Hooks, Ropes, Bags, Harnesses, Helmets, Bags, Gloves
SKYLOTEC							Pulleys, Ascenders, PCDs, Descenders, Swivels, Rig Plates, Tool Hooks, Ropes, Bags, Harnesses, Helmets, Gloves
SMC							Pulleys, PCDs, Swivels, Rig Plates, Tool Hooks, High Directionals
STIHL							Harnesses, Helmets
WEAVER LEATHER							Harnesses, Bags,
TRAINING/EDUCATION							
CMC							
LYON EQUIPMENT							
ROPES THAT RESCUE							
TREE CARE INDUSTRY ASSN							

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HARNESS TOOL CARRIERS

As the name suggests, these are supplementary hooks that are designed to clip onto your harness in a semi-permanent fashion and then easily stow your equipment. This is either as a general storage option for carabiners, hardware, slings etc. or, in the case of heavier duty hooks, for attaching and continually switching between being stowed and being used. We should be calling this Guide 'CARITOOLS' since that's what most people know them as but in contrast to a time when Hoover cornered the vacuum market so completely that they turned a noun into a verb, Petzl didn't stand unopposed for quite long enough. You have to be quick these days and although it may seem to arborists that Petzl had things their own way for many years, there were always competitors on the sport side with Camp, CT, Singing Rock, Kong, Black Diamond and the now discontinued Mammut IceBreaker and even this tandem hook (right) from Simond. There have also always been more industrial options. But it is arborists rather than rope access/rescue that have driven development and proliferation of harness carry hooks. Early arborist harnesses like the Whillans had (and have) steel, offset tool clips incorporated into their design and later, add-on steel hooks appeared like the French Komet and German Treerunner. Protekt of Poland, better known to arborists as 'TreeUp' have the simplest of designs - something akin to a blunt, steel, meat-hook but they also have a more conventional plastic carabiner-style hook. More recently we have seen the Shembiner chainsaw hook and two of the alloy wizards - DMM and Rock Exotica introducing more complex carabiner-style models. All of these companies would probably moan about using Petzl's product name as a generic term but sometimes it's just easier. Don't forget, the plastic hooks are only rated to about 5kg/11 lb so you can't generally hang, for instance, a chainsaw off them. That normally requires the metal versions although Petzl's larger Caritool was originally sold by Husqvarna as a chainsaw holder so presumably some others will also cope. CMI took Shem Kendrick's idea for a chainsaw hook and ran with the Shembiner, slightly different to most of the models here because it's an open hook. More on this later. You sometimes hear comments that a Caritool or similar clip has broken - this will almost certainly be due to overloading and/or torquing - in other words, user-error! Of course, you could use practically any inverted carabiner as a tool attachment and especially a bent-gate snap carabiner but what sets ALL of these models apart is an adaptation to be used on webbing which will be some form of captive eye or just a stabilisation bar as with



Petzl's PRO version of the CARITOOOL has a nylon anti-snag shroud to the gate and includes an eye at the top for safety cord/lanyard to make sure you don't drop your kit just as you unhook it.



the Treeup hook model (right) which pushes through a narrow sewn eye with the T-bar sitting on top. Most models have a maximum webbing size they will fit and therefore harnesses that they won't fit. Some stockists actually list the harnesses their hook WILL fit but that's a bit too exhaustive for us and liable to change every few months so we've listed the maximum web size it will fit (in orange) in the dimensions column.



The Petzl CARITOOOL (above) is plastic (or more accurately, glass-reinforced plastic) and has changed just a bit from the first Guide with just the yellow all black with just the yellow anti-snag cover version rather than the original all-black. The Evo continues to be a sport model aimed t mountaineers but it does the same job and fixes to wider range of belt widths. Courant's Large Honos (above right) comes in a fetching blue, red or yellow (as does the small version) and is unusual in having a wire retaining loop on the webbing hook as well as a sliding plastic keeper on the gate that you can move down to act as a lock. The latest metal tool-holding incarnations are alloy and becoming quite complex with locking gates and screw-on belt attachment (Left). Some of the older models can still hold their own though and this Treerunner folding model (right) overcomes the problem of taking up space unnecessarily and unwanted hang-ups by folding flat to the harness when not in use. Some of the plastic models have 'Not Load Bearing' emblazoned on them. Not surprising since they're plastic but so do the latest generation of metal carriers. This warning refers to the possibility of someone hooking their fadass directly onto one and trying to hang on it. Non-living loads like your tools are absolutely fine.



In their original, modified carabiner form, you have the sport climbing fraternity and ice climbers in particular to thank for this handy genre of tool clips intended to keep your rack lighter (and cheaper) and clip and unclip ice screws or chocks and cams (pro) quickly and easily. Consequently, a number of the models here are aimed at mountaineering but we've included them because they do the same job. You'll notice that a number of designs have a broad, top surface with a prominent lip above the gate, while others have a heavily ribbed top surface. This is for stacking items safely out of the way so that you can extract another item while still attached within the hook. This evolved from the sport requirement for racking multiple sizes of ice-screws and pro but it works for any multiple items like spare carabiners.

Ultimately, the highest strength and toughest items are the chainsaw hooks from *Treerunner/Protekt* and *Krok* (russian models currently sanctioned so not listed) and the latest generation of all-alloy models like *CMI's Shembiners*, *DMM's Vault*, *Rock Exotica's Transporter* and the newest model, *Notch's Swinger* (pic above-right) which has a locking gate that opens outwards and inwards. (NB: the *Husqvarna* all metal hook was replaced by the interesting plastic-

cased hook shown on the right aimed at forestry rather than arb and by a *CariHook* made by *Petzl*). They're undoubtedly the most robust options, it's just a question of whether the extra cost, weight and bulk on your harness is preferable to the cheap and light plastic models. Many harnesses have sewn tabs specifically to take a *Caritool* or other suitably sized carabiner and the iconic *Teufelburger TreeMotion* harnesses are basically one big *Caritool* carrier. But as we've mentioned, the big difference between a standard carabiner and the models in this guide is that they are purpose-designed tool carriers with a stabilising element that keeps them firm and correctly oriented on ANY suitably sized harness accessory webbing. Most models have an integral keeper along the spine that clips over the webbing but others like the *Singing Rock Porter* (left), *CT Truck* and *Camp Hub* have a simple straight, often flattened, spine with an add-on rubber 'keeper' that weighs about 4g if you're counting and enables the hook to fit most harness webbing more firmly.

Be aware that no tool clip will fit ALL webbing, some will fit the now standard 45mm but not the older standard 50mm/2" webbing. One model, the *Petzl Caritool Evo* (right) has, as the name suggest, evolved



Security Cord attachment eye.
Note that the holes in the Shembiner are actually for machining purposes but could equally function as cord attachment eyes for securing lose items.
This Treehog model has a **web securing clip** and an **open web slot** so it could fit a wider belt than the recommended 45mm.

Be wary of larger metal hooks (in particular) standing proud of webbing with narrow waist bands. This Singing Rock harness has extra wide padding. Also ensure that you do NOT clip into load bearing webbing and cause personal injury in a fall.

Lanyard/Carabiner attachment eye.
Amazingly, CMI does not quote a WLL for either Shembiner model but expect a minimum of 20kg/44lb



since our last GUIDE and now has an elastic cord to fit the widest range of webbing in our guide. All of these dedicated tool hooks are designed to firmly grasp webbing and limit rotation of the hook when clipping or unclipping gear. The original *Caritool* has plastic barbs on its web clip, the *Camp Hub* has a profiled and ribbed spine, the new *Courant Honos* has a retaining clip to 'lock' the webbing into the retainer as does the *Treehog TH1035* (top right) and the new *Edelrid SML3* (right). Some of the metal carriers are actually screwed onto your harness so they ain't going anywhere, actually, two plates are screwed together onto the accessory webbing rather than actually screwing into life-support webbing but you knew what we meant. This immobility is particularly important when you're hanging on with one hand while trying to clip or unclip vital equipment including your chainsaw. The best carriers need to be unobtrusive on the harness, easy to clip and unclip but also be absolutely secure both in terms of the attachment to the harness and keeping the equipment safe when it's clipped in, no matter what mystical



vigorous manoeuvring you undertake on the rope. A lighter-duty plastic model will break more readily when overloaded so is less of a hang-up risk than the heavier-duty models which can carry a small elephant. With this in mind, the very strong russian *Krok* model (right)



UPDATED April '24

has had the keeper on the nose removed. The gate will still close to keep your carried items safe but if loaded over 110kg or 150kg respectively for the two models will bend and release you. The CAMP Kilo too will release at 150kg in the event of a hang-up. On the other hand, if you've just cut your rope and are about to hurtle through the canopy to certain death, you might be glad of the open hook and strength of something like a *Shembiner* or Eyolf's Hake snagging a branch on the way down.

If you look at the Petzl *Caritool* and the *Courant Honos* in the title pictures you'll notice an eye in the top left corner and at the bottom, respectively and you'll also find this or some form of captive eye on other models like the *Treehog* and the *Recoil* hook which is more of a tool hanger. The eye is for attaching a cord or full size lanyard to your gear so that you don't immediately drop it as soon as you've taken it off the hook. In the case of the *Shembiner XL* left you have the best of all worlds because it has eyes you can tie cord into, a large eye at the bottom for clipping a chainsaw lanyard into and the hook itself with a large opening, therefore easy to drop your saw onto but it has a slight 'barb' to stop your saw falling off if you invert. The other steel chainsaw hooks are easier to clip into than to unclip, as is the case with all tool clips with a sprung gate, but that's on the valid assumption that you'll need to stow the saw faster, having made a cut,



than prior to the cut when you have the time to go through the fiddlier process of unhooking. Skylotecs' *CT Hammer Lodge* (left) has a little plastic clip to hold the gate open should you prefer and the nose of the hook is nicely rounded so as not to snag anything on the way in or out.



In contrast, the *DMM Vault* (right) and *RE RE Transporter* (left) can lock closed if you prefer so that you won't lose kit regardless of the aerial gymnastics you perform. Note that the *Vault* hinges in the middle of the spine to fit webbing in from the top. The *Transporter* and *Vaults* are very much the top end of tool carriers with the *Transporter* and *Mini Vault* both bolt-equipped for a more secure, semi-permanent fixing to the harness.



IMAGES NOT TO SCALE							
MANUFACTURER	BLACK DIAMOND	BUCKINGHAM	BUCKINGHAM	CAMP	CAMP	CMI	CMI
MODEL VARIANT	Ice Clipper	2402G	BuckCarrier 2402B	Hub	Kilo	Shembiner	Shembiner
ORIGIN							
COST	£9 \$10 €8	£8 \$9 €9	£44 \$54 €55	£8 \$12 €10	£31 \$43 €36	£27 \$33 €31	£37 \$46 €
WEIGHT	35g 1.2oz	284g 10oz	68g 2.4oz	36g 1.3oz	52g 1.8oz	47g 1.6oz	60g 2.15oz
MAX LOAD	5kg 11lb	11-16kg 25-35lb*	6.8kg 15lb	5kg 11lb	20kg 44lb	n/a	n/a
GATE CLEARANCE	65mm 2.6"	23mm 0.9"	10mm 0.4"	23mm 0.9"	25mm 1"	14mm 0.55"	31mm 1.22"
DIMENSIONS height x width	105 x 50mm 4.1x2"	120 x 63mm 4.75 x 2.5"	114 x 45mm 4.5 x 1.75"	116 x 58mm 4.6 x 2.3"	118 x 72mm 4.6 x 2.9"	104 x 55mm 4.08 x 2.2"	127 x 76mm 5 x 3"
FITS to WEB SIZE...	≥60mm ≥2.4"	≥50mm ≥2"	≥50mm ≥2"	≥45mm ≥1.75"	≥45mm ≥1.75"	≥50mm ≥2"	≥50mm ≥2"
STANDARDS LOCKING	--	--	--	--	--	--	--
MATERIAL FRAME GATE	Plastic Stainless Steel	Polymer Polymer	Alloy Alloy	Plastic Stainless Steel	Alloy Stainless Steel	Alloy	Alloy
NOTES		*depending on whether the gate is closed	Comes with spacers. Can be secured with zip-tie	Rubber web keeper	Releases at 150kg in event of hang up. fixes with bolts		
WEBSITE	blackdiamondequipment.com	buckinghammfg.com	buckinghammfg.com	camp.it	camp.it	cmigearusa.com	cmigearusa.com

COSTS: Any £\$€ shown in burnt orange are currency conversions only and will not include shipping, import duty and tax

HARNESSTOOL CARRIERS

DMM's newish *Parking Lot* (pic-top) is not included here as it's not a hook/carrier by itself but it fixes to your harness and then the *Mini-Vault* or their U-shaped *Stowaway* bolts to it in various hole-positions and configurations. We haven't included *Grivel's CarryAbiner* because it is, cunningly, a regular strength snap carabiner with an add on rubber keeper, the idea being that your tool carry hook can be used as a life-bearing carabiner should the need arise. Good idea but if we included that we'd have to include virtually every snap-gate carabiner!



Something else a little different is *Petzl's Interfast* (pic right) which fits any slotted harness and enables you to drop a bag or whatever onto the hook and release it by pushing in that yellow-edged button. The hole in the bottom is for attaching a leash to whatever you're hooking on the harness.

IN THE FOLLOWING TABLES:

COSTS: include local Tax/VAT, are **approximate and rounded up**.

ORIGIN: Is the country of the 'manufacturer' but they are not necessarily the actual manufacturer of this particular product. Where we know we have put a smaller inset flag to show where it's made if different from the host flag.

MATERIALS: Some manufacturers use the word 'nylon' instead

of 'Plastic'. While they are outwardly the same, nylon is a DuPont product with strict manufacturing procedures. **WLL** is Working Load Limit but it is often the case that this figure is decidedly lower than the figure that some quote as a SWL or Safe Working Load. We tend to use only WLL these days -we always thought that was the same as SWL but maybe not so it's best to err on the side of caution when it comes to load limits. We haven't quoted an MBS/MBL Minimum Breaking Strength which is quoted by some manufacturers, because these are all non-live-load carriers so if we put a much higher breaking figure some clown is bound to try and hang off it.

GATE CLEARANCE: is the physical space between the nose and the spine through which you can fit an item - those with a bent gate will tend to have a larger opening but some don't have a gate at all, being open hooks, so these are good for larger kit and chainsaws.

FITS to WEB SIZE: is the width (or height) of webbing that the carrier can be fitted to - those that simply slot over the top like Buckingham's Kermit green hook are not as limited as those like the Vault or Camp's Kilo that have a definite containment area. Rubber keepers are also a bit more forgiving of webbing width but on the whole, most are designed for 45mm/1.75" or 50mm/2".

LOCKING: mean that the carrier can be locked once you've loaded something in so that, no matter what, it ain't going anywhere. Some might also lock it when not in use as an anti-snap precaution.

	COURANT	COURANT	DMM	DMM	DMM	DMM	EDELRID	EDELRID
	Honos sm	Honos lg	Mega Vault	Vault Lock	Vault Wire	Micro Vault	SM Clip	SM Clip 3R
Weight	£7 \$9 €8	£15 \$19 €17	£65 \$81 €75	£45 \$57 €60	£34 \$43 €45	£20 \$24 €26	£6 \$8 €7	£8 \$11 €10
Weight (g)	35g	82g	126g	72g	61g	22g	24g	41g
Weight (oz)	1.2oz	2.9oz	4.5oz	2.5oz	2.15oz	0.8oz	0.85oz	1.45oz
Strength (kg)	5kg	15kg	30kg	30kg	30kg	30kg	5kg	5kg
Strength (lb)	11lb	33lb	66lb	66lb	66lb	66lb	11lb	11lb
Webbing Width (mm)	20mm	37mm	46mm	20mm	23mm	12mm	25mm	33mm
Webbing Width (in)	0.8"	1.5"	1.8"	0.8"	0.9"	0.5"	1"	1.3"
Dimensions (mm)	112 x 65mm	150 x 92mm	147 x 88mm	111 x 56mm	111 x 56mm	68 x 35mm	85 x 58mm	118 x 56mm
Dimensions (in)	4.4 x 2.6"	6 x 3.6"	5.8 x 3.5"	4.37 x 2.2"	4.37 x 2.2"	2.7 x 1.4"	3.35 x 2.3"	4.6 x 2.2"
Gate Clearance (mm)	>45mm	>45mm	>45mm	>45mm	>45mm	>45mm	<50mm	<95mm
Gate Clearance (in)	>1.75"	>1.75"	>1.75"	>1.75"	>1.75"	>1.75"	<2"	<3.7"
Material	--	■	■	■	--	■	--	--
Material	Glass Fibre Plastic Stainless Steel	Glass Fibre Plastic Stainless Steel	Alloy Alloy	Alloy Alloy	Alloy Stainless Steel	Alloy Alloy	Plastic Stainless Steel	Nylon Stainless Steel
Notes						fixes with bolts	Made from recycled rope. Rubber web keeper	Web slot kept closed with rubber keeper
Website	mycourant.com	mycourant.com	dmmwales.com	dmmwales.com	dmmwales.com	dmmwales.com	edelrid.com	edelrid.com

IMAGES NOT TO SCALE							
MANUFACTURER	EYOLF	HONEYWELL	HONEYWELL	HUSQVARNA	HUSQVARNA	KONG	NOTCH
MODEL VARIANT	Hake	Chainsaw hook	Ch'saw hook Lg	Carry Hook	Chainsaw Hook	Owl	Swinger
ORIGIN							
COST	£15 \$18 €16	£51 \$50 €49	£40 \$50 €46	£15 \$18 €16	£12 \$17 €15	£24 \$29 €27	£72 \$80 €1
WEIGHT	56g 2oz	260g 9.2oz	190g 6.7oz	25g 0.9oz	65g 2.3oz	68g 2.4oz	136g 4.8oz
MAX LOAD	n/a	20kg 44lb	20kg 44lb	5kg 11lb	n/a	10kg 22lb	20kg 44lb
GATE CLEARANCE	33mm 1.3"	50mm 2"	54mm 2.1"	20mm 0.8"	60mm 2.4"	17mm 0.7"	26mm 1.02"
DIMENSIONS height x width	110 x 43mm 4.3 x 1.7"	160 x 67mm 6.3 x 2.6"	192 x 110mm 7.5 x 4.3"	114 x 54mm 4.5 x 2.13"	150 x 80mm 6 x 3"	172 x 92mm 6.8 x 3.6"	137 x 70mm 5.4 x 2.75"
FITS to WEB SIZE...	<80mm <3.15"	45mm 1.75"	Any	<45mm <1.75"	<80mm <3.15"	Any	<50mm <2"
STANDARDS LOCKING	--	--	--	--	--	--	--
MATERIAL FRAME GATE	Alu Alloy	Alloy Alloy	Alloy Alloy	Glass Fibre Plastic Stainless Steel	Plastic Stainless Steel	Alloy Alloy	Alloy Alloy/Stainless Steel
NOTES	lanyard/accessory hook holes=7mm		slides into web loop via hook-nose first		Intended for forestry rather than arb. Also loop-hook version	Attaches to eyes/loops with snap carabiners	Gate opens outward and inward. Lanyard chainsaw eye
WEBSITE	eyolf.ca	sps.honeywell.com	sps.honeywell.com	husqvarna.com	husqvarna.com	kong.it	notchequipment.com
IMAGES NOT TO SCALE							
MANUFACTURER	REECOIL	ROCK EMPIRE	ROCK EXOTICA	ROCK EXOTICA	SINGING ROCK	SINGING ROCK	SKYLOTEC
MODEL VARIANT	Drill-Grab	Helper	Transporter	TransporterXL	Porter	Porter XL	Hammer Lock
ORIGIN							
COST	£9 \$11 €11	£5 \$6 €6	£85 \$81 €100	£94 \$90 €110	£7 \$12 €8	£11 \$16 €14	£10 \$13 €1
WEIGHT	40g 1.4oz	28g 1oz	95g 3.4oz	142g 5oz	32g 1.13oz	80g 2.8oz	19g 0.7oz
MAX LOAD	Hook 5kg 11lb Eye*3.5kg 7.7lb	5kg 1.1lb	23kg 50 lb	23kg 50 lb	5kg 11lb	20kg 44 lb	5kg 11lb
GATE CLEARANCE	45mm 1.75"	18mm 0.7"	32mm 1.25"	48mm 1.9"	23mm 0.9"	40mm 1.6"	25mm 1"
DIMENSIONS height x width	90 x 74mm 3.5 x 2.9"	115 x 54mm 4.5 x 2.1"	142 x 80mm 5.6 x 3.15"	145 x 86mm 5.7 x 3.4"	112 x 53mm 4.4 x 2.1"	143 x 86mm 5.6 x 3.4"	101 x 43mm 4 x 1.8"
FITS to WEB SIZE...	<45mm <1.75"	<45mm <1.75"	<50mm <2"	145mm 5.7"	<75mm 3"	<75mm 3"	>45mm >1.75"
STANDARDS LOCKING	--	--	■	■	--	--	--
MATERIAL FRAME GATE	Plastic	Plastic Stainless Steel	Alloy Alloy	Alloy Alloy	Plastic Stainless Steel	Plastic Stainless Steel	Nylon Nylon
NOTES	* Lanyard eye for chainsaw or tool being used			Coming Jan 2024 180kg MBS	rubber web keeper	100kg MBS New for 2024	rubber web keeper Climbing Technology owned by Skylot
WEBSITE	recoil.com	rockempire.com	rockexotica.com	rockexotica.com	singingrock.com	singingrock.com	skylotec.com

COSTS: Any £\$€ shown in burnt orange are currency conversions only and will not include shipping, import duty and tax

HARNESSTOOL CARRIERS

								expansion column
	OMEGA PACIFIC	PETZL	PETZL	PETZL	PETZL	PROTEKT	PROTEKT	
	Deputy+	CARITOOL Sml	CARITOOL Lg	CARITOOL Evo	Interfast	TU300	AY100	
Price	£30 \$36 €34	£6 \$8 €7	£14 \$20 €16	£12 \$15 €14	£ 12 \$15 €14	£4 \$6 €5	£4 \$6 €5	
Weight	108g 3.8oz	25g 0.9oz	75g 2.6oz	40g 1.4oz	55g 1.9oz	80g 2.8oz	31g 1oz	
Capacity	22.7kg 50lb	5kg 11lb	15kg 33lb	5kg 11lb	5kg 11lb	50kg 110lb	25kg 55lb	
Width	26mm 1.02"	20mm 0.8"	45mm 1.75"	120mm 4.73"	>6mm >0.25"	27mm 1"	23mm 0.9"	
Dimensions	116.3 x 65mm 4.57 x 2.55"	114 x 54mm 4.5 x 2.13"	142 x 80mm 5.6 x 3.15"	146 x 74mm 5.75 x 2.9"	85 x 45mm 3.4 x 1.75"	112 x 50mm 4.4 x 2"	110 x 50mm 4.3 x 2"	
Depth	<45mm <1.76"	<45mm <1.75"	<45mm <1.75"	Any	<60mm <2.4"	T=35mm 1.4" wide	<60mm <2.4"	
Standards	--	--	--	--	ANSI/ISEA ■	--	--	
Material	Alloy Alloy	Glass Fibre Plastic Stainless Steel	Glass Fibre Plas- tic GFP/ Stainless Steel	Glass Fibre Plastic Stainless Steel	Nylon Nylon	Steel	Plastic Stainless Steel	
Notes	+ is a colour variant. Cost is \$10 more			Fixes with elastic cord	hinged backplate traps belt webbing	Top T-section retains hook within loop		
Website	rocknrescue.com	petzl.com	petzl.com	petzl.com	petzl.com	protekt.com	protekt.com	

	SKYLOTEC	TREEHOG	TREERUNNER	TREERUNNER
	Truck	TH1045	ChSaw Folding	ChainSaw Hook
Price	£9 \$11 €10	£11 \$14 €13	£37 \$47 €43	£34 \$42 €39
Weight	20g 0.7oz	31g 1oz	114g 4oz	260g 9.2oz
Capacity	5kg 11lb	5kg 11 lb	20kg 44 lb	20kg 44 lb
Width	25mm 1"	23mm 0.9"	30mm 1.2"	50mm 2"
Dimensions	108 x 55mm 4.25 x 2.16"	110 x 50mm 4.3 x 2"	126 x 70mm 5 x 2.75"	190 x 120mm 7.5 x 4.7"
Depth	>45mm >1.75"	≤50mm 2"	≤80mm 3.15"	≤80mm <3.15"
Standards	--	--	--	--
Material	Nylon Stainless Steel	Plastic Stainless Steel	Aluminium Aluminium	Aluminium Aluminium
Notes	rubber web keeper. Climbing Technology (Italy) owned by Skylootec		can be fixed with bolts	
Website	skylotec.com	treehog.co.uk	grube.de	grube.de

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UPDATED March '24

MULTI-POINT ANCHOR/RIGGING PLATES



Rigging plates haven't changed much from our first Market Guide in **TECHNICALRESCUE** over a dozen years ago. SMC now has the newest range with their *Origin* plates with angular holes rather than round. The *Origin TT* below is their answer to RE's *Bolt*. There are around four times more plates now thanks to three key changes. The first is that we're seeing more round, wheel-style plates; Canada's *Eyolf* were first (pic top) while DMM introduced a new concept with the more arb-oriented *Hub*, *ISC* have the *Halo* (title image) and *Kong*, *Grivel*, *SMC* and *CMI* all have circular plates. These are all slick looking wheel hubs and more will follow. Second, having identified a need for anchor/rig plates in their range, larger distributors have them made on their behalf by bulk manufacturers like *ISC* in Wales or one of the Italian companies or in China/Taiwan. Consequently you will recognise a lot of the same plates under different names, sometimes the same plate will be slightly customised, perhaps an extra eye or two or the shape changed a bit but they're essentially the same plates despite some odd differences in weight and size (we've mostly used the specifications listed by the name on the plate but if in doubt look for the source manufacturer). The other change is the number of Chinese manufacturers now quite adept at making climbing hardware.

We've traditionally steered clear of including Chinese and Taiwanese manufacturers

under their own name because of trademark/copyright/design infringement issues with copycat equipment flooding the market and not always to

the best of standards. *Lixada* /*MagiDeal* for instance market a plate that is identical to the *ISC* range down to the odd shaped indents. But the Chinese and Taiwanese are just as capable as anyone else of making high quality goods, it's

the customer demand for cheaper options and reducing the spec of the equipment they're asking to be made that has been the problem. If you spec high, they'll make high-spec gear. It's refreshing to see that *Fusion* in California and *Beal Ropes* make no bones about the fact that their plates are made in Taiwan. So we've speculatively included *Anpen* from China but not yet others like *GM* or *Xinda* even though they are making very similar plates for better known brands. Remember that in our tables, the country of ORIGIN is not necessarily the country of manufacture - where we know - there's a small inset flag. Watch out for plates from theatrical rigging (which might be pretty good) and from bondage. We were almost caught out including one called a 'Boner' or something equally dubious that was stronger than most in this list!

The images in this introduction are NOT to scale but they are roughly to scale in the tables because there is a big difference in size, weight and cost between a small 4-hole plate and a giant 12-hole plate and especially with the 3D models which we discussed in more details later because there is still some confusion about so-called 3-D rigging.

NOT INCLUDED IN THIS GUIDE

Originally only seen in rescue stretcher rigs, rigging rings are endemic in arb and we have **NOT** included them here even though you can attach multiple carabiners because it doesn't do much 'organising'. We also haven't included the excellent *X-Rigging* rings from David Driver or 'textile' anchors like the *Notch Bone* (right) which are basically knot replacements to save you time



Images in this introduction NOT to scale

www.arbclimber.com

rather than rigging organisers. There are many rigging organisers incorporated into carabiners like this *Grivel Vlad*, *Rock Exotica's* huge *Kootenay Carriage* knot-passing pulley and their more diminutive *Hydra*. We'll try to incorporate all of these into a later update but for the moment we're dealing with plates and shapes full of holes rather than as a secondary use on other products. Finally, we haven't included the so-called splicing plates (*MSA* pic left) but they could certainly be used as organiser plates despite their in-line characteristics which limits your options somewhat.



PLATE DESIGN

The basic job of a rigging plate hasn't changed; tidying, organising and best of all ensuring correct directional loading but the rigging plate is so much more than simply an organiser for the anchor end of your rope systems. Originally, teams got their local metalworker to fabricate metal plates of all types, mainly stainless steel and alloy. These were cut to shape, drilled to accept carabiners and if you were lucky, deburred. They were mostly triangular, intended to have a number of ropes or webbing collected

at one point which would then be securely anchored. My own team procured bearing plates uncannily similar to *DMM's Hub* (above right), which were heavy but served us well and I'm certain there were plenty of other home-grown innovations. The do-it-yourself approach was overtaken in the late 80's when *Russ Anderson*, *CMC*, *SMC* and *Rock Exotica* in particular started producing quality machined and anodised plates that could accept multiple anchor connections and redistribute them to several load and/or belay ropes. These were generally at the larger end of things but in the pocket-sized versions, *Rock Exotica* (rights later bought by *Petzl*) came up with a model that became the industry watch-word for rigging plates due to its shape- the *Paw* (title opposite) That particular paw design still exists as the *Tri-Rig* and *Penta* plate by *Rock Exotica* while the *Paw* name has been retained by *Petzl*. The original *Paw* was the forerunner of a whole raft of designs that used a large collection eye capable of accepting the largest of carabiners or maillons or multiples thereof. This presents a slight contradiction as the large eye may be overcrowded with carabiners causing a return to unruly and untidy rigging rather than preventing jamming of carabiners against each other. Some say that this particular design problem has been addressed with the tear-drop eye design which purports to prevent carabiner jamming but its hard to see how that stops you cramming in more metal than you should. In reality the teardrop makes clipping larger carabiners much easier than with a small hole. Individual holes on larger plates addresses the original problem of overcrowded hardware by increasing separation. Another thing that has changed is a move away from straight edged eyes intended just for carabiners and towards more rounded edges for direct tying of rope and webbing. This is exemplified by the gentle curves of *Kong's Rally Bent* (right), *Skylotec's CT Cheese* or



the *Shizll* plate (below right) or by the design complexities of *Rock Exotica* with their *RockStar* (titles opposite) and *DMM* with their *HUBs* (sml version above). The newest model, *CMC's Squid* (right) uses an element of the *Rockstar's* design, the yolk-shape, to produce an angled, 3-way attachment perfectly suited to the use of double devices. Some models are better suited to 3-dimensional rigging aimed primarily at arborists, a concept that baffles some so we have a separate text box later for some further explanation. At the less complex end of things the simple 4 or 5-hole mini plates like the *Petzl Paw* are still held by some users to be the ONLY size you need since anything more means your rigging is too complicated!



LOADING

In this era of system redundancy, a dilemma faces users of rigging plates which are often treated as 'bombproof' with a number of collected rope systems terminating in one large eye. This means that if that one collection eye fails the whole system fails. In many cases the sturdiest stainless steel and 7075 T6 aircraft alloy plates probably are about as bombproof as things get but there's no accounting for metal fatigue and stress fractures and sheer bad luck so local or company protocols may mandate that rigging plates should always have a built-in bypass to provide redundancy. This can be the simple application of a sling running through some or all of the connected carabiners or on smaller plates an additional large carabiner can be clipped between the top and bottom carabiners (but ensuring that the plate is still taking all the load). Alternatively, *DMMs Bat Plates* can be bolted together to give you two plates in one and *Edelrid's Maggi* already is two plates bolted together - how bombproof do you want it?

One thing that is often overlooked is that the quoted Minimum Breaking Strength of, for instance 45kN, refers to any ONE eye acting as the main collection eye and it may ONLY refer to the main collection eye. So it doesn't mean that you can load ALL of the eyes to 45kN at the same time because clearly one or more eyes needs to be connected to an anchor and would be overwhelmed once it's own capacity of 45kN is



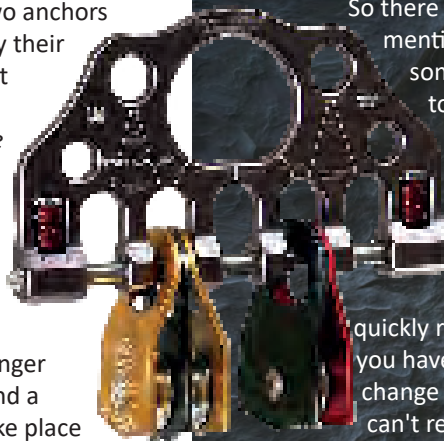
exceeded. You must treat that MBS figure as the maximum total load that can be **TRANSMITTED** through the plate via **the main collection eye** - therefore, in the 45kN example, if you had 6 eyes evenly connecting to ONE central collection eye, each of those eyes should only be loaded to 750 kg/1650 lbs or preferably less, or whatever combination totals around 4500kg/9900lbs. If you add another anchor connection to the collection eye (or to a separate eye if you have any spare), this calculation of input forces can virtually double providing the load is fairly evenly divided and certainly if the two anchors are equally loaded. *Edelrid's Master Plates* specify their smaller eyes with a maximum loading of 10kN but we would be surprised if that is the actual MBS rather than an indication of maximum *cumulative* loading.

A key aspect of loading, and something the rigging plates were designed to assist with, is torquing of your carabiners ie. where they try to twist in-situ and apply uneven load to certain parts and are actually bent by contact with a stronger component. In reality it takes a hell of a lot to bend a carabiner but that's the action that is trying to take place and must be avoided at all costs because what actually happens is the weaker gate pins will fail or the nose may snap. A rigging plate spaces components out but they can still rotate in the plate's eye so you're never completely out of the woods, so to speak, unless you incorporate a swivel or an integrated swivel-pulley or swivel-carabiner. Careful selection of the rigging plate design suitable for your particular system is vital. *DMM* for instance use kidney-shaped eyes to allow 'sliding' and better load balance while *SMC* use elongated eyes for easier clipping. The smoothest edged plates can even be used as a belay plate. *Rock Exotica* took things to the ultimate with the *UFO*, a solid cube of holes enabling all four corners to be connected although we struggled to find the perfect alignment for a stretcher rig with our existing carabiners and had to purchase custom-shaped and fitting carabiners to avoid the very torquing we were using the *UFO* to avoid in the first place. The *UFO* was superseded by the *Rockstar*.

APPLICATIONS

1) MAIN ANCHOR

Enables connection of all the various ropes and safeties and haul systems etc. into their own positions on the same collection point which can then be attached to one or several anchors. This is where the largest of plates excel with a dozen or more eyes to utilise. The bigger plates have large indents to help reduce weight but some, like the now discontinued *Rock Exotica Se7en*, pushed these indents all the way through to create irregular holes that look as though they can be pushed into action using either webbing or very large carabiners. However, be careful that such 'holes' are actually designed to take load.



ROCK EXOTICA

Rock Thompson and his band of metal wizards deserve special mention because, along with *DMM* they have come up with rigging ideas that are well outside of the conventional box. These aren't necessarily the most applicable to arb but it's actually arb work and to some extent rope access that is pushing the technical boundaries of rigging rather than rescue.

So there are four 'plates' worthy of separate mention although the term 'plate', implying something rather flat, can only be applied to the Bolt. We were quite excited by the prospect of the **Bolt** with a removable stainless anchor pin (or bolt) meaning that you could load hardware like pulleys and cams directly without the need for a carabiner. However, having got our mitts on one we quickly realised that this was only a bonus once you have a set-up that you're never going to change while in use because you obviously can't remove any of the hardware that's placed directly on that pin/bolt once loaded.

In the case of pulleys you also can't add in rope unless you laboriously thread it from one end. So it does require a degree of pre-planning but if you get that right first time the Bolt does indeed save on carabiners, working space and can improve orientation of your hardware. This has, however spawned the new *SMC Origin TT* (pic title page) designed for twin tensioned rope (a rescue thing) which has a two-part bolt allowing at least one of the two sets of connections to be removed/added during work though you would need to be mindful of load balance.

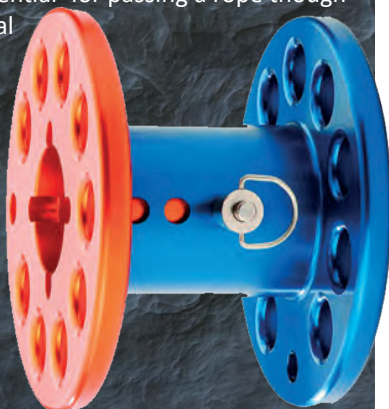
The cubist *UFO* was discontinued a decade ago with the mantle taken up by its lighter cousin the *Rockstar* which enables connection of carabiners in all directions so they are truly 3-dimensional before you even apply a rope. The problem we had with the *UFO* in particular was the ease with which you could adversely torque a carabiner. In the picture on the right you can see how a simple 2-dimensional rigging option with 3-point loading on a single collection point can result in torquing of the carabiner at the points circled in red. In this case neither of the outer carabiners can be loaded directly downwards or indeed even at the angle they are now without applying unacceptable load near the nose of the carabiners. In the carabiner on the right even releasing the screwgate didn't alleviate the angle enough and in fact made it substantially weaker as it twisted on the nose pin when the screw might have taken at least some of the load. You really have to be on



the ball when it comes to ensuring that they load correctly because before load is applied, each carabiner is loose and trying to go with gravity from a different part of the cube. It can be like herding cats to orientate multiple directions simultaneously. It is again, all about pre-planning and systematic loading rather than winging it, so the UFO wasn't really a 'rig-&-forget' tool. However, smart cookies that they are, R.E. introduced the Rockstar in 2013 to take over from the UFO and it has fewer 'walls' to impede the carabiner hang so there's less potential for torquing of the carabiners.



The largest offering in our list is the beautifully crafted AZORP and we don't just say that because it was designed by our US Rope Editor Reed Thorne. In Rock's hands Reed's original napkin design is again a work of art. It consists of two separate plates that pin together to form a giant cotton reel or rope drum-looking device. I'm not sure that it was part of Reed's original thinking (because this was intended as an accessory for a tripod head or monopod system) but 3D aficionados will already have spotted the potential for passing a rope through the spindle intended for metal

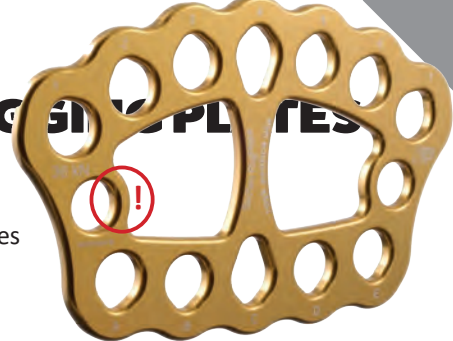


rope-festival going on. As a set of wheels, it will sit nicely on the ground still allowing access to most of the upper holes. At the very least if you stand it back on end, the bottom plate acts as a foot keeping the top plate off the floor so that your carabiners load nicely in free space rather than jammed against the ground. Finally, you can separate the two halves and have two entirely functional plates albeit with a round lump hanging out the middle of each. Having discussed this with Reed, he's quite keen to see you incorporating a short extension pole so that you can experiment with jamming between two trees with the AZORP rigged in the middle. If your rigging looks like the set-up below you're probably trying to do too much in one go! AZORP is available in the US & Canada through CMC RESCUE and worldwide via Rock Exotica stockists. Check out TECHNICAL RESCUE 71 for several pages of ideas using the AZORP.



ANCHORS/RIGGING PLATES

If they're surrounded by a thickness of material equal to or greater than the regular eyes then you're probably OK.



2) BRIDGE STRAP ORGANISER

Now a feature of many arb harnesses like this *Weaver Denali*, a small rigging plate attaches the bridge to the harness, waist belt and/or leg loops leaving one or two eyes for whatever takes your fancy.

3) MAIN HARNESS CONNECTION (PICK-OFF RIG)

Tidy up your personal attachments from your main hard-point or bridge with the smallest plates as these will provide separate connection points for attachment to your descender/ascender rig, pick-off (rescue) sling and/or pulley system, and most importantly will ensure that there is no 3-way loading of carabiners which has traditionally been a necessary evil of the standard pick-off rescue procedure. Mini plates are so small and light there is no reason for the lightest of climbing rigs not to have one. I have a harness from Swedish company *Actsafe* that actually already has a multi-eye rigging plate instead of a normal D-ring MHP so this may yet become more popular.



4) HIGHLINE/ZIPLINE 'TROLLEY' ORGANISER.

A plate makes a great trolley attachment for connecting pulleys to the main rope and pulleys, control lines to either side and your own array of connections beneath. *ISC's* photo in the titles shows what we mean by 'trolley organiser'. Of course some pulleys, notably the *Kootenay Carriage* and *DMM's 'Hitch Climber'* already incorporate rigging points into the cheeks which may negate the need for a separate plate.

5) HAUL SYSTEMS

A plate can give you better alignment of your prusik (if you are using it for progress capture) bypassing the top pulley and onto the rope. Quite often you see the prusik bent around the pulley block in an effort to connect back into the main supporting carabiner.

Your belay and redirect pulley(s) can also be better separated and provide more direct alignment with the load. Use swivels or swivel-integrated pulleys to ensure the carabiners or pulley eye aren't subjected to inappropriate torque loading during the haul.



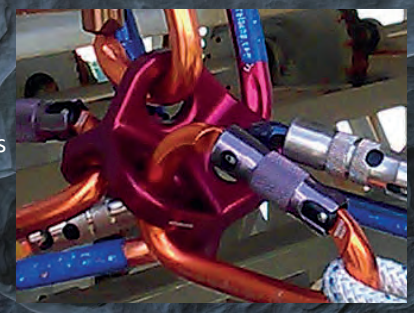


3-D RIGGING



Nothing to be afraid of here, 3-D rigging is simply the means to rig or deviate at 90 degrees to your anchor point(s) at the same time as your other ropes or connections continue in the usual directions away from the anchor. *DMM* and those cunning *Treemagineers* who, incidentally, are far too clever for their own good, started the 3D rigging 'trend' with the awesome *Hubs*. These were originally confusingly sized as a medium and large implying that there should be a small - maybe they always intended to create a smaller one but ran out of T7075 alloy because these are almost as bulky as those old steel bearing plates mentioned earlier. 2-dimensional rigging (an unorthodox example top-right) allows you to connect to an anchor at one end and then distribute out at the other end. You might change the angle that the connection comes into the plate but the loading is ultimately 2-dimensional, transmitted from front to back through the flat or flattish plate. You can rig 3-dimensionally through most standard plates but the contact edges are thin and loadings are outside of the norm which is why many of the plates listed in our tables don't have the '3-D' column ticked. What the **Hub** did was to provide the fattest, most smoothly rounded holes on the planet, in particular the central hole, to allow direct connection of a rope and webbing. In this case it allows the rope to pass straight through, in effect you thread

the *Hub* onto the rope which can then allow you to position the side loaded eyes wherever needed or redirect the ropes running through it as in the picture on the right. CNC milling and/or hot-forging of the eyes gives them this large, smooth radius and allows direct use of rope and webbing without the need for carabiners. Some 2-D plates are better suited to 3-D rigging than others for instance the *ISC Halo*, *SMC Vortex* and the *Grivel 9* which is concave or convex depending on which side you view it from. 3-D rigging as originally envisaged by *Treemagineers*, usually takes the form of the hub running along a rope and then rigging lines radiating out laterally to that. The centre eye has an enlarged lip for really smooth and high-strength rope-running and the external eyes can take carabiners or direct web connection. *Rock Exotica's* own take on things was an actual three-dimensional lump of rigging plate - the *UFO* and *Rockstar*. These require carabiner connection but again enable your ropes and webbing to fly off in all directions, 360 degrees and maintain an acceptable loading on all components (aside from the risk of torquing discussed previously) see pic below. Talking of torque, Canadian company *Eyolf* has the *SnoFlake L* and *Kong* have the *DiscoHub* as large, round multi-holed flat plates that could exhibit a torque problem on all but the outer eyes. Specialist 3D anchors like the *Hub* and *Rockstar* and *CMI's* new *Neptune* (above), can obviously still be used as a regular 2-dimensional rig-point but this is much easier with the flat *Hub* than it is with the *Rockstar* where you need to monitor the carabiner contact points.



STANDARDS

A quick word about standards because European standards that are usually the 'go-to' for technical definitions and adherence to quality are in something of a state of flux. They now state that rigging plates are not fully covered by rigid and flexible anchor standards EN795 and 354 which is what most plates mean when they have a CE marked on it (although EN362 could apply to Bolt and OriginTT as they are openable). Consequently a 'temporary fix in 2018 was via a PPE directive PPE-R/11.114 version 1 that uses parts of EN 12275 and EN 365 as well as applicable parts of EN 795 and EN 354! I think we'll just put CE and leave that to the manufacturers and reputable stockists even though many will show a 'CE' mark that is not strictly accurate.

CONCLUSIONS

Back to operational stuff and don't assume that any old rigging plate will suit your task - the chances are you'll have a set rig that seldom changes and you should be able to predetermine the number of top and bottom eyes you will need to negate

torquing or 'unbalancing' the plate. A bit of see-sawing due to load coming on and off of various components is expected and fine but if torquing remains a problem (twisting under load) then simply add a swivel, there are now several excellent designs available. Also think about using load release straps like a *Mariners Hitch* for critical tensioned elements that might need to be slackened off independently of other components on your plate. Don't be afraid to invert the plate if it suits your purposes to improve directional loading. Nobody mandates that the concave face or the small eyes have to point towards the load or vice-versa – use whatever orientation best fits your system.

In the following tables, **£\$ Prices shown in orange** are a currency conversion guide only. They do not take into account shipping and import duty etc. that will likely increase that price.

The **Smallest Dimension of the Largest Eye** refers to the largest round bar section that can fit because many of these are an odd shape or tapered.

Alu = Aluminium Alloy

rock exotica

GEAR FOR THE Z AXIS

rockO WireEye

We've taken our popular oval carabiner and added the "wire eye" to keep your gear, lanyards and lines where they belong.

rockStar

The rockStar is now the choice for compact and lightweight 3-dimensional rigging.



BOLT
Connect lines or pulleys without carabiners.

rockSteel
Updated design yields 50 kN MBS NFPA-G and ANSI 2007 rated.

rockGrab
Slimmer and lighter than the competition for snag-free use.

ORCA
Opens like a non-locker, closes like an autolock.

Omni
Swivel pulley with moveable sideplate, available in multiple sizes.

Unicender
Switch easily from DdRT to SRT. Attaches mid-line.



26 Years of innovation and quality design. Made in USA



images approximately to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	MATERIAL	PLA DEP
		B03	ANPEN		£9* \$10* €10*	53g 1.9oz	Alu	5m 0.2
		B04	ANPEN		£19* \$22* €21*	210g 7.4oz	Alu	8m 0.3
		B05	ANPEN		£31* \$27* €26*	250g 8.8oz	Alu	8m 0.3
		B70	ANPEN		£32* \$39* €37*	230g 8.1oz	Alu	10m 0.4
		B80	ANPEN		£27* \$32* €31*	182g 6.4oz	Alu	10m 0.4
		B130	ANPEN		£82* \$99* €94*	452g 15.9oz	Alu	9.5m 0.4
		THRP1	ARBORTEC/ TREEHOG		£17 \$21 €20	93g 3.3oz	Alu	10m 0.4
		THRP2	ARBORTEC/ TREEHOG		£30 \$37 €35	240g 8.5oz	Alu	10m 0.4
		THRP3	ARBORTEC/ TREEHOG		£50 \$59 €58	500g 1.1lb	Alu	10m 0.4
		AirPort4	BEAL		£31 \$38 €35	92g 3.25oz	Alu	8m 0.3
		AirPort8	BEAL		£47 \$58 €54	188g 6.6oz	Alu	10m 0.4
		MultiAnchor5 1269	CAMP		£43 \$53 €40	70g 2.5oz	Alu	8m 0.3
		MultiAnchor8 126901	CAMP		£69 \$85 €70	245g 8.6oz	Alu	12m 0.4
		MultiAnchor12 126902	CAMP		£105 \$130 €100	590g 1.3 lb	Alu	12m 0.4
		Hexa RP2 DISCONTINUED	CAPITAL SAFETY/ DBI SALA/3M		£59 A\$113 \$73	228g 8oz	Alu	10m 0.3
		Deca RP3 DISCONTINUED	CAPITAL SAFETY/ DBI SALA/3M		£84 A\$161 \$104	410g 14.5oz	Alu	10m 0.3
		Tetra RP1 DISCONTINUED	CAPITAL SAFETY/ DBI SALA/3M		£84 A\$161 \$104	564g 1.25 lb	Alu	10m 0.3

NOTES: COST: Approx & in oca ax, AT, SE or ge are a currency conversion guide only not the actual sale price MBS or MBL Minimum Bre

ANCHOR/RIGGING PLATES

PLATE THICKNESS	DIMENSIONS	STANDARDS	MBS <small>approx 10x WWL</small>	MIN HOLE DIAM	SMALLEST DIMENSION OF LARGEST EYE	HOLES LARGE EYE(S)	3D	OTHER COLOURS	NOTES	WWW.
19mm 3/4"	90 x 82mm 3.5 x 3.2"	CE	40kN 8992 lbf	20mm 0.75"	30mm 1.2"	3 +1			* Price is retail FOB China so excludes shipping/import duty etc.	en.anpen.net
19mm 3/4"	156 x 121mm 6.1 x 4.8"	CE	50kN 11240 lbf	20mm 0.75"	52mm 2"	4 +1			* Price is retail FOB China so excludes shipping/import duty etc.	en.anpen.net
19mm 3/4"	173 x 113mm 6.8 x 4.5"	CE	50kN 11240 lbf	20mm 0.75"	40mm 1.6"	5 +1			* Price is retail FOB China so excludes shipping/import duty etc.	en.anpen.net
19mm 3/4"	158 x 100mm 6.25 x 3.9"	CE	45kN 10116lbs	20mm 0.75"	40mm 1.6"	7 +1			* Price is retail FOB China so excludes shipping/import duty etc.	en.anpen.net
19mm 3/4"	173 x 85mm 6.8 x 3.4"	CE	45kN 10116lbs	20mm 0.75"	40mm 1.6"	7 +1			* Price is retail FOB China so excludes shipping/import duty etc.	en.anpen.net
19mm 3/4"	247 x 150mm 9.8 x 5.9"	CE	45kN 10116lbs	19mm 0.75"	65mm 2.6"	13 +2			* Price is retail FOB China so excludes shipping/import duty etc.	en.anpen.net
19mm 3/4"	90 x 84mm 3.5 x 3.3"	CE NFPA-G	36kN 809 lbf	19mm 0.75"	36mm 1.4"	3 +1				treehog.co.uk
19mm 3/4"	159 x 100mm 6.25 x 3.9"	CE	40kN 8993 lbf	19mm 0.75"	38mm 1.5"	7 +1				treehog.co.uk
19mm 3/4"	248 x 149mm 9.8 x 5.9"	CE	50kN 11240 lbf	19mm 0.75"	66mm 2.6"	13 +1				treehog.co.uk
19mm 3/4"	83 x 85mm 3.25 x 3.4"	CE	45kN 10116 lbf	20mm 0.75"	30mm 1.2"	3 +1			Also branded as Edelweiss	beal-pro.com
19mm 3/4"	174x85mm 6.8 x 3.4"	CE	45kN 10116 lbf	20mm 0.75"	30mm 1.2"	7 +1				beal-pro.com
19mm 3/4"	93 x 72mm 3.6 x 2.8"	CE EAC	36kN 8093lbs	19mm 0.75"	19mm 0.75"	5				camp.it
19mm 3/4"	149 x 86mm 5.8 x 3.3"	CE EAC	45kN 10116lbs	19mm 0.75"	19mm 0.75"	8				camp.it
19mm 3/4"	227 x 128mm 8.9 x 5"	CE EAC	45kN 10116lbs	19mm 0.75"	19mm 0.75"	12				camp.it
19mm 3/4"	153 x 101mm 6 x 4"	NFPA G	50kN 11240lbs	19mm 0.75"	27mm 1.1"	4 +2			Also branded as SRTE or Rollgliss Technical Rescue. 5-hole Penta ALA Rock Exotica's Penta also discontinued.	capitalsafety.com
19mm 3/4"	170 x 123mm 6.7 x 4.8"	NFPA G	50kN 11240 lbf	22mm	25mm 1"	8 +2			Also branded as SRTE or Rollgliss Technical Rescue. Rubber spacers protect surfaces & connector when flush with ground.	capitalsafety.com
19mm 3/4"	245 x 125mm 9.6 x 4.9"	NFPA G	50kN 11240 lbf	19mm 0.75"	19mm 0.75"	14			Also branded as SRTE or Rollgliss Technical Rescue	capitalsafety.com

Working Load represents approximately 10 times the WLL Working Load Limit **HYPHEN-** = not applicable **N/A** = info Not Available/not given

images approximately to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	MATERIAL	PLA DEP
		Micro Anchor Plate 300623	CMC		£33 \$42 €38	74g 2.6oz	Alu	8.2m 0.3
		Anchor Plate 30061	CMC		£61 \$79 €71	204g 7.4oz	Alu	6.7m 0.2
		Anchor Plate 300615	CMC		£71 \$93 €83	278g 9.8oz	Stainless Steel	3m 0.1
		AZORP Arizona Omni Rigging Pod	CMC		£na/770* \$343/650* €na/896*	1400g 3 lb	7075 Alloy	12m 0.4
		SQUID	CMC		£120 \$149 €137	240g 8.5oz	Alu	51m 2.0
		RigPlat4	CMI		£37 \$48 €43	91g 3.2oz	Alu	9.5m 0.37
		RigPlat1	CMI		£78 \$101 €90	190g 6.7oz	Aircraft Alu	9.5m 0.37
		RigPlat2	CMI		£83 \$108 €97	245g 8.6oz	Stainless Steel	3m 0.1
		Maxi/RigPlat3	CMI		£104 \$136 €121	500g 1.1 lb	Aircraft Alu	9.5m 0.3
		Neptune	CMI		£125 \$163 €145	363g 0.8lb	Aircraft Alu	41m 1.62
		Focus	CONTERRA		£35 \$45 €40	270g 9.5oz	Alu	8.9m 0.3
		Anchor Multiplier Small	COURANT		£20 \$24 €22	93g 3.3oz	Alu	9.8m 0.3
		Anchor Multiplier Med	COURANT		£32 \$39 €37	202g 7oz	Alu	9.5m 0.3
		Anchor Multiplier Large	COURANT		£67 \$81 €76	422g 1 lb	Alu	10m 0.3
		Hub Small	DMM		£83 \$160 €118	260g 9.2oz	Alu	* <20 <0.
		Hub Large	DMM		£125 \$250 €178	550g 1.2 lb	Alu	* <20 <0.

NOTES: **COST:** Approx & inc local tax/VAT **£/\$/€** in orange are a currency conversion guide only not the actual sale price **MBS or MBL Minimum Bre**

ANCHOR/RIGGING PLATES

DEPTH	DIMENSIONS	STANDARDS	MBS <small>approx 10x WLL</small>	MIN HOLE DIAM	SMALLEST DIMENSION of LARGEST EYE	HOLES LARGE EYE(S)	3D	OTHER COLOURS	NOTES	WWW.
25mm 2"	89 x 70mm 3.5 x 2.75"	NFPA G	46kN 10341lbf	16mm 0.6"	25mm 1"	3 +1				cmcpro.com
38mm 1.5"	158 x 117mm 6.2 x 4.6"	NFPA G	45kN 10116lbf	22mm 0.9"	51mm 2"	4 +1				cmcpro.com
38mm 1.5"	158 x 117mm 6.2 x 4.6"	NFPA G	43kN 9666lbf	22mm 0.9"	51mm 2"	4 +1				cmcpro.com
38mm 1.5"	165 x >140mm 6.5 x >5.5"	NFPA G	67kN 15062lbf	22mm 0.9"	50mm 2"	18 +1 +2	■		\$650* =AZORP kit 2 rig plates/pins.. Cord and rope can be passed through central spindle. Outer sleeve opening 60mm	cmcpro.com (for North American Sales)
38mm 1.5"	104 x 84mm 4.1 x 3.3"	CE NFPA G*T	TBA	TBA	TBA	3			New 2023 Model * G+ certain configurations only	cmcpro.com
38mm 1.5"	88 x 70mm 3.5 x 2.75"	NO	89kN 20007lb	20mm 0.75"	20mm 0.75"	4				cmi-gear.com
38mm 1.5"	171 x 127mm 6.75 x 5"	exceeds NFPA G but not certified	57.8kN 13000lb	23mm 0.9"	57mm 2.25"	5 +1				cmi-gear.com
38mm 1.5"	171 x 127mm 6.75 x 5"	exceeds NFPA G but not certified	57.8kN 13000lb	23mm 0.9"	57mm 2.25"	5 +1				cmi-gear.com
38mm 1.5"	241 x 120mm 9.5 x 4.75"	exceeds NFPA G but not certified	57kN 13000lb	20mm 0.75"	57mm 2.5"	11 +1 +1*			* 1 x 3" webbing eye	cmi-gear.com
38mm 1.5"	100mm 4"		40.1kN 9000lbf	14mm 0.55"	30mm 1.2"	6 +1	■			cmi-gear.com
38mm 1.5"	152 x 121mm 6 x 4.75"	NFPA G	40kN 8993lbf	24mm 0.95"	30mm 1.2"	6 +2	■			conterra-inc.com
38mm 1.5"	91 x 84mm 3.5 x 3.3"	CE NFPA-G	36kN 8093lbf	20mm 3/4"	36mm 1.4"	3 +1		■	Individually marked	mycourant.com
38mm 1.5"	166 x 108mm 6.5 x 4.25"	CE NFPA G	40kN 8993lbf	20mm 0.75"	38mm 1.5"	7 +1		■	Individually marked	mycourant.com
38mm 1.5"	249 x 150mm 9.8 x 5.9"	CE NFPA G	45kN 10116lbf	20mm 0.75"	66mm 2.6"	13 +1			Individually marked	mycourant.com
38mm 1.5"	119mm 4.7"	CE RFU 11.114 V1	45/80kN 10116 lbf 16186 lbf	16mm 0.63"	24mm 0.94"	4** +1	■	■	*Reduces to 10mm depth. Individually marked. 80kN load = central eye. ** eyes for web/rope 45mm wide. 4x 6mm eyes aesthetic only	dmmprofessional.com
38mm 1.5"	169mm 6.6"	CE RFU 11.114 V1	150/45kN 10116lbf 33721lbf	19mm 0.75"	48mm 1.9"	4 +1 +4*	■	■	* Plate thickness reduces to 10mm. Individually marked. 80kN load = central eye. * web eyes 43mm wide	dmmprofessional.com
										expansion row

Peak Load represents approximately 10 times the WLL Working Load Limit **HYPHEN-** = not applicable **N/A** = info Not Available/not given

images approximately to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	MATERIAL	PLA DEP
		X Small Bat Plate	DMM		£23 \$30 €28	37g 1.3oz	Alu	8m 0.3
		Small Bat Plate	DMM		£29 \$30 €47	159g 5.5oz	Alu	10m 0.3
		Medium Bat Plate	DMM		£38 \$66 €64	247g 8.6oz	Alu	10m 0.3
		Large Bat Plate	DMM		£49 \$95 €83	322g 11.2oz	Alu	10m 0.3
		Maggi Rig	EDELRID		£47 \$64 €60	140g 4.0oz	Stainless Steel	10m 0.3
		Mini Rig	EDELRID		£22 \$25 €30	62g 2.2oz	Alu	6m 0.2
		MasterRig II	EDELRID		£68 \$86 €81	165g 5.8oz	Alu	7m 0.2
		Hertz XS	EDELWEISS		£31 \$37 €35	36g 1.3oz	Light Alloy	8m 0.3
		Hertz S	EDELWEISS		£31 \$37 €35	92g 3.25oz	Alu	8m 0.3
		Hertz M	EDELWEISS		£47 \$57 €54	188g 6.6oz	Alu	10m 0.4
		SnoFlake S	EYOLF		£27 \$32 €31	73g 0oz	Alu	10m 0.4
		SnoFlake M	EYOLF		£43 \$52 €50	121g 0oz	Alu	10m 0.4
		SnoFlake L	EYOLF		£59 \$71 €68	220g 7.8oz	Alu	10m 0.4
		Little Foot	FUSION CLIMBING		£16 \$17 €20	74g 2.6oz	Alu	8m 0.3
		Big Foot	FUSION CLIMBING		£25 \$19 €30	115g 4oz	Alu	8m 0.3
		Vlad	GRIVEL		£33 \$40 €35	90g 3.2oz	Alu	-

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ANCHOR/RIGGING PLATES

PLATE THICKNESS	DIMENSIONS	STANDARDS	MBS <small>approx 10x WWL</small>	MIN HOLE DIAM	SMALLEST DIMENSION OF LARGEST EYE	HOLES LARGE EYE(S)	3D	OTHER COLOURS	NOTES	WWW.
12mm 1/2"	62 x 62mm 2.4 x 2.4"	CE RFU 11.114 V1	36kN 8093lbf	15mm 0.6"	17mm 0.7"	3 +1		■	Individually marked. Large eye 27mm wide	dmmprofessional.com
19mm 3/4"	129 x 95mm 5 x 3.7"	CE RFU 11.114 V1	60kN 13,200lbs	19mm 0.75"	25mm 1"	2 +2 +2*		■	*2 bolt holes for connecting plates together. Individually marked. Large eye 40mm wide	dmmprofessional.com
19mm 3/4"	189 x 97mm 7.4 x 3.8"	CE RFU 11.114 V1	60kN 13,200lbs	19mm 0.75"	25mm 1"	6 +2 +2*		■	*2 bolt holes for connecting plates. Individually marked. Narrow plate profile for restrictive spaces. Large eye 40mm wide	dmmprofessional.com
19mm 3/4"	249 x 99mm 9.8 x 3.9"	CE RFU 11.114 V1	60kN 13,200lbs	19mm 0.75"	25mm 1"	10 +2 +2*		■	*2 bolt holes for connecting plates. Individually marked. Narrower plate profile for restrictive spaces. Large eye 40mm wide	dmmprofessional.com
19mm 3/4"	60 x 60mm 2.4 x 2.42	CE CNB/P 11.114 pFE	70kN 15,737lbf	20mm 0.75"	20mm 0.75"	4			two plates riveted together for maximum redundancy	edelrid.de
19mm 3/4"	101 x 83mm 4 x 3.25"	CE	36kN 8093 lbf	20mm 0.75"	30mm 1.2"	3 +1			Hot-forged update of previous flat-plate design still available from some outlets	edelrid.de
19mm 3/4"	149 x 98mm 5.9 x 3.9"	CE	50kN 11240lbf	20mm 0.75"	30mm 1.2"	7 +1			Hot-forged update of MasterRig I, a flat-plate design still available from some outlets	edelrid.de
19mm 3/4"	62 x 61mm 2.4 x 2.4"	CE	36kN 8093 lbf	15mm 0.6"	17mm 0.7"	3 +1				edelweiss-ropes.com
19mm 3/4"	83 x 85mm 3.25 x 3.4"	CE	45kN 10116 lbf	20mm 0.75"	25mm 1"	3 +1				edelweiss-ropes.com
19mm 3/4"	174x85mm 6.8 x 3.4"	CE	45kN 10116 lbf	20mm 0.75"	25mm 1"	7 +1				edelweiss-ropes.com
19mm 3/4"	90 x 70mm 3.5 x 2.75"	CE	36kN 8093lbf	20mm 0.75"	20mm 0.75"	4		■		eyolf.ca
19mm 3/4"	100mm 4"	CE	36kN 8093lbf	20mm 0.75"	20mm 0.75"	7		■		eyolf.ca
19mm 3/4"	145mm 5.7"	CE	36kN 8093lbf	20mm 0.75"	20mm 0.75"	13		■		eyolf.ca
19mm 3/4"	89 x 82mm 3.25 x 3.24"	CE	30kN 6744lbf	19.75mm 0.78"	35.5mm 1.4"	3 +1		■		fusionclimb.com
19mm 3/4"	152 x 120mm 6 x 4.7"	CE	40kN 8992 lbf	23mm 0.9"	51mm 2"	4 +1		■		fusionclimb.com
19mm 3/4"	120 x 82mm 4.7 x 3.2	CE	12*-30kN 6744lbf	22mm 0.9"	22mm** 0.9"	3 +1			*Minor axis - loading across the gate. Double gate with 15mm opening. **round bar capacity	grivel.com
										expansion row

Working Load represents approximately 10 times the WLL Working Load Limit **HYPHEN** - = not applicable **N/A** = info Not Available/not given

images approximately to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	MATERIAL	PLA DEP
		Tris	GRIVEL		£12 \$14 €13	39g 1.4oz	Alu	10n 0.3
		Four	GRIVEL		£14 \$17 €16	55g 1.9oz	Alu	10n 0.3
		Nine	GRIVEL		£19 \$23 €22	149g 5.3oz	Alu	10n 0.3
		Shuttle	GRIVEL		£19 \$18 €17	86g 3oz	Alu	10n 0.3
		Small Rigging Plate RP300	ISC		£20 \$30 €22	93g 3.3oz	Alu	9.8n 0.3
		Med Rigging Plate RP310	ISC		£29 \$45 €37	202g 7oz	Alu	9.5n 0.3
		Large Rigging Plate RP320	ISC		£61 \$87 €76	422g 14.8oz	Alu	10n 0.3
		Small Halo RP302	ISC		£20 \$30 €22	118g 4.1oz	Alu	7.8n 0.3
		Med Halo RP303	ISC		£29 \$45 €37	221g 7.8oz	Alu	9.8n 0.3
		Large Halo RP304	ISC		£61 \$87 €76	337g 11.9oz	Alu	12.8n 0.5
		Tris DISCONTINUED	KONG		£26 \$34 €27	57g 2oz	Alu	4m 0.1
		3-Rig	KONG		£23 \$28 €26	95g 0oz	Alu	10n .39
		4-Rig	KONG		£27 \$34 €32	150g 0oz	Alu	10n 0.3
		Poker DISCONTINUED	KONG		£30 \$37 €34	96g 3.4oz	Alu	4m 0.1
		PentaPlan DISCONTINUED	KONG		£35 \$39 €33	106g 3.7oz	Alu	4m 0.1
		Full	KONG		£34 \$42 €39	90g 3.2oz	Alu	10n 0.3
		Rally	KONG		£38 \$40 €36	180g 0oz	Alu	10n 0.3

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ANCHOR/RIGGING PLATES

PLATE THICKNESS	DIMENSIONS	STANDARDS	MBS <small>approx 10x WWL</small>	MIN HOLE DIAM	SMALLEST DIMENSION of LARGEST EYE	HOLES LARGE EYE(S)	3D	OTHER COLOURS	NOTES	WWW.
19mm 9"	60 x 60mm 2.4 x 2.4"	CE	29kN 6519 lbf	19mm 0.75"	19mm 0.75"	3	■			grivel.com
19mm 9"	79 x 59mm 3.1 x 2.3"	CE	30kN 6744 lbf	19mm 0.75"	19mm 0.75"	4	■		Concave profile, Individually marked.	grivel.com
19mm 9"	104mm 4.1"	CE	30kN 6744 lbf	19mm 0.75"	25mm 1"	8 +1	■		Concave profile, Individually marked	grivel.com
19mm 9"	125 x 87mm 4.9 x 3.4"	CE UIAA	20kN 4496 lbf	19mm 0.75"	13mm 0.5"	3 +1 +2*	■		Also Belay/descender. Concave profile. 2 Rope slots for 7.3-13mm rope. Similar to Kong Full. Large eye 51mm long. Individually marked.	grivel.com
18mm 8"	91 x 84mm 3.5 x 3.3"	CE NFPA-G	36kN 8093 lbf	20mm 0.75"	36mm 1.4"	3 +1			Individually marked.	iscwales.com
17mm 7"	166 x 108mm 6.5 x 4.25"	CE NFPA G	40kN 8993 lbf	20mm 0.75"	38mm 1.5"	7 +1			Individually marked.	iscwales.com
19mm 9"	249 x 150mm 9.8 x 5.9"	CE NFPA G	45kN 10116 lbf	20mm 0.75"	66mm 2.6"	13 +1			Individually marked.	iscwales.com
11mm 1"	115mm 4.5"	CE NFPA G	40kN 8992 lbf	20mm 0.75"	29mm 1.14"	6 +1	■		Individually marked. Outer eyes are 27mm/1" wide	iscwales.com
18mm 8"	144mm 5.72"	CE NFPA G	50kN 11240 lbf	25mm 1"	39mm 1.5"	6 +1	■		Individually marked. Outer eyes are 36mm/1.4" wide	iscwales.com
19mm 9"	165mm 6.5"	CE NFPA G	70kN 15736 lbf	28mm 1.1"	52mm 2"	6 +1	■		Individually marked. Outer eyes are 39mm/1.5" wide	iscwales.com
15mm 5"	89.5 x 75mm 3.5"	CE	30kN 6744 lbf	20mm 0.75"	24mm 0.95"	3 +1				kong.it
19mm 9"	96 x 76mm "	CE	36kN 8093 lbf	20mm 0.75"	24mm 0.95"	3 +1			Stronger version-replaced the Tris	kong.it
19mm 9"	125.5 x 90mm "	CE	36kN 8093 lbf	20mm 0.75"	32mm 1.25"	4 +1			Stronger version-replaced the Poker	kong.it
15mm 5"	118 x 94mm 4.7 x 3.7"	CE	30kN 6744 lbf	20mm 0.75"	32mm 1.25"	4 +1 +2*			* 2x 22mm webbing eyes. Large eye 43mm wide	kong.it
15mm 5"	155 x 122mm 6.1 x 4.8"	CE	30kN 6744 lbf	20mm 0.75"	26mm 1"	5 +1			There was a 4-hole version of this weighing 74g, still available from some outlets. Large eye is 46mm high	kong.it
19mm 9"	125 x 90mm 4.9 3.5"	CE	30kN 6744 lbf	20mm 0.75"	20mm 0.75"	3 +1 +2*	■	■	Also a fully capable belay plate/descender *Slots for single or double ropes 8-12mm Large eye 30m wide	kong.it
19mm 9"	160 x 56mm	CE	36kN 8093 lbf	20mm 0.75"	20mm 0.75"	10				kong.it

Breaking Load represents approximately 10 times the WLL Working Load Limit **HYPHEN-** = not applicable **N/A** = info Not Available/not given

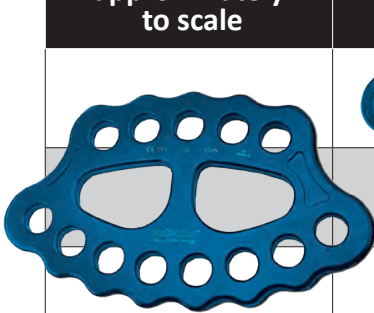











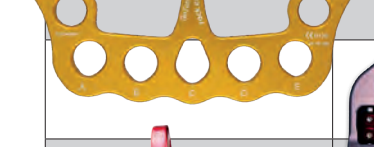



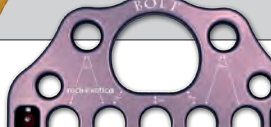






















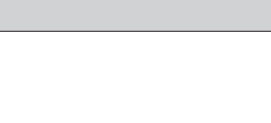




images approximately to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	MATERIAL	PLA DEP
		Rally Bent	KONG		£24 \$36 €30	180g 0oz	Alu	10n 0.3
		BigRig	KONG		£243 \$302 €280	1500g 0oz	Alu	10n 0.3
		DiscoRig	KONG		£68 \$86 €74	390g 0oz	Alu	10n 0.3
		3 Hole FA6003605	KRATOS SAFETY		£28 \$35 €32	53g 1.9oz	Alu	6m 0.2
		5-Hole FA6003605	KRATOS SAFETY		£34 \$42 €40	210g 7.4oz	Alu	7m 0.2
		Stretcher	MSA		£92 \$120 €107	330g 11.6oz	Alu	8.6 0.3
		Stealth	MSA		£69 \$90 €81	250g 8.7oz	Alu	8m 0.3
		Hec	ONBOARD SYSTEMS		n/a	1.75lb 0.8kg	Stainless Steel	
		Paw S	PETZL		£26 \$32 €28	60g 2.1oz	Alu	6m 0.2
		Paw M	PETZL		£46 \$55 €42	210g 7.4oz	Alu	6m 0.2
		Paw L	PETZL		£72 \$83 €71	350g 12.3oz	Alu	10n .35
		RSI Anchor Plate 603210	RESCUE SYSTEMS inc		£55 \$71 €68	211g 8oz	Alu	10n .35
		Micro	RESCUE TECHNOLOGY		£26 \$33 €30	93g 3.3oz	Alu	9.8 0.3
		Tech.Rescue 603215	RESCUE TECHNOLOGY		£39 \$51 €50	202g 7oz	Alu	9.5 0.3
		Magnum 603216	RESCUE TECHNOLOGY		£85 \$103 €92	422g 16oz	Alu	10n 0.3
		RIT Rigging Plate	RIT SAFETY SOLUTIONS		£44 \$53 €50	n/a	Alu	8m 0.3
		Anchor Plate 1:3	ROCK EMPIRE		£26 \$32 €30	73g 2.6oz	Alu	6m 0.2

NOTES: COST: Approx & inc local tax/VAT £\$€ in orange are a currency conversion guide only not the actual sale price MBS or MBL Minimum Bre

ANCHOR/RIGGING PLATES

PLATE THICKNESS	DIMENSIONS	STANDARDS	MBS <small>approx 10x WWL</small>	MIN HOLE DIAM	SMALLEST DIMENSION OF LARGEST EYE	HOLES LARGE EYE(S)	3D	OTHER COLOURS	NOTES	WWW.
9mm	139.5 x 56mm	CE	36kN 8093 lbf	20mm 0.75"	20mm 0.75"	10				kong.it
9mm	295 x	CE	36kN 8093 lbf	20mm 0.75"	50mm 2"	5 8xoval +1 +8bolt	■		Intended as an adjunct to Kong's tripod winch but will function anywhere as a rig plate and will fit 50mm scaffold tube	kong.it
9mm	187mm	CE	36kN 8093 lbf	20mm 0.75"	38mm 1.5"	12 +5	■			kong.it
5mm	103 x 83mm 4 x 3.25"	CE NFPA	36kN 8093 lbf	19mm 0.75"	25mm 1"	3 +1				kratossafety.com
8mm	149 x 98mm 5.9 x 3.8"	CE NFPA	45kN 10116 lbs	19mm 0.75"	27mm 1.1"	7 +1				kratossafety.com
4mm	254 x 95mm 10 x 3.75"	NFPA G	54kN 12200lbs	25mm 1"	25mm 1"	10 +2*			* 2 accessory eyes	msanet.com
2mm	184 x 89mm 7.25 x 3.5"	NFPA G	48kN 11000lbs	22mm 0.8"	24mm 0.93"	4 +1 +2*			* 2 accessory eyes	msanet.com
		FAA	3.56kN 800lbf			6 +2			FAA	onboardsystems.com
4mm	96 x 75mm 3.8 x 2.95"	CE, NFPA G UKCA	36kN 8093lbf	19mm 0.75"	24mm 0.93"	3 +1	■		Previous version also in red	petzl.com
4mm	160 x 90mm 6.3 x 3.5"	CE, NFPA G UKCA	36kN 8093 lbf	19mm 0.75"	35mm 1.4"	7 +1	■		Individually marked. Large eye 40mm wide Previous version also in blue	petzl.com
9mm	221 x 120mm 8.7 x 4.7"	NFPA G	36kN 8093 lbf	19mm 0.75"	35mm 1.4"	12 +2	■		Individually marked. Voids not to be used	petzl.com
9mm	178 x 137mm 7 x 5.4"	CE, NFPA G UKCA	48kN 11000 lbf	20mm 0.75"	36mm 1.4"	5 +1*	■		*+1 central slot - can be used as brake-plate for 1/2" rope	petzl.com
8mm	91 x 84mm 3.5 x 3.3"	CE NFPA-G	36kN 8093 lbf	20mm 0.75"	36mm 1.4"	3 +1			Individually marked.	rescuetech1.com
7mm	166 x 108mm 6.5 x 4.25"	CE NFPA G	40kN 8993 lbf	20mm 0.75"	38mm 1.5"	7 +1			Individually marked.	rescuetech1.com
9mm	249 x 150mm 9.8 x 5.9"	CE NFPA G	45kN 10116 lbf	20mm 0.75"	66mm 2.6"	13 +2			Individually marked. Large central eyes not intended for load	rescuetech1.com
2mm	121 x 83mm 4.75 x 3.25"	NFPA G	55kN 12365 lbf	22mm 0.8"	25mm 1"	3 +1			Apex eye is slightly larger at just over 25mm. Large eye is 35mm wide	ritsafetysolutions.com
4mm	80 x 65mm 3.2 x 2.6"	CE	33kN 7419 lbf	20mm 0.75"	22mm 0.9"	1 +3			Individually marked.	rockempire.cz

Peak Load represents approximately 10 times the WLL Working Load Limit **HYPHEN-** = not applicable **N/A** = info Not Available/not given









images approximately to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	MATERIAL	PLA DEP
		Anchor Plate 3:5	ROCK EMPIRE		£39 \$49 €46	240g 8.5oz	Alu	10r 0.3
		Anchor Plate 5:8	ROCK EMPIRE		£70 \$87 €82	500g 1.1 lb	Alu	10r 0.3
		Tri Rig RP1	ROCK EXOTICA		£20 \$27 €40	51g 1.8oz	7075 Alu	8.9r 0.3
		Penta Plate RP2	ROCK EXOTICA		£29 \$47 €63	108g 3.8oz	7075 Alu	8.9r 0.3
		V5 RP4 DISCONTINUED	ROCK EXOTICA		£55 \$67 €64	310g 10.9oz	7075 Alu	10r 0.3
		Se7en RP3 DISCONTINUED	ROCK EXOTICA		£66 \$74 €95	376g 13.3oz	7075 Alu	9.7r 0.3
		Bolt RP5	ROCK EXOTICA		£94 \$114 €108	489g 1.07 lb	Alu + St Steel pin	12r 0.4
		Rock Star RP22	ROCK EXOTICA		£102 \$112 €178	209g 7.4oz	Alu	11.3r 0.4
		Totem F10	ROCK EXOTICA		£30 \$40 €38	128g 4.5oz	Alu	10r 0.3
		Totem CRT	ROCK EXOTICA/ RICH CARLSON		£40 \$48 €46	278g 9.8oz	Alu	12r 0.4
		AZORP	ROCK EXOTICA		£281 \$343 €897	1400g 3 lb	7075 Alu	12r 0.4
		SMALL RS015	SAR PRODUCTS		£20 >\$27 >€24	93g 3.3oz	Alu	9.8r 0.3
		MEDIUM RS016	SAR PRODUCTS		£29 \$38 €34	202g 7oz	Alu	9.5r 0.3
		LARGE RS017	SAR PRODUCTS		£61 \$80 €71	422g 14.8oz	Alu	10r 0.3
		SpiderPlate	SHIZLL		£30 \$40 €39	55g 1.9oz	Alu	10r 0.3
		Big Spider	SHIZLL		£40 \$65 €52	134g 4.7oz	Alu	14r 0.5

NOTES: **COST:** Approx & inc local tax/VAT £\$€ in orange are a currency conversion guide only not the actual sale price **MBS or MBL Minimum Bre**

ANCHOR/RIGGING PLATES

PLATE THICKNESS	DIMENSIONS	STANDARDS	MBS <small>approx 10x WWL</small>	MIN HOLE DIAM	SMALLEST DIMENSION of LARGEST EYE	HOLES LARGE EYE(S)	3D	OTHER COLOURS	NOTES	WWW.
19mm 9"	159 x 100mm 6.25 x 3.9"	CE	40kN 8993 lbf	20mm 0.75"	38mm 1.5"	7 +1			Individually marked.	rockempire.cz
19mm 9"	248 x 149mm 9.8 x 5.9"	CE	50kN 11240lbf	20mm 0.75"	66mm 2.6"	13 +2			Individually marked. Large central eyes not intended for load	rockempire.cz
15mm 5"	84 x 72mm 3.3 x 2.8"	CE	33kN 7419lbf	19mm 0.75"	25.4mm 1"	3 +1			All Rock Exotica plates are machined flat from oversized material	rockexotica.com
19mm 9"	123 x 101mm 4.9 x 4"	CE NFPA G	36kN 8093lbf	19mm 0.75"	57mm 2.25"	5 +1				rockexotica.com
19mm 9"	197 x 149mm 7.8 x 5.9"	CE NFPA G	36kN 8093lbf	25mm 1"	67mm 2.65"	5 +1			teardrop carabiner holes are 35mm long	rockexotica.com
17mm 7"	238 x 152mm 9.4 x 6"	CE NFPA G	36kN 8093lbf	22mm 0.87"	24mm 0.93"	12* +2 +2		■	Original Large Rig-Plate. *10 of the 12 are teardrop. Central large spaces are not intended for loading so Large Eye diameter is length of remaining 2 smaller eyes	rockexotica.com
17mm 7"	203 x 127mm 8 x 5"	NO	36kN 8093lbf	19mm 0.75"	53mm 2.1"	9 +1			Stainless steel pin retained by sprung 'keepers' either end. Lower holes-18mm opening with 21mm interior space. Top 2 eyes 20.7mm/0.8"	rockexotica.com
15mm 5"	75 x 93mm 3 x 3.7"	CE NFPA G	36kN 8093lbf	20mm 0.77"	20mm 0.77"	9	■		Rockstar and UFO are machined from a solid lump of alloy	rockexotica.com
19mm 9"	190 x 64mm 7.5 x 2.5"	NO	30kN 6744lbf	18mm 0.72"	44mm 1.7"	2 +2* +1	■		*Accepts 10.5-13mm ropes for abseil/belay with carabiner adjunct. elliptical eyes 26 x 18mm	rockexotica.com
17mm 7"	216 x 121mm 8.5 x 4.8"	NO	36kN 8093lbf	21mm 0.8"	48mm 1.9"	3 +2* +2	■		DISCONTINUED *Accepts 10.5-13mm ropes. Two fabric/rope rigging bollards. Rich Carlson design.	canyonsandcrag.com
17mm 7"	165 x >140mm 6.5 x >5.5"	NFPA G	67kN 15062lbf	22mm 0.9"	50mm 2"	18 +1 +2	■		So good it gets in twice. AZORP kit inc. two rig plates, pins and bag. Rope can be passed through central spindle. Outer sleeve opening 60mm	rockexotica.com cmrescue.com
18mm 8"	91 x 84mm 3.5 x 3.3"	CE NFPA-G	36kN 8093lbf	20mm 3/4"	36mm 1.4"	3 +1			Individually marked.	sarproducts.com
17mm 7"	166 x 108mm 6.5 x 4.25"	CE NFPA G	40kN 8993lbf	20mm 3/4"	38mm 1.5"	7 +1			Individually marked.	sarproducts.com
19mm 9"	249 x 150mm 9.8 x 5.9"	CE NFPA G	45kN 10116lbf	20mm 3/4"	66mm 2.6"	13 +1			Individually marked.	sarproducts.com
19mm 9"	58 x 58mm 2.3 x 2.3"	Machinery Directive '06	50kN 11240lbf	14mm 0.5"	14mm 0.5"	4	■		Accepts 12-13mm rope. Individually marked. *MBS equates to use with carabiners/webbing. Rope-only connection = 25kN	shizll.com
15mm 5"	76 x 76mm 3 x 3"	Machinery Directive '06	100kN* 22480lbf	17mm 0.7"	17mm 0.7"	4	■		accepts 14-16mm rope. Individually marked. *MBS equates to use with carabiners/webbing. Rope-only connection = 50kN	Shizll.com
										expansion row

Working Load represents approximately 10 times the WLL Working Load Limit HYPHEN - = not applicable N/A = info Not Available/not given

images approximately to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	MATERIAL	PLA DEP
		Rigging Plate 1/3	SINGING ROCK		£38 \$30 €27	65g 2.3oz	Alu	6m 0.2
		Rigging Plate 3/5	SINGING ROCK		£94 \$115 €72	145g 5.1oz	Alu	8m 0.3
		Cheese Plate S	SKYLOTEC		£48 \$59 €55	75g 2.6oz	Alu	6m 0.25
		Cheese Plate L	SKYLOTEC		£95 \$116 €90	160g 5.6oz	Alu	7m 0.25
		Genesis	SLACK-TECH		£78 \$95 €90	304g 10.7oz	Alu	20m 0.8
		NFPA Mini DISCONTINUED	SMC		£26 \$31 €30	79g 2.8oz	Alu	9m 0.3
		Origin 5	SMC		£27 \$33 €31	113g 4oz	Alu	9.5m 0.3
		NFPA Large DISCONTINUED	SMC		£47 \$57 €54	323g 11.4oz	Alu	127m 0.5
		Origin 8	SMC		£45 \$55 €52	264g 9.3oz	Alu	127m 0.5
		Origin TT	SMC		TBA*	n/a	Alu & Stainless Steel	n/a
		Vector DISCONTINUED	SMC		£39 \$47 €45	168g 5.9oz	Alu	127m 0.5
		Tree Angel	TREE CLIMBING JAPAN		£114 \$90 €85	420g 14.4oz	Alu	127m 0.5
		TF-CD404	TREE-FORCE		£25 \$35 €33	240g 8.5oz	Alu	10m 0.35
		Mini Rigger 1012	YATES		£41 \$50 €47	130g 4.7oz	6061 T6 Alu	10m 0.35
		Rescue Rigger 1015	YATES		£46 \$56 €53	243g 8.6oz	6061 T6 Alu	10m 0.35

NOTES: **COST:** Approx & inc local tax/VAT £\$€ in orange are a currency conversion guide only not the actual sale price **MBS or MBL Minimum Bre**

ANCHOR/RIGGING PLATES

DEPTH	DIMENSIONS	STANDARDS	MBS <small>approx 10x WWL</small>	MIN HOLE DIAM	SMALLEST DIMENSION of LARGEST EYE	HOLES LARGE EYE(S)	3D	OTHER COLOURS	NOTES	WWW.
5"	100 x 82mm 4 x 3.25"	CE	36kN 8093lbf	20mm 0.75"	26mm 1"	3 +1			Individually marked	singingrock.com
5"	153 x 88mm 6 x 3.5"	CE	50kN 11240lbf	20mm 0.75"	26mm 1"	7 +1			Individually marked	singingrock.com
5"	103 x 83mm 4 x 3.25"	CE	36kN 8093lbf	20mm 0.75"	30mm 1.2"	3 +1		■	Individually marked. <i>CLIMBING TECHNOLOGY</i> now owned by SKYLOTEC	skylotec.com climbingtechnology.com
5"	149 x 98mm 5.9 x 3.8"	CE	45kN 10116lbs	20mm 0.75"	30mm 1.2"	7 +1		■	Individually marked. <i>CLIMBING TECHNOLOGY</i> now owned by SKYLOTEC	skylotec.com climbingtechnology.com
5"	152 x 122mm 6 x 4.8"	No	70kN 15736 lbf	20mm 0.8"	40mm 1.57"	3 +1 +3*	■		* 3 Webbing eyes Designed for Slack-lining/ Tight-rope walking! Largest eye 42mm wide.	slacklinetechnology.com
7"	75 x 95mm 3 x 3.7"	NFPA "G"	36kN 8093 lbf	19mm 0.74"	25mm 1"	3 +1		■	small eye height 27mm Large eye height 30mm	smcgear.com
7"	104 x 84.9mm 4.1 x 3.3"	CE NFPA G UKCA	36kN 8093 lbf	20mm 0.8"	25mm 1"	3 +2				smcgear.com
7"	178 x 135mm 7 x 5.3"	NFPA "G"	50kN 11240 lbf	25mm 1"	57mm 2.25"	5 +1		■	individually numbered small eye height 36mm	smcgear.com
7"	169 x 99mm 6.6 x 3.9"	CE NFPA G UKCA	50kN 11240 lbf	20mm 0.8"	25mm 1"	5 +3				smcgear.com
7"	n/a	CE NFPA G UKCA	45kN 10116lbf	n/a	n/a	4 +3			NEW- Out late 2023 *Not Yet Available	smcgear.com
7"	105 x 116mm 4.15 x 4.16"	NFPA G	48kN 10791 lbf	18mm 0.72"	46mm 1.8"	6 +1			individually numbered Small eye width 31mm	smcgear.com
7"	240 x 150mm 9.5 x 6.875"	No	90kN 20232 lbf	13.5mm 0.5"	43mm 1.7"	8 +1 +4*	■		Also branded for STEIN. Also used as a Knotless rigging device. * 4 accessory cord holes RRP shown can be as low as £75. Individually numbered	steinworldwide.com
9"	159 x 100mm 6.25 x 3.9"	CE	40kN 8993 lbf	20mm 0.75"	38mm 1.5"	7 +1			Also a Small & large plate in this range - see Arbortec/Treehog THRP1 & 3 for spec	tree-force.com
8"	102 x 112mm 4 x 4.4"	-	45kN 10000 lbf	19mm 0.75"	27mm 1.1"	3 +1			Previous ISC-made version discontinued	yatesgear.com
8"	165 x 108mm 6.5x 4.25"	-	45kN 10000 lbf	19mm 0.75"	27mm 1.1"	7 +1		■		yatesgear.com
									expansion row	
									expansion row	

Working Load represents approximately 10 times the WLL Working Load Limit HYPHEN - = not applicable N/A = info Not Available/not given



Nov 2022 due to a manufacturing fault . As we've noted in our tables, these should be back shortly. But that glitch aside, the principle was for a range of hot-forged shackle and eye options within a diminutive milled frame just large enough to attach directly to most of the hardware currently used and in the case of the *Mini-Swivel* and *Focus*, with a plastic insert to hold the carabiner firmly. *Rock Exotica's Nano-Swivel* started the drive towards smaller but with *DMM's* recall, *Petzl* have stolen the show with their openable micro swivels.

A swivel's key advantage is in taking the twist out of ropes so they are particularly useful for long rope operations. On a stretcher rig plate they provide excellent freedom of movement to the attendant allowing easier rotational movement in tending to the casualty without the constant counter-rotation battle against the rope/sling and carabiner - for this reason swivels have become a standard harness fitting for many arborists and for tactical use where operators may need to rotate into a firing position without the risk of being 'torqued' back to forward-facing at an inopportune moment. Haul systems are an obvious application where the ability of the whole pulley system to rotate on the anchor can prevent twisted strands from increasing your input effort.

The most 'recent' innovations are from *CAMP* with the previously mentioned *Enigma* and their *Gyro* series with 1, 3 or 4 swivel eyes mounted on a common swivel housing and giving directional loading to individual carabiners without cramming a larger hole and minimising the chances for adverse torquing. This is pretty much the opposite of *Petzl* and *DMM's* efforts to shrink the swivel to the smallest sizes possible.

Swivels have evolved into an individual asset for direct attachments to hardware , rope/slings and harness bridges, not just for haul systems and anchoring so its uses are myriad..... don't leave home without one.

IN THE FOLLOWING TABLES:

Max Eye diameter: refers to the largest of the two (or more) eyes if they are different sizes usually the top eye. This figure may NOT be the same as the largest bar diameter of carabiner that can be accommodated - many are oval and some will accommodate more than one carabiner. Some we have measured to give a round-bar figure but some quote the max dimension - if the eye is round you'll know that you can get pretty much that same bar size through (make sure it's not too tight though or you will have problems with torque) . If the eye is an oval you'll have to limit your ambitions.

LIFE SUPPORT SWIVELS

ENFORCER

LOAD-CELL

Monitor and Record forces up to 20 kN

Communicates Wirelessly via Bluetooth to your iPhone

Compact & Portable

Weighs just 14 oz (397 gm) with batteries!

Monitor and graph in real-time or capture dynamic test data in .CSV file

*App sold separately For use with iPhone 4S or newer

For more information please visit:

WWW. **rock exotica** .com

MADE IN USA

Images NOT to Scale								
MANUFACTURER	ART	BEAL	BLACK DIAMOND	CAMP	CAMP	CAMP	CAMP	CAMP
MODEL VARIANT	Twister	Twist-Air B	Rotor Swivel	Swivel 1393	Enigma 3259	Gyro 1 3260	Gyro 3 2940	Gyro 4 3109
ORIGIN								
COST	£45 \$60 €52	£44 \$50 €48	£65 \$0 €0	£50 \$64 €60	£104 \$180 €118	£45 \$50 €52	£76 \$120 €90	£105 \$180 €0
WEIGHT	58g 2oz	88g 3.1oz	83g 2.9oz	150g 5.3oz	116g 4.1oz	76g 2.7oz	155g 5.5oz	265g 9.3oz
MAX LOAD	25/28kN* 0lbf	22kN 4945lbf	26kN 5845lbf	35kN 7868lbf	23kN 5170lbf	25kN 0lbf	26kN 5845lbf	26kN 5845lbf
LOWER/MAX EYE SIZE	18mm 0.7"	18mm 0.7"	25mm 1"	23mm 0.9"	18-36mm 0.7"	10-16mm 0.4-0.6"	10-16mm 0.4-0.6"	10-16mm 0.4-0.6"
DIMENSIONS height x width	78 x 30mm 3.1 x 1.2"	86 x 39mm 3.4 x 1.5"	85 x 40mm 3.3 x 1.6"	110 x 55mm 4.3 x 2.1"	100 x 51mm 4 x 2"	73 x 35mm 2.9 x 1.4"	80 x 90mm 3.2 x 3.5"	125 x 90mm 4.9 x 3.5"
BEARING/BUSHING	-	■	■	■	■	Steel Ball/Socket	Steel Ball/Socket	Steel Ball/Socket
OPENABLE	-	■	-	-	■	-	-	-
STANDARDS	CE	CE	CE	CE EAC	CE EAC ANSI	CE ANSI EAC	CE ANSI EAC	CE ANSI EAC
MATERIAL	Machined Alu	Alu	Alu	Alu	Alu St Steel	Allu, Steel, St Steel	Alu, Steel, St Steel	Alu, Steel, St Steel
OTHER COLOURS/NOTES	*28kN max load, tested with 25kN. Does not twist under load				Black. Collapsible, take-apart	plastic inserts for tighter 10mm fit	plastic inserts for tighter 10mm fit	plastic inserts for tighter 10mm fit
WEBSITE	climb-art.de	beal-planet.com	blackdiamondequipment.com	camp.it	camp.it	camp.it	camp.it	camp.it

Images NOT to Scale								
MANUFACTURER	DMM	DMM	DMM	EDELRID	EDELRID	EDELRID	EDELWEISS	FIXE CLIMBING
MODEL VARIANT	Nexus Bow-D SW470	Nexus D-D SW480	Nexus Bow-Bow SW490	Cupid	Conecto	Vortex	SWR	SW1 590
ORIGIN								
COST	£80 \$115 €100	£80 \$115 €100	£80 \$115 €100	£85 \$107 €90	£50 \$60 €63	£52 \$62 €56	£40 \$45 €45	£30 \$0 €0
WEIGHT	103g 3.6oz	95g 3.4oz	110g 3.9oz	105g 3.7oz	155g 5.5oz	88g 3.1oz	88g 3.1oz	154g 5.5oz
MAX LOAD	26kN 5845lbf	26kN 5845lbf	26kN 5845lbf	20kN 4496lbf	15kN 3372lbf	22kN 4945lbf	22kN 4945lbf	30kN 6744lbf
LOWER/MAX EYE SIZE	16 20-30mm 0.6 0.8-1.2"	16mm 0.6"	20-30mm 0.8-1.2"	25mm 1"	20mm 0.8"	18mm 0.7"	18mm 0.7"	23mm 0.9"
DIMENSIONS height x width	103 x 48mm 4 x 1.9"	97 x 35mm 3.8 x 1.4"	108 x 48mm 4.25 x 1.9"	95 x 50mm 3.7 x 2"	100 x 52mm 4 x 2"	86 x 39mm 3.4 x 1.5"	86 x 39mm 3.4 x 1.5"	110 x 55mm 4.3 x 2.1"
BEARING/BUSHING	■	■	■	■	■	■	■	■
OPENABLE	■	■	■	■	■	-	■	-
STANDARDS	CE	CE	CE	CE	CE	CE	CE	
MATERIAL	Body Milled Alu	Body Milled Alu	Body Milled Alu	Hot forged Alu	Hot forged Alu	Alu	Alu	Alu
OTHER COLOURS/NOTES	Black RECALLED 2022 Restock pending	Black RECALLED 2022 Restock pending	Black RECALLED 2022 Restock pending	Replaced Conecto. Gate opening=12mm	DISCONTINUED			
WEBSITE	dmmwales.com	dmmwales.com	dmmwales.com	edelrid.com	edelrid.com	edelrid.com	edelweiss-ropes.com	fixeclimbing.com

COSTS: Any £\$€ shown in burnt orange are currency conversions only and will not include shipping, import duty and tax

LIFE SUPPORT SWIVELS

									
CMC/RE	CMC/RE	CMI	CMI	CON TERRA	DMM	DMM	DMM	DMM	DMM
Rescue	ProSeries	Rescue	Cali Swivel2	TiRadius	Axis L	Axis S	Mini SW400	Focus D SW440	Focus Bow SW450
									
£71 \$86 €82	£102 \$124 €117	£101 \$122 €116	£104 \$126 €119	£119 \$145 €137	£80 \$110 €100	£70 \$95 €75	£60 \$79 €64	£75 \$110 €95	£75 \$110 €95
125g 4.4oz	184g 6.5oz	159g 5.6oz	204g 7.2oz	83g 2.9oz	184g 6.5oz	117g 4.2oz	48g 1.7oz	64g 2.3oz	72g 2.5oz
36kN 8093lbf	36kN 8093lbf	40kN 9000lbf	43.6kN 9800lbf	38kN 8500lbf	50kN 11240lbf	36kN 8093lbf	26kN 5845lbf	26kN 5845lbf	26kN 5845lbf
25mm 1"	30mm 1.2"	30mm* 1.2"	20 18mm 0.8 0.7"	25mm 1"	20-38mm 0.8-1.1"	18-30mm 0.7-1.2"	16mm 0.6"	10-16 16mm 0.4-0.6"	10-16 20-30mm 0.4-0.6 0.8-1.2"
93 x 49mm 3.75x1.9"	114 x 50mm 4.5 x 2"	108 x 45mm 4.25 x 1.75"	100 x 76.2mm 4 x 3"	76.2 x 32mm 3 x 1.25"	96 x 60mm 3.8 x 2.4"	80 x 50mm 3.2 x 2"	66 x 32mm 2.6 x 1.3"	76.5 x 35mm 3 x 1.4"	82 x 48mm 3.2 x 1.9"
-	-	-	-	-	-	-	-	-	-
NFPA	NFPA	NFPA		NFPA	CE	CE	CE	CE	CE
Machined Alu	Machined Alu	Machined Alu	Machined Alu	Titanium	Hot forged Alu	Hot forged Alu	Body Milled Alu	Body Milled Alu	Body Milled Alu
		*max bar size 20mm/0.8"	Green/Silver. Blue/Silver		Black	Black	Black RECALLED 2022 Restock pending	Black RECALLED 2022 Restock pending	Black RECALLED 2022 Restock pending
cmcpro.com	cmcpro.com	cmgearusa.com	cmgearusa.com	conterra-inc.com	dmmwales.com	dmmwales.com	dmmwales.com	dmmwales.com	dmmwales.com
									
FUSION CLIMB	FUSION CLIMB	KONG	IRUDEK	PETZL	PETZL	PETZL	PETZL	PROTEKT	ROCK EMPIRE
Delta	Oval	Dancer	Swiver	Swivel S	Swivel L P58-L	Micro Swivel P58 XSO	Open Swivel	KR-200 210	ZWB018
									
£50 \$56 €53	£54 \$61 €56	£55 \$80 €61	£25 \$34 €29	£61 \$65 €60	£71 \$75 €76	£55 \$65 €60	£77 \$95 €83	£27 \$37 €31	£39 \$49 €46
170g 6oz	170g 6oz	160g 5.6oz	79g 2.8oz	95g 3.4oz	150g 5.3oz	75g 2.6oz	130g 4.6oz	157 167g 5.5 5.9oz	74.2g 2.6oz
36kN 8093lbf	36kN 8093lbf	42kN 9442lbf	35kN 7868lbf	23kN 5170lbf	36kN 8093lbf	26kN 5845lbf	23kN 5170lbf	30kN 6744lbf	30kN 6744lbf
30.5mm* 1.2"	31.75mm 1.25"	23mm 0.9"	21mm 0.8"	19 22mm 0.75 0.8"	27mm 1.2"	14 22mm 0.55 0.9"	23 29mm 0.9 1"	29-34mm* 1.1-1.3"	21mm 0.83"
10 x 54.7mm 4.3 x 2.15"	114 x 52mm 4.5 x 2"	113.5 x 54mm 4.5 x 2.1"	85 x 36mm 3.3 x 1.4"	82 x 45mm 3.2 x 1.6"	105 x 53mm 4.1 x 2.1"	76 x 45mm 3 x 1.8"	97 x 50mm 3.5 x 2"	113 x 54mm 4.5 x 2.1"	83 x 38mm 3.3 x 1.5"
-	-	-	-	-	-	-	-	-	-
CE ANSI	CE ANSI	CE	CE	CE NFPA EAC UKCA	CE NFPA EAC UKCA	CE EAC UKCA	CE EAC UKCA	CE	CE
Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu
*max bar size < 25mm/1"				Black		no bearings so Does not rotate once loaded	14mm gate	*max bar size 23mm/0.9"	
fusionclimb.com	fusionclimb.com	kong.com	irudek.com	petzl.com	petzl.com	petzl.com	petzl.com	protekt.com	rockempire.com

Images NOT to Scale									
MANUFACTURER	ROCK EXOTICA								
MODEL VARIANT	Shackle Swivel SS1	Triangle S1L	Rotator Round Large S2L	Orbitor S3	Nano Swivel S11	Stainless Steel S2S-B	SwivaEye C82 A	SwivaBiner C81 A	
ORIGIN									
COST	£95 \$90 €104	£65 \$75 €90	£60 \$73 €90	£58 \$73 €86	£72 \$75 €93	£156 \$190 €180	£110 \$96 €113	£120 \$106 €125	
WEIGHT	163g 5.76oz	144g 5.1oz	127g 4.5oz	99g 3.5oz	57g 2oz	227g 8oz	137g 4.86oz	166g 5.9oz	
MAX LOAD	36kN 8093lbf	36kN 8093lbf	36kN 8093lbf	26kN 5845lbf	23kN 5170lbf	36kN 8093lbf	30kN 0lbf	30kN 6744lbf	
LOWER/MAX EYE SIZE	19 24-30mm 0.75 0.9-1.2"	26-30mm 1-1.2"	24-30mm 0.9-1.2"	20-28mm 0.8-1.1"	11 18-20mm 0.4 0.7-0.8"	30mm 1.2"	24-30 21mm* 0.95-1.2 0.84"	24-30 24-30mm* 0.9-1.2 0.9-1.2"	
DIMENSIONS height x width	97x 50mm 3.8 x 2"	108 x 50.8mm 4.24 x 2"	97 x 50mm 3.8 x 2"	71 x 37mm 2.8 x 1.44"	69 x 38mm 2.7x1.5"	94 x 51mm 3.7x 2"	138 x 66mm 5.42x 2.6"	185 x 66mm 7.3 x 2.6"	
BEARING/BUSHING	■	■	■	■	■	■	■	■	
OPENABLE	■	-	-	-	-	-	-	-	
STANDARDS	CE	-	CE	CE	CE	-	CE	-	
MATERIAL	Machined Alu, Steel	Machined Alu	Machined Alu	Machined Alu	Machined Alu	Stainless Steel	Machined Alu	Machined Alu	
OTHER COLOURS/NOTES		DISCONTINUED	Rotator Small discontinued			non-black S2S version discontinued	*Top eye figure =gate opening	*Top & bottom eye figure =gate opening	
WEBSITE	rockexotica.com	rockexotica.com	rockexotica.com	rockexotica.com	rockexotica.com	rockexotica.com	rockexotica.com	rockexotica.com	

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Enforcer LC1	Twister	WIB H074	CT Twister	CT Twirl	Reactor L	Reactor S			
									
£95 \$1000 €1250	£36 \$55 €38	£44 \$50 €46	£60 \$65 €63	£70 \$76 €77	£50 \$60 €57	£41 \$50 €48			
400g* 14oz	88g 3.1oz	160g 5.7oz	80g 2.8oz	170g 6oz	136g 4.8oz	82g 2.9oz			
36kN* 8093lbf	22kN 4945lbf	40kN 8992lbf	24kN 5396lbf	36kN 8093lbf	40kN 8992lbf	40kN 8992lbf			
24-30mm 0.9-1.2"	18mm 0.7"	35mm* 1.3"	19-24mm 0.75-1"	26-30mm 1-1.2"	25mm 1"	14mm 0.55"			
203 x 53mm 8 x 2.1"	86 x 39mm 3.4 x 1.5"	110 x 50mm 4.3 x 2"	84 x 43mm 3.3 x 1.7"	116 x 53mm 4.6 x 2.1"	101 x 50mm 4 x 2"	67 x 83mm 3.3 x 2.64"			
-	-	-	-	-	-	-			
CE	CE	CE	CE	CE	CE NFPA UKCA	CE NFPA UKCA			
Machined Alu	Alu	Alu	Hot forged Alu	Hot forged Alu	Forged Alu	Forged Alu			
*20kN max reading. *inc batteries	4kN swivelling limit	*max round bar size 23mm/0.9"	Black climbingtechnology.com	*max round bar size 24mm/0.9"					
ockexotica.com	singingrock.com	skylotec.com	skylotec.com	skylotec.com	smcgear.com	smcgear.com			

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MULTISCENDERS

HYBRID ASCENDER/DESCENDER/ WORK POSITIONING DEVICES

This Guide deals with stand-alone hardware for ascending/descending/Work positioning and since its first publication in ARBCLIMBER#10 in 2017 the only real changes are the establishment of the *RopeRunner* and *Akimbo* as market leaders alongside the *Zig Zag* and *Richard Mumford's XF* version of the *Hitch Hiker*. The more traditional and modern equivalent systems utilise a prusik cord and some associated hardware like the *Hitch Climber*, *Rope Wrench*, *HitchHiker* etc. and proponents will say that these are better systems. They are certainly cheaper and generally lighter.

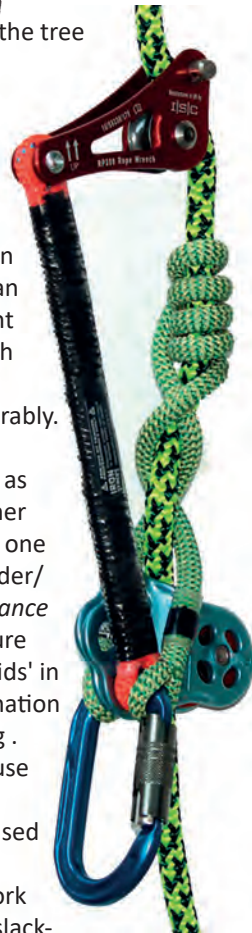
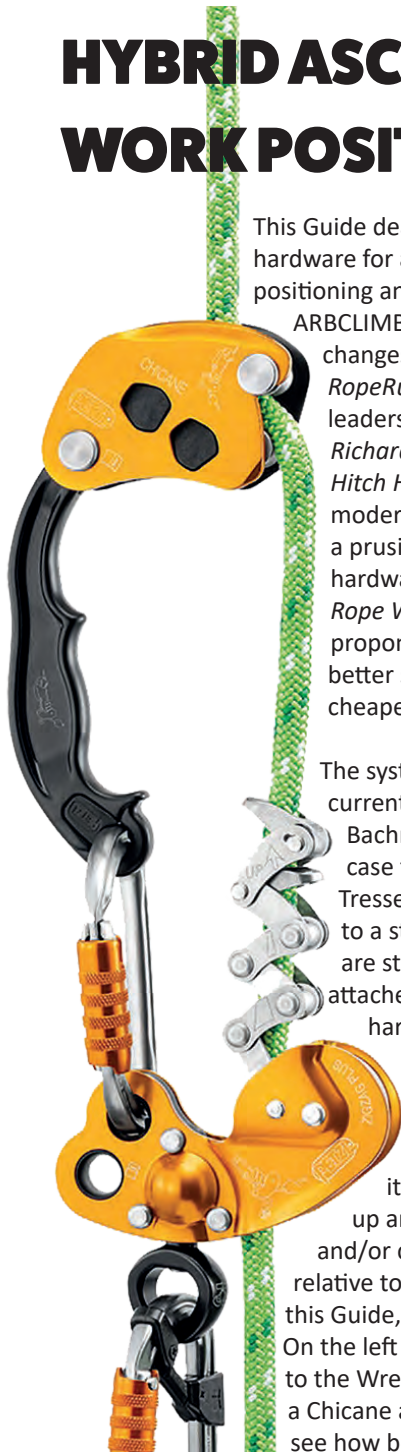
The system on the right is typical of a current prusik system utilising either a Bachmann's or Klemheist or, in this case the highly favoured Valdotaín Tresse. It has a *Rope Wrench* attached to a stiffened 'lanyard' and both are straddling a *HitchClimber* pulley attached to your rope bridge or main hard-point connection. The *Wrench* diverts load away from the hitch and makes it easier to control. The whole system is relatively inexpensive but it's quite an expansive set up and takes time to set up and/or change around relative to the subject of this Guide, multiscenders. On the left is Petzl's answer to the Wrench, their is called a *Chicane* and you can see how both options require the same

amount of supporting kit and length items to create a more efficient ascent system. For a multiscender to be more efficient than simply foot-locking the rope around your boot **you'll need a foot and/or knee ascender** but at its most basic level, the hardware we're talking about here is all that you attach to your harness. You can use it to get into

the tree, get out of the tree and work around the tree while you're in the canopy.

Then there is the eternal question of SRT/SRS versus DdRT (MRS). DdRT uses two ends of the same rope and so gets a 2:1 advantage which makes taking in during ascent easier, it also makes descent mode more controllable. In contrast it could be said to be less efficient than SRT because you have to pull twice the amount of rope to move the same distance you do with SRT. Fight it out amongst yourselves. Some of these devices will do both SRT and DdRT admirably.

As a definition, 'Hybrid' is not strictly accurate as the term could equally be applied to a few other items of rope hardware like that fit more than one usage category like the *CMC MPD* as a descender/lowering/progress capture device or *SMC Advance HX* and *Petzl Traxions* as pulley/progress capture devices, but are in no way similar to the 'Hybrids' in this article which are used routinely as combination ascender/descenders and for work positioning. Even that definition is a little misleading because *Petzl's GriGri*, *Notch's Glide*, the *Taz Love* and indeed many autolocking descenders can be used for progress-capture and therefore as a make-shift ascender as well as descender and for work positioning due to their easy take-in of slack (slack-tending). But they won't tend slack automatically when you pull the tail/trail-rope through those devices as you ascend which is one of two things that sets them apart from multiscenders and you wouldn't use them in place of a prusik-hitch ascending system which is the Holy Grail that multiscenders aspire to. Not that it has ever been acceptable to descend at speed using unmitigated rope prusiks but that's what a lot of old-timers did (do?). The safer option is to switch to a dedicated ascender so really, the 'Holy Grail' is to effectively replace an ascender or prusik hitch system AND a descender with one device and these are more accurately described as 'multiscenders'. Incidentally, it might seem like the concept of 'multiscenders' (with an 's') is new but we were discussing them in UK caving circles back in the early eighties. Not forgetting of course that pretty much everything we



HYBRIDS/MULTISCENDERS

do in SRT, including the original commercial development of autolock descenders by *Petzl* with the *STOP*, stems from caving. However, the most recent crop of devices highlighted in this article may have more to do with the original *Jumars* than the *Stop* descender, take a look at the silver ascender opposite-top from an Iranian climbing group that credits this device as the fore-runner of the iconic yellow *Swiss Jumar* so is presumably from midway through the last century - does that chain link style grip look familiar?

In terms of development of the artificial prusik we should probably credit *ART* with that because their original *LockJack* has been around for a good many years. I remember picking one of the early versions up from the lads at Royal Kew Gardens Arb section back in the nineties and it's still hung in my workshop but it didn't look anything like the slick *SpiderJack 3.0* you see in the pictures here. It has taken a long time between Hubert Kowalewski's first model and now to kick-start the development of 'artificial prusiks' and that has everything to do with the dramatic switch from traditional tree climbing methods with rope-on-rope systems to 'technical' climbing using an ever widening array of hardware and sophistication. Once companies from the technical ropes arena like *DMM*, *Petzl*, *Rock Exotica*, *ISC* etc. got involved, expansion and development mushroomed. And yet.... When you look at the hybrids in this Guide it's perhaps a little surprising that not only are there not many, but the majority, starting with *ART* but later typified by Morgan Thompson's *Unicender* and Kev Bingham's *RopeRunner* have been developed within the arb industry before being taken on by the metal wizards. Admittedly, in the case of the *Unicender*, which, for many years was the only such device available, it was an obvious and short route from Morgan's original idea to his namesake's company taking on development and production but nevertheless it was still an idea born outside of the rope access and rescue mainstream. Kev Bingham's *RopeRunner* is available in a US version made by *CMI* and the sumptuous *Pro* version by *Notch* and this has clearly become a popular contender to the *ZigZag* long with Jamie Merrit's *Akimbo* made by *Rock Exotica*. All have gone from garage prototype to an 'elite' level of production and perhaps Gordon Svedberg's *Bulldog* devices and *Climbing Innovation's XF* will go the same way but it hadn't really made much of an inroad between the original version of this article in 2017 and this 2023 update. As of 2023 the key three models are the *Petzl's ZigZag*, *Rope Runner* and the *Akimbo* with very worthy though less 'mass'-market models in the form of the *Unicender* and *ART's SpiderJack* and *LockJacks* representing the arb industries break out into dedicated technical rope hardware rather than borrowing from the rope access & rescue fields. Following in *ART's* footsteps the *ZigZag* has most closely followed doubled rope technique (DdRT) and the traditional functioning of a closed-loop/split-tail prusik systems. This is in contrast to the *Rope Runner* and *Akimbo* which are firmly SRT oriented. The *ZigZag* failed to achieve universal acceptance before these new kids on these block arrived and this was partly exacerbated by its inability to permit mid-rope attachment and to an early mishap and recall which spooked

the market. It's fair to say that the *ZigZag* missed its original window which might have made it as universally common in the arb world as the *GriGri* became in the sport climbing world.

All of the devices in this Guide appeal to the techies and repel the traditionalists. Techies are the shiny-metal fetishists who will always be happy to buy and experiment with anything new that weighs more than a traditional prusik and is...well.... shiny. And for most of these devices you need to be a bit of a techie because they're not for beginners. Any thoughts of making life easier for those who weren't overly proficient with traditional methods could result in an early visit to the ER. Take a look at *Unicender's* various control functions in the pictures overleaf. Once you're used to them and especially if you've used a range of other technical devices it all comes together quite easily. Novices on the other hand should cut their teeth on rope prusik systems first and especially using



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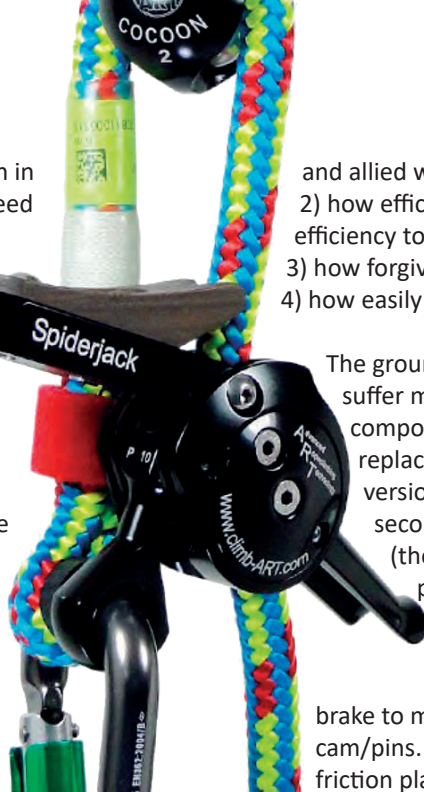
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the *Rope Wrench* which was Kev Bingham's revelation in diverting part of the load away from the knot (or indeed any compact multiscender) and making them much easier to control. Outside of Germany there has been a preponderance of 'chain-link' style devices since this is the primary way for metal to function in a similar way to a prusik. The *Unicender* is a chain link, *Zig-Zag* is a chain link, *RopeRunner* and *Bulldog Bone* are sideways chain-links and *Akimbo* is an alien chain link. The Germans on the other hand, in the guise of those complex metal artisans *ART*, have continued to evolve their original *RopeJack* which now looks every inch the most sophisticated device on the market as the *SpiderJack*. These might look intimidatingly complex but all four current *ART* DdRT devices are actually quite straightforward modifications to the *LockJack*'s original locking mechanism enhanced by various handles and casings and *Dyneema* (in the case of *LockJack 2.1*). Their function is as



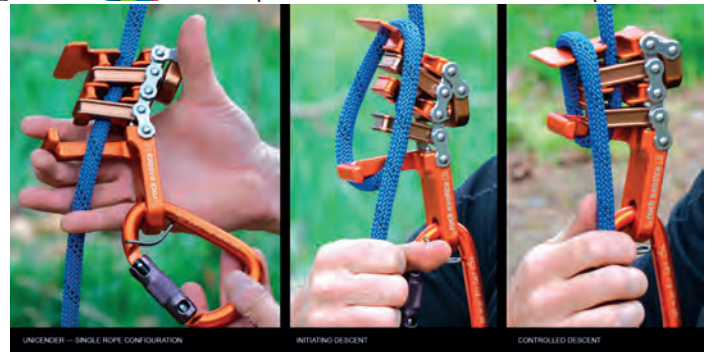
- and allied with this...
- 2) how efficient it is in NOT losing progress and efficiency to drop-back
 - 3) how forgiving the start-stop function is
 - 4) how easily it switches between modes

The ground-breaking *LockJacks* seemed to suffer more than others with wear to 'metal components' which, to be fair, can be replaced easily enough but in their second version they introduced that rather odd second rope-contact point made of wood (the brown section in the *SpiderJack2* picture left). It just shows that you can't beat natural materials and in this case the robust nature of a tough hardwood adds a second friction brake to mitigate wear on the original metal cam/pins. In fact, the wood is really the primary friction plate since it's the first contact point and

smooth as their design curves, in fact, the slack tending on *ART* devices is so efficient that the latest variant, *SpiderJack3* has a secondary lock that you can engage (black handle in the pic on the previous page). This is not to prevent slippage, but to prevent rope take-in when moving around the canopy. Even without the weight of trail-rope beneath the *Lockjack* it will self-tend so efficiently that you might be at your required work position and simply adjust your hips for comfort, only to find that *LockJack* has shortened more rope and put you slightly out of position! Hence the extra locking position - brilliant when you have to add a feature because your device is TOO efficient. *SpiderJack3* also added a pulley for more efficient redirection of the trail rope when limb-walking and was orientated to make it easier to use with left or right hand.

The one thing we can say for sure about ALL hybrid devices is that they must squeeze the rope between two metal elements somewhere along the line. Whether that's in a camming action, a simple squeeze or a moving chain link where the hole's alignment alters the friction, it means that there are varying degrees of friction within your system that also affect:

- 1) how well it functions as an ascender,



climbers proficient with its use can apply finite levels of friction such that spectacular fliers of dozens if not hundreds of feet are possible. Proficiency is the key to smooth starts on *LockJacks* but the *Zig Zag* and *Akimbo* have an action that seems to give much gentler transition from stopped to moving (in descent) mode. Certainly far smoother than the *Unicender* and *RopeRunner* which take more getting used to (although *Akimbo* can be far more difficult to adjust). This is not surprising with the *Zig-Zag* or *Lockjacks* since they are DdRT devices (unless the *ZigZag* is used with the *Chicane* SRT adjunct) but *Akimbo* functions this way on single rope which may yet become the favoured route in the arb industry. The *Akimbo* also exhibits minimal drop back in ascent mode, something the *Unicender* is also adept at but others struggle with. You can get used to working with drop-back but it's better when there isn't much.

WARNING: Unlike every other area of rope access & rescue, arborism generates a lot of home/garage modifications of existing products. Just like a car, ANY modification voids the warranty and any certification.

SEE ALSO **ARBCLIMBER #21** for detailed discussion of Multiscenders in comparison with enhanced DdRT systems and SRT Descenders. **BUYERS GUIDE** to **ROPE EQPT** has Autolocking Descenders. NB: **ART devices** seem to have a wider variety of weights quoted for them than any other piece of hardware. The weights we show represent them actually having been weighed.





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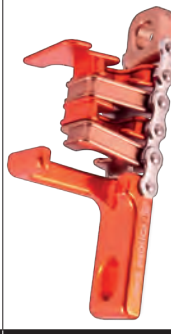







Patented



Images NOT to Scale							
MANUFACTURER	ART	ART	ART	ART	CLIMBING INNOVATIONS	CVI/ SINGING TREE	GORD SVEDB
MODEL VARIANT	Lockjack 2 Basic (aka Sport)	Lockjack 2 (swivel)	SpyderJack 2.1 Dyneema	SpyderJack 3	HitchHiker XF	Rope Runner	Bulldog Adjustable
ORIGIN							
COST	£234 \$410*€273	£265 \$415 €306	£254 \$395 €274	£386 \$500 €413	£248 \$300 €285	£289 \$350 €333	£320 \$380
WEIGHT (System)	255g 9oz	268g 9.5oz	281/241g 9.9oz/8.5oz	549g 1lb 3oz	n/a	246g 8.67oz	433g 14.4oz
MBS/MBL	23kN 5170lbf	23kN 5170lbf	16kN 3597lbf	25kN* 5620lbf	-	22.7kN 5103lbf	-
WLL (Specific Ropes)	200kg 440lb	200kg 440lb	200kg 440lb	200kg 440lb	<227kg* <500lb	125kg 275lb	<113kg <250lb
MINIMUM Rope Diameter	11mm 7/16"	11mm 7/16"	11mm 7/16"	11mm/12mm* 7/16"/1/2"	9mm 3/8"	11mm 7/16"	10.5mm 7/16"
MAXIMUM Rope Diameter	13mm 1/2"	13mm 1/2"	13mm 1/2"	12mm/14mm* 1/2"/9/16"	14mm 9/16"	13mm 1/2"	12mm 1/2"
HEIGHT (System)	150/220*mm 6/8.7"	150/220mm 6/8.7"	127/89*mm 5/3.5"	195/93mm 7.6/3.6"	150/230mm 6/9"	160 mm 6.3"	175mm 6.9"
SRT / SRS	-	-	-	-	■	■	■
DRT /SRS	-	-	-	-	-	-	-
DdRT / MRS	■	■	■	■	●	●	●
ASCEND	■	■	■	■	■	■	■
DESCEND	■	■	■	■	■	■	■
ADJUST FRICTION	●	●	●	●	●	●	-
MIDLINE ATTACH	■	■	-	-	■	■	■
INTEGRAL SWIVEL	-	■	-	■	-	-	-
ATTACH to CHEST	●	●	-	-	■	■	■
STANDARDS (System)	CE	CE	CE	CE	NO	CE	NO
FRAME MATERIAL	Alu	Alu	Alu	Stainless Steel	Alu/Steel	Alu /Steel	Alu/S
RECOMMENDED ROPES	*imported by VSG/ Sherril so price of basic vs swivel seems to be higher than £€ equivalent.	*system=with rope & knob. Swivel carabiner eye. All components replaceable. Approved for two person load	*difficult to say what is length and what is width! Available with Dyneema extender allows for quick carabiner change - deduct approx £37/\$45 and 40g for Velcro version.	*difficult to say what is length and what is width! All wearing parts are replaceable. Approved for two person load. *supplied with 3 cams which need to be swapped in for different rope sizes. *NB some stockists quoting 23kN- ART manual states 25kN. Add approx10% for laser-cut of your logo	runs on 24 strand & Kernmantle, requires 8-10mm cord for climbing hitch 2 versions - with and without captive eye. Works 180to90° website address is: climbing-innovations.com	EN 1891 type A low stretch kernmantle ropes	The BD constantly and hard track of - @survey Treebuzz for info (out Japan) Image shows Japanese adjustable *via a tied
NOTES	*system=with rope & knob. Fixed carabiner eye. All components replaceable . Approved for two person load						
WEBSITE	climb-art.de	climb-art.de	climb-art.de	climb-art.de	see above	cmigearusa.com	works-od

COSTS: £\$€ shown in burnt orange are currency conversions only & do not inc shipping, import duty or tax COST: Approx & inc local tax/VAT WLL: If no WLL is given by man

HYBRIDS/MULTISCENDERS

							Expansion column	Expansion column
BRAND	NOTCH	PETZL	PETZL	ROCK EXOTICA	ROCK EXOTICA	ROPETEK		
Model	Rope Runner Pro	Zig Zag	Zig Zag Plus	Akimbo	Unicender	HitchHiker 2		
Country								
Price	£366 \$380 €384	£212 \$300 €198	£253 \$360 €249	£408 \$400 €490	£408 \$400 €490	£248 \$300 €285		
Weight	425g 15oz	365g 12.9oz	425g 15oz	261g 9.2oz	310g 10.9oz	275/545g 9.6oz/1.2lb		
Strength	-	-	-	0kN 0lbf	31kN 6969lbf	25kN 5620lbf		
Max Load	140kg 308lbf	140kg 308lbf	140kg 308lbf	100/130kg 220/286lb	<545kg* <1200lb	<522kg* <1150lb		
Width	11mm 7/16"	11.5mm 7/16"	11.5mm 7/16"	11.5mm 7/16"	11mm 7/16"	11.5mm 7/16"		
Height	13mm 1/2"	13mm 1/2"	13mm 1/2"	13mm 1/2"	13mm 1/2"	13mm 1/2"		
Length	158mm 6.2"	115*-248/290mm 4.5*-7.9/11.8"	127*258/300mm 5*-10.1/11.8"	85*-200mm 3.4*-7.9"	155mm 6.1"	105mm 4.15"		
Features	■	●*	●*	■	■	■		
Material	-	-	-	-	-	-		
Attachment	●	■	■	●	■	●		
Adjustment	■	■	■	■	■	■		
Other	■	■	■	■	■	■		
Additional	●	-	-	●	■	●		
More	■	-	-	■	■	■		
Special	-	-	■	-	-	-		
Compliance	CE	CE ANSI	CE ANSI	CE	CE	NO		
Material	Alu	Alu/Steel	Alu/Steel	Alu	Machined Alu	Steel & Alu		
Notes	Centre chest attachment, smoother edges and drop-free mid-line rope attach	* height when in use EN 1891 type A low stretch kernmantle ropes * with Chicane	* height when in use EN 1891 type A low stretch kernmantle ropes * with Chicane	* height when in use Check website for list of specific ropes to use	*Load at which ropes slips thru SRT Barrel attachment available to improve frictional adjustment. Not officially sold in Europe.	*Load at which prusik slips \$495 as system with cord. 24 strand and Kernmantle requires 8-10mm cord for climbing hitch *Comes with steel carabiner. Ropetek no longer supply cord but some stockists do.		
Website	notchequipment.com	petzl.com	petzl.com	rockexotica.com	rockexotica.com	ropetek.com		

Manufacturer we show a Max Load based on approx 10:1 safety ratio HYPHEN = NO or not applicable N/A = info Not Available/not given. ○ = OK but not ideal

UPDATED Nov '23

AUTOLOCKING, 2-WAY LANYARD/ FLIPLINE AJUSTERS

AKA ROPE SHORTENERS

For the purposes of tree work, we're defining a lanyard as connected to two load bearing elements of your harness (the Side-mounted D-Rings) but most will also function as a single attachment in the same way as a rappel/ascending rope anchored above the climber. The important words here are **'TWO-WAY'** because virtually any ascender and in particular rope grabs can and are used as lanyard adjusters but they will only allow you to extend the length of lanyard when your weight is taken off the device. They are ascenders-only, not descenders. You can check out one-way adjusting rope grabs in the separate guide to ROPE GRABS from page __ or some of the Progress Capture Devices on page _ will also function as lanyard adjusters as will some Mobile Fall Arresters (see our ROPE EQUIPMENT BUYERS GUIDE). This guide relates to technical hardware but you can of course use the various prusiks to do a very similar job at a fraction of the cost. *Teufelberger* introduced their *CE Lanyard (Hipstar Flex)* years ago when combination flipline/extended lanyards first started to appear and their rope/pulley/prusik combo subsequently led the market for quite some time but was fairly easy for others to copy and compete against. The rope itself is the key element and we would suggest that the specialist Aramid/Twaron/Technora ropes might be the best compromise between a wire-core and a regular rope in terms of abrasion resistance but these will all be personal choice. Remember though, none of these, even wire core, are cut-proof but clearly you stand a greater chance of survival with a wire core followed by the Aramid style fibre ropes followed by the thickest -ass rope you can find but the key lesson is to cut carefully and always have a back up. With that in mind, the longer rope lengths that make the type of two-way device we're dealing with in this guide so useful, means that you can use the tail as a second backup polestrap when moving up a spar or between trunks. The devices in this guide are really modified descenders or belay devices that will allow you to release rope (in SRT or doubled lanyard mode) in a controlled manner even when fully loaded - in effect you are performing a series of very short abseils/rappels whenever you adjust or increase the length out or simply pulling on the rope tail to take rope in. Consequently these can be used more for work positioning on longer rope lengths than simply a traditional, short pole-strap style lanyard - though they will do both jobs admirably. With the loaded descent capability they tend to be larger/bulkier than basic rope grabs.

You could also use a prusik as a two-way lanyard adjuster and any handled descender or indeed arborist-specific device like

ART's Ukrainian-supporting colours in their limited edition swivel positioner

www.rescuemagazines.com

the *Akimbo* and *RopeRunner* but we're talking 'handily-sized'. Actually the *Akimbo* is handily -sized but it seems a bit like entering a *Masarati* into a donkey derby! There is also the small matter that, technically, **to meet the European standard as a Lanyard Adjuster the side plates need to be fixed** which is why so many come with ready-installed lengths of rope/lanyard. For some devices that might normally have swivel plate access to loading the rope this can simply mean that the swivel plate is now bolted but you can unbolt it to apply a new lanyard. *Notch's Glide* for instance has an Allen Key bolt on the silver rope-chamber cover for changing rope and/or adjusting the cam face to better fit the rope.

Although many of these devices will function admirably on a single rope in the same way as any abseil/rappel device, the intention is for the rope to be doubled as it extends from one pole strap D-ring - passes around your anchor branch (or via a friction-saver) and back to your adjuster on the opposite pole-strap D-ring. With longer lengths of rope/lanyards the climber is able to limb-walk and manoeuvre around the work area with enhanced stability - think of a tripod and the stability afforded when compared to working away from the vertical line of a single point attachment

Flip-lines or pole-straps are shorter than the newer generation of working rope lanyards and may also have a wire core to prevent being cut through by your chainsaw. Standards for use on rope do not include wire-core rope which are effectively wire cable with a braided sheath allowing camming devices to work but not in the same way as they do on a fibre core rope which compresses under load and improves grip. In contrast a wire-core rope will only compress for the thickness of the braided sheath.

Some devices **NOT included** here that crop up in the Belay Devices Guide in the ROPE EQUIPMENT BUYERS GUIDE which you might otherwise expect to be included here include the *Mad Rock Lifeguard* and *Safeguard*, *Beal Birdy*, *Anpen P15* and *Edelweiss Kinetic* because they require a degree of dynamic

ROPE SHORTENERS

arrest so are not truly hands-off auto-locking as required of a lanyard adjuster. The *GriGri* and *GriGriPlus* only because the *Grillon* is a more compact version, the russian *Ice Rock Gnome* and *Krok Fedor* because they're...well....russian and therefore persona non-grata during the current bizarre period of invasion of a neighbouring democracy. The *ISC D2* because, like the *Petzl GriGri* it's a little bulky compared to *ISC's* dedicated lanyard adjuster the *RAD*. We have left in the *Taz Lov2* because, although it is quite bulky, it is a true multi-role device. The *Trango Vergo* is a belay device and usually precluded because, like the *Birdy* etc. it requires a dynamic brake assist and therefore not truly auto-locking but the *Vergo* has a more positive brake override. It also only just made it due to its small diameter rope range (the reason many tactical and bailout devices also didn't make it in) but lanyard ropes can be anywhere between 10 and 13mm (½") so it's close enough.



ART, *Petzl* and *Notch Equipment* deserve special mention because they have bespoke products specifically engineered to be lanyard adjusters but of course, by default, this function makes them suitable for other tasks as you'll see in the list below. As usual *ART* have some beautifully over-engineered adjusters, one with a swivel, one without (top) which, like *Petzl's Zillon* opposite, are actually cut-down versions of their larger climbing device. *Notch Equipment* have the interesting *Glide* (right) specifically designed to fit easily in the hand and align with the direction of operation in a slimline (and swivelling) package. The rope access plate is removed with an Allen key. Finally *Petzl's* bespoke device is not the afore-mentioned *Zillon* but the smallest, cheapest, lightest and simplest device in our selection, the *Progress Adjust* (right). Sport climbers will recognise the principle of this as a camming frame that we see on some belay devices where the carabiner provides the spacer and the locking surface against which the rope is jammed by the frame. A little plastic accessory y helps to hold the carabiner in a set position rather than flopping around making it easier to clip.

The versatility of many of these adjusters as belay devices, descenders, progress capture and ascenders means that your humble adjustable lanyard can do so much:

- 1) Pole-Strap/Flip Line on a pole/trunk/spur
- 2) lateral Work positioning
- 3) vertical, single point work positioning
- 4) edge restraint (for access 7 rescue)
- 5) Quick-attach 2:1 tMA with device on target
- 6) Quick attach 3:1 tMA with device on self, pulley/link on target
- 7) Short Belay/lifeline
- 8) Ascent progression (ladder or via-ferrata style ascent)

IN THE FOLLOWING TABLES:.....

ORIGIN: The main flag refers to the manufacturer's home country, but this may not be where the device is made. If we know, we show an inset flag. As we often mention, the figures in this Guide are verified by the manufacturer but you will see different spec on some supplier websites and for some manufacturers that have rebadged a model. No idea why!

COST: Prices are a rough guide only - it can vary due to exchange rates, taxes etc. and we usually round the price up. Chinese devices may need import duty added.

WEIGHT: for the individual device in black and including the lanyard in burnt orange.

DIMENSIONS: of the device itself This is mainly given as height or length by width with some quoting the depth (or thickness) of the device. If only one figure is given it will be the longest height or length. This should include the handle in stowed position but some may be quoting length with the handle extended or possibly not including the handle at all.

MATERIALS: **ALLOY** refers to **ALUMINIUM ALLOY** or **ALUMINUM ALLOY** unless otherwise shown. Note that many showing the handle as Alloy (alu) or Steel may also have a comfort cover of rubber or plastic etc. Others like the *Core* use the entire body of the descender as a lever style handle.

MBL: Minimum Breaking Loads is a complex area when you have multi-role devices and it is always best to read the manufacturers product instructions thoroughly to make sure that you really understand what your device is capable of.

Where a device actively squeezes the rope to perform its task the MBL may be more about the resilience of the rope in not breaking

WLL: Working Load Limit (Safe Working Load). Again, rarely used in sports devices. The **MINIMUM** indicates the lowest weight that will be able to descend or that you can lower. This can also be an indication of how easily rope will pull through the device but most will simply quote the standards requirement even if they can handle lower loads.

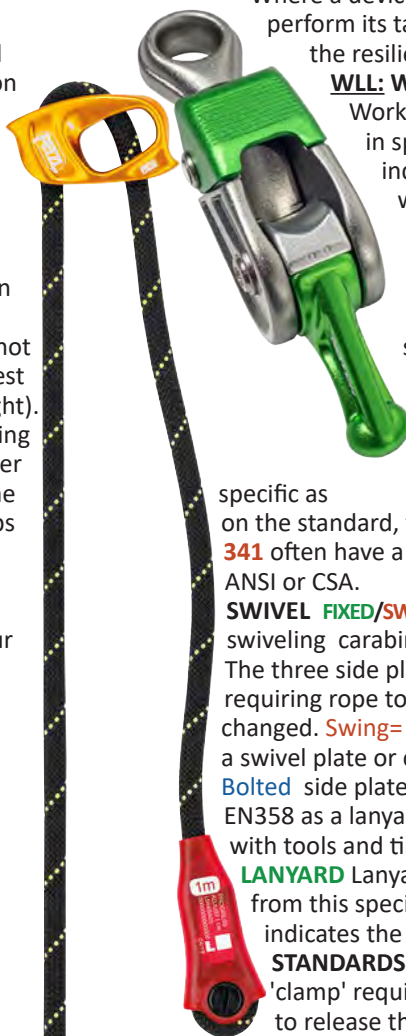
MAXIMUM figure for the larger rope in the device's range. This figure is not as

specific as an MBL and can vary depending on the standard, for instance ropes meeting **EN 341** often have a lower WLL than those meeting **ANSI** or **CSA**.

SWIVEL FIXED/SWING/BOLTED: Swivel refers to a swiveling carabiner attachment - most are fixed. The three side plate options are **fixed**= always requiring rope to be fed or the lanyard cannot be changed. **Swing**= swing plate/cam. The device has a swivel plate or cam for easy loading onto rope. **Bolted** side plates as per the requirements of **EN358** as a lanyard adjuster but can be unbolted with tools and time.

LANYARD Lanyard are the lengths available from this specific manufacturer - an asterisk indicates the length quoted in the **COST**.

STANDARDS: Aside from **EN567** as a rope 'clamp' requiring at least two actions to release the rope which all of these meet, the other relevant standards are more complex and determined not so much by the device as by the rope you put in it. **EN12841:2006-C** Rope diameter 10.5mm-11.0mm Max weight 130kg. **EN15151-1:2012-6** Rope diam 9.9mm-11.3mm. **EN358:2018** (when used with specified Lanyard) Max weight 150kg. **EN795:2012-B** (when used with specified lanyard) 1-person load. **EN341:2011/2D** (with approved pre-threaded rope) 1x 200m Max weight 104kg- Min weight 40kg



Images NOT to Scale					
MANUFACTURER	ABTECH	ANPEN	ART	ART	CAMP
MODEL VARIANT	ROPE RAT ABRAT	P15	Positioner Basic	Positioner 2 Swivel	Druid Pro 2P654
ORIGIN					
COST (inc Tax) DEVICE-ONLY Inc. Integral LANYARD	- £144* \$177 €165	£111 \$135* €125 -	£103 \$165 €110 -	£125 \$200 €140 -	£135 \$220 €113 -
WEIGHT exc lanyard	346g 12.2oz	245g 8.6oz	175g 6.2oz	175g 6.2oz	280g 9.9oz
MAX LOAD- WLL MBS	191kg 16kN 420lb 3597lbf	250kg 16kN 551lb 3597lbf	200kg 23kN 441lb 5170lbf	200kg 23kN 441lb 5170lbf	200kg 12kN 441lb 2697lbf
ROPE RANGE Ø	11mm 7/16"	9.5-11mm 3/8-7/16"	11-13mm* 7/16 - 1/2"	11-13mm* 7/16 - 1/2"	10-11mm 3/8-7/16"
DIMENSIONS ht x w x depth	114 x 73 x 24mm 4.5 x 2.9 x 0.9"	140 x 50mm 5.5 x 2"	120 x 45 x 38mm 4.7 x 1.8 x 1.5"	135 x 45 x 38mm 5.3 x 1.8 x 1.5"	118 x 76 x 46mm 4.7 x 3 x 1.8"
SWIVEL FIXED/SWING/BOLTED	- ■	- ■	- ■	■ ■	■ ■
LANYARDS RELEASE UNDER LOAD	2*/5/10m ■	■	■	■	■
USES: PCD BELAY DESC ASC	-	■ ■ ■ ■	■ ■	■ ■	■ ■ ■ ■
FRAME CAM HANDLE	Alu S.Steel Alu	Alu Alu Plastic	Alu Alu Alu	Alu Alu Alu	Alu S.Steel Alu
STANDARDS (with lanyard)	CE ANSI	GA494-2004	CE ANSI	CE ANSI	CE
OTHER COLOURS		■	-	-	-
NOTES	Rebranded by many companies	*FOB China	*Change cam for wire core rope 12-13mm	*Change cam for wire core rope 12-13mm	Std Druid version has dbl
WEBSITE	abtechsafety.com	enanpen.com	smcgear.com	cmcpro.com	camp.it
IMAGES NOT to SCALE					
MANUFACTURER	NOTCH	PETZL	PETZL	PETZL	RnR
MODEL VARIANT	Glide 64055	GrillonPlus Grillon	Zillon	Progress Adjust-I L044	Renegade P54
ORIGIN					
COST (inc Tax) DEVICE-ONLY Inc. Integral LANYARD	£123 \$140 €131 -	- £126 \$240 €155*	- £198 \$254* €203	£66 \$72 €66* -	- £123 \$150 €140
WEIGHT inc Lanyard	206g 7oz	208g 7.3oz	570g 20oz	185g 5oz	140g 4.9oz
MAX LOAD- WLL MBS	- 23kN - 5170lbf	100-140kg n/a kN 220-309lb n/albf	150kg n/akN 330lb n/albf	140kg n/akN 308lb n/albf	509kg 23kN 1124lb 5170lbf
ROPE RANGE Ø	11-13mm* 7/16 - 1/2"	11mm 7/16"	11mm 7/16"	11mm 7/16"	≤11mm ≤3/16"
DIMENSIONS ht x w x depth	140 x 90 x 33mm 5.5 x 3.5 x 1.3"	105 x 63 x 42mm 4.2 x 2.5 x 1.65"	100+ x 35mm 4+ x 1.4"	50 x 36mm 2 x 1.4"	85.5 x 44 x 31mm 3.4 x 1.7 x 1.2"
SWIVEL FIXED/SWING/BOLTED	■ ■	- ■	- ■	- ■	- ■
LANYARD S RELEASE UNDER LOAD	■	2*/3/4/5/10/15/20m ■	2.5*/4/5.5m ■	1*/2/3/4/5m ●	8', 12' ■
USES: PCD BELAY DESC ASC	● ●	● ■ ■ ■	■ ■ ■	●	● ●
FRAME CAM HANDLE	Alu StSt Alu	Alu StSt Plastic	Alu StSt -	Alu - -	Alu Alu Alu
STANDARDS (with lanyard)	ASTM CE	CE ANSI CSA EAC UKCA	CE	CE ANSI CSA EAC UKCA	CE
OTHER COLOURS	■	■	■	■	-
NOTES	3 friction settings to cater for rope sizes		*As a DdRT device	can use dynamic rope	
WEBSITE	notchequipment.com	petzl.com	petzl.com	petzl.com	rocknrescue.com

UPDATED March '24

CARABINER PULLEYS

We're going to guess that the birth of the carabiner pulley was many, many years with climbers using a plastic wheel slipped onto an oval carabiner- something you can still do now but as a manufactured product it was maybe not until this century that a properly integrated sheave appeared. So it took a long time for the evolution of what you might think would be quite a straightforward design. But no, *DMM's Revolver* (green version right) with its diminutive friction reducing wheel kick started a drive towards a whole new genre of kit that was

gleefully taken up by *Petzl* with the first fully functioning pulley sheave integrated into the structure of the carabiner, the *RollClip*. The genre has latterly taken a more unusual direction with *Harken's Snatchet* (left) with a faceted sheave held onto an oval carabiner with a bolted plastic frame or 'cheeks'. The faceted version provides increased friction for lowering while their non-faceted version acts as a regular pulley in both directions. The intention of course is to provide hauling efficiency with less space and kit; instead of a carabiner length plus a pulley length you just have the carabiner length.

These things are perfect for creating a quick 2:1 or as part of a larger hauling system since they are as efficient as a fair quality pulley at 80-90%. They also have a slight advantage over a regular swing-cheek pulley that you

can insert the rope while the carabiner element is connected therefore negating the chance of dropping the pulley. The *Revolver* is less of a pulley and more of an efficient carabiner offering useful rapid redirection capabilities that create less drag than a carabiner alone but don't forget that redirects create high load and not all carabiner pulleys are up to this task. The newest addition is China's *Kailas* which produces bespoke, properly branded products and this is a slick, hot-forged option (Black version shown above).

IN THE FOLLOWING TABLES:.....

ORIGIN: The main flag refers to the manufacturer's home country, but this may not be where the device is made. If we know, we show an inset flag.

COST: Prices are a rough guide only - it can vary due to exchange rates, taxes etc. and we usually round the price up. Chinese devices may need import duty added.

WEIGHT: for the individual item in its basic form

DIMENSIONS: Height/length by width

MATERIALS: **ALU** refers to **ALUMINIUM** or **ALUMINUM ALLOY**
StSt = Stainless Steel and some are '**Steel**' = carbon steel

MBS: Minimum Breaking Strength for the **Minor Axis** which is across the width, **Major Axis** which is down the spine of the



carabiner and always the strongest direction of load and with the **Gate Open** which is usually the weakest because it allows the carabiner to bend away from its two ends.

WLL: Working Load Limit (specifically the pulley sheave

ROPE Ø: Any rope that will fit through the gate can be used but the pulley will only function to this diameter.

SHEAVE Ø: Diameter of wheel but may be the max or the min/tread diameter which are quite different figures. **Where we know the verified inner/tread Ø it is shown in italics.**

GATE OPENING: is the widest rope or bar that can pass through an open carabiner gate.

EFFICIENCY: IS how good the pulley axle (bearing or bushing) is at reducing friction - anything less than 100% is saving you effort whereas passing a rope over a standard carabiner would likely be well in excess of 120%.

GATE LOCK: is whether and how the gate is secured. **SNAP** has no locking action and can open if the gate is pushed against.

SCREWg is 'Screwgate' requiring the user to manually unwind and wind up the collar on the gate, failure to do so renders it a snap-gate.

AUTO means automatically locks on release of the locking collar. There is a spring action on the barrel which keeps the gate locked until you open the collar by twisting against the spring. A secondary and even third action may also be required involving pushing the collar up/downwards as well as twisting. We have not differentiated the 3 AUTO options.

CAPTIVE EYE: is a bar, as shown in the *Revolver Rig* above, that ensures that the rope cannot migrate off of the pulley sheave(s). Some of these can be an optional addition as with the *Petzl RollClips* but they do mean that rope has to be threaded rather than hot-loaded mid-rope.

BECKET: An unusual feature with these carabiner pulleys and at the time of writing only present on the *Revolver Rig* and slack-lining's *Rollex* where the becket is for tape not rope. Don't just assume that a gap beneath the sheaves can be used as a load-bearing becket - *RnR's Onyx* specifically states this in writing on its lower frame.

STANDARDS: for CE standards there are 3 that may be applicable: **EN12278** as a PULLEY ■

EN12275 as a SPORT CONNECTOR/CLIP ■ and **EN362** as WORK CONNECTOR/CLIP ■

EAC covers Eastern Europe and Russia

UIAA covers mountaineering activities

UKCA is a superfluous addition/replacement to ENs for the UK.



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Images NOT to Scale						
MANUFACTURER	DMM	DMM	DMM	DMM	DMM	DMM
MODEL VARIANT	Revolver Snap A238	Revolver SG A272	Revolver LockSafe A277	Revolver Kwiklok A273	Revolver Rig SG A5821CB	Revolver Rig LockSafe A5871
ORIGIN						
COST (inc Tax/VAT)	£29 \$37 €33	£31 \$39 €36	£35 \$44 €48	£34 \$43 €39	£82 \$107 €90	£85 \$106 €111
WEIGHT min- max (see gatelock colour-coding)	51 g 1.8oz	63 g 2.2oz	70 g 2.4oz	69 g 2.4oz	196 g 6.9oz	203 g 7.2oz
MBS Minor Axis Major Axis Gate Open	7kN 1573lbf 24kN 5395lbf 9kN 2023lbf	8kN 1798lbf 24kN 5395lbf 8kN 1798lbf	8kN 1798lbf 24kN 5395lbf 8kN 1798lbf	8kN 1798lbf 24kN 5395lbf 8kN 1798lbf	7kN 1574lbf 25kN 5620lbf 7kN 1574lbf	7kN 1574lbf 25kN 5620lbf 7kN 1574lbf
MIN-MAX ROPE Ø	<12.7mm ½"	<12.7mm ½"	<12.7mm ½"	<12.7mm ½"	13mm ½"	13mm ½"
DIMENSIONS ht x w x depth	103 x 59mm 3.6 x 2.4"	109 x 59mm 3.8 x 2.4"	109 x 60mm 3.8 x 2.4"	109 x 60mm 3.8 x 2.4"	161 x 76mm 6.3 x 3"	161 x 76mm 6.3 x 3"
SHEAVE Ø TREAD GATE OPENING	12mm 0.47" 16mm 0.63"	12.7mm 0.5" 15mm 0.6"	12.7mm 0.5" 15mm 0.6"	12.7mm 0.5" 15mm 0.6"	24mm 0.95" 23mm 0.9"	24mm 0.95" 22mm 0.87"
PULLEY EFFICIENCY SWL	n/a	n/a	n/a	n/a	n/a	n/a
GATELOCK- SNAP SCREW Auto2 Auto3 Auto4 ACTIONS	■	■	■	■	■	■
CAPTIVE EYE BECKET	--	--	--	--	■ ■	■ ■
MATERIAL: 'BINER SHEAVE	Alu Alu	Alu Alu	Alu Alu	Alu Alu	Alu Alu	Alu Alu
STANDARDS	UIAA CE ■	UIAA CE ■ ■	UIAA CE ■ ■	UIAA CE ■ ■	CE ■ ■ ■	CE ■ ■ ■
OTHER COLOURS	■ ■	■	■	■	■	■
NOTES						
WEBSITE	dmmwales.com	dmmwales.com	dmmwales.com	dmmwales.com	dmmwales.com	dmmwales.com

Images NOT to Scale						
MANUFACTURER	HARKEN	HARKEN	KAILAS	LACD	PETZL	PETZL
MODEL VARIANT	Snatchet INSN65R	Snatchet INSN65	Rota EC202	Trilock W 1242	RollClip Snap P74	RollClip Triac P74TL
ORIGIN						
COST (inc Tax/VAT)	£264 \$330 €304	£228 \$286 €263	£44 \$51 €46	£35 \$49 €40	£33 \$38 €46	£40 \$50 €44
WEIGHT min- max (see gatelock colour-coding)	178g 6.3oz	178g 6.3oz	121g 4.3oz	131g 4.6oz	69g 2.4oz	115g 4oz
MBS Minor Axis Major Axis Gate Open	20kN 4496lbf 38kN 00lbf 16kN 1574lbf	20kN 4496lbf 38kN 00lbf 16kN 1574lbf	8kN 1798lbf 22kN 4946lbf 7kN 1574lbf	7kN 1574lbf 20kN 4496lbf 8kN 1798lbf	8kN 1798lbf 20kN 4496lbf 7kN 1574lbf	8kN 1798lbf 20kN 4496lbf 7kN 1574lbf
MIN-MAX ROPE Ø	9-14mm ¾-½"	9-14mm ¾-½"	7-13mm ½-½"	7-13mm ½-½"	7-13mm ½-½"	7-13mm ½-½"
DIMENSIONS ht x w x depth	146.5 x 72mm 5.8 x 2.8"	146.5 x 72mm 5.8 x 2.8"	112 x 73mm 5.8 x 2.8"	130 x 70mm 5.1 x 2.75"	109 x 60mm 4.3 x 2.4"	109 x 60mm 4.3 x 2.4"
SHEAVE Ø TREAD GATE OPENING	65mm 2.6" 21mm 0.825"	65mm 2.6" 21mm 0.825"	25mm/1" 24mm/1"	18mm 0.7" 23mm 0.9"	18mm 0.7" 25mm 1"	18mm 0.7" 22mm 0.87"
PULLEY EFFICIENCY SWL	n/a 10kN	n/a 10kN	85% 4kN	n/a	85% 4kN	85% 4kN
GATELOCK- SNAP SCREW Auto2 Auto3 Auto4 ACTIONS	■	■	■	■	■	■
CAPTIVE EYE BECKET	--	--	--	--	□	□
MATERIAL: 'BINER SHEAVE	Steel StSt -	Steel StSt	Alu Alu	Alu Alu	Alu Alu	Alu Alu
STANDARDS	CE ■ ANSI	CE ■ ■ ANSI	CE ■ ■ ■	CE ■ ■ ■	CE ■ ■ ■ EAC UKCA	CE ■ ■ ■ EAC UK
OTHER COLOURS	■	■	■ ■	■	■	■
NOTES	Ratchet version	Non-Ratchet version	Hot-forged, no snag nose	DISCONTINUED?		
WEBSITE	harkenindustrial.com	harkenindustrial.com	kailasgear.com	lacd.de	petzl.com	petzl.com

CARABINER PULLEYS

							expansion column
	DMM Revolver Rig Durolok A5841CB	DMM Revolver Rig SG Dbl A5822CB	DMM Revolver Rig LockSafe Dbl A5872CB	DMM Revolver Rig Durolok Dbl A5842CB	EDELRID Axiom Slider 54640	EDELRID Axiom 54640	
	£87 \$110 €95	£87 \$110 €95	£90 \$115 €120	£95 \$120 €110	£42 \$54 €50	£36 \$50 €43	
	213g 7.5oz	214g 7.5oz	219g 7.7oz	226g 8oz	68g 2.4oz	66g 2.3oz	
	7kN 1574lbf 25kN 5620lbf 7kN 1574lbf	7kN 1574lbf 25kN 5620lbf 7kN 1574lbf	7kN 1574lbf 25kN 5620lbf 7kN 1574lbf	7kN 1574lbf 25kN 5620lbf 7kN 1574lbf	8kN 1798lbf 22kN 4945lbf 7kN 1574lbf	8kN 1798lbf 22kN 4945lbf 7kN 1574lbf	
	13mm ½"	8mm ⅝"	8mm ⅝"	8mm ⅝"	13mm ½"	13mm ½"	
	161 x 76mm 6.3 x 3"	161 x 76mm 6.3 x 3"	161 x 76mm 6.3 x 3"	161 x 76mm 6.3 x 3"	125 x 65mm 4.9 x 2.6"	125 x 65mm 4.9 x 2.6"	
	24mm 0.95" 20mm 0.8"	2x 25.7mm 1" 23mm 0.9"	2x 25.7mm 1" 22mm 0.87"	2x 25.7mm 1" 20mm 0.87"	12mm 0.47" 15mm 0.6"	12mm 0.47" 15mm 0.6"	
	n/a	n/a	n/a	n/a	86% 4kN	86% 4kN	
	■	■	■	■	■	■	
	■ ■	■ ■	■ ■	■ ■	■	--	
	Alu Alu CE ■ ■	Alu Alu CE ■ ■	Alu Alu CE ■ ■	Alu Alu CE ■ ■	Alu Alu CE ■	Alu Alu CE ■	
	■	■	■	■	-	■	
	dmmwales.com	dmmwales.com	dmmwales.com	dmmwales.com	edelrid.com	edelrid.com	3 friction settings to cater for rope sizes
							expansion column
	PETZL RollClip Z SL P75SL	PETZL RollClip Z Triact P75TL	RNR Onyx RC049	SPIDER SLACKLINES Rollex Highline SS 2P	SPIDER SLACKLINES Rollex Highline SG 2P	TREERUNNER Spin 64055	
	£33 \$38 €45	£40 \$48 €46	£40 \$39 €46	£43 \$55 €50/75	£47 \$58 €53	£31 \$39 €35	
	105g 3.7oz	110g 3.9oz	139g 4.9oz	129g 4.6oz	139g 4.9oz	132g 4.7oz	
	8kN 1798lbf 20kN 4496lbf 7kN 1574lbf	8kN 1798lbf 20kN 4496lbf 7kN 1574lbf	8kN 1798lbf 20kN 4496lbf 7kN 1574lbf	8kN 1798lbf 20kN 4496lbf 7kN 1574lbf	8kN 1798lbf 20kN 4496lbf 7kN 1574lbf	7kN 1574lbf 20kN 4496lbf 8kN 1798lbf	
	7-13mm ⅜-½"	7-13mm ⅜-½"	7-13mm ⅜-½"	web24-26mm0.9-1"	web24-26mm0.9-1"	7-13mm ⅜-½"	
	109 x 60mm 4.3 x 2.4"	109 x 60mm 4.3 x 2.4"	n/a	130 x 67mm 5.1 x 2.6"	130 x 67mm 5.1 x 2.6"	130x73mm 5.1 x 2.9"	
	18mm 0.7" 21mm 0.825"	18mm 0.7" 20mm 0.8"	?mm ?mm	27mm/1.1" 31mm/1.2"	25mm/1" 24mm/1"	21mm/1" 24mm/1"	
	85% 4kN	85% 4kN	n/a 4kN	n/a 4kN	n/a 4kN	n/a n/a	
	■	■	■	■	■	■	
	□	□	--	--	--	--	
	Alu Alu CE ■ ■ ■ ■ EAC UKCA	Alu Alu CE ■ ■ ■ ■ EAC UKCA	Alu Alu -	Alu Alu CE ■	Alu Alu CE ■	Alu Alu CE ■	
	■	■	■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	
	petzl.com	petzl.com	rocknrescue.com	spider-slacklines.com	spider-slacklines.com	grube.eu	Steel or Stainless Steel bearing Small lanyard eye

PROGRESS CAPTURE PULLEYS



Progress capture is a term uniquely related to hauling and effectively function ropes - allowing direction around then traps the rope that little or no complete or during the upwards and also ensure be released in an that require a arborist arsenal seen some favour cut branch or trunk. systems are nearly are in wilderness are most often in vertical orientation. The PCP or PCD (Device) can be used as part of a pulley system or by itself for material handling to hold load as you take in on the rope Pull on the rope and raise or pull in on your load, release and it is arrested by the cam. In more complex systems the PCP is incorporated into a mechanical advantage (MA) system offering upwards of 3:1 and most often 4 or 5:1 depending on how it is rigged with the PCP best incorporated at or near the first entry or last exit strand from the hauler. Functionally these would equally operate as belay devices keeping rope tight to the load during raising were it not for the fact that most use toothed cams and ARE NOT DESIGNED TO BE SHOCK LOADED as might occur during belay and definitely does occur when dropping a branch or section of timber. Nevertheless, one or two will function in both PCP and Belay modes because the camming action is more passive than the usual toothed cam and is mitigated by the gripping action of the sheave. CMC's new *Capto* (pic top) for instance has a faceted cam to limit force applied to the rope but, despite the name and looking the part with a pulley sheave and cam, it's not actually intended to be a full time 1:1

PCP but instead an additional device to increase the MA of your existing system. *Petzl* meanwhile do have full time 1:1 PCPs and have revamped and brought back the *Mini Traxion* and the *Pro Traxion*, the latter as part of their *SPIN* family with a meaty swivel (pic left) The *CMC MPD*, *Harken Clutch*, *ASAP RD2* and *Petzl Maestro* are examples of what are effectively descenders incorporating a pulley sheave/wheel hence their inclusion in this guide and they would function well with an ancillary device like the *Capto* to increase MA and progress-capture (eg. in place of the rope grab as shown at the top of p51). The majority of devices however, are designed to be used in one-direction for hauling such that release of the cam would result in dropping the load unless mitigated by incorporation of a descender or friction bollard, again this isn't the case with the *MPD*, *Clutch*, *RD2* and *Maestro* with their one-way pulley wheel and it's also not the case with one or two other, more conventional designs where the sheave only rotates in one direction like the 'D' version of the *Petzl Spin* swivel pulley.

One type of device we *haven't* included is the integrated load arresters typified by the *Rollgliss 350* (left) and *ISC RALF*. These are very much 'Devices' rather than 'pulleys' and are either part of a pre-rigged system or in *Cresto* and *Rollgliss's* case, are a self-contained unit that effectively functions as a PCD crossed with a capstan winch. The *RALF* and some *Rollgliss* models can be activated and released remotely while the complex capstan style models can deal with very heavy loads extremely well including multiple fall-arrests but are the size and cost of a small car. It's a fine line, but while we haven't included the *Ralf* we have included *CMC's CSR2* because it is anatomically similar to a pulley even though you could argue they function in a similar way to *Ralf* and the *350* with remote release/lock option. Since we first wrote this guide our three groups of product has expanded to 4 groups with the inclusion of the heaviest and most expensive options- double sheave PCPs:

1. WALLHAULERS

The first type we shall call **WALLHAULERS** after the original *Rock Exotica* model, later purchased by *Petzl* and subsequently discontinued when they developed their *PROTRAXION* range. The apparent reintroduction of the *Wallhauler* may be uncertified/unlicensed copies. In their simplest form these are a pulley bolted onto a basic hand ascender as seen in the *Kong Block Roll* and *Xindi/Reico* model by *Rock Empire*. These later evolved into a one piece housing typified by the *ISC model on the right*. *SRTE's models were swallowed up and discarded when they were bought by DB-Sala/Rollgliss and then 3M as the largest company in our sector but with by far the worse website and marketing!*). The ascender is part of the same single body of metal as the pulley and most offer double as well as single sheave options.

Consequently these are by far the largest and heaviest models but there are some diminutive options like the *CMI Micro*. Most, in fact all in this list, incorporate a double becket enabling them to be used as part of a larger MA system and some are only available as part of a full rope kit. Many come with cord (or you can add cord) for remote removal of the cam from the rope where the pulley system is rigged out of reach - this is common in rescue but not the norm in arb work.

2. INTEGRATED 'COMPACT' PCD

2) Next came the second group, we're calling *integrated compact* models. At the smallest end of things are the *Petzl Micro-Traxion* (above), *Skylotec/CT RollIN'lock*, *Edelrid Spoc*, *Kong Duck* (left) and the second newest model *CAMP's Turbolock* (left) where the 'pulley' and cam are effectively together in the same side cheeks or side plates as distinct from *Wallhaulers* which are two separate components even if they are con-joined. At the larger end is the *SMC HX* (right) and the *Petzl Pro Traxion* at around 300g they're a fraction the weight of a *Wallhauler* or *Descender* but over three times heavier than the *Micro-Traxion* (NB: the *Mini-Traxion* has been updated and reintroduced). While these are not three times stronger they are more geared to heavy duty and long-hauling and in fact the *Pro Traxion* has been overtaken in the 'humongous' category by its cousin the *Petzl Twin Release* which we'll discuss shortly. As pioneers of this genre *Petzl's* term '*Traxion*' is often used to describe all such devices ala '*Hoover*'. *SMC's Advance Tech HX* (right) is a slick, purpose designed progress capture pulley with double sheave and a single cam. It has a double becket meaning it too can be incorporated into an MA system but it is reasonably compact at 129mm/5" tall and is fully rescue-capable. Although they've now been out a few years both the *Traxions* and *HX* deserve praise as designs that weren't simply variations on a theme as most of the '*Wall-Hauler*' style are. Also new since the original guide are a couple of 'plumpers', *Petzl's* unimaginatively named *Twin-Release* and *Anpens'* even less imaginatively named '*Aluminum Universal Brake Double Pulley for rescue and high work*', (pic right) no really that is the product name - needless to say we've shortened it.

3. DESCENDER PCDs

We originally listed these as *oddities* but with *CMC/Harken's Clutch* (left) and *ASAT's RD2* (right) joining *CMC's* original *MPD* (below-left) and *Petzl's Maestro* (shown above right in the hauling mode they can all perform) they have coalesced into this separate grouping as heavy-duty descenders /lowering devices with an integral rotating or partially rotating pulley sheave. None can be described as compact by any stretch of the imagination but they all function as heavy-duty progress capture pulleys as well as belay and lowering

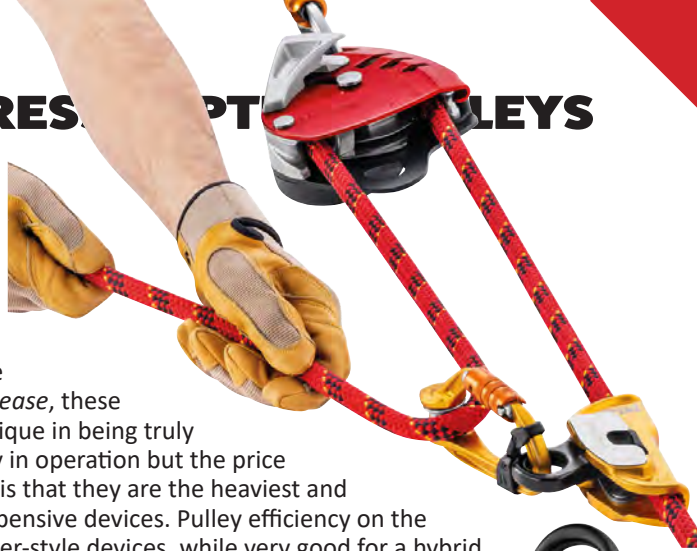
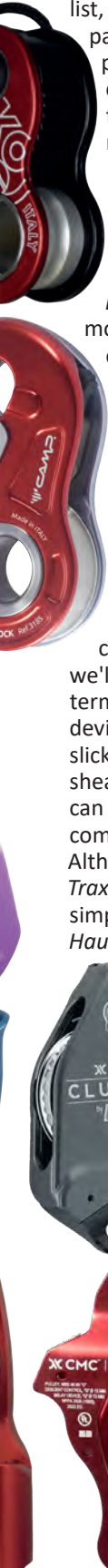
PROGRESS CAPTURE PULLEYS

devices. Until the *Twin-Release*, these were unique in being truly two-way in operation but the price you pay is that they are the heaviest and most expensive devices. Pulley efficiency on the descender-style devices, while very good for a hybrid, is definitely lower than *Petzl's* true pulley derivative the *Twin-Release*.

4. ODDITIES. The final group of oddities starts with the aforementioned *Petzl Twin Release* (right) which we're starting a petition to rename to the *Walrus*. We call it that because it's big, flabby and unwieldy in the hand but in its true environment, is as sleek as a sea-lion....ish.

Despite looking like the car that Homer Simpson designed, the function of this is a thing of wonderment - it's a swivelling, double sheave pulley with locking swing cheeks that not only has a camming action to hold a rope, it even has a fold-out handle to enable you to lower a heavy load and is especially efficient within a 4-5:1 system with a second pulley below. Close but with no lowering handle is *Anpens' Aluminum Universal Brake Double Pulley for rescue and high work* (where's that petition when you need it). This uses a swivel and a fixed becket with a toothed cam on one of the two sheaves. Next are the system components like *CMC's CSR²* which are intended to be the progress capture element of a two-pulleys system (as indeed is the *Twin-Release* if it didn't have a lowering handle). *Rock Exotica's Aztek* (right) is also normally part of a two-pulley system but we've included it because it is equipped with an anchor point specifically for a custom built prusik acting as the integrated progress capture via a customised prusik. There may well be other system components not sold separately. Incidentally, the *DMM RPM* (right) that we originally mentioned as being similar in function to the *Aztek* has been discontinued. This was a slick piece of kit, probably too slick for the size of market.

Also in this final grouping of 'oddities' were the Russian models which seem to have evolved in splendid isolation with some truly unique designs and names. These are primarily domestic to Russia and with their international pariah status requiring they not be included, that won't change any time soon but they're certainly interesting. The *Traction-Shackle* (right) for instance, uses a bollard for



the top attachment that allows direct attachment to a rigging plate or to a rope/sling stitched eye, bypassing the need for a carabiner something that the latest SMC APEX also does (albeit without being a PCD). These are all interesting ideas. There are a number of models in this list that can only be used for non-live loads so make sure you check the HUMAN-CAPABLE column if you are using your PCD for anything other than load-handling. Our go-to kit man Paul Witheridge of access specialists Lyon Equipment and several Mountain, Cave and Mines Rescue organisations has some useful pointers for selecting a PCP:

As you say [in your Tables key], users must never confuse the WLL of the pulley with the WLL when used as a progress capture device. The WLL when used with the cam actuated is always lower, sometimes much lower, because the applied load is attempting to drag the rope through the cam. There have been some nasty outcomes when this has been overlooked or misinterpreted.

- Contrary to popular belief, positioning the cam contact face at the apex of the pulley is not automatically a bad thing. People think that this is the area of highest stress on the rope because it is 'loaded on both sides'. In fact, the 'load' is actually shared rather than being on one strand (think of the pulley effect and mechanical advantage). Further, the rope at this point is under compression and the downward forces increase the frictional contact on the pulley face. Rope is more resilient under compression than in tension.

- Good designs of swing cheek pulley or progress capture device use the forces applied to the attachment eye to create a mechanical lock, preventing the plate from moving when in use. This may be by the side plate moving and the central axle being locked in a groove within that plate. For the highest efficiency, go for the largest diameter pulley wheel and a bearing with the lowest coefficient of friction. Pulleys are like spanners, the longer the distance from the centre (bolt) to the outside edge (hand) the better – it's a torque thing.

- In general basic solid bushes although coping well with slow rotation speeds and high loads are nowhere near as efficient as ball raced bearings. Single race bearings are good for medium speeds and loads, twin raced bearings cope with higher loads but can overheat at higher speeds (less space for lubricant and cooling air = quicker heat generation)

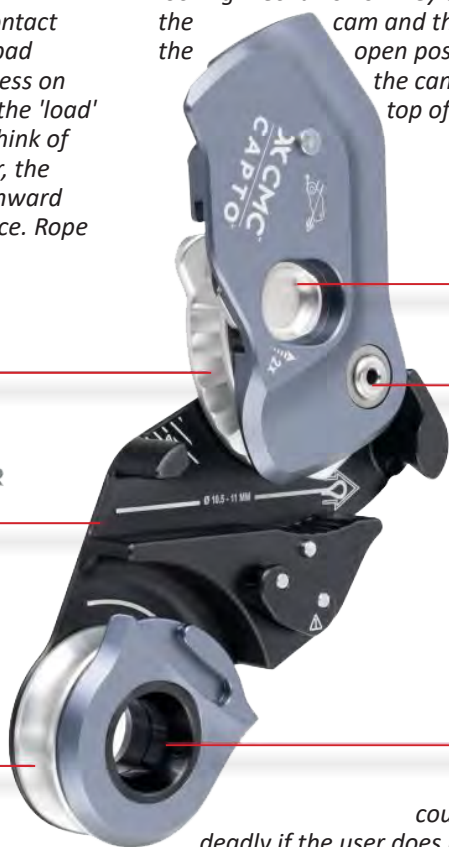
- Physically small progress capture pulleys may not be as efficient, but they can be very versatile; the Swiss army knife of access equipment. They can be a pulley, a hand ascender, a chest ascender, prevent load roll back on an inclined rope, used for simple kit bag hauling or contained in a mechanical advantage 'jigger' pulley system. Technicians have developed techniques for breaking into a tight line that rely on such devices (see Spanish balancer technique)

- NEVER use a progress capture pulley for life lining / self-lining / belaying unless the manufacturer specifically approves the use. Although very commonly taught because of the ease of use, the risk of slack in the system and a subsequent dynamic fall onto the toothed cam can be sufficient to catastrophically damage the rope.

- Some models of progress capture pulley require the side plate to be secured by fitting of a connector into the becket eye. Failure to do this can cause the side plate to swing open, releasing the rope. IF THE PRODUCT INSTRUCTIONS SAYS FIT A CONNECTOR, THEN FIT ONE!

- Some products allow the fitting of cam release cords. None of these will release the cam when loaded. All they allow is an unloaded cam to be remotely lifted clear of the rope. Cords are useful when operating out of reach of the device itself but still able to pull on the tail rope.

- Top quality designs seem to have unnecessarily fiddly locking mechanisms. They usually require the operator to lift the cam and then press a button to lock the cam in the open position. The reason for this is that if the cam automatically locked open at the top of its arc an oblique pull on the rope



FORCE-LIMITING V-GROOVE CAM

QUICK ACCESS FOR RAPID RIGGING

HIGH-EFFICIENCY PULLEY

DOUBLE-ACTION RELEASE BUTTON

OPTIONAL ACCESSORY LOOP

CMC's new Capto (left) shows inner workings that will be familiar to users of technical descender, belay and PCP products. As the newest device on the market these are the features that CMC felt to be game-changers but remember that this is not intended to be a stand-alone PCP .

could cause the cam to lift and lock; deadly if the user does not realise and lets go of the rope. Check what a product does before deciding to buy.

IN THE FOLLOWING TABLES:.....

COST: as always is rough guide only - it can vary due to exchange rates, taxes etc. Simple **Currency conversions are shown in orange** but do not include import duty, shipping and local taxes so are a very rough guide only.

PULLEY SHEAVE/TREAD Ø DIAMETER is the maximum to the outer edge of the wheel or TREAD is the true, inner dimension to the bottom of the curve.

MBS/MBL as a pulley: in burnt orange This figure is the minimum combined load that the pulley can withstand before failure. This figure should be halved for the actual load that can be lifted.

PROGRESS CAPTURE PULLEYS

MAX WLL of PC Cam means the Maximum Working Load at the pulley cam interface, ie. when the rope is in arrest or hold mode. In PC mode, this breaking load is frequently defined as the limit of what the rope may withstand before being damaged by the cam. Why use the word 'MAX'? Because the manufacturer guarantees this figure as the minimum that will be achieved with the rope types described, but cannot confirm the device will reliably perform at loads above this figure. For this guide we're more interested in the progress capture capabilities than simply as a pulley. This figure is generally defined as the limit before the applied load overcomes the gripping force of the device and the rope slides through; or the limit before control of the load becomes unmanageable due to forces at the control handle or limits in braking efficiency. For NFPA models that don't technically have an MBS for capture cams, the cam interface requirement becomes relevant and must be at least 280kg for 'G' or 136kg for the lighter 'T' models, in practice this becomes the **WLL (normally quoted in kN as a unit of force rather than kg as a weight for SWL)**. On some products where a descender/belay function is incorporated, the **MBS or MBL as a PC** may also define the maximum load that can be held in a limited dynamic event (FF0.3) where the true applied force is significant. MBL's are a complex area and it is always best to read the manufacturers product instructions thoroughly to make sure that you really understand what your device is capable of.

SAFE ROPE LOADING There is no danger of dropping the device because it can remain attached while the rope is inserted

normally via a swing cheek and or hinged gate like the CAMP model above.

HUMAN HAULING: The manufacturer states that this device can be used for hauling a live load to the stated limits, not just material handling.

SWIVEL EYE/BECKET for MA system use: An attachment eye at one end to incorporate another pulley and create a Mechanical Advantage (MA) system

ALSO USE AS:

PULLEY-only: The device can be used as a stand-alone pulley by disengaging the cam. Some function well while others will prove cumbersome but can still function as a pulley.

ASCENDER-only: The device can be used as a stand-alone ascender - usually just the smaller models like the *Duck* and *RollnLock* shown as a solid black square ■. Those with an outline CIRCLE meaning OK but not ideal, ○ ○ ○ may require creative use (and in some cases only as a last resort) but still possible. The multi-role descenders for instance can all function as a pull-through ascender but it's cumbersome.

STANDARDS: NFPA is the US Fire-Rescue standard while ASTM covers industrial use (including arboriculture and forestry). In Europe there are at least two different functional requirements here - a standard for the **Pulley (EN 12278)** and one for the cam or **Ascender element (EN 567)**. In addition the multi-function devices will be certified as a **Descender (EN341)** mountaineering descenders) or **EN12841** (Rope Adjustment Systems). Those for non-human load adhere to the cover-all **Machinery** directive **2006/42/EC**. All CE devices are required to use EN1891 ropes.

DS MEDICAL

FIRST AID | MEDICAL | TRAUMA

Essential life saving resuscitation (CPR)
Emergency guide for adults, children and babies

Critical Injury Kit
Product code: DS02331















MANUFACTURER		ANPEN	ANPEN	ASAT/AT HEIGHT	BEAL	CAMP	CMC
MODEL VARIANT		Universal PSB U31	Universal PDB U32	RD2	Tract Up	Turbo Lock 3185	MPD Sml
SPECIFICATIONS	ORIGIN						
	COST	£106 \$130* €122	£118 \$145* €136	£386 \$474 €443	£44 \$53 €46	£110 \$185 €120	£950 \$890 €1083
	WEIGHT	270g 9.5oz	462g 1lb	790g 1.75lb	78g 2.75oz	198g 7oz	1200g 2.6lb
	WLL MBS of pulley	5 28kN 1124 6295lbf	5 28kN 1124 6295lbf	- 21kN - 4720lbf	2 4kN* 450 900lbf	5 23kN 1124 5171lbf	- 44kN - 9892lbf
	MAX WL MBS of PC Cam	186kg 409lb	186kg 409lb	140/200kg* 308/440lb	204kg 450lb	255kg 562lb	240kg 5.28lb
	MAX ROPE Ø	8-13mm 5/16-1/2"	8-13mm 5/16-1/2"	10.5-11mm 1/2-7/16"	8-11mm 5/16-7/16"	8-13mm 5/16-1/2"	11mm 7/16"
	SHEAVE/TREAD Ø	35/26mm 1.4/1"	2x 35/26mm 1.4/1"	53mm 2.1"	23mm 1"	41mm 1.6"	50mm 2"
	DIMENSIONS <small>height/length x width x depth</small>	115 x 51 x 39mm 4.5 x 2 x 1.5"	148 x 51 x 66mm 5.8 x 2 x 2.6"	160 x 140 x 60mm 6.3 x 5.5 x 2.4"	65x35mm 2.6x1.4"	106 x 58 x 27mm 4.2 x 2.3 x 1.1"	190 x 140 x 84mm 7.4 x 5.5 x 3.3"
	BODY MATERIAL	Alu	Alu	Alu	Alu	Alu	Alu
	SHEAVE MATERIAL	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
USES & FEATURES	AXLE MATERIAL	Steel	Steel	Faceted Cam	Stainless Steel	Stainless Steel	Faceted Sheave
	CAM MATERIAL	Steel	Steel	Faceted Cam	Stainless Steel	Stainless Steel	Faceted Sheave
	PULLEY EFFICIENCY	n/a	n/a	88%	n/a	95%	n/a
	MAIN EYE Ø	22mm 0.86"	22mm 0.86"	12mm 1/2"	19mm 0.75"	19mm 0.75"	20mm 0.8"
	SECONDARY EYE Ø	-	22mm 0.86"	13mm 1/2"	-	21mm 0.8"	18mm 0.8"
	BEARING/BUSHING	■	■	■	■	■	■
	SWING CHEEK	■	■	■	■	■	■
	SAFE ROPE-LOADING	-	-	■	-	■	■
	HUMAN-HAULING	■	■	■	■	■	■
	SWIVEL EYE BECKET	■	■	■	■	■*	■
ALSO USE as	■	■	●	■	■	●	
PULLEY	●	-	●	■	■	●	
ASCENDER	-	-	■	-	-	■	
DESCENDER	-	-	■	-	-	■	
STANDARDS: CE: PULLEY	CE	CE	CE	CE	UIAA	NFPA*	
CE: ASCENDER	-	-	-	-	CE	CE CE CE**	
ADJUST/DESCENDER MACHINERY	-	-	-	-	-	-	
OTHER COLOURS	-	-	■	-	■	-	
NOTES	*FOB China -Excludes shipping/import duty	*FOB China -Excludes shipping/import duty	*200kg under last resort rescue conditions only	*will also take flat webbing * Load figures are with the cam engaged	*	*11mm Certified as 'G' in p... 'T' in lowering/Bela... **CE version not	
WEBSITE	en.anpen.com	en.anpen.com	asatsafe.com	beal-planet.com	camp.it	cmcpro.com	

NOTES: COSTS: £\$€ shown in burnt orange are currency conversions only N/A = info Not Available/not given COST: Approx & inc.local tax/VAT WT: Device Only STANDARDS: CE: PULLEY ASCENDER DESCENDER MACHINERY OTHER COLOURS

PROGRESS CAPTURE PULLEYS

















CMC	CMC/HARKEN	CMC/HARKEN	CMC	CMC	CMC	CMi	CMi
MPD Lg	Clutch 11mm	Clutch 13mm	CSR ²	Capto 11	Capto 13	Uplift NFPA	Lock Pulley
	335011	335013	300343	336011	336013	2940	2940
£0 \$890 €1083	£720 \$750 €825	£720 \$750 €825	£561 \$689 €643	£296 \$359 €341	£296 \$359 €341	£342 \$420 €392	£161 \$200 €185
1200g 2.6lb	836g 1.84lb	816g 1.8lb	1100g 2.5lb	513g 1.13lb	508g 1.12lb	1200g 2.6lb	155g 2.6lb
- 44kN - 9892lbf	- 40kN - 8992lbf	- 40kN - 8992lbf	- 40kN - 8992lbf	- 36kN - 8093lbf	- 36kN - 8093lbf	5.4 53kN 1200 12000lbf	- 8kN - 1800lbf
280kg 617lb	272kg 600lb	272kg 600lb	- -	* -	* -	199kg 440lb	163kg 360lb
13mm ½"	10.5-11mm ¾"	12.5-13mm ½"	11-13mm 7/16-½"	10.5-11mm 7/16"	12.5-13mm ½"	10-13mm ¾-½"	≤13mm ≤½"
50mm 2"	50mm 2"	50mm 2"	2x 57mm* 2x 2.25"	50/45mm 2/1.77"	50/45mm 2/1.77"	2x 75/56mm 2x 3/2.2"	38/25mm 1.5/1"
208 x 140 x 84mm 8.2 x 5.5 x 3.3"	208 x 112 x 47mm 8.2 x 4.4 x 1.9"	208 x 112 x 47mm 8.2 x 4.4 x 1.9"	156 x 114 x 84mm 6.1 x 4.5 x 3.3"	150 x 70 x 31mm 5.9 x 2.75 x 1.2"	150 x 70 x 31mm 5.9 x 2.75 x 1.2"	254 x 102 x 62mm 10 x 4 2.4"	127 x 76 x 57mm 5 x 3 x 2.25"
Alu Alu Stainless Steel Faceted Sheave	Alu Stainless Steel Stainless Steel Faceted Sheave	Alu Stainless Steel Stainless Steel Faceted Sheave	Alu Alu Stainless Steel Faceted Sheave*	Alu Alu Stainless Steel Faceted Sheave	Alu Alu Stainless Steel Faceted Sheave	Alu Alu Stainless Steel Steel	Alu Alu Stainless Steel Steel
n/a	n/a	n/a	n/a	91%	91%	184%	n/a
20mm 0.8"	12mm ½"	12mm ½"	22mm 0.86"	3.9mm (for cord) 0.15"	3.9mm (for cord) 0.15"	25mm 1"	22mm 0.66"
18mm 0.8"	13mm ½"	13mm ½"	-	18.4mm 0.7"	18.4mm 0.7"	25mm 1"	-
■	■	■	■	■	■	■	■
■	-	-	-	■	■	-	-
■	■	■	-	■	■	-	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	-
● ● ■	● ● ■	● ● ■	■ - -	■ ■ ●	■ ■ ●	■ - -	■ ■ -
NFPA CE CE CE	ANSI NFPA CE CE CE	ANSI NFPA	NFPA CE CE CE**	NFPA CE CE CE	NFPA	NFPA*	
pulley mode but by mode. in US.			*2nd sheave is a deep V-groove locking sheave **CE version not in US.	NOT intended to be a 1:1 PCP *load applied to cam automatically limited but forced tested to 11.1kn/2500lbf	NOT intended to be a 1:1 PCP. *load applied to cam automatically limited but forced tested to 11.1kn/2500lbf	* exceeds NFPA requirements but not certified	NOT a true PCP - Designed as a quick means of reversal during decent but could be incorporated into a haul system
cmcpro.com	cmcpro.com	cmcpro.com	cmcpro.com	cmcpro.com	cmcpro.com	cmigearusa.com	cmigearusa.com

ARDS: CE = EN 567, CE=Machinery Directive Only PC = Progress Capture. USES: ●●● = OK BUT NOT IDEAL













Images NOT to Scale							
MANUFACTURER	CMI	CMI	EDELRID	EDELWEISS	HEIGHTEC	HEIGHTEC	H
MODEL VARIANT	Micro Hauler Micro S	Micro Hauler DbL Micro D	Spoc 737430001380	Micro B	Cyclone P201	Hurricane D431	H
ORIGIN							
COST	£172 \$211 €197	£203 \$249 €233	£65 \$75 €70	£44 \$53 €46	£151 \$186 €174	£155 \$191 €178	£1
WEIGHT	204g 7.2oz	250g 8.8oz	60g 2.1oz	78g 2.75oz	340g 12oz	330g 11.6oz	
WLL MBS of pulley	6.2 31.1kN 1400 7000lbf	6.2 31.1kN 1400 7000lbf	- 15kN - 3372lbf	2 4kN* 450 900lbf	1 -kN* 225 -lbf	1 -kN* 225 -lbf	
MAX WL MBS of PC Cam	318kg 700lb	318kg 700lb	4kN* 900lb	204kg 450lb	100kg 200lb	204kg 450lb	
ROPE Ø	≤13mm ≤½"	≤13mm ≤½"	7-11mm ¾-¾"	8-11mm* ⅝-¾"	10.5-11mm ⅞"	10.5-11mm ⅞"	
SHEAVE/TREAD Ø	32mm 1.25"	2x 32mm 2x 1.25"	24/20mm 0.9/0.8"	23mm 1"	50mm 2"	50mm 2"	
DIMENSIONS height x width	157 x 55 x 40mm 6.25 x 2.2 x 1.6"	157 x 55 x 60mm 6.25 x 2.2 x 2.4"	62 x 46 x 24mm 2.4 x 1.8 x 0.9"	65x35mm 2.6x1.4"	210 x 80 x 30mm 8.3 x 3.2 x 1.2"	200 x 80 x 30mm 7.9 x 3.2 x 1.2"	200 x 80 x 30mm 7.9 x 3.2 x 1.2"
BODY MATERIAL	Alu	Alu	Alu	Alu	Alu	Alu	St
SHEAVE MATERIAL	Alu	Alu	Alu	Alu	Nylon	Nylon	St
AXLE MATERIAL	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	St
CAM MATERIAL	Steel	Steel	Stainless Steel	Stainless Steel	Steel	Steel	
PULLEY EFFICIENCY	84.1%	84.1%	92%	n/a	n/a	n/a	
TOP EYE Ø	22mm 0.9"	22mm 0.9"	20mm 0.8"	19mm 0.75"	0mm 0"	14mm 0.55"	
LOWER EYE Ø	16mm 0.6"	16mm 0.6"	-	-	14mm 0.55"	8mm 0.3"	
BEARING/BUSHING	■	■	■	■	■	■	
SWING CHEEK	-	-	-	■	■	■	
SAFE ROPE LOADING	-	-	-	-	-	-	
HUMAN-HAULING	■	■	■	■	NO	NO	
SWIVEL EYE BECKET	■	■	--		●	■	
USE as	■	■	■	■			
PULLEY	■	■	■	■			
ASCENDER	-	-	■	■			
DESCENDER	-	-	-	-			
STANDARDS CE: PULLEY ASCENDER DESCENDER MACHINERY	ANSI CE	ANSI CE	CE CE	CE	UKCA CE	UKCA CE	
OTHER COLOURS							
NOTES			* WLL with cam engaged	*will also take flat webbing * Load figures are with the cam engaged	* Material Handling Only, not for human-hauling . Stainless version discontinued	* Material Handling Only, not for human-hauling.	
WEBSITE	cmigearusa.com	cmigearusa.com	edelrid.com	edelweiss-ropes.com	heightec.com	heightec.com	

NOTES: COSTS: £/\$/€ shown in burnt orange are currency conversions only N/A = info Not Available/not given COST: Approx & inc local tax/VAT WT: Device Only STAND:

PROGRESS CAPTURE PULLEYS

							
HEIGHTEC	HEIGHTEC	HEIGHTEC	ISC	ISC	ISC	ISC	KONG
Hurricane Pro D43	Tornado D701	Twister D71	PCP Single RP702	PCP Double RP703	PCP Single 1-Way RP704	PCP Double 1-Way RP705	Duck 3109
							
£55 \$191 €178	£245 \$302 €282	£45 \$56 €52	£158 \$194 €180	£198 \$246 €200	£176 \$220 €205	£192 \$240 €220	£50 \$75 €58
330g 11.6oz	400g 14.1oz	300g 10.6oz	663g 1.5lb	905g 2lb	672g 1.5lb	905g 2lb	70g 2.5oz
1 -kN* 225 -lbf	0.5 -kN 112 -lbf	0.1 5.9kN 22 1323lbf	- 40kN - 8992lbf	- 40kN - 8992lbf	- 30kN - 6744lbf	- 30kN - 6744lbf	2.5 4kN* 562 880lbf
204kg 450lb	50kg 110lb	10kg 22lb	800kg 17631lb	800kg 17631lb	600kg 1322lb	600kg 1322lb	400kg 880lb
10.5-11mm 7/16"	10.5-12mm 7/16-15/32"	10.5-12mm 7/16-15/32"	10-13mm 3/8-1/2"	10-13mm 3/8-1/2"	10-13mm 3/8-1/2"	10-13mm 3/8-1/2"	8-13mm* 5/16-1/2"
50mm 2"	54mm 2.1"	40mm 1.6"	67mm 2.6"	2x 67mm 2x 2.6"	67/55mm 2.6/2.16"	2x 67/55mm 2x 2.6/2.16"	25mm 1"
100 x 80 x 30mm 3.9 x 3.2 x 1.2"	130 x 145mm 5.1 x 5.7"	110 x 80mm 4.3 x 3.2"	235 x 82 x 37mm 9.25 x 3.25 x 1.4"	235 x 82 x 63mm 9.25 x 3.25 x 2.5"	235 x 82 x 37mm 9.25 x 3.25 x 1.4"	235 x 82 x 63mm 9.25 x 3.25 x 2.5"	63x31mm 2.5x1.2
Alu Nylon Stainless Steel Steel	Alu Nylon Stainless Steel No Toothed Cam	Alu Alu Alloy Stainless Steel No Toothed Cam	Alu Alu Stainless Steel Stainless Steel	Alu Stainless Steel Stainless Steel Stainless Steel	Alu Alu Stainless Steel Stainless Steel	Alu Stainless Steel Stainless Steel Stainless Steel	Alu Alu Stainless Steel Steel
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
14mm 0.55"	12mm 0.5"	15mm 0.6"	30mm 1.2"	30mm 1.2"	30mm 1.2"	30mm 1.2"	18mm 0.7"
8mm 0.3"	-	-	20mm 08"	20mm 08"	20mm 08"	20mm 08"	-
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
-	-	-	-	-	-	-	-
■	NO	NO	■	■	■	■	■
■	--	--	■	■	■	■	-
			■	■	■	■	■
			■	■	●	●	■
			■	■	■	■	■
UKCA CE	UKCA CE	UKCA CE	UKCA NFPA ANSI CE CE	UKCA NFPA ANSI CE CE	UKCA NFPA ANSI CE CE	UKCA NFPA ANSI CE CE	CE
							■ ■ ■
can be used For human hauling	One way sheave for lowering light loads only . Stainless version discontinued	No toothed cam, fixed wheel load controller instead of sheave for lowering of very light loads only			one-way pulley sheave for increased friction on lowering hence the marginal use for descending	one-way pulley sheave for increased friction on lowering hence the marginal use for descending	* Load figures are with the cam engaged * will also take webbing 10-15mm 3/8-3/4"
heightec.com	heightec.com	heightec.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com	kong.it

MARKS: CE = EN 567, CE=Machinery Directive Only PC = Progress Capture. USES: ○ ● ● = OK BUT NOT IDEAL













Images NOT to Scale							
MANUFACTURER		KONG	KONG	KONG	PETZL	PETZL	PETZL
MODEL VARIANT		Block Roll 81800NO	Block Roll Dbl 81801NO	Futura MiniBlock 944	Maestro Lg IR0415	Maestro Sml -	Jag Traxion P51
ORIGIN							
COST		£108 \$160 €124	£145 \$210 €166	£130 \$170 €110	£504 \$600 €475	£504 \$600 €475	£106 \$121 €95
WEIGHT		550g 1.2lb	740g 1.6lb	165g 0.36lb	1100g 2.4lb	1100g 2.4lb	145g 5.1oz
WLL MBS of pulley		- 30kN - 6744lbf	- 30kN - 6744lbf	- 24kN - 5395lbf	9 36kN 2023 8093lbf	9 36kN 2023 8093lbf	6 16kN 1349 3372lbf
MAX WL MBS of PC Cam		500kg 1100lb	500kg 1100lb	400kg 880lb	280kg 617lb	250kg 551lb	255kg 562lb
ROPE Ø		8-13mm 5/16-1/2"	8-13mm 5/16-1/2"	8-12mm 5/16-15/32"	11.5-13mm 7/16-1/2"	10.5-11.5mm 3/8-7/16"	8-13mm 5/16-1/2"
SHEAVE/TREAD Ø		60/50.2mm 2.36/2"	2x 60/50.2mm 2x 2.36/2"	35mm 1.38"	75mm 3"	75mm 3"	2x 33/27mm 2x 1.3/1"
DIMENSIONS height x width		280 x 78 x 42mm 11 x 3 x 1.6"	280 x 60 x 54mm 11 x 3 x 2.1"	130 x 48 x 32mm 5.1 x 1.9 x 1.3"	220 x 150 x 85mm 8.7 x 5.9 x 3.3"	220 x 150 x 85mm 8.7 x 5.9 x 3.3"	92 x 54 x 44mm 3.6 x 2.1 x 1.7"
BODY MATERIAL		Alu	Alu	Alu	Alu	Alu	Alu
SHEAVE MATERIAL		Alu	Alu	Alu	Stainless Steel	Stainless Steel	Alu
AXLE MATERIAL		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
CAM MATERIAL		Steel	Steel	Stainless Steel	No Toothed Cam	No Toothed Cam	Steel
PULLEY EFFICIENCY		n/a	n/a	n/a	95%	95%	91%
TOP EYE Ø		13.5mm 0.5"	13.5mm 0.5"	15mm 0.6"	30mm 1.2"	30mm 1.2"	20mm 0.75"
LOWER EYE Ø		13.5mm 0.5"	13.5mm 0.5"	15mm 0.6"	24mm 0.9"	24mm 0.9"	20mm 0.75"
BEARING/BUSHING		■	■	■	■	■	■
SWING CHEEK		■	■	■	■	■	■
SAFE ROPE-LOADING		■	■	-	-	-	-
HUMAN-HAULING		■	■	■	■	■	■
SWIVEL EYE BECKET		●	●	■	■	■	■
USE as		■	■	■	●	●	■
PULLEY		■	■	■	●	●	■
ASCENDER		-	-	-	●	●	●
DESCENDER		-	-	-	■	■	-
STANDARDS		UIAA	UIAA	UIAA	NFPA-G EAC	NFPA-T EAC	UKCA NFPA
CE: PULLEY ASCENDER		CE CE	CE CE	CE CE	CE	CE	CE
DESCENDER MACHINERY							
OTHER COLOURS							
NOTES							
WEBSITE		kong.it	kong.it	kong.it	petzl.com	petzl.com	petzl.com

NOTES: COSTS: £/\$/€ shown in burnt orange are currency conversions only N/A = info Not Available/not given COST: Approx & inc local tax/VAT WT: Device Only STAND:

PROGRESS CAPTURE PULLEYS

PETZL	PETZL	PETZL	PETZL	PETZL	RESCUE TECHNOLOGY	RESCUE TECHNOLOGY	ROCK EMPIRE
Micro Traxion P53	Mini Traxion P054	Old Pro Traxion P51	2023 Pro Traxion P055	Twin Release 3109	Extractor RP702	Extractor DbI RP703	Self Blocking Pulley ZWP022
£75 \$95 €85	£146 \$120 €110	£130 \$164 €110	£156 \$210 €159	£362 \$440 €410	£158 \$220 €170	£198 \$260 €200	£68 \$84 €77
85g 3oz	150g 5.3oz	265g 9.4oz	295g 1.76lb	800g 1.76lb	663g 1.5lb	905g 2lb	391g 13.8oz
510kg 15kN 125lb 3372lbf	5 20kN 1125lb 4945lbf	5 22kN 1125lb 4945lbf	5 23kN 1125 5171lbf	9 36kN 2023 8093lbf	- 40kN - 8992lbf	- 40kN - 8992lbf	- 25kN - 5620lbf
255kg 562lb	255 400kg 562 880lb	255 400kg 562 880lb	280kg 617lb	280kg 617lb	800kg 17631lb	800kg 17631lb	255 407kg 562 899lb
8-11mm 5/16-7/16"	7-11mm 9/32-7/16"	8-13mm 5/16-1/2"	8-13mm 5/16-1/2"	8-13mm 5/16-1/2"	10-13mm 3/8-1/2"	10-13mm 3/8-1/2"	8-13mm 5/16-1/2"
33/27mm 1.3/1"	32mm 1.3"	46/38mm 1.8/1.5"	46/38mm 1.8/1.5"	2x 56 & 46/40 & 38*mm 2x 2.2 & 1.8/1.6 & 1.5"	67mm 2.6"	2x 67mm 2x 2.6"	56mm 2.2"
90 x 53 x 24mm 3.5 x 2.1 x 1"	90 x 63 x 30mm 3.5 x 3.5 x 1.2"	118 x 70 x 35mm 4.6 x 2.75 x 1.4"	155 x 78 x 37mm 6.1 x 3.1 x 1.5"	180 x 105 x 77mm 7 x 4.1 x 3"	225 x 75 x 37mm 8.9 x 3 x 1.4"	235 x 75 x 63mm 8.9 x 3 x 2.5"	190 x 75 x 40mm 7.5 x 3 x 1.6"
Alu Alu Stainless Steel Steel	Alu Stainless Steel Stainless Steel Steel	Alu Stainless Steel Stainless Steel Steel	Alu Stainless Steel Stainless Steel Steel	Alu Stainless Steel Stainless Steel Steel	Alu Alu Stainless Steel Stainless Steel	Alu Stainless Steel Stainless Steel Stainless Steel	Alu Alu Stainless Steel Steel
91%	93%	95%	95%	95%	n/a	n/a	n/a
20mm 0.75"	18mm 0.7"	18mm 0.7"	26mm 1"	26mm 1"	30mm 1.2"	30mm 1.2"	22mm 0.9"
-	14mm 0.55"	14mm 0.55"	16mm 0.6"	16mm 0.6"	20mm 08"	20mm 08"	-
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
-	■	-	■	■	-	-	-
■	■	■	■	■	■	■	NO
-	■	■	■ ■	■ ■	■	■	-
■ ■	■ ●	■ ●	■ ●	■ ●	■	■	■ ●
-	-	-	-	●	-	-	-
UKCA UIAA CE	UKCA NFPA-T EAC UIAA CE CE CE	UKCA NFPA-T EAC CE CE CE	UKCA NFPA-T EAC CE CE CE	NFPA-G CE CE CE	UKCA NFPA ANSI CE CE	UKCA NFPA ANSI CE CE	CE*
■	■	■	■	■			
Nano Traxion discontinued		DISCONTINUED replaced by new swivel version P055	Replaces P51		Also available with one-way sheave - see ISC RP704	Also available with one-way sheaves - see ISC RP705	
petzl.com	petzl.com	petzl.com	petzl.com	petzl.com	rescuetech1.com	rescuetech1.com	rockempire.com

MARKS: CE = EN 567, CE=Machinery Directive Only PC = Progress Capture. USES: ●●● = OK BUT NOT IDEAL

Images NOT to Scale							
MANUFACTURER		ROCK EXOTICA	ROCK N RESCUE	RSI/YATES	RSI/YATES	SKEDCO	SKEDCO
MODEL VARIANT		Aztek P41	Dbl Camming Pulley RPU001	Haul Safe D43	Haul Safe Dbl D701	MicroHauler Dbl SK-710-M	Rescue Hauler SK710
ORIGIN							
COST		£105 \$127 €121	£250 \$312 €287	£182 \$227 €210	£209 \$260 €240	£190 \$237 €220	£320 \$399 €367
WEIGHT		210g 7.4oz	1200g 2.6lb	680g 1.5lb	725g 1.6lb	250g 8.8oz	1200g 2.6lb
WLL MBS of pulley		9* 36kN 2023 8093lbf	5.4 53kN 1200 12000lbf	- 44.5kN - 10000lbf	- 44.5kN - 10000lbf	6.2 31.1kN 1400 7000lbf	5.4 53kN 1200 12000lbf
MAX WL MBS of PC Cam		306kg** 674lb**	199kg 440lb	455kg 1000lb	455kg 1000lb	318kg 700lb	199kg 440lb
MAX ROPE Ø		8mm 5/16"	≤13mm ≤1/2"	11-13mm 7/16-1/2"	11-13mm 7/16-1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"
SHEAVE/TREAD Ø		2x 36/28mm 2x 1.4/1.1"	2x 75/56mm 2x 3/2.2"	55/45mm 2.1/1.8"	2x 55/45mm 2x 2.1/1.8"	2x 32mm 2x 1.25"	2x 75/56mm 2x 3/2.2"
DIMENSIONS height x width		104 x 50mm 4.1 x 2"	267 x 108 x 64mm 10.5 x 4.25 x 2.5"	227x 78 x 36mm 8.9 x 3.5 x 1.4"	227 x 78 x 78mm 8.9 x 3.1 3.1"	157 x 55 x 60mm 6.25 x 2.2 x 2.4"	267 x 108 x 64mm 10.5 x 4.25 x 2.5"
BODY MATERIAL		Alu	Alu	Alu	Alu	Alu	Alu
SHEAVE MATERIAL		Alu	Alu	Alu	Alu	Alu	Alu
AXLE MATERIAL		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
CAM MATERIAL		prusik cord	Steel	Steel	Steel	Steel	Steel
PULLEY EFFICIENCY		>90%	184%	n/a	n/a	84.1%	184%
TOP EYE Ø		24-30mm 1-1.2"	25mm 1"	22mm 0.9"	22mm 0.9"	22mm 0.9"	25mm 1"
LOWER EYE Ø		-	25mm 1"	20mm 0.8"	20mm 0.8"	16mm 0.6"	25mm 1"
BEARING/BUSHING		■	■	■	■	■	■
SWING CHEEK		-	-	■	■	-	-
SAFE ROPE-LOADING		-	-	-	-	-	-
HUMAN-HAULING		■	■	■	■	■	■
SWIVEL EYE BECKET		■	■	-	-	■	■
USE as		■	■	■	■	■	■
PULLEY		■	■	■	■	■	■
ASCENDER		-	-	-	-	-	-
DESCENDER		-	-	-	-	-	-
STANDARDS		CE	NFPA*	CSA NFPA ANSI	CSA NFPA ANSI	ANSI CE	CE ANSI BERRY
CE: PULLEY ASCENDER							
DESCENDER MACHINERY							
OTHER COLOURS							
NOTES		*with top prusik. **WLL for material handling is 510kg1125lb	* exceeds NFPA requirements but not certified				
WEBSITE		rockexotica.com	rocknrescue.com	rescuystems.com	rescuystems.com	skedco.com	skedco.com

NOTES: COSTS: £/\$/€ shown in burnt orange are currency conversions only N/A = info Not Available/not given COST: Approx & inc local tax/VAT STANDARDS: CE = EN 56

UPDATED Jan '24

PULLEYS

for General Rope-Use

Pulleys 101 states that the Minimum Breaking Load or strength quoted for any pulley is the resultant total of input forces on the two, four or six stands of rope entering and leaving the pulley (depending on whether it is a single double or triple sheave pulley). That means that if the MBS is 20kN you can only input 10kN on each of 2 stands of rope NOT 20kN on each stand of rope. This is referred to as the **WLL or Working Load Limit** but is a straight 50% (or 33% in a triple sheave) of the MBS so **NOT** the same as the WLL we see on all other rope equipment which is a ratio of the MBS from 4:1 to 15:1 and therefore a much lower figure. This ratio varies depending on what the manufacturer or end-user determines is 'safe'. In rescue an ultra-safe ratio between 10:1 and 15:1 is used whereas the arb industry routinely uses 7:1. Divide the MBS by 7 or 10 or whatever your local protocols are to get the appropriate WLL. Not all quote WLL but figures shown in black in the WLLMBS row are those advocated by the manufacturer based on between 4 & 15:1 ratio not simply the 2:1 or 3:1 fractional loading stamped on the pulleys. You cannot simply look at the WLL of a pulley to see if it is stronger or weaker than another unless you know the ratio they are using. Also bear in mind that the actual force is on the main hole with the carabiner - **the max MBS does NOT relate to any secondary attachment eyes like the becket**, with the exception of the model shown above, these are invariably around **30-50% weaker** than the main eye as they are only intended to take partial load in a mechanical advantage system. Also remember that a double or triple sheave pulley is designed to be loaded across all sheaves not a single sheave pulley with one or two spare sheaves! You could use a central sheave on a triple to maintain balance but the load limit may be considerably less than is stamped on it. The strongest in this GUIDE is the *P3Ta* by *LRV8* of Sydney. This is a resurrection of our old mates *SRTe's P3* with a whopping 120kN MBS and WLL of 24kN more akin to an impact pulley. There are several different and distinct types of pulley used in rope-related activities- some of which have their own **separate GUIDES** within these **BUYERSGUIDES**:

- 1) **General Purpose Swivel Cheek Pulleys**
- 2) **General Purpose Fixed Cheek Pulleys**
- 3) **PMPs or Prusik Minding Pulleys**
- 4) **HitchClimbing Pulleys:** Unique to arborism. Developed for use in a Doubled rope 'prusik' hitch climbing system. Any small pulley with multiple top eyes is in this category.
- 5) **Swivel Pulleys (integral swivel and locking cheek)**
- 6) **Carabiner-Pulleys** a sheave is integrated into the carabiner - almost always lighter duty options.
- 7) **Stand-Alone Sheaves:** often using a shackle/carabiner



IMAGES NOT TO SCALE

as the axle.

8) **Progress Capture Pulleys** with an integral cam

9) **Carriage/Trolley Pulleys** for use on ziplines, tyroleans and cableways

10) **Tandem pulleys** - (a sub-set of 9) above) two pulley sheaves mounted

along the same rope-line but on separate axles within a frame (as distinct from a double pulley where the sheaves are side by side on the same axle).

11) **Knot-Passing Pulleys**. Aka *Kootenay Carriage* and is a vast nylon sheave about a foot wide within a swivel frame with numerous attachment holes. Intended as a highline trolley where ropes have been joined and would therefore not fit through most regular trolleys.

12) **Impact Pulleys** ultra heavy-duty pulleys designed to arrest a falling load (section of tree). The top connection point is a solid pin or bollard rather than an eye in the pulley cheeks.

13) **Shear Load Pulleys**. Designed to divert load and impart friction in a lowering system with a non-rotating sheave

14) **All of the Above:** Well, not quite but *Rock Exotica/CMC's latest SwivaBiner* is about as close as we currently are to an all-round rope tool. *Rock Exotica* actually has a utility version of the *Omni-Block* that can take an impact load so if they married that to their *SwivaBiner* instead of this regular *Omni* and added a progress capture cam they would indeed be all the way there!

IN THE FOLLOWING TABLES.....

SHEAVE(WHEEL)/TREAD DIAMETER Ø: The diameter of the wheel. **This can vary from the outer edge to the bottom of the rope channel (tread) and many companies do not state which figure they are using so there can be quite a difference. this figure gives you an idea of the overall size of pulley.** The smaller the wheel the greater the proportion of diameter would be lost in the rope channel ie. a 1" diameter sheave could lose 30% of that diameter when measured to the bottom of the rope channel (tread) whereas a 4" diameter sheave may only lose around 8% of the total diameter. On *Petzl's* micro-pulleys for instance, the same 20mm sheave is shown as 30mm on other models-with the same size sheave. Use as large a diameter as possible because the tighter the bend on the rope the more it impacts the strength of the rope. If you are able to use a 4" or greater sheave you would lose none of the rope's in-line strength. **We will update all pulleys to show which dimension is being used - any in green are verified as being the minimum or tread diameter.**

PRUSIK TEND LOCK BECKET: 'Prusik tend' is more usually called **prusik-minding** and refers to the ability of the pulley to halt a prusik knot's upward slide on a moving rope rather than it disappear into the pulley wheel, the prusik then locks when the rope is released. This is achieved with a squaring and sometimes a slight inward curve on the bottom part of the pulley frame.



MAGNAPULLEYS



The Patented Magnapulleys offer a revolution in equipment flexibility, providing a Double Sheave Pulley that splits apart into two Single Sheave Pulleys.



Two sets provide the operator 2 Doubles, 1 Double and 2 Singles, or 4 Singles, drastically reducing the hardware necessary for work and rescue rope systems. This flexibility is a great advantage to small teams or teams who have to travel or climb a great distance to their work site (Mountain Rescue, Military/Tactical, Work at Height, Arborist, Etc.) and need to strip down their kit to the minimum.



*CE and UKCA
Certified*

*Exceeds the NFPA
Standard 1983 (2017
ed) for Technical use.*

*Max Rope Diameter:
1/2", 12.5mm*

*Sheave Diameter
at Center: 1"*

*Double Pulley 3
Sigma Strength
Rating: 40kN*

*Single Pulley 3
Sigma Strength
Rating: 28kN*

Unlike a regular round-bottom pulley, these can often stand on their flatter base. Some designs are more complex like the *CAMP Sphinx* with an extension to its frame and some like the *Omni* (see Swivel Pulley Guide) have a teardrop extension on one side. **LOCK** refers to the locking of the pulley cheeks (or in the case of *ISC's new Ultralink*, the shackle arms) so that they cannot be swivelled open unless you undo the securing pin/bolt. This may be a bolt that requires a tool or it may be push-button. Button release is now common with the bigger, swivel pulleys like *Rock Exotica's Omni Pulleys*, *Petzl's Spins* and *SMC's Apex* but is also on the much smaller *ISC's Ultralink*. These requires no tools and is a hand action only but there are only the *Ultralinks* and *SMC's* swivel-less *Apex Direct* in the regular pulley selection. Of course, they're unusual in regular pulleys because the carabiner or connector you use to clip into virtually all regular pulleys, locks the cheeks and stops them swivelling. It is only on cheeks that can have the rope applied while the pulley is still connected to the anchor that we see the locking cheeks Bolt or screw release means that a tool, often an Allen Key, is required to open the cheeks in order to access the sheave for rope placement (or you could feed rope in from one end as if it were a fixed-cheek pulley). Again there are none in the current selection because these are all life-support pulleys - this feature is more commonly seen in engineering where a pulley is a machinery component that should not be undone except for maintenance. **BECKET** is a load-bearing bottom connection point - usually an obvious eye but it may be an extension of the frame as with the bottom of the *DMM Pinto* pulleys. The title image shows the *RevolutionFR* from *Conterra* with a 'becket' eye through the middle (similar to some Impact Pulleys)- expect to see more of this. Note that you

cannot load the joining bar beneath the sheave of some models unless it specifically says so.

BUSH/BEARING/PIN The efficiency part of a pulley that tries to minimize friction under load. Bushings are the grunts of the industry, able to take abuse but not quite as efficient as a bearing. Bearings are ball bearing or needle rods that rotate against each other under load. They require more care than a bushing but are more efficient. A PIN is a simple axle with no frictional assistance beyond you daring to add a blob of grease (nor recommended in life-support rope activities). These will be simple pulley sheaves with a shackle bar or a carabiner acting as the axle. However, one or two models, notably the *PulleyOne* by *AtHeight* and the *Ultralight* by *ISC* might appear to be simple pin (or carabiner axles) but they both have independent bearings so they are not simply a passive 'PIN'.

Ball bearings and needle bearings are often shown simply as bearings and we may not have differentiated. Unless you are operating at extreme speed or extreme loads you are unlikely to notice the difference. Needle bearing are not quite as efficient as ball-bearings but they are able to take a higher load and even a bit of shock loading (not recommended) which ball bearings and are almost as robust as bushings. *CMI* use a lot of needle bearings which are effectively a pile of cylinders rotating against each other so the load is better spread than with the point-loaded (but friction-reducing) ball bearings.

EFFICIENCY: is dictated by the quality of the bushing or bearing that is handling the load. Bearings are better for lower loads at higher speed while bushing are good for high loads at low speed. Note that efficiency will be multiplied beyond 100% by the number of sheaves.

Images NOT to Scale								
MANUFACTURER	ART	CMI	CMI	CMI	DMM	DMM	DMM	DMM
MODEL VARIANT	Cocoon 5	RP141	RP151	MicroTrolley RP161RS	HitchClimber Eccentric pul500	Rigger pul400	Rigger becket pul410	HitchClimber Triple Attach
ORIGIN								
COST (inc Tax) Conversion-only	£101 \$157 €108	£48 \$65 €52	£46 \$62 €50	£91 \$110/114 €105	£65 \$90 €85	£65 \$90 €85	£85 \$110 €100	£55 \$75
WEIGHT	177g 6.2oz	44g 1.5oz	113g 4oz	204/226g 7.2/8oz	176g 6.2oz	176g 6.2oz	198g 3.5oz	133g 4.7oz
MAX LOAD- WLL MBS	- 29kN - 6520lbf	3.1 31.1kN 700 7000lbf	3.1 31.1kN 700 7000lbf	8.8 44kN 1980 9900lbf	6 32kN 1349 6744lbf	8 40kN 1798 8992lbf	8 40kN 1798 8992lbf	6 30kN 1349 6744lbf
MAX ROPE Ø	≤14mm ≤9/16"	≤12.7mm ≤1/2"	≤12.7mm ≤1/2"	≤13mm ≤1/2"	7-14mm 5/16-9/16"	7-14mm 5/16-9/16"	7-14mm 5/16-9/16"	≤14mm ≤9/16"
SHEAVE/TREAD Ø	30mm 1.2"	32mm 1.25"	32mm 1.25"	32mm 1.25"	28mm 1.1"	28mm 1.1"	28mm 1.1"	28mm 1.1"
DIMENSIONS ht x w x depth	90 x 42 x 36mm 3.5 x 1.6 x 1.4"	76x70x51mm 2.8x2.75x2"	102x76x51mm 3.75x2.8x2"	114x50x32mm 4.5 x 2 x 1.25"	96x76x44mm 3.8x2.8x1.7"	94x68x33mm 3.7x2.7x1.3"	124x68x33mm 4.9 x 2.7x1.3"	94x68x33mm 3.7x2.7x1.3"
PRUSIK TEND LOCK BECKET	- - -	■ - -	■ - -	■ - -	■ - - -	■ - -	■ - ■	■ - -
BUSHING BEARING PIN	■	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY								
CHEEK SHEAVE AXLE	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu
STANDARDS	CE	ANSI	?	CE	CE	CE NFPA	CE NFPA	CE
OTHER COLOURS	-	-	-	-	■ ■ ■ ■	■	■	■
NOTES	rope feeds directly onto top pin			RS=removable axle/sheave	For HitchClimber prusik system			For HitchClimber prusik sys
WEBSITE	climb-art.de	cmigearusa.com	cmigearusa.com	cmigearusa.com	dmmwales.com	dmmwales.com	dmmwales.com	dmmwales.com

MATERIALS: CHEEK SHEAVE AXLE: the cheeks/frame are in black while the sheave/wheel is shown in orange and the axle material in green. Any that purport to handle wire rope will be in stainless steel as the hardest wearing material while those looking to shed weight may have plastic (nylon, Delrin or Celcon) sheaves. Some axles shown as StSt for stainless steel may actually be steel or galvanised but not 'stainless'

Aluminium or Aluminium Alloy = Alu

Stainless Steel = StSt

Zinc-Coated Steel = ZStl

STANDARDS: As usual, you can't go far wrong with a bona-fide European CE or US NFPA mark (with EN12278 & NFPA requiring tamper-proof rivets) but there is also US ANSI (Industrial) and a number of country-specific standards. Because so many are, or were, designed for mountaineering, UIAA is also common. EAC is for eastern Europe and UKCA is a more recent UK introduction to reinvent the wheel and offer an alternative to the pan-European CE. Virtually pointless.

OTHER COLOURS: = Polished metal finish. Many have a black option which usually costs a little more. See **BLACK EQUIPMENT**

BUYERS GUIDE for tactical personnel and film/stage riggers who need the black to blend into the background.... unless they're in snow.

COSTS shown are the full retail including Vat/tax and rounded up to the nearest whole figure.

Simple currency conversions are shown in orange. These are a rough guide only. They exclude import duty/shipping so the actual price will probably be much higher Below is an extracted selection of arb-specific pulleys mostly for use with climbing hitches in Moving/ Doubled Rope Systems (DdRT/MRS), some for redirect.




















































































Looking for a multifunctional harness?
Our Viking Gen5 with rope bridge is the solution.

www.EYOLF.ca

	ISC	NOTCH	OMEGA PACIFIC	PROTEKT	ROCK EXOTICA	SINGING ROCK	SKYLOTEC	STEIN	STEIN
Model	Phlotich RP282BRBS	Rook x	Octavia	TREE UP TU 421	Hydra P4	Miky RK806	CT Orbiter A 2P665	Skywalker	Skywalker Pro
Country									
Price	€51 \$75 €60	£111 \$120 €154	€50 \$60 €57	€23 \$28 €26	£127 \$120 €134	€33 \$45 €38	€30 \$43 €35	€40 \$55 €48	€51 \$75 €60
Weight	145g 5oz	189g 6.7oz	166g 5.85oz	160g 5.6oz	189g 6.7oz	105g 3.7oz	104g 3.7oz	100g 3.5oz	145g 5oz
Strength	- 30kN - 6744lbf	2.8 28kN 629 6295lbf	- 32kN - 4945lbf	5 25kN 1124 5620lbf	5 28kN 1124 6295lbf	- 28kN - 6295lbf	5 30kN 1124 6744lbf	- 36kN - 8093lbf	- 30kN - 6744lbf
Sheave Dia	≤13mm <1/2"	≤13mm <1/2"	8-14mm 5/16-9/16"	≤13.5mm <1/2"	≤13mm <1/2"	≤13mm <1/2"	8-13mm 5/16-1/2"	≤13mm <1/2"	≤13mm <1/2"
Sheave Dia	42/30mm 1.6/1.2"	53mm 2.1"	44/30mm 1.7/1.2"	38mm 1.5"	35/25mm 1.4/1"	30mm 1.2"	19mm 0.75"	38mm 1.5"	42/30mm 1.6/1.2"
Dimensions	97x69x34mm 3.8x2.7x1.3"	112x63.5x33mm 4.6 x 2.5 x 1.3"	94x69x31mm 3.7x2.7x1.2"	90x70x37mm 3.5x2.75x1.5"	112x63.5x33mm 4.4x 2.5 x 1.3"	76x55x34mm 3x2.2x1.3"	71x58x32mm 2.8x2.3x1.3"	74x60x29mm 2x1.77x1.1"	97x69x34mm 3.8x2.7x1.3"
Material	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu
Standards	CE UKCA	ANSI CE	CE	CE	CE	CE	CE	CE	CE UKCA
Notes	For HitchClimber prusik system			Updated model'23			NB: this CT data differs from Skylotec's		For HitchClimber prusik system
Website	iscwales.com	notchequipment.com	omega-pacific.com	protekt.pl	rockexotica.com	singingrock.com	skylotec.com	stein.com	stein.com

Images NOT to Scale								
MANUFACTURER	ALPIDEX	ANPEN	ANPEN	ANPEN	ANPEN	ARS ANDERSON RESCUE SOLUTIONS	ARS ANDERSON RESCUE SOLUTIONS	ARS ANDERSON RESCUE SOLUTIONS
MODEL VARIANT	Mobile 107	U29	U28	U01	U02 2155	Magna Single	Magna Becket	Magna D
ORIGIN								
COST (inc Tax) Conversion-only	£15 \$22 €16	£38 \$46 €45	£54 \$65 €62	£25 \$30 €29	£58 \$70 €66	£75 \$90 €86	£91 \$110 €104	£145 \$175
WEIGHT	87g 3.1oz	360g 12.7oz	407g 14.4oz	280g 9.9oz	500g 17.6oz	227g 8oz	255g 9oz	454g 16oz
MAX LOAD- WLL MBS	- 20kN - 4496lbf	- 32kN - 7195lbf	- 32kN - 7195lbf	- 32kN - 7195lbf	- 32kN - 7195lbf	- 28kN - 0lbf	- 26kN - 5845lbf	- 40kN - 8992
MAX ROPE Ø	≤11mm ≤3/16"	8-13mm 5/16-1/2"	8-13mm 5/16-1/2"	8-13mm 5/16-1/2"	8-13mm 5/16-1/2"	≤11mm ≤3/16"	≤11mm ≤3/16"	≤11mm ≤3/16"
SHEAVE/TREAD Ø	20mm 0.8"	48mm 1.9"	48mm 1.9"	48mm 1.9"	48mm 1.9"	25mm 1"	25mm 1"	25mm 1"
DIMENSIONS ht x w x depth	72 x 40 x 28mm 2.8x1.6x1.1"	110 x 73mm 4.3 x 2.9"	176 x 94mm 7 x 3.7"	121 x 82 x 36mm 4.7 x 3.2x 1.4"	147x82x60mm 5.8 x 3.2x 2.4"	76x63x26mm 3 x 2.5 x 1"	105x63x26mm 4.1 x 2.5 x 1"	76x63x51mm 3 x 2.5 x 1"
PRUSIK TEND LOCK BECKET	---	---	---	---	---	---	---	---
BUSHING BEARING PIN	■	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	-	-	-	-	-	-	-	-
CHEEK SHEAVE AXLE	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu
STANDARDS	CE	CE	CE	CE	CE	CE UKCA	CE UKCA	CE UKCA
OTHER COLOURS						-	-	-
NOTES						Magnetic cheeks to form double sheave	Magnetic cheeks to form double sheave	Magnetic-car into single p
WEBSITE	alpidex.com	en.anpen.net	en.anpen.net	en.anpen.net	en.anpen.net	andersonrescue.com	andersonrescue.com	andersonrescue.com
Images NOT to Scale								
MANUFACTURER	BEAL	BEAL	BEAL	BLACK DIAMOND	BLUEWATER	BLUEWATER	BLUEWATER	BLUEWATER
MODEL VARIANT	Trans'air 1B	Trans'air 2	Trans'air 2B	RP102D	Micro Pulley 61000	Mini Pulley	Mini Dbl Pulley 610121	Mini Dbl Pulley 610122
ORIGIN								
COST (inc Tax) Conversion-only	£39 \$46 €43	£46 \$61 €57	£63 \$77 €73	£25 \$25 €27	£39 \$15 €16	£44 \$22 €24	£57 \$28 €27	£59 \$30
WEIGHT	280g 9.9oz	475g 17oz	500g 17.6oz	76g 2.7oz	120g 4.2oz	50g 1.8oz	80g 2.8oz	85g 3oz
MAX LOAD- WLL MBS	5 30kN 1125 6744lbf	10 30kN 2250 6744lbf	10 30kN 2250 6744lbf	- 17kN - 3822lbf	- 22kN - 2445lbf	- 24kN - 5396lbf	- 24kN - 5396lbf	- 24kN - 5396
MAX ROPE Ø	≤16mm ≤5/8"	≤16mm ≤5/8"	≤16mm ≤5/8"	n/a n/a	≤13mm 1/2"	≤8mm ≤3/16"	≤8mm ≤3/16"	≤8mm ≤3/16"
SHEAVE/TREAD Ø	48mm 1.9"	2x 48mm 2x 1.9"	2x 48mm 2x 1.9"	n/a n/a	21mm 0.825"	21mm 0.825"	2x 21mm 2x 0.825"	2x 21mm 2x 0.825"
DIMENSIONS ht x w x depth	118x83x36mm 4.6x3.3x 1.4"	150x83x60mm 4.6x3.3x 2.4"	150x83x60mm 4.6x3.3x 2.4"	n/a n/a	81x36mm 3.2x 1.4"	73x39x25mm 2.9x1.5x 0.9"	73 x 39mm 2.9 x 1.5"	91 x 39mm 3.6 x 1.5"
PRUSIK TEND LOCK BECKET	---	---	---	---	---	---	---	---
BUSHING BEARING PIN	■	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	-	-	-	-	-	-	-	-
CHEEK SHEAVE AXLE	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Nylon Alu	Alu Alu ZStl	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
STANDARDS	CE UIAA	CE UIAA	CE UIA	CE	CE UIAA	CE	CE	CE
OTHER COLOURS	-	-	-	-	■	-	-	-
NOTES								
WEBSITE	beal-planet.com	beal-planet.com	beal-planet.com	blackdiamond.com	bluewaterropes.com	bluewaterropes.com	bluewaterropes.com	bluewaterropes.com

ARS ANDERSON RESCUE SOLUTIONS	ART	ART	AT HEIGHT JAMIMY DESIGN	AUSTRIALPIN	BEAL	BEAL	BEAL	BEAL
Magna Double Becket	Link 2	Turnbase PSA	PulleyOne P36	AL02B	Transf'air Mini	Transf'air Fixe	Transf'air FixeB	Transf'air 1
£166 \$178 \$215 €204	£47 \$53 €50	£73 \$88 €83	£92 \$105 €96	£11 \$15 €13	£23 \$31 €29	£17 \$26 €24	£38 \$48 €45	£31 \$41 €38
510g 18oz	135g 4.8oz	160g 5.6oz	140g 5oz	48g 1.7oz	120g 4.2oz	90g 3.2oz	120g 4.2oz	270g 9.5oz
- 40kN - 8992lbf	- N/AkN - N/Albf	- 24kN - 5396lbf	- 36kN - 8093lbf	4 15kN 899 3372lbf	5 20kN 1125 4496lbf	5 20kN 1125 4496lbf	5 20kN 1125 4496lbf	5 30kN 1125 6744lbf
≤11mm ≤1/8"	≤14mm ≤1/2"	≤14mm ≤1/8"	≤11.5mm ≤1/8"	≤12mm ≤1/2"	≤11mm ≤1/8"	≤12mm ≤1/2"	≤13mm ≤1/2"	≤16mm ≤5/8"
25mm 1"	22mm 0.9"	27mm 1.1"	50/42mm 2/1.6"	19mm 0.75"	28mm 1.1"	20mm 0.8"	28mm 1.1"	48mm 1.9"
105x63x53mm 0 x 2.5 x 2.1"	74 x 35mm 2.9 x 1.4"	115x48x38mm 4.5 x 1.9 x 1.5"	70x75x18mm 2.75 x 3 x 0.7"	70 x 36mm 2.75 x 1.4"	80 x 68 x 36mm 3.1 x 2.7 x 1.4"	82 x 45 x 21mm 3.2 x 1.8 x 0.8"	82 x 45 x 21mm 3.2 x 1.8 x 0.8"	118 x 83 x 36mm 4.6 x 3.3 x 1.4"
■ - ■	---	■ - ■	---	---	---	---	---	---
■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■
Alu	Alu Alu Alu	Stst Alu StSt	Alu Alu Alu	Alu Alu -	Alu Polymer Alu	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
CE UKCA	CE	CE	CE	CE	CE	CE UIAA	CE UIAA	CE UIAA
-	-	-	-	-	-	-	-	-
Magnetic-can divide into single pulleys	redirect for ART Rope Guide	inc. bridging spindle for becket	Clip through axle					
andersonrescue.com	climb-art.de	climb-art.de	atheightuk.com	austrialpin.at	beal-planet.com	beal-planet.com	beal-planet.com	beal-planet.com
CAMP	CAMP	CAMP	CAMP	CAMP	CAMP	CAMP	CAMP	CAMP
Andry 0108	Sphinx 2152	Sphinx Pro 2153	Tethys 2154	Tethys Pro 2155	Dryad 2156	Dryad Pro 2157	Naiad 2158	Naiad Pro 2159
£29	£11 \$14 €12	£28 \$30 €32	£34 \$35 €40	£31 \$30 €35	£35 \$36 €40	£49 \$48 €50	£58 \$60 €69	£49 \$60 €57
100g 3.5oz	95g 3.4oz	85g 3oz	100g 3.5oz	90g 3.2oz	170g 6oz	155g 5.5oz	280g 9.9oz	300g 10.6oz
- 22kN 0 4945lbf	4 24kN 899 5396lbf	6 25kN - 5620lbf	4 24kN 899 5396lbf	6 25kN - 5620lbf	4 24kN 899 5396lbf	7 26kN 1574 5845lbf	7 44kN 1574 9892lbf	10 46kN 0 10341lbf
≤12mm ≤ 1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤16mm ≤5/8"	≤16mm ≤5/8"
36/26mm 1.4/1"	28mm 1.1"	28mm 1.1"	28mm 1.1"	28mm 1.1"	28mm 1.1"	2x 28mm 2x 1.1"	2x 28mm 2x 1.1"	49mm 2"
75 x 36 x 30mm 3 x 1.4 x 1.2"	86x50x29mm 3.4x2x1.1"	86x50x29mm 3.4x2x1.1"	78x61x29mm 3x2.4x1.1"	78x61x29mm 3x2.4x1.1"	102x61x49mm 4x2.4x2"	102x61x49mm 4x2.4x2"	149x96x31mm 5.9x3.8x1.2"	149x96x31mm 5.9x3.8x1.2"
■	■ - ■	■ - ■	■ - ■	■ - ■	■ - ■	■ - ■	■ - ■	■ - ■
■	■	■	■	■	■	■	■	■
70%	80%	92%	80%	92%	80%	92%	90%	97%
StSt	ZStl Nylon ZSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
CE	CE EAC	CE EAC	CE EAC	CE EAC	CE EAC	CE EAC	CE EAC	CE EAC
-	■	■	■	■	-	-	-	-
designed for safety net tensioning								
camp.it	camp.it	camp.it	camp.it	camp.it	camp.it	camp.it	camp.it	camp.it

Images NOT to Scale								
MANUFACTURER	CAMP	CAMP	CMC	CMC	CMC	CMC	CMC	CMC
MODEL VARIANT	Janus 2160	Janus Pro 2161	Protech single 300501	Protech dbl 300502	HD2 300441	HD2 Double 300442	HD4 300461	Rescue s 300300
ORIGIN								
COST (inc Tax) Conversion-only	£65 \$80 €79	£77 \$100 €96	£58 \$71 €67	£93 \$115 €108	£149 \$184 €172	£202 \$249 €232	£234 \$289 €270	£0 \$0
WEIGHT	405g 14.3oz	425g 15oz	94g 3.3oz	156g 5.5oz	367g 13oz	605g 1.3lb	850g 1.9lb	145g 5.1oz
MAX LOAD- WLL MBS	8 38kN 0 8543lbf	12 42kN 2698 9442lbf	- 36kN - 8093lbf	- 36kN - 8093lbf	- 50kN - 11240lbf	- 50kN - 11240lbf	- 46kN - 10341lbf	- 52kN - 11690lbf
MAX ROPE Ø	≤16mm ≤5/8"	≤16mm ≤5/8"	≤11mm ≤7/16"	≤11mm ≤7/16"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"
SHEAVE/TREAD Ø	2x 49mm 2"	2x 49mm 2"	25mm 1"	2x 25mm 2x 1"	65/57mm 2.6/2.2"	2x 65/57mm 2x 2.6/2.2"	100/95mm 4/3.7"	38mm 1.5"
DIMENSIONS ht x w x depth	147x100x54mm 5.8 x 4x 2.1"	147x100x54mm 5.8 x 4x 2.1"	76 x 62 x 19mm 3 x 2.45 x 0.75"	100 x 62 x 37mm 3.95 x 2.45 x 1.45"	145 x 107 x 30mm 5.7 x 4.2 x 1.2"	165 x 95 x 50mm 6.5 x 3.75 x 2"	197 x 140 x 30mm 7.75 x 5.5 x 1.2"	89 x 64 x 25mm 3.5 x 2.5 x 1"
PRUSIK TEND LOCK BECKET								
BUSHING BEARING PIN								
CHEEKS - SWIVEL FIXED								
EFFICIENCY	90%	97%						
CHEEK SHEAVE AXLE	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu
STANDARDS	CE EAC	CE EAC	CE	CE	NFPA	NFPA	NFPA	NFPA
OTHER COLOURS		-	-	-	-	-	-	-
NOTES			machined alloy	machined alloy	Discontinued	Discontinued	Discontinued	
WEBSITE	camp.it	camp.it	cmcprou.com	cmcprou.com	cmcprou.com	cmcprou.com	cmcprou.com	cmcprou.com
Images NOT to Scale								
MANUFACTURER	CMI	CMI	CMI	CMI	CMI	CMI	CMI	CMI
MODEL VARIANT	RP104BB	RC104	RC105	RP105	RP105D	RC106	RP106BB	RP106
ORIGIN								
COST (inc Tax) Conversion-only	£95 \$122 €0	£101 \$121 €113	£70 \$83 €78	£94 \$113 €106	£151 \$182 €170	£108 \$130 €122	£124 \$146 €158	£198 \$238
WEIGHT	283g 10oz	397g 14oz	454g 1lb 0oz	595g 1lb 5oz	1049g 2lb 5oz	490g 1lb 1oz	612g 1lb 6oz	1043g 1lb 5oz
MAX LOAD- WLL MBS	7.5 37.8kN 1700 8500lbf	7.5 37.8kN 1700 8500lbf	7.5 37.8kN 1700 8500lbf	14.2 71.2kN 3200 16000lbf	17.8 88.9kN 4000 20000lbf	7.5 37.8kN 1700 8500lbf	14.2 71.2kN 3200 16000lbf	17.8 88.9kN 4000 20000lbf
MAX ROPE Ø	16mm 5/8"	16mm 5/8"	16mm 5/8"	16mm 5/8"	16mm 5/8"	16mm 5/8"	16mm 5/8"	16mm 5/8"
SHEAVE/TREAD Ø	60mm 2.4"	60mm 2.4"	60mm 2.4"	75mm 3"	75mm 3"	60mm 2.4"	75mm 3"	75mm 3"
DIMENSIONS ht x w x depth	108x83x25mm 4.25x3.25x1"	111x89x25mm 4.4 x 3.5 x 1"	152x83x25mm 6 x 3.25 x 1"	165x108x26mm 6.5 x 4.25 x 1"	184x108x50mm 7.25x4.25x2"	152x83x25mm 6 x 3.25 x 1"	165x108x26mm 6.5 x 4.25x1"	184x108x26mm 7.25x4.25x1"
PRUSIK TEND LOCK BECKET								
BUSHING BEARING PIN								
CHEEKS - SWIVEL FIXED								
EFFICIENCY	95.6%	95.6%	91.4%	92.1%	n/a	95.6%	94.1%	94.1%
CHEEK SHEAVE AXLE	StSt Alu StSt	StSt Steel StSt	StSt Steel StSt	StSt Alu StSt	StSt Alu StSt	StSt Steel StSt	StSt Alu StSt	StSt Alu
STANDARDS	CE	CE	CE	CE	CE	CE	CE	CE
OTHER COLOURS	-	-	-	-	-	-	-	-
NOTES	* Needle Bearing	wire cable-able *needle bearing	Wire cable-able	bush		wire cable-able *needle bearing	*needle bearing	
WEBSITE	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com

	CMC	CMI	CMI	CMI	CMI	CMI	CMI	CMI	CMI
Single	Rescue db1	RP101	RP101	RP102	RP102D	RC102	RP103	RP103BB	RC103
	300302								
€0	£0 \$0 €0	£40 \$48 €46	£66 \$78 €76	£60 \$72 €68	£112 \$134 €125	£69 \$83 €78	£82 \$104 €97	£90 \$108 €100	£87 \$104 €97
g	249g	170g	0g	198g	510g	340g	198g	198g	340g
oz	8.8oz	6oz	oz	7oz	1lb 2oz	12oz	7oz	7oz	12oz
N	- 45kN	5.3 26.7kN	5.3 26.7kN	5.3 26.7kN	5.3 26.7kN	5.3 26.7kN	5.3 26.7kN	5.3 26.7kN	5.3 26.7kN
lbf	- 10116lbf	1200 6000lbf	1200 6000lbf	1200 6000lbf	1200 6000lbf	1200 6000lbf	1200 6000lbf	1200 6000lbf	1200 6000lbf
m	≤13mm	≤16mm	≤16mm	≤16mm	≤16mm	≤16mm	≤16mm	≤16mm	≤16mm
	<1/2"	<5/8"	<5/8"	<5/8"	<5/8"	<5/8"	<5/8"	<5/8"	<5/8"
n	2x 38mm	60mm	60mm	60mm	2x 60mm	60mm	60mm	60mm	60mm
	2x 1.5"	2.4"	2.4"	2.4"	2.4"	2.4"	2.4"	2.4"	2.4"
23mm	117 x 64 x 43mm	108 x 83 x 25mm	165 x 89 x 25mm	108 x 83 x 25mm	165 x 89 x 25mm	111 x 89 x 25mm	108 x 83 x 25mm	108 x 83 x 25mm	111 x 89 x 25mm
(x 0.9")	4.6 x 2.5 x 1.7"	4.25 x 3.25 x 1"	6.5 x 3.5 x 1"	4.25 x 3.25 x 1"	6.5 x 3.5 x 1"	4.4 x 3.5 x 1"	4.25 x 3.25 x 1"	4.25 x 3.25 x 1"	4.4 x 3.5 x 1"
	- ■	- ■	- ■	- ■	- ■	- ■	- ■	- ■	- ■
	■	■	■	■	■	■	■*	■	■*
	■	■	■	■	■	■	■	■	■
		93.3	93.3	91.4	n/a	91.4	95.6	n/a	95.6%
StSt	Alu Alu StSt	Alu Celcon StSt	Alu Celcon StSt	Alu Alu StSt	Alu Alu StSt	Alu Steel StSt	Alu Alu StSt	Alu Alu StSt	Alu Steel StSt
A	NFPA	-	-	-	-	-	-	-	CE
	-	■	-	-	-	-	-	-	-
			Discontinued				* Needle Bearing		* Needle Bearing
com	cmcpro.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com
									CMI PULLEYS NUMBERING 130,131, 145, 146,160,162 = Impact Blocks 139 & 143 = Trolleys. 141&151 =p64 No 128 or 150
	CMI	CMI	CMI	CMI	CMI	CMI	CMI	CMI	
D	RP107	RP108BB	RP109	RP110	RP110	RP110D	RP111	RP112	
€222	£100 \$120 €112	£132 \$159 €168	£37 \$44 €42	£37 \$45 €43	£48 \$58 €55	£61 \$74 €70	£65 \$79 €74	£100 \$121 €115	
g	822g	822g	71g	71g	71g	113g	318g	318g	
oz	1lb 13oz	1lb 13oz	2.4oz	2.5oz	2.4oz	4oz	11.2oz	11.2oz	
9kN	14.2 71.2kN	14.2 71.2kN	6.2 31.1kN	6.2 31.1kN	6.2 31.1kN	6.2 31.1kN	- 37.8kN	7.5 37.8kN	
00lbf	3200 16000lbf	3200 16000lbf	1400 7000lbf	1400 7000lbf	1400 7000lbf	1400 7000lbf	1700 8500lbf	1700 8500lbf	
n	16mm	16mm	≤12.7mm	≤12.7mm	≤12.7mm	≤12.7mm	16mm	16mm	
	5/8"	5/8"	<1/2"	<1/2"	<1/2"	<1/2"	5/8"	5/8"	
n	100mm	100mm	31mm	31mm	31mm	2x 31mm	60mm	60mm	
	4"	4"	1.25"	1.25"	1.25"	1.25"	2.4"	2.4"	
50mm	190x127x26mm	190x127x26mm	70x41x24mm	70x41x24mm	70x41x24mm	89x41x46mm	146x75x25mm	152x83x25mm	
5x2"	7.5 x 5 x 1"	7.5 x 5 x 1"	2.75x1.6x1"	2.75x1.6x1"	2.75x1.6x1"	3.5 x 1.6x1.8"	5.75 x 3 x 1"	6 x 3.25 x 1"	
	- ■	- ■	■ -	■ -	■ -	- ■	- ■	- ■	
	■	■*	■	■	■	■	■	■*	
	■	■	■	■	■	■	■	■	
%	93.7%	95.6%	84.1%	84.1%	7%	133.6%	91.4%	95.6%	
StSt	StSt Alu StSt	StSt Alu StSt	Alu Nylon Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	StSt Alu StSt	StSt Alu StSt	
	-	-	CE	ANSI	ANSI	CE	CE	CE	
	-	-	-	-	-	■	-	-	
		*needle bearing		Alu sheave version shown	Alu sheave version shown			*needle bearing	
a.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	

Images NOT to Scale								
MANUFACTURER	CMI	CMI	CMI	CMI	CMI	CMI	CMI	CMI
MODEL VARIANT	RP113	RP114	RP115	RP116	RP116BB	RP117NFPA	RP118NFPA	RP118
ORIGIN								
COST (inc Tax) Conversion-only	£20 \$24 €23	£46 \$56 €53	£38 \$46 €44	£44 \$53 €51	£48 \$65 €52	£48 \$65/88 €52	£65 \$79/88 €74	£60 \$72
WEIGHT	43g 1.5oz	284g 10oz	198g 7oz	184g 6.5oz	184g 6.5oz	227g 8oz	340g 12oz	340g 12oz
MAX LOAD- WLL MBS	4.5 22.2kN 1000 5000lbf	6.6 33.3kN 1500 7500lbf	6.6 33.3kN 1500 7500lbf	6.6 33.3kN 1500 7500lbf	6.6 33.3kN 1500 7500lbf	7.1 35.5kN 1600 8000lbf	7.1 35.5kN 1600 8000lbf	7.1 35.5kN 1600 8000lbf
MAX ROPE Ø	≤13mm ≤½"	≤12.7mm ≤½"	≤12.7mm ≤½"	≤12.7mm ≤½"	≤12.7mm ≤½"	≤12.7mm ≤½"	≤12.7mm ≤½"	≤12.7mm ≤½"
SHEAVE/TREAD Ø	31mm 1.25"	60mm 2.4"	50mm 2"	50mm 2"	50mm 2"	50mm 2"	50mm 2"	50mm 2"
DIMENSIONS ht x w x depth	75x38x20mm 3 x 1.5 x 0.8"	127x 0x24mm 5 x 2.5 x 0.9"	127x 0x24mm 5 x 2.5 x 0.9"	127x 0x24mm 5 x 2.5 x 0.9"	127x 0x24mm 5 x 2.5 x 0.9"	127x 0x21mm 5 x 2.5 x 0.8"	127x 0x21mm 5 x 2.5 x 0.8"	127x 0x21mm 5 x 2.5 x 0.8"
PRUSIK TEND LOCK BECKET	---	---	---	---	---	---	---	---
BUSHING BEARING PIN	■	■	■	■*	■	■*	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	86.4%	89.2%	89.2%	90.6%	90.6%	90.6%	89.2%	89.2%
CHEEK SHEAVE AXLE STANDARDS	Alu Nylon StSt CE	Alu StSt StSt CE	Alu Alu StSt CE	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	StSt Alu StSt Exceeds NFPA but no cert	StSt Alu StSt Exceeds NFPA but no cert
OTHER COLOURS	-	■	-	-	-	-	-	-
NOTES				*Needle Bearing		*Needle Bearing		Alloy sheave version of f
WEBSITE	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com
Images NOT to Scale								
MANUFACTURER	CMI	CMI	CMI	CMI	CMI	CMI	CMI	CMI
MODEL VARIANT	RP124NFPA	RP125	RP125NFPA	RP126	RP127	RP129NFPA	RP132	RP133NFPA
ORIGIN								
COST (inc Tax) Conversion-only	£208 \$250/320	£240 \$288 €273	£300 \$360 €341	£67 \$81 €77	£112 \$134 €128	£130 \$156 €148	£79 \$95 €90	£130 \$156
WEIGHT	1792g 3lb 15oz	1792g 3lb 15oz	1792g 3lb 15oz	363g 12.8oz	476g 16.8oz	737g 1lb 10oz	397g 14oz	737g 1lb 10oz
MAX LOAD- WLL MBS	22.2 111.2kN 5000 25000lbf	22.2 111.2kN 5000 25000lbf	22.2 111.2kN 5000 25000lbf	- 44.5kN - 10000lbf	- 44.5kN - 10000lbf	14.2 71kN 3200 16000lbf	7.1 35.5kN 1600 8000lbf	11.5 57kN 2600 13000lbf
MAX ROPE Ø	≤16mm ≤⅝"	≤16mm ≤⅝"	≤16mm ≤⅝"	≤13mm ≤½"	≤13mm ≤½"	≤12.7mm ≤½"	≤12.7mm ≤½"	≤12.7mm ≤½"
SHEAVE/TREAD Ø	2x 100mm 2x 4"	2x 100mm 2x 4"	2x 100mm 2x 4"	51mm 2"	2x 51mm 2x 2"	75mm 3"	50mm 2"	50mm 2"
DIMENSIONS ht x w x depth	229x121x52mm 9 x 4.75 x 2"	229x121x52mm 9 x 4.75 x 2"	229x121x52mm 9 x 4.75 x 2"	152x70x22mm 6 x 2.75 x 0.8"	152x70x22mm 6 x 2.75 x 0.8"	172x132x22mm 6.75x5.2x0.8"	127x100x31mm 5 x 4 x 1.2"	172x133x22mm 6.75x5.2x0.8"
PRUSIK TEND LOCK BECKET	■	■	■	■	■	■	■	■
BUSHING BEARING PIN	■	■*	■*	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	-	-	-	-	-	91.7%	90.7	-
CHEEK SHEAVE AXLE STANDARDS	StSt Alu StSt NFPA	StSt Alu StSt NFPA	StSt Alu StSt NFPA	StSt Alu StSt	StSt StSt StSt	StSt Alu StSt CE	StSt Alu StSt *	StSt Alu StSt *
OTHER COLOURS	-	-	-	-	-	-	-	-
NOTES		* Needle Bearing	* Needle Bearing	Intended as a ropes course pulley			*Not NFPA but exceeds test	*Not NFPA but exceeds test
WEBSITE	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com

									Expansion Column
	CMI	CMI	CMI	CMI	CMI	CMI	CMI	CMI	
Part No.	RP119	RP120	RP120A	RP121	RP122NFPA	RP122SS	RP123NFPA	RP123SS	
Country									
Price	€68 £84 \$102 €97	€90 \$108 €102	£81 \$99 €94	£19 \$22 €53	£100 \$120/144	£150 \$180 €0	£126 \$134/151	£166 \$200 €190	
Weight	397g 14oz	589g 20.8oz	397g 14oz	284g 10oz	998g 2lb 4oz	998g 2lb 4oz	998g 2lb 4oz	1633g 3lb 10oz	
Strength	5kN 1100lbf 9.7 48.9kN 2200 11000lbf	5kN 1100lbf 9.7 48.9kN 2200 11000lbf	5kN 1100lbf 9.7 48.9kN 2200 11000lbf	5kN 1100lbf - 30.2kN - 6800lbf	5kN 1100lbf 17.8 88.9kN 4000 20000lbf	5kN 1100lbf 17.8 88.9kN 4000 20000lbf	5kN 1100lbf 17.8 88.9kN 4000 20000lbf	5kN 1100lbf 17.8 88.9kN 4000 20000lbf	
Dimensions	≤12.7mm ≤½"	≤12.7mm ≤½"	≤12.7mm ≤½"	≤16mm ≤⅝"	≤16mm ≤⅝"	≤16mm ≤⅝"	≤16mm ≤⅝"	≤16mm ≤⅝"	
Mounting	2x 50mm 2x 2"	2x 50mm 2x 2"	2x 50mm 2x 2"	50mm 2"	100mm 4"	100mm 4"	100mm 4"	100mm 4"	
Dimensions	165x66x37mm 6.5x2.6x 1.5"	165x66x37mm 6.5x2.6x 1.5"	165x66x37mm 6.5x2.6x 1.5"	140x108x31mm 5.5x4.25x1.2"	203x121x26mm 8 x 4.75 x 1"	203x121x26mm 8 x 4.75 x 1"	203x121x26mm 8 x 4.75 x 1"	203x121x26mm 8 x 4.75 x 1"	
Material	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu	
Efficiency	185.7%	172.9%	172.9%	89.2%	92.3%	92.3%	95%	95%	
Material	StSt	StSt Alu StSt	StSt Alu StSt	StSt Alu ZPS	StSt Alu StSt	StSt StSt StSt	StSt Alu StSt	StSt StSt StSt	
Notes	-	-	-	-	Exceeds NFPA but no cert	-	NFPA	-	
Accessories	-	-	-	-	-	-	-	-	
Notes	* Needle Bearing								
Website	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	

									Expansion Column
	CMI	CMI	CMI	CMI	CMI	CMI	CMI	CMI	
Part No.	RP134	RP135	RP137	RP137D	RP138	RP140	RP142	RP144	
Country									
Price	€6 €0 £210 \$306 €243	£232 \$337 €268	£49 \$66 €53	£75 \$114 €85	£93 \$134 €107	£46 \$55 €53	£19 \$22 €22	£63 \$76 €73	
Weight	2382g 3lb 4oz	2382g 3lb 4oz	91g 3.2oz	136g 4.8oz	1270g 2lb 13oz	91g 3.2oz	71g 2.5oz	85g 3oz	
Strength	8kN 1800lbf 26.6 133kN 6000 30000lbf	8kN 1800lbf 26.6 133kN 6000 30000lbf	3.1 31.1kN 700 7000lbf	3.1 31.1kN 700 7000lbf	13.3 66.7kN 3000 15000lbf	3.1 31.1kN 700 7000lbf	18kN 800 4047lbf	- 35.5kN - 8000lbf	
Dimensions	≤16mm ≤⅝"	≤16mm ≤⅝"	≤12.7mm ≤½"	≤12.7mm ≤½"	≤16mm ≤⅝"	≤12.7mm ≤½"	≤12.7mm ≤½"	≤12.7mm ≤½"	
Mounting	3x 100mm 3x 4"	3x 100mm 3x 4"	32mm 1.25"	2x 32mm 2x 1.25"	100mm 4"	32mm 1.25"	32mm 1.25"	32mm 1.25"	
Dimensions	203x121x72mm 8x4.75x2.8"	203x121x72mm 8x4.75x2.8"	76x70 x25mm 3 x 2.75 x 1"	95x70x45mm 3.75x2.75x1.8"	222x178x26mm 8.75 x7 x 1"	64 x 44.5mm 2.5 x 1.75"	70x48x20mm 2.75x1.9x08."	63x38mm 2.5x1.5"	
Material	Alu	Alu	Alu	Alu	Alu	Alu	Nylon	Alu	
Efficiency	-	-	-	-	-	-	-	-	
Material	StSt	StSt Alu StSt	Alu Alu Alu	Alu Alu Alu	StSt Alu StSt	Alu Alu StSt	Alu Nylon StSt	StSt Alu StSt	
Notes	-	-	CE	CE	CE	CE	CE	CE	
Accessories	-	-	-	-	-	-	-	-	
Notes		* Needle Bearing							
Website	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	

Images NOT to Scale								
MANUFACTURER	CMI	CMI	CMI	CMI	CMI	CMI	CMI	CMI
MODEL VARIANT	RP147	RP148	RP149	RP152	RP153	RP154	RP155	RP156
ORIGIN								
COST (inc Tax) <i>Conversion-only</i>	£107 \$130 €123	£107 \$130 €123	£117 \$142 €134	£69 \$83 €79	£102 \$123 €117	£90 \$110 €104	£137 \$164 €155	£48 \$65 €52
WEIGHT	408g 14.4oz	408g 14.4oz	692g 1lb 9oz	199g 7oz	340g 12oz	363g 12.8oz	635g 1lb 6.4oz	199g 7oz
MAX LOAD- WLL MBS	12.4 62kN 2800 14000 lbf	12.4 62kN 2800 14000 lbf	14.2 71.2kN 3200 16000 lbf	8.7 43kN 1960 9800 lbf	12.4 62kN 2780 14000 lbf	8.8 44kN 1980 9900 lbf	12.4 61kN 2780 13900 lbf	5.8 28kN 1300 6500 lbf
MAX ROPE Ø	≤9mm cable ≤3/8" cable	≤12.7mm cable ≤1/2" cable	25mm 1"	≤12.7mm ≤1/2"	≤12.7mm ≤1/2"	≤12.7mm ≤1/2"	≤12.7mm ≤1/2"	≤12.7mm ≤1/2"
SHEAVE/TREAD Ø	50mm 2"	50mm 2"	70mm 2.75"	51mm 2"	2x 51mm 2x 2"	75mm 3"	2x 75mm 2x 3"	51mm 2"
DIMENSIONS ht x w x depth	127x50x25mm 5 x 2 x 1"	127x50x25mm 5 x 2 x 1"	165x108x36mm 6.5x4.25x1.4"	100 x 75 x 23mm 4 x 3 x 0.9"	127 x 76mm 5 x 3"	152x100x23mm 6 x 4 x 0.9"	178 x 100x42mm 7 x 4 x 1.7"	100x70x23mm 4 x 2.75x0.9"
PRUSIK TEND LOCK BECKET	---	---	---	■--	■-■	■--	■-■	---
BUSHING BEARING PIN	■	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	n/a	n/a	n/a	93.3%	93.3%	n/a	n/a	n/a
CHEEK SHEAVE AXLE STANDARDS	StSt StSt StSt	StSt StSt StSt	StSt Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
OTHER COLOURS	CE	CE	CE	CE	CE	CE	CE	CE
NOTES	cheek gap lets rope direct to sheave	cheek gap lets rope direct to sheave						
WEBSITE	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com
Images NOT to Scale		Expansion Column						
MANUFACTURER	CONTERRA		COURANT	COURANT	DMM	DMM	DMM	DMM
MODEL VARIANT	Revolution FR RPFRR		Mova Eccentric	Orbit22	Polo pul110	Pinto pul110	Pinto Rig pul120	Gyro pul230
ORIGIN								
COST (inc Tax) <i>Conversion-only</i>	£00 \$90 €00		£16 \$25 €16	£12 \$17 €14	£55 \$67 €64	£40 \$60 €46	£60 \$90 €70	£75 \$93 €100
WEIGHT	188g 6.6oz		85g 3.4oz	110g 4.3oz	17g 0.6oz	114g 4oz	162g 6.4oz	225g 8.9oz
MAX LOAD- WLL MBS	- 38kN - 8543 lbf		- 20kN - 4496 lbf	- 22kN - 4946 lbf	15kN 3372 lbf	10 50kN 2248 11240 lbf	10 50kN 2248 11241 lbf	10 50kN 2248 11241 lbf
MAX ROPE Ø	8-13mm 5/16-1/2"		≤11mm ≤7/16"	≤13mm ≤1/2"	2-6mm 3/32-1/4"	≤14mm ≤9/16"	≤16mm ≤5/8"	≤13mm ≤1/2"
SHEAVE/TREAD Ø	50mm 2"		20mm 0.8"	21mm 0.825"	18mm 0.7"	20.4mm 0.8"	28.7mm 1.13"	38mm 1.5"
DIMENSIONS ht x w x depth	190x102x51mm 7.5x3.75x2"		73 x 43 x 28mm 2.9 x 1.7 x 1.1"	85x44x29mm 3.4 x 1.7 x 1.1"	48x23x12mm 1.9x0.9x0.5"	90x43x32mm 3.5x1.7x1.3"	100x48x37mm 4x1.9x1.5"	97x68x31mm 3.8 x 2.7 x 1.2"
PRUSIK TEND LOCK BECKET	■-■		---	---	---	--■	--■	---
BUSHING BEARING PIN	■		■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■		■	■	■	■	■	■
EFFICIENCY	184%		n/a	n/a	n/a	n/a	n/a	n/a
CHEEK SHEAVE AXLE STANDARDS	Alu Alu StSt		Alu Alu Alu	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
OTHER COLOURS	NFPA		CE	CE	CE	CE NFPA	CE NFPA	CE
NOTES	centre eye=becket							originally for 12mm rope, uprated to 13
WEBSITE	conterra-inc.com		mycourant.com	mycourant.com	dmmwales.com	dmmwales.com	dmmwales.com	dmmwales.com

PULLEYS

CMI	CMI	CMI	CMI	CMI
RP157	RP158	RP159	UP101	UP102
£88 \$107 €101	£118 \$142 €136	£195 \$233 €224	£156 \$187 €179	£156 \$187 €179
340g 12oz	709g 1lb 9oz	822g 2lb 13oz	737g 1lb 10oz	708g 1lb 9oz
9.8 48kN 2200 1100lbf	7.1 35kN 1600 800lbf	12 60kN 2700 1350lbf	- 53.4kN - 12000lbf	- 53.4kN - 12000lbf
≤12.7mm ≤½"	16mm ⅝"	16mm ⅝"	≤12.7mm ≤½"	≤12.7mm ≤½"
2x 51mm 2x 2"	100mm 4"	2x 100mm 2x 4"	2x 75mm 2x 3"	2x 75mm 2x 3"
140x70x43mm 5.5x2.75x1.7"	203x114x28mm 8 x 4.5 x 1.1"	229x114x54mm 9 x 4.5 x 2.1"	190x102x51mm 7.5x3.75x2"	152x102x51mm 5.75x3.75x2"
-- ■	---	-- ■	-- ■	---
■	■	■	■	■
n/a	n/a	n/a	184%	184%
Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
CE	CE	CE	NFPA*	NFPA*
-	-	-	-	-
			*Not NFPA but exceeds test	*Not NFPA but exceeds test
cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com

DMM	DMM	EDELRID	EDELRID	EDELRID
Gyro PM PUL231	Gyro PM Twin PUL241	Turn 71789	Easy 88906	Run Down 88907
£75 \$93 €87	£100 \$124 €140	£26 \$33 €25	£23 \$26 €20	£51 \$64 €44
234g 9.2oz	346g 13.6oz	94g 3.3oz	108g 3.8oz	200g 7oz
10 50kN 2248 1124lbf	10 50kN 2248 1124lbf	- 30kN - 6744lbf	- 30kN - 6744lbf	- 32kN - 7194lbf
≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"
38mm 1.5"	2x 38mm 2x 1.5"	29mm 1.1"	29mm 1.1"	50mm 2"
97x70x31mm 3.8 x 2.7 x 1.2"	125x70x52mm 4.9 x 2.7 x 2"	75x44x29mm 3 x 1.7 x 1.1"	85x44x29mm 3.4 x 1.7 x 1.1"	124x70x30mm 4.9 x 2.7 x 1.2"
■ -	■ ■	---	---	---
■	■	■	■	■
n/a	n/a	80%	80%	96%
Alu Alu StSt	Alu Alu StSt	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu
CE	CE	CE	CE	CE
		■	-	-
originally for 12mm rope, uprated to 13	originally for 12mm rope, uprated to 13			
dmmwales.com	dmmwales.com	edelrid.com	edelrid.com	edelrid.com



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Images NOT to Scale								
MANUFACTURER	EDELRID	EDELRID	EDELWEISS	EDELWEISS	EDELWEISS	EDELWEISS	EDELWEISS	EDELWEISS
MODEL VARIANT	Roll Single	Roll Double	Rotor	Rotor 113R	Trafic 111	Trafic 116	Trafic 116R	Trafic 2
ORIGIN								
COST (inc Tax) Conversion-only	£75 \$93 €73	£88 \$122 €110	£17 \$26 €24	£38 \$48 €45	£23 \$31 €29	£31 \$41 €38	£39 \$46 €43	£46 \$61
WEIGHT	210g 7.4oz	345g 12.2oz	85g 3oz	85g 3oz	142g 5oz	270g 9.5oz	280g 9.9oz	475g 17oz
MAX LOAD- WLL MBS	- 32kN - 7194lbf	- 50kN - 11241lbf	- 20kN - 4496lbf	- 20kN - 4496lbf	- 20kN - 4496lbf	5 30kN 1124 6744lbf	5 30kN 1124 6744lbf	5 30kN 1124 6744lbf
MAX ROPE Ø	≤13mm ≤½"	≤13mm ≤½"	8-12mm ≤⅜-⅞"	8-13mm ≤⅜-½"	8-11mm ≤⅜-⅞"	≤16mm ≤⅝"	≤16mm ≤⅝"	≤16mm ≤⅝"
SHEAVE/TREAD Ø	50mm 2"	2x 50mm 2"	20mm 08"	28mm 1.1"	28mm 1.1"	48mm 1.9"	48mm 1.9"	2x 48mm 2x 1.9"
DIMENSIONS ht x w x depth	147 x 70 x 30mm 5.8 x 2.7 x 1.2"	150 x 70 x 30mm 6 x 2.7 x 1.2"	82 x 45 x 29mm 3.2 x 1.77 x 1.1"	82 x 45 x 29mm 3.2 x 1.77 x 1.1"	80 x 68 x 36mm 3.1 x 2.7 x 1.4"	118 x 83 x 36mm 4.6 x 3.3 x 1.4"	118 x 83 x 36mm 4.6 x 3.3 x 1.4"	150 x 83 x 36mm 4.6 x 3.3 x 1.4"
PRUSIK TEND LOCK BECKET	---	---	---	---	---	---	---	---
BUSHING BEARING PIN	■	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	96%	96%	n/a	n/a	n/a	n/a	n/a	n/a
CHEEK SHEAVE AXLE	Alu Alu Alu	Alu Alu Alu	Alu Alu Zstl	Alu Alu Zstl	Alu Alu Zstl	Alu Alu Zstl	Alu Alu Zstl	Alu Alu
STANDARDS	CE	CE	CE	CE	CE UIAA	CE	CE	CE
OTHER COLOURS	-	-						
NOTES								
WEBSITE	edelrid.com	edelrid.com	edelweiss-ropes.com	edelweiss-ropes.com	edelweiss-ropes.com	edelweiss-ropes.com	edelweiss-ropes.com	edelweiss-ropes.com
Images NOT to Scale								
MANUFACTURER	HEIGHTEC	HEIGHTEC	HEIGHTEC	ISC	ISC	ISC	ISC	ISC
MODEL VARIANT	PO1	PO2	PO4	UltraLink L	UltraLink S	Eiger Micro	Eiger sm	Eiger sm
ORIGIN								
COST (inc Tax) Conversion-only	£15 \$18 €17	£52 \$65 €61	£67 \$84 €78	£48 \$70 €75	£48 \$70 €75	£20 \$21 €28	£24 \$36 €38	£35 \$46
WEIGHT	90g 3.2oz	174g 6.1oz	282g 9.9oz	218g* 7.7oz	208g* 7.3oz	92g 3.25oz	87g 3oz	153g 5oz
MAX LOAD- WLL MBS	2.6 26kN 0 5845lbf	3 30kN 674 6744lbf	3 30kN 674 6744lbf	- 40kN - 8992lbf	- 40kN - 8992lbf	0 28kN 0 6294lbf	- 36kN - 8093lbf	- 36kN - 8093lbf
MAX ROPE Ø	≤12mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"
SHEAVE/TREAD Ø	21mm 0.825"	50mm 2"	50mm 2"	32/21mm 1.2/0.8"	32/21mm 1.2/0.8"	30/20mm 1.2/0.8"	32/22mm 1.6/0.9"	32/22mm 1.6/0.9"
DIMENSIONS ht x w x depth	82x45x29mm 3.2 x 1.77 x 1.1"	114x70x30mm 4.5 x 2.75 x 1.2"	114x70x30mm 4.5 x 2.75 x 1.2"	70x57x32mm* 2.75 x 2.3 x 1.3"	68x55x32mm* 2.65 x 2.1 x 1.3"	88x45x34mm 3.5 x 1.8 x 1.4"	74x45x32mm 3x1.75x1.3"	94x45x55mm 3.75 x 1.75 x 2.1"
PRUSIK TEND LOCK BECKET	---	---	---	■	■	---	---	---
BUSHING BEARING PIN	■	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CHEEK SHEAVE AXLE	Alu Alu Zstl	Alu Nylon StSt	StStNylonStSt	StSt Alu StSt	StStl Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu
STANDARDS	CE	CE	CE	CE UKCA	CE UKCA	CE UKCA	CE UKCA	CE UKCA
OTHER COLOURS								
NOTES		PO3 discontinued		*with sheave Recall Nov/23	- Recall Nov/23	bridge can be used as a textile becket		
WEBSITE	heightec.com	heightec.com	heightec.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com

Image	EDLWEISS	EDLWEISS	EYOLF	EYOLF	EYOLF	FIXE	FUSION CLIMB	FUSION CLIMB	FUSION CLIMB	FUSION CLIMB
Model	Traffic 216R	Traffic 216R	Katrol S	Katrol V	Katrol L	Aux	Micro	Nuro	Strux	Secura DbI
Code	0	0	P20	P10	P40	746	746	418	8152	8155
Country	FR	FR	CA	CA	CA	ES	US	US	US	US
Price	€57	€63 \$77 €73	€23 \$27 €26	€31 \$37 €35	€46 \$55 €52	€37 \$47 €44	€12 \$14 €13	€16 \$24 €23	€17 \$23 €22	€36 \$43 €40
Weight	500g 17.6oz	500g 17.6oz	66g 2.3oz	88g 3.1oz	258g 9.1oz	91g 3.2oz	142g 5oz	85g 3oz	280g 9.9oz	500g 17.6oz
Strength	5 30kN 1124 6744lbf	5 30kN 1124 6744lbf	- 15kN - 3372lbf	- 30kN - 6744lbf	- 36kN - 8093lbf	- 20kN - 4496lbf	- 20kN - 4496lbf	- 20kN - 4496lbf	2 34kN 0 00lbf	2 32kN 0 4945lbf
Width	≤16mm ≤5/8"	≤16mm ≤5/8"	≤11mm ≤7/16"	≤11mm ≤7/16"	≤13mm ≤1/2"	≤13mm ≤1/2"	8-11mm ≤3/16-7/16"	8-12mm ≤3/16-7/16"	9-14mm 3/8-9/16"	9-15mm 3/8-9/16"
Height	2x 48mm 2x 1.9"	2x 48mm 2x 1.9"	32/19mm 1.25/0.8"	32/19mm 1.25/0.8"	54/37mm 2.1"	21mm 0.825"	28mm 1.1"	28mm 1.1"	50mm 2"	50mm 2"
Dimensions	150 x 83 x 60mm 4.6 x 3.3 x 2.4"	150 x 83 x 60mm 4.6 x 3.3 x 2.4"	77 x 50 x 28mm 3 x 1.6 x 1.1"	75 x 42 x 29mm 3 x 1.6 x 1.2"	119 x 76 x 37mm 4.7 x 3 x 1.45"	82 x 45 x 29mm 3.2 x 1.77 x 1.1"	80 x 68 x 36mm 3.1 x 2.7 x 1.4"	82 x 45 x 29mm 3.2 x 1.77 x 1.1"	118 x 83 x 36mm 4.6 x 3.3 x 1.4"	150x83x 60mm 4.6 x 3.3 x 2.4"
Material	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu
Standard	CE	CE	CE	CE	CE	CE	CE	CE	CE	CE
Notes			New for 2024 *Needle Bearing	New for 2024 *Needle Bearing	New for 2024					
Website	edelweiss-ropes.com	edelweiss-ropes.com	eyolf.ca	eyolf.ca	eyolf.ca	fixecimbing.com	fusionclimb.com	fusionclimb.com	fusionclimb.com	fusionclimb.com

Image	ISC	ISC	ISC	ISC	ISC	ISC	ISC	ISC	ISC
Model	Eiger Redirect	Eiger m	Eiger m dbI	Eiger m dbI	Rope Wrench	Prusik sm	Prusik sm	Prusik sm dbI	Prusik sm dbI
Code	RP031	RP032	RP033	RP034	RP281	RP060	RP060	RP061	RP061
Country	UK	UK	UK	UK	UK	UK	UK	UK	UK
Price	€29 \$40 €35	€33 \$45 €39	€46 \$68 €52	€38 \$50 €45	€24 \$36 €29	€36 \$43 €54	€67 \$107 €99	€54 \$77 €84	€67 \$107 €99
Weight	124g 4oz	158g 6oz	284g 10oz	180g 6oz	76g 2.7oz	214g 8oz	396g 14oz	340g 12oz	674g 24oz
Strength	- 30kN - 6744lbf	- 36kN - 8093lbf	- 36kN - 8093lbf	- 36kN - 8093lbf	- 36kN - 8093lbf	- 40kN - 8992lbf	- 40kN - 8992lbf	- 40kN - 8992lbf	- 40kN - 8992lbf
Width	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"
Height	2x 32/22mm 2x 1.6/0.9"	50/42mm 2/1.65"	2x 50/42mm 2x 2/1.65"	50/42mm 2/1.65"	32/22mm 1.6/0.9"	50/42mm 2/1.65"	50/42mm 2/1.65"	2x 50/42mm 2x 2/1.65"	2x 50/42mm 2x 2/1.65"
Dimensions	72x45x50mm 3 x 1.75 x 2"	90x52x34mm 3.5 x 2.1 x 1.4"	110x52x56mm 4.3 x 2 x 2.2"	126x52x34mm 5 x 2 x 1.4"	75x45x32mm 3x 1.75 x 1.3"	103x70x34mm 4.1 x 5.1 x 1.4"	103x70x34mm 4.1 x 5.1 x 1.4"	128x70x58mm 5 x 5.1 x 2.3"	128x70x58mm 5 x 5.1 x 2.3"
Material	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu	Alu
Standard	CE UKCA	CE UKCA	CE UKCA	CE UKCA	CE UKCA	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA
Notes									
Website	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com

Images NOT to Scale								
MANUFACTURER	ISC	ISC	ISC	ISC	ISC	ISC	ISC	ISC
MODEL VARIANT	Prusik m RP063	Prusik m RP063	Prusik m dbl RP064	Prusik m dbl RP064	Prusik m RP065	Prusik m RP065	Prusik lg RP066	Prusik lg RP066
ORIGIN								
COST (inc Tax) <i>Conversion-only</i>	£50 \$65 €60	£55 \$81 €75	£66 \$108 €100	£92 \$140 €130	£53 \$78 €72	£63 \$93 €86	£52 \$66 €61	£67 \$96
WEIGHT	280g 9.9oz	584g 20.6oz	555g 20oz	1036g 37oz	0g 0oz	620g 22oz	463g 1lb	896g 2lb
MAX LOAD- WLL MBS	- 50kN - 11240lbf	- 50kN - 11240lbf	- 50kN - 11240lbf	- 50kN - 11240lbf	- 50kN - 11240lbf	- 50kN - 11240lbf	- 70kN - 15736lbf	- 50kN - 11240lbf
MAX ROPE Ø	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤16mm ≤5/8"	≤16mm ≤5/8"
SHEAVE/TREAD Ø	50/42mm 2/1.65"	50/42mm 2/1.65"	2x 50/42mm 2x 2/1.65"	2x 50/42mm 2x 2/1.65"	50/42mm 2/1.65"	50/42mm 2/1.65"	67/55mm 2.6/2.16"	67/55mm 2.6/2.16"
DIMENSIONS ht x w x depth	130x 88x35mm 5.1 x 3.5 x 1.4"	130x88x35mm 5.1 x 3.5 x 1.4"	158x88x58mm 6.2 x 3.5 x 2.3"	158x88x58mm 6.2 x 3.5 x 2.3"	157x88x34mm 6.1 x 3.5 x 1.4"	157x88x34mm 6.1 x 3.5 x 1.4"	156x105x37mm 6.1 x 4 x 1.47"	156x105x37mm 6.1 x 4.1 x 1.47"
PRUSIK TEND LOCK BECKET	- - -	- - -	■ - ■	■ - ■	■ - ■	■ - ■	■ - -	■ - -
BUSHING BEARING PIN	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CHEEK SHEAVE AXLE	Alu Alu StSt	Alu StSt StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	StSt StSt StSt	Alu Alu StSt	StSt StSt
STANDARDS	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA
OTHER COLOURS	■	-	■	■	■	-	-	-
NOTES							Bushing option same spec as bearing	
WEBSITE	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com
Images NOT to Scale								
MANUFACTURER	ISC	KAILAS	KAILAS	KONG	KONG	KONG	KONG	KONG
MODEL VARIANT	Double Rescue RP700701	Mini K010613	Rescue 0	Turbo Roll 0	Swing 993N(P)	Swing Steel 994	Mini Twin Evo 0	Reflector 0
ORIGIN								
COST (inc Tax) <i>Conversion-only</i>	£67 \$107 €99	£25 \$30 €29	£71 \$85 €79	£48 \$25 €24	£0 \$29 €23	£0 \$30 €0	£0 \$87 €72	£64 \$0
WEIGHT	660g 23oz	155g 5.5oz	367g 13oz	65g 2.3oz	120g 4.2oz	162g 5.7oz	171g 60oz	270g 9.5oz
MAX LOAD- WLL MBS	- 3040kN - 67448992lbf	8 28kN 17986295lbf	8 50kN 179811240lbf	- 26kN - 5845lbf	- 30kN - 6744lbf	- 30kN - 6744lbf	- 32kN - 7194lbf	- 26kN - 5845lbf
MAX ROPE Ø	10-13mm 25/64-1/2"	≤12mm ≤1/2"	7-13mm 7/32-1/2"	≤11mm ≤7/16"	≤11mm ≤7/16"	≤11mm ≤7/16"	≤13mm ≤1/2"	≤13mm ≤1/2"
SHEAVE/TREAD Ø	2x 67/55mm 2x 2.6/2.16"	26mm 1"	51mm 2"	40.5/27mm 1.6/1"	40.5/27mm 1.6/1"	40.5/27mm 1.6/1"	2x 35mm 2x 1.5"	60mm 2.4"
DIMENSIONS ht x w x depth	154 x 74 x 62mm 6 x 3 x 2.4"	81 x 58 x 29mm 3.2 x 2.3 x 1.1"	121 x 85 x 23mm 4.8 x 3.3 x 0.9"	98 x 30 x 26mm 3.9 x 1.2 x 1"	77 x 52 x 26mm 3 x 2 x 1"	77 x 52 x 26mm 3 x 2 x 1"	106 x 62 x 47mm 4.2 x 2.4 x 1.9"	154 x 80 x 26mm 6 x 3.1 x 1"
PRUSIK TEND LOCK BECKET	■ - -	■ - -	■ - -	- ■	- - -	- - -	■ - ■	- - ■
BUSHING BEARING PIN	■	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	n/a	94%	94%	93%	87%	87%	91%	96%
CHEEK SHEAVE AXLE	Alu StSt StSt	Alu Alu StSt	S.Steel Alu	Alu Nylon StSt	AluNylonStSt	AluNylonStSt	Alu Alu StSt	Alu Alu
STANDARDS	CE NFPA UKCA	CE UIAA	CE NFPA	CE EAC	CE UIAA	CE UIAA	CE UIAA	CE UIAA
OTHER COLOURS	■	-	-	-	■	■	■	-
NOTES	700=1-way sheave			alloy red side plate version discontinued	Polished model=\$21	PHASING OUT		*Fully load-t-double end
WEBSITE	iscwales.com	kailasgear.com	kailasgear.com	kong.it	kong.it	kong.it	kong.it	kong.it

ISC	ISC	ISC	ISC	ISC
Prusik lg dbl RP067	Prusik lg dbl RP067	Prusik lg dbl RP067	Prusik lg RP068	Prusik xl RP069
£89	£84 \$129 €120	£99 \$151 €140	£53 \$78 €72	£67 \$107 €99
	818g 29oz	1.62kg 3.6lb	477g 1lb1oz	466g 16oz
	- 70kN - 15736lbf	- 50kN - 11240lbf	- 70kN - 15736lbf	- 70kN - 15736lbf
	≤16mm ≤5/8"	≤16mm ≤5/8"	≤16mm ≤5/8"	≤20mm ≤3/4"
	2x 67/55mm 2x 2.6/2.16"	2x 67/55mm 2x 2.6/2.16"	67/55mm 2.6/2.16"	80mm 3"
	180x105x60mm 7 x 4.1 x 2.4"	203x106x60mm 8 x 4.2 x 2.4"	180x105x35mm 7 x 4.1 x 1.4"	156x105x54mm 6.1 x 4.1 x 2.1"
	n/a	n/a	n/a	n/a
StSt	Alu Alu StSt	StSt StSt StSt	Alu Alu StSt	Alu Alu StSt
UKCA	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA
	Bushing option same spec as bearing		Bushing option same spec as bearing	
com	iscwales.com	iscwales.com	iscwales.com	iscwales.com
KONG	KONG	KONG	LRV8	NOTCH
Extra-Roll 0	Twin 0	Twin 0	P3Ta	Micro P52
£60	£46 \$63 €53	£60 \$87 €65	AU\$185 \$120	£26 \$32 €31
	245g 8.6oz	490g 1lb 1oz	486g 19oz	73g 2.56oz
	- 30kN - 6744lbf	- 50kN - 11240lbf	24 120kN 539526977lbf	- 30.6kN - 6900lbf
	≤13mm ≤1/2"	≤13mm ≤1/2"	8-24mm 5/16-1"	≤13mm ≤1/2"
	60mm 2.4"	2x 60mm 2x 2.4"	60/52mm 2.4/2"	33mm 1.3"
	110 x 83 x 29mm 4.3 x 3.2 x 1.1"	132 x 83 x 54mm 5.2 x 3.2 x 2.1"	140x80x60mm 5.5x3.2x2.4"	75 x 43mm 3 x 1.7"
	96%	96%	-	n/a
StSt	Alu Alu* StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
AA	CE EAC UIAA	CE UIAA	CE NFPA	ANSI
	*Nylon sheave option discontinued		Remake of SRTe original	
it	kong.it	kong.it	lrv8.com.au	notchequipment.com



Pulley One

Optimised for 11.5mm Rope
Clip-in, Clip-out Easily
MBS 36kN

Patent Pending No. 2205034.8
British Registered Design No. 6171217
Europe Registered Design No. 009084551



A Design Collaboration between
@jammy.design and At Height UK



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Images NOT to Scale								
MANUFACTURER	OMEGA PACIFIC	PALM	PETZL	PETZL	PETZL	PETZL	PETZL	PETZL
MODEL VARIANT	Revo Ice	Whitewater	Mobile	Fixe	Oscillante	Partner	Mini	Gemini
ORIGIN								
COST (inc Tax) Conversion-only	£14 \$16 €15	£35 \$32 €31	£22 \$28 €25	£23 \$32 €24	£15 \$23 €18	£37 \$55 €38	£48 \$65 €52	£86 \$95
WEIGHT	52g 1.83oz	90g 3.2oz	75g 2.6oz	90g 3.2oz	42g 1.5oz	56g 2oz	80g 2.8oz	135g 4.8oz
MAX LOAD- WLL MBS	- 22kN - 4945lbf	5 30kN 1124 6744lbf	5 15kN 1124 3372lbf	5 23kN 1124 5171lbf	4 15kN 899 3372lbf	4 15kN 899 3372lbf	5 23kN 1124 5171lbf	6 23kN 1349 5171lbf
MAX ROPE Ø	≤12.7mm ≤½"	≤11mm ≤⅜"	7-13mm ⅜-½"	7-13mm ⅜-½"	7-11mm ⅜-⅞"	7-11mm ⅜-⅞"	7-11mm ⅜-⅞"	7-11mm ⅜-⅞"
SHEAVE/TREAD Ø	20mm 0.8"		21mm 0.8"	21mm 0.8"	25mm 1"	25mm 1"	25mm 1"	2x 25mm 1"
DIMENSIONS ht x w x depth	67 x 45 x 28mm 2.6 x 1.8 x 1.1"	75 x 63mm 3 x 2.5"	64 x 46 x 29mm 2.5 x 1.8 x 1.15"	76 x 44 x 29mm 3 x 1.75 x 1.15"	68 x 47 x 26mm 2.7 x 1.9 x 1"	68 x 47 x 26mm 2.7 x 1.9 x 1"	78 x 60 x 25mm 3 x 2.4 x 1"	96 x 60 x 25mm 5.5 x 3.5 x 1"
PRUSIK TEND LOCK BECKET	■ --	■ --	■ --	---	---	---	■ --	■ --
BUSHING BEARING PIN	■	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	n/a	n/a	71%	71%	71%	91%	91%	91%
CHEEK SHEAVE AXLE	AluNylonStSt	Alu Alu Alu	Alu Alu StSt	Alu Alu StSt	AluNylonAlu	Alu Alu Alu	Alu Alu Alu	Alu Alu
STANDARDS	CE	CE UIAA UKCA	CE UIAA UKCA	CE UKCA	CE UIAA UKCA	CE UIAA UKCA	CE	CE NFPA
OTHER COLOURS	-		-	■ ■	■	■	-	-
NOTES					Emergency pulley			
WEBSITE	omega-pacific.com	palmequipementeuropa.com	petzl.com	petzl.com	petzl.com	petzl.com	petzl.com	petzl.com

Images NOT to Scale								
MANUFACTURER	PROTEKT	PROTEKT	PROTEKT	PROTEKT	RNR	RNR	RNR	RNR
MODEL VARIANT	TREE UP	TREE UP	TREE UP	TREE UP	Poseidon PMP	Poseidon PMP	Poseidon PMP	Poseidon PMP
ORIGIN								
COST (inc Tax) Conversion-only	£34 \$42 €39	£40 \$49 €45	£83 \$101 €95	£78 \$52 €48	£63 \$77 €72	£75 \$92 €86	£67 \$82 €77	£99 \$122
WEIGHT	257g 9oz	470g 16.6oz	153g 5.4oz	450g 15.8oz	210g 7.4oz	354g 12.5oz	374g 13.2oz	652g 1.44lb
MAX LOAD- WLL MBS	6 30kN 1349 6744lbf	6 30kN 1349 6744lbf	5 25kN 1124 5620lbf	5 30kN 1124 6744lbf	- 43kN - 9800lbf	- 62kN - 1400lbf	- 44kN - 9900lbf	- 61kN - 13900lbf
MAX ROPE Ø	≤15mm ≤⅝"	≤15mm ≤⅝"	≤10mm ≤⅜"	8-12mm* ⅜-½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"
SHEAVE/TREAD Ø	60mm 2.4"	2x 60mm 2x 2.4"	30/22mm 1.2/0.9"	108mm 4.25"	50mm 2"	2x 50mm 2x 2"	75mm 3"	2x 75mm 2x 3"
DIMENSIONS ht x w x depth	122 x 80 x 38mm 4.8 x 3.1 x 1.5"	162 x 80 x 63mm 6.4 x 3.1 x 2.5"	85 x 40 x 39mm 3.3 x 1.6 x 1.6"	133x128x56mm 5.2 x 5 x 2.2"	100 x 23mm 4 x 3 x 0.9"	127 x 76mm 5 x 3"	152x100x23mm 6 x 4 x 0.9"	178 x 100 x 23mm 7 x 4 x 0.9"
PRUSIK TEND LOCK BECKET	---	-- ■	---	---	■ --	■ --	■ --	■ --
BUSHING BEARING PIN	■	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CHEEK SHEAVE AXLE	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Nylon StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu
STANDARDS	CE	CE	CE	CE	-	-	-	-
OTHER COLOURS	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	-	-	-	-	-
NOTES			<21mm Webbing on hidden load pin	*or 6mm cable				
WEBSITE	protekt.pl	protekt.pl	protekt.pl	protekt.pl	rocknarbor.com	rocknarbor.com	rocknarbor.com	rocknarbor.com

	PETZL		PETZL		PETZL		PETZL		PROCLIMB		PROCLIMB		PROCLIMB		PROCLIMB		PROTEKT	
	Jag P45		Rescue P50		Minder P60		Twin P65		USR-PFB-AU		USR-PMS-AU		USR-PSW-AU		USR-PTW-AU		TREE UP TU 420	
	FR		FR		FR		FR		US		US		US		US		US	
Price	€94	£64 \$90 €55	£56 \$68 €60	£72 \$80 €70	£116 \$194 €125	£13 \$16 €15	£13 \$16 €15	£13 \$35 €15	£13 \$45 €15	£26 \$33 €30								
Weight	120g 4.2oz	185g 6.5oz	295g 10.4oz	450g 15.8oz	85g 3.5oz	130g 5.1oz	247g 8.7oz	425g 15oz	120g 4.2oz									
Strength	6 22kN 1349 4945lbf	8 36kN 1798 8093lbf	8 35kN 1798 7868lbf	8 35kN 1798 7868lbf	- 22kN - 4945lbf	- 20kN - 4496lbf	5 30kN 1124 6744lbf	5 30kN 1124 6744lbf	5 25kN 1124 5620lbf									
Dimensions	8-11mm 5/16-7/16"	7-13mm 9/32-1/2"	7-13mm 9/32-1/2"	7-13mm 9/32-1/2"	<13mm <1/2"	<11mm <7/16"	<16mm <5/8"	<16mm <5/8"	<13.5mm <1/2"									
Length	2x 28mm 1.1"	46/38mm 1.8/1.5"	51mm 2"	2x 51mm 2"	32/21mm 1.25/0.825"	37/25mm 1.5/1"	30.5mm* 1.2"	2x 30.5mm* 2x 1.2"	34/24mm 1.3/0.9"									
Size	70 x 40 x 44mm 2.75 x 1.6 x 1.7"	96 x 70 x 32mm 3.8 x 2.75 x 1.3"	124 x 90 x 31mm 4.9 x 3.5 x 1.2"	143 x 90 x 51mm 5.6 x 3.5 x 2"	80.5 x 44 x 29mm 3.2 x 1.7 x 1.2"	80 x 57 x 33mm 3.2 x 2.2 x 1.3"	121 x 82 x 30.5mm* 4.8 x 3.2 x 1.2"	143 x 82 x 57mm* 5.6 x 3.2 x 2.1"	86 x 44 x 40mm 3.4 x 1.7 x 1.6"									
Material	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Zstl	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
Standards	CE NFPA	CENFPAUIAAUKCA	CE NFPA	CE NFPA	CE UIAA	CE UIAA	CE* UIAA	CE* UIAA	CE									
Notes	designed to be part of Jag mini-haul kit						*Spec does not match scaling.	*Spec does not match scaling.	Updated model '23									
Website	petzl.com	petzl.com	petzl.com	petzl.com	usrigging.com	usrigging.com	usrigging.com	usrigging.com	protekt.pl									
																		
	RNR		RNR		RNR		ROCK EMPIRE		ROCK EMPIRE		ROCK EMPIRE		ROCK EMPIRE					
	Poseidon 2"		Poseidon 2" Double		Poseidon 4"		Poseidon 4" Double		Poseidon 3" Companion Dbl		Mini ZWP018		Small SS ZWP121		Big ZWP119		Big Double ZWP121	
	US		US		US		US		US		US		US		US		US	
Price	£114	£39 \$48 €45	£64 \$78 €73	£86 \$106 €99	£141 \$174 €163	£113 \$139 €130	£24 \$31 €28	£20 \$25 €23	£41 \$51 €47	£72 \$89 €83								
Weight	204g 7.2oz	340g 12oz	703g 1.55lb	1270g 2.8lb	737g 1b 10oz	88g 3.5oz	130g 5.1oz	250g 9.8oz	440g 17.3oz									
Strength	- 28.9kN - 6500lbf	- 40kN - 1100lbf	- 35.6kN - 8000lbf	- 60kN - 13500lbf	- 53.4kN - 12000lbf	- 24kN - 5395lbf	- 20kN - 4496lbf	8 36kN 1798 8093lbf	8 36kN 1798 8093lbf									
Dimensions	<13mm <1/2"	<13mm <1/2"	<16mm <5/8"	<16mm <5/8"	<12.7mm <1/2"	<12mm <1/2"	<11mm <7/16"	<13mm <1/2"	<13mm <1/2"									
Length	50mm 2"	2x 50mm 2x 2"	100mm 4"	2x 100mm 2x 4"	2x 75mm 2x 3"	21mm 0.825"	37/25mm 1.5/1"	50mm 1.9"	2x 33mm 2x 1.3"									
Size	100x70x23mm 4 x 2.75x0.9"	140x70x43mm 5.5x2.75x1.7"	203x114x28mm 8 x 4.5 x 1.1"	229x114x54mm 9 x 4.5 x 2.1"	190x102x51mm 7.5x3.75x2"	82x45x29mm 3.2 x 1.77 x 1.1"	80 x 57 x 33mm 3.2 x 2.2 x 1.3"	117 x 82 x 35mm 4.6 x 3.2 x 1.3"	107 x 80 x 35mm 4.2 x 3.1 x 1.4"									
Material	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu Zstl	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
Standards	-	-	-	-	NFPA*	CE	CE UIAA	CE UIAA	CE UIAA	CE UIAA	CE UIAA	CE UIAA	CE UIAA	CE UIAA	CE UIAA	CE UIAA	CE UIAA	CE UIAA
Notes						*Not NFPA but exceeds test												
Website	rocknarbor.com	rocknarbor.com	rocknarbor.com	rocknarbor.com	rocknarbor.com	rocknarbor.com	rockempire.cz	rockempire.cz	rockempire.cz	rockempire.cz	rockempire.cz	rockempire.cz	rockempire.cz	rockempire.cz	rockempire.cz	rockempire.cz	rockempire.cz	rockempire.cz

Images NOT to Scale								
MANUFACTURER	ROCK EXOTICA	ROCK EXOTICA	ROCK EXOTICA	ROCK EXOTICA	SINGING ROCK	SINGING ROCK	SINGING ROCK	SINGING ROCK
MODEL VARIANT	1.1" Mini P21	1.1" Mini Dbl P21D	1.5" Rescue P22	1.5" Rescue Dbl P22D	Small RK800	Extra RK801	Extra+ RK808	Tw... RK808
ORIGIN								
COST (inc Tax) Conversion-only	£55 \$68 €64	£93 \$115 €108	£61 \$75 €70	£106 \$130 €122	£20 \$30 €30	£37 \$50 €33	£44 \$55 €40	£64 \$90
WEIGHT	83g 2.9oz	141g 5oz	144g 5.1oz	254g 9oz	92g 3.3oz	257g 9.5oz	276g 9.7oz	421g 14.9oz
MAX LOAD- WLL MBS	5 30kN 1124 6744lbf	8 36kN 1798 8093lbf	8 36kN 1798 8093lbf	8 36kN 1798 8093lbf	- 22kN - 4946lbf	6 32kN 1349 7194lbf	6 32kN 1349 7194lbf	6 32kN 1349 7194lbf
MAX ROPE Ø	≤11mm < 7/16"	≤11mm < 7/16"	≤13mm < 1/2"	≤13mm < 1/2"	≤13mm < 1/2"	≤13mm < 1/2"	≤13mm < 1/2"	≤13mm < 1/2"
SHEAVE/TREAD Ø	28mm 1.1"	2x 28mm 2x 1.1"	38mm 1.5"	2x 38mm 2x 1.5"	29mm 1.1"	56mm 2.2"	56mm 2.2"	2x 56mm 2x 2.2"
DIMENSIONS ht x w x depth	76 x 62 x 19mm 3 x 2.45 x 0.75"	100 x 62 x 37mm 3.95 x 2.45 x 1.45"	89 x 64 x 23mm 3.5 x 2.5 x 0.9"	117 x 64 x 43mm 4.6 x 2.5 x 1.7"	76 x 44 x 34mm 3 x 1.7 x 1.3"	117 x 88 x 28mm 4.6 x 3.5 x 1."	146 x 88 x 33mm 5.7 x 3.5 x 1.3"	141 x 88 x 33mm 5.5 x 3.5 x 1.3"
PRUSIK TEND LOCK BECKET	■ - -	■ ■	■ - -	■ ■	- - -	■ - -	■ ■	■ ■
BUSHING BEARING PIN	■	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	n/a	n/a	n/a	n/a	81%	94%	94%	94%
CHEEK SHEAVE AXLE	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
STANDARDS	CE UIAA	CE UIAA	CE UIAA	CE UIAA	CE	CE	CE	CE
OTHER COLOURS	-	-	-	-	■	■	■	■
NOTES	Machined alloy	Machined alloy	Machined alloy	Machined alloy. 2" model discontinued				
WEBSITE	rockexotica.com	rockexotica.com	rockexotica.com	rockexotica.com	singingrock.com	singingrock.com	singingrock.com	singingrock.com
Images NOT to Scale								
MANUFACTURER	SKYLOTEC	SKYLOTEC	SKYLOTEC	SKYLOTEC	SKYLOTEC	SKYLOTEC	SKYLOTEC	SKYLOTEC
MODEL VARIANT	CT Up Roll 2P671	CT Orbiter F 2P663	CT Orbiter D 2P661	CT Orbiter T 2P662	Darios	Pollux	Castor	Castor
ORIGIN								
COST (inc Tax) Conversion-only	£52 \$65 €58	£22 \$30 €23	£66 \$82 €74	£84 \$104 €99	£72 \$89 €82	£80 \$104 €97	£75 \$120 €111	£78 \$125
WEIGHT	115g 4oz	100g 3.5oz	215g 7.6oz	310g 10.9oz	100g 3.5oz	290g 10.2oz	310g 10.9oz	540g 19oz
MAX LOAD- WLL MBS	5 30kN 1124 6744lbf	5 30kN 1124 6744lbf	8kN 32kN 1798 7194lbf	12kN 50kN 2698 11240lbf	- 30kN - 6744lbf	- 36kN - 8093lbf	- 36kN - 8093lbf	- 48kN - 10793lbf
MAX ROPE Ø	8-11mm 7/16-7/16"	≤13mm < 1/2"	≤13mm < 1/2"	≤13mm < 1/2"	≤14mm < 9/16"	≤13mm < 1/2"	≤13mm < 1/2"	≤14mm < 9/16"
SHEAVE/TREAD Ø	2x 25mm 1 x 1"	39mm 1.5"	39mm 1.5"	2x 39mm 2x 1.5"	44mm 1.7"	64/51mm 2.5/2"	64/51mm 2.5/2"	2x 64/51mm 2x 2.5"
DIMENSIONS ht x w x depth	89x36x44mm 3.5x1.4x1.7"	85x48x29mm 3.3x1.9x1.1"	140x70x32mm 5.5x2.7x 1.3"	137x70x55mm 5.4x2.7x2.2"	85 x 50 x 32mm 3.3 x 2x 1.25"	130 x 80 x 35mm 5.1 x 3.1 x 1.4"	170 x 80 x 35mm 6.7 x 3.1 x 1.4"	170 x 80 x 35mm 6.7 x 3.1 x 1.4"
PRUSIK TEND LOCK BECKET	- ■	- - -	- - -	- ■	- - -	- - -	- ■	- ■
BUSHING BEARING PIN	■	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■	■
EFFICIENCY	90%	80%	96%	96%	-	-	-	-
CHEEK SHEAVE AXLE	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
STANDARDS	CE	CE UIAA	CE UIAA	CE UIAA	CE	CE	CE	CE
OTHER COLOURS	-	-	-	-	-	■	■	■
NOTES	designed for 'UP' pulley system							
WEBSITE	climbingtechnology.com	climbingtechnology.com	climbingtechnology.com	climbingtechnology.com	climbingtechnology.com	skylotec.com	skylotec.com	skylotec.com

Images NOT to Scale							
MANUFACTURER	SMC	SMC	SMC	SMC	SMC	SMC	SMC
MODEL VARIANT	Swiftwater 147000	2" PMP NFPA1527	2" PMP Dbl NFPA1528	2" RussAnderson NFPA1500	2" RussAnderson NFPA1505	3" PMP RP281	3" PMP Dbl NFPA1505
ORIGIN							
COST (inc Tax) Conversion-only	£47 \$58 €55	£65 \$80 €75	£105 \$130 €122	£71 \$87 €82	£50 \$61 €57	£96 \$117 €110	£142 \$174 €163
WEIGHT	170g 6oz	179g 6.3oz	295g 10.4oz	244g 8.6oz	244g 8.6oz	354g 12.5oz	590g 20.8oz
MAX LOAD- WLL MBS	- 34kN - 7644lbf	- 36kN - 8093lbf	- 46kN - 10341lbf	- 29kN - 6520lbf	- 29kN - 6520lbf	- 38kN - 8543lbf	- 48kN - 10791lbf
MAX ROPE Ø	<13mm <½"	<13mm <½"	<13mm <½"	<13mm <½"	<13mm <½"	<13mm <½"	<13mm <½"
SHEAVE/TREAD Ø	50mm 2"	50mm 2"	2x 50mm 2x 2"	50mm 2"	50mm 2"	75mm 3"	2x 75mm 2x 3"
DIMENSIONS ht x w x depth	100 x 75 x 32mm 4 x 3 x 1.25"	101 x 74 x 35mm 4 x 2.9 x 1.4"	130 x 74 x 56mm 5.1 x 2.9 x 2.2"	117 x 63 x 36mm 4.6 x 2.5 x 1.4"	117 x 63 x 36mm 4.6 x 2.5 x 1.4"	149 x 106 x 35mm 5.8 x 4.2 x 1.4"	180 x 106 x 56mm 7.1 x 4.2 x 2.2"
PRUSIK TEND LOCK BECKET	■ - -	■ - -	■ - ■	- - -	- - -	■ - -	■ - ■
BUSHING BEARING PIN	■	■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■
EFFICIENCY	-	-	-	-	-	-	-
CHEEK SHEAVE AXLE	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	StSt Alu StSt	StSt Alu StSt	Alu Alu Alu	Alu Alu Alu
STANDARDS	UIAA	NFPA	NFPA	NFPA	NFPA	NFPA	NFPA
OTHER COLOURS	-	■	■	-	-	-	-
NOTES							
WEBSITE	smcgear.com	smcgear.com	smcgear.com	smcgear.com	smcgear.com	smcgear.com	smcgear.com
Images NOT to Scale							
MANUFACTURER	SMC	SMC	SPIDER	STEIN	TRANGO	TREEHOG	TREERUNNER
MODEL VARIANT	3" RA Single NFPS1510	4" RA Double NFPA15705	Highline	Rope Wrench Pulley -	Rock Prodigy	Fixed Pulley THPUL1	71-993
ORIGIN							
COST (inc Tax) Conversion-only	£89 \$109 €102	£200 \$245 €230	£31 \$38 €35	£21 \$26 €25	£13 \$15 €14	£20 \$25 €23	£22 \$39 €36
WEIGHT	454g 16oz	1142g 40.3oz	91g 3.2oz	76g 2.7oz	91g 3.2oz	91g 3.2oz	285g 10oz
MAX LOAD- WLL MBS	- 51kN - 11465lbf	- 63kN - 14163lbf	4 20kN 899 4497lbf	- 36kN - 8093lbf	- 26kN - 5845lbf	- 22kN - 4946lbf	6 42kN 1349 6744lbf
MAX ROPE Ø	<13mm <½"	<16mm <⅝"	24-26mmWEB 1-1.1"WEB	<13mm <½"	<12mm 0"	<13mm <½"	<15mm <⅝"
SHEAVE/TREAD Ø	75mm 3"	2x 100mm 2x 4"	25mm 1"	32/22mm 1.6/0.9"	24/17mm 0.9/0.7"	21mm 0.825"	60mm 2.4"
DIMENSIONS ht x w x depth	168 x 91 x 38mm 6.6 x 3.6 x 1.5"	252 x 117 x 61mm 9.9 x 4.6 x 2.4"	79 x 44mm 3.1 x 1.7"	75 x 45 x 32mm 3x 1.75 x 1.3"	57 x 35x 30mm 2.3 x 1.3 x 1.2"	57 x 58 x 32mm 2.3 x 2.7 x 1.3"	122 x 82 x 38mm 4.8 x 3.1 x 1.5"
PRUSIK TEND LOCK BECKET	- - -	- - ■	- - -	- - -	- - -	- - -	- - -
BUSHING BEARING PIN	■	■ ■ ■	■	■	■	■	■
CHEEKS - SWIVEL FIXED	■	■	■	■	■	■	■
EFFICIENCY	-	-	-	n/a	-	-	n/a
CHEEK SHEAVE AXLE	StSt Alu StSt	StSt Alu StSt	Alu Alu StSt	Alu Alu Alu	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
STANDARDS	NFPA	NFPA	NOT PPE	CE UKCA	CE	CE	CE
OTHER COLOURS	-	-	■	■	-	-	-
NOTES			Load transport only	won't rotate >200kg load			
WEBSITE	smcgear.com	smcgear.com	spider-slacklines.com	stein.com	trango.com	treehog.co.uk	grube.eu

TANDEM PULLEYS

for Zip-Lines

Tandem pulleys have sheaves that are in-line rather than side-by-side as we see with MA system pulleys. Most of these can be used to create MA systems but their rigid, wide profile make them impracticable. There are a number of other devices in the 'TROLLEY/CARRIAGES GUIDE in **ROPE EQUIPMENT BUYERSGUIDE**. In-line tandem pulleys were originally for tyrolean traverses in mountaineering. Now, arborists use them on high-load zip or speed lines to move branches and wood away from the tree. In the burgeoning field of high-ropes, activity/play areas use them for high speed zip-lines and in rescue they are used to access or evacuate. In arb they are used only for material handling and not as often as they could be in favour of simpler and cheaper single pulleys or just sliding carabiners. Nevertheless, we have included Tandems in this **ARBORIST BUYERSGUIDE** for those shifting heavy wood sections or seeking a better load spread on a more efficient pulley combination, many of which have steel sheaves intended for wire cables but with the benefit of very high wear resistance if using a rope. All of these models can take multiple attachments in the main eye to allow for two control lines as well as the load itself to be clipped in. Some have separate control line eyes like the CMI and ISC models

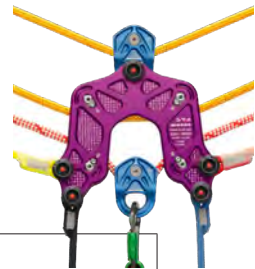


UPDATED Nov '23






















or more complex basal eyes like the *Petzl Reeve*, *SMC Shuttles* and *CMI LHT* for use with a separate rigging plate. Several have a top eye to allow connection to a redundant system (second or safety zip-line) which is rarely the case for arborists using it for material handling unless it is a higher risk, higher load removal. Many of these

designs are variations on the *Petzl Tandem* which has been around for decades for mountaineering and is a design that has barely changed. Most use bearings instead of bushings because high-speed efficiency is the name of the game rather than any degree of dynamic absorbency which can be achieved by the zip-line rope itself which, although tensioned, is often of significant enough length to absorb the necessary impact load 'dropped' on it though this should obviously be kept to a minimum. Most speed-lines are low-load, high speed affairs where multiple branches can be shifted out of the canopy using the now familiar speed-line kits with multiple pre-sewn slings with carabiners. Tandem pulleys are for more serious, high-load rigging using 13mm/½" low stretch rope.

Of particular mention is the *Petzl Reeve*, a solid, simple, mid-line attachable trolley utilising the *Spin* pulleys. Far from simple and nowhere near as aesthetically pleasing as the *Reeve* is *DMM's Keanu* (right), a complex, modular frame with tandem sheaves but the ability to alter/add sheaves and control lines and a rig-plate as per the *CMIHD* above. Note that some 'CE' adherence may be to the new Adventure Parks standard rather than the work & rescue standards we are used to.





























Images NOT to Scale					
MANUFACTURER	ALPIDEX	BEAL	CMI	CMI	CMI
MODEL VARIANT	Tandem 2P654	Trans'air Twin B	Trolley HD (+ Plate)	Velocity Micro ½ %	Rapid Transit
ORIGIN					
COST (inc Tax) Conversion-only	£39 \$0 €37	£66 \$70 €66	£270 \$327*€311	£135 \$163 €156	£231 \$280 €266
WEIGHT	280g 9.9oz	290g 13.8oz	1.9kg* 2.4lb*	368/397g 13/14oz	648g 1lb 6oz
MAX LOAD- WLL MBS	10 20kN 2248 4497lbf	8 30kN 1798 6744lbf	- 62.3kN - 14000lbf	- 62.3kN - 14000lbf	- 62.3kN - 14000lbf
MAX ROPE CABLE Ø	13 12mm ½ ½"	≤13 12mm ≤½ ½"	≤16mm ≤¾"	≤12.7 12.7-16mm ≤½ ½-¾"	9-12.7mm ¾-½"
SHEAVE/TREAD Ø	2x 27mm 2x 1.1"	2x 27mm 2x 1.1"	2x 75mm 2x 3"	2x 38mm 2x 1.5"	2x 50mm 2x 2"
DIMENSIONS ht x w x depth	83 x 108 x 28mm 3.3 x 4.2 x 1.1"	108 x 78 x 36mm 4.3 x 3.1 x 1.4"	75 x 127 x 26*mm 9.5 x 6 x 1"	75 x 127x23/27*mm 3 x 5 x 0.9/1.1"	142 x 95x26.8*mm 5.6 x 3.75 x 1"
BUSHING BEARING PIN					
CHEEKS - SWIVEL FIXED					
EFFICIENCY	?	?	n/a	n/a	n/a
CHEEK SHEAVE AXLE	Alu StSt StSt	Alu StSt StSt	Alu Alu StSt	StSt StSt StSt	StSt StSt StSt
STANDARDS	CE	CE	CE	CE	CE
MAX SPEED	-	33mph 15m/s	60mph 27m/s	60mph 27m/s	90mph 40m/s
NOTES	7 Colour options		*Exc mandatory use of CMI Maxi-Plate attached to bottom pins	depth does not include bolt *heads	depth does not include bolt *heads
WEBSITE	alpindex.com	beal-planet.com	cmigear.com	cmigear.com	cmigear.com

						
MANUFACTURER	CMI	CAMP	CAMP	DMM	EDELRID	EDELRID
MODEL VARIANT	Trolley 1/2	Wing2	Flyte 3121	Keanu TR400	Rail 71791	
ORIGIN						
COST (inc Tax) <i>Conversion-only</i>	£231 \$280 €266	£121 \$160 €138	£0 \$150 €82	£550 \$700 €650	£70 \$87 €80	£55
WEIGHT	648g 1lb 6oz	347g 12.2oz	280g 9.9oz	1698g 3lb 12oz	290g 13.8oz	
MAX LOAD- WLL MBS	- 62.3kN - 14000lbf	6 15kN 1349 3372lbf	10 20kN 2248 4497lbf	10 50kN 2248 11240lbf	0 25kN 0 5620lbf	8 179
MAX ROPE CABLE Ø	9-12.7mm 16mm 3/8-1/2" 5/8"	≤13 12mm ≤1/2 1/2"	≤13 12mm ≤1/2 1/2"	≤13 12mm ≤1/2 1/2"	≤13 12mm ≤1/2 1/2"	≤1
SHEAVE/TREAD Ø	2x 50mm 2x 2"	2x 26mm 2x 1"	2x 27mm 2x 1.1"	2x 38mm 2x 1.5"	2x 28mm 2x 1.1"	2x 2
DIMENSIONS ht x w x depth	165 x 152 x 24*mm 6.5 x 6 x 1"	125 x 75 x 30mm 5 x 3 x 1.2"	83 x 108 x 28mm 3.3 x 4.2 x 1.1"	250 x 220 x 40mm 9.8 x 8.7 x 1.6"	0 x 0mm 0 x 0"	78 x 1 3.1 x
BUSHING BEARING PIN	■	■	■	■	■	
CHEEKS - SWIVEL FIXED	■	■	■	■	■	
EFFICIENCY	n/a	n/a	n/a	n/a	90%	
CHEEK SHEAVE AXLE	StSt StSt StSt	Alu StSt StSt	Alu StSt StSt	Alu Alu StSt	Alu StSt StSt	Alu
STANDARDS	CE	CE	CE	CE	CE	
MAX SPEED	90mph 40m/s	45mph 20m/s	45mph 20m/s	-	-	33m
NOTES	depth does not include bolt *heads	DISCONTINUED Sprung gate. Hooks each end are to store backups during travel		Also in Purple. Modular sheaves, pins and rig plate		
WEBSITE	cmigear.com	camp.it	camp.it	dmmwales.com	edelrid.com	edel
Images NOT to Scale						
MANUFACTURER	KONG	KONG	PETZL	PETZL	PETZL	PETZL
MODEL VARIANT	MegaZip 91200N00KK	Zip Evo Hook 826040400KK 826050400KK	Tandem P21	Tandem Speed P21 SPE	Reeve P21 SPE	Tree-Up
ORIGIN						
COST (inc Tax) <i>Conversion-only</i>	£250 \$289 €285	£106 \$125 €120	£46 \$85 €43	£64 \$100 €73	£180 \$220 €207	£40
WEIGHT	1310g 2lb 14oz	440 470g 15.5 16.6 oz	195g 6.9oz	270g 9.5oz	650g 1lb 7oz	
MAX LOAD- WLL MBS	- 21kN - 4721lbf	- 22kN - 5000lbf	10 24kN 2248 5395lbf	10 24kN 2248 5395lbf	- 36kN - 8093lbf	4 107
MAX ROPE CABLE Ø	12-16mm 1/2-5/8"	≤13mm ≤1/2"	≤13mm ≤1/2"	≤13 13mm 1/2 1/2"	7-13mm 5/32- 1/2"	≤
SHEAVE/TREAD Ø	2x 55mm 2x 2.16"	2x 40mm 2x 1.6"	2x 21mm 2x 0.8"	2x 27.5mm 2x 1.1"	2x 38mm 2x 1.5"	2x 2
DIMENSIONS ht x w x depth	200 x 215 x 35mm 7.9 x 8.5 x 1.4"	200 x 170 x 35mm 7.9 x 6.7 x 1.4"	75 x 108 x 32mm 3 x 4.2 x 1.25"	75 x 108 x 32mm 3 x 4.2 x 1.25"	132 x 195mm 5.2 x 7.7"	90 x 10 35.4
BUSHING BEARING PIN	■	■	■	■	■	
CHEEKS - SWIVEL FIXED	■	■	■	■	■	
EFFICIENCY	n/a	95%	71%	95%	95%	
CHEEK SHEAVE AXLE	Alu Steel StSt	Alu StSt StSt	Alu Alu StSt	Alu StSt StSt	Alu StSt StSt	Alu
STANDARDS	CE	CE	CE UIAA UKCA	CE UIAA UKCA	CE NFPA UKCA	
MAX SPEED mph m/s			22mph 10m/s	89mph 20m/s		
NOTES		Sprung safety gate for sheaves. Hook version (shown) avoids safety backup wear on wire cable				
WEBSITE	kong.it	kong.it	petzl.com	petzl.com	petzl.com	pr

TANDEM PULLEYS/TROLLEYS

www.arbclimber.com

						
ELWEISS	FIXE	FUSION CLIMB	FUSION CLIMB	ISC	KAILAS	KONG
	DB2 Cable 418	Advent GT Tactical FP-8160-SS-SILBLK	Tesa Speed FP-8154-7-BLU	ZipSpeed RP075	Trolley Double	Pamir Fast 94600(4/N)401KK
						
£68 €38	£75 \$92 €86	£73 \$89 €84	£52 \$63 €59	£0 \$0 €0	£105 \$130 €120	£80 \$100 €90
290g 13.8oz	291g 10.3oz	765g 1lb 11oz	311g 11oz	875g 1lb 14oz	372g 13.1oz	365g 12.9oz
8 30kN 8 6744lbf	10 20kN 2248 4497lbf	- 50kN - 11240lbf	10 24kN 2248 5395lbf	- 40kN - 8992lbf	12 26kN 2697 5845lbf	8 30kN 1798 6744lbf
13 12mm 1/2 1/2"	≤13 12mm 1/2 1/2"	9-13 8-12mm 3/8-1/2 15/16-1/2"	9-13 8-12mm 3/8-1/2 15/16-1/2"	≤13 16 & 20mm 1/2 5/8 & 3/4"	≤13 12mm 1/2 1/2"	≤13 13mm 1/2 1/2"
2x 27mm 2x 1.1"	2x 27mm 2x 1.1"	2x 50/40mm 2x 2/1.6"	2x 35/27mm 2x 1.4/1.1"	2x 50/75mm 2x 2/3"	2x 28mm 2x 1.1"	2x 37mm 2x 1.5"
108 x 36mm 4.3 x 1.4"	83 x 108 x 28mm 3.3 x 4.2 x 1.1"	100 x 168 x 39mm 3.9 x 6.6 x 1.5"	78.5 x 108 x 27mm 3.1 x 4.25 x 1.1"	111x206x31mm 4.4 x 8.1 x 1.2"	87 x 104 x 31mm 3.4 x 4.1 x 1.2"	86.5 x 113 x 29mm 3.4 x 4.5 x 1.1"
■	■	■	■	■	■	■
n/a	n/a	n/a	n/a	n/a	n/a	n/a
StSt StSt CE	Alu StSt StSt CE	StSt Alu StSt CE	Alu Alu StSt CE ANSI	Alu StSt StSt CE	Alu Alu StSt CE	Alu StSt StSt CE
mph 15m/s	-		89mph 20m/s	69mph 30.8m/s		-
		Tactical version=Black		Also available with 13&16mm cable sheaves & 75mm/3" rope sheaves		Top-cap=finger protector. Also available in Blue
weisscom	fixeclimbing.com	fusionclimb.com	fusionclimb.com	iscwales.com	kailas.com	kong.it
						
ROTEKT	ROCK EMPIRE	SINGING ROCK	SKYLOTEC	SMC	SMC	
DbI Transport CD101	Tandem ZWP120	Tandem RK803	CT Duetto 2P654	Shuttle 156302	Shuttle Extreme 156304	
						
£50 €46	£78 \$97 €90	£65 \$76 €71	£66 \$75 €64	£58 \$69 €65	£105 \$128 €120	
250g 8.8oz	280g 9.9oz	290g 10.2oz	290g 13.8oz	162g 5.7oz	227g 8oz	
8 24kN 9 5395lbf	- 20kN - 4496lbf	5 25kN 1124 5620lbf	10 25kN 2248 5620lbf	- 26kN - 5845lbf	- 26kN - 5845lbf	
13mm 1/2"	≤13 12mm 1/2 1/2"	≤13 12mm 1/2 1/2"	≤13 12mm 1/2 1/2"	≤13 13mm 1/2 1/2"	≤13 13mm 1/2 1/2"	
2x 28mm 2x 1.1"	2x 27mm 2x 1.1"	2x 28mm 2x 1.1"	2x 27mm 2x 1.1"	2x 35mm 2x 1.37"	2x 35mm 2x 1.37"	
103 x 36.5mm 4 x 1.4"	83 x 108 x 28mm 3.3 x 4.2 x 1.1"	80 x 101mm 31.4 x 4"	80 x 100 x 33mm 3.2 x 3.9 x 1.3"	82 x 108 x 27mm 3.2 x 4.25 x 1.1"	82 x 108 x 27mm 3.2 x 4.25 x 1.1"	
■	■	■	■	■	■	
n/a	n/a	n/a	90%	n/a	n/a	
StSt StSt CE	Alu StSt StSt	Alu StSt StSt	Alu StSt StSt CE	Alu StSt StSt	Alu StSt StSt	
			-	-	-	
					Replaceable bearings. For high volume jobs	
rotekt.pl	rockempire.com	singingrock.com	skylotec.com	smcgear.com	smcgear.com	

UPDATED Dec '23

SWIVEL PULLEYS

& CARABINER/PULLEYSWIVELS

Yachting was the first to use swivel pulleys, indeed pulley development in general has been led by the various maritime industries but it took the genius of *Rock Exotica* to once again cross the design divide into life-critical tasking in 2005 with the *OmniBlock* which quickly found a home in an arb industry that was now keen to embrace all things metal and shiny. *Rock Exotica* not only married a rescue-spec swivel eye with a pulley they also added a locking button to the swing-cheek making this super-safe as well as super-tough being machined out of a single block of aircraft alloy. They had the field to themselves for a few years and produced (produce) for large players like *CMC* with the US-only NFPA version but once *Petzl* introduced their *Spin* series the gloves seemed to be off and swivel pulleys and latterly carabiner/swivel pulleys are appearing more and more and they're doing so with interesting variations on some elements of the *OmniBlock* design.

The ultimate in *Swiss-Army Knife* optimism is the *SwivaBiner* also from *RockExotica/CMC* where a full size carabiner sits on top of a swivel, on top of a pulley. The carabiner takes the place of the swivel eye which usually requires you to clip in a carabiner making the whole assembly longer so the *Swivabiner* is saving some space and the whole assembly is replacing 3 separate items. Not sure that the three separate items wouldn't be more useful but the *Swivabiners* are pretty flash

none-the less. We've used a *SwivaEye* (which is the 'biner and swivel bit minus the pulley) since *Rock* invented them and it has been a real workhorse in all kinds of weird and wonderful situations that it was never intended for. *Petzl* have followed the single carabiner-swivel concept with their own variation using their 'Open' swivel. This does allow connection to other 'closed' components as a carabiner does but only with the more time-consuming job of removing an Allen bolt. It is however, considerably smaller than a carabiner and only barely larger than a closed swivel. (see pic comparison right) The logical extension of the *Swiv-A-Biner* pulley concept is of course, to have two pulleys on a swivel - so double blocks with a bucket completes the carabiner-swivel series nicely with *Rock Exotica* and their proxy series by *CMC* still having this particular field to themselves.



Where *RockExotica*, *Petzl* and *CMC* swivel their cheeks on the central axle, *SMC* decided to buck the trend and have their swivel on a pin at the top. The centre is the cheek release; a sprung, push button requiring 90 degree rotation of the button before pushing it in to release the side plate. *Petzl*'s *Spins* all have a red warning flash to indicate that the side plate is not properly locked (pic above)

The *OmniBlock* and its competitors have tended to be at the larger and certainly bulkier end of the scale but once again *Rock Exotica* led the way with a more diminutive swivel pulley when they produced Reed Thorne's baby, the *AZTEK* mini pulley system using mini *OmniBlocks* where the swivel is almost as large as the pulley. This was subsequently taken up by *CMi*'s *MicroTrolley* (right) which is actually even smaller albeit as a single rather than double sheave. *Rock Exotica* have since brought out a model specifically aimed at arborists. The *Hydra* (below-right) is their swivelling variation of the *Hitchclimber*



IN THE FOLLOWING TABLES.....

See the Pulleys Introduction on page 62 for the same key to these tables.

Sheave Diameters in green are verified as the minimum/tread diameter - others may be the max or outer diameter - we will update as we get the data

- Alu = Aluminium or Aluminium Alloy
- StSt = Stainless Steel but may simply be galvanised steel in a few cases or....
- Zstl = Zinc plated steel



OMNI 2.0" DOUBLE

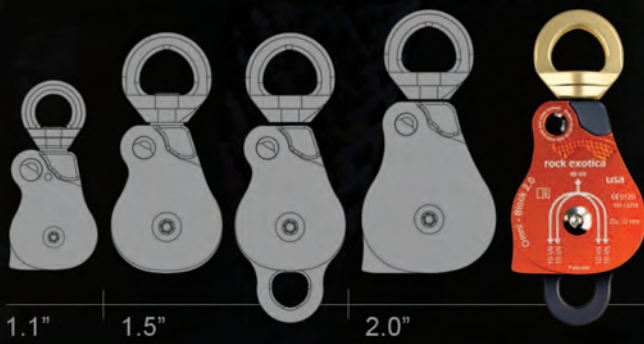
- Install and remove rope while still connected to the anchor.
- Sideplate locks with two-stage, double-catch safety mechanism.



- Integrated swivel allows pulley to orient while reducing gain.
- Connect, install and remove rope with one hand.
- CNC machined for optimal weight & strength.















THE NEWEST OF THE OMNI FAMILY
















































































Available in single or double sheave versions, from 1.1" up to 2.0" sheave diameter.



Images NOT to Scale						
MANUFACTURER	CMC	CMC	CMC	CMC	CMC	CMC
MODEL VARIANT	1.1 PMP Single 300434	1.1 PMP Double 300433	1.5 PMP Single SS 300430	1.5 Single 300431	1.5 Double 300432	2.0 PMP Single 300437
ORIGIN						
COST (inc Tax) Conversion-only	- \$95 -	- \$123 -	- \$139 -	- \$105 -	- \$155 -	- \$130 -
WEIGHT	140g 4.9oz	245g 8.6oz	331g 11.7oz	260g 9.2oz	411g 14.5oz	348g 12.3oz
MAX LOAD- WLL MBS	5 22kN 1124 4946lbf	7.25 22kN 1630 4946lbf	8 36kN 1798 8093lbf	8 36kN 1798 8093lbf	8 36kN 1798 8093lbf	8 36kN 1798 8093lbf
ROPE Ø	≤13mm <1/2"	≤13mm <1/2"	≤13mm <1/2"	≤13mm <1/2"	≤13mm <1/2"	≤13mm <1/2"
SHEAVE/TREAD Ø	36/28mm 1.4/1.1"	2x 36/28mm 2x 1.4/1.1"	48/38mm 1.9/1.5"	48/38mm 1.9/1.5"	2x 48/38mm 2x 1.9/1.5"	60/51mm 2.4/2"
DIMENSIONS ht x w x depth	112 x 51 x 30mm 4.4 x 2 x 1.2"	135 x 51 x 53mm 5.3 x 2 x 2"	135 x 64 x 32mm 6.3 x 2.5 x 1.3"	135 x 64 x 32mm 5.3 x 2.5 x 1.3"	160 x 64 x 57mm 6.3 x 2.5 x 2.3"	148 x 76 x 32mm 5.8 x 3 x 1.3"
PRUSIK TEND LOCK BECKET						
BUSHING BEARING PIN						
CHEEKS - SWIVEL FIXED						
EFFICIENCY	>90%	>90%	>90%	>90%	>90%	>93%
CHEEK SHEAVE AXLE	Alu Alu Alu	Alu Alu Alu	Alu StSteel Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu
STANDARDS	NFPA	NFPA	NFPA	NFPA	NFPA	NFPA
OTHER COLOURS	-	-	-	-	-	-
NOTES			*steel cable≤12mm			
WEBSITE	cmcpro.com	cmcpro.com	cmcpro.com	cmcpro.com	cmcpro.com	cmcpro.com

Images NOT to Scale						
MANUFACTURER	PETZL	PETZL	PETZL	PETZL	PETZL	ROCK EXOTIC
MODEL VARIANT	Spin S1 S1	Spin S1 Open 2P654	Spin L1 L1	Spin L2 dbl L2D	Spin L1D 1-way L2	Hydra P4
ORIGIN						
COST (inc Tax) Conversion-only	£58 \$72 €66	£65 \$75 €70	£90 \$110 €100	£144 \$175 €160	£168 \$205 €190	£127 \$120 €13
WEIGHT	145g 5.1oz	0g 0oz	290g 10.2oz	480g 1lb 9oz	425g 15oz	189g 6.7oz
MAX LOAD- WLL MBS	5 23kN 1124 8093lbf	5 23kN 1124 8093lbf	6 36kN 1348 8093lbf	6 36kN 1348 8093lbf	6 36kN 1348 8093lbf	5 28kN 1124 6295lbf
ROPE Ø	7-11mm 3/32-7/16"	7-11mm 3/32-7/16"	8-13mm 5/16-1/2"	8-13mm 5/16-1/2"	8-13mm 5/16-1/2"	≤13mm <1/2"
SHEAVE/TREAD Ø	25mm 1"	25mm 1"	50/38mm 2/1.5"	2x 50/38mm 2x 2/1.5"	60/45mm 2.4/1.8"	35/25mm 1.4/1"
DIMENSIONS ht x w x depth	103x48x33mm 4 x 1.9 x 1.3"	105x48x33mm 4.1 x 1.9 x 1.3"	150x70 x 32mm 5.9 x 2.75 x 1.25"	180 x 70 x 70mm 7 x 2.75 x 2.75"	150 x 74 x 32mm 5.9 x 2.9 x 1.25"	112 x 63.5 x 33mm 4.4 x 2.5 x 1.3"
PRUSIK TEND LOCK BECKET						
BUSHING BEARING PIN						
CHEEKS - SWIVEL FIXED						
EFFICIENCY	91%	91%	95%	95%	93% one-way	>90%
CHEEK SHEAVE AXLE	Alu StSt StSt	Alu StSt StSt	Alu StSt StSt	Alu StSt StSt	Alu StSt StSt	Alu Alu StSt
STANDARDS	CE NFPA UKCA UIAA	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA	CE
OTHER COLOURS						-
NOTES	red warning mark if sheave is not locked	red warning mark if sheave is not locked	red warning mark if sheave is not locked	Red warning mark if sheave is not locked	Integrated progress capture cam.*=faceted cam	
WEBSITE	petzl.com	petzl.com	petzl.com	petzl.com	petzl.com	rockexotica.com

							
	CMC	CMC	CMC	CMC	CMI	NOTCH	PETZL
	2.0 PMP Double	2.6 PMP Single	1.1 PMP SwivaBiner	1.1 PMP SwivaBiner	MicroTrolley	Rook	Twin Release
	300438	300436	300435	300439	RP161RS	x	
							
	- \$195 -	- \$225 -	- \$125 -	- \$155 -	£91 \$110/114 €105	£111 \$120 €114	£362 \$440 €410
	591g 20.9oz	850g 29.9oz	200g 7oz	298g 11oz	204/226g 7.2/8oz	189g 6.7oz	800g 1lb 12oz
	10 40kN 2248 8992lbf	20 70kN 4496 15737lbf	- 22kN - 4946lbf	- 22kN - 4946lbf	8.8 44kN 1980 9900lbf	2.8 28kN 629 6295lbf	9 36kN 2023 8093lbf
	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	8-13mm ¾-½"
	2x 60/51mm 2x 2.4/2"	75/66mm 2.95/2.6"	36/28mm 1.4/1.1"	2x 36/28mm 2x 1.4/1.1"	32mm 1.25"	53mm 2.1"	2x 56 & 46/40 & 38*mm 2x 2.2 & 1.8/1.6 & 1.5"
	180 x 76 x 57mm 7 x 3 x 2.3"	191 x 92.5 x 42mm 7.5 x 3.6 x 1.6"	168 x 51 x 30mm 6.6 x 2 x 1.2"	195 x 51 x 53mm 7.7 x 2 x 2"	114 x 50 x 32mm 4.5 x 2 x 1.25"	112 x 63.5 x 33mm 4.6 x 2.5"	180 x 105 x 77mm 7 x 4.1 x 3"
							
							
							
	>93%	>90%	>90%	>90%		>90%	95%
	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu StSt	Alu Alu StSt	Alu StSt StSt
	NFPA	NFPA	NFPA	NFPA	CE	ANSI CE	CE NFPA ANSI UKCA
	-	-	-	-	-	-	
	cmcpro.com	cmcpro.com	cmcpro.com	cmcpro.com	cmigearusa.com	notchequipment.com	petzl.com
							
	RE / CMC	ROCK EXOTICA	ROCK EXOTICA	ROCK EXOTICA	ROCK EXOTICA	ROCK EXOTICA	ROCK EXOTICA
	AZTEK	Omni Block 1.1	Omni Block 1.1 dbi	Omni Block 1.5	Omni Block 1.5 SS	Omni Block 1.5	Omni Block 1.5 dbi
	P41 / 300321	P54	P54D	P51	P51 SS	P51 SH	P51 D
							
	£105 \$127 €121	£110 \$98 €122	£150 \$135 €162	£122 \$105 €142	£100 \$90 €87	£122 \$105 €142	£150 \$160 €190
	226g 7.9oz	140g 4.9oz	245g 8.6oz	260g 9.2oz	303g 10.7oz	303g 10.7oz	411g 14.5oz
	9 36kN 2023 8093lbf	5 23kN 1124 4946lbf	7.25 30kN 1630 6744lbf	8 36kN 1798 8093lbf	8 36kN 1798 8093lbf	8 36kN 1798 8093lbf	8 36kN 1798 8093lbf
	8mm ⅝"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"
	2x 36/28mm 2x 1.4/1.1"	36/28mm 1.4/1.1"	2x 36/28mm 2x 1.4/1.1"	48/38mm 1.9/1.5"	48/38mm 1.9/1.5"	48/38mm 1.9/1.5"	2x 48/38mm 2x 1.9/1.5"
	104 x 50mm 4.1 x 2"	112 x 51x 30mm 4.4 x 2 x 1.2"	135 x 51 x 53mm 5.3 x 2 x 2"	135 x 64 x 32mm 5.3 x 2.5 x 1.3"	135 x 64 x 32mm 5.3 x 2.5 x 1.3"	135 x 64 x 33mm 6.3 x 2.5 x 1.3"	160 x 64 x 58mm 6.3 x 2.5 x 2.3"
							
							
							
	>90%	>90%	>90%	>90%	>90%	>90%	>90%
	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu StSteel Alu	Alu Alu Alu	Alu Alu Alu
	CE NFPA	CE	CE	CE	CE	CE	CE
						-	
	rockexotica.com	rockexotica.com	rockexotica.com	rockexotica.com	rockexotica.com	DISCONTINUED	rockexotica.com

UPDATED Dec '23

Images NOT to Scale					
MANUFACTURER	ROCK EXOTICA				
MODEL VARIANT	Omni Block 2 P53	Omni Block 2 dbl P53 D	Omni Block 2.6 P55	1.1 Swivabiner P54 SB B	1.1 Swivabiner dbl P54D SB B
ORIGIN					
COST (inc Tax) <i>Conversion-only</i>	£150 \$134 €162	£225 \$202 €263	£256 \$235 €223	£135 \$137 €150	£190 \$170 €220
WEIGHT	348g 12.3oz	591g 20.9oz	850g 29.9oz	140g 4.9oz	300g 10.5oz
MAX LOAD- WLL MBS	8 36kN 1798 8093lbf	10 40kN 0lbf	20 80kN 4496 17984lbf	5 23kN 1124 5170lbf	7 28kN 1573 6295lbf
MAX ROPE Ø	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"
SHEAVE/TREAD Ø	60/51mm 2.4/2"	2x 60/51mm 2x 2.4/2"	75/66mm 2.95/2.6"	36/28mm 1.4/1.1"	2x 36/28mm 2x 1.4/1.1"
DIMENSIONS ht x w x depth	148 x 76 x 32mm 5.8 x 3 x 1.3"	180 x 76 x 57mm 7 x 3 2.3"	191 x 92.5 x 42mm 7.5 x 3.6 x 1.6"	168 x 51 x 30mm 6.6 x 2 x 1.2"	195 x 51 x 53mm 7.7 x 2 x 2"
PRUSIK TEND LOCK BECKET					
BUSHING BEARING PIN					
CHEEKS - SWIVEL FIXED					
EFFICIENCY	>90%	>90%	>90%	>90%	>90%
CHEEK SHEAVE AXLE	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu	Alu Alu Alu
STANDARDS	CE	CE	CE	CE	CE
OTHER COLOURS			-	-	-
NOTES					
WEBSITE	rockexotica.com	rockexotica.com	rockexotica.com	rockexotica.com	rockexotica.com

Images NOT to Scale					
MANUFACTURER	ROCK EXOTICA	ROCK EXOTICA	SMC	SMC	SMC
MODEL VARIANT	Material Handling Omni 2.6 MHP55	Material Handling Omni 4.5 MHP58	Apex 1.1 165020	Apex 1.5 165120	Apex 1.5 dbl 165130
ORIGIN					
COST (inc Tax) <i>Conversion-only</i>	£207 \$250 €238	£392 \$475 €451	£82 \$99 €94	£87 \$105 €100	£140 \$169 €161
WEIGHT	850g 29.9oz	2.65kg 5.8lb	190g 6.7oz	306g 10.8oz	478g 16.9oz
MAX LOAD- WLL MBS	20 100kN 4500 22500lbf	26.6 133.4kN 6000 30000lbf	3 12kN 674 2697lbf	9.5 38kN 2135 8542lbf	9.5 38kN 2135 8542lbf
MAX ROPE Ø	9-13mm ¾-½"	9-19mm ¾-¾"	≤13mm ≤½"	≤13mm ≤½"	≤13mm ≤½"
SHEAVE/TREAD Ø	75/66mm 2.95/2.6"	114/95mm 4.5/3.75"	28mm 1.1"	38mm 1.5"	2x 38mm 2x 1.5"
DIMENSIONS ht x w x depth	191 x 92.5 x 37mm 7.5 x 3.6 x 1.5"	0 x 0mm 0 x 0"	121 x 59.4 x 29mm 4.75 x 2.3 x 1.13"	150 x 74 x 29mm 5.9 x 2.9 x 1.13"	171 x 74 x 58mm 6.7 x 2.9 x 2.3"
PRUSIK TEND LOCK BECKET					
BUSHING BEARING PIN					
CHEEKS - SWIVEL FIXED					
EFFICIENCY	>90%	>90%			
CHEEK SHEAVE AXLE	Alu Alu Alu	Alu Alu Alu	Alu Alu StSt	Alu Alu StSt	Alu Alu StSt
STANDARDS	ASME	ASME	CE NFPA UKCA	CE NFPA UKCA	CE NFPA UKCA
OTHER COLOURS	-	-	-	-	-
NOTES	non-human loads	non-human loads			
WEBSITE	rockexotica.com	rockexotica.com	smcgear.com	smcgear.com	smcgear.com



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UPDATED April '24

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IMPACT PULLEYS

aka **RIGGING BLOCKS &**

DISMANTLING PULLEYS



ABOVE Left to right- approximately to scale: DMM Large Impact Block, ISC 3/4" medium and 5/8" small and DMM XS Impact Block. Top right (NOT to scale) the DMM Small Impact Block. Note the no-low spindle on the DMM which is also seen in the Arbortec and TreeUp models. This is for 3D rigging allowing a rope to pass through and redirect or reposition the pulley in free space away from the trunk or to allow a clear route past an obstruction post-arrest. Interestingly, in the TreeUp models the full screw closure is slightly weaker, or perhaps we should say less-strong than their identical pulley with a sprung half turn closure similar to the blue and red ISC pulleys above. ISC's newest model is shown top-right as the series 200 RP248 - the smallest of 3 sizes in a sleek new design.

Seldom do we see such a diversity of names or category titles for one product as we do for these heavyweights. Are they blocks or pulleys and are they snatch, impact, rigging or just plain ol' arborist? We're going to go with 'IMPACT' as a true description for what sets them apart from regular pulleys and the term PULLEY because that too is a more accurate modern description. I bet we still intersperse this article with 'Block' out of habit and because even DMM still use the term. But 'Block' is really an archaic term from days of huge wooden ships with giant canvas sails that were so heavy they could only be raised with the mechanical advantage afforded by a set of 'blocks' These didn't necessarily have moving sheaves, they might just have had a shiny wooden bar over which the rope ran with somewhat less efficiency than it would over a moving wheel. Nevertheless, with rope running over a couple of sets of such 'blocks' replete with shiny wood or proper revolving wooden wheels there was mechanical advantage enough to make hauling far easier than it would have been with a single rope from hand to load. So, 'PULLEYS' it is. You'll normally find Impact Pulleys separated from 'Climbing' gear in the catalogues and instead listed under the 'Rigging' sections but this too is a little misleading because virtually any large pulley can be used for rigging in the true sense of attaching and securing stuff to stuff for the purposes of doing stuff. The term 'ARBORIST' is a fair one because it's arborists rather than any other rope access area that has driven development of this hardware genre and the remarkable DMM Arborist Rigging Blocks that turned them from ugly, cast lumps into works of art. This guide is for pulleys

that are specifically designed to have heavy lumps of wood dropped on them as a first line of arrest before being lowered to the ground, hence the term 'Impact'. It's this heavily abusive task that normally mandates that an impact pulley uses bushing

rather than bearings because although bearings are more efficient due to there being less surface contact they don't like shock loading because the steel ball-bearing or 'needles' are effectively point-loaded and rammed into the inner face of the bearing housing and each other during impact. Nevertheless, needle may trump ball-bearings for this particular task with their longer contact area. You can of course use any of the IMPACT PULLEYS for regular rigging tasks but not only are they generally bigger and heavier, they may not be quite as efficient for regular high-speed rope running tasks as bearing pulleys, that's if you can even tell the difference.

WHAT DOES IT DO?

There are no hard and fast rules as to how best to utilise an impact pulley, there are numerous anchorage options and configurations and it is always best to minimise shock load by rigging

above the cut so that the load can be tensioned and initially held rather than dropped. However, with no other options, the worst case scenario, in terms of highest loads is 'negative blocking/rigging' where the section being cut falls onto an anchor rigged below the cut-line, in climbing terms virtually a factor 2 fall. Current consensus is to anchor the impact pulley (or pulleys if using twin lowering), just below the intended cut using a large diameter anchor rope with a spliced eye, often called a 'dead-eye' sling but generically a topping or anchor strop because some are webbing. The eye is looped over the top anchor spindle/bollard on the pulley and then wrapped around the target tree in a tensionless or releasable hitch. The lowering rope runs through an anchored lowering device or deviation at the base of the tree, runs up to and through the impact pulley and is then tied to the section or branch to be dropped ensuring that it doesn't interfere with your intended cutting path and doesn't subsequently deflect towards the climber's feet/legs when it arrests the load. This is where a good ground crew will arrest with a degree of dynamic absorbency and downwards movement of the load to mitigate the shock loading at the top which can be severe enough to shake the climber off his stance. The arresting/ lowering rope has to be tough, it has to be low stretch rather than dynamic which may be too elastic to arrest within an acceptable distance but with enough stretch to happily absorb the impact without having the characteristic of a wire cable. Rigging regs suggest the topping or anchor strop that attaches to the top spindle should be twice the capacity of the

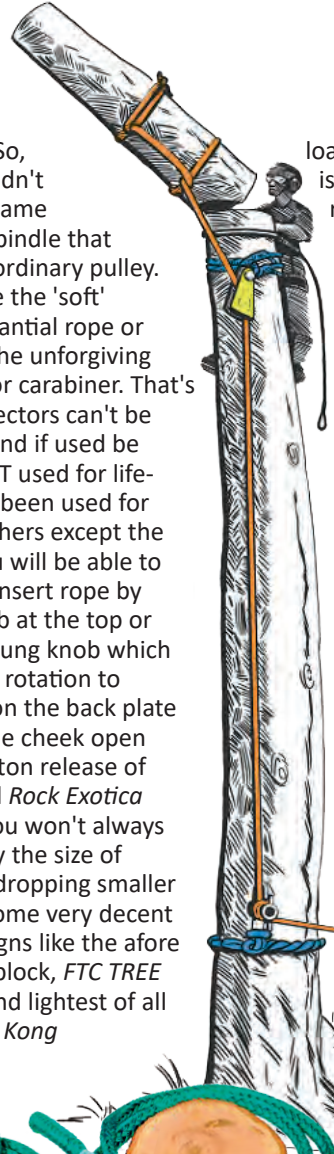


main rigging rope. So, if the sheer bulk hadn't already given the game away it's this top spindle that tells you this is no ordinary pulley. It's designed to take the 'soft' anchorage of a substantial rope or a sling in preference to the unforgiving fixed curves of a shackle or carabiner. That's not to say that hard connectors can't be used but it is best not to and if used be sure your connector is NOT used for life-support activity once it's been used for impact-rigging. For all others except the *Straightpoint* model, you will be able to open the side cheeks to insert rope by either unscrewing the knob at the top or some, like *ISC*, have a sprung knob which you turn a quarter or half rotation to release from a 'keyhole' on the back plate and then simply swivel the cheek open or there's the push-button release of the *ArbPro*, *Kong* and *Rock Exotica* models. Of course you won't always need to have a pulley the size of walrus if you're only dropping smaller sections so there are some very decent smaller and/or lighter designs like the aforementioned *OxBlock*, the *ISC Mini* block, *FTC TREE Mini Eclipse 2*, *ArbPro/CT Grizzly* and lightest of all the *CMI Mini Arborist Block*. Neither the *Kong Alby* or the *OxBlock* is a true impact pulley but they can handle light loads.

NON-ARBORIST BLOCKS

There are many 'Impact Blocks' sold for use with 4-WD vehicles and they look pretty tough but the nature of their construction with steel sheaves for use with wire rope and steel cheeks isn't very forgiving on the rest of your gear. One of the off-road pulleys is called an *ARB 9000* but it doesn't mean 'arborist', it's the name is derived from the owners initials. In truth, many of these would probably do the job you want but is 'probably' good enough? Go for the blocks in this Guide that are marketed specifically to arborists and you won't go far wrong.

ISC produce a **shear reduction pulley (SHP)** (below) which we haven't included in this Guide since it's not intended for the arborist market but you may want to know more about it because there ARE situations where this might be handy. It has all the appearance of a regular stainless steel cheek impact block. That's not a slip of the tongue, this actually is 'block' because the sheave is fixed and if it doesn't rotate it's certainly not a 'pulley'. The idea is to impart friction rather than minimise it as a pulley does so you can see where this might actually be applicable to a dynamic arrest situation? It's not unlike the *Notch AFB* (far right) in this regard but minus the extra-wrap options. However, the *AFB* is NOT designed for negative rigging impact



loads. Back to the *SHP* and its top bobbin is designed to take a long *Maillon Rapide* rather than a rope so is narrower in diameter than those on normal impact pulleys. More recently we have seen the introduction of *Rock Exotica's Downrigger* (right) which is a cross between an impact block and a swivel pulley with a one-way sheave for increased friction on lowering. We will have a separate guide for this type of shear reduction device because, thanks to *ISC* there are quite a few. This is not an impact block for large timber sections with only 300lbs of working load to work with but it will function nicely for smaller sections and branches.

CONSTRUCTION

CAST VERSUS FORGED.

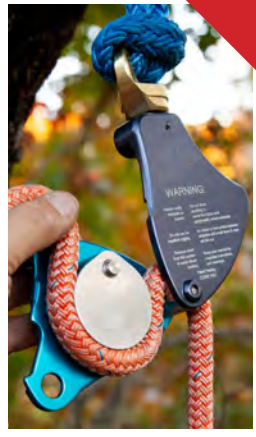
Originally, impact blocks were cast, a process where molten metal is poured into a mould. This has subsequently been largely replaced by hot and cold forging where, in the case of hot-forging, the metal is heated and then beaten into submission in the required shape, often with strategic placement of metal pushed into reinforced areas



that need it most. You can tell the forged models, as exemplified by *DMM* blocks, by their exceptionally smooth curves as this comparison of a cast and forged version of the same *ISC* pulley (above) shows. Forging is stronger and more forgiving than more 'brittle' casting. The edges of forged pulleys are a decent thickness and nicely rounded so they're very rope-friendly and in an impact you don't have to worry so much if your rope comes off-line.

PLATE - on the other hand has relatively sharp edges so you need to be careful that the rope feeds in and out properly and doesn't cross the plate. These are much easier and cheaper to produce than forged and they're plenty strong enough but they're again not as forgiving as forged models. They're not 'sharp' in the knife-edge sense but being hard and thin and maybe with some burrs if they're not looked after properly they can seem that way to a rope impacting the edge at several hundred pounds/kilos of force. The *Kong Alby* (top left) and *ISC SHP* (left) and *Flame* pulley on the next page are examples of plate construction.

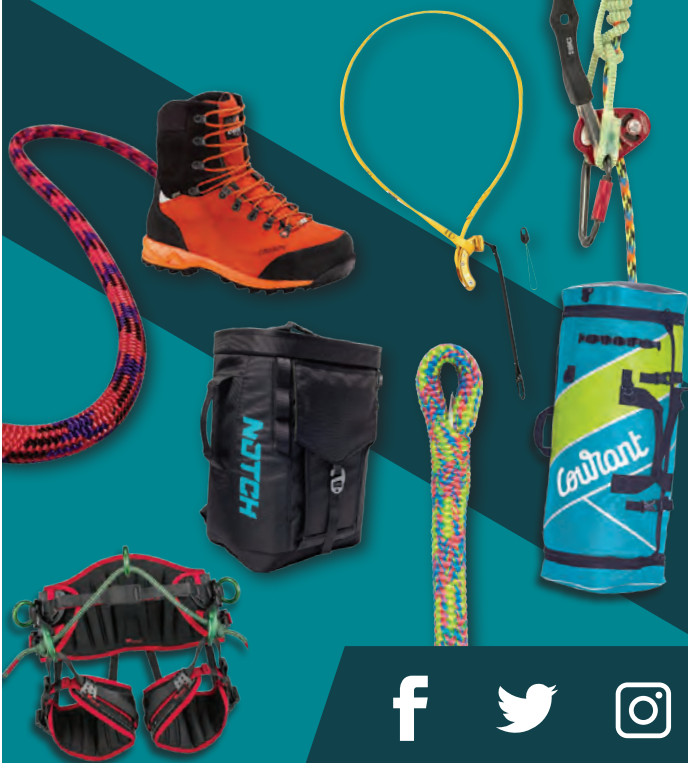
MILLED produces the strongest metal per ounce because it is a single, solid block that has bits shaved and drilled and milled off of it until you're left with the desired shape. In fact it's not necessarily stronger because heat treating strengthens metals but there are less likely to be imperfections in such a process which is often undertaken by a robotic process that should be exactly the same each time. *Rock Exotica* are the masters of milled products and we originally had one of their



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material-handling pulleys listed together with *Buckingham's OxBlock* which they also make (see next paragraph) but, like the new *R.E. Downrigger*, with a swivel rather than rigid bollard as the anchor point, these sail too close to the wind for the kind of abuse meted out in impact loading, so the two RE 'material-handling' models (right) and *Downrigger* and other sheer reduction pulleys will get their own guide and in the meantime are included in the **Swivel Pulley Guide** on page 86.



ISC has a colour coding for their various sheaves and anchor bollards - all anchors are red and sheaves are: Grey for 1/2", Orange for 5/8", Green for 3/4". Not entirely sure why they didn't simply colour-code the main side cheeks for the rope size instead of just the sheaves so that any Blue ISC pulley is for half inch, any red is for 7/16"/11mm etc? Currently a Blue ISC pulley could be a 3/4" or a 5/8" until or unless you notice whether it's a green or orange sheave. These multi-coloured *Arbortec/TreeUp* pulleys (top-right) aren't colour-coded for size or strength either, they're just prettier.

SOMETHING DIFFERENT

We mentioned the *Rock Exotica*-made *OxBlock* from *Buckingham* and the more delicate nature of a swivel for impact loading but this is also available with a shackle so we have included it. It is described as by *Buckingham* as a 'snatch-block' replacement with additional friction so will inevitably be used for impact loads but is not really designed for dynamic loading so make sure you stay below 2250 lb of force. It has ball bearings which is generally an indicator for lower impact loading. The idea of the extended shape is to wrap the trail rope around the spine of the carabiner-looking section at the bottom.



The name '*OxBlock*' stands out as one of only three named devices in our entire list. And we do like names rather than numbers and codes. First prize goes to *Climbing Technology* for their *Grizzly*, a name so good I might buy one just because it's called '*Grizzly*'. ISC has the aptly named *Flame* although we're hoping it just refers to the appearance of the holes in the cheeks and not an indication of the state of your rope after using the pulley. The other one is *Kong's Alby* which I'm not so sure about because I have an Uncle called *Alby* and I don't like to think of dropping huge lumps of wood on his face but we still salute the use of a name and not a code.

Talking of ISC's *Flame* (left) this is one you also see a variant of rebadged for *Stein*. It's a stainless steel plate construction but it has had a series of 'flame'-shaped cut outs which reduces weight and may inadvertently aid cooling - or maybe that was part of the cunning plan all along. *Climbing Technology* is now owned and rebranded by *Skylotec* so it's now the *Skylotec CT's Grizzly*. This and *ArbPro's AP-RB01* has a few strategically placed holes as well and one of those even acts as a second stage release for the push-button opening.





StraightPoint in conjunction with *DMM* produce perhaps the most useful 'odddity' with an 80KN impact pulley with built-in load cell monitor (right) that sends data to your phone or other wi-fi device. What could be more useful in such high-stress loading with all the implications of rope and equipment

damage than knowing what you've actually dropped. It's often the case that the first chunk is your indicator for everything that follows because you've had a sighter of the approximate load per foot but this device gives you an exact figure, time after time so that pretty soon you and your crew will become the world's top experts at predicting wood weight. What's more, just to add to this extra safety, the readings can be taken from a range of 700m/2300ft so you can stand at a very safe distance if you don't trust your climber's rigging skills. The only necessary drawback with this design is that the cheeks are fixed so rope has to be fed through and it's large and costs quite a lot. So much so that it's like a state secret but worth it if you can afford it.

IN THE FOLLOWING TABLES:

£\$€ prices in burnt orange are a currency conversion only (no tax/duty/shipping)

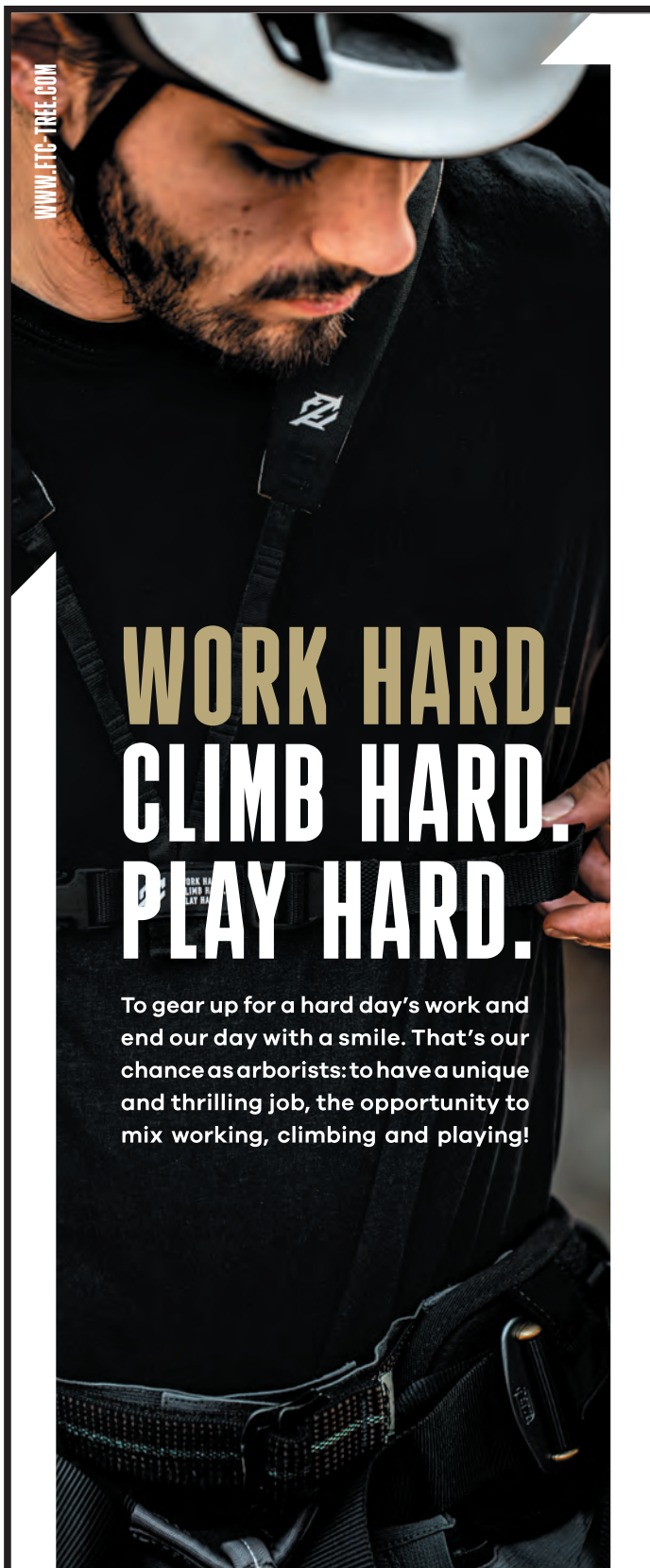
Needle bearings have a solid black box ■ in the BEARING column, ball-bearings have an outline box □.

Some of the 'depth/thickness' figures may or may not include the release button. Despite the obvious bulk of some release knobs some give depth as just the body of the pulley!

We've converted all **MBS** figures to force instead of mass - KiloNewtons and Lb Force to indicate the absolute maximum impact force that can (or can't) be sustained and switched all Working Load Limit figures to mass in Kg and lbs to give a better indication of the physical maximum weight of your lump of wood before you inflict it on the impact pulley given that there is some leeway with 7:1 up to 10:1 safety ratio to allow for the conversion back to force which would be a little higher than the figure we've shown for WLL mass. CMI give their own WLL mass but we've converted their original MBS mass to force.

In the **STANDARDS** column the CE generally refers to the Machinery Directive which is NOT applicable to PPE. At the risk of stating the obvious, don't forget that the **WLL Working Load Limit** on the main sheave is the cumulative total of load on *each* side of the rope as it enters and exits the sheave.

TOP ANCHOR WIDTH is the distance between side plates so is the physical width that a rope or webbing can fit into. **TOP SHEAVE DIAMETER** refers to the top bollard or sheave and is the 'height' rather than the previous width.











































WWW.FTC-TREE.COM

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CLIMB HARD.
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Images NOT to Scale							
MANUFACTURER		ARBORTEC	ARBORTEC	ARBPRO	BUCKINGHAM	CMI	CMI
MODEL VARIANT		Treehog TH2040	Treehog TH2050	AP-RB01 -	OxBlock PM5062(clevis)	Mini Arb Block RP162	Small Arb B RP160
ORIGIN							
COST		£190 \$236 €220	£190 \$236 €220	£131 \$162 €151	£600 \$745 €695	£137 \$169 €158	£198 \$358 €
WEIGHT		1.36kg 2.86lb	1.4kg 3lb	880g 1.94lb	1.4kg 2.86lb	450g 1lb	1.3kg 2.95lb
MBS of Pulley		100kN 22,481lbf	100kN 22,481lbf	80kN 17,985lbf	44kN 10,000lb	97kN 21,900lbf	227kN 51,000lb
WLL		2039kg 4496lb	2039kg 4496lb	1600kg 3527lb	1100kg 2425lb	1422kg 3128lb	3312kg 7286 lb
MAX ROPE Ø		18mm <3/4"	18mm <3/4"	15mm 9/16"	16mm 5/8"	12.7mm 1/2"	19mm 3/4"
TOP ANCHOR WIDTH		18mm <3/4"	18mm <3/4"	20mm 3/4"	22mm 0.9"	22mm 0.9"	28mm 1 1/8"
HEIGHT		175mm / 6.9"	175mm / 6.9"	185mm / 7.3"	260mm / 10.2"	102mm / 4"	140mm / 5.5"
WIDTH		105mm / 4.1"	105mm / 4.1"	95mm / 3.7"	65mm / 2.6"	57mm / 2.25"	76mm / 3"
DEPTH		50mm / 2"	50mm / 2"	35mm / 1.4"	50mm / 2"	45mm / 1.75"	70mm / 2.75"
CHEEK MATERIAL		Alu	Alu	Alu	Alu	Stainless Steel	Alu
SHEAVE MATERIAL		Alu	Alu	Alu	Alu	Nylon	Nylon
AXLE MATERIAL		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
CONSTRUCTION		Forged	Forged	Plate	Milled	Milled	Milled
BEARING/BUSHING							
BUTTON		-	-			-	-
SPRUNG		-	-			-	
SCREW				-	-		-
STANDARDS		ANSI CE	ANSI CE	-	CE	-	-
OTHER CHEEK COLOURS				-		-	-
TOP SHEAVE COLOUR					-		
MAIN SHEAVE COLOUR							
NOTES		Solid spindle/axle. 30kg lanyard eye. Sprung, half-turn cheek release. Full-turn screw cheek release	20mm spindle hole. 30kg lanyard eye. Sprung, half-turn cheek release. Full-turn screw cheek release	LIGHT IMPACT LOADS ONLY Gold anchor eye	LIGHT IMPACT LOADS ONLY Carb spine=Friction post. . Spec for CLEVIS version - Swivel eye option	Voluntary Safety Recall Sept'23 - see CMI Website	Voluntary Safety Recall Sept'23 - see CMI Website
WEBSITE		treehog.com	treehog.com	arbpro.com	buckinghammfg.com	cmigearusa.com	cmigearusa.com













SPECIFICATIONS

CHEEK RELEASE

NOTES: **COST:** Approx & inc local tax/VAT **£€€** prices in burnt orange are a currency conversion only (no tax/duty/shipping) **HYPHEN-**

							expansion column
	CMI	CMI	CMI	CMI	DMM	DMM	
Block	5/8" Rig Block RP130	3/4" Rig Block RP131	3/4" Rig Block RP145	1" Rig Block RP146	XS Arb Impact P201	S Arb Impact P201	
Price	£229	£279	£134	£401	£330	£290	
	\$218	\$345	\$166	\$497	\$450	\$400	
	€205	€322	€155	€464	€399	€339	
Weight	1.04kg 2.3lb	2.5kg 5.6lb	1.66kg 3.65lb	2.3kg 6.6lb	0.78kg 1.72lb	1.86kg 4.1lb	
Strength	125kN 28000 lbf	178kN 40,000lbf	125kN 28,000lb	302kN 68,000lbf	100kN 22,480lbf	200kN 44,961lbf	
	1818kg 4000 lb	2597kg 5714lb	1818kg 4000lb	6169kg 13600lb	2039kg 4496lb	4078kg 8992lb	
Top Thimble	16mm 5/8"	19mm 3/4"	19mm 3/4"	25mm 1"	16mm 5/8"	16mm 5/8"	
Bottom Thimble	19mm 3/4"	25mm 1"	25mm 1"	28mm 1 1/8"	20mm 3/4"	22mm 0.9"	
Top Width	165mm / 6.5"	178mm / 7"	165mm / 6.5"	235mm / 9.25"	137mm / 5.4"	180mm / 7"	
Bottom Width	102mm / 4"	127mm / 5"	102mm / 4"	152mm / 6"	82mm / 3.3"	100mm / 4"	
Eye Width	45mm / 1.75"	63mm / 2.5"	63mm / 2.5"	76mm / 3"	55mm / 2.2"	80mm / 3.15"	
Material	Alu Alu Stainless Steel Plate	Alu Alu Stainless Steel Plate	Alu Alu Stainless Steel Plate	Alu Alu Stainless Steel Plate	Alu Alu Stainless Steel Milled	Alu Alu Stainless Steel Hot Forged	
	■	■	■	■	■	■	
	-	-	-	-	-	-	
	-	-	-	-	-	-	
	■	■	■	□	■	■	
					CE	CE	
	■	■	■	■	■	■	
	■	■	■	■	■	■	
Safety				cotter-pin locking closure	10mm Hollow spindle/ axle	Solid spindle/axle	
Website	cmigearusa.com	cmigearusa.com	cmigearusa.com	cmigearusa.com	dmmwales.com	dmmwales.com	

- not applicable N/A = info Not Available/not given, MAX ANCHOR WIDTH is the max rope or webbing you can fit on the top thimble

Images NOT to Scale							
MANUFACTURER		DMM	FTC TREE	FTC TREE	ISC	ISC	ISC
MODEL VARIANT		L Arb Impact	Mlni Eclipses 2	Eclipse 3	1/2" Compact/Mini Block RP048	1/2" Rig Block RP051	5/8" Small Block RP162
ORIGIN							
COST		£450 \$650 €569	£139 \$172 €160	£184 \$228 €212	£105 \$201 €149	£168 \$220 €199	£168 \$220 €162
WEIGHT		3.47kg 7.6lb	650g 1.43lb	1.04kg 2.3lb	490g 1.08lb	1.54kg 3.4lb	1.49kg 3.3lb
MBS of Pulley		300kN 67,443 lbf	100kN 22,480 lbf	150kN 33,721lbf	85kN 18,000 lbf	100kN 22,480lbf	100kN 22,480lbf
WLL		6118kg 13488lb	2039kg 4496lb	3059kg 6744lb	1700kg 3748lb	2039kg 4496lb	2039kg 4496lb
MAX ROPE Ø		20mm ¾"	16mm ⅝"	18mm <¾"	13mm ½"	13mm ½"	16mm ⅝"
TOP ANCHOR WIDTH		27mm 1.06"	24mm <1"	26mm 1"	16mm ⅝"	19mm ¾"	25mm 1"
HEIGHT		225mm / 8.85"	189mm / 7.4"	189mm / 7.4"	125mm / 4.9"	190mm / 7.5"	190mm / 7.5"
WIDTH		120mm / 4.7"	65mm / 2.6"	93mm / 3.7"	76mm / 3"	99mm / 3.9"	99mm / 3.9"
DEPTH		97mm / 3.82"	65mm / 2.6"	65mm / 2.6"	75mm / 3"	108mm / 4.25"	108mm / 4.25"
CHEEK MATERIAL		Alu	Alu	Alu	Alu	Alu	Stainless S
SHEAVE MATERIAL		Alu	Alu	Alu	Alu	Alu	Nylon
AXLE MATERIAL		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless S
CONSTRUCTION		Hot Forged	Plate	Plate	Forged	Forged	Forged*
BEARING/BUSHING		■	■	■	■	■	■
BUTTON		-	-	-	-	-	-
SPRUNG		-	-	-	■	■	■
SCREW		■	■	■	-	-	-
STANDARDS		ANSI CE	CE	CE	CE	CE	CE
OTHER CHEEK COLOURS					■		
TOP SHEAVE COLOUR		■	■	■	■	■	■
MAIN SHEAVE COLOUR		■	■	■	■	■	■
NOTES		Hollow spindle/axle	Dyneema lanyard to prevent locking pin loss	Dyneema lanyard to prevent locking pin loss	Red Anchor bollard Phasing out		*Older version cast
WEBSITE		dmmwales.com	ftc-tree.com	ftc-tree.com	iscwales.com	iscwales.com	iscwales.com



SPECIFICATIONS

CHEEK RELEASE

NOTES: **COST:** Approx & inc local tax/VAT £\$€ prices in burnt orange are a currency conversion only (no tax/duty/shipping) **HYPHEN-**

							
	ISC	ISC	ISC	ISC	ISC	ISC	ISC
Rig	5/8" Med Rig Block RP054	5/8" Flame RP056	3/4" Med Rig Block RP055	3/4" Large Rig Block RP057	200-Series Compact RP248	200-Series Small RP251	200-Series Med R255
							
£198	£202 \$250 €233	£132 \$171 €162	£153 \$270 €244	£198 \$300 €280	£175 \$240 €205	£210 \$300 €249	£240 \$340 €282
	2.16kg 4.75lb	1.64kg 3.6lb	2.3kg 5.1lb	2.3kg 5.1lb	0.61kg 1.3lb	2.3kg 5.1lb	2.7kg 5.9lb
bf	150kN 33,721lbf	100kN 22,480lbf	150kN 33,721lbf	200kN 44,962lbf	100kN 22,480lbf	250kN 67,422lbf	300kN 67,443lbf
	3312kg 7286 lb	2039kg 4496lb	3059kg 6744lb	4078kg 8992lb	2039kg 4496lb	5099kg 11240lb	6118kg 13488lb
	16mm 5/8"	16mm 5/8"	19mm 3/4"	19mm 3/4"	14mm 9/16"	16mm 5/8"	20mm 3/4"
	25mm 1"	25mm 1"	29mm 1.25"	29mm 1.25"	16mm 5/8"	25mm 1"	
5"	230mm / 9"	182mm / 7.2"	230mm / 9"	300mm / 11.8"	125mm / 4.9"	178mm / 7"	222mm / 8.7"
9"	124mm / 4.9"	99mm / 3.9"	124mm / 4.9"	158mm / 6.2"	69mm / 2.7"	99mm / 4"	123mm / 4.8"
25"	108mm / 4.25"	57mm / 2.25"	108mm / 4.25"	*108mm / 4.25"	65mm / 2.6"	93mm / 3.7"	93mm / 3.7"
steel	Alu Nylon Stainless Steel Forged*	Alu Alu Stainless Steel Plate	Alu Alu Stainless Steel Forged	Alu Alu Stainless Steel Cast	Alu Alu Stainless Steel Hot Forged	Alu Alu Stainless Steel Hot Forged	Alu Alu Stainless Steel Hot Forged
	■	■	■	■	■	■	■
	-	-	-	-	■	■	■
	■	-	■	■	■	■	■
	-	■	-	-	-	-	-
	CE	CE	CE	CE	CE UKCA	CE UKCA	CE UKCA
						■	■
	■	■	■	■	■	■	■
	■	■	■	■	■	■	■
ns are	*Older versions are cast		*Older versions are cast	*Depth exc sprung release.			
om	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com	iscwales.com

= not applicable N/A = info Not Available/not given, MAX ANCHOR WIDTH is the max rope or webbing you can fit on the top thimble

Images NOT to Scale							
MANUFACTURER	ISC	KONG	NOTCH	NOTCH	NOTCH	SKYLOTEC	
MODEL VARIANT	200-Series Large RP257	Alby	1/2" Block	5/8" Block	3/4" Block	CT Grizzly H279	
ORIGIN							
COST	£444 \$560 €513	£134 \$170 €100	£0 \$160 €0	£0 \$220 €0	£217 \$250 €0	£160 - €110	
WEIGHT	5kg 11lb	1.15kg 3.05lb	0.45kg 1lb	1.4kg 3.1lb	1.55kg 3.49lb	914g 2lb	
MBS of Pulley	380kN 85,257lbf	50kN 11,240lbf	100kN 22481lbf	125kN 28101lbf	150kN 33,720 lbf	80kN 17,985lbf	
WLL	7600kg 17085lb	700kg* 1543lb*	2039kg 4496lb	2549kg 5620lb	3059kg 6744lb	1600kg 3527lbf	
MAX ROPE Ø main sheave	26mm 1"	26mm 1"	13mm ½"	16mm ⅝"	19mm ¾"	15mm ⅝"	
TOP ANCHOR WIDTH	32mm 1¼"	28mm 1.1"	16mm ⅝"	25mm 1"	29mm 1⅝"	20mm ¾"	
HEIGHT	283mm / 11.1"	236mm / 9.25"	118mm / 4.7"	158mm / 6.2"	176mm / 7"	185mm / 7.3"	
WIDTH	156mm / 6.15"	124mm / 5"	68mm / 2.7"	87mm / 3.4"	101mm / 4"	95mm / 3.7"	
DEPTH	95mm / 3.7"	38.5mm / 1.5"	*62mm / 2.4"	*74mm / 3"	*78mm / 3"	35mm / 1.4"	
CHEEK MATERIAL	Alu	Alu	Alu	Alu	Alu	Alu	
SHEAVE MATERIAL	Alu	Alu	Alu	Alu	Alu	Alu	
AXLE MATERIAL	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	
CONSTRUCTION	Hot Forged	Plate	Hot Forged	Hot Forged	Hot Forged	Plate	
CHEEK RELEASE							
BEARING/BUSHING	■	■	■	■	■	■	
BUTTON	-	-	-	-	-	■	
SPRUNG	-	-	-	■	■	■	
SCREW	■	■	■	-	-	-	
STANDARDS	CE UKCA		CE	CE	CE		
OTHER CHEEK COLOURS							
TOP SHEAVE COLOUR							
MAIN SHEAVE COLOUR							
NOTES	Hollow spindle/axle	LIGHT IMPACT LOADS ONLY Older version is red.	Dyneema lanyard to prevent locking pin loss. *exc bolt head of approx 0.6"	Red Anchor bollard Phasing out. *exc bolt head of approx 0.6"	*exc bolt head of approx 0.6"	LIGHT IMPACT LOADS ONLY Not available in	
WEBSITE	iscwales.com	kong.it	notchequipment.com	notchequipment.com	notchequipment.com	skylotec.com	

NOTES: **COST:** Approx & inc local tax/VAT £€ prices in burnt orange are a currency conversion only (no tax/duty/shipping) **HYPHEN-**

							expansion column
C	STEIN	STRAIGHTPOINT	TREEUP (PROTEKT)	TREEUP (PROTEKT)	TREEUP (PROTEKT)	TREEUP (PROTEKT)	
y	SS-1H6056	LOAD CELL Impact Block RP054	Small TU400 TU401	Small TU402 TU403	Large TU404 TU405	Large TU406 TU407	
							
32	£144 \$179 €165	£3600 > \$5000 €4163	£116 \$0 €132	£0 \$150 €0	£168 \$220 €192	£168 \$220 €192	
	1.55kg 3.49lb	6kg 13.2lb	1.36kg 2.86lb	1.4kg 3lb	2.3kg 5lb	2.5kg 5.5 lb	
	100kN 22480lbf	60kN 13,488 lbf	100kN 22,481 lbf	100kN 22,481 lbf	100/125kN 22481/28101lbf	100/125kN 22481/28101lbf	
	2039kg 4496lb	1224kg 2698 lb	2039kg 4496lb	2039kg 4496lb	2039/2549kg 4496/5620 lb	2039/2549kg 4496/5620 lb	
	16mm ¾"	20mm ¾"	18mm <¾"	18mm <¾"	<30mm <1.2"	<30mm <1.2"	
	25mm 1"	20mm ¾"	18mm <¾"	18mm <¾"	<30mm <1.2"	<30mm <1.2"	
3"	182mm / 7.1"	348mm / 13.7"	176mm / 6.9"	176mm / 6.9"	238mm / 9.4"	238mm / 9.4"	
"	100mm / 3.9"	131mm / 5.16"	96mm / 4.1"	96mm / 4.1"	85mm / 3.4"	85mm / 3.4"	
"	37mm / 1.45"	89mm / 3.5"	81mm / 3.46"	81mm / 3.46"	115mm / 4.5"	115mm / 4.5"	
eel	Alu Alu Stainless Steel Plate	Alu StSteel Stainless Steel Milled	Alu Alu Stainless Steel Forged	Alu Alu Stainless Steel Forged	Alu Alu Stainless Steel Forged	Alu Alu Stainless Steel Forged	
	■	■	■	■	■	■	
	-	-	-	-	-	■	
	■	■	-	■	■	■	
	-	-	■	-	-	-	
	CE	CE	CE	CE	CE	CE	
			■ ■	■ ■	■ ■	■ ■	
	■	■	■	■	■	■	
	■	■	■	■	■	■	
LOADS	Discontinued as STEIN but still available	Made by DMM. Integral wireless load cell monitor. Top screw-bolt to allow anchor sling attachment	20mm Hollow with option of half-turn or full unscrew release (401/403) Sold in the US as ESA	20mm Hollow with option of half-turn or full unscrew release (401/403) Sold in the US as ESA	30mm Hollow with option of half-turn or full unscrew release (405).	Solid spindle each with option of half-turn or full unscrew release (407).	
USA							
om	steinworldwide.com	straightpoint.com	protekt.pl	protekt.pl	protekt.pl	protekt.pl	

- = not applicable N/A = info Not Available/not given, MAX ANCHOR WIDTH is the max rope or webbing you can fit on the top thimble

NON-HANDLED ASCENDERS & LEVER CAMS

**CHEST ASCENDERS
HAND ASCENDERS
ROPE GRABS
EMERGENCY ASCENDERS**

Last time we thanked Mountaineers for the handled ascenders but the chest ascender in the form of *Petzl's Croll* and the rope grab or lever-cam ascender in the form of the *Gibbs* are firmly back in the cavers' camp having first appeared as manufactured products in the 60s and 70s. We'll cover lever-cams on page 120 as a separate development because they are rarely used as rope climbing ascenders by arborists and instead used in secondary systems and for hauling. It must be clearly stated at the outset, that we consider ANY toothed cam ascender, which is necessarily aggressive in order to grip even a wet or icy rope during ascending, to be best used ONLY for ascending/rope climbing. That's why the second part of this guide has *rope grabs* like the *Petzl Rescuender*(2) and *CMC Ascender*(7) and with a range of uses while these hand and chest ascenders don't. The risk of imparting shock load or much higher loads than you might intend when using them as a back up or a haul-cam is great and potentially catastrophic. This can even be the case in something as seemingly benign as a flip-line because you could slip and fall onto it but this is admittedly unlikely to do much more than damage the sheath. Nevertheless, a more forgiving smooth or ribbed cam wouldn't and is a better choice. This does not alter the fact that with good management you could easily use most of these devices and especially the six 'emergency' ascenders we've included for all of the uses shown in the rope grab/lever cam guide. But we wouldn't want to recommend ANY of those other uses in this first part - it's up to you to decide if you're OK to use toothed cams as lanyard adjusters or haul cams etc. When you ascend you regularly generate 2kN of load simply because of the 'bounce' and dynamic activity of moving so it wouldn't take much of a harsh sit-back to start pushing 4 or 5kN. If you can generate such forces in ascending, anything more in activities that can or do accumulate extra force is likely to be too close for comfort so why take the chance? Ascenders for ascending because they grip all kinds of rope in all kinds of conditions and rope grabs with their more rope-friendly cams for all the other jobs (including ascending in most cases!).

Petzl Croll 1975



Petzl Croll Lg 2023



Clog 1960s



(Clog)/ISC RP229 2023



Clog/Wild Country 2023

Gibbs 1965



Gibbs 2023

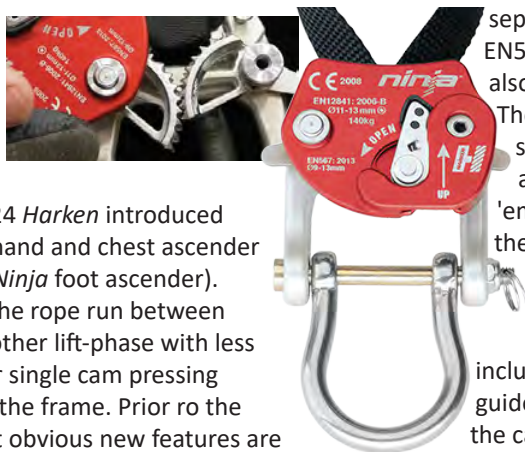


HISTORY

While the most basic of hand ascenders existed from the 60's, in the form of devices like Denny Moorehouse's 'Clogger' hand ascender, *Petzl's* first entry into the rope ascender market wasn't until 1975 with *Croll* chest ascender. This was a direct evolution of the mountaineering Jumar rather than handle-less *Clogger* and was intended, by inventor Dressler, to be specifically for use in caving. Fernand Petzl had been one of the world's leading cavers since the 30's and was already producing kit like caving ladders, mountaineering bivi platforms and of course his revolutionary electric headlamps, but it was actually other luminaries of the 60's like Moorhouse, Dressler, Jusi and Marbach who came up with ascender and descender designs which Fernand Petzl was able to refine and bring to production before beginning his own prolific rope hardware inventing. The *Croll* was designed to sit flatter against the chest, with a top eye that angles backwards and a bottom eye that extends around the curve of the channel to allow the harness carabiner to sit flat. Chest ascenders are connected between the sit harness and chest harness so as to limit rotation during ascent and therefore be more efficient for climbing. It was a design quickly taken up by the *Kong Cam Clean* (1) and these two models remain largely unchanged in design to this day. The silver *Croll* opposite from Doc Storrick's collection is one of the earliest, probably from 1975/76 because it has the F. PETZL stamp rather than simply PETZL but you can see from the modern *Kong Cam Clean* (1) from 2023 and a plethora of similar models in these tables, that the traditional design of the *Croll* is still a market leader. Incidentally, *ISC* went away from the *Clog*-style ascender and instead concentrate on lever-cam rope grabs. As a sign of the times, the red model shown opposite is not actually made by *ISC*.

MODERN DESIGN

That's not to say there haven't been developments and improvements in cam design and safety. In 2024 *Harken* introduced their *Ninja* double cam hand and chest ascender (a modification of their *Ninja* foot ascender). *Harken* say that having the rope run between two cams means a smoother lift-phase with less resistance than a regular single cam pressing against a flat surface on the frame. Prior to the *Ninja*, perhaps the most obvious new features are *CAMP's* rollers on their *Turbo-Chest* (3 -of which more later), and the incorporation of a swivel-eye in the Czech, *Rock Empire Chest Up* (4) and *Skylotec's Get Up* (5). *Skylotec's* is a 180° integral shackle bolted to the frame while *Rock Empire's* is a 360° swivel incorporated 'within' the frame with the addition of a bolt-on retainer. It will be interesting to see how this stands up to prolonged wear. All four of these models and a few others also exhibit the modern trend towards a 'tab' on the safety cam to enable easier manipulation of the cam for large or gloved hands. If you're looking for something different, these and *Kong's Futura Body* (9) with it's diminutive size and angled



and twisted bottom eye along with *Beal/Edelweiss's Hold-Up/B16* (6) with their extraneous eye or the similarly extruded *Kalias Chest-Up* model might be worth a look. What's with the preponderance of 'Up'-named models these days?

EXCLUSIONS

We have NOT included in this Guide, Fall arresters like the *Rockers, UAscend, CAMP Lift* etc. even though they will function well as an ascender because we have to draw the line somewhere and, in reality, we were to include ALL devices that can function as an ascender that would include all cam descenders and hybrids! We have also not included the larger dedicated Progress Capture Devices like the *Petzl ProTraxion* or *SMC Advanced HX*, but we have included smaller 'emergency' ascenders which include smaller PCDs like the *Kong Duck* (8), *Edelrid Spoc* and *CT RollINLock*. The *Petzl 'Traxion'* family and all other Progress Capture Pulleys have a separate guide and all meet EN567 as an ascender (while also functioning as a pulley). The *Wild Country Ropeman* style mini ascenders are all considered to be 'emergency' ascenders but they do function well across a variety of tasks. The ultimate emergency ascenders, the *Petzl Tibloc* and *Skylotec Ringo* are included in the second part of this guide because they load directly through the cam rather than the frame. We haven't included the heavy-duty fall-arrest 'grabs' like the original *Altochute* or *Stickrun*. These are intended to run up AND down even though they are superficially very similar to lever cam ascenders like the *Gibbs* and *Rescuecender*. Where there's any doubt we've simply gone for those aimed at climbers rather than industry.



If we leave out the *CAMP TURBO CHEST* for now, the difference between a *CHEST* and *HAND/BASIC* ascender is pretty much just the orientation of the

UPDATED March '24

attachment eyes which extend 'around-the-corner' on the chest versions to enable it to sit flat on the chest. But there can be other subtle differences. The two *Petzl* models here show this well - the Hand or Basic ascender on the left is designed to be grasped in the palm of the hand and has a 'comfort' grip on the shoulder. The *Croll* on right is *Petzl's* smaller model with a reinforced cam-enclosure to improve wear. [NB: an early report from Italian and UK cavers indicating that the reinforcement wear could cause rope damage was investigated and dealt with- see Emag#28]. The cam safeties are different because the hand is in a different position on each during use. Both clip onto the frame out of way during rope installation (CAM-PARK in our tables). The new crop of swivel versions mentioned earlier are labelled as 'chest' ascenders by the manufacturer but can easily be used for all of the same purposes as hand/basic ascenders bearing in mind the reservations we expressed earlier about overloading toothed cams:

- Progress Capture in haul systems
- Lanyard/Flip line/Rope length adjusters
- Top Ascender
- Self Belay/Fall Arrest (maybe but beware!)

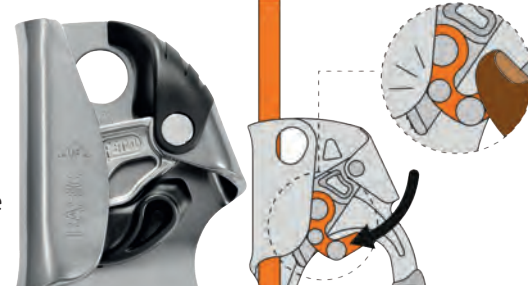
OTHER FEATURES...

TOP EYE: That obvious top eye can serve the same purpose it did on the handled models but for chest ascenders it is a specific chest harness attachment point, so, the other uses are:

- 1) to clip a carabiner around the rope thus ensuring the ascender cannot detach completely
- 2) as a hauling aid or to anchor for hauling - in this function the little man symbol or 'UP' arrows should be upside down!

SAFETY CATCH: If the safety catch clicks to the disengaged position too easily during use you could be in for a scary drop. You never downclimb by releasing the cam via the safety catch and should instead press or 'thumb' the actual cam where sideways and/or downward pressure from your thumb or finger on the cam itself is enough to release the rope but will then enable it to re-engage the second you removed your thumb. For this reason some cams have a more pronounced bottom edge while others have an opening or additional material to facilitate better thumb purchase. The latest ascender range from *Edelrid* (right) makes sure you can't miss the safety!

RELEASABLE CAM UNDER LOAD: Climbing Technology now has an additional pillar on their safety catch which, in the event of a rope or debris-jam halting your progress, or for safer downclimbing, acts as a pivot-post to provide leverage against the frame and force the cam off the rope. This takes some force if the cam is under load so cannot be released by accident. We have previously seen this on *Krok* ascenders and will crop up on others but we're told it's a patented *CT* design. Shown as



■ =leverage cam in the CAM-PARK column the tables.

ROLLERS: *CAMP* has incorporated rollers into their excellent *Turbo-Chest* (above & right). This isn't a new idea, roller-boxes were used in caving systems back in the 60's and 70's as a separate chest or waist attachment to improve rope glide and climbing efficiency but not integrated into the ascender itself. This helps keep the rope and cam in line during twisting and manoeuvring which otherwise creates unequal loading and stresses along the length of the cam enclosure. The top roller can also function as a deviation pulley during hauling (right).

CHINESE & RUSSIAN MANUFACTURE

China is a continual problem for us because, in between counterfeits, so many prominent companies (even manufacturers) in the access and rescue sectors buy in Chinese products to rebadge as their own. We have only recently included Chinese companies under their own names because some have transparent and comprehensive websites and can be contacted for information, most notably *Anpen* and *Kailas*. But no sooner had we included *Xinda* products in our magazines than they were seriously called out by trading standards in the US and Europe for having helmets mislabelled as meeting standards that they absolutely did not. We can be fairly sure that European companies rebadging products have satisfied themselves of standards adherence but we remain a little bit sceptical because companies like *Lixada*, *Magideal*, *GM*, *New Doar*, *SUT*, *Camnal*, *Lepard*, *Tupa* and *Yundxi* are difficult to pin down or tell their products apart. You **will** find models on *Amazon* etc that look identical but have different specification. We can only quote the data supplied to us but we often double-check by scaling the image. We've included *Anpen* and cautiously included *SOB*, *Xinda* and *SE Peak* but **don't** take that as an endorsement. *SE Peak* is a German brand used by Shanghai's *Liedell* and maybe also Taiwan's *NalHon* which seems to have identical products! We haven't included *Camnal*/*Lixada's* *Camp Turbo* look-a-like or *NalHon's* '*CMI Ropewalker*'. We usually include *Kailas* but their hand ascender seems to be discontinued even though they have expanded their range of handled ascenders. Unlike *Anpen* etc. *Kailas* only seem to make their own products which seem well specified with unique features, some of their hot-forged products even incorporate the *Kailas* name so they're not 'rebadging' these things. They have a comprehensive website but more geared to outdoor soft products. We had to delete Taiwanese company *Adela* for lack of data and responses. It's even harder to track down Russian companies which often develop their own unique and interesting products but unfortunately also make close copies. As do *KROK* which we would have stuck with as the sole



Russian entry because they have a comprehensive website and answer emails but they're currently sanctioned until they get a less despotic government that stops invading neighbouring democratic countries.

ARBORIST USE of ASCENDERS/CAMS

It has to be said that the use of chest ascenders and hand ascenders in particular is currently quite limited amongst arborists. Most arborists use either a hybrid system with a descender/ascender like the *ZigZag*, *Akimbo*, *SpiderJack* or *Roperunner* or a *hitchclimbing* knot system. If they are used, chest/hand ascenders are most often a third ascender set up on the harness between a foot and/or knee ascender below and a handled ascender above. Competition climbers are regular users as they look for increased speed and efficiency between point A and point B with no pesky tree work to undertake in between but most arborists prefer a system which allows much greater upper-body manoeuvrability. However, a chest ascender worn between the sit and chest harness can be a useful reserve or intermittent item even if it is not the primary system and not always connected to the rope. If it's on your harness it's out of the way and can be attached temporarily for long entry climbs but released from the main rope during canopy work.

Some folk prefer a non-handled ascender as their top ascender instead of the much bulkier handled models and old-hands in particular like the ease of movement of the ascender afforded by simply grasping the frame rather than inserting into a handle particularly with gloved hands. However, for rope climbing, the hand or basic ascenders are most often seen as a knee or floating cam between a foot ascender and the chest and/or top (handled) ascender.



While the four types of ascender we are describing here are largely interchangeable for all tasks, some are better at one or more tasks than others. Chest ascenders, by definition are best used directly attached to your harness but most, if not all can still do what the hand and lever-cam ascenders can. The commonest uses for all ascenders and rope grabs are:

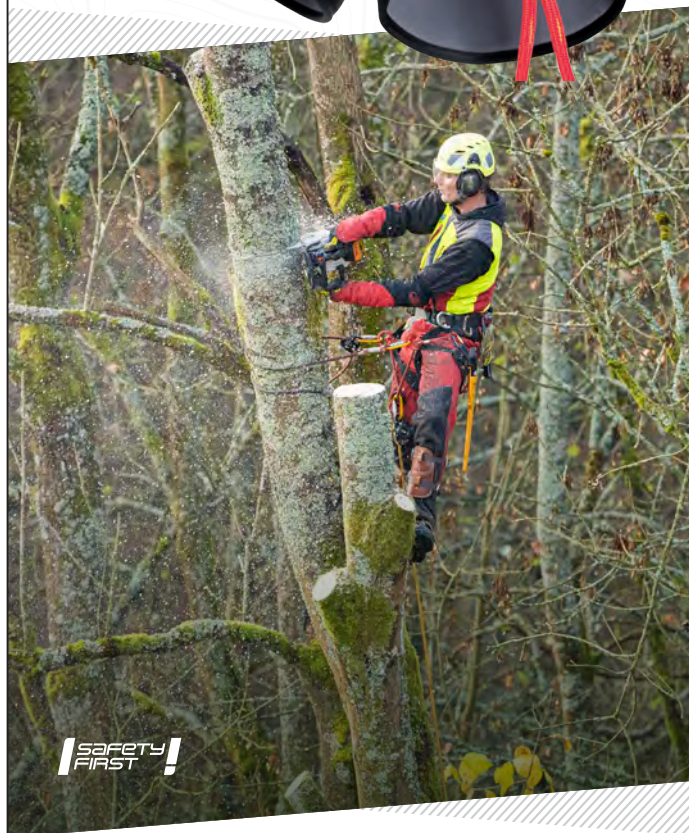
- Ascending/Rope-climbing
- Self-belay/back-up during climbing and this is a use that may increase if two-rope systems are mandated NB: this is largely for dedicated fall-arresters but also smooth cam and some ribbed cam devices - **there are huge risks to using toothed cams for self-belay even where it is implied or stated as an acceptable use for any given device**
- lanyard & flip-line/pole strap rope length adjustment
- direct hauling and progress capture in a haul /raising system *but monitor your input forces and loads carefully.*

The key proviso to all that we have written so far and will write in the Lever-Cam/Rope Grab section is that **any ascender with teeth is best used for ascending-only because it will cut into and maybe sever the rope if over-loaded.** Some Rope grabs will too but are more often designed to slip at around 4 or 5kN, toothed ascenders will rarely slip unless they're stripping rope!



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IN THE FOLLOWING TABLES:**ORIGIN:**

The country selling the product but this is not always the same as the country of manufacture. Where we know, there is an inset flag to show where it is made.

COST: approximate, rounded up and inclusive of local taxes which are generally from 10% and more often 20% in Europe. Often priced much lower locally or online.

WEIGHT: for a single ascender/cam without a carabiner

DIMENSIONS: Width x Height x Depth/thickness but this last one is not always given - the depth is dictated by the cam enclosure but in lever cams this is also increased by the length of the axle pin which may have a locking nut or spring-release mechanism (pip-pin). Even for hand and chest ascenders the depth may vary from reality if the quoted measurements don't include protruding rivet heads etc.

MATERIALS: When we say 'Alu' we mean Aluminium Alloy unless otherwise specified. These are practically all alloy so we've differentiated the construction rather than the material. Most are shown as 'Stamped' meaning that a flat plate of metal is cut to shape then forcibly stamped and rolled into form. Extrusion forces heated metal through a die to create the shape, hot-forged too takes heated metal and forces it into shape like a smithy making a sword or horseshoe. Milled takes a solid lump of alloy and carves/mills it away to create the desired shape, like a sculpture.

STANDARDS: for CE these fall into two categories EN 567 (rope clamp Ø 8 - 11mm) for sport use and EN 12841 B (rope adjustment device Ø 10-13mm) for professional use. Unlike the handled ascenders which generically met EN567 with a few meeting EN12841-B, this Guide includes lever-cam 'ascenders' meeting a wider range so we have to be more specific than simply using 'CE' as a coverall for the applicable European standards. EN567 (ascenders) is still the most common standard in this list but is generally for ropes up to 13mm rather than the original 11mm sport limit. EN12841 for rope adjusters takes in ascenders (-B) hybrids and descenders (C) and fall arrest devices (A) which can all act as ascenders. These require a slightly larger diameter rope so the lower limit is higher - usually around 10mm rather than 8mm. The Mini PCD's may also have EN12278 for pulleys. UIAA is the mountaineering standard with some enhanced testing and EAC applies to Russia and its southern satellite states. Lever cam rope grabs have further standards listed separately.

ROPE DIAM RANGE: It is best to always use the millimetre sizes in ALL of our MARKET GUIDES because the fractional inch equivalents are less specific. 1/2" for instance can be anywhere from 12 to 13mm. Fatter ropes make progress harder but too thin a rope can be positively dangerous as it can jam between the cam and enclosure. ***It's best to ignore the lowest and highest rope diameter claims.*** Remember that a rope will often get fatter with age so if it was a tight fit with a new rope it may become too large with use and stress the cam enclosure if heavily loaded. The rope range quoted uses the lower limit for EN567 up to the sometimes higher limit for EN12841- B. More often than not EN12841-B starts at 10mm rather than 8mm.

WLL(SWL): is the weight of person actually climbing or the weight that can be pulled/hailed before either the rope begins to tear or the cam enclosure unfolds. A small button or 'crease' in the frame on most models stops the cam from flipping upwards under high load if the cam enclosure starts to unfold/bend resulting in an unstoppable downward slide - this is why both ascenders in a Texas-rig-style, two-ascender system, should have direct connection to the harness. Having just a foot ascender doesn't constitute a safe back-up, it's really a third ascender to improve climbing efficiency because if your top ascender were to fail/slip/be accidentally removed, the foot ascender is unlikely to hold you upright unless you had spookily anticipated the precise moment of top-ascender failure! Some WLL figures quoted are suspiciously high and are more likely simply to be an extrapolation of the MBS. Where we see 4kN quoted it is likely to be a re-interpretation of EN567's requirement for a 4kN load to be held at 5 different spots along a fixed rope of minimum and maximum diameters within the ascenders rope range. Most will quote a WLL based entirely on the standards they have met even though their actual capability may be much higher - 100kg for EN567 or 120/140kg for EN12841-B etc.

The **MBS** figure is largely irrelevant as it refers to the strength of the frame, or to be more exact, the ascender's connection eye(s) and even this will vary with rope size. 4kN is usually the lower limit for what may range up to and beyond 12kN for larger rope. For lever cams there is no end-to-end connection and an MBS is often not given because the rope will slip through or perhaps fail before the cam enclosure. If you were to use the framed ascenders as a carabiner or a link in a hauling system rather than as the means to exert the pull this might come into play as you try to stretch the frame end to end, otherwise, for operational use, don't worry about it because the failure mode, if you overload the ascender, will be the cam or the rope, probably the rope.

(Bottom) EYE DIAM: Not necessarily the actual size of connector/carabiner you can get into the bottom eye. Round eyes tend to be a true diameter in which case your carabiner/bar would need to be slightly smaller than this figure.

CAM-PARK: This applies to virtually all handled ascenders and is the ability to hold the cam off the rope completely, generally by clipping the safety catch onto the opposite part of the frame. This facilitates easier rope installation/removal.

■='leverage cam' extra post to release cam under load see p104

ANTI CAM-INVERT: This is now a custom-incorporated pinch in the frame material or a 'knob' to stop the cam rotating too far and releasing out of the top of the frame under high load. This was originally mitigated by clipping a carabiner through the top eye and is still used as such by many.

COLOURS: the colour of the frame or cam enclosure. Different model colour options are separated by a comma. A forward slash/ indicates two (or more) colours on one model which, for Rope Grabs may be a cam-colour. Unlike the handled ascenders, there are not many left AND right hand models. Left-hand model colours are shown in burnt orange. ***See the lever-cam section for further, different data headings.***

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images approximately to scale		MODEL	COMPANY	ORIGIN	COST <small>Currency conversion</small>	WEIGHT	DIMENSIONS Width x Height x Depth	STANDARDS
		Explorer Chest Retrofit	3M/ DBI SALA/ ROLLGLIS		\$185 A\$182	170g 6oz	104 x 65mm 4 x 2.6"	EN567 NFPA AS/NZS4488
		Olymp	ALPIDEX		£32 \$40 €36	154g 5.4oz	100 x 78 x 33mm 4 x 3 x 1.3"	EN567 UIAA
		A12	ANPEN		£40 \$49* €46	163g 5.8oz	121 x 76mm 4.7 x 3"	EN567
		Hold Up	BEAL		£40 \$52 €54	90g 3.2oz	82 x 74 x 59mm 3.2 x 2.9 x 2.3"	EN567 EN12841B
		Solo 2	CAMP		£60 \$90 €75	95g 3.4oz	95 x 57 x 24mm 3.7 x 2.2 x 0.9"	EN567 EN12841B UIAA
		TurboChest	CAMP		£85 \$90 €102	110g 3.9oz	94 x 59 x 39mm 3.7 x 2.3 x 1.5"	EN567 EN12841B UIAA
		Nahuel 2019	CLIMAX		£34 \$34 €31	165g 5.8oz	118 x 80 x 35mm 4.6 x 3.1 x 1.4"	EN567
		Nahuel 2020	CLIMAX		£36 \$36 €33	122g 4.3oz	110 x 68mm 4.3 x 2.5"	EN567 EN12841B
		Evo Chest	COURANT		£39 \$48 €47	130g 4.6oz	105 x 74 x 23mm 4.1 x 2.9 x 0.9"	EN567
		Chest Ascender	CYPHER		£61 \$75 \$70	147g 5.2oz	105 x 74 x 23mm 4.1 x 2.9 x 0.9"	EN567 EN12841B
		Uni Cruiser	EDELRID		£60 \$80 €57	126g 4.4oz	106 x 65 x 32mm 4.1 x 2.6 x 1.2"	EN567 EN12841B
		Chest Cruiser	EDELRID		£57 \$75 €55	162g 5.7oz	80 x 65 x 40mm 3.2 x 2.6 x 1.6"	EN567 EN12841B

NOTES COST: Approx & inc local tax/VAT CURRENCY CONVERSION ONLY * FOB China WLL: Where no WLL is given by



HAND & CHEST ASCENDERS

MATERIALS ALLOY SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	(Bottom) EYE DIAM	CAM-PARK	ANTI-CAM INVERT	SERIAL NO	HAND/ BASIC	CHEST/offset	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
Extruded Alu Stainless Steel		11*-13mm 7/16 - 1/2"	300kg 661lbf 7.9kN 1776lbf	15mm 0.6"	■	-	■	-	■	■	-	Was SRTe. Still sold but this and std model discontinued by 3M. Top 'eye' is for webbing. *Prod-Info states 10.5mm but 11mm is printed on the device.	3m.com.au
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	4kN 900lbf	18mm 0.7"	■	■	-	-	■	■	■		alpidex.com
Stamped Alu Alu		8-13mm 5/16 - 1/2"	5kN 1124lbf	20mm 0.8"	■	■	■	-	■	■	■	Also a 12AA model but details are sketchy! *FOB China	en.anpen.net
Extruded Alu Stainless Steel		8-13mm 5/16 - 1/2"	100kg 220lb	*15mm 0.6"	■	■	■	-	■	■	-	*15x18mm See also <i>Beal Tract Up</i> in PCP guide	pro.beal-planet.com
Stamped Alu Hardened Steel		8-13mm 5/16 - 1/2"	140kg 308lb	14mm 0.5?"	■	-	■	■	-	■	■		camp.it
Stamped Alu Hardened Steel		8-13mm 5/16 - 1/2"	120kg 265lb	16mm* 0.6"	■	-	■	-	■	■	■	Equipped with two patented rollers for a smooth interface with the rope. *17x16mm	camp.it
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	100kg 220lb 4kN 900lbf	19mm 0.8"	■	■	-	-	■	■	-	Also rebadged from chinese original as Lapard, GM Climbing, Xinda, Epic Peak, Vento, NTR, Rock Empire etc.	productosclimax.com
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	100kg 220lb 4kN 900lbf	*15mm 0.6"	■	■	■	■	-	■	■	*29x15mm	productosclimax.com
Stamped Alu Stainless Steel		10-13mm 3/8 - 1/2"	100kg 220lb 6kN 1349lbf	19mm 0.75"	■	■	■	-	■	■	■	■=leverage cam	mycourant.com
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	140kg 308lb	19mm 0.75"	■	■	-	-	■	■	■	■=leverage cam	cypherclimbing.com
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	150kg 331lb	31x20mm 1.2x0.8"	■	■	-	■	■	■	■	Modular ascender, can be integrated into Chest Cruiser plate (becomes the Chest Cruiser)	edelrid.de
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	150kg 331lb	29x5mm 1.1x0.2"	■	■	-	-	■	■	■	Component of Uni Cruiser. Modular ascender with adapter for various harnesses. Comes with webbing.	edelrid.de

Manufacturer we show a Max Load based on approx 10:1 of MBS N/A: info Not Available/not given USE: ■=OK but not ideal

images approximately to scale	MODEL	COMPANY	ORIGIN	COST <small>Currency conversion</small>	WEIGHT	DIMENSIONS Width x Height x Depth	STANDARDS
	BS16	EDELWEISS		£40 \$52 €54	160g 5.6oz	82 x 74 x 59mm 3.2 x 2.9 x 2.3"	EN567 EN12841B
	InduVentral W51630	FIXE		£42 \$53 €48	190g 6.7oz	120 x 80 x 32mm 4.7 x 3.1 x 1.2"	EN567 EN12841B
	Ninja Ninja	HARKEN		£150 \$190 €174	272g 9.6oz	121 x 76 x 37.5mm 4.75 x 3 x 1.5"	EN567 EN12841B
	Compact D41	HEIGHTEC		£51 \$72 €60	160g 5.6oz	115 x 75 x 23mm 4.5 x 3 x 0.9"	EN567 EN12841B
	Sync D44	HEIGHTEC		£56 \$70 €65	140g 4.9oz	95 x 75 x 25mm 3.7 x 3 x 1"	EN567 EN12841B
	Twist D42	HEIGHTEC/ PMI		£50 \$75 €55	150g 5.3oz	105 x 70 x 35mm 4.1 x 2.75 x 1.4"	EN567 EN12841B
	Cam Clean	HONEYWELL MILLER/KOMET		£99 \$123 €114	150g 5.3oz	115 x 78 x 40mm 4.5 x 3 x 1.6"	EN567 EN12841B NFPA
	RP229	ISC		£51 \$82 €59	130g 4.6oz	116 x 75 x 24mm 4.6 x 3 x 1"	EN567

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HAND & CHEST ASCENDERS

MATERIALS ALLOY SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	(Bottom) EYE DIAM	CAM-PARK	ANTI-CAM INVERT	SERIAL NO	HAND/ BASIC	CHEST/ offset	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
Extruded Alu Stainless Steel -		8-13mm 5/16 - 1/2"	100kg 220lb	*15mm 0.6"	■	■	■	-	■	■		*15x18mm	edelweiss-ropes.com
Stamped Alu Alu		8-12mm 5/16 - <1/2"	100kg 220lb 4kN 900lbf	20mm 0.8"	■	■	■	-	■	■		Also Fixe 'Dome' model with no anti-cam invert which is the same model as Climax Nahuel	fixeclimbing.com
Stamped Alu Cast Steel		9-13mm 3/8 - 1/2"	140kg 308lb	>35mm >1.4"	-	-		■	■	■	■	Two cams - one either side of the rope. Use as chest and hand ascender. Has 2 release triggers to make down-climbing easier.	harken.com
Stamped Alu Hardened Steel		9-13mm 3/8 - 1/2"	100kg 220lb	15mm 0.6"	■	■	■	■	-		■		heightec.com
Stamped Alu Hardened Steel		10.5-12mm 7/16 - <1/2"	100kg 220lb	*<50mm <2"	■	■	■	-	■	■		*Fixes direct to chest harness webbing but can still be detached. Only sold with chest harness.	heightec.com
Stamped Alu Hardened Steel		10-13mm 3/8 - 1/2"	100kg 220lb	16mm 0.6"	■	■	■	-	■	■			heightec.com
Stamped Alu Hardened Steel		8-13mm 5/16 - 1/2"	100kg 220lb 5kN 1124lbf	*17mm 0.7"	■	-	-	-	■	■	■	*17 x 21 mm Good luck finding this-see Kong for original model!	honeywellsafety.com
Stamped Alu Stainless Steel		9-13mm 3/8 - 1/2"	140kg 308lb 2.5kN 562lbf	*17mm 0.7"	■	-	■	-	■	■	■	Also rebadged by Checkmate, Stein, WestfallPro and others. *17 x 21 mm	iscwales.com

For manufacturer we show a Max Load based on approx 10:1 of MBS N/A: info Not Available/not given USE: ■=OK but not ideal

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images approximately to scale	MODEL	COMPANY	ORIGIN	COST <small>Currency conversion</small>	WEIGHT	DIMENSIONS Width x Height x Depth	STANDARDS
	Chest-Up	KAILAS		£101 \$125 €116	106g 3.7oz	97 x 66 x 31mm 3.8 x 2.6 x 1.2"	EN567
	Cam Clean 82400	KONG		£55 \$76 €55	150g 5.3oz	115 x 78 x 40mm 4.5 x 3 x 1.6"	EN567 EN12841B UIAA
	Futura Body 94200	KONG		£68 \$90 €69	80g 2.8oz	82 x 48 x 35mm 3.2 x 1.9 x 1.4"	NFPA-L EN567 EN12841B UIAA EAC
	Modular 875	KONG		£42 \$68 €44	170g 6oz	114 x78 x25mm 4.5 x 3 x 1"	NFPA-L EN567 UIAA
	Ventral FA7001500	KRATOS SAFETY		£51 \$64 €55	160g 5.6oz	115 x 75 x 21mm 4.5 x 3 x 0.8"	EN567
	Basic B18BAA	PETZL		£53 \$88 €55	85g 3oz	104 x 64 x 30mm 4 x 2.5 x 1.2"	EN567 EN12841B UIAA EAC
	Croll-S B16BAA	PETZL		£53 \$88 €55	83g 2.9oz	97 x 58 x30mm 3.8 x 2.3 x 1.2"	NFPA EN567 EN12841B UIAA, EAC
	Croll-L B016AA00	PETZL		£53 \$88 €55	140g 4.9oz	110 x 70 x 30mm 4.3 x 2.75 x 1.2"	NFPA EN567 EN12841B UIAA, EAC
	UltraLight CD201L/202L	PROTEKT		£31 \$38 €35	135g 4.8oz	110 x75 x 30mm 4.4 x 3 x 1.1"	EN567
	TREEUP CD201/202	PROTEKT		£35 \$43 €40	220g 7.8oz	134 x 86 x 28mm 5.3 x 3.4 x 1.1"	EN567

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HAND/CHEST ASCENDERS

MATERIALS ALLOY SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	(Bottom) EYE DIAM	CAM-PARK	ANTI-CAM INVERT	SERIAL NO	HAND/BASIC	CHEST/offset	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
Milled Alu Stainless Steel		8-13mm 5/16 - 1/2"	140kg 308lb	20mm 0.8"	■	■	-	-	■	■		Discontinued but some still available from Russo-Asian stockists	Kailasgear.com
Stamped Alu Hardened Steel		8-13mm 5/16 - 1/2"	100kg 220lb 5kN 1124lbf	*17mm 0.7"	■	-	-	-	■	■ ■		*17 x 21 mm	kong.it
Extruded Alu Hardened Steel		9-12mm 3/8 - <1/2"	100kg 220lb	*15mm 0.6"	■	■	■	-	■	■		*Lower eye is twisted and angles backward and measures 18 x 15 mm	kong.it
Stamped Alu Hardened Steel		11-13mm 7/16 - 1/2"	100kg 220lb	14mm 0.55"	■	■	-	■	-	■ ■	■ ■	Being Phased Out. can be retrofitted to Kong winches and with a handle etc.	kong.it
Stamped Alu Alu		10-12mm 3/8 - <1/2"	4kN 899lbf 15kN 1686lbf	13mm 0.5"	■	-	-	■	■		■		kratossafety.com
Stamped Alu Stainless Steel		8-11mm 5/16 - 7/16"	140kg 308 lb	16mm* 0.6"	■	-	■	■	-		■	*28 x 16mm	petzl.com
Stamped Alu Stainless Steel		8-11mm 5/16 - 7/16"	140kg 308 lb	22mm 0.9"	■	-	■	-	■	■		stainless steel wear resistant plate fitted	petzl.com
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	140kg 308 lb	22mm 0.9"	■	-	■	-	■	■			petzl.com
Stamped Alu Steel		8-12mm 5/16 - <1/2"	4kN 899lbf	21mm* 0.8"	■	-	-	-	■	■	■	21.8x23mm Also badged as Proverti	protekt.pl
Extruded Alu Steel		8-13mm 5/16 - 1/2"	100kg 220 lb	20mm* 0.8"	■	-	-	■	-	■	■	*27x20mm Also badged (made by?) GT	protekt.pl
													Expansion Row
													Expansion Row

From manufacturer we show a Max Load based on approx 10:1 of MBS N/A: info Not Available/not given USE: ■=OK but not ideal

images approximately to scale		MODEL	COMPANY	ORIGIN	COST <small>Currency conversion</small>	WEIGHT	DIMENSIONS Width x Height x Depth	STANDARDS	
		Chest Up ZWB019	ROCK EMPIRE		€54 \$67 €61	118g 4.2oz	99 x 62 x 30mm 3.9 x 2.4 x 1.2"	EN567 EN12841B	H
		Chest	ROCK EMPIRE		£48 \$59 €54	163g 5.7oz	118 x 78 x 32mm 4.6 x 2.8 x 1.2"	EN567	S S
		Chest SA-208	S.E.PEAK Shanghai Leidell Ind Co Ltd/NalHon		£36 \$46 €33	150g* 5.3oz	104 x 75mm 4.1 x 2.9"	EN567(?)	S S
		Chest	S-TEC		£38 \$48 €44	160g 5.6oz	118x80x30mm 4.6x3.1x1.2"	EN567	S S
		Chest Croll RA009	SAR PRODUCTS		£54 \$69 €63	130g 4.6oz	105x74x23mm 4.1x2.9x0.9"	EN567 EN12841B UIAA	S S
		Cam Clean	SINGING ROCK		£47 \$65 €54	125g 4.4oz	100x70x35mm 4x2.75x1.4"	EN567 EN12841B	S S
		Chest (AC30)	SKYLOTEC		£45 \$60 €57	140g 4.9oz	118x79x30mm 4.6x3.1x1.2"	EN567 EN12841B UIAA	S
		CT Chest Ascender +	SKYLOTEC		£45 \$70 €53	147g 5.2oz	105 x 74 x 23mm 4.1 x 1.9 x 0.9"	EN567 EN12841B UIAA	S S
		CT Chest Ascender HC	SKYLOTEC		£47 \$70 €55	147g 5.2oz	105 x 74 x 23mm 4.1 x 2.9 x 0.9"	EN567 EN12841B UIAA	S St
		CT Ascender Simple +	SKYLOTEC		£42 \$54 €48	150g 5.3oz	110 x 74 x 23mm 4.3 x 2.9 x 0.9"	EN567 EN12841B UIAA	S St

NOTES COST: Approx & inc local tax/VAT CURRENCY CONVERSION ONLY * FOB China WLL: Where no WLL is given by ma

HAND & CHEST ASCENDERS

MATERIALS ALLOY SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	(Bottom) EYE DIAM	CAM+PARK	ANTE-CAM INVERT	SERIAL NO	HAND/ BASIC	CHEST/ offset	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
Hot-Forged Alu Alu		8-11mm 5/16 - 7/16"	4kN 899lbf	16mm 0.6"	■	■	-	■	■	■ ■		Swivel eye	rockempire.cz
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	4kN 899lbf	19mm* 0.75"	■	-	-	■	■	■		DISCONTINUED by RE but also rebadged from Chinese original as Lapard, GM Climbing, Xinda, Epic Peak, Vento, NTR, etc.*23x19.5mm	rockempire.cz
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	100kg 220lb 4kN 900lbf	*15mm 0.6"	■	■	■	-	■		■ ■ ■	Upgrade from S-206 *29x15mm Also listed as 130g? See SE.Peak notes on p155	sepeak.net (often difficult to access)
Stamped Alu Stainless Steel		8-12mm 5/16 - <1/2"	4kN 899lbf 20kN 4496lbf	19mm 0.75"	■	-	-	-	■	■		Variation of the Rock Empire model above.	safetecbr.com.br
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	100kg 220 lb	19mm 0.75"	■	■	■	-	■	■		■ =leverage cam	sar-products.com
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	120kg 265 lb 12kN 2697lbf	19mm 0.75"	■	-	■	-	■	■		Updated model. Safety catch has a secondary trigger to allow safer cam- release for short downclimbs	singingrock.com
Stamped Alu Alu		9-13mm 3/8 - 1/2"	4kN 899lbf 14kN 3147lbf	13mm 0.5"	■	-	■	-	■	■ ■		Skylotec Germany owns Anthon Slovenia. Anthon brand-name being phased out	skylotec.com (anthon.si)
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	140kg 308lb	19mm 0.75"	■	■	■	-	■	■		Also rebadged by others inc 'Bornack'. Listed as 'Evo' by some stockists ■ =leverage cam	skylotec.com climbingtechnology.com
Stamped Alu Stainless Steel*		8-13mm 5/16 - 1/2"	140kg 308lb	19mm 0.75"	■	■	■	-	■	■		*HC= Hard-coated shell for improved abrasion resistance. ■ =leverage cam	skylotec.com climbingtechnology.com
Stamped Alu Stainless Steel		8-13mm 5/16 - 1/2"	140kg 308lb	19mm 0.75"	■	■	■	■	-		■	■ =leverage cam	skylotec.com climbingtechnology.com
													Expansion Row
													Expansion Row

Manufacturer we show a Max Load based on approx 10:1 of MBS N/A: info Not Available/not given USE: ○ ● = OK BUT NOT IDEAL

images approximately to scale		MODEL	COMPANY	ORIGIN	COST <small>Currency conversion</small>	WEIGHT	DIMENSIONS Width x Height x Depth	STANDARDS	
		Hoist (AB20)	SKYLOTEC (ANTHRON)		£62 \$70 €67	150g 5.3oz	104 x 75 x 30mm 4.1 x 3 x 1.2"	EN567 EN12841B UIAA	S
		Get Up H-210	SKYLOTEC		£101 \$125 €115	123g 4.3oz	129 x 122 x 66mm 5 x 4.8 x 2.6"	EN567 EN12841B	S
		RB16AAA	SOB		£59 \$74 €67	138g 4.9oz	107 x 80 x 30mm 4.2 x 3.2 x 1.2"	EN567 EN12841B	S
		RP229	STEIN		£42 \$53 €49	130g 4.6oz	116 x 75 x 24mm 4.6 x 3 x 1"	EN567	S St
		Chest	US CLIMB		£61 \$75 €70	159g 5.6oz	101 x 88 x 33mm 4 x 3.5 x 1.3"	EN567 UIAA	S
		Ropeman 1	WILD COUNTRY		£60 \$75 €68	62g 2.2oz	55 x 36 x 31mm 2.1 x 1.4 x 1.2"	EN567 UIAA	Ho
		Ropeman 2	WILD COUNTRY		£65 \$81 €75	92g 3.25oz	55 x 36 x 31mm 2.1 x 1.4 x 1.2"	EN567 UIAA	Ho S
		OCA H-XS01	XINDA (BINFEN OUTDOOR)		£22 \$27* €25	112g 3.9oz	102 x 72 x 32mm 4 x 2.8 x 1.3"	EN567 UIAA	S S
		Chest HXS03	XINDA (BINFEN OUTDOOR)		£18 \$22* €21	150g 5.3oz	115 x 75mm 4.5 x 3"	EN567	S S
		PCA (DeLuxe) HXS02	XINDA (BINFEN OUTDOOR)		£21 \$26* €24	150g 5.3oz	115 x 95mm 4.5 x 3.7"	EN567	S

NOTES COST: Approx & inc local tax/VAT CURRENCY CONVERSION ONLY * FOB China WLL: Where no WLL is given by

HAND & CHEST ASCENDERS

MATERIALS ALLOY SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	(Bottom) EYE DIAM	CAM-PARK	ANTI-CAM INVERT	SERIAL NO	HAND/ BASIC	CHEST/offset	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
Stamped Alu Alu		9-13mm 3/8"-1/2"	4kN 899lbf 14kN 3147lbf	13mm 0.5"	■	■	■	■	■		■	Skylotec Germany owns Anthron Slovenia. Anthron brand-name being phased out. Also rebadged by 'Skalt'	skylotec.com (anthon.si)
Stamped Alu Alu		8-13mm 5/16"-1/2"	140kg 308 lb	13mm 0.5"	■	-	-	■	■		■	Integral shackle-eye	skylotec.com (anthon.si)
Stamped Alu Alu		10-13mm 3/8"-1/2"	100kg 220 lb 4kN 899lbf	21mm 0.8"	■	■	-	-	■	■		Updated version still listed by SOB as 120g? Verify certification	cnsob.com
Stamped Alu Stainless Steel		9-13mm 3/8"-1/2"	140kg 308lb 2.5kN 562lbf	*17mm 0.7"	■	-	■	-	■	■		Also rebadged by Checkmate, WestfallPro and others. *17 x 21 mm	steinworldwide.com
Stamped Alu Alu		8-13mm 5/16"-1/2"	4kN 899lbf	18mm 0.7"	■	■	-	-	■	■			usclimb.com climbclean.com.br
Hot-Forged Alu Alu		10-13mm 3/8"-1/2"	400kg 880lbf	13mm 0.5"	■	-	-	■	-		■		wildcountry.com
Hot-Forged Alu Stainless Steel		8-13mm 5/16"-1/2"	400kg 880lbf	13mm 0.5"	■	-	-	■	-		■	There was also a Ropeman mk3, narrower than the mk1/2 but was discontinued	wildcountry.com
Stamped Alu Stainless Steel		8-13mm 5/16"-1/2"	150kg 331lb	20mm 0.8"	■	-	-	■	■	■	■	Fold-down safety catch keeps it out of the way. Hardened frame coating	xindaoutdoor.com
Stamped Alu Stainless Steel		8-13mm 5/16"-1/2"	150kg 331lb	20mm 0.8"	■	-	-	-	■	■	■	No hardened coat - regular anodizing	xindaoutdoor.com
Stamped Alu Steel		8-13mm 5/16"-1/2"	150kg 331lb	20mm 0.8"	■	-	-	-	■	■	■	Hardened frame coating & enhanced safety catch ■ allows release when jammed. See CT models	xindaoutdoor.com
												Expansion Row	
												Expansion Row	

For manufacturer we show a Max Load based on approx 10:1 of MBS N/A: info Not Available/not given USE: ■=OK but not ideal



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LEVER CAM ROPE GRABS



all-steel construction, often having tandem cams (rather than the single cam in this guide) and being the size and weight of a small planet. Such mobile fall-arresters often require a very specific rope brand and model and are not certified to operate on anything else. Not all are steel, the *Buck 5004T* Rope Grab (right) is alloy but **we have not included any of these industrial-specific mobile fall arresters**. If you are tempted, because your mate in the power company gave you one, it would flag up to rival companies that you don't have the most appropriate gear for the job. Over the years and particularly thanks to the arb industry, the term 'rope grab' has come to mean any cam-&- shell device which 'grabs' and holds a rope. This is despite the fact that it would be a fatal mistake to think that all devices now called a rope grab can act as a fall arrest device. It is in fact, far better to assume that NO Rope grab can be used for fall-arrest unless it specifically says so in the instructions or meets EN 353-2 for mobile fall arresters.

A lever-cam rope grab comprises a cam 'shell' or frame (which is basically a rope channel) and a pivoting cam with a connection eye that, when loaded, rotates onto the rope and squeezes it between the cam and the frame. The frame may have a 'relief' channel or scalloping which allows part of the rope to escape the cam-frame squeeze-point which might otherwise result in complete severing of the rope if overloaded. Most cams are cast or milled aluminium with a hardened coating to prevent undue wear. They have transverse ribs and ridges running across the face of the cam to increase grip on the rope without the aggression of teeth which is why they are generally more suited to high-loads and hauling.

Very distinctive in appearance, this group of 'ascenders' is more often called 'rope grabs' these days. Despite their origin as ascenders, lever cams are not often used as ascenders for progressive ascent of a fixed rope except in caving. Instead they are mostly used in tree work for:

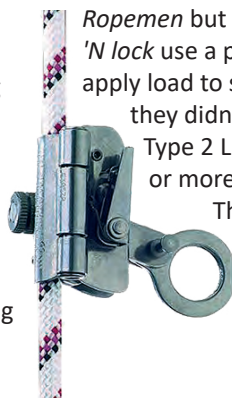
- **Haul-Cam and Progress capture** in haul systems. NB: Progress-capture only requires it to hold the weight being hauled but a haul-cam can be subjected to many times the actual load because of the input forces of the haulers and the mechanical advantage of the system which inevitably adds friction to the effort. Consider using a load cell to monitor your input forces and loads.
- **Flipline/Pole-Strap, Lanyard or rope length adjuster** which will never load the cam beyond your single bodyweight and often not even that since the arborist only leans against the strap rather than hanging on it. Unless you slip.
- **Work positioning/safety** - which might include ascending and fall arrest. This will/may take full bodyweight in a vertical system and could take a small shock load in the event of a slip or primary system failure.

The term 'Rope grabs' was originally used for industrial fall arresters like the *Komet Altochute/StickRun* (right), some of which function and look like a knobbly *Gibbs*-style ascender but are usually quite obviously different thanks to mostly being

These devices are further defined and distinguished from regular frame ascenders, by the guru of hardware Doc Storrick, as type 1 and type 2 Lever Cams because the cam is levered against the rope directly via your loading rather than indirectly via the frame as with a standard ascender. Indeed, it's Storrick that first took issue with some companies calling their devices a rope grab when it was clearly a type 1 Lever Ascender! I think he's now firmly lost that battle but it doesn't mean he wasn't right to raise the point in the early days. Within this category there are a sub-section of mini, emergency ascenders like the *Petzl Tiblock* and *Skylotec Ringo* which are technically not type 1 lever cams but they work by directly loading the cam as a single component with the body so it's close enough for us. The original mini ascenders were of course the *Wild Country Ropemen* but these and the *Kong Duck* and *Skylotec/CT Roll 'N lock* use a pivoting cam and it's the frame you initially apply load to so would be in with Basic/Hand Ascenders if they didn't have their own guide to PCs.

Type 2 Levers are where a completely smooth 'cam' or more accurately 'bar' is loaded against the rope.

The frame itself further pivots to create further contact with the rope at the top. The *Petzl Shunt* (7) is the original proponent of this design and having once ruled the rope access



ROPE GRABS



world it is now largely confined to the sports catalogue. See Emag#22 for discussion of the *Shunt's* revised capabilities as of 2011. Despite the multi-roles it had when first introduced, the *Shunt* is now sold only as an abseil/rappel backup device. However, it can obviously still function as an ascender. Uniquely in this Guide, the *Shunt* can operate on two ropes but had slippage issues at moderate to high loads which needed to be mitigated or accounted for in your rigging or system set-up. The *Shunt's* baton was taken up by the *Brazilian Safetec Duck* (6) and *Enforcer* models. Unlike a type 1 lever cam, the frame on a type 2 can be rotated by hand against the force of the pivot to lessen the holding force. Not something you would necessarily want to do much but it better demonstrates the difference between type 1 and type 2 lever cams.

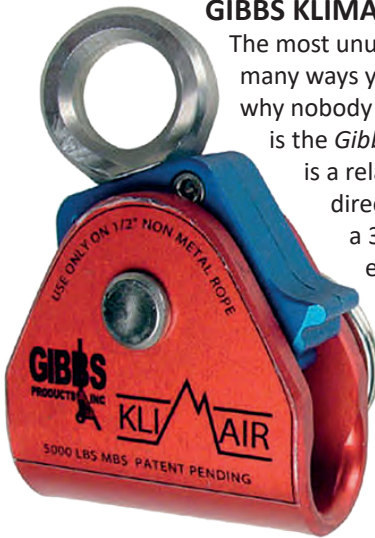
The granddaddy of all manufactured lever-cam ascenders is the *Gibbs* (2) This was introduced in 1965 by brothers Charles and Peter Gibbs, Charles the inventor, Peter the manufacturer but both were prominent cavers. They were soon adopted by mountaineers and then by rescue for a whole range of applications that they weren't necessarily designed for. In the latter part of the last century their use in rescue tailed off in favour of other emerging devices because some high load applications caused the cam to severely damage, if not sever the rope. That's why you see all the non-sport models with a 'NOT FOR SELF BELAY' inscription. In European standards terms this can be a little confusing because EN567 for ascenders/rope clamps defines 'self-belay' as a constituent requirement for any ascender to meet, not because it is a fall-arrest device in the sense of the afore-mentioned EN353-2 standard, but because the climber may slip or accidentally release an ascender during climbing and fall back onto it - we would probably call that fall-arrest but UIAA defines it as self-belay. Despite this being more of a user-problem in terms of using the correct *Gibbs* for the correct application, the *Gibbs* was eventually swamped by competitors, most notably *Rock Exotica's Rescucender* (5) We considered this to be the finest lever-cam ascender on the market at that time and *CMC's Ascender* (4) obviously shares some ancestry. Prolific ascender-makers *CMI* introduced their renowned hardened cams to an extensive lever-cam range of *RopeWalkers* which are quite striking in appearance (1) and have sold well into the arborist industry with tough stainless steel models. *Rescucenders* were eventually bought by *Petzl* who discontinued the original design (5) but continue to work some magic with the design producing perhaps the most complex *Rescucender* model to date. (3) .

Back to *Gibbs* devices which never went away and having expanded their range in the 1980s and 90s to take in rescue-sized ropes from 1/2" to 3/4" they began to find new markets in treework and rope access in the early 2000s as well as continuing to service traditional caving, mountaineering and rescue. Key differences between models are shell material - alloy or stainless steel, rope capacity, whether the device is detachable via a spring pin or bolted and needs to be fed and whether it is has free running or sprung cams or both. The former relies on loading the cam to hold rope position while the sprung cam automatically pushes the cam



onto the rope so that it holds position even with no load. The heavier-duty models have thicker shells and greater clearance for increased rope diameter variations as well as high load applications. *Gibbs* are an iconic design in the rope industries little changed in over 50 years and still recognisable in many models with their webbing cam/release pin attachments. They continue to rank as by far the largest range of lever-cam rope grabs in the world with 11 models which seem to alter in some way on a frustratingly regular basis, always the way with genius inventors!

GIBBS KLIMAIR



The most unusual model and in many ways you have to wonder why nobody else ran with this, is the *Gibbs Klimair*. This is a relatively small bi-directional model with a 360 degree swivel eye and removable axle-pin. Instead of mounting the cam eccentrically so that the cam will only allow rope to feed in one direction like every other lever-cam, the *Klimair* has it centrally mounted like a see-

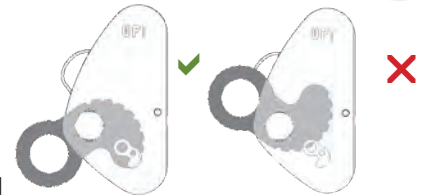
saw, able to pivot both ways with ribs along the entire quadrant to grip the rope in either direction but missing in the middle section so as to allow rope to run through. This is most often used on flielines/lanyards/pole-straps where you might otherwise use a small prusik cord as that is also bi-directional. A double rope length with a hook on both ends enables you to create two flielines on the same lanyard, usually called a 2-in-1 utilising a 2-way prusik. You can bypass branches while remaining attached at all times by throwing the tail around the trunk above the branch and clipping back to your harness side-D while your lower pole strap is still connected. Take your weight in on the top rope long enough to release the bottom eye and slide the prusik/*Klimair* up the rope until it can take your weight again. You are never fully disconnected and the *Klimair* is able to take load one way as the lower strap and then the opposite way on the upper strap. Despite loading both ways the cam will slide when de-weighted with the cam either centrally positioned or you thumb the cam against the direction of travel. The *Klimair* is the only rope grab from this guide also listed in the lanyard adjuster/rope shortener guide

Don't be fooled by the delineation of Gibbs models into Sport, Rescue and Arborist models. Arborists usage will cross into all three Gibbs Categories so, apart from the *Klimair* and bolted models intended more for flip lines/lanyards, use the data in the tables to decide which model best suits your requirements.

CAM RETENTION

For novices, the most confusing thing about a lever cam device apart from the *Gibbs Klimair* is making sure that when you disconnect the cam to insert the rope, you put it back the right way up! The cam and locking pin are always connected to the shell in some way so that you can't lose them, either by a wire, webbing or small chain. Of these, the stiffer wires which act as springs to hold the cams positions on the rope, tend also to orient the cam the right way. But not always. If there's enough wire/cord/tape you will be able to accidentally flip the cam upside down as in this ISC demonstration (right).

Petzl's re-imagining of the *Rescuecenter* (3) uses a retractable, solid connection which only allows you to reconnect the cam the correct way up.



As just mentioned, the wire loop you see on most cams not only keeps the cam connected, it also acts as a



spring to maintain enough load on the cam to hold it in position on the rope when not loaded. With no spring, the cam is effectively free-running and this means it doesn't have to be manually moved down a rope as it will slide when it is not loaded. This mode of operation is a consequence of its use as a back-up device when climbing/abseiling. The fact that a device has a free-running function implies that it is suitable for fall-arrest but this is not a wise assumption with any camming device - check suitability.



By far the commonest connection for removable cams is a pip-pin or push-pin as in the *USClimb* and *SE Peak* (rebadged as *Lixada*) models above.

Earlier we mentioned the sprung and free-running options with some models allowing both options in the one device so we'll use the *Gibbs* usage description for converting a sprung cam to a free-running cam to also serve as instruction on the push

ROPE GRABS

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pin and before that, *Lixada's* rebadged SE Peak model has a useful visual guide and you can see how the stiff wire on the cam helps keep it properly oriented so you don't put it back upside down although that's always possible.



GIBBS Pin-use & sprung to free-running conversion

Assembly: Depress button on pin and pull pin out until cam swings free.

Place Ascender on rope and align holes in cam and shell.

Depress button and insert pin.

Convert to Free Running Mode:

Remove the small screw in the black or white spring cover. The spring will rotate freely.

Do not remove the screw in the cam. Do not try to remove the spring.

Reconvert to Spring Loading: Hold cam down and re-insert screw in spring cover.



Our all-time favourite (and that's very subjective) *Rock Exotica Rescuer* shown on page 121 used a fixed sprung pin to keep the cam pin in place similar to the *SMC/PMI Grip* (8). While there was definitely no risk of losing that and it protruded far less than a large pip or push-pin it does represent an extra action since there is still a removable pin acting as an axle. Hugh Banner's *HB* cams (which we managed to bend the eyes of in testing) are no longer with us but the *SMC/PMI Grip* is an evolution of those models with the same sprung pin retention and gentle body-curves. Aside from the many *Gibbs* models, the models we see the most in 2020 are the *CMi Ropewalkers* (1) discussed earlier and the *ISC RP Grabs* (9) adopted by a number of other manufacturers/distributors like *Stein* and *Courant* because they're well made and there's often no point in reinventing the wheel.



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CAM EYE MODIFICATIONS

We've already mentioned the *Gibbs Klimair* with its (so far) unique swiveling eye but there are some with a fixed eye that has been rotated 90 degrees to the norm. *Rock Exotica* have their *RockGrabs 90* (pic bottom), while the *BuckGrab* (inset bottom) was the first to patent the 90 degree eye. The reason for the offset is to help the device lie flat



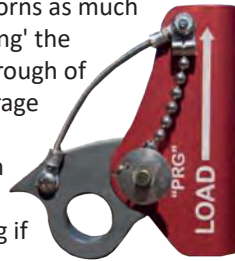
and in the same plane as the connecting carabiner.

This negates the need for a twisted shackle used by some including the arborist in the image above but it does mean they may apply cross-gate loading if you try to use a standard carabiner in conventional ascending mode. Adverse **torque on the carabiner and cam-eye is something to look out for with the relatively 'thick' profile of many lever cams.**

Something else you may notice on one or two cams is an extra horn emanating from the carabiner eye as part of the cam assembly. This has been adopted by *Petzl* on the *MicroGrab* pictured left as a much bigger feature than on one of the original innovators, Jerry Smith's now discontinued *PRG* (right) from 2008.

ProClimb's uniquely rubber-covered-333 (pic inset top), the *Russian Krok* and both Chinese *Xinda/Lixada* models also have these horns as much

larger features. It makes 'thumbing' the cam for downward movement or pulling through of rope a little easier thanks to increased leverage and a larger surface contact area. This is particularly useful when adjusting length on a pole-strap or lanyard, when resetting the haul ready for another pull or downclimbing if ascending.



CHINESE & RUSSIAN

As always we have to add a proviso about Chinese and Russian manufacture. The Chinese continue to increase their ranges in any given market sector of the rope access market by supplying an off-the-shelf and often extremely

well made product that can be rebranded. But not always 'well-made' and not always with appropriate standards despite the markings on the product. In fact, *Lixada's* AZW031 grab which is the same as *Xinda's* XD-Q9666 was omitted because its picture had EN341 stamped on it which is a descender standard; that may be a typo but it doesn't inspire confidence. We've seen other ascenders with a carabiner (connector) standard printed on them. *Xinda* also annoyed us a while back with some ridiculously poor safety helmets that clearly didn't meet their labelled standards and this has again made us wary of their products but, as we see with their chest ascender they do have some unique designs. We haven't included their *Gibbs* look-a-like under their name but Spanish company *Climax* sells it as the *Otto* so it has been included because we should be able to trust their certification since they would need to meet EU standards as a member of the EU.

Russian devices are more 'off-the-wall' than 'off-the-shelf' but always interesting. When the Ukraine invasion sanctions are lifted we mostly show *KROK* which purports to meet European standards and has a good website and provides us with data but you'll need to satisfy yourself that these are appropriate to your needs.

FOR ALL ASCENDERS & GRABS, THE OPTIMUM ROPE SIZE IS IN THE MIDDLE OF THEIR QUOTED ROPE RANGE ESPECIALLY FOR HIGH LOADS

IN THE FOLLOWING TABLES additional to the notes on page 98.....

DIMENSIONS

As usual this is **HEIGHT** by **WIDTH** by **DEPTH (SPAN measured from SIDE-to-SIDE)** but not everyone quotes the depth/thickness. The terms width and depth can be a bit confusing because they are interchangeable. For our purposes, the width is measured from the back edge of the cam shell to the front of the carabiner eye. The Depth we renamed **SPAN** and is the side-to-side measurement as you look at the cam-face. Some manufacturers may just be quoting the cam enclosure without any bolt-heads. We have therefore given two figures in many cases - the first is just the cam enclosure/frame without any pins or bolts and the second figure in **burnt orange** is the length of the bolt or pin eg. 26/**67**mm which is always more than just the cam enclosure. Some, like the *Rock Exotica* models (pic left) don't have any bolt heads; the bolt is flush to the frame and kept in place by a locking pin through the frame. Height can also be an optical illusion because we expect this be the greater figure but some are wider than they are tall - the *ISC 203/209* for instance is 20mm wider than it is high.

STANDARDS

Once again, some of the load figures are artificially low because they simply reflect the standards requirements NOT the actual capabilities. It is the European standards that best define the capabilities of different types of ascender/cam although the US NFPA does at least narrow your options to ONLY the most applicable available to North American rescue users which is often a great indicator of tough gear for arborists.

- EN353-2 - Mobile Fall Arrest
- EN358 - Lanyard adjuster
- EN12841 typeB - Industrial ascender
- EN567 - Sport Ascender
- EN365 - Generic PPE Fall Protection

EN12841 type B - and **EN567** are ascender standards but EN567 is just for sport/climbing ascenders and does NOT include a fall test. However, this doesn't necessarily mean that EN567 ascenders are less applicable to arborists because the fall test for EN12841-B incorporates a 'dynamic lanyard' or shock absorber which is routinely used in rope access but not yet (if ever) by arborists. Despite being an 'ascender' standard some devices like the *Rock Exotica Rockgrabs* tested to EN567 are NOT intended to be used as ascenders.

EN365 is a generic standard for fall arrest PPE maintenance and marking etc. so most rope grabs would meet it and is rarely quoted other than in paperwork.

Many of these lever cams are shown as meeting only one or two of these specific standards and we often find that devices of pretty much the same design and load rating show different standards - this is almost certainly down to the market that the manufacturer sees for the device rather than the actual capabilities. There's no doubt that most EN353 and 358 models without an offset eye would function adequately as ascenders. However, in these days of litigation you may need to prove it is 'Fit-for-Purpose' if a device doesn't show your required standard. One thing to note, as with hand and chest ascenders is that the minimum and maximum rope diameters quoted should largely be avoided except for special purposes. Thinner rope may tend to slip more readily and larger ropes may be damaged more easily under high load.

FIXED & DETACHABLE

Very few, if any rope grab cams are truly fixed - they will all detach but here we use 'FIXED' to describe a bolt requiring tools to dismantle and 'DETACHABLE' to describe a spring-release pin easily removed by hand.

USES

LAD meaning LENGTH ADJUSTING DEVICE for longer lanyards or **FLIP LINE/POLE STRAP**. Any camming device, whether it's an ascender or a descender or both, will function as a length adjuster on a lanyard or flip line. Here we are primarily concerned with flip-lines/pole straps because the longer work positioning lanyards use length adjusters which pay-out under load AND take in. Ascenders/rope grabs only take-in unless you fully release the cam which is dangerous, so are best suited to short lengths on your pole strap around the main trunk. Many arborists use their longer lanyards as a pole strap but bespoke

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f t i

fliplines often have a wire core to resist being cut in what is a high risk place to be during cutting.

Just to reiterate, every ascender or rope grab within this category will function as a polestrap/flipline adjuster but some are more compact and some simply do it better. We listed the bolted models with an orange box as MOST appropriate because they are more compact than pip-pin models. The *Fusion Puma* model below clearly shows how a sprung pin or pip-pin can virtually double the width of the device. Bolted devices fed onto the rope or flipline can't subsequently be accidentally removed from the rope or reconnected incorrectly. If you're on a budget that might be seen as a disadvantage because you can't multi-task your kit! Nevertheless the more compact rope grabs are far better in this role than, for instance, a huge-great handled ascender, they're easier to feed through more rope and they usually have a ribbed cam rather than teeth so are kinder on your rope and again rope is more easily paid out without continually 'catching' or snagging on the teeth. Those devices designed primarily as flip-line adjusters/rope shorteners, are also at the least expensive end of the spectrum. That's not to say they're not well made but if it costs less than \$50 it's probably not what you want as a critical component for hauling or ascending.

HAUL: hauling includes two distinct tasks for cams -

1) **HAULING**, as with the *Rescuender* above in a simple 3:1 pulley system. This is where the cam moves with the rope, physically grasping the rope while the mechanical advantage or pulley system pulls it in, usually with the help of ground-crew pulling the end of the rope.

2) **PROGRESS CAPTURE DEVICE (PCD)** where the cam is in a fixed position so it doesn't move while rope is pulled through during hauling but then holds the load when the haul system stops taking in for rest or if the rope were to be accidentally released. It stops you losing the rope and losing the progress made during hauling. Haul cams may be subjected to much higher forces than the progress capture cam. These days there are a number of dedicated PCD's with integrated pulleys like the Petzl Traxion and larger more complex models like the SMC Advanced Tech HX. These negate the need to use a separate cam as a PCD and are called PCPs, most being usable as a stand-alone pulley. Smaller PCDs that function as ascenders as per EN567 have been included in the PCP Guide since they load via the frame as well as the cam but they are designed specifically to be used as part of a pulley system rather than for ascending, indeed, most of them can operate just as a pulley with the cam detached. Again, hauling is a rather arbitrary category since ALL ascending devices will haul up to their given load ratings. However, some, like the *Gibbs*, have reinforced cam-shells to better cope with high CONSTANT loads. That strength does not translate to dynamic loading though. *Gibbs* are at pains to point out when



one of their many devices is NOT to be used for self belay though they don't make the distinction between ascending and self-belay - see our notes below. Also on hauling, if you're creating a haul system from components it is easier to do this with a detachable

rather than fixed cam where the rope needs to be fed through the device or you have to unbolt it.

ASCENDER: This is a tricky one because any camming device can be used to ascend but not all are suitable. Ascending requires the device to be loaded with a single bodyweight with careful weight transfer to an anchored rope with *no shock load*. However, some, like the offset-eye models by *Rock Exotica* and *Buckingham*, specifically *preclude* ascending because their eyes are more susceptible to carabiner torquing. Two instances when shock-load can occur are.....

1) when you sit back down or load an ascender you have just moved and do it too harshly - you may even 'fall' back onto it during reset instead of a controlled loading. This creates increased shock or impact force at the cam-rope interface and will be exacerbated when you are fatigued.

2) Failure of one of two cams being used or one fails to grip properly and slips down the rope or you accidentally remove it from the rope. In any of these cases you may 'fall' onto the second ascender applying a shock load that might be similar to SELF BELAYING described below. This obviously isn't intended and isn't the ascending perfection that ascenders/grabs prefer but virtually all can cope well enough.



Fusion Climbing's Puma shows the rope channel that stops the cam from completely severing a rope if overloaded

SELF BELAY differs from ASCENDING in that the device is intended to follow you up the rope (or you move it up manually) while you are climbing and it will arrest you should you fall. There is often a period of climbing when slack develops between you and the cam and if you fall, the cam will be shock loaded albeit mitigated by stretch in the rope above the device which will absorb a lot of the impact. Nevertheless, this is NOT a mode of use that many ascender manufacturers would recommend or even imply. Following self-belay accidents on *Gibbs SPORTS* ascenders, *Gibbs* placed stern warnings on their devices and added devices to

their range more suited to higher loadings but still NOT self belay. Industrial climbers mitigate this with shock absorbers and some in this list mandate a shock absorber if being used for self belay/fall arrest. The *Climax Otto* is interesting; it's clearly a copy of the *Gibbs* but it comes with a short sling attachment which negates inappropriate torque on a carabiner and is intended primarily as a fall arrester. *Rescueteck1* sell the *Gibbs* with their own short sling attached but not for fall arrest. Don't say we didn't warn you about this whole fall-arrest/self-belay subject. **Double-check your devices suitability.**

Special thanks to Paul Witheridge

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images approximately to scale	MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Span-Frame/Pin	STANDARDS
	Rescue Rope Grab 5000032	3M DBI-SALA		£88 \$110 €101	374g 13.2oz	98x90x44/62mm 3.8x3.5x1.75/2.4"	EN567
	Rescue Grab RG10	AT HEIGHT		£80 \$82 €149	375g 13.2oz	100 x 100 x 44/82mm 3.9 x 3.9 x 3/3.2"	EN567
	Hold Up	ATN		£80 \$99 €92	295g 10.4oz	88 x 90 x 44mm 3.5 x 3.5 x 1.7"	-
	BuckGrab 5004b 5004BQ4	BUCKINGHAM		£117 \$145 €134	172g 6oz	70 x 73 x 32/42mm 2.8 x 2.9 x 1.25/1.7"	ASTM
	Otto	CLIMAX		£62 \$78 €62	281g 9.9oz exc sling	104 x 78 x 28/65mm 4 x 3.1 x 1.1/2.6"	*EN353-2
	Ascender	CMC		£83 \$103 €95	252g 8.8oz	114 x 76 x 25/58mm 4.5 x 3x1/2.3"	NFPA T/G
	Ropewalker Aluminum NPWRAL	CMI		£93 \$115 €106	200g 7oz	102 x 76 x 19/57mm 4 x 3 x 0.75/2.25"	-
	Ropewalker Stainless RPWRSS	CMI		£102 \$127 €117	312g 11oz	102 x 76x19x57mm 4x3x0.75x2.25"	-
	Arborist Ropewalker NPWRALARB	CMI		£89 \$111 €102	198g 7oz	102 x 76 x 19/38mm 4x3 x 0.75 x 1.5"	-
	Rescue Rope Grab	CRESTO		£120 \$147 €135	374g 13.2oz	98 x 98 x 44/78mm 3.9 x 3.9 x 1.75/3.3"	EN567
	Puma Grab II 12mm	FUSION		n/a	335g 11.8oz	113x99x63mm 4.4x3.9x2.5"	EN567 ANSZI
	Puma Grab II 16mm	FUSION		n/a	300g* 10.6oz	113x99x63mm 4.4x3.9x2.5"	EN567 ANSI

NOTES COST: Approx & inc local tax/VAT * excludes duty/import taxes & shipping DEPTH/THICKNESS: /00mm, figure in

MATERIALS SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	EYE DIAM	FIXED	DETACHABLE	SERIAL NO.	LAD	HAUL	ASCENDER	FALL ARREST	OTHER COLOURS	NOTES	WWW.
Alu Alu		8-16mm 5/16 - 5/8" <30mm web	600kg 1320lb	18mm 0.7"	-	■	-	○	■	■	-			3m.beratertool.de
Alu Alu		8-16mm* 5/16-5/8"	140kg 309lb	22mm 0.9"	■	■	■	○	■	■	-		*or 20-30mm webbing or 4-5mm wire cable	atheightuk.com
Stainless Steel Stainless Steel		9-16mm 3/8-5/8"	n/a	17mm* 0.7"	-	■	-	-	-	■	-		A CMI made sailors' device for mast climbing in a marine environment. #Original version in aluminium *shackle - may vary	atninc.com
Alu Alu		12.7mm 1/2"	n/a	16mm 0.6"	■	-	-	■	-	○	-		5004BQ4= Bolt has a split ring option. 90° offset eliminates the need for a locking twisted clevis	buckinghammfg.com
Alu Alu		8-12mm 5/16 - <1/2"	15kN 3372lbf	18mm 0.7"	-	■	-	-	-	■	■		*This is the Chinese 'GM Climbing' model and clearly a Gibbs copy but sold in Europe. by Climax with the extension sling for fall-arrest	productosclimax.com
Alu Alu		11-13mm 7/16-1/2"	*5kN 1124lbf	25mm 1"	-	■	■	■	■	■	-		*MBS for 11mm MBS=11kN for 13mm	cmcpro.com
Alu Hardened Steel		11-16mm 7/16-5/8"	33kN 7500lbf	25mm 1"	-	■	-	■	■	■	-		Wired Pip-pin	cmigearusa.com
Stainless Steel Hardened Steel		9-16mm 3/8-5/8"	33kN 7500lbf	25mm 1"	-	■	-	■	■	■	-		Hard-coated cam with lifetime warranty	cmigearusa.com
Alu Hardened Steel		11-16mm 7/16-5/8"	33kN 7500lbf	25mm 1"	■	-	-	■	■	■	-		Stainless Bolt secures cam closed for lanyard use	cmigearusa.com
Alu Alu		8-16mm* 5/16-5/8"	600kg 1320lb	22mm 0.9"	-	■	■	■	■	■	■		NB: intended primarily for use in rescue hauling hence the arrow opposite to ascending direction. Also fits webbing 21-32mm wide	cresto.com
Alu Alu		7-12mm 9/32 - <1/2"	23kN 5170lbf	24mm 1"	-	■	-	-	■	■	-		DISCONTINUED	fusionclimb.com
Alu Alu		12-16mm 1/2-5/8"	23kN 5170lbf	24mm 1"	-	■	-	-	■	■	■		DISCONTINUED *Larger rope version is lighter because more shell has been removed to fit 16mm rope	fusionclimb.com

burnt orange is the length of the bolt/pin N/A: info Not Available/not given USE: ○=OK but not ideal ■=Best Suited to this use

images approximately to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Span-Frame/ Pin	STANDARD
		Sport #1	GIBBS PRODUCTS		£50 \$62 €57	195g 6.9oz	104 x 76 x 63mm 4 x 3 x 2.5"	-
		Sport #2	GIBBS PRODUCTS		£50 \$62 €57	200g 7oz	104 x 76 x 63mm 4 x 3 x 2.5"	-
		Rescue #3	GIBBS PRODUCTS		£65 \$80 €74	236g 8.5oz	104 x 76 x 28/ 63 mm 4 x 3 x 1.1/ 2.5 "	ANSI
		Rescue/ Arborist #3B	GIBBS PRODUCTS		£61 \$75 €67	230g 11.6oz	104 x 76 x 28/ 56 mm 4 x 3 x 1.1/ 2.1 "	ANSI
		Rescue #3S	GIBBS PRODUCTS		£61 \$75 €67	331g 11.7oz	104 x 76 x 28/ 63 mm 4 x 3 x 1.1/ 2.5 "	ANSI
		Rescue #3SF	GIBBS PRODUCTS		£61 \$75 €67	331g 11.7oz	104 x 76 x 28/ 63 mm 4 x 3 x 1.1/ 2.5 "	ANSI
		Arborist #3SB	GIBBS PRODUCTS		£61 \$75 €67	320g 11.3oz	104 x 76 x 28/ 56 mm 4 x 3 x 1.1/ 2.1 "	ANSI
		Rescue/ Arborist #4	GIBBS PRODUCTS		£66 \$81 €75	310g 10.9oz	104 x 90 x 30/ 63 mm 4 x 3 x 1.2/ 2.5 "	ANSI
		Rescue/ Arborist #4S	GIBBS PRODUCTS		£66 \$81 €75	425g 15oz	104 x 92 x 30/ 63 mm 4 x 3.6 x 1.2/ 2.5 "	ANSI
		Arborist #4SB	GIBBS PRODUCTS		£66 \$81 €75	414g 14.6oz	104 x 92 x 30/ 56 mm 4 x 3.6 x 1.2/ 2.1 "	ANSI
		Arborist Klimair B	GIBBS PRODUCTS		£105 \$110 €103	156g 5.5oz	75 x 50 x 23/ 32 mm 3 x 2 x 1/ 1.2 "	ANSI
		Mini Ropegrab RP203	ISC		£62 \$85 €71	176g 6.2oz	65 x 85 x 32/ 40 mm 2.6 x 3.4 x 1.3/ 1.6 "	EN353-2


NOTES COST: Approx & inc local tax/VAT * excludes duty/import taxes & shipping DEPTH/THICKNESS: /00mm, figure

TYPE	MATERIALS SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	EYE DIAM	FIXED	DETACHABLE	SERIAL NO.	LAD	HAUL	ASCENDER	FALL ARREST	OTHER COLOURS	NOTES	WWW.
	Alu Alu		11-13mm 7/16-1/2"	11.3kN 2550lb	17mm 0.67"	-	■	-	○	○	■	-		single-person load only. Free-running only, no spring option	gibbsproducts.com
	Alu Alu		11-13mm 7/16-1/2"	11.3kN 2550lb	17mm 0.67"	-	■	-	○	○	■	-		spring can be removed	gibbsproducts.com
	Alu Alu		11-13mm 7/16-1/2"	22.24kN 5000lb	17mm 0.67"	-	■	-	○	■	■	-		spring can be removed	gibbsproducts.com
	Alu Alu		11-13mm 7/16-1/2"	24.02kN 5400lb	17mm 0.67"	■	-	-	■	■	○	-		spring can be removed	gibbsproducts.com
	Alu Alu		11-13mm 7/16-1/2"	24.02kN 5400lb	17mm 0.67"	-	■	-	○	■	■	-		also called ~3SS and previously called #2SS! spring can be removed	gibbsproducts.com
	Alu Alu		11-13mm 7/16-1/2"	24.02kN 5400lb	17mm 0.67"	-	■	-	○	■	■	-		Free-running only - no spring option	gibbsproducts.com
	Stainless Steel Alu		11-13mm 7/16-1/2"	24.02kN 5400lb	17mm 0.67"	■	-	-	■	○	○	-		spring can be removed	gibbsproducts.com
	Alu Alu		14-19mm 5/8-3/4"	25kN 5650lb	17mm 0.67"	-	■	-	○	■	■	-		#4B (bolted) appears to be discontinued but is an easy retrofit. spring can be removed	gibbsproducts.com
	Stainless Steel Alu		14-19mm 9/16-3/4"	25kN 5650lb	17mm 0.67"	-	■	-	○	■	■	-		spring can be removed	gibbsproducts.com
	Stainless Steel Alu		14-19mm 9/16-3/4"	25kN 5650lb	17mm 0.67"	■	-	-	■	○	○	-		Alloy case version still available from stockists. spring can be removed	gibbsproducts.com
	Alu Alu		11-13mm 7/16-1/2"	22.24kN 5000lb	17mm 0.67"	■	□	-	■	■	■	-		Two-way device with swivel. Can run in either direction- locks when loaded. Also available as removable pin model	gibbsproducts.com
	Alu Alu		10-13mm 3/8-1/2"	140kg 308lb 2.5kN 562lbf	19mm 0.75"	■	-	■	■	○	□	-		Also rebadged by Yates	iscwales.com

in burnt orange is the length of the bolt/pin N/A: info Not Available/not given USE: ○=OK but not ideal ■=Best Suited to this use

images approximately to scale	MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Span-Frame/Pin	STANDARD
	Mini Ropegrab RP209	ISC		£65 \$94 €82	180g 6.4oz	65 x 85 x 32/ 62 mm 2.6 x 3.4 x 1.3/ 2.4 "	EN353-2
	Ropegrab RP205	ISC		£67 \$93 €85	302g 10.6oz	99 x 98 x 40/ 67 mm 3.9 x 3.9 x 1.6/ 2.6 "	EN567
	Ropegrab RP204	ISC		£62 \$79 €72	299g 10.6oz	99 x 98 x 40/ 46 mm 3.9 x 3.9 x 1.6/ 1.8 "	EN567
	FA2010300B	KRATOS SAFETY		£67* \$85* €77*	176g 6.2oz	62 x 85 x 28/ 60 mm 2.5 x 3.4 x 1.1/ 2.4 "	EN353-2 EN358
	Tibloc 2	PETZL		£32 \$48 €37	35g 1.2oz	55 x 39 x 22mm 2.2 x 1.5 x 0.9"	EN567 UIAA EAC
	MicroGrab	PETZL		£84 \$80 €85	150g 5.3oz	76 x 84 x 36mm 3 x 3.4 x 1.4"	EN567 NFPA-T EAC
	Rescucender	PETZL		£96 \$110 €97	260g 9oz	110 x 82 x 36mm 4.3 x 3.2 x 1.4"	EN567 EN12841B NFPA-T EAC
	Shunt	PETZL		£63 \$85 €66	188g 6.6oz	110 x 80 x 55mm 4.3 x 3.2 x 2.2"	UIAA
	Grip	PMI		£70 \$86 €79	190g 6.7oz	98 x 74 x 35/ 47 mm 3.9 x 2.9 x 1.4/ 1.85 "	NFPA Berry- Compliant
	Better-Grab2 USR-MRG-333	PRO CLIMB (US RIGGING)		£48 \$60 €55	249g 8.7oz	71 x 90 x 40mm 2.8 x 2.5 x 1.6"	ANSI
	Alu Mini RopeGrab USR-MRG-200	PRO CLIMB (US RIGGING)		£33 \$40 €37	312g 11oz	74x65x30/ 40 mm 2.9x2.6x1.2/ 1.6 "	ANSI

NOTES COST: Approx & inc local tax/VAT * excludes duty/import taxes & shipping DEPTH/THICKNESS: /00mm, figure in I

MATERIALS SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	EYE DIAM	FIXED	DETACHABLE	SERIAL NO.	LAD	HAUL	ASCENDER	FALL ARREST	OTHER COLOURS	NOTES	WWW.
Alu Alu		10.5-13mm 3/8-1/2"	140kg 308lb 2.5kN 562lbf	19mm 0.75"	-	■	■	■	■	■	■		RP201 R-Clip version discontinued. After Nov2017 cord used to retain the pin instead of wire	iscwales.com
Alu Alu		14-16mm 9/16-5/8"	140kg 308lb 2.5kN 562lbf	24mm 0.9"	-	■	■	■	■	■	-		RP206 R-Clip version discontinued. After Nov2017 cord is used to retain the pin instead of wire	iscwales.com
Alu Alu		14-16mm 9/16-5/8"	140kg 308lb 2.5kN 562lbf	24mm 0.9"	■	-	■	■	○	○	-			iscwales.com
Alu Alu		11mm 7/16"	15kN 3372lbf	17mm 0.6"	-	■	-	■	■	-	■	■	*Price includes captive-eye steel carabiner	kratossafety.com
Stainless Steel		8-11mm 5/16 - 7/16"	140kg 308lb 4kN 899lbf	10-12mm* 0.4-0.5"	-	■	■	○	○	○	-		Emergency ascender/hauling device *minimum and maximum carabiner bar size to use, not eye diam.	petzl.com
Alu Alu		8-13mm 5/16 - 1/2"	140kg 308lb 5kN 1124lbf	16mm 0.6"	■	-	■	■	○	○	■			petzl.com
Alu Alu		9-13mm 3/8-1/2"	140kg 308lb 5kN 1124lbf	20mm 0.8"	-	■	■	■	■	■	-		Red 'unlocked' warning indicator shows when cam is not properly secured	petzl.com
Alu Alu		8*/10-11mm 5/16 * 3/8 - 7/16"	#1-8kN 225-1800lbf 20kN 4496lbf	16mm 0.6"	-	■	■	○	-	○	■		*double ropes >8mm Single ropes > 10mm # rope dependent	petzl.com
Alu Alu		10-13mm 3/8-1/2"	5kN 1124lbf (3Sigma)	18mm 0.7"	-	■	■	■	■	■	-		Co-Produced with SMC	pmirope.com
StainlessSteel /Rubber Alu		*11-16mm *7/16-5/8"	24.02kN 5400lbf	16mm 0.6"	□	■	-	■	■	-	-		Rubber coated frame. *min wire core flip-line=13mm,1/2" 300 model discontinued	usrigging.com
Alu Alu		*11-16mm *7/16-5/8"	24.02kN 5400lbf	16mm 0.6"	■	-	-	■	○	-	-		*min wire core flip-line=13mm,1/2"	usrigging.com

burnt orange is the length of the bolt/pin N/A: info Not Available/not given USE: ●=OK but not ideal ■=Best Suited to this use

images approximately to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Span-Frame/ <i>Pin</i>	STANDARD
		RG4-90	ROCK EXOTICA		£90 \$108 €103	227g 8oz	60 x 73 x 32mm 2.4 x 2.9 x 1.3"	EN567
		RG2-90	ROCK EXOTICA		£84 \$98 €112	142g 5oz	60 x 73 x 32mm 2.4 x 2.9 x 1.3"	EN567 ANSI
		RG2	ROCK EXOTICA		£78 \$88 €112	142g 5oz	66 x 98 x 35mm 2.6 x 3.9 x 1.4"	EN567
		S-008/009	S.E. PEAK Shanghai Leidell Ind Co Ltd/NalHon		£77 \$50 €88	180g 6.4oz	85 x 77 x 28/62mm 3.4 x 3 x 1.1/2.4"	EN353-2 EN358
		S-010/011	S.E. PEAK Shanghai Leidell Ind Co Ltd/NalHon		£77 \$50 €88	172g 6oz	85 x 77 x 28/41mm 3.4 x 3 x 1.1/1.6"	ANSI
		Duck R T02 *T02L	SAFETEC		£126 \$178 €144	258g 9.1oz *325g 11.5oz	97 x 73 x 41mm 3.9 x 3 x 1.6"	EN12841A
		Enforcer T03L T03H*	SAFETEC		£138 \$198 €167	305g 10.7oz *390g 13.7oz	86 x 76 x 42mm 3.9 x 3 x 1.6"	EN12841A ANSI NBR CA
		Ringo	SKYLOTEC		£54 \$87 €63	52g 1.8oz	70 x 40 x 18mm 2.7 x 1.6 x 0.7mm	-
		Rope Adjuster 1540RB-Bolt	SL TECH		£27 \$33 €31	181g 6.4oz	62 x 85 x 28/40mm 2.5 x 3.4 x 1.1/1.6"	EN353-2 EN358
		Grip	SMC		£73 \$90 €83	190g 6.7oz	98x74x35/47mm 3.9x2.9x1.4/1.85"	NFPA


NOTES COST: Approx & inc local tax/VAT * excludes duty/import taxes & shipping DEPTH/THICKNESS: /00mm, figure in l

MATERIALS SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	EYE DIAM	FIXED	DETACHABLE	SERIAL NO.	LAD	HAUL	ASCENDER	FALL ARREST	OTHER COLOURS	NOTES	WWW.
Alu Alu		13.5-16mm ½-⅝"	140kg 308lb 4kN 899lbf	15.8mm 0.625"	■	-	■	■	■	-	-		90° offset eye. Despite being EN567 this is NOT intended for ascending because of carabiner torque	rockexotica.com
Alu Alu		9-13mm ⅜-½"	140kg 308lb 4kN 899lbf	15.8mm 0.625"	■	-	■	■	■	-	-		90° offset eye. Despite being EN567 this is NOT intended for ascending because of carabiner torque	rockexotica.com
Alu Alu		9-13mm ⅜-½"	140kg 308lb 4kN 899lbf	15.8mm 0.625"	■	-	■	■	■	-	-		Despite being EN567 this is NOT intended for ascending because of carabiner torque	rockexotica.com
Alu Alu		11-13mm ⅞-½"	15kN 3372lbf	16mm 0.6"	-	■	-	■	-	-	■	■	same or similar models 'badged' as Lixada, Side-Up, NTR-Jiangsu, Yundxi etc. S-009=Bolted version	en.sepeak.net
Alu Alu		11-13mm ⅞-½"	15kN 3372lbf	16mm 0.6"	■	-	-	■	-	○	-		90° Offset eye. S-011 = Sprung pin version -	en.sepeak.net
Alu Alu or *Stainless Steel		10.5-11mm ⅞"	100kg 220lb	19mm 0.75"	-	■	■	■	-	○	■		Tested to 200kg for rescue at FF.0 or less * Stainless Steel cam is silver, (alu is red)	safetecbr.com.br
Stainless Steel Alu or *Stainless Steel		10.5-12mm ⅞-<½"	200kg# 440lb	19mm 0.75"	■	-	■	-	■	■	■		* Stainless Steel cam is silver, (alu is red). #Heavy duty - specifically designed for rescue loads. =cam-rope interface in profile	safetecbr.com.br
Stainless Steel Stainless Steel		8-13mm ⅝-½"	-	10mm 0.4"	-	■	-	-	■	○	-		Emergency Ascender/hauling device. Note Skylootec also has 'Ergograbs' only sold as part of fliplines	skylotec.com
Alu Alu		11mm ⅞"	15kN 3372lbf	17mm 0.6"	■	-	■	■	■	-	■		Also a second model with offset lever-cam eye but not enough details as yet	securitelandry.com
Alu Alu		10-12.5mm ⅜-½"	5kN 1124lbf (3Sigma)	18mm 0.7"	-	■	■	■	■	■	-		Co-Produced with PMI	smcgear.com
													Expansion Row	
													Expansion Row	

burnt orange is the length of the bolt/pin N/A: info Not Available/not given USE: ●=OK but not ideal ■=Best Suited to this use

images approximately to scale	MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Span-Frame/ <i>Pin</i>	STANDARD
	Climb Right Fixed Pin Rope Grab 85528	SPYDER MANUFACTURING		£65 \$80 €74	195g 6.85oz	76x70x32/45mm 3x2.75x1.25/1.75"	ANSI
	Climb Right Fixed Pin Rope Grab Mini 85568	SPYDER MANUFACTURING		£62 \$76 €70	166g 5.85oz	64x69x32/45mm 2.5x2.7x1.25/1.75"	ANSI
	Climb Right Rope Grab 85538	SPYDER MANUFACTURING		£73 \$90 €83	207g 7.3oz	76x70x32/65mm 3x2.75x1.25/2.5"	ANSI
	Climb Right Rope Grab Mini 85578	SPYDER MANUFACTURING		£68 \$84 €77	179g 6.3oz	64x69x32/65mm 2.5x2.7x1.25/2.5"	ANSI
	Rope Grab	STEIN		£54 \$83 €60	176g 6.2oz	65x85x26/40mm 2.6x3.4x1/1.6"	EN353-2 EN567
	MiniRope Grab	STEIN		£48 \$75 €55	166g 5.85oz	64x69x32/45mm 2.5x2.7x1.25/1.75"	EN353 UKCA
	THRG1	TREEHOG/ ARBORTEC		£45 \$60 €49	180g 6.4oz	85 x 45 x 22/40mm 3.4 x 1.8 x 1/1.6"	EN 567
	THRG2	TREEHOG/ ARBORTEC		£58 \$71 €64	175g 6.2oz	85 x 45 x 22/60mm 3.4 x 1.8 x 1/2.4"	EN 567
	Block	US CLIMB		£66 \$82 €75	176g 6.2oz	85 x 45 x 26/62mm 3.4 x 1.8 x 1/2.4"	EN 567
	Block2 UC1219	US CLIMB		£83 \$103 €94	374g 13.2oz	98 x 90 x 44/62mm 3.8 x 3.5 x 1.75/2.4"	EN567
	XD-Q9666	XINDA (BINGFEN OUTDOOR)		£44 \$55 €49	239g 8.4oz	105 x 85mm 4.1 x 3.3"	n/a

NOTES COST: Approx & inc local tax/VAT * excludes duty/import taxes & shipping DEPTH/THICKNESS: /00mm, figure in k

MATERIALS SHELL CAM	CAM	ROPE DIAM RANGE	WLL/MBS	EYE DIAM	FIXED	DETACHABLE	SERIAL NO.	LAD	HAUL	ASCENDER	FALL ARREST	OTHER COLOURS	NOTES	WWW.
Alu Alu		12.7-16mm ½-⅝"	178kg 350lb	19mm 0.75"	■	-	■	■	■	-	-			spyderman.com
Alu Alu		10-12.7mm ⅜-½"	178kg 350lb	19mm 0.75"	■	-	■	■	■	-	-			spyderman.com
Alu Alu		12.7-16mm ½-⅝"	178kg 350lb	19mm 0.75"	-	■	■	■	■	-	-			spyderman.com
Alu Alu		10-12.7mm ⅜-½"	178kg 350lb	19mm 0.75"	-	■	■	■	■	-	-			spyderman.com
Alu Alu		10-13mm ⅜-½"	140kg 308lb 2.5kN 562lbf	19mm 0.75"	■	-	■	■	○	○	■			steinworldwide.com
Alu Alu		11-13mm ⅞-½"	100kg 220lb	19mm 0.75"	■	-	-	■	○	○	-			steinworldwide.com
Alu Alu		9-13mm ⅜-½"	15kN 3372lbf	18mm 0.7"	■	-	■	■	○	■	-			treehog.co.uk
Alu Alu		9-13mm ⅜-½"	15kN 3372lbf	18mm 0.7"	-	■	■	○	■	■	-		DISCONTINUED	treehog.co.uk
Alu Alu		9-13mm ⅜-½"	15kN 3372lbf	18mm 0.7"	-	■	-	○	■	■	■			usclimb.com climbclean.com.br
Alu Alu		8-16mm ⅝-⅝" <30mm web	600kg 1320lb	18mm 0.7"	-	■	-	○	■	■	-		Larger device which runs on 30mm webbing as well as rope	usclimb.com climbclean.com.br
Alu Alu		8-12mm ⅞-½"	15kN 3372lbf	16mm 0.6"	■	-	-	■	○	-	■		* excludes duty/import taxes & shipping	xindaoutdoor.com
Expansion Row														

Turnt orange is the length of the bolt/pin N/A: info Not Available/not given USE: ○=OK but not ideal ■=Best Suited to this use



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UPDATING layout in '24

HANDLED ASCENDERS

Usually for the history of SRT development, it wasn't the cavers we have to thank for handled ascenders it's mountaineers; this time in the guise of the mythical Swiss *Jumar*. Ascender development actually stems from a handled version before being pared down to the hand, chest and foot variants. *Jumar* was years ahead of its time and is a design that wouldn't look out of place today (inset pic right). The original versions from the 60's were grey but after some failures resulting from weakness in the bottom eye and subsequently the frame when the eye was removed, this evolved into the much tougher, vivid yellow signature colour of the so-called *Jumar 79* after its year of introduction. This became my first handled ascender and they served me well for a decade even while experimenting with others. *Jumar* cornered the market to such an extent that they did a 'Hoover' and turned themselves into a verb, to *Jumar* or *Jumaring* as a more precise description of using a mechanical device to climb a rope. 'Ascending' has become the modern generic term but this could equally describe my Great Grandad taking 3 days to get up a flight of stairs. *Swiss-Rescue* continued to produce a newer version of the *Jumar* and fountain-of-all-knowledge Doc Storrick has a double rope version but I'm not sure if this is a home-made conversion since it uses a single bolt through the middle of two handles (pic opposite) but we couldn't find any contacts or details on *Swiss Rescue/Pewatec's* website so we're guessing they're no longer produced. If they are still produced someone needs to have a word about their marketing, it sucks but it's clear that this model shares a lot of ancestry with *Protekt's Proverti* you're interested. Next on the icon list was the 'Clog', another Denny Moorhouse invention and the first of the plate metal rather than cast and extruded models. He incorporated a wider hand opening to better fit a gloved hand and an ergonomic plastic grip. I'm not entirely sure that the *Jumar* can have pre-dated the *Clog* by much since this too was born in the 60's and carried on until '85 when *ClogWales* was bought by *Wild Country*. Denny then continued the good fight with *ISC* and its own iconic modern ascenders. I used both *Jumars* and *Clogs* for a few years with the *Jumar* hand profile being considerably smaller than the *Clog*. Both *Kong* and *Petzl* launched into the fray in the 80's, *Kong* with some revolutionary ideas including their 'Cam Clean' chest and hand ascenders and *Petzl* with their market-leading handled *Expedition* ascender. I was, by then, an avid *Petzl Stop* user but I bypassed the *Petzl Expedition* in favour of *CMI's Ultrascenders* and then to *SRTe's Explorer* (now *3M/Sala* and may be discontinued) both of which I used throughout the 90s and noughties. Both are ultra hard-wearing, heavy duty ascenders. Not that I'm overweight and likely to tax a standard ascender (at least not back then) but we often pushed the envelope beyond their design and certified loading so it was just more



TOP: CAMP TurboHand Pro with additional guide/eye reinforcement at the bottom and rope deviation roller at the top.

MIDDLE: The original Swiss Jumar but this very model is still on the Australian 3M/DBI Sala website rebadged as a Rollgliss 'rope-gripping handle'!

Opposite Page: Top-The spacious CMI Expedition Twin. Below that is the modern version of a Jumar (doubled in this case) by Swiss Rescue but may already be discontinued.

LEFT: Petzl Ascendree double handled, double cam ascender with custom-built frame as distinct from bolting two regular ascenders together.

prudent to go with the highest strength options. I haven't yet changed from my trusty *SRTe* system but I do like the *CAMP Turbo* model pictured here and will probably make a last kit-switch to those for what's likely to be my last set of gear before I start trying to beat Great Grandad's stair-ascending record.

IT'S ALL ABOUT TECHNIQUE

The traditional, and most basic ascending system, pioneered in mountaineering is often called a *Jumar* system later modified into the *Texas Rig*. The *Texas Rig* uses two handled ascenders (or two bootlaces if you're James Bond). One will be attached to a footloop via a length of rope or webbing a few feet long, the other will be attached direct to the sit section of your harness. There should also be a web or rope link between the footloop ascender and the harness as a backup safety in the event of failure or slippage on the harness ascender. In contrast, true *Jumaring* as used by mountaineers was seen by many to be an etrier (tape ladder) attached to each ascender - it might look cumbersome but it gives a great range of options.

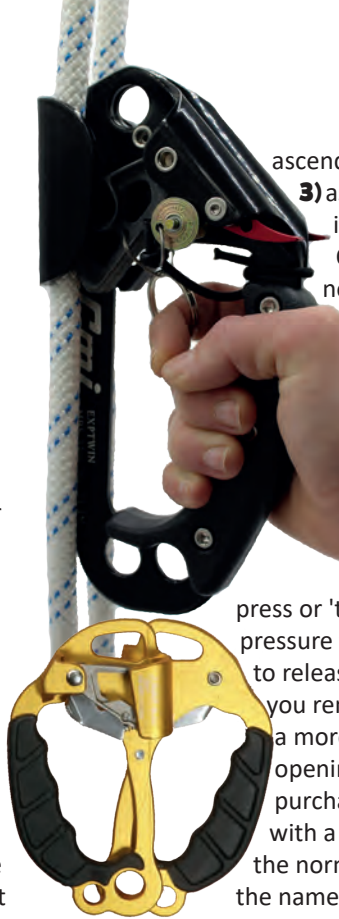
If we put aside double rope ascenders discussed separately overleaf, most arborists currently use a single handled ascender together with a foot ascender (or floating knee system) and/or a chest ascender. Chest ascenders are the more common rope access and caving system while foot ascenders are

more common in arb work. Many will use a hybrid auto-locking descender as a second ascender; it creates more drag than a regular ascender but allows rapid changeover from ascent to descent when manoeuvring around a canopy. Whichever system you use, there is one important scientific principal to consider - centre of gravity. If you sit on the floor with your feet out in front of you and you try to stand up what do you do first? On a Saturday night you might simply try to lunge your backside and upper body upwards while your feet are still out in front and wonder why you've smacked unceremoniously back down (everyone else will know why). On a work day, you would bring you feet inwards and as far under your backside as possible before attempting to stand. Foot ascenders can mitigate some degree of poor technique but on the whole, smoothness of progress and conservation of effort is best when you get your centre of gravity right over your feet and you have smooth upward progress of the ascenders WITHOUT pulling the handle out at an angle - keep them straight or they will catch and stall your progress. Everyone should first learn to ascend with a basic Jumar or Texas system because if you can do that efficiently every other ascending system is a piece of cake. On the other hand, if you only ever ascend on something like a full Mitchell 3-phase system with top ascender, chest roller, knee-cam, foot ascender and weird bits of elastic you might come a cropper if you ever need to do a James Bond and use your bootlaces to escape certain death. Don't say we didn't warn you.

OTHER HANDLED ASCENDER FEATURES

That obvious top eye has traditionally been used to clip a carabiner serving three purposes:

- 1) an added safety to stop the cam enclosure 'unfurling' allowing the cam to invert under high load but these days mitigated by other design features
- 2) to clip a carabiner around the rope thus ensuring the



HANDLED ASCENDERS

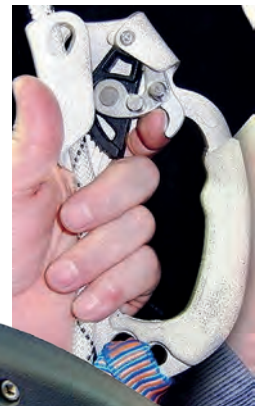
ascender cannot detach completely 3) as a hauling aid or to anchor for use in a haul system.

Otherwise, a sprung safety catch now stops the cam from opening wide enough to release the rope. The catch can also be disengaged and parked (CAM-PARK in our tables) by clipping open on the cam enclosure to make it easier to get on and off the rope. However, if it clicks to the disengaged position too easily during use you could be in for a scary drop. You rarely downclimb by releasing the safety catch and should instead



press or 'thumb' the cam where sideways and/or downward pressure from your thumb or finger on the cam itself is enough to release the rope but it will then re-engage the second cam if you removed your thumb. For this reason some cams have a more pronounced bottom edge while others have an opening or additional material to facilitate better thumb purchase. The pic above right shows *Black Diamond's Index* with a cam that can be 'thumbed' from both sides; thumb in the normal way and your index finger on the back face, hence the name.

Even more unusual is a supremely Russian answer to a problem you didn't even know existed- what to do when you want to downclimb but are using a right handed ascender as a left handed ascender.....add an extra curved hook thingy to allow you to push the cam off the rope with your trigger-finger. This picture also shows the traditional tie off for webbing by larks-footing the bottom eye(s) as mentioned below.



The *CMI Twin* (pic right) has a pip-pin keeping the cam from opening until you depress the end of the

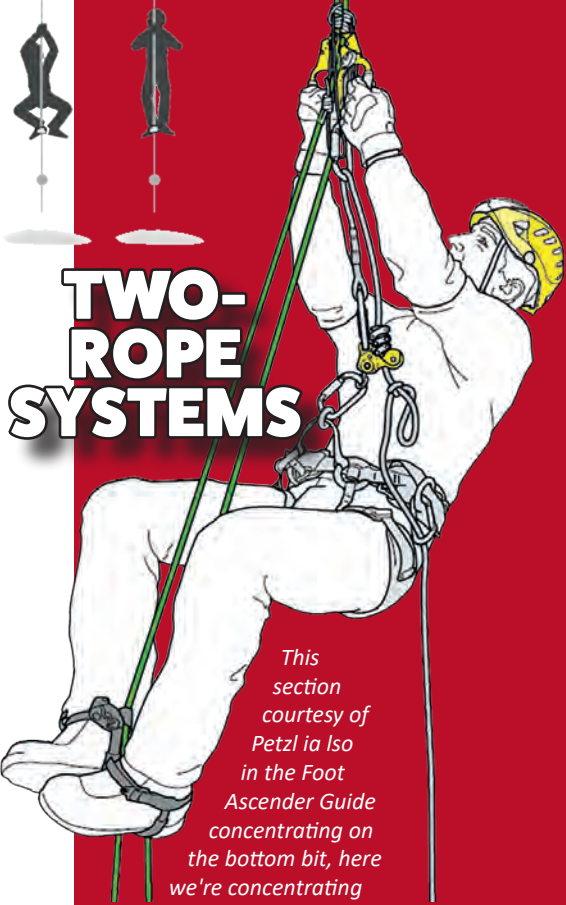


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TWO-ROPE SYSTEMS

This section courtesy of Petzl ia Iso in the Foot Ascender Guide concentrating on the bottom bit, here we're concentrating on the top bit.....With

the modern emphasis on safety using double ropes, this system, courtesy of Petzl, uses con-joined hand ascenders (backed up with prusiks and attached to the ZigZag for easy direction reversal) and a pair of foot ascenders in a conventional sit-stand method which could become the norm or it may remain on the peripheries of systems actually being used. This system helps complicate the DRT/DdRT and SRT/MRS discussion elsewhere in this issue (as it was in issue 13) because it could be that this climber is on a Doubled Rope or DdRT where the rope is simply looped over a branch or through a ring(s) on a cambium saver. Or it could be a Double Rope or DRT using two separately anchored ropes. Of course if you really want to get fussy this could be the same rope with two terminations tied in the middle and attached to the same or two separate anchors - does that make it Single Rope Technique because it's one rope and if it's DdRT isn't that defined as MRS or Moving Rope System in the new terminology? But this one is Stationary? In fact, if this is a doubled rope that isn't tied off and the foot ascenders are con-joined in the old inch-worm style, the rope will indeed be stationary. But if two separate foot ascenders are used, a DdRT rope NOT anchored at the top will actually move a little with each step with some small degree of mechanical advantage - so back to an MRS then? My head still hurts from the last time we mentioned all this.



pin and remove it while the *Kong Trender* (pic left) has a carabine hook attached to a short wire to similarly stop the cam disengaging. On both these models, the pin/carabine hook are in addition to the normal cam safety catch that you see on other ascenders and the *Kong* even has a debris trap above the cams so these

seem like quite extraordinary measures. I can't remember if these were on the very first versions and one wonders if there was unintentional cam opening on the first versions that prompted installation of these backups? Nevertheless, for arborists and the greater risk of debris from above opening or jamming the cam, these are reassuring extra measures.

The holes at the bottom are for a carabiner or *Maillon* and usually connect to a footloop. There is often a second hole which can be used to attach a cowstail which would otherwise need to be clipped into the carabiner in a single-hole ascender. In the original *Jumar* designs webbing was wrapped around the frame rather than trusting to a single eye which, in early stamped models was also pretty thin and not so nicely finished as the modern stamping affords. Nevertheless there is no doubt that if you were connecting direct to webbing the strongest option would be the extruded frame models with their wide cross-section rather than the thin plate of a stamped frame. The old *SRTe Explorer* (now *SALA/Rollglis* and unfortunately virtually gone from the market) had a reinforcing ring on one of its two bottom eyes. This not only strengthens the eye and prevents wear, it also makes the eye more textile-friendly for those connecting their foot loop or cow's-tail direct to the ascender without a *Maillon*/carabiner. The extra material around the eye on the *CAMP TurboHandPro* shown in our titles is a stainless rope guide but has a secondary function as reinforcement of the eye; this model also has a roller to allow deviated rope-entry (left) when inverting the ascender as a haul cam. This picture also nicely illustrates the other main use for the bottom eye we were just discussing.



CHINESE & RUSSIAN MANUFACTURE

Hard to track down and verify are most Russian companies though we have kept *KROK* in. Like Israel they often develop their own incredibly unique and interesting products but unfortunately also copy competitor products far too closely. Currently Russia is a sanctioned state so you couldn't buy their stuff even if you wanted it but there may come a time when their current bizarre dictatorship collapses or is overthrown and they return to a normal democratic state. China is an ongoing problem for us because so many prominent companies in the access and rescue sectors buy in Chinese products to rebadge as their own. We have only recently started including Chinese companies under their own names because some have transparent and comprehensive website and can be contacted for information most notably *Anpen*, *ASAT*. But no sooner had we included *Xinda* products in a previous guide than they were seriously called out by trading standards in the US and Europe for having helmets that were virtually ALL mislabelled as meeting standards that they absolutely did not and it doesn't get any more dangerous than that. In this GUIDE we can be fairly sure that the companies have satisfied themselves of the quality and standards adherence but we remain a little bit sceptical because companies like *Lixada*, *Magideal*, *GM*, *New Doar*, *SOB* and *Xinda* are difficult to track down. We've cautiously included the *Xinda* model because it is well spec'd but don't take that as an endorsement.

HANDLES & ERGONOMICS

Given the amount of load you'll be applying to the handle it's important that this fits nicely in the hand even with a glove on; provides appropriate grip and remains comfortable when you apply load for a sustained period. The first thing you'll need to ascertain is whether your hand will actually fit comfortably in the gap provided. You will see a number of models with quite prominent finger indents rather than a uniformly round handle grip. Compare the *Climbing Technology* and *ISC* handles above right with the more conventional *Black Diamond* handle above Left.. If they fit your hand then these will offer both comfort and enhanced purchase and efficiency, particularly noticeable when pushing up when you're tiring. The top protrusion is the most pronounced feature on many models and acts in a similar fashion to the hilt of a sword; it stops your hand sliding up the handle and has your index and middle fingers nestled

either side as per the picture on the left However, in true Goldilocks tradition, if your hand is a little too large or too small these prominent ridges can be uncomfortable. Try

the grip in your stockist - some may even give you the opportunity to apply some weight on rope which is worth doing and comparing. Just because a handle has no Loch Ness monster curves doesn't necessarily mean it's not as good. Many purists will swear by the cleaner lines of a smooth handle and in the case of the *BD Index* top-left, the black inner face is a more tactile material than simply a smooth plastic so they might argue that they provide just as much grip as the green *ISC* handle above, just in a different way.

Other quirks in handles comes from *Beal/Edelweiss's HandsUp/A16* (left)

which carries on where *Kong's* now discontinued *ProCave* (right) started with a 'shelf' to allow your second hand to be used on the same ascender hence there is no left hand version.

Black Diamond's now discontinued *N-Force* (top-right) had a pivotal attachment to the cam at the top and bottom of the handle. This was another innovation first used by *Kong* in the early eighties and then dispensed with so it's odd that *BD* felt it had enough merit to make a return

HANDLED ASCENDERS

but it does impart a proportionally higher load on the rope so that means it will grip all kinds of rope well but equally may mean you have to be more careful about imparting a shock load as the forces will multiply at the cam-rope interface. This may explain why it is no longer made? Inadvertent force is something you have to beware of with all toothed cams but this could be something as seemingly benign as sitting back too hard on reset.

Grivel's A&D (right) has a built in brake bar rack allowing you to use a carabiner as the brake bar to create a descender making quite sure that your cam is in the locked-the-hell-outa-the-way mode. This would certainly be the quickest changeover option but is clearly aimed at mountaineers rather than arb or industry. However, if you had to have a handled ascender, it's useful to have one that could do this.

Climbing Technology have their double ascender mentioned opposite but they also have the *QuickRoll* (below-right) which is their *Quick Up* ascender with an integrated pulley. (*KROK* have one too but we haven't included it, they're lucky we included the *DoubleCam* given how close both models are to both *CT originals*!) This is for immediate creation of a mechanical advantage system when added to a descender or a pulley. The pulley itself isn't rated for human loading in the same way as the rest of the ascender even though it takes up to a creditable 2kN loading. You really have to treat it as a separate entity that doesn't improve personal safety because it's doing a different job - like a vanity mirror in your vehicle's sun-visor - it doesn't get mentioned in the NCAP safety-in-a-crash ratings but it's handy for checking your hair.

Yet another one from *Kong* - they certainly don't sit around procrastinating do they - is the *Futura* which is one of the smallest designs on the market because it has an external handle unlike every other model in this guide which has an enclosed frame. This means the size of hand is not limited in any way but has also allowed *Kong* to give you a swap-out handle with different finger sizing for a better fit. .



DOUBLES

You could create your own double rope ascender quite easily by gerry-rigging two handled ascenders back-to-back with some strong cable-ties and a couple of carabiners. Since there is no specific standard for a double rope descender and your two single ascenders are still operating in their certified role this might, unusually, contravene any standards or safety issues. With a carabiner or maillon linking the two at the bottom they cannot separate and a sturdy cable-tie or two can withstand any tendency to slide apart if one is loaded while the other isn't. Some companies have pretty much done just this but they have at least used bolts and rivets that are absolutely secure.

So a commercially available double ascender can mean one of four things:

- double cams on an otherwise single handled ascender like the *Miller/Komet* (left) and *CMI* models below left
- Double cams with two handles which are two con-joined ascenders like the six examples far right, four of which are side-by-side and intended ONLY to be used with 2 ropes. The *Petzl* and *Fusion* use custom frames rather than a joining bracket.
- Single cam on a double handle like the *CMI Expedition* and *KROK* on the right. These are unique and are really a fully grown version of what the *Beal Hands Up* and *Kong Caver* aimed with their extra shelf for your second hand.

It is more unusual for both *CMI* and *Komet* (above left), in the new guise of *Honeywell*, to have opted for double cams on a single handed ascender. *CMI's Twin* has the ability to move both cams with one 'trigger' finger via a split ring which seems a little bit of an afterthought in terms of design but does nevertheless do the trick. Both of the Italian

models have opted to have a debris shield on top of the cams - this is to stop ingress of hard material or vegetation that might stop the cams from closing properly - a possibly catastrophic scenario. Odd that this isn't found on EVERY ascender since all have this same failure potential and particularly during tree



The top eye mentioned earlier as a means of stopping cam inversion and for clipping the ascender to the rope so that it cannot completely detach is still present though unlikely to be necessary if you have two opposing cams engaged simultaneously. However this eye can also be used to anchor the

ascender when used as part of a haul system or to haul it up or along a rope during reset.

The Ascender standard EN567 is carried out on single rope so it's a little misleading in terms of the side-by-side models (top 4 pics above)intended to be used on two ropes at all times whereas the back-to-back models can still be used more easily as single rope ascenders. Petzl had this to say about the CE listed in theirs (and CT's) entry: *the Ascentree is not EN567 or 12841 as Petzl do not consider that ascenders used on a 'doubled rope' can fall within the current EN standards. These standards are written for devices used on a single rope, which is clearly not how they are used. To test on a single rope would not be representative and could give false data. Petzl have carried out their own testing in realistic scenarios and offer the product knowing that it has an appropriate level of performance for the techniques illustrated in the product instructions.*



IN THE FOLLOWING TABLES:

ORIGIN: The country selling the product but this is not always the same as the country of manufacture. Where we know, there is an inset flag to show where it is made. You will be able to spot a number of rebadged items in these tables. as usual there are two or three key Chinese companies that make for several US and European companies.

COST: approximate, rounded up and inclusive of local taxes which are generally from 10% and more often 20% in Europe

WEIGHT: for a single ascender except the double versions obviously which still count as a single ascender

DIMENSIONS: Width x Height x Depth/thickness but this last one is not always given - the thickest part will generally be the cam enclosure but occasionally it may be the handle if it is moulded into something akin to a joystick handle on one of those stuffed toy grabbing cranes at an amusement arcade. Also note that this figure can vary from reality of they don't include protruding rivet heads etc.

MATERIALS: When we say 'Alloy' we mean Aluminium Alloy unless otherwise specified.

STANDARDS: for CE these fall into two categories EN567 is the main ascender standard to which all single rope models in this list meet and shown as 'CE'. This is the also standard that the rope diameter ranges meet - usually 8-13mm. There is also EN12841 type B for rope adjusters which also takes in a number of hybrid and descent/fall arrest devices and this requires a slightly larger diameter rope as the lower limit - usually around 10mm. Some of these ascenders meet that standard but a handled/toothed ascender really only has two jobs - ascending and pulling!

ROPE DIAM RANGE: It is best to always use the millimetre sizes in ALL of our MARKET GUIDES because the fractional inch equivalents are just too widely spaced. 1/2" for instance can be anywhere from 12 to 13mm. Fatter ropes make progress harder but too thin a rope can be positively dangerous as it can jam between the cam and enclosure. It's best to ignore the lowest and highest rope diameter claims. Remember that a rope will only get fatter with age so if it was a tight fit with a new rope it may become too large with use and stress the cam enclosure if heavily loaded. The rope range quoted for any models meeting CE is based on EN567; other uses meeting EN12841- B will require a rope that is at least 2mm larger in diameter.

WLL: is the weight of person actually climbing or the weight that can be pulled/hailed before either the rope begins to tear or the cam enclosure unfolds. This was a problem with early stamped models and is now mitigated by a small button or 'crease' in the frame which stops the cam from flipping upwards under high load resulting in an unstoppable downward slide - on that ascender at least - this is why some systems like the Texas Rig, tie the second ascender to the first ascender via a harness tie-in. Incidentally, Skylotec/Anthron and the Russian KROK quote 15, 20 and 18kN (the KROK website figures are different to model images) as a breaking strength of the frame and 4kN as a Working Load Limit which

presumably DOES NOT account for rope failure. *Some of these ascenders list a Working Load Limit of 100kg/220lb which is probably simply anod to minimum standards requirements but, for a fully kitted climber is way too low for operational requirements in a work/rescue environment. These have a huge safety margins to the actual MBS but you could still have insurance problems if something goes wrong. and you are deemed to be applying, let's say a 120kg load to an ascender showing 100kg as the working load limit?*

The **MBS** figure is largely irrelevant as it refers to the strength of the frame, or to be more exact the eyes at each end. If you were to use the frame as a carabiner or a link in a hauling system rather than as the means to exert the pull this might come into play as you try to stretch the frame end to end, otherwise, for operational use, don't worry about it because the failure mode if you overload the ascender will be the cam or the rope, probably the rope. For those that meet EN12841-B there is a minimum 100kg requirement so this might be the figure quoted for WLL here even though it may be capable of a higher working load.

CAM-PARK: This applies to virtually all handled ascenders and is the ability to hold the cam off the rope completely, generally by clipping the safety catch onto the opposite part of the frame.

ANTI CAM-INVERT: This is now a custom-incorporated button or pinch of frame material to stop the cam releasing out of the top of the frame under high load. This was originally mitigated by clipping a carabiner through the top eye and is still used as such by many.

TWIN ROPES ONLY: The double ascenders that use two single rope ascenders connected side by side to facilitate twin rope working are imbalanced if you only use one rope and are designed specifically to be used on two ropes simultaneously at all times. You can use just one rope but it's cumbersome and the ascender will tend to fall to the unweighted side when you take your hand off it.

DOUBLE ROPES: The ability to operate on two ropes simultaneously. Those ascenders without a black square in the TWIN-ONLY column will operate just as easily on one rope, they're just a little heavier and bulkier than usual.

COLOURS: different model colours are separated by a comma. A forward slash/ indicates two (or more) colours on one model. Most companies make their left hand and right hand in two specific colours and for a while we thought the original Petzl colour scheme of Gold for right, Blue for left, might become an industry wide norm. But no, it's now a veritable rainbow of colours, usually with a different colour for each but some use the same colour and many offer just black for both left and right for the tactical and theatre markets. The left hand ascender colour is shown in burnt orange.

images NOT to scale	MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Depth
	Explorer	3M/ DBI SALA/ ROLLGLIS		£117 \$127 A\$200	386g 13.6oz	212 x 88 x 30mm 8.3 x 3.5 x 1.2"
	Move Up	ALPIDEX		£31 \$39 €35	240g 8.5oz	205 x 103 x 27mm 8 x 4.2 x 1.1"
	A11/A10 (A14)	ANPEN		£70 \$86 €80	136g 4.8oz (210g 7.4oz)	205 x 93mm 8 x 3.7"
	Hands Up	BEAL		£63 \$79 €72	265g 9.3oz	235 x 110 x 35mm 9.25 x 4.3 x 1.4"
	Index	BLACK DIAMOND		£80 \$85 €91	200g 7oz	188 x 90 x 28mm 7.4 x 3.5 x 1.1"
	Turbohand	CAMP		£52 \$90 €77	185g 6.5oz	185 x 95 x 22mm 7.3 x 3.7 x 0.9"
	Turbohand- Pro	CAMP		£97 \$120 €102	198g 7oz	185 x 95 x 22mm 7.3 x 3.7 x 0.9"
	Expedition EXPASC	CMI		£107 \$123 €112	273g 10oz	208 x 106 x 35mm 8.2 x 4.2 x 1.4"
	Ultrascender ULT01R	CMI		£102 \$136 €125	270g 9.5oz	188 x 76 x 29mm 7.4 x 3 x 1.12"
	Mini Ultrascender ULT502	CMI		£88 \$79 €73	170g 6oz	127 x 76 x 29mm 5 x 3 x 1.12"

NOTES COST: Approx & inc local tax/VAT WLL: Where no WLL is given by manufacturer we show a

HANDLED ASCENDERS











MATERIALS SHELL CAM GRIP	CAM	STANDARDS	ROPE DIAM RANGE	WLL/ MBS	TOP EYE BOTTOM EYE	CAM -PARK	ANTI CAM- INVERT	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
Extruded Alu Stainless Steel Plastic		CE NFPA AS/NZ	10.5-13mm 3/8 -1/2"	600kg* 1323lbf	00mm 00" 00mm 00"	■	■	■ ■	■ ■	NB: Originally also a 16mm version in red. Previously SRTE.and may be DISCONTINUED. *600kg is to cam-failure	3m.com.au
Stamped Alu Steel Plastic/Rubber		CE	8-13mm 5/16 -1/2"	120kg 265lb	00mm 00" 00mm 00"	■	■	■	■		alpidex.com
Stamped Alu Steel Plastic/Rubber		CE	8-13mm 5/16 -1/2"	5kN 1124lbf	00mm 00" 00mm 00"	■	■	■ ■	■ ■	A14=More substantial handle and plastic covered cam release	en.anpen.net
Stamped Alu Steel Rubber		CE	8-13mm 5/16 -1/2"	100kg 220lb	00mm 00" 00mm 00"	■	■	*	■	*single ascender only, not a pair. Comfort grip on cam enclosure when gripped with second hand	pro.beal-planet.com
Stamped Alu Steel Plastic/Rubber	n/a	CE	8-13mm 5/16 -1/2"	n/a	00mm 00" 00mm 00"	■	■	■	■	previous models grey	blackdiamondequipment.com
Stamped Alu Hardened Steel Rubber		CE EAC	8-13mm 5/16 -1/2"	120kg 265lb	00mm 00" 00mm 00"	■	■	■ ■	■ ■		camp.it
Stamped Alu Hardened Steel Rubber		CE EAC	8-13mm 5/16 -1/2"	120kg 265lb	00mm 00" 00mm 00"	■	■	■ ■	■ ■		camp.it
Stamped Alu Hardened Steel Plastic		NFPA*	9-16mm 3/8-5/8"	17.8kN 4000lbf	00mm 00" 00mm 00"	■	■	■	■	Hard-coated cam with lifetime warranty, *Also an NFPA version available +\$10	cmigearusa.com
Extruded Alu Hardened Steel Rubber		NFPA*	9-16mm 3/8-5/8"	20.4kN 4600lbf	00mm 00" 00mm 00"	■	■	■ ■	■ ■	Hard-coated cam with lifetime warranty *NFPA version +\$10	cmigearusa.com
Extruded Alu Hardened Steel None		NFPA*	9-16mm 3/8-5/8"	20.4kN 4600lbf	00mm 00" 00mm 00"	■	■	■ ■	■ ■	Hard-coated cam with lifetime warranty *NFPA version +\$10	cmigearusa.com

Max Load based on approx 10:1 safety ratio N/A: info Not Available/not given COLOURS: =Body colour.

images NOT to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Depth
		Hand Cruiser	EDELRID		£54 \$85 €65	201g 7.1oz	188 x 103 x 34mm 7.4 x 4 x 1.3"
		AS16	EDELWEISS		£57 \$70 €48	240g 8.5oz	235 x 110 x 35mm 9.25 x 4.3 x 1.4"
		Capitan/ (Capitan Industry)	FIXE		£38 \$65 €42	270g 9.5oz	200 x 90 x 35mm 7.9 x 3.5 x 1.4"
		Beklim (Voltron)	FUSION		£54 \$65 €60	175g 6.2oz	191 x 89 x 27mm 7.6 x 3.6 x 1"
		A1	GRIVEL		£47 \$70 €49	247g 8.7oz	203 x 98 x 35mm 8 x 3.9 x 1.4"
		A&D	GRIVEL		£59 \$80 €54	261g 9.2oz	203 x 98 x 35mm 8 x 3.9 x 1.4"
		Pulsar D40	HEIGHTEC		£51 \$84 €76	240g 8.5oz	195 x 91 x 29mm 7.7 x 3.6 x 1.1"
		Single	HONEYWELL MILLER/KOMET		£99 \$123 €98	225g 7.9oz	193 x 90 x 25mm 7.6 x 3.5 x 1"
		RP220	ISC		£93 \$105 €95	130g 4.6oz	218 x 82 x 32mm 8.6 x 3.2 x 1.3"
		RP221 Ultrasafe	ISC		£105 \$110 €100	183g 6.5oz	218 x 82 x 32mm 8.6 x 3.2 x 1.3"

NOTES COST: Approx & inc local tax/VAT WLL: Where no WLL is given by manufacturer we show a

HANDLED ASCENDERS

MATERIALS SHELL CAM GRIP	CAM	STANDARDS	ROPE DIAM RANGE	WLL/ MBS	TOP EYE BOTTOM EYE	CAM -PARK	ANTI CAM- INVERT	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
Stamped Alu Stainless Steel Rubber		CE UIAA	8-13mm 5/16 - 1/2"	140kg 308lb	43 x 21mm 1.7 x 0.8" 35 x 15mm 1.8 x 0.6"	■	■	■	■		edelrid.de
Stamped Alu Hardened Steel Plastic		CE	8-13mm 5/16 - 1/2"	100kg 220lb	00mm 00" 00mm 00"	■	■		■	single ascender only, not a pair.	edelweiss-ropes.com
Stamped Alu Steel Rubber		CE UIAA	8-12mm 5/16 - 1/2"	20kN 2039lbf	00mm 00" 00mm 00"	■	■	■	■	As far as we can tell, the Industry has a slightly different cam and cam safety - less aggressive teeth perhaps?	fixeclimbing.com
Stamped Alu Steel Plastic		CE	8-13mm 5/16 - 1/2"	2kN 450lbf 100kg 220lb	15mm 0.6" 26 x 16mm 1 x 0.6"	■	■	■	■	NB: carbon Fibre pattern not actually made of carbon-fibre.	fusionclimb.com
Stamped Alu Steel Plastic		CE UIAA	8.3-13mm 5/16 - 1/2"	20kN 2039lbf	00mm 00" 00mm 00"	■	-	■	■		grivel.com
Stamped Alu Steel Plastic		CE UIAA	8.3-13mm 5/16 - 1/2"	n/a	00mm 00" 00mm 00"	■	-	■	■	Ropes from 7.3-13mm for descent	grivel.com
Stamped Alu Hardened Steel Nylon		CE	9-13mm 3/8 - 1/2"	100kg 220lb	15mm 0.6" 15mm 0.6"	■	■	■	■		heightec.com
Stamped Alu Hardened Steel Plastic		CE NFPA	8-13mm 5/16 - 1/2"	100kg 220lb 5kN 1124lbf	00mm 00" 00mm 00"	■	■	■	■		honeywellsafety.com
Extruded Alu Hardened Steel Plastic		CE	9-13mm 3/8 - 1/2"	140kg 308 lb 2.5kN 562lbf	00mm 00" 00mm 00"	■	-	■	■		iscwales.com
Extruded Alu Hardened Steel Plastic		CE	9-13mm 3/8 - 1/2"	140kg 308lb 2.5kN 562lbf	00mm 00" 00mm 00"	■	■	■	■	Ultrasafe version has cam arc restriction/Anti-cam-invert pin	iscwales.com
										Expansion Row	
										Expansion Row	

Max Load based on approx 10:1 safety ratio N/A: info Not Available/not given COLOURS: =Body colour.

images NOT to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Depth
		Futura Hand/ Futura Hand Tactical	KONG		£70 \$85 €75	125g 4.4oz	140 x 88 x 24mm 5.5 x 3.5 x 1"
		Lift/ Lift Tactical	KONG		£49 \$72 €51	225g 7.9oz	193 x 90 x 25mm 7.6 x 3.5 x 1"
		FA 70 003 00 FA 70 002 00	KRATOS SAFETY		£82 \$102 €60	220g 7.8oz	206 x 95.5 x 35mm 8.1 x 3.8 x 1.4"
		Ascension	PETZL		£58 \$100 €66	165g 5.8oz	190 x 90 x 26mm 7.5 x 3.5 x 1"
		Proverti CD211/212	PROTEKT		£37 \$46 €42	280g 9.9oz	207x100x28mm 8.1x3.9x1.1"
		Ultralight CD211L/212L	PROTEKT		£40 \$50 €45	205g 7.2oz	190 x 93 x 24mm 7.5 x 3.7 x 1"
		RE Ascender	ROCK EMPIRE		£48 \$60 €54	220g 7.8oz	203 x 98 x 35mm 8 x 3.9 x 1.4"
		Clean Cam	SAR PRODUCTS		£60 \$82 €75	216g 7.6oz	189 x 90 x 32mm 7.5 x 3.5 x 1.3"

NOTES COST: Approx & inc local tax/VAT except* which is exc import duty and shipping WLL: Where no WLL is given by ma



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HANDLED ASCENDERS

MATERIALS SHELL CAM GRIP	CAM	STANDARDS	ROPE DIAM RANGE	WLL/ MBS	TOP EYE BOTTOM EYE	CAM -PARK	ANTI CAM- INVERT	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
Extruded Alu HardenedSteel Rubber		CE	8-13mm 5/16 -1/2"	n/a	00mm 00" 00mm 00"	■	■	■ ■	■ ■	two different sized grips available	kong.it
Stamped Alu HardenedSteel Plastic		CE NFPA	8-13mm 5/16 -1/2"	100kg 220 lb 5kN 1124 lbf	00mm 00" 00mm 00"	■	■	■ ■ ■	■ ■ ■		kong.it
Stamped Alu Steel Plastic		CE	10-12mm 3/8-1/2"	20kN 2039 lbf	00mm 00" 00mm 00"	■	-	■	■	002=Black 003 = Green	kratossafety.com
Stamped Alu Stainless Steel Plastic/Rubber		CE EAC NFPA	8-13mm 5/16 -1/2"	140kg 308 lb	00mm 00" 00mm 00"	■	-	■	■ ■	All -black version is two or three £\$€ more	petzl.com
Extruded Alu Steel Plastic		CE UIAA	9-13mm 3/8-1/2"		00mm 00" 00mm 00"	■	-	■	■	Older right hand models were blue. Proverti is a wholly owned subsidiary of Protekt	protekt.pl
Stamped Alu Steel Plastic		CE	8-13mm 5/16 -1/2"	100kg 220 lb	00mm 00" 00mm 00"	■	■	■	■		protekt.pl
Stamped Alu Steel Plastic		CE	8-12mm 5/16 -1/2"	4kN 899lbf	00mm 00" 00mm 00"	■	■	■	■	Discontinued by RE but many rebadged versions inc Lixada, GM, Newdoar, Climbtech, Xinda, Grivel and Fixe	rockempire.cz
Stamped Alu Stainless Steel Soft Nylon		CE UIAA	8-13mm 5/16 -1/2"	140kg 308 lb	00mm 00" 00mm 00"	■	■	■	■ ■		sar-products.com

manufacturer we show a Max Load based on approx 10:1 safety ratio N/A: info Not Available/not given COLOURS: =Body colour.

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images NOT to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Depth
		SA203	S.E.PEAK		£37 \$45 €42	184g 6.5oz	191 x 89 x 27mm 7.6 x 3.6 x 1"
		Lift	SINGING ROCK		£59 \$70 €59	190g 6.7oz	192 x 90 x 34mm 7.6 x 3.5 x 1.3"
		Lift Fix	SKYLOTEC (ANTHRON)	 	£62 \$70 €67	216g 7.6oz	203 x 91 x 34mm 8 x 3.6 x 1.3"
		CT Quick'Up+	SKYLOTEC		£66 \$82 €75	215g 7.6oz	190 x 90 x 33mm 7.5 x 3.5 x 1.3"
		CT Quick Roll	SKYLOTEC		£101 \$120 €110	255g 9oz	190 x 95 x 35mm 7.5 x 3.7 x 1.4"
		RB17	SOB		£28 \$34* €32	210g 2.4oz	200 x 90 x 26mm 7.9 x 3.5 x 1"
		Jumar	SWISS RESCUE/ PEWATEC		n/a	250g 8.8oz	183 x 85 x 28mm 7.3 x 3.3 x 1.1"
		Passport	TRANGO	 	£53 \$65 €60	219g 7.4oz	194 x 86 x 27mm 7.6 x 3.3 x 1"
		71-257/8	TREERUNNER		£41 \$44 €40	200g 7oz	190 x 90 x 25mm 7.5 x 3.7 x 1"
		H-SS02	XINDA (BINGFENG OUTDDOR)		£53 \$65 €60	210g 7.7oz	190 x 90 x 25mm 7.5 x 3.7 x 1"

NOTES COST: Approx & inc local tax/VAT except * which is exc import duty and shipping WLL: Where no WLL is given by ma

HANDLED ASCENDERS

MATERIALS SHELL CAM GRIP	CAM	STANDARDS	ROPE DIAM RANGE	WLL/ MBS	TOP EYE BOTTOM EYE	CAM -PARK	ANTI CAM- INVERT	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
Stamped Alu Stainless Steel Plastic		CE	8-13mm 5/16 -1/2"	2kN 450lbf 140kg 308lb	15mm 0.6" 26 x 16mm 1 x 0.6"	■	■	■ ■ ■	■ ■ ■		sepeak.net (often difficult to access)
Stamped Alu Stainless Steel Plastic		CE UIAA	8-13mm 5/16 -1/2"	120kg 265 lb 12kN 2698 lbf	00mm 00" 00mm 00"	■	-	■	■		singingrock.com
Stamped Alu Steel Rubber 'cork' compound		CE NFPA	9-13mm 3/8-1/2"	4kN 899lbf 18kN 4047 lbf	00mm 00" 00mm 00"	■	■		■ ■	Skylotec Germany owns Anthon Slovenia	skylotec.com
Stamped Alu Steel Plastic/Rubber		CE	8-13mm 5/16 -1/2"	140kg 308lb	00mm 00" 00mm 00"	■	■	■	■		climbingtechnology.com
Stamped Alu Steel Plastic/Rubber		CE	8-13mm 5/16 -1/2"	140kg 308lb	00mm 00" 00mm 00"	■	■	■	■		climbingtechnology.com
Stamped Alu Steel Plastic		CE	8-13mm 5/16 -1/2"	100kg 220lb	00mm 00" 00mm 00"	■	■	■	■	optimum rope=10-13mm [arborists reported cam- rope interface problems with the SOB foot ascender - beware!]	chinasob.com
Extruded Alu Steel Plastic		CE*	9-13mm 3/8-1/2"		00mm 00" 00mm 00"	■	-	■	■	DISCONTINUED ?	swiss-rescue.de
Stamped Alu Steel Plastic		CE	8-13mm 5/16 -1/2"	4kN 899lbf	15mm 0.6" 14mm 0.6"	■	■	■	■	purple Left colour discontinued	trango.com
Stamped Alu Steel Plastic		CE	8-13mm 5/16 -1/2"	100kg 220lb	00mm 00" 00mm 00"	■	■	■	■		grube.de
Stamped Alu StainlessSteel Rubber		CE UIAA	8-12mm 5/16 -1/2"	150kg 3lb	00mm 00" 00mm 00"	■	-	■ ■ ■	■ ■ ■		xindaoutdoor.com
											Expansion Row
											Expansion Row

Manufacturer we show a Max Load based on approx 10:1 safety ratio N/A: info Not Available/not given COLOURS: =Body colour.

images NOT to scale		MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Depth
		A10 AB	ANPEN		£107 \$130 €120	540g 19.4oz	205 x 155mm 8 x 6.1"
		Expedition Double	CMI		£172 \$213 €196	369g 13oz	208 x 178 x 35mm 8 x 7 x 1.4"
		Expedition Twin	CMI		£211 \$258 €237	432g 15oz	208x106x51mm 8.2x4.2x2"
		Double	HONEYWELL MILLER/KOMET		£150 \$186 €170	550g 19.4oz	220x180x50mm 8.7x7x2"
		Trender	KONG		£180 \$240 €205	550g 19.4oz	220x180x50mm 8.7x7x2"
		Ascentree	PETZL		£132 \$250 €175	330g 11.6oz	190x175x51mm 7.5x6.9x2"
		SA-205D	S.E.PEAK		£78 \$97 €88	390g 13.7oz	195 x 165 x 50mm 7.7 x 6.5 x 2"
		CT QuickArbor H	SKYLOTEC		£125 \$200 €165	500g 17.6oz	160x220mm 6.3x8.7"

NOTES COST: Approx & inc local tax/VAT WLL: Where no WLL is given by manufacturer we show a Max Load based on approx 10:1 safe

TWIN CAM & TWIN HANDLED ASCENDERS

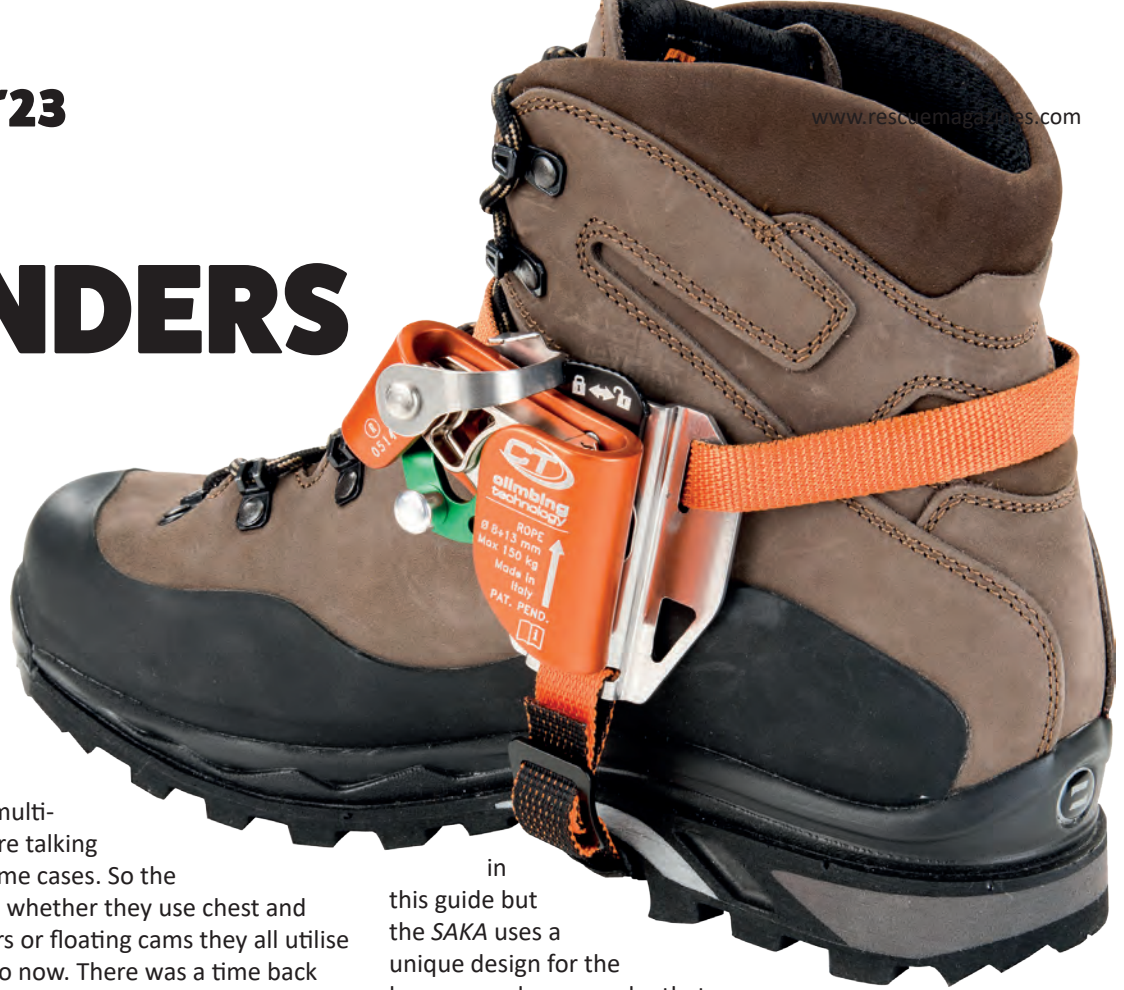
MATERIALS SHELL CAM GRIP	CAM	STANDARDS	ROPE DIAM RANGE	WLL/ MBS	TWIN ROPES ONLY	DOUBLE &/or SINGLE ROPE	CAM -PARK	ANTI CAM- INVERT	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
Stamped Alu Steel Plastic		CE	8-13mm 5/16 - 1/2"	5kN 1124lbf	-	■	■	■	■/■	■/■		en.anpen.net
Stamped Alu Hardened Steel Plastic		-	9-16mm 3/8-5/8"	15.1kN 3400lbf	-	■	■	■	■	■	Hard-coated cam with lifetime warranty	cmigearusa.com
Stamped Alu Hardened Steel Plastic		-	9-16mm 3/8-5/8"	14.7kN 3300lbf	-	■	■	■		■	Hard-coated cam with lifetime warranty	cmigearusa.com
Stamped Alu Hardened Steel Plastic		CE UIAA	11-13mm 7/16 - 1/2"	100kg 220 lb	-	■	■	■		■/■		honeywellsafety.com
Stamped Alu Hardened Steel Plastic		CE UIAA	11-13mm 7/16 - 1/2"	100kg 220 lb	-	■	■	■	■/■	■/■	debris ingress protection plate	kong.it
Stamped Alu Stainless Steel Plastic/Rubber		CE*	8-13mm 5/16 - 1/2"	140kg 308 lb	■	-	■	■	■	■	Not EN567	petzl.com
Stamped Alu Stainless Steel Plastic		CE	8-13mm 5/16 - 1/2"	140kg 308lb	■	-	■	■	■	■	Beklim Double discontinued by Fusion. S.E.Peak is Shanghai Leideer Trading Co but hard to pin down their own website - they use Amazon & Alibaba shops	sepeak.net (may be difficult to access)
Stamped Alu Steel Plastic/Rubber		CE	10-13mm 3/8 - 1/2"	140kg 308 lb	■	-	■	■	■	■	Cam cover protects from debris ingress. No depth given as the two ascenders are angled	skylotec.com
												Expansion Row
												Expansion Row
												Expansion Row 2x Russian Krok models temporarily excluded

Weight ratio N/A: info Not Available/not given TWIN ROPES ONLY-can operate on one but imbalanced/cumbersome COLOURS: =Body colour.

UPDATED Nov '23

FOOT ASCENDERS

Once again we have cavers to thank for inventing a genre of hardware that has only recently been pushed on to the next level of development by the impetus of arborists. Rope walking systems were developed for long single and multi-pitch ascents in caving and we're talking well over a thousand feet in some cases. So the systems had to be efficient and whether they use chest and knee combinations, chest rollers or floating cams they all utilise a foot ascender. At least they do now. There was a time back in the dark ages of 70s caving before dedicated foot ascenders when the venerable *Jumar* hand ascender - perhaps the original mechanical ascender and the reason many still use the term 'Jumaring' generically - was unceremoniously strapped to a metal bar in a kind of double stirrup formation known as a *Mar-Bar*. This was used in a sit-stand or inchworm ascending method in combination with a top ascender. It had largely seen its day by the eighties but oddly was revived for a time by *Buckingham* using *CMI Ultrascenders* and sold to arborists. It does have the advantage of being an incredibly simple and forgiving technique if all you want to do is get from point A to point B in a vertical straight line and it may well still be used to good effect by some arborists and cavers. But for the most part the *Mar-Bar* was superseded by a dedicated foot ascender which strapped to the boot with a web harness. But not always as a simple cam with a minimalist cam enclosure. I remember using a French design for a while in the early nineties, or thereabouts, that had a metal platform angling under the boot sole. This was 'bent' at right angles from the rest of the cam frame and sat snugly in front of the heel offering decent support. It's not a million miles away from an arborist spur/gaff and it's a little surprising that a similar design doesn't still exist. Probably an engineering issue with that bent heel section flexing too much and eventually cracking? Instead we now have a whole host of cams-with-boot-harness and their latest guise as direct-to-boot mounts or direct-to-spur/gaff mounts. Concurrently with foot ascenders has been the development of 'floating' cam systems at the knee like *HAAS* and *SAKA* where one leg may have a proprietary foot ascender while the other has a modified chest or foot ascender located at the knee and connected to a foot loop with a semi-rigid strap.. We haven't included these knee ascenders



in this guide but the *SAKA* uses a unique design for the knee ascender so maybe that will end up being modified as new brand of foot ascender rather than use the *Skylotec/CT* model as they do now. All of these latter designs have been uniquely developed by and for arborists so it's nice to be giving something back to the cavers who don't generally have enough of a market share to drive sophisticated development.

This isn't an instructional article on how to climb so we do assume a basic knowledge of climbing using a foot ascender(s). But just to clarify the basics, the current norm for arb-work climbing is a foot ascender married to your 'descent' system to capture progress. As you stand up on the foot ascender (straighten your leg) you pull the tail rope through your descender/hybrid device, sit back/load your device and start again but not as slowly as this sentence took to write. Efficiency can be improved using an additional ascender, chest ascender etc. and various drag attachments to help self tail (pull slack rope through your devices.) The more efficient and quicker ascent systems may not include a descent-capable device at all since this causes increased friction. Now the foot ascender and its associated systems are all about efficiency. Efficiency in terms of using less energy, increasing speed and not being limited to a simple straight line ascent before having to switch equipment. Foot ascenders are the start point for most current arb systems. Arborists want to be able to get into and move around the canopy so foot ascenders also became smaller and less obtrusive. The *Petzl Pantin* was, for a long time, the market leader until it had issues with rope's falling out when the cam jammed open but its back now and hunting for top spot against a whole load of other models. Some retain the simplicity of the earliest models with a simple eye to clip a carabiner and

stop the cam opening during ascent and releasing your rope and some are a lot more technical like the *Camp Turbo* with its integral rollers and the *Notch Jet-Step* with its double cams, of which, more later. Most designs now have a safety cam to prevent rope coming out and some, like the *ISC Stryder* take this to a new level by having a release knob long enough to be kicked on and off with your boot - no more pesky bending to engage or disengage.



And then came bolt-on models. These will directly attach to either your boot or your spurs/spikes/gaffs. These have advantages over a webbing harness of NOT coming loose during work and being quicker and easier to put on and take off. In the case of spikes, some, like the *KiwiKlimbers* above, are semi-permanently bolted on- not that you can't take them off but it requires tools and isn't the intention so when you're not using the ascender - it's still there. Luckily it's not very obtrusive and remains the sturdiest of all foot ascender options. Latterly *CAMP* have joined the spike party with their *TurboSpike*. The *CT* model has an intermediate mounting plate (right) between the spike and the ascender (left) which is designed to resist the rotational forces that you would get when applying weight during the 'stand' phase. Again, a little bulky but it needs to be to provide a firm fix.

The midway option between direct attachment and harness attachment is a harness with an intermediate plate (right) . This seems a little superfluous, after all, you could just attach a *CT* foot ascender directly to the harness but this plate has a considerably smaller profile than the ascender so the ability to remove the ascender leaving just the plate means you can leave the harness on your boot with less concerns of hindrance while walking or driving. Finally for this genre you could buy the plate separately and bolt it on to your own boots but don't come crying to us when the side of your boots rip out. We're guessing that *ArbPro* and *CT* have firm grounds to choose the specific boots they have to take a plate or lug fixing not to mention plenty of testing.

IT'S ALL ABOUT TECHNIQUE

All ascenders require good technique to operate efficiently and foot ascenders are no exception. You might think that having the ascender strapped to your foot absolves you of the need to do anything but 'walk' up the rope with an exaggerated high knee action. But you'll quickly find out that poor technique, poor posture and fatigue can all cause you to align the rope to the cam badly and either increase drag or decrease traction. In fact, if you angle your foot enough some cams may not engage at all and your foot could slip until the correct angle is regained.

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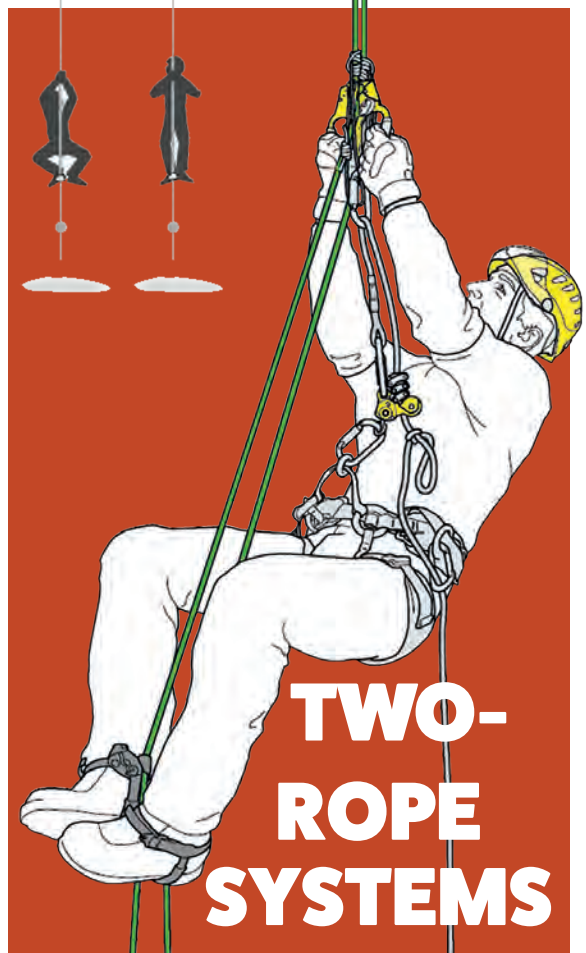
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Some climbers in other rope work sectors take advantage of this anomaly to be able to reposition downwards, something that would normally require you to release the cam and keep it clear of the rope for the duration of the downward movement. Slight angling of the cam and indeed the entire ascender is why many have a specific left and right and the tendency to drag the cam or inadvertently jam it open is why you need to stick to the prescribed cam orientation as well as aspire to good technique. The trick is to figure out how your particular cam wants to work. Some cams are more aggressive than others particularly European models that evolved from caving or mountaineering where wet, muddy and icy ropes need to be contended with. *Petzl*, *Camp*, *Kong* and *CT* all tend to have quite aggressive teeth and these will bite through ice and mud but can catch the threads of larger weave arb ropes. *ISC* and *CMI* cams are less aggressive teeth patterns, slightly broader and shorter while the *Ninja* and *Jet-Step* uses rope-friendly ribs. Notice how the *Petzl* cam (above right) has a mud/water ejecting slot and more downward facing teeth while the *ISC* cam's (right) are more perpendicular and slightly multi-directional, this probably makes it more forgiving of poor directional loading but you can see how it might clog and freeze more easily in snow and ice.



While performance on specific ropes will vary and durability over time will vary, one thing you can say about the majority of these designs is that they are quite similar - you can't really get too far away from a toothed or ribbed cam and a metal cam enclosure albeit that some are rolled /stamped sheet metal while one or two are much bulkier but stronger milled or extruded alloy. **Some have an extended cam release knob that enables you to use your foot to 'kick' off the cam but this can also be a snag hazard if you're not used to it.** The majority are anodized, one or two like the *Russian Krok* and *CMI* are powder-coated. The cam lock/unlock is a feature that differs from model to model with some dispensing with it altogether in favour of the original, rather cumbersome carabiner eye while others have both. Two models that do stand out however are the *Notch Jet-Step* and *Harken Ninja* (below), basically the same kit, different colour. They have two cams but are quite specifically for a single rope with the rope sandwiched between the two cams instead of against a cam enclosure wall. The silver section at the top is a rope guide. This is the only ascender in our list to have a ribbed instead of toothed cam and the manufacturer claims this will grip wet, muddy and icy ropes. Certainly there's less to clog up and trap debris and ribbed cams are well tried and tested by such rope-industry giants as *Rock Exotica* and *Gibbs*. This sandwich-style cam design might be familiar to yachtsmen and indeed its pedigree is *Harken* so quality is pretty much assured. It has a lighter spring than normal so self-tending of an unloaded tail of rope is a little easier (ie. it doesn't to drag unloaded rope as you raise your foot).



TWO-ROPE SYSTEMS

Above: With the modern emphasis on safety using double ropes this system from Petzl using con-joined hand ascenders and a pair of foot ascenders in a conventional sit-stand method could become the norm or it may remain on the peripheries of systems actually being used. This system helps complicate the DRT/DdRT and SRT/MRS discussion elsewhere in this issue because it could be that this climber is on a Doubled Rope or DdRT where the rope is simply looped over a branch or through a ring(s) on a cambium saver. Or it could be a Double Rope or DRT using two separately anchored ropes.

Of course if you really want to get fussy this could be the same rope with two terminations tied in the middle and attached to the same or two separate anchors - does that make it Single Rope Technique because it's one rope and if it's DdRT isn't that defined as MRS or Moving Rope System in the new terminology? But this one is Stationary? In fact, if this is a doubled rope that isn't tied off and the foot ascenders are con-joined in the old inch-worm style, the rope will indeed be stationary. But if two separate foot ascenders are used, a DdRT rope NOT anchored at the top will actually move a little with each step with some small degree of mechanical advantage - so back to an MRS then? My head hurts.

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SUMMARY OF FOOT ASCENDER TYPES:

1) BOOT HARNESS FOOT ASCENDER

The majority of models in our list come with a pre-threaded and stitched webbing harness. Some have fixed elements particularly the stirrup section that goes under the sole but most adjust both around the boot and under the boot.



these are the two newest arrivals, virtually identical *Notch Jet Step* in green and the *Harken Ninja* in red. They have a dual cam arrangement providing grip to both sides of a **single rope** strand. A rope guide above ensures that the rope runs through the middle of the cams. Grip should be the best but they are bulkier than many might like. Definitely worth investigating.

2) DIRECT TO BOOT ASCENDER

ArbPro have pioneered this one with the *Cervino Wood Quickstep* able to have the *ArbPro* foot ascender directly connected to lugs without the need for a web harness/strapping. Currently this is the only such model.



In the following TABLES, Foot ascenders ARE NOT PPE so the usual life safety **STANDARDS** don't apply.

We've used the term '**MAX LOAD**' rather than the more usual WLL or SWL because the manufacturers have used differing terms but this is the Working load limit not MBS.

3) INTERMEDIATE BOOT-PLATE ASCENDER



This can be fixed directly to the boot, effectively giving you the same as 2) above except with a little more bulk but most often the plate will be attached to a web harness/strapping and you attach the ascender to that. The big advantage of a harness-with-plate is that the ascender can be removed without having to take the entire harness off your boot so you can walk around or drive unhindered.



'**ANTI CAM-INVERT**' refers to a cam restraint or cam safety at the top &/or bottom that stops it opening wide enough to release the rope.

CRAB EYE is a carabiner hole which can act as safety catch with a crab clipped in.

CAM-PARK means the cam can be locked in the open position so as not to contact the rope.

4) DIRECT TO SPUR/GAFF ASCENDER

Your climbing spikes are already a bulky item so what's a few extra ounces/grams? Directly fixed ascenders make this whole assembly a versatile option and there's no chance of inefficiency caused by a slackening web harness. Currently three options; KiwiKlimbers are directly bolted while CT use an intermediate plate and CAMP uses a strap and bolts (right).



4) DOUBLE CAM ASCENDER (for single rope)

Aside from the Edelrid

Cruisers



KNEE-CAM SYSTEMS

Something of an adjunct to foot ascenders, but one of the still rising systems so it deserves a separate mention, is the floating knee cam exemplified by Michael Frankhauser's HAAS (Velox version pictured) and Richard Mumford's SAKA (far right). Nothing new about the concept of a floating knee cam because, as we've mentioned on numerous occasions we've been using similar systems in caving since well into the last century and ironically the original caving ascender-maker Petzl have now entered the fray with their own system. The difference with the HAAS/SAKA is incorporation of bungy/elastication and stiffening to improve the operation. Basically this might replace the foot ascender if you're using your regular descent device or one leg might use a conventional foot ascender while the other leg uses this knee cam attached to a stiffened tether with a foot loop on the end. The knee cam has a clip or elastic bungy on top clipped to your harness which allows variable step length and drags the cam up to help capture progress while you move the foot ascender up or tend the trail rope through your descent or hybrid device. There seems to be some bizarre patent issues going on at the moment between the Weaver owned HAAS and SAKA with the SAKA drawing the short straw. It's hard to see how a concept that is simply a modification of something that's been around for decades, albeit with a useful improvement, can lay claim to a broad patent that stops further development by others. Perhaps Padgett and Smith should have patented the original floating knee cam concept back in the 1980s!



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PATENTED DESIGN

U.S. Patents #9,352,190 and #9,643,054
European Patent #2994202



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images NOT to scale	MODEL	COMPANY	ORIGIN	COST	WT inc strap	SHELL	CAM
	A13	ANPEN		£41 \$50 €46	136g 4.8oz 170g 6oz	Stamped Alu	Cast Steel
	QuickStep	ARBPRO		£85 \$106 €95	130g 4.6oz	Stamped Alu	Cast Steel
	Turbo-Foot Evo Turbo Spike	CAMP		£81105 \$99131 €92110	97g 3.4oz 135g 4.8oz	Stamped Alu	Cast Steel
	Foot Ascender	CMI		£90 \$110 €102	320g 11.2oz 324g 11.4oz	Extruded Alu	Cast Steel
	Foot Cruiser	EDELRID		£55 \$83 €60	142g 5oz 160g 5.6oz	Stamped Alu	Cast Steel
	Tree Cruiser	EDELRID		£65 \$93 €65	134g 4.7oz	Stamped Alu	Cast Steel
	Ninja	HARKEN		£102 \$114 €112	136g 4.8oz 177g 6.2oz	Stamped Alu	Cast Steel
	Stryder RP227X	ISC		£51 \$87 €80	130g 4.6oz 202g 7.1oz	Stamped Alu	Stainless Steel
	Spikescender 2	KIWI KLIMBER		£152 \$188 €173	n/a	Alu	Titanium
	Futura	KONG		£59 \$90 €67	72g 2.5oz 130g 4.6oz	Stamped Alu	Stainless Steel

NOTES COST: Approx & inc local tax/VAT DEPTH: = material thickness WLL/Max Load: Where no WLL is given by manufac

DIMENSIONS Width x Height x Depth	ROPE DIAM RANGE	MBS	MAX LOAD	CAM- ANTI- INVERT	CRAB EYE	CAM PARK	LEFT RIGHT	HARNES S	SPURS	DIRECT TO BOOT	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
72 x 51mm 2.8 x 2"	8-13mm 5/16 - 1/2"	4.9kN 1102lbf	140kg 308lb	-	■	■	■	■	-	-	■	■		en.anpen.net
83 x 65mm 3.3 x 2.6"	8-13mm 5/16 - 1/2"	-	150kg 330lb	■	-	■	■	□	■	■	■	■	Fits direct to ArbPro QuickStep Boots with adapter plate or separate adapter for spurs (\$60) or universal web boot harness	arbpro.it
67 x 69 x 25mm 2.6 x 2.7 x 1"	8-13mm 5/16 - 1/2"	-	150kg 330lb	■	■	■	■	■	■	-	■	■	Non-Evo version precludes the safety lock. Rollers in the rope channel reduce friction. Turbo Spike version fits direct to Distal spikes	camp.it
80 x 56 x 32mm 3.1 x 2.2 x 1.3"	9-16mm 3/8 - 5/8"	3.5kN 800lbf	-	■	-	■	■	-	-	-	■	■	ANSI Hard-coated cam	cmigear.com
82 x 62 x 37mm 3.3 x 2.6"	8-13mm 5/16 - 1/2"	-	-	■	■	■	■	■	-	-	■	■	green cam safety cover is removable	edelrid.com
127 x 80 x 45mm 5 x 3.2 x 1.8"	8-13mm 5/16 - 1/2"	-	-	■	-	■	■	■	■	-	■	■	Fits to the Edelrid Talon Spurs green cam safety cover is removable	edelrid.com
83 x 74 x 27mm 3.3 x 3 x 1.1"	8-13mm 5/16 - 1/2"	-	150kg 330lb	-	-	-	■	■	-	-	■	■	Rope guide above cams	harken.com
75 x 52 x 28mm 3 x 2 x 1.1"	8-13mm 5/16 - 1/2"	2.5kN 562lbf	140kg 308lb	■	-	■	■	■	-	-	■	■	Extended (removable) cam safety allows kick-release of cam	iscwales.com
75 x 36 x 74mm 3 x 1.4 x 3"	10-12.5mm 25/64 - 1/2"	6kN 1348lbf	150kg 331lb	■	-	-	■	■	■	-	■	■	Versions Can be retro-fitted to KK Carbons or Distel / Gecko, Notch, Buck, Baslin Stein, Climbright & Edelrid spurs/gaffs. Cam safety is a 'button that can be pushed in to load rope	kiwiklimbers.com
78 x 57 x 25mm 3.1 x 2.2 x 1"	8-13mm 5/16 - 1/2"	-	150kg 330lb	-	■	-	■	■	-	-	■	■	metal boot stirrup prevents torsional rotation-greater efficiency	kong.it

Manufacturer we show a Max Load based on approx 10:1 safety ratio ○ ● = OK BUT NOT IDEAL COLOURS: =Body colour □ =Option

images
NOT
to scale

MODEL

COMPANY

ORIGIN

COST

WT
inc strap

SHELL

CAM

images NOT to scale	MODEL	COMPANY	ORIGIN	COST	WT inc strap	SHELL	CAM
	Jet-Step	NOTCH EQUIPMENT		£91 \$110 €110	136g 4.8oz 195g 6.9oz	Stamped Alu	Plated Steel
	Pantin BO2CL/RA	PETZL		£60 \$85 €63	55g 1.9oz 85g 3oz	Stamped Alu	Stainless Steel
	Foot Lift RK807BX0L/P	SINGING ROCK		£47 \$60 €52	120g 4.2oz 161g 5.6oz	Stamped Alu	Cast Steel
	CT Quick Step A	SKYLOTEC		£65 \$85 €74	130g 4.6oz 165g 5.8oz	Stamped Alu	Stainless Steel
	Quick Step S	SKYLOTEC		£62 \$80 €66	125g 4.4oz 155g 5.5oz	Stamped Alu	Stainless Steel
	CT Quick Tree	SKYLOTEC		£64 \$84 €69	130g 4.6oz	Stamped Alu	Stainless Steel
	Django	STEIN		£63 \$113 €75	130g 4.6oz 198g 7oz	Stamped Alu	Stainless Steel
	SA207	S.E PEAK		£30 \$36* €33	115g 4oz 156g 5.5oz	Stamped Alu	Cast Steel
	SUT	SUNTEK		£28 \$33* €31	84g 3oz 116g 4.1oz	Stamped Alu	Cast Steel
	Pro Foot Ascender	XINDA/ SOB		£0 \$0 €0	90g 3.2oz 135g 4.7oz	Stamped Alu	Cast Steel

NOTES COST: Approx & inc local tax/VAT DEPTH: = material thickness WLL/Max Load: Where no WLL is given by manufact

DIMENSIONS Width x Height x Depth	ROPE DIAM RANGE	MBS	MAX LOAD	CAM- N/VERT	C/RAB EYE	CAM PARK	LEFT RIGHT	HARNES S	SPURS	DIRECT to BOOT	COLOURS LEFT	COLOURS RIGHT	NOTES	WWW.
80 x 73 x 27mm 3.2 x 3 x 1.1"	8-13mm 5/16 - 1/2"		152kg 337lb	-	-	-	■	■	-	-	■	■	Rope guide above cams	notchequipment.com
64 x 45 x 23mm 2.5 x 1.8 x 0.9"	8-13mm 5/16 - 1/2"		150kg 331lb	□*	-	□*	■	■	-	-	■	■	<i>Pantin</i> is now on perhaps its 3rd or 4th variant. *optional plastic Safety catch screws into cam to provide rope safety and cam-off option (£6)	petzl.com
72 x 54 x 30mm 2.8 x 2.1 x 1.2"	8-13mm 5/16 - 1/2"		120kg 264lb	■	-	■	■	■	-	-	■	■	Stainless steel back plate	singingrock.com
73 x 51 x 27mm 3.3 x 2.6 x 1.1"	8-13mm 5/16 - 1/2"		150kg 331lb	■	-	■	■	■	-	-	■	■	Speleo version 'S' is 10g lighter with harness	Skylotec.com
73 x 51 x 27mm 3.3 x 2.6 x 1.1"	8-13mm 5/16 - 1/2"		150kg 331lb	■	-	-	■	■	-	-	■	■	Same as QSA but is a <u>Caver's</u> minimalist version with no safety catch	Skylotec.com
73 x 65 32mm 3.3 x 2.6 1.3"	8-13mm 5/16 - 1/2"		150kg 331lb	■	-	■	■	□	■	-	■	■	Has an integrated back plate for mounting to adapter. Requires separate adapter for spurs (\$60/€45) or harness for boots (\$26/€24)	skylotec.com
75 x 52 x 25mm 3 x 2 x 1"	8-13mm 5/16 - 1/2"	2.5kN 562 lbf	140kg 308lb	-	-	■	■	■	-	-	■	■	Made by ISC Wales Extended (removable) cam safety allows kick-release of cam	steinworldwide.com
73 x 47 x 27mm 2.9 x 1.85 x 1.1"	8-13mm 5/16 - 1/2"		140kg 308lb	-	■	■	■	■	-	-	■	■	*FOB China	n/a
64 x 70 x 24mm 2.5 x 2.8 x 1"	8-13mm 5/16 - 1/2"		150kg 330lb	■	■	■	■	■	-	-	■	■	BEWARE: This copy of a CAMP Turbo may list a CE but foot ascenders DO NOT comply with PPE standards. *FOB China	n/a
75 x 47 x 25mm 3 x 1.85 x 1"	8-13mm 5/16 - 1/2"		150kg 331lb	-	■	-	■	■	-	-	■	■	*FOB China One of many Chinese models with the same design under under various names, New Doar, Camnal & Wildken	xindaoutdoor.com

urer we show a Max Load based on approx 10:1 safety ratio ○●● = OK BUT NOT IDEAL COLOURS: =Body colour □ =Option

UPDATED Feb '24

FIXED & FLYING BOLLARDS

for LOWERING

Tricky to know what to call this product guide as there are so many different terms. We're looking at two types of heavy duty lowering devices and since they both have a cylinder of metal at their core we've gone with bollard rather than capstan. The lighter option is typified by the *Port-A-Wrap* as a metal tube with some rope tie-off or control posts and one or two eyes with which to secure it to the base of a tree. Since this may be rigged so as to sit a few inches or even a few feet away from the tree it is termed 'FLYING' 'FLYING CAPSTAN' or 'FLOATING'. The *RC200* in this picture (below) is actually rigged as a fixed bollard as all *Port-A-Wraps* can be with a *Whoopie* sling and some creative rigging. The term 'BOLLARD' is used universally to describe a static metal tube of material with a smooth surface around which rope can be wrapped to increase friction and arrest and hold a load or the rope can be unwrapped to decrease friction and begin lowering a load. This could be interchanged with 'CAPSTAN' or

'WINDLASS' but to be more accurate these involve rotation rather than being static. Back to a static bollard and a good ground crew will estimate the number of wraps relevant to the load being held/lowered and this will be hand-held or tied off initially and then slowly released through a gloved hand to provide the required speed of lowering. Only when you are new to a device or the load has been underestimated will you need to alter the initial lowering set-up by adding or removing entire wraps otherwise the lowering work can be achieved by taking off a locking loop and then altering the contact angle between rope and pins as the rope feeds through your gloved hands. In fact, a skilled ground crew can add a degree of force mitigation to alleviate impact forces to the climber by allowing some run-through to create a more dynamic arrest than a dead-stop.

The same function applies to our second and heavier option which is a

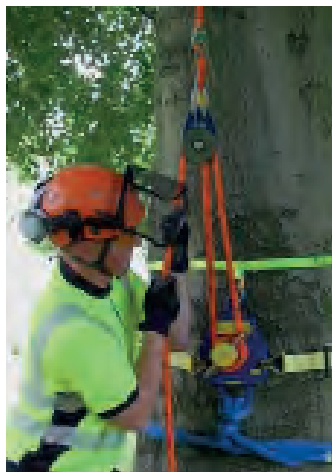


Just to be clear, this guide does NOT include any rotating capstan/drum style fixed winches like the *GRC*, *Hobbs* or *Harken* devices, they are in the separate **GUIDE to Hand Winches**. The tables in this guide are ONLY devices which perform heavy-duty arrest and lowering not raising and in fact the job of arresting heavy loads is generally left to Impact blocks rigged closer to the load, (as in our diagram from *Wesspur* above), which are only then lowered on the kinds of devices listed in this article. Some of the fixed bollards in this guide can be retro-fitted with a winch to make raising easier (pic right), this is indicated by the 'WINCH-ADAPT' column. None of the devices listed in this GUIDE includes a winch or raising option in the price and data but most can be retro-fitted with at least a rope & pulley raising system by attaching it to the top eye as can be seen in the





LOWERING BOLLARDS



picture on the left showing the same Stein model

but instead of a winch we have a 2:1 mechanical advantage pulley incorporated to assist with raising or tensioning. One model, the *Transformeur* (right) from *FTC TREE* in France, is a fully modular system allowing one or two bollards to be fixed

to a back plate and then a winch to also be added. This is possibly the most versatile system we have yet seen although it's not cheap at €3500 for the complete system including bombproof case, ratchets and straps, winch, 2x bollards (which can be used independently) and a back plate with replaceable rubber feet. You can buy each component separately starting with just one bollard and building on that so it may well cover just about every scenario you can come up with.



Thor in the US for long lowers/raises, to create a 4" diameter *Thor Tube*. This was about two feet long and was rigged as a flying anchor (through the tube itself) to give us the maximum strength of

rope possible for heavy arrest and lowering so I suppose it was a giant version of a *Port-A-Wrap*. So giant, that if we still had it today we'd probably be arrested for manufacturing a pipe bomb. But the principle is the same and wrapping your rope around the widest diameter smooth surface possible

will always offer the maximum residual rope strength and be the simplest option for lowering a heavy weight whether it incorporates a manufactured device or a *Eucalyptus* trunk. The main reason for switching to bespoke devices is continuity of performance and minimising damage to either the target tree or an adjacent tree.

One thing to consider is the material the tube is made of. Aluminium is lighter but steel and stainless steel in particular is much tougher even if the aluminium is coated. Heavy woods like *Eucalyptus* will seriously tax your metal especially in sandy/sandstone areas where the ropes will pick up abrasive particles and you will find wear points that will accelerate renewal.

AUTO-LOCKING LOWERING DEVICES

One key type of 'Flying/Floating' lowering device NOT included here because the sheave or 'drum' rotates is an alternative you may also want to consider. It's the now tried and trusted *CMC MPD*. This should never be as robust as any of the bollards in this guide because it has mechanically interfacing components but with a working load limit of round 4000kg/ 8800lb which is limited by the becket MBS of 29kN rather than the wheel, it can deal with the vast majority of daily jobs. It has the added advantage of being easily incorporated into a more efficient raising system than the bollards would offer and it's quite compact. Just don't look too closely at the price (several hundred Dollars), that's why the boss insists on you sticking with a *Port-A-Wrap*.



PORT-A-WRAPS

The term *Port-A-Wrap* is, of course a product name that has come to describe this whole genre. Indeed, most of the companies making and selling them actually use '*Port-A-Wrap*' in the name so somebody at *Buckingham* must have slipped up on patent or trade name registering. The concept is simple and comes from the ancient art of wrapping rope around the tree's trunk or a branch to provide enough friction to arrest and lower a branch, section or entire trunk. As a manufactured device though, this concept probably has mountain rescue to thank because I'm pretty sure the tube style lowering device was in play back in the 50's and 60's at least. We're not laying claim to anything but in the late 80's we adapted the idea of the *Thor Anchor*, a metal 'tree' substitute bolted to Mt.

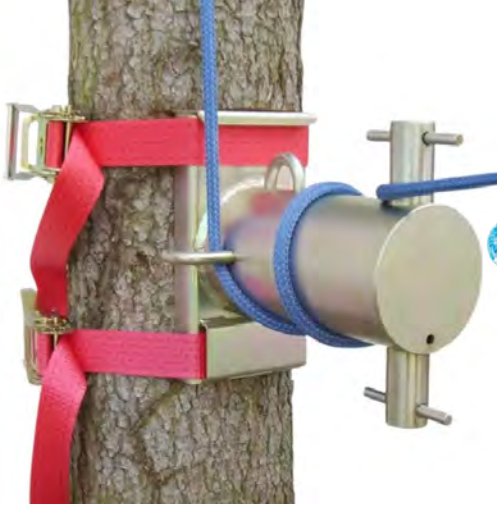
Aside from the obvious tube of metal there are posts sprouting from the main cylinder/ tube for redirecting and tying off the lowering rope as well as anchor eyes top and bottom. *WesSpur's* neat size comparison at the top shows the difference between the mini and the X-large *Buckingham* models. We call them flying or floating rather than fixed but in reality the basal tie off tends to be so firm as to be akin to a fixed system but it will function remote from the target tree if required. One of the two eyes on the standard offset oval models is used to anchor it to the tree (usually the longest eye) while the other eye can have a hauling system attached or you can make the device truly fixed by using that to anchor it as well. The friction posts act as redirects allowing the ground crew to stand well away from the danger (drop) zone and still control the arrest and lower.



UPDATE

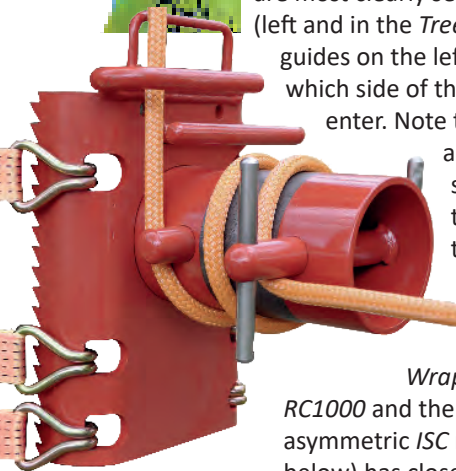
PINS, POSTS & GUIDES

The forward posts are for redirect and tie-off that you can lock off the load and move away. On some bollards



you'll notice the posts have additional 'T' pins through them, often removable. These stop the rope from coming off the redirect or lock-off posts. However, there will be times when you may actually want to flick the rope off the pin to adjust lowering tension while standing clear of the drop-zone, hence the ability to remove some of them as with this German Obilasser model (above).

Posts at the rear of the cylinders are primarily rope-guides and on some models are curved or bent while on larger models there are dedicated open 'hook' style guides which allow the rope to pass easily into them. Both the post and the hook will guide the vertical section of rope onto the rear of the bollard and stop it sliding forward on the cylinder, potentially overlaying other strands and causing the rope to jam and impede rope progress. Hook-style guides are most clearly seen in this *Courant Hulk* guide (left and in the *Treerunner* model (left) with top guides on the left and the right depending on which side of the drum you want the rope to enter. Note that the rear pin also acts as a rope guide to stop the rope sliding forward.



Port-A-Wraps too have a post or two set at the rear of the tube which stops the rope sliding off the back of the cylinder. Still another style of *Port-A-Wrap* exemplified by the *Stein RC1000* and the now discontinued and oddly asymmetric *ISC* models (large version shown below) has closed eyes which can be used as rope guides by connecting a carabiner into the eye and then the rope - make sure the carabiner gate is facing outwards towards the ground crew.



Some of the rear posts are shaped or bent to more safely guide the rope upwards or into the bollard but, as with straight posts which will also function as redirects, we have listed them as 'rope guides' in our columns. ie. a standard *Port-A-Wrap* will have 2 friction posts and 1 rope guide which could also be deemed a

www.



third friction or redirect post. In the case of the larger *Stein* models the difference in function between the four available posts is blurred as the rear two are set proportionally further forward than most models so they operate more as friction/redirect posts than rear rope guides. We listed them as friction posts but they will direct rope upwards at the rear albeit at more of an angle than most.

ODDITIES.....

Courant Hulk (above) Talking of posts and rope guides, the aptly named *Courant Hulk* doesn't actually have any conventional tie-off or redirect posts but it does have three shaped rope guides to vary the rope exit position and therefore the friction imparted by the 4 bollards. The *Hulk* is truly unique in this selection because it has taken the cylinder/tube or bollard, cut it into four slices and bolted them back onto the backing frame. Where others have the rope wrapped a few times around the bollard this has a single pass around each section as it would if the cylinder were a whole bollard! The bollards, or more accurately in this case, non-revolving sheaves, can be rotated to a new fixed position so that wear is spread more evenly around the bollard otherwise it would be the same area receiving wear each use while other areas of the drum get none at all. Once worn you can simply buy replacement sheave.

Notch Aerial Friction Brake

This one has been discontinued by Notch but could yet get picked up by someone else. It was very familiar to us as a rescue belay device which is why it's equally good for the high impact loading of tree work. This is effectively a fixed sheave pulley with a round-edged square in place of the usual 'cylinder' and separator posts emanating from the top edge. It opens in the same way as an impact pulley by swivelling the front plate around allowing you



WORK HARD. CLIMB HARD. PLAY HARD.

To gear up for a hard day's work and end our day with a smile. That's our chance as arborists: to have a unique and thrilling job, the opportunity to mix working, climbing and playing!

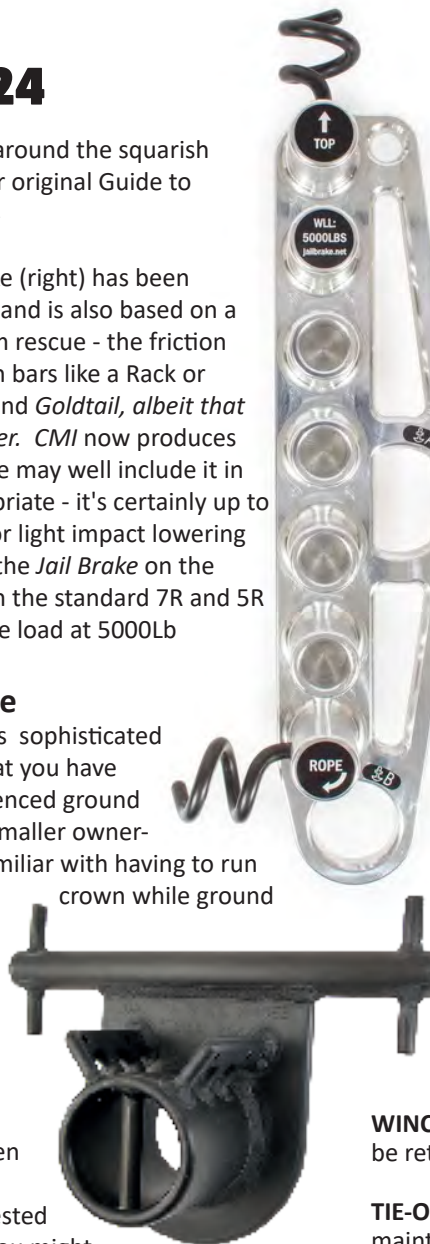


to add two or three rope wraps around the squarish spindle. Details for this are in our original Guide to Bollards in **ARBCLIMBER** issue 14

The newest models, the Jail Brake (right) has been around now for a couple of year and is also based on a principle we're familiar with from rescue - the friction created by weaving rope through bars like a Rack or captive eyes like the *Whaletail* and *Goldtail*, *albeit that the Jail Brake is 3 or 4 times larger*. CMI now produces th *Goldtail* as a descender but we may well include it in this guide if CMI think it's appropriate - it's certainly up to the task because we were one for light impact lowering 35 years ago. The HD version of the *Jail Brake* on the right is 30% more expensive than the standard 7R and 5R versions but can handle twice the load at 5000Lb

. McDermott Crown Brake

In the midst of all this sometimes sophisticated equipment is the assumption that you have sufficient and sufficiently experienced ground crew to operate these devices. Smaller owner-operators in particular will be familiar with having to run lowering operations from the crown while ground crew wrestle large limbs to a suitable landing point. Jim McDermott came up with a device he anchored with him near the cutting point using the top double 'T' bar and maybe the stabilising bar inside the cylinder. The lowering rope is then threaded through the holes and tied off during cutting. Once arrested the climber does the lowering. You might wonder why you couldn't simply use a smaller *Port-a-Wrap* (although this isn't a small device). Well, you could but the *MCB* is directional in that rope can only exit on the down/underside of the cylinder. We're guessing the top eyes are enclosed to ensure the rope doesn't jump out during untended arrest. This was sold by *Wesspur* but now seems discontinued



bend radius but also by the gap at the rear rope guide. **MBS** and **WLL** - is the Maximum Breaking Strength. This figure isn't given by everyone in the arb sector, many preferring to stick with a Working Load Limit or Safe Working Load WLL/SWL. However, you could work this figure back to a maximum breaking strength by multiplying the WLL by 7 the usual safety ratio in the arb sector although *ProClimb* quote 5:1, Buckingham have the *Port-a-Wrap III* Medium with a 6:1 ratio and the XL with a 10:1 ratio. We list the MBS in units of force as KiloNewtons and Pounds Force and WLL in terms of weight as Kilograms and Lbs but they are broadly comparable figures ie. 50kN isn't quite 5000kg, it's 5099kg, close enough for you to be able to work out the load limits are and stay well clear of them.

A solid black square ■ in the **Anchor Strap** column indicates that the device comes complete with the necessary strapping (whether you want it or not!) An outline square □ in the **Anchor Strap** column indicates that bespoke strapping is available as an option.

TRUNK GRIPS refers to hard/aggressive teeth or serrations that bite into the bark to find a purchase.

RUBBER BARK PROTECTION refers to protective feet or in the case of *Port-a-Wraps*, a rubber cap to protect bark from damage during lowering operations.

ANCHOR STRAP: some companies supply their device with anchor straps, often ratchet straps for the larger models and *whoopie* slings for the smaller *Port-a-Wraps*.

WINCH ADAPT: a black square here means that the device can be retrofitted with a winch.

TIE-OFF/CONTROL POSTS: The number of posts available to maintain wraps on the cylinder and redirect the entry rope to allow the ground to stand in the safest position for lowering eg. not directly beneath the limb/section being cut. This does NOT include the rear-most posts which are listed under **ROPE GUIDES**. **ROPE GUIDES** will also include specific hook-style guides which you can see in each products picture.

TOP/BOTTOM ANCHOR EYE refers to a load bearing eye located on the the top for clipping in a raising/tensioning system or on the bottom as an ancillary anchor point, often for a *Whoopie* sling style anchor.

Among the models we haven't included in our tables is the *Obermeier Forst Technik* model mentioned earlier because details are so scant. We have not included the Russian brand *KROK* because they're russian and face a copyright issue with one of their models (not shown) but the bulk of their equipment looks pretty unique. We haven't included another prolific russian brand *VTT* but they have at least 4 devices including a fixed bollard with a detachable handle for pre-tensioning which looks like a smaller version of the *Stein Dual* model. More on these in a post-war update once russia returns to its senses. As mentioned before the *Notch AFB* and *McDermott Crown Brake* appear to be discontinued but it that subsequently changes we will update this guide.

IN THE FOLLOWING TABLES:.....

COST: Approximate. Includes local taxes but can vary due to exchange rates, other taxes etc. We generally round up the cost to the nearest Pound£, US Dollar\$ or Euro€

ORIGIN: Is the country of the company selling the item which is not necessarily the same as the origin of the product itself since so many items are 're-badged'. Where we know the manufacturing origin is different here is an inset flag.

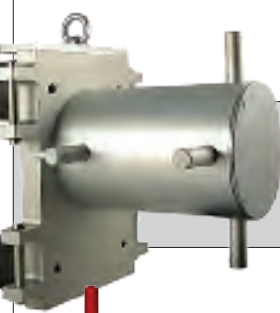



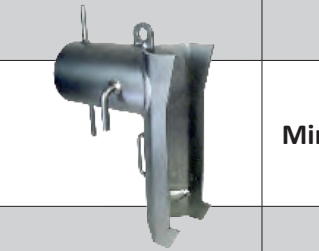


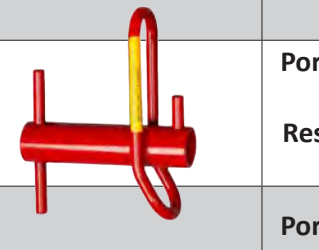















MAX DIMENSIONS: Usually the height (inc top eye) and the width but in some cases, like *Port-a-Wraps*, it will be the depth of the cylinder and that may also be case for some fixed bollards.

MAX ROPE DIAMETER Given by the manufacturer. This should be dictated by the diameter of the cylinder maximising the



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Eucalyptus trimming, Praia de Arneles,
Galicia, Spain




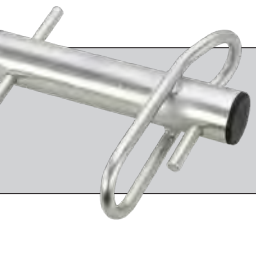
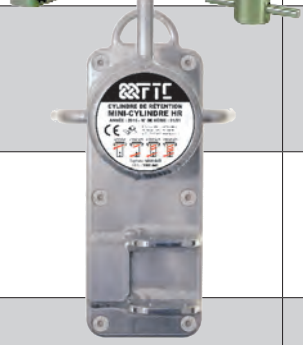

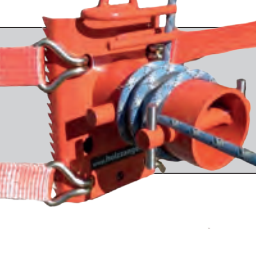
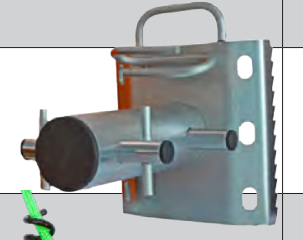


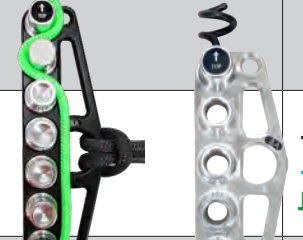







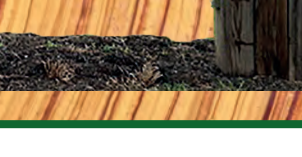



images NOT to scale		MODEL VARIANT	COMPANY	ORIGIN	COST inc tax	WEIGHT exc straps	MATERIALS	DI
		AL3	ARBPRO		£455 \$530 €495	n/a	Aluminium	31 1
		AL2	ARBPRO		£560 \$680 €637	10kg 22lb	Aluminium	33
		Mini Bollard	ART		£234 \$286 €268	2.6kg 5.7lb	Stainless Steel	30 1
		Maxi Bollard	ART		- - €352	7.3kg 16lb	Powder-coated Steel	49 15
		Port-A-Wrap Mini/Rescue Mini 601	BUCKINGHAM		£160 \$210 €170	0.9kg 2lb	Nickel-plated Steel	14 5
		Port-A-Wrap III Medium 601	BUCKINGHAM		£190 \$225 €220	1.8kg 4lb	Nickel-plated Steel	18
		Port-A-Wrap III Large	BUCKINGHAM		£200 \$243 €240	3.2kg 7lb	Nickel-plated Steel	24 9
		Port-A-Wrap XL	BUCKINGHAM		£300 \$350 €350	8.3kg 18lb	Nickel-plated Steel	33 1
		LCD	CMI		£660 \$835 €775	7.66kg 16.9lb	Stainless Steel	305 1
		Hulk	COURANT		£310 \$376 €352	4.3kg 9.5lb	Alloy Bollards Stainless Steel posts, HT & Coated Steel Back Plate	30 1
		Rigging Bollard Silver	FREEWORKER		£222 \$312 €292	7.1kg 15.6lb	Stainless Steel	30 1

NOTES COST: Approx & inc VAT in the UK MAX DIMENSIONS: usually the height and width but may be the distance from back to front

LOWERING BOLLARDS

MAX MENSIONS	BOLLARD Ø	MAX ROPE Ø	MBS	WLL (Max Working Load)	FLYING	FIXED	TRUNK GRIPS	RUBBER BARK PROTECTION	ANCHOR STRAP	WINCH ADAPT	TIE-OFF/ CONTROL POSTS	ROPE GUIDES	TOP/BOTTOM ANCHOR EYE	NOTES	WWW.
100 x 155mm 2.2 x 6.1"	100mm 4"	19mm 3/4"	-	n/a	-	■	-	■	■	-	4	2	■		arbpro.it
133 x 355mm 13 x 14"	150mm 6"	25.4mm 1"	3.5kN 16534 lbf	1200kg 2645 lb*	-	■	-	■	-	-	4	2	■	* WLL 1500kg without rubber feet	arbpro.it
100 x 206mm 1.8 x 8.1"	90mm 3.5"	14mm 9/16"	-	1000kg 2204lb	-	■	■	-	-	-	2	2	■		climb-art.de
100 x 285mm 9.3 x 11.2"	140mm 5.5"	19mm 3/4"	-	2000kg 4408lb	-	■	■	-	-	-	2	2	■	DISCONTINUED	climb-art.de
100 x 165mm 3.5" x 6.5"	33.5mm 1.32"	12.7mm 1/2"	31kN 7000 lbf	450kg 1000lb	■	-	-	-	-	-	2	1	■	Price is for polished. Black powder-coated also available Red with integral Tenex rope for RESCUE = \$250.	buckinghammfg.com
104 x 228mm 7.25 x 9"	48mm 1.9"	16mm 5/8"	53kN 12000lbf	907kg 2000lb	■	-	-	-	-	-	2	1	■	Also available as black powder-coated	buckinghammfg.com
101 x 280mm 9.5" x 11"	61mm 2.4"	18mm 3/4"	53kN 12000lbf	907kg 2000lb	■	-	-	-	-	-	2	1	■	Also branded as 'ArborMax 601LN'	buckinghammfg.com
130 x 55mm 13" x 14"	89mm 3.5"	22mm 7/8"	6.7kN 60000lbf	2720kg 6000lb	■	-	-	-	-	-	2	1	■		buckinghammfg.com
100 x 305 x 15mm 2 x 12 x 6"	?	19mm 3/4"	-	2720kg 6000lb	-	■	-	-	■	-	4	2	■	LCD=Lowering Control Device	cmigearusa.com
100 x 330mm 11.8 x 13"	60mm 2.36"	14mm 9/16"	25kN 5620lbf	500kg 1102lb	■	-	-	-	-	-	-	3	■	Sheaves/bollards can be rotated to even out wear or replaced	mycourant.com
100 x 160mm 1.8 x 6.3"	112mm 4.4"	16mm 5/8"	-	500kg 1102lb	-	■	-	-	□	-	2	2	■		freeworker.de

the front of the tube if that's a higher figure **WLL/Max Load**: normally based on 7:1 to 10:1 of the MBS **N/A**: info Not Available/not given

images NOT to scale		MODEL	COMPANY	ORIGIN	COST inc tax	WEIGHT exc straps	MATERIALS	DI
		Obilasser	FREWORKER		£354 \$432 €405	8.55kg 18.9lb	Galvanised Steel, Stainless pins	309
		Micro	FTC TREE		£336 \$413 €385	1.7kg 3.75lb	Aluminium	224
		Mini	FTC TREE		£540 \$664 €620	3.6kg 7.9lb	Aluminium	341
		Flying Capstan H2611	HARKIE		£149 \$176 \$163	1.92kg 4.2 lb	Galvanised Steel	261
		Heavy Duty Capstan H2621	HARKIE		£302 \$371 \$346	6.45kg 14.2 lb	Galvanised Steel	3313
		AbseilPoller	HOLZZANGEN (DONHAUSER)		- - €105	8kg 17.6lb	Powder-coated Steel	281
		Jail Brake 7R Jail Brake 5R Jail Brake HD	JAIL BRAKE		£500 \$411 \$605 €635	?	6061 Aluminium	
		Port-A-Wrap Medium	NOTCH		£162 \$190 €186	1.9kg 4.25lb	Stainless Steel	171

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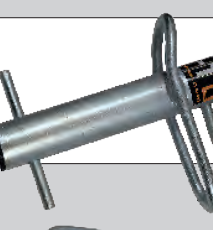







LOWERING BOLLARDS

MAX DIMENSIONS	BOLLARD Ø	MAX ROPE Ø	MBS	WLL (Max Working Load)	FLYING	FIXED	TRUNK GRIPS	RUBBER BARK PROTECTION	ANCHOR STRAP	WINCH ADAPT	TIE-OFF/ CONTROL POSTS	ROPE GUIDES	TOP/BOTTOM ANCHOR EYE	NOTES	WWW.
15 x 160mm 1.2 x 6.3"	140mm 5.5"	19mm 3/4"	-	1400kg 3086lb		■			□		2	2	■	Removable pins	freeworker.de
14 x 163mm 1.8 x 6.4"	75mm 3"	14mm 9/16"	36.2kN 8819 lbf	800kg 1764lbf		■		■	■		2	2	■ ■	Comes with storage box and 9m ratchet strap	ftc-tree.com
10 x 120mm 1.2 x 4.7"	100mm 4"	16mm 5/8"	49kN 11023lbf	1000kg 2204lbf		■		■	■		2	2	■	Comes with storage box and 9m ratchet strap	ftc-tree.com
15 x 230mm 10.4 x 9"	75mm 3"	14mm 9/16"	50kN 11240lbf	1000kg 2204lb	■			■			3		■ ■	Comes with storage bag	harkieglobal.com
15 x 300mm 1.2 x 11.8"	75mm 3"	14mm 9/16"	50kN 11240lbf	1000kg 2204lb		■	■		■		4	1	■	Comes with storage bag	harkieglobal.com
10 x 230mm 11 x 9"	102mm 4"	19mm 3/4"	-	2000kg 4408lbf		■	■		□		4	2	■	direct from manufacturer	holzlangen.de
?	?	19mm 3/4"	-	1136kg 2500lb 907kg 2000lb 11000kg 5000lb	■	-	-	-	-	-	5-7*	2	■ ■	*Note the 'Bollards' are effectively acting as tie-off/ Control posts.	jailbrake.net
18 x 236mm 7 x 9.3"	40mm 1.6"	14mm 9/16"	88.9kN 20000lbf	897kg 1978lb	■			■			2	1	■ ■	Tree protection cap on tube-end	notchequipment.com

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www.arbortechsupply.com
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images NOT to scale		MODEL	COMPANY	ORIGIN	COST inc tax	WEIGHT exc straps	MATERIALS	DI
		Port-A-Wrap Large	NOTCH		£180 \$210 €207	3.3kg 7.25lb	Stainless Steel	23 9
		InvertaWrap LD750	STEIN		£150 \$185 €172	2kg 4.4lb	Plated steel	22 8
		RC1000	STEIN		£204 \$251 €235	3.6kg 7.9lb	Plated Steel	24 9
		RC2000	STEIN		£240 \$295 €275	6.2kg 13.7lb	Plated Steel	28 11
		RC2001	STEIN		£420 \$516 €482	5.8kg 12.8lb	Plated & powder-coated Steel	18 7
		RC(W)3001	STEIN		£600 \$825 €688	13.3kg 29lb	Plated & powder-coated Steel	27 10
		RC(W)3002	STEIN		£774 \$950 €890	26kg 57.3lb	Plated & powder-coated Steel	41 16
		SMB1000	STEIN		£276 \$295 €320	4.4kg 9.7lb	Plated & powder-coated Steel	31 12
		TH LD1	TREEHOG		£126 \$155 €145	1.92kg 4.2lb	Galvanised Steel	26 1
		TH LD2	TREEHOG		£300 \$360 €345	7.3kg 16lb	Galvanised Steel	37 14
		TH LD3	TREEHOG		£305 \$375 €350	6.45kg 14.2lb	Galvanised Steel	33 13

NOTES COST: Approx & inc VAT in the UK MAX DIMENSIONS: usually the height and width but may be the distance from back to th

LOWERING BOLLARDS

MAX DIMENSIONS	BOLLARD Ø	MAX ROPE Ø	MBS	WLL (Max Working Load)	FLYING	FIXED	TRUNK GRIPS	RUBBER BARK PROTECTION	ANCHOR STRAP	WINCH ADAPT	WINCH CONTROL POSTS	ROPE GUIDES	TOP/BOTTOM MANHOOD EYE	NOTES	WWW.
4 x 287mm 1.2 x 11.3"	61mm 2.4"	19mm 3/4"	88.9kN 20000lbf	897kg 1978lb	■	■	■	■	■	■	2	1	■ ■	Tree protection cap on tube-end	notchequipment.com
5* x 250mm 1.7 x 9.8"	51mm 2"	13mm 1/2"	-	750kg 1653lb	■	■	■	■	■	■	2	2	■ ■	* inc 10mm Rubber bark pro which is replaceable	steinworldwide.com
5 x 300mm 1.7 x 11.8"	61mm 2.4"	14mm 9/16"	-	1000kg 2204lb	■	■	■	■	■	■	2	1	■ ■		steinworldwide.com
5 x 370mm 1.2 x 14.6"	76mm 3"	16mm 5/8"	-	2000kg 4409lb	■	■	■	■	■	■	4	1	■ ■		steinworldwide.com
5 x 325mm 1.3 x 12.8"	76mm 3"	16mm 5/8"	-	2000kg 4409lb	■	■	■	■	■	■	4		■ ■		steinworldwide.com
5 x 480mm 1.8 x 18.9"	115mm 4.5"	19mm 3/4"	-	3000kg 6614lb	■	■	■	■	■	■	4		■ ■	(W) refers to winch capable adaption, this is otherwise the same model previously listed as 'RC'.	steinworldwide.com
5 x 480mm 1.5 x 18.9"	115mm 4.5"	19mm 3/4"	-	3000kg 6614lb	■	■	■	■	■	■	8		■ ■	Winch piggybacks to lowering line temporarily bypassing (not replacing) the lowering bollard.	steinworldwide.com
5 x 210mm 1.2 x 8.3"	73mm 2.9"	14mm 9/16"	-	1000kg 2204lb	■	■	■	■	■	■	4	1	■ ■	(W) refers to winch capable adaption, this is otherwise the same model previously listed as 'RC'.	steinworldwide.com
5 x 230mm 1.0 x 9"	75mm 3"	12mm 1/2"	30kN 6744lbf	600kg 1323lb	■	■	■	■	■	■	2	1	■ ■	Comes in zip-up canvas bag	arbortec.com
5 x 385mm 1.6 x 15.2"	75mm 3"	14mm 9/16"	50kN 11240lbf	1000kg 2204lb	■	■	■	■	■	■	2	4	■	comes in PVC pack	arbortec.com
5 x 300mm 1.2 x 11.8"	75mm 3"	14mm 9/16"	50kN 11240lbf	1000kg 2204lb	■	■	■	■	■	■	2	3	■	May be discontinued comes in PVC pack	arbortec.com

the front of the tube if that's a higher figure WLL/Max Load: normally based on 7:1 to 10:1 of the MBS N/A: info Not Available/not given

images NOT to scale		MODEL	COMPANY	ORIGIN	COST inc tax	WEIGHT exc straps	MATERIALS	DI
		TH LD5 3.0T	TREEHOG		£440 \$540 €505	5.8kg 12.8lb	Stainless Steel	25 9
		Port-A-Wrap (71-817)	TREERUNNER		£195 \$236 €220	2.6kg 5.7lb	Stainless Steel	25 9
		P500 (71-879)	TREERUNNER		£280 \$321 €300	5.8kg 12.8lb	Powder-coated Steel	32 1
		Poller Classic (71-818)	TREERUNNER		£255 \$310 €289	9.1kg 20lb	Powder-coated Steel	30 13
		P3000 (71-877)	TREERUNNER		£455 \$490 €459	16kg 35.3lb	Powder-coated Steel	47 11
		Port-A-Wrap-TU200	TREE-UP (PROTEKT)		£115 \$142 €132	1.92kg 4.2lb	Galvanised Steel	26 7
		Port-A-Wrap TU201	TREEUP (PROTEKT)		\$105 €78	2.32kg 5.1lb	Stainless Steel	26 10
		Port-A-Wrap TU100	TREEUP (PROTEKT)		£274 \$336 €315	7.3kg 16lb	Galvanised Steel	37 14
		Port-A-Wrap TU110	TREEUP (PROTEKT)		£254 \$312 €291	6.45kg 14.2lb	Galvanised Steel	33 13
		Ultralight TU101	TREEUP (PROTEKT)		£367 \$450 €421	5.8kg 12.8lb	Stainless Steel	25 9
		PEPA Drum Medium	WORKSAFETY/MELATAR		€235	8.15kg 18lb	Zinc coated Steel	40 1

NOTES COST: Approx VAT in the UK MAX DIMENSIONS: usually the height and width but may be the distance from back to front

LOWERING BOLLARDS

MAX DIMENSIONS	BOLLARD Ø	MAX ROPE Ø	MBS	WLL (Max Working Load)	FLYING	FIXED	TRUNK GRIPS	RUBBER BARK PROTECTION	ANCHOR STRAP	WINCH ADAPT	TIE-OFF/ CONTROL POSTS	ROPE GUIDES	TOP/BOTTOM ANCHOR EYE	NOTES	WWW.
150 x 200mm 5.9 x 7.9"	75mm 3"	14mm 9/16"	150kN 33721lbf	3000kg 6614lb		■		■	■		2	3*	■	*Top anchor eye is designated as a rope guide by manufacturer. Comes in PVC pack	arbortec.com
150 x 310mm 5.8 x 12.2"	60mm 2.36"	18mm 3/4"	-	1000kg 2204lb	■						3		■ ■		grube.de
150 x 220mm 5.6 x 8.7"	76mm 3"	16mm 5/8"	-	500kg 1102lb		■		■	□		4	2	■ ■		grube.de
150 x 380mm 5.8 x 14.9"	76mm 3"	16mm 5/5"	-	500kg 1102lb		■			□		3	2	■		grube.de
150 x 380mm 5.8 x 14.9"	140mm 5.5"	20mm 3/4"	-	3000kg 6613lb		■	■		□		4	2	■		grube.de
155 x 230mm 5.10.4 x 9"	75mm 3"	14mm 9/16"	50kN 11240lbf	1000kg 2204lb	■			■			3		■ ■	Comes with storage bag Also available in Yellow.	treeup.pl
150 x 282mm 5.10.2 x 11.1"	108mm 4.25"	20mm 3/4"	50kN 11240lbf	1000kg 2204lb	■			■			3		■ ■		treeup.pl
150 x 385mm 5.10.6 x 15.1"	75mm 3"	14mm 9/16"	50kN 11240lbf	1500kg 3306lb		■		■	■		4	1	■	Comes with storage bag. Also available in Yellow with dome-top capstan	treeup.pl
155 x 300mm 5.10.3.2 x 11.8"	75mm 3"	14mm 9/16"	50kN 11240lbf	1500kg 3306lb		■	■		■		4	1	■	Comes with storage bag. Also available in Yellow with dome-top capstan.	treeup.pl
150 x 200mm 5.9.8 x 7.9"	75mm 3"	14mm 9/16"	150kN 33721 lbf	3000kg 6613lb		■		■	■		4	1*	■	*Top anchor eye is designated as a rope guide by manufacturer (with carabiner?)	treeup.pl
150 x 200mm 5.7.5 x 7.9"	100mm 4"	19mm 3/4"	49kN 11023lbf	715kg 1576lb		■					4	4	■ ■*	DISCONTINUED *Listed eyes require carabiner or maillon connections	worksafety.cz

the front of the tube if that's a higher figure **WLL/Max Load**: normally based on 7:1 to 10:1 of the MBS **N/A**: info Not Available/not given

UPDATED March '24

HAND-POWERED ROPE WINCHES

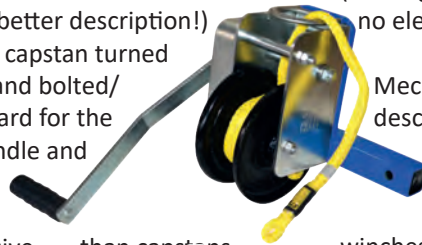
including **COMBINATION WINCH/BOLLARDS**



Handled winches that use ROPE instead of wire cable, do a similar job of lowering to the static bollards we covered in the last MARKET GUIDE and are of two distinct types:

1) CAPSTAN WINCHES which are cotton-reel'-shaped bollards stolen from yachting via the market leader, Harken Industrial shown in the picture on the left. They often have a lovely shiny surface around which several wraps of rope can absorb friction and lower some substantial weights to the ground in a controlled manner. Specific arborist models have a longer drum able to use more wraps and/or larger ropes. In the case of the ubiquitous Harken 46 model, it will take 5 wraps of half inch rope.

2) HAND WINCHES (for want of a better description!) which are basically the gearing of a capstan turned sideways into a flat metal housing and bolted/pinned above a standard static bollard for the purposes of PULLING rope via a handle and an appropriate number of wraps rather than just lowering. These are less efficient but far less expensive than capstans.



The difference between a winch and a static bollard as we featured in last issue's GUIDE is that they have a handle and



On the left is the original arborist winch with steel back plate, the Hobbs which is still going strong after nearly 40 years in the form of the H2 version [pic courtesy of Blair's Arborist Eqpt in MD] while on the right is an engineered alloy model from Italy using a modular back plate and yachting quality capstan together with guides and a cam above that have evolved to meet the specific needs of arborists.

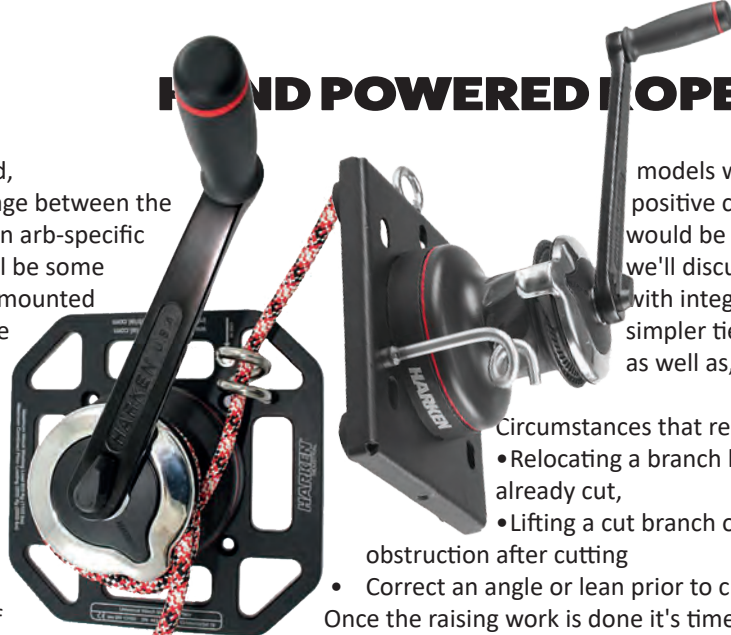
some cogs connected to the capstan to offer varying degrees of mechanical advantage allowing you to *lift* heavy weights as well as lower. This GUIDE focuses only on manual devices but you may obviously wish to consider powered winches - battery in particular seems to be the way things are going and prices aren't actually a lot different, in fact, many are considerably cheaper than some of these finely engineered models with their Harken Capstans fit for a millionaire's yacht. The clincher will often be the sheer brute competence and reliability of manually operated winches, no fuel/power to worry about, no inadvertent application of power when you didn't want it (bearing in mind that most don't have protective clutches) and no electronics to go wrong on a cold or hot day.

Mechanical advantage, in the case of capstan winches, is described by the gear ratio or alternatively by the power ratio which both relate to the movement of a gearing mechanism when compared to the distance the load is raised. More on this later. There are many capstan winches covering every industry and one or two rescue models but they are mostly NOT applicable to arborist work purely because they can't be adequately mounted to a trunk for a stable lowering and raising position.

Specific arborist models were pioneered by Ed Hobbs in 1980 with the novel idea of mounting a capstan to a base-plate and side-mounting it to a tree trunk using ratchet straps. Ratchet straps were part of the original idea rather than simply tensioned rope and this continues to be the simplest, fastest and most secure option. That first Hobbs design had a bespoke straight handle rather than the modern yacht-evolved modified Z-shape. The *Hobbs* also demonstrate the key arborist requirement which is a quite specifically designed backing plate able to grip the trunk and remain in a stable position during winching or lowering. These days rubber pads are used to protect the bark and with a much broader backing plate and heavier securing straps they tend not to have the serrated teeth we discussed in the Bollards guide. In this Guide we have also included a rescue model from *Skyhook* and *Harken's* own model (opposite-top) which both have universal back plates designed to fit, amongst other things, telegraph poles which is as difficult as it gets because it's much easier to get a secure purchase on a broader trunk, especially if you can cut a level mount into the trunk. Aside from *FTC TREE's* fine Italian *Antal* winch, the *Harken* capstan is a common theme for most of the capstan winches in this GUIDE which is testament to the quality and reverence within the industry. The *Protekt Tree Up* model

HAND POWERED ROPE WINCHES

which we think has been discontinued, (right) for instance was a clear marriage between the slick Harken capstan and Protekt's own arb-specific base plate with rubber feet. There will be some die-hards who swear by their vehicle mounted drum winch for various aspects of tree work, but....different animal entirely, different skill-set and vast scope for failure. Were we discussing winches with the sole job of pulling we could probably include virtually anything including the multitude of drum winches and even the venerable Tirfor winch which invariably uses wire cable and will do a sterling job of pulling over leaners. They would all do this from an anchor point far away from the target tree and often with direct connection to the load rather than via a redirect.



models with an altogether more positive cam which, in yachting, would be a jamming cleat which we'll discuss shortly, while those with integral bollards can use their simpler tie-off posts instead of, or as well as, the cleat or cams.

Circumstances that require raising include

- Relocating a branch being cut or that is already cut,
- Lifting a cut branch or trunk over an

obstruction after cutting

- Correct an angle or lean prior to cutting

Once the raising work is done it's time to lock off the load and prepare for lowering. This may use those integral camming cleats we mentioned or the tie-off posts but remember that a cam would require you to take load off before it will release the rope for lowering so you're either going to need that winch again to take in enough rope to release the cam or you might have one like the ArbPro pictured above or the ATD on the right and left which have a small handle on the cam to release the cam and transfer load to your lowering bollard/capstan which you will have taken in firmly.

RAISING & LOWERING

The style of winch we're discussing could still be said to take some of the skills necessity out of the hands of ground crew; no setting up of pulley systems, no tying of knots even. It will always be secured to the base of a tree so as long as your crew can pick a good site (not too close to the ground and not directly in an impact area), you're sorted. The winch will almost always be attached to the target tree or very close to it and the rope (NOT WIRE CABLE) will be redirected to the load branch or trunk section via a snatch or impact block/pulley. The ground

crew stand to one side when lowering in the same way as the static bollards and use a handle to wind the bejesus out of the rope when raising. Because the loads can be quite high you must ensure that you are adequately capturing the progress you make after the manic winding. Capstans generally have their own progress capture (called **Self-Tailing** or, more appropriately, **CAPTIVE self-tailing** which is a pair of gripping 'lips' at the top of the capstan which will hold the rope if you have enough turns to absorb the weight. You can see this most clearly in the Sterling Rope ad a few pages on where the Harken capstan is shown in profile with the two gripping surfaces and the silver coloured rope guide and



in the GRCS pic overleaf. This works best on the largest rope in the winch's range and may be augmented or replaced in some

Tie-off posts are the same as you always have with a bollard, a few sturdy wraps and a strong hand grasp as you gently unwrap until the load comes on and remains manageable. With capstan winches this then becomes a self-tailing action where several wraps wound around the shiny surface allow one person to hold the load and gently run the rope through gloved hands to lower. *FTC TREE* provide these handy figures for the load holding ability of a new 12mm rope when wrapped around their mini-bollard with the operator(s) feeling a weight/resistance on the rope of around 30-40kg/67-90lb:

3/4 turn	= 75 daN / 77kg / 169 lb
1 3/4 turns	= 200 daN / 204kg / 450 lb
2 3/4 turn	= 470 daN / 479kg / 1057 lb
3 3/4 turn	= 1000 daN / 1020kg / 2248 lb

For the lowering function we can pretty much use exactly the same description as we did for fixed-location static bollards last time and add in the new winch stuff, how's this for lazy.....: *After flying and fixed or static bollards our third and heaviest lowering option is a winch with a large ROTATING DRUM driven by a crank handle. The winch is mounted (bolted, pinned or welded) to a backing plate with the whole assembly anchored firmly to the tree's trunk with ratchet straps. Many have rubber feet or the option of rubber feet to protect the bark from inevitable damage during tensioning and arrest/lowering. You need to have a fairly level surface to sit the back plate on so that it can't rock under load and loosen its retaining straps. Interestingly, a number of models quote a lower WLL with rubber feet than without, probably due to compression forces on the rubber and pushing the plate further out from the trunk, so it's fair to assume that the same should be the case for ANY model with the option of rubber feet. Nevertheless a solid flat surface is best so for dismantling jobs you would be able to*

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cut a flat section into the bark with your chainsaw. Alternatively, for dismantling operations or if you don't like the client, there are plates with teeth or serrations which dig into the bark to provide a firm fixing though we haven't seen this with winches which all have flat back plates. Once you add raising into any equation the forces multiply considerably because there's a whole load of friction to take into account that you don't have with lowering. This is why the Working Load Limit is higher for the capstan or bollard in lowering than it is for the capstan and/or cleat in raising and then you may also need to reduce the load in your calculation for rubber feet depending on what the manufacturer has quoted.

It won't have escaped your notice that, not only are these systems quite expensive, they're also pretty big and heavy. So much so, that you could be into back-injury' territory if you didn't lift it into place correctly. Were it not for the fact that the biggest and heaviest systems like the *GRCS* (below), come in two, three or four separate parts - usually the back plate, the capstan, a handle/windlass, and a cleat and/or a lowering bollard. Notable exceptions to the comment on being heavy are the more rescue oriented models from *Skyhook* and *Harken Industrial* and the newest winch on the market the *ODSK Elephant* (inset below-right) all of which are less than 10kg/22 lbs. Well, OK, *Krok's* heavy duty steel *Ilya* and *Tree-Up's TU120* were also very close at 10.2kg each but otherwise, the rest in this list are pretty heavy. Jeez.

Note that our figures are for the Capstan/winch version NOT the interchangeable rigging bollard (where there is one) unless specifically listed as such. Rope capacity diameters for instance, are often a couple of mil larger for the bollard than they are for the capstan. A noticeable exception to this is the *FTC TREE Transformeur* (advert opposite) which might sound very heavy at 43kg but that includes two, count 'em, two bollards AND the winch on the same assembly all of which can be



removed from the plate as required - you could for instance have just one bollard on the back plate or none at all and the weight would go down accordingly. The Stein 3002 also offers two bollards but these are fixed so the basic weight of the unit is quite high at 42kg but the 15kg winch attachment is easily separated.

GEAR RATIO versus POWER RATIO :

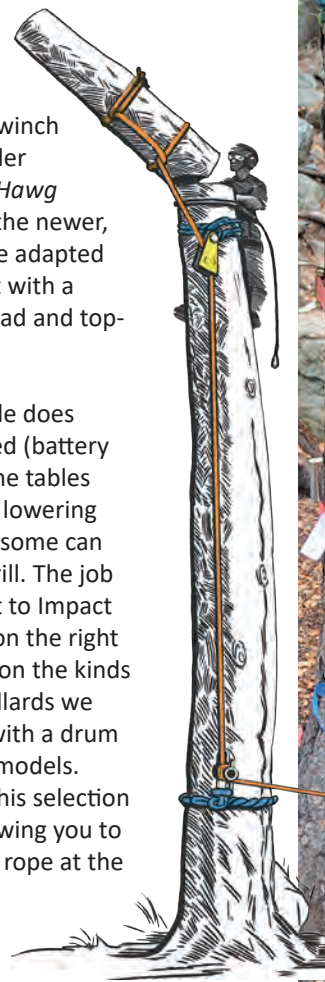
We're listing this as **MA** or **MECHANICAL ADVANTAGE** which correlates to the Power ratio. While the actual gear ratio on, for instance a Harken winch may be 2:1 and 6:1 as it is on the Rigger 500, this actually translates to the much higher 'Power' ratio of 13:1 and 40:1. You calculate the 'Power' ratio by dividing the handle length by the **Drum Radius** (not diameter) and multiplying that by the gear ratio. Not sure how that works if you choose to measure the handle in millimetres? This power ratio figure is obviously starkly different to the gear ratio so make sure you are talking the same language when comparing 'Ratios' . For two speed winches the low ratio winding direction is often one way, while the higher ratio is in the opposite winding direction. This gearing principle is the same throughout the world of mechanical devices from watches to cars - you drive a small cog which engages with a bigger cog, maybe several cogs with the effect that the shorter revolutions of the small cog causes you to wind quite furiously while it engages teeth to teeth with the larger cog rotating much more slowly which in turn may be engaging and driving even larger cogs until it connects with the thing being driven, in this case a heavy load. There's always a trade off in effort and in this case its an increased number of turns to achieve the same aim. In capstans, the cogs sit horizontally in the larger section of the 'cotton reel' in the base. In the case of arborist methodology, this means they sit vertically but in the capstan's original yachting mode it would be sat flat to the deck winding horizontally. The flat, drum winches that attach to the top of some bollard devices like the Stein models, are oriented, and intended to be used, vertically.

DRILL ADAPTERS

Where the handle is detachable it is often possible to use a power drill and adapter to drive the winch. Harken winches in particular have a universal star-shaped bit (pic-top) that will fit any drill and any Harken winch. This saves on what can be a manic winding action in high ratio. You can use the drill to do most of the donkey work and then switch back to hand-winding for finite control when you need it. This adaptation came from yachting because of the repetition and from rescue because extremely long raises might be needed in the mountains (picture opposite), certainly far higher than we ever see in arb work but in an environment where time literally is money, it can speed up the job no end on consecutive raises and lowerings. If you have the spare cash after having stumped



up four figures for your winch system you might consider Milwaukee's \$300 Hole Hawg (opposite-top) which is the newer, ergonomic version of the adapted drill shown opposite but with a dedicated right angle head and top-handle.



Just to be clear, this guide does NOT include any powered (battery or fuel) winches, they are in the following GUIDE The tables in this Guide are devices which perform heavy-duty lowering and raising using manual winding power albeit that some can augment this action with a regular battery power drill. The job of dynamically arresting heavy loads is generally left to Impact blocks rigged closer to the load, (as in our diagram on the right courtesy of Wesspur), which are only then lowered on the kinds of devices listed in this article. Some of the fixed bollards we included in the previous GUIDE can be retro-fitted with a drum winch for raising like the FTC TREE, Stein and KROK models. Stein (top) and FTC TREE (ad below) are unique in this selection because they can use a separate winching rope allowing you to rig up to two separate lowering ropes AND a raising rope at the same time.



In this picture from Skyhook you can tell that this is a wilderness rescuer rather than arborist! The winch is secured to a small diameter pine without the optional Universal plate attachment to sit it more snugly to the trunk so it's vital that there is no lateral load to destabilise the placement hence the redirect above and below which align the tail rope and the loaded rope more vertically. The winch operator is using a powered adapter to do the work while the capstan self-tails for progress capture with an ancillary PCD in the form of a prusik on the entry rope. We'll pretend this is all an effort to rescue an injured arborist. Skyhook bought up all 300 of the now discontinued but highly sought after 40.2sta original capstans for their Classic model while the Skyhook Lightweight uses the 40.2sta Radial. However, a lot of rescue winches don't see much use, are far better looked after than most Arb winches and certainly don't see the same level of abuse so if you get the chance to buy a second-hand winch from a rescue agency- do it.



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WORK HARD. CLIMB HARD. PLAY HARD.

To gear up for a hard day's work and end our day with a smile. That's our chance as arborists: to have a unique and thrilling job, the opportunity to mix working, climbing and playing!

FTC TREE 

SAFE OPERATING TECHNIQUE

The standard bollard devices are solid lumps of metal that you are very unlikely to damage in a controlled lowering even if it gets sideswiped by the section being lowered. However, a winch has extraneous components that are much more susceptible to damage - the handle for instance if left in and the side cheeks on a drum winch or the top lip and control surfaces on a capstan. These are expensive as well so it's best to ensure that you position it so that it is offset and the lowered section comes down to one side. In the case of the *ATD* and the *Smartwinch* (below), the integral bollard provides a protective shroud for the capstan but if the handle is in place on either the capstan or, in this case, the web tensioner, this would still be a weak-point. Don't forget to factor in that your load may start out in a controlled lower but end up in freefall should an operator or component fail.



A key factor in positioning your winch offset to the load is the fact that the operator will need to stand directly adjacent to the winch to wind the handle and so could be in the danger/drop zone. Also bear in mind that raising adds forces to the system that make it a more dangerous operation with greater scope for component failure at the rigging or even the rope itself than lowering imparts. When lowering, the operator will typically stand a minimum of 6ft-2m from the lowering device, often much more and will ALWAYS wear gloves.

Good technique requires the operators to use the appropriate number of wraps to hold the load and when arresting a falling branch or section to do so dynamically allowing enough rope to run through gloved hands so that impact forces are minimised. If the load comes to a sudden arrest because you've wrapped too many turns around the bollard or capstan the impact forces will magnify considerably and could adversely affect ANY of the components including the rope and the winch if that is being used is a lowering bollard.

Ensure that the wraps are regular and do not over-lap or override each other - this can make your job harder at best and can be extremely dangerous at worst. Some of the *Harken* winches have moulded diagonal grooves which help guide each turn of rope in the right place.

IN THE FOLLOWING TABLES:.....

COST: Approximate. Includes local taxes but can vary due to exchange rates, other taxes etc. We generally round up the cost to the nearest Pound£, US Dollar\$ or Euro€ **Simple currency conversions are shown in orange** for reference - they are lower than the actual price because it does not take into account import duty, shipping or tax.

ORIGIN: Is the country of the company selling the item, not necessarily the same as the origin of the product itself which is shown as an inset flag where we know.

MAX DIMENSIONS: Height and the width of the base plate but in some cases, a third figure will be the depth of the winch or bollard. These should be excluding handle but we think some of the submitted figures have strayed!

CAPSTAN DIAMETER: The wider the sheave on a pulley the more residual strength is available in the rope - it's all about avoiding tight radius bends and it's the same with a winch, the wider the capstan diameter the better it is for your rope - The magic figure is 4"/100mm, this is the diameter at which you will lose virtually NO strength in your rope due to bending fibres.

MA RATIO: Mechanical Advantage expressed as a ratio. As already discussed this is the input power to ultimate drive that you create rather than the gearing ratio of the cogs. Invariably a figure on quality capstans around the 40:1 mark in high ratio and around 12:1 or low ratio. We have rounded the figures because to be accurate the Harken 46 is 11.7:1 & 46.5:1 not 12:1 and 46:1 as we have shown.

MAX ROPE DIAMETER: Given by the manufacturer. This should be dictated by the diameter of the cylinder maximising the bend radius and the number of wraps you can fit but also by the gap at the rear rope guide. Oddly, many of these DO NOT correspond to the capstan manufacturer's own recommended diameters. In some cases this may be because they are quoting the bollard capacity rather than the capstan (for winches that have both options).

MBS and WLL: ... is the Maximum Breaking Strength and in the case of all these winches refers to the LOWERING mode NOT RAISING mode which would be considerably less and best factored into your calculations using the maximum Working Load (WLL) for raising shown in orange in the WLL column. MBS isn't given by everyone in the arb sector, many preferring to stick with a Working Load Limit or Safe Working Load WLL/SWL because it's often dictated by the webbing rather than the actual device (like the *Hobbs*). We list the MBS in units of force as KiloNewtons and Pounds Force and WLL in terms of weight as Kilograms and Lbs but they are broadly comparable figures ie. 50kN isn't quite 5000kg, it's 5099kg, close enough for you to be able to work out the load limits and stay well clear of them. These figures are for NON-HUMAN LOADS. CE standards require a separate rating for rescue/human-riding which is just over half of the WLL of these winches. However, it is quite obvious that none of these winches has a problem with the physical weight of a casualty, it's just a question of being tested to specific standards which the rescue winches in this list would additionally need to adhere to.

HAND POWERED ROPE WINCHES

MODULAR: means that the base plate can be separated from the winch and/or bollard =the majority of models in this guide.

ANCHOR STRAPS: A solid black square ■ indicates that the device comes complete with the necessary strapping (whether you want it or not!). An outline square □ indicates that bespoke strapping is available as an option.

TRUNK GRIPS Hard/aggressive teeth or serrations that bite into the bark to find a purchase- shown as a black square ■

RUBBER BARK PROTECTION: refers to protective feet to protect bark from damage during lowering operations. None of the models here appears to offer teeth/serrations in the same way as some of the static bollards did but virtually all of those with rubber pads can have them removed to leave you with the basic metal plate which, of course, is stronger than with rubber feet but you are more likely to damage the bark.

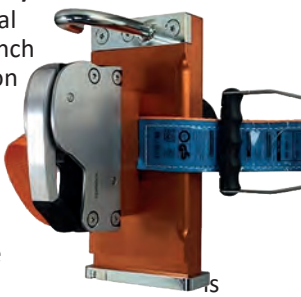
TIE-OFF/CONTROL POSTS: Refers ONLY to bollards rather than the winch and is only relevant here for models that have an integrated bollard like the *Smartwinch* or where the bollard is attached to the plate simultaneously with the winch as with the *Transformeur*. Such posts help to maintain wraps on the cylinder and direct the entry rope to allow the ground to stand in the safest position for lowering eg. not directly beneath the limb/section being cut.

PROGRESS CAPTURE - SELF-TAIL / CAM / RATCHET

A black square ■ indicates an integral 'jamming' action on the top of the winch drum called self-tailing and common on *Harken* models.

An orange square ■ indicates an add-on camming option like this from *ArbPro* Italy and the black one below from *ATD*.

A Green square ■ indicates a simple ratchet cam where a cog-like wheel is stopped from going backwards by some form of 'catch'. This is typical on the *Stein* models.



ROPE GUIDES: Also known as **FAIRLEADS**. This includes specific hook-style guides and spiral pig-tails which make sure the rope enters and leave the winch drum in the correct alignment.













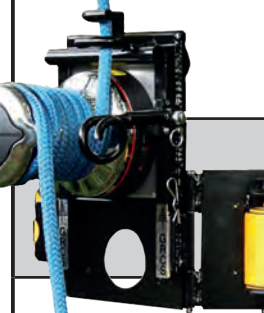
















TOP/BOTTOM ANCHOR EYE: refers to a load bearing eye located on the top for clipping in a raising/tensioning system or on the bottom as an ancillary anchor point, often for a *Whoopie* sling style anchor.

Among the models we haven't included in our tables is the *Harken 200 Riggers Winch* because the base plate is too small for arb work - it is intended as a portable light-load-lifting/hauling winch for remote deployment. Krok are omitted but in the hope that russia returns to sanity at some point and rejoins the normal world so we can again list Krok and we have precluded another russian brand *VTT* for lack of contacts rather than sanctions on russia - they have a model with a detachable handle for pre-tensioning which looks like a smaller version of the *Stein Dual* model.



A classic example of where raising is necessary prior to lowering. This is *ODSK's Elephant winch* from Japan using the ubiquitous *Harken* capstan and an alloy frame with a trio of unique, machined rope guides which double as friction posts. In this picture the winch is secured to a standing tree used as the anchor from which to raise a faller that is entangled in its branches. This is storm damage from a busy year of typhoons in 2018 and you have little say on where the tree ends up. On another day (with that impact block above the winch), this could have been a congested work area in which a cut section has to be 'unpicked' from an adjacent tree and raised, using the winch, before it can be lowered. It may be an optical illusion but doesn't it look like the ratchet strap on the winch is squeezing the life out of that trunk?



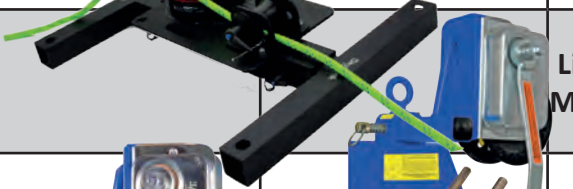





images NOT to scale		MODEL	COMPANY	HARKENN TYPE	ORIGIN	COST inc tax <small>€/\$ Currency conversion only</small>	WEIGHT exc straps	MATERIALS BASE PLATE CAPSTAN
		ATD Winch	ARBOTEAM	46		£4255 \$5200 €4873	30.3kg 67lb	Steel Aluminium
		LD1	ARBPRO	40		£2223 \$2700 €2500	21.3kg 47lb	Steel Stainless Steel
		LD2	ARBPRO	46		£3176 \$3900 €3570	26kg 57lb	Alloy Alloy
		SmartWinch	CPR INNOVATIONS BV	46		£3180 \$3885 €3640	23kg 51lb	Stainless Steel Stainless Steel
		Transformeur	FTC TREE	46		£3775 \$4610 €4320	43kg 95lb	Alloy Stainless Steel
		GRCS	GOOD RIGGING	46		£2890 \$3500 €3285	38.5kg 85lb	Alloy & Steel Stainless Steel
		Rigger 500	HARKEN INDUSTRIAL	40		£1850 \$2150 €2200	7kg 15.4lb	Alloy Aluminium
		H2 (Hobbs)	K&R Products	46		£2386 \$2520 €2735	26.3kg 58lb	Steel Aluminium
		Elephant	ODSK/ TAKASHI OSAKA	40		¥330000	7.6kg 16.75lb	Alloy Aluminium

NOTES COST: Approx & inc VAT/Taxes MAX DIMENSIONS: height x width x Depth MBS: In lowering mode. WLL/Max Load

HAND POWERED ROPE WINCHES

MAX DIMENSIONS exc handle	CAPSTAN Ø	MA RATIOS	CAPSTAN ROPE Ø	MBS	WLL Max Load for RAISING LOWERING	MODULAR	RUBBER TRUNK GRIPS	ANCHOR STRAP	Includes BOLLARD	SELF-TAIL CAM RATCHET	PROGRESS CAPTURE	CONTROL POSTS	THE OFF/ROPE GUIDES	TOP/BOTTOM ANCHOR EYE	NOTES	WWW.
30x370x330mm 3.9 x 14.5 x 13"	100mm 3.9"	12:1 46:1	14-16mm 9/16-5/8"	-	1300kg* 2866lb 2000kg 4400lb	☐		1	☐	■	■		7	■	* WLL for hard securing of back plate. Rubber mounting max= 800kg. Cost inc carbon-plastic Case	arboteam.it freeworker.de
200x300x250mm 24 x 12 x 10"	140mm 5.5"	13.5:1 40:1	12-14mm 1/2-9/16"	48kN 10791 lbf	800kg 1764lb 1000kg 2200lb	■	■	3	■		■		2	■	MBS is when used with optional cam. 140mm diam Bollard weighs 11kg	arbpro.it
200x350x250mm 24 x 14 x 10"	150mm 5.9"	12:1 46:1	12-19mm 1/2-3/4"	73.5kN 16535 lbf	1200kg 2645lb 1500kg 3306lb	■	■	3	■		■		4	■	MBS is when used with optional cam. 150mm diam Bollard weighs 5kg	arbpro.it
100x350x250mm 20 x 14 x 10"	101mm 4"	12:1 46:1	8-14mm 5/16-9/16"	70kN 15736 lbf	1300kg 2866 lb 700kg 1575 lb	☐	■	1	☐			2	3	■	Integral bollard protects capsatn. Straps are tightenend using the winch handle in the riht-hand webbing pin.	cprinnovations.com
180x450 x 370mm 18 x 14.5"	93mm 3.7"	20:1 43:1	10-16mm 3/8-5/8"	100kN 22481 lbf	816kg 1798lb 2040kg 4500lb	■	■	2	■		■	0-4	2-6	■	All components can be purchased separately. Model shown includes 2x Bollards and case.	ftc-tree.com
150x230x250mm 14.1 x 9 x 10"	100mm 3.9"	12:1 46:1	<19mm <3/4"	91.6kN 20592 lbf	907kg 2000lb 1360kg 3000lb	■	■	■	■	■			3	■	Base plate is hinged for greater stability on a curved surface.	goodrigging.com
190x290x369mm 14.4 x 11.4 x 14.5"	80mm 3.5"	13.5:1 40:1	8-12mm 5/16-1/2"	25kN 5620 lbf	500kg 1102lb						■		1	■	Also available is a smaller, lighter Rigger 200 but not marketed to arborists	harkenindustrial.com
133x436x236mm 19 x 19 x 9.3"	*75- 152mm 3-6"	16:1	12-19mm 1/2-3/4"	>89kN >20000 lbf	1360kg 3000lb		■	■	☐	■		1	2	■	The original arborist lowering device with raising capability. *Has a highly tapered capstan	blairsae.com
139x250x240mm 1.4 x 10 x 9.5"	80mm 3.5"	13.5 40:1	12mm 1/2"	>40kN >8992 lbf	400kg 881lb		■	■			■	3*	3*	■	Guides designed as 'hyperbars that double as tie-off posts	works-odsk.jp
Expansion Row																

ad: normally based on 7:1 to 10:1 of the MBS. INC BOLLARD: Add on. Except ■ which are integral N/A info Not Available/not given

images NOT to scale	MODEL	COMPANY	HARKENN TYPE	ORIGIN	COST inc tax <small>£\$€ Currency conversion only</small>	WEIGHT exc straps	MATERIALS BASE PLATE CAPSTAN
	Classic/Basic	SKYHOOK	40		£3135 \$3950 €3610	9.3kg 20.5 lb	Alloy Aluminium
	Lightweight/ Multi-Mission	SKYHOOK	40		£3045 \$3840 €3510	7.9kg 17.5 lb	Alloy Aluminium
	RCW3001	STEIN			£1078 \$1400 €1350	29kg 64 lb	Steel Steel
	RCW3002	STEIN			£1415 \$1730 €1625	41.7kg 92 lb	Steel Steel



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HAND POWERED ROPE WINCHES

MAX DIMENSIONS exc handle	CAPSTAN Ø	MA RATIOS	CAPSTAN ROPE Ø	MBS	WLL Max Load for RAISING LOWERING	MODULAR	RUBBER TRUNK GRIPS	ANCHOR STRAP	Includes BOLLARD	SELF-TAIL CATCHER	PROGRESS CAPTURE	CONTROL POSTS	TOP/BOTTOM ANCHOR EYE ROPE GUIDES	NOTES	WWW.
Ø8x254x235mm 10 x 10 x 9.25"	80mm 3.5"	13.5:1 40:1	11-13mm 7/16-1/2"	-	500kg 1100 lb	■					■		1	Price includes (and requires) 'Universal' back plate for efficient attachment to trunks.	skyhookrescue.com
?	80mm 3.5"	13.5:1 40:1	11-13mm 7/16-1/2"	-	500kg 1100 lb	■					■		1	Lightweight shown attached to accessory H-plate. Bottom anchor eyes on guide roller frame.	skyhookrescue.com
275xmm 11 "	115mm* 4.5"	5.4:1	8mm 5/16"	-	681kg 1501 lb 3000kg 6614 lb	■		■	□	■		2	2	* No capstan - this is the Bollard diameter. Winch has separate 8mm raising rope	steinworldwide.com
365xmm 14.4 x "	115mm* 4.5"	5.4:1	8mm 5/16"	-	681kg 1501 lb 3000kg 6614 lb	■		■	□	■		2 x2	2 x2	* No capstan - this is the Bollard diameter. Winch has separate 8mm raising rope	steinworldwide.com



POWERED ROPE WINCHES/ASCENDERS (no wire-rope winches)

Independently anchored, fibre rope winches

A few years ago powered rope winches might only have consisted of a handful of small petrol/gas powered models that were effectively a chainsaw or brushcutter engine attached to a capstan. Now, we not only have a wider range of specifically designed petrol capstan winches like the Portable Winch Co. range, we also have a whole heap of battery powered models that use a rotating grip or jaw instead of a capstan. All such models can use any length of rope within their operating limits - often limited by temperature in the case of battery power. We need to say straight away that the number of battery winches is artificially bolstered by the meteoric rise of powered ascenders because they can all be used for ascending a rope AND as a conventional but light-duty winch because it's the same job - hauling a weight on a rope. There is really only one dedicated battery rope winch of note, the PCW3000-Li, the rest are either wire-rope models which we'll discuss shortly, or powered ascenders that can be used as a winch, dragging a suitably sized rope through its cleated circular 'jaw' instead of around a large capstan while fixed to an anchor. Within the battery genre there are now several models that would very rarely make it

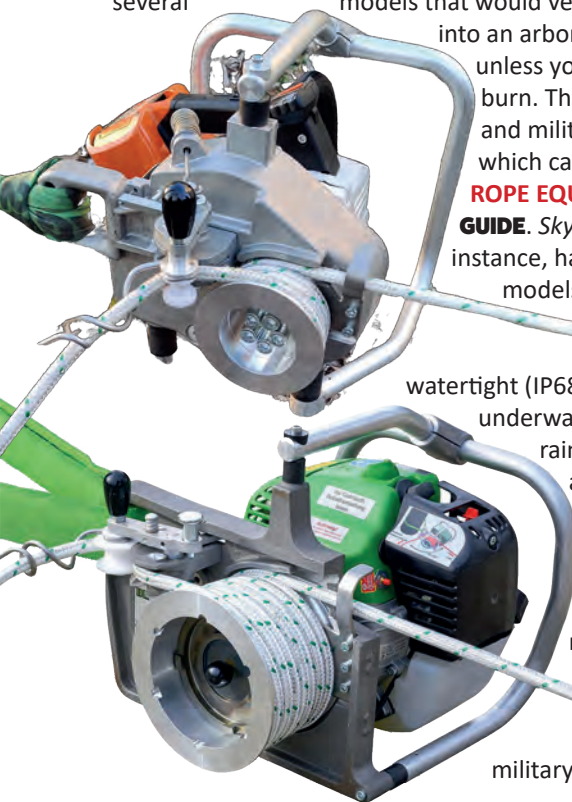
into an arborist inventory at all unless you have money to burn. These are the rescue and military spec models which can be found in the **ROPE EQUIPMENT BUYERS GUIDE**. Skylotec/Actsafte for instance, has 5 or 6 military models including a SEAL model which is completely watertight (IP68), even operating underwater. So, while heavy rain is no hindrance to any winch, whether petrol or battery, they do have saturation limits which these overtly military model don't. Skylotec have balanced these overtly military models with their

new utility ICX model using the Husqvarana battery platform and therefore of particular interest to arborists.

We must stress once more, that **battery powered ascenders used as winches have a very much lower load capacity than petrol/gas/battery dedicated winches.**

Powered ascenders will NOT drag logs across the ground because the actual load will vary so wildly as it snags on differing substrates and obstructions. Powered ascenders are for more precise hauling operations either within the tree or on a highline/zipline where your rigging skills can mitigate the loads to within required margins. Taking a winch into the canopy to anchor it would be unheard of if weren't for the fact that you may have already used it to ascend into the canopy instead of having to haul it into position as a dead-weight. But when grunt is the primary requirement, a dedicated winch, whether gas or battery, will have, on average, around 7 or 8 times MORE hauling power than a battery-powered ascender and can cope just fine with dragging heavy weights through the forest. One last thing to consider is operating temperature. Petrol/gas can do weird things in extreme cold and extreme heat but you deal with it all the time with your chainsaws so a winch just demands the same care and attention and will function OK in extreme temperatures. Those of you who have switched to battery chainsaws and work in very low or very high temperatures will have noticed that they are not so forgiving. Power drops off below freezing (that's 0 degrees centigrade not the Fahrenheit scale which freezes at 32 degrees and boils at some other unmemorable number). You may see as much as a 15% power reduction. The same is true of high temperatures with a similar percentage reduction. A good rule of thumb is that if it's a comfortable temperature for you to work in, it will be comfortable for battery powered tools. Take it as a reason to tell the boss it's too hot or too cold to be working safely if your battery tools are playing up.

Powered winches are generally employed to do a different job to the manually operated capstan winches. The manual capstans allow for precise taking in of slack over small distances during limb removal, to take in slack in preparation for a cut and to arrest the fall of cut sections in conjunction with a suitable snatch block before lowering your branch or



ABOVE: Germany's Grube/Eder 1800 model and above it their new 1200 battery version using a readily available Stihl36v battery. Note the black knob on the left is sprung or sometimes screw-threaded and is to allow installation of the rope into a redirect. The knob inside the capstan allows it to be changed or replaced.

TOP RIGHT: Canada's Portable Winch Co. has a battery model, the PCW3000-Li, using a Briggs&Stratten/Cramer 82v battery.

POWERED ROPE WINCHES/ASCENDERS

trunk section to the ground in a controlled manner. Powered winches on the other hand are generally in it for the long-haul, literally. They're for repetitive lifting and dragging or where speed is important or for winching/hauling long distances. Battery models do offer more precise handling with variable speeds from 0 to Way-too-fast, so skilled operators can quickly learn to use them as easily as a manual capstan and probably get the job done a lot faster. However, don't forget that a number of the manual capstans and in particular any that use a *Harken* capstan can use a power-drill attachment for winding instead of the handle and this too would speed up the job. Petrol/gas powered winches mostly use a full capstan around which you wind a number of turns of rope as in the *Grube* model opposite while battery powered ascenders use a single turn of rope grasped within a jaw-like 'cog'. The multi-wrapped capstan offers conventional lowering where more turns = more friction but the battery ascenders use reverse drive of the motor to enable lowering so this is not a design function for heavy loads and they most certainly should NOT be subjected to any kind of shock load, something you might get away with on a manual capstan winch though still not recommended. If the loads are within lowering limits, some battery ascenders actually recharge during lowering so if you have a mixed bag of lowering and raising you can get extended battery life from a powered ascender which otherwise has considerably less longevity than a liquid-fuel driven winch.

CAPTIVE DRUM WIRE & ROPE WINCHES

It's ironic that an article on winches doesn't include the world's biggest name in winches, *WARN*. Warn Industries concentrates on vehicle-mounted, wire rope winches. It does have two models that might be useful for arborists because they use rope; the battery driven *Pullzall* and the 500lb Drill winch. Both have integrated wire or synthetic rope on a captive drum but only have a very short working length UNLESS you piggyback it to another rope system to give you the reach you require to get to the target tree, branch or section. Your working range will still be fairly limited since it is only what is wound onto the internal drum. The *Pullzall* (pic below right) has 15ft of wire or fibre rope. Its pull capacity is 1000lb@5.6ft/min but it will only do this for about 150ft on a full charge. Of more use to arborists is *Docma's* L55 series using 80m of 5mm rope/cord. This sounds like a very small diameter but it can haul up to 1260kg assuming NO friction and, as with all pulleys, more if you add a 2:1. The 2 *Docma* models are currently the only captive rope on drum models that we have included and are intended more for forestry but can be carried in their own back-pack.

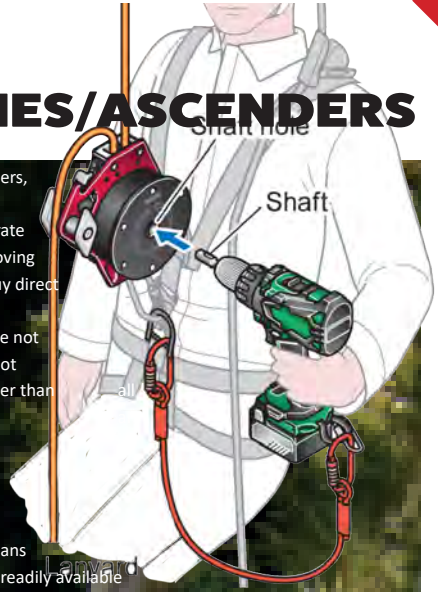


This next section on pulling, raising and lowering has some of the same info as the manual capstan winch GUIDE except where there are differences when using electric or petrol/gas power.



Main Pic: Acstafe's Powered ascenders, whether petrol like this PMX or the battery-driven ACX (inset), can operate as 'light-duty' winches as well as moving a human load up or down a rope by direct attachment.

Right: The Japanese *Kenzi* models are not yet available outside of Japan and not included in our tables but are smaller than others as a consequence of using electric drill to do the work something we've seen in rescue with the *Skyhook* listed in our manual winches Guide. This means that your 'motor' is a readily available and considerably cheaper alternative to a bespoke battery. We will be updating soon with the Chinese *AWAH* drill-powered ascender.



As with manual capstan winches, some powered winches can be anchored directly to the target tree and remotely controlled using the tail of the rope but it's an expensive bit of kit if you hit it with a log!



The diagram above, courtesy of Eder Maschinbau, shows a typical pulling/dragging operation where the pulley on the load significantly reduces the load experienced by all of the components which would otherwise be overloaded at 3.6tonnes. The load is never halved by the travelling pulley, to do that it would need to be 100% efficient with no friction and the second anchor would have to be rigged so that it was directly in line with main anchor.

PULLING, RAISING & LOWERING

The terms 'Pulling' and 'Raising' are both the same and different. For the purposes of this article, pulling implies horizontal 'dragging' of the target tree, either to assist in felling it by pulling against its angle of lean or an opposing wind force or to physically drag it across the ground from the felling site to the vehicle or log-stack as in the diagram on the left. Raising also requires the rope to be 'pulled' but the load will invariably be off the ground and were it not connected to the winch would freefall to the ground. Circumstances that require raising include:

- Relocating a branch being cut or that is already cut,
- Lifting a cut branch or trunk over an obstruction after cutting
- Correct an angle of lean on branches or sections that are off the ground on the target tree, prior to cutting

Once the raising work is done it's time to lock off the load and prepare for lowering. This may use those an integral cam, some form of tie-off post for the raising rope or in the case of powered ascenders the rope is permanently grasped and a direction change from raise to lower in initiated by the flip of a switch or button. Remember that a cam would require you to take load off before it will release the rope for lowering so you're either going to need that winch again to take in enough rope to release the cam or you might piggyback a small pulley system to allow the load transfer. Tie-off posts are the same as you always have with a bollard, a few sturdy wraps and a strong

hand grasp as you gently unwrap until the load comes on and remains manageable. With capstan winches this then becomes a self-tailing action where several wraps wound around the shiny surface allow one person to hold the load and gently run the rope through gloved hands to lower. *FTC TREE* provide these handy figures for the load holding ability of a new 12mm rope when wrapped around their 100mm mini-bollard with the operator(s) feeling a weight/resistance on the rope of around 30-40kg/67-90lb:

3/4 turn	= 75 daN / 77kg / 169 lb
1 3/4 turns	= 200 daN / 204kg / 450 lb
2 3/4 turn	= 470 daN / 479kg / 1057 lb
3 3/4 turn	= 1000 daN / 1020kg / 2248 lb

The styles of winch we're discussing could still be said to take some of the skills necessity out of the hands of ground crew; no setting up of pulley systems, not even knot-tying and the powered ascender style of winch doesn't even require the 'feel' of tension on the trail rope for expert control - you just press the trigger/button/throttle and raise or lower away. Your winch will always be secured to the base of a tree, a vehicle or other suitable anchor. Unlike a manual capstan designed primarily as a lowering device that can do a bit of raising, powered winches are designed for raising/pulling with a bit of lowering. They are therefore not generally connected to the target tree but rather an appropriate anchor adjacent the target tree. If used for lowering cut sections/branches, the rope (NOT WIRE CABLE) will be redirected to the load branch or trunk section via a snatch or impact block/pulley. Powered winches often have a built in redirect and sturdy rope guides. If you look at the main title picture you can see that the rope is entering the capstan at a 90 degree angle thanks to the pulley redirect and spring-like rope guide but this entry angle can often be adjusted as required. One of the reasons that some petrol/gas-powered winches are not used on their side, attached to the target tree, is the fuel and maybe oil feed which may have a tendency to spill or not flow efficiently. However engines like the Honda GX35 and 50 are designed to work in any orientation (like a chainsaw) as are most, if not all, of the winches in this GUIDE. The *Grube/Eder 500* also shown on the title page has rubber-lined feet and anchor eyes that specifically allow it to be attached to the target tree in the same was as the manual capstans. The *PCH1000* has an optional rigid mounting plate that anchors to the target tree or anchor tree/pole keeping the winch levelled while providing an integral redirect.

Instead of winding manically on a handle when raising or pulling, the powered winch operator has only to use a throttle, trigger or button to initiate movement. However, there are two things to note

- 1) make sure that you take in slack and initiate lift with the trigger/throttle in a controlled manner not like a teenager over-revving a motorcycle and wheelying up the road as if he meant to do it.
- 2) Just as you do with a descender, maintain contact and control of the trail rope as it enters/exits the capstan or drum/grip. This also means ensuring the correct number of wraps if it's a capstan and ensuring that there are no kinks or knots in the

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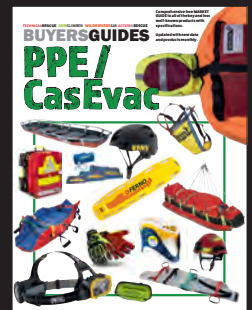
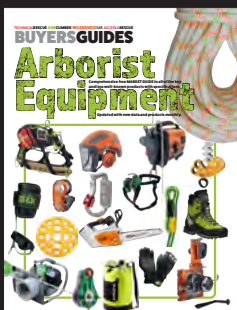
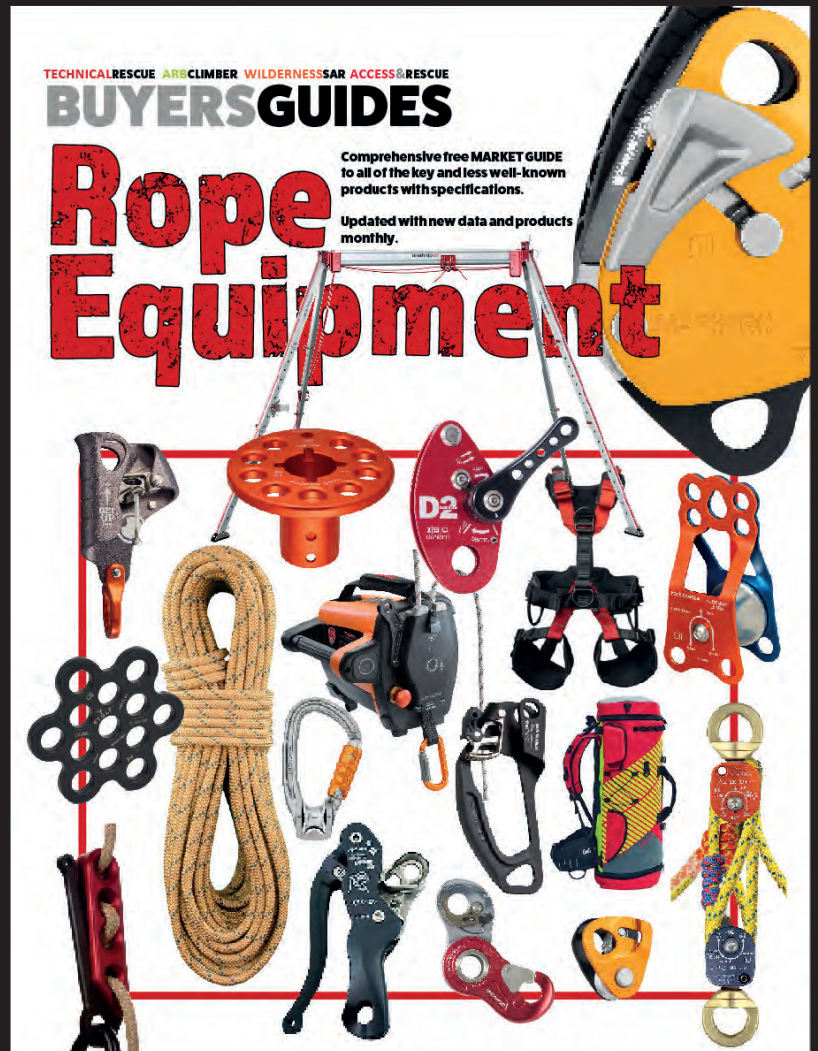
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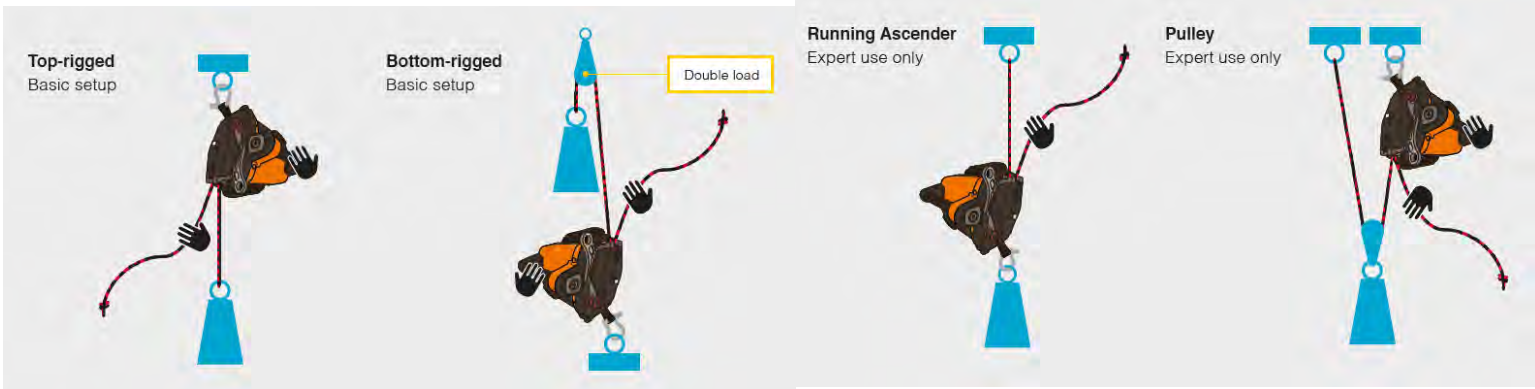
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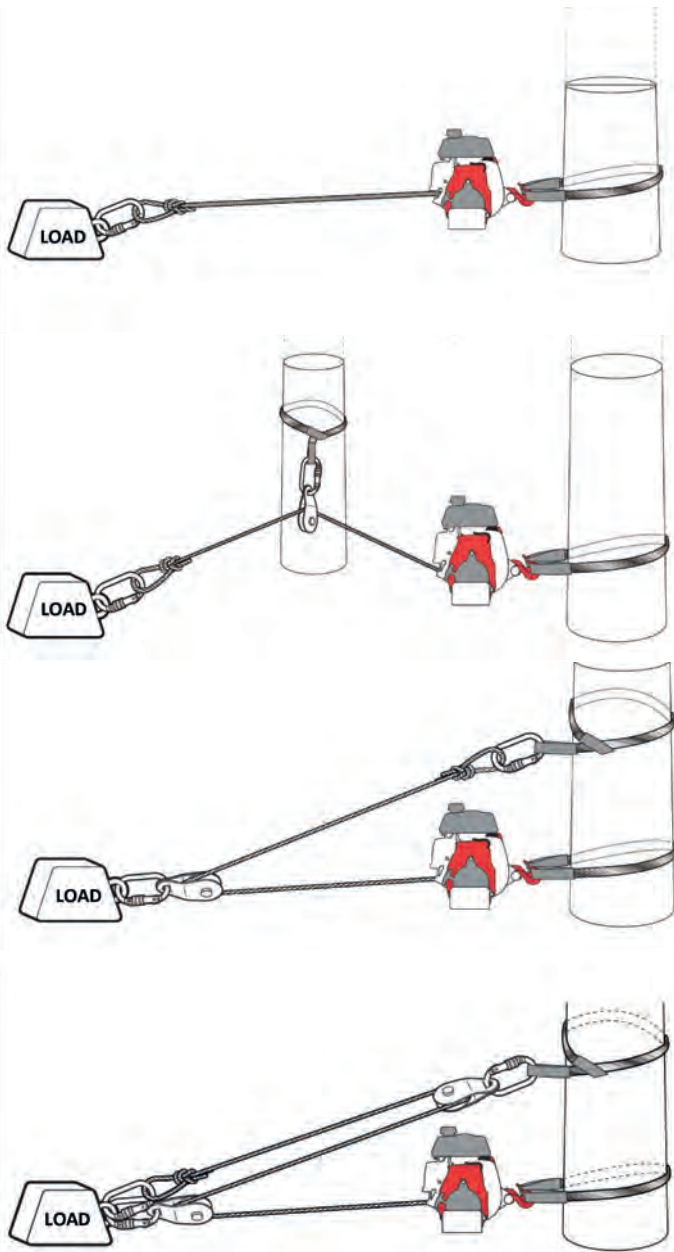
Arborist Equipment, Rope Equipment
USAR/Extrication, Water Rescue,
'Black' Equipment (Tactical & Theatre/Film),
and **PPE/Casualty Packaging**

The image shows a screenshot of a Buyers Guide table for 'AUTOLOCK DESCENDERS'. The table is organized into columns for various specifications and includes small images of different descender models. The top of the table is labeled 'NOV23' and 'AUTOLOCK DESCENDERS'. The table contains multiple rows of data, each representing a different product model with its corresponding image and technical details.





ABOVE: All of these options for anchoring a powered ascender can be applied to a dedicated winch, whether battery or petrol/gas powered. However, petrol/gas models shown below in Portable Winch Co.'s diagrams, are primarily designed to be used on or near the ground in a horizontal orientation. You could therefore look at the Actsafe diagrams above as if rigged horizontally as well as vertically. The principle of halving the load (theoretically) using a pulley on the load, holds true for all types of winch/power ascender. Remember, this halves the load to the winch but requires twice as much rope and takes twice as long to take in than direct connection to the load. More importantly it SIGNIFICANTLY increases the load at the pulley and deviation anchor.



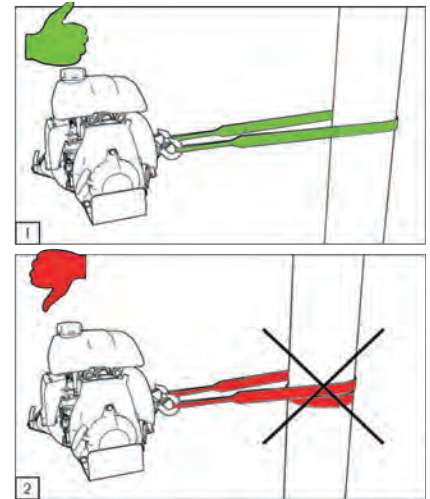
rope to jam things up - a powered device is far, far less forgiving than a manual winch in this respect, in fact prospectively, catastrophically so.

WHAT COULD POSSIBLY GO WRONG?

The rope could snap! Most winches have no mechanical clutch mechanism to mitigate the powerful pulling action should a jam occur. Most will cut out if loaded to the maximum or overloaded but that's not much consolation with the more powerful models. For capstan models your rope handling skills around the capstan are therefore important. You should have hold of the trail rope at all times and have enough wraps on the drum so that if you release tension on the rope the wraps will start to run under load. This acts as your safety 'clutch' should the load jam or be heavier than expected and heavier than your safety margins were anticipating. As you take in on the trail rope, it tightens the wraps on the drum causing it to grip and start taking in. If it slips continuously you need an extra wrap.

Clearly, you cannot allow a knot or kink to enter the winch or capstan from either direction. If you see or feel a potential obstruction in the rope you will need to immediately stop taking in and ensure the load remains secured if it is off the ground. You may need to employ a secondary, manual pulley system to hold the load in order to clear an obstruction between the capstan or rope grip and the load. Of course, if you were using the winch to correct a felling angle, then tension needed to be maintained throughout and any necessity to stop taking in could be disastrous. Should have checked the rope thoroughly before starting the winch!

Many winches are supplied with an anchor sling and some, like the *Portable Winch Co.*, have two swivel hooks spaced across the front of the winch instead of the single attachment eye that most have. This demands that you DO NOT take an extra 'wrap' of the sling around the anchor (2.right) because, once loaded you may end up with only one leg of the sling and therefore one hook, taking the



POWERED ROPE WINCHES/ASCENDERS

load and the winch being off-centre in terms of rope feed. Pulling can look the same as raising except in one key element - progress-capture. Two models from *Portable Winch Co.* (*PCH1000* and *PCH2000*) quote two different figures; one for pulling and one for raising. Here is why; when pulling a load horizontally, the engine has the chance to ramp up to its maximum capacity and therefore pull heavier weights. Whereas, when raising a load from mid air, the engine has to provide all its power at this very instant in order to keep raising the load. Those two lifting winches are equipped with a progress-capture cam that is integrated into their frame. It is designed to hold the load during resetting or if the tail of the rope has been accidentally released. In this last case, there will necessarily be an aggressive compressing action from the progress-capture, which can weaken the rope, but at least, the load and workers will be safe.

CHAINSAW WINCH ADAPTERS

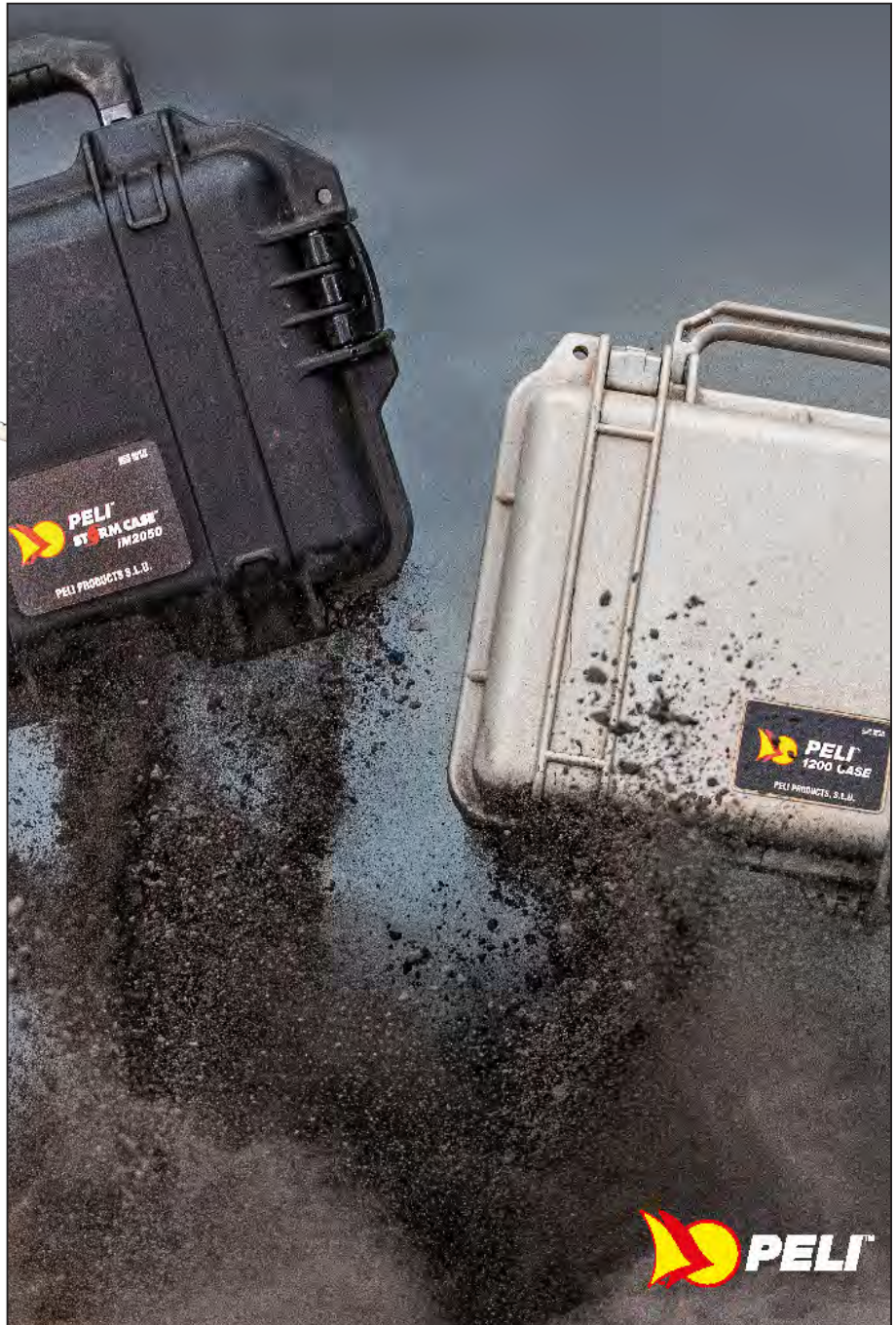
Unlike the drill adapters mentioned last time which could help drive many of the manual rope capstan winches instead of using the handle, only one winch utilises a drill and that is a wire-rope model from *Warn* with 227kg/500lb capacity using 30ft of cable and is not included here. There are some, like the *Simpson CS-CW* that is a winching unit powered by your chainsaw, as long as that chainsaw has a 3/8" drive sprocket and is less than 57cc. It weighs only 4kg/9lb not surprisingly, since it doesn't have an engine, and costs around \$700. So it's not a massive saving over some of the less expensive winches in our list but if you're dragging wood in remote areas and already have to carry a chainsaw it makes your overall travel weight much less.

SAFE OPERATING TECHNIQUE

The standard bollard devices are solid lumps of metal that you are very unlikely to damage in a controlled lowering even if it gets side-swiped by the section being lowered. However, a winch has extraneous components that are much more susceptible to damage - the fuel tank or battery and switches/triggers for instance. These are

expensive as well so it's best to ensure that you position it so that the winch is offset and the lowered section comes down to one side. Don't forget to factor in that your load may start out in a controlled lower but end up in freefall should an operator or component fail.

A key factor in positioning your winch offset to the load, is the fact that the operator may need to stand directly adjacent to the winch to control it and so could be in the danger/drop zone. Also bear in mind that raising adds forces to the system that make it a more dangerous operation with greater scope for component failure at the rigging or even the rope itself than lowering imparts. When lowering, the operator will typically stand a minimum of 6ft-2m from the winch, often much more and will ALWAYS wear gloves. In the case of electric ascenders





Above: Eder's petrol-engined PowerClimber has now been joined by a battery-powered version



Right: Ronin's Lift was the first to try and make powered ascenders available to the masses with smaller, well priced devices. Now Skylotec and the above-mentioned PowerClimber are fighting back with models that use 'off-the-shelf' Stihl and Husqvarna batteries used in many chainsaws, blowers and power tools.

Left: Ronin's Non HEC Lift for material handling rather than human transport

POWERED ASCENDERS



there is often a remote control option and this really can mitigate a lot of the hazards in handling heavy loads.

Good technique requires the operators to use the appropriate number of wraps to hold the load and when lowering too fast, to reduce speed dynamically allowing enough rope to run though gloved hands so that impact forces are negated. If the load comes to a sudden arrest because you've wrapped too many turns around the capstan the impact forces will magnify considerably and could adversely affect ANY of the components including the rope and the winch.

Ensure that the wraps are regular and do not over-lap or override each other - this can make your job harder at best and can be extremely dangerous at worst. Some capstans have moulded diagonal grooves which help guide each turn of rope in the right place.

NB: New European standards are coming in requiring safe operation of the winch from 5m away and a dead-man switch - we will incorporate these into the tables during 2024.

Powered ascenders like the *Skylotec/Actsafte*, *Ronin*, *Ropetek* and *Eder* models can revolutionise your tree work, they not only get you up and down much more efficiently and with minimal effort, they can all be used as light-duty winches which you can anchor and control from the canopy if necessary. **For full discussion of Powered Ascenders see ROPE EQPT BUYERS GUIDE.**

On the *Ronin* model (left) you can see the obvious anchor eyes top and bottom which can be used to anchor the device before pulling rope through or paying out/lowering under power. This is a key difference between powered ascenders and capstan winches, capstans take in under power and lower by hand, whereas ascenders maintain grip on the rope and power both ways. As always with battery power there is no noise or fumes during operation and control is much more finite enabling a skilled operator to tweak lifting and lowering operations within fine margins. None of them are as powerful as petrol/gas winches however and none should be used for dragging because of the excessive spikes in load that can occur. Bravely in the face of the battery onslaught, German winch company *EDER* followed *Skylotec/Actsafte* and *RopeTek* in creating a gas/petrol powered human-riding ascender, the *Power Climber* but they now have a battery model coming out in 2024 that, usefully for arborists, uses *Stihl AP* batteries. Stealing a march on *Eder* is *Skylotec/Actsafte's* new *ICX* ascender (pic bottom left) a co-development with *Husqvarna* using their battery platform which, like the *Stihl* platform, is used for pro chainsaws, blowers, trimmers etc. making even wider use of your specific battery. This seems like the obvious way to go rather than bespoke batteries that only fit the powered ascender and are not readily available from your local hardware store. The *ICX* also has powered, rather than just inertia, descent.

We have included ONLY models costing less than (approx) £15K/\$20K. Our Guide to Power Ascenders in the **ROPE EQPT BUYERS GUIDE** includes many other models and variants with higher load capacities, greater water ingress protection and in some cases submersible, aimed at rescue and military/govt agencies. They include *Atlas Devices* (which we had previously included in the first version of this Guide in **ARBCLIMBER#16** but they haven't yet brought out a model aimed at the utility market) and more of the *KOPARS* South Korean range that is interesting if not rather 'boxy'.

The *Kenz* models mentioned on page 191 were new for 2023/24 and use a regular (quality brand) power drill as the driver. Currently only available in Japan but watch this space. *Ronin* has a smaller model, the *TL* with less range than the *Lift* but smaller and lighter and they also have a new materials-handling model not for humans which stands out in its white livery (Inset pic far left).

Finally there are four Chinese ranges - *ASAT* we are familiar with as a rope equipment manufacturer, *Petro Steel* - not so much. They appear to be an agri-chemical company with fingers in many mechanical pies but these are decidedly affordable if not a little too good to be true. However as a portable winch rather than for life-support - they may be worth investigating. The more capable *Mode* model seems to have some connection with *Petro-steel* but there is some litigation on copyright infringement going on. Finally a drill-driven *AWAH* model will be added in 2024 depending on how our review goes!

BOTH CAPSTAN AND ASCENDER STYLE WINCHES REQUIRE THE TRAIL/TAIL ROPE TO BE CONTROLLED BY THE HAND AT ALL TIMES DURING RAISING AND LOWERING.

IN THE FOLLOWING TABLES:.....

COST: Including at least one battery unless stated otherwise.

Prices are approximate, include VAT@20% &/or US State Sales Tax. We generally round up the cost to the nearest Pound£, US Dollar\$ or Euro€. **£\$€ in orange is a currency conversion only.**

ORIGIN: Is the parent company - an inset flat may indicate the manufacturer's country if different but we don't always know.

WEIGHT: Includes battery unless otherwise indicated but **does not include fuel** for petrol/gas models.

MAX DIMENSIONS CAPSTAN DIAMETER: Height by width by depth but not necessarily in that order! **For the capstan**, it's all about avoiding tight radius bends and the wider the capstan diameter the better it is for your rope. The magic figure is 4"/100mm, this is the diameter at which you will lose virtually NO strength in your rope due to bending fibres.

SOUND LEVEL (LWA): Liquid-fuel engines have similar sound levels to chainsaws and the levels quoted may not be the maximum depending on the work the engine is subjected to and its age and efficiency. Figured quoted are for new engines. However, battery power is different because there is literally NO NOISE when it's not working (ie. it does not idle like a petrol engine) and even when it does work the maximum noise is considerably less than an engine. So low in fact that most manufacturers don't even give a noise level in their stats.

ROPE DIAMETER: Given by the manufacturer as range but the optimum size is often in the middle. Some require a specific type and/or brand of rope. As we are now seeing with descenders this is the only way to be specific about the performance specifications quoted.

WLL & HAUL (ASCEND) SPEED: This is for a single rope in direct contact with the load with the speed shown with maximum load. Both figures will be affected by using a 2:1 or travelling pulley rig, speeds will effectively be halved and loads will be doubled but only in a perfect, frictionless world. **Speeds will also be altered using different size capstans.** Hauling rope in is the same whether you're dragging a log, lifting a branch or ascending the rope. The difference is in the degree of interference that might increase load and severely reduce the speed and load figures quoted. Dragging along the ground obviously imparts a lot more friction than a person ascending the rope. Similarly a little more friction is imparted with every deviation of the rope, this might be quite efficient over a bearing pulley or quite inefficient directly over a branch.

SPEEDS/VARIABLE: Most capstan winches have one set speed. This can be altered by gripping the rope or changing the capstan diameter but some have 2 speeds and battery powered winches using a 'trigger' or throttle can have finite control from zero to top speed so that you can make smooth starts/restarts

HUMAN-RIDING: Obviously all powered ascenders are intended for human transport but despite their increased capacity only very few winches are suitably certified.

POWERED ASCENDERS are listed separately but with the same parameters as the regular winches apart from extra battery information, **CONTROLLED DESCENT SPEED** and **RESCUE-CAPABLE** in terms of a two-person load. It's fair to say that in a dire emergency you could do the maths on the max load on any winch and decide if its worth the risk Winches have **PROGRESS CAPTURE** to indicate some form of rope cam at the rope entry point preventing drop back during hauling and/or at end of hauling operation - something **POWER ASCENDERS** all have.

LOWERING: ■ = manual control with a capstan, ■ = Lowering under power as a reverse of ascending/hauling.



POWER ASCENDERS - FOR PROFESSIONALS.

ActSafe Power Ascenders are an ingenious combination of a high-capacity rope winch in a compact, lightweight and user-friendly design. They simply redefine the possibilities for working in vertical environments.

skylotec.com



More Information





































ActSafe PMX

- working load limit (WLL) of 250 kg
- 17 m / min at 100 kg
- suitable for 11 mm ropes

















































ActSafe ACX




- simplifies and accelerates work on complex or difficult to access structures
- power-saving use
- remote control up to 150m

	Images NOT to Scale			
				
MANUFACTURER	ASAT	ASAT	EDER	EDER
MODEL VARIANT	ACE24	ACE22	PowerClimber EPC130	PowerClimber EPC240
ORIGIN				
COST	£5680 \$9400 €8945	£7000 \$8500 €8085	£3560 \$4325 €4100	£3960 \$4850 €4570
POWER BATTERY/PETROL/GAS				
WEIGHT inc battery/fuel	18 3.4kg 39.6 7.5lb	10.5 2kg 32 4.4lb	11.2kg 24.6lb	10.3kg 22.7lb
BATTERY ONLY				
MATERIAL RESCUE/WINCH				
STOP/GO CONTROL	Dial	Dial	Throttle	Throttle
WLL (Overload cut-out)	260kg 572lb	180kg 396lb	130kg 286lb	240kg 528lb
DIMENSIONS BATTERY-ONLY	30x23x35cm 11.8 x 9.1 x 13.8" n/a	26x16x24cm 10 x 6.3 x 9.4" n/a	36 x 30 x 27cm 14.1 x 11.8 x 10.6" -	39 x 30 x 28cm 15.4 x 11.8 x 11" -
Specific/Any Rope Ø	11mm EN1891A 7/16" EN1891A	11-12mm 7/16"	11-12.9mm 7/16-1/2"	11-12.9mm 7/16-1/2"
RANGE on 1 charge/tank	300m 984ft*	400m 1312ft*	240m	240m
ASCENT SPEED	0-30min 0-98.4ft/m	0-30min 0-98.4ft/m	0-30* m/min 0-98ft/min	0-24-36* m/min 0-78-118ft/min
DESCENT SPEED	0-40m 0-98.4ft/m	0-40min 0-131ft/m	18m/min 59ft/min	18m/min 59ft/min
Metres/feet/minute				
ENGINE/BATTERY POWER	48v Lithium 7.5Ah	44v Lithium 5Ah	Honda GX50 2stroke 47.9cc / 2Hp	Kawasaki TJ53 2stroke 53.2cc / 2.68Hp
RECHARGE TIME ON DESCENT	60min 	<60min 	-	-
REMOTE APP CONTROL RANGE	<input type="checkbox"/> 150m 492ft -	<input type="checkbox"/> 150m 492ft -	-	-
ON-BOARD CHARGE STATUS			-	-
ANCHOR TOP BOTTOM	1 1	1 1	1 1	1 1
NOISE/SOUND LEVELS	70dB	70dB	97dB	>97dB
EMERGENCY IMPACT STOP	 -	 -	- -	- -
NO-POWER DESCEND				
TEMP RANGE °C/°F	-30to60°C -10to120°F	-20to60°C -4to120°F	-20to40°C -4to104°F	-20to40°C -4to104°F
IP RATING	56 -	54 -	55	55
MID/ END ROPE FEED				
WARRANTY GOVT ONLY	6-12months	6-12months	12months	12months
CARRY CASE c/w ROPE	 <input type="checkbox"/>	 <input type="checkbox"/>	- 	- 
STANDARDS				
NOTES	*@150kg NB: Combination of ascent and descent increases duration to 700m/2296ft	*@120kg NB: Combination of ascent and descent increases duration to 400m/1312ft	*36m/min@130kg Supplied with 100m Beal 11 or 12.9mm rope +£300 for 12.9mm	RESCUE-capable version *36m/min@130kg Supplied with 100m Beal 11 or 12.9mm rope +£300 for 12.9mm
WEBSITE	asatsafe.com	asatsafe.com	edertools.com grube.de	edertools.com grube.de

COSTS: Approx & inc local tax/VAT £/\$€ shown in burnt orange are currency conversions only & do not inc shipping, import duty or tax WLL: If no WLL is given by manu

POWERED ROPE WINCHES/ASCENDERS











				
EDER	HARKEN	HARKEN	K1PARS	MODE
PowerClimber 240-11B	Lokhead Power Hauler PWRS-G.COMPACT	Lokhead Power Hauler PWRS-B.COMPACT	KEA-HB-W1/S1	Spider Pro
				
£4500 \$5750 €5205	£4550 \$5750 €5250	£5690 \$7175 €6560	n/a	£5995 \$7300 €6950
				
10.5 1.77 kg 23.1 3.9 lb	13.5kg 29.8lb	21.6 3.6 kg 47.5 7.9 lb	13.5/ 13 kg 29.7/ 28.6 lb	14.3 00 kg 31.5 00 lb
				
Throttle	Trigger	long-Trigger & lever*	Throttle	Throttle
240kg 528lb	273kg 600lb	300kg 661lb	250/ 120 kg 551/ 264 lb	200kg 440lb
30 x 40 x 30cm 11.8 x 15.75 x 11.8"	55.8 x 41.7 x 36.4cm 23 x 16.4 x 14.3"	41.7 x 53.8 x 36.4cm 16.4 x 21.2 x 14.3" 24 x 13.4 x 9.3cm 9.5 x 5.3 x 3.7"	45 x 24 x 30cm 17.7 x 9.5 x 12"	33x 26.5x 26.7cm 13x10.4x10.5" 00 cm 00 "
11 -mm ½ "	10-12.7mm ¾-½"	10-12.7mm ¾-½"	10-12.7mm ¾-½"	10.5-13mm typeA ¾-½"
TBA	600m 1968ft*	550m 1804ft*	600/ 550 m 1968/ 1804 ft*	330m 1082ft*
0--36*/m/min 0-118ft/min	0-11-15m/min 0-36-49ft/min	0-13.5m/min 0-44.3ft/min	0-13.5m/min 0-44.3ft/min	≤22m/min 72ft/min
18m/min 59ft/min	0-14m/min 0-46ft/min	0-14m/min 0-46ft/min	0-72m/min 0-236ft/min	37m/min 121ft/min
36v Stihl AP300S 7.2Ah or AP500 8.8Ah	Honda GX35 4stroke 35.8cc	50.4v Lithium ion 9Ah	Honda GX35 4stroke 35.8cc	36v Lithium-ion 5Ah
75-150mins	-	270min	-	150min
-	-	- -	□100m/328ft* -	100m/328ft 
	-		-	
1 1	1 1	1 1	1 1	1 1
TBA	81.3/96.2dB	80/90dB	81.3/96.2dB	>97dB
TBA	 -	 -	- -	 -
				
-10to50°C -10to120°F	-5to40°C 23to104°F	-10to50°C -10to120°F	-5to40°C 23to104°F	-20to50°C -4to122°F
>X4	55	54	55	54
				
24months (batteries)	24months	24months	n/a	n/a
- 	 	 	 	 
RESCUE-capable version *36m/min@130kg Supplied with 100m Beal 11 or 12.9mm rope +£300 for 12.9mm	Also Powerseat version with a seat and extension post for human-riding	Also Powerseat version with a seat and extension post for human-riding	S1=speed version *@100kg/328lb *Hybrid device with electronic interface -optional remote control. See ROPE EQPT BUYERS GUIDE for K1PARS battery models	*@90kg/198lb
edertools.com grube.de	harkenindustrial.com	harkenindustrial.com	k1pars.co.kr	modepowerascender.com

Manufacturer we show a Max Load based on approx 10:1 safety ratio N/A = info Not Available/not given. ○ = OK but not ideal    = Option

	<p>Images NOT to Scale</p>			
MANUFACTURER	PETRO STEEL	PETRO STEEL	ROPETEK	RONIN
MODEL VARIANT	Pesco Smart Spider PSJ120-11	Pesco Smart Spider PSJ120-8	Wraptor HD	Lift PN2805-11
ORIGIN				
COST	£865 \$1050 €1000	£825 \$1000 €950	£3032 \$3200 €3500	£3960 \$3830 €4565
POWER BATTERY/PETROL/GAS				
WEIGHT inc battery	12.5kg integral	11.5kg integral	10.9kg -	11 2.7kg
BATTERY ONLY	27.5lb integral	27.5lb integral	24lb -	24 6lb
MATERIAL RESCUE/WINCH				
STOP/GO CONTROL	Rocker Button	Rocker Button	Throttle	Thumbwheel
WLL	≤ 140kg 309lb	≤ 120kg 265lb	141kg 310lb	182kg(272kg-2-person) 400lb (600lb-rescue-only)
DIMENSIONS BATTERY-ONLY	37x25.5 x 27.5cm 14.6x10x10.8" integral	37 x 25.5 x 27.5cm 14.6 x 10 x 10.8" integral	41 x 26 x 22cm 16.1 x 10.2 x 9" -	39 x 34 x 28.8 cm 15.4 x 13.4 x 11.4" 24.4 x 11.4 x 9.9cm 9.6 x 4.5 x 3.9"
Specific/Any Rope Ø	12-14mm ½-9/16"	12-14mm ½-9/16"	11-16mm 7/16-5/8"	11.5-13mm 7/16-½"
RANGE on 1 charge/tank	600m 787ft*	500m 787ft*	approx 227m 500ft	244m 800ft* or 15mins
ASCENT SPEED Metres/feet/minute	≤11m/min ≤36ft/min	<8/min ≤26ft/min	0-30m/min 0-100ft/min	0-27.4m/min 0-90ft/min
DESCENT SPEED Metres/feet/minute	11m/min 36ft/min	8/min 26ft/min	18m/min 59ft/min	0-45.7m/min 0-150ft/min
ENGINE/BATTERY POWER	36v Lithium-ion 20Ah	36v Lithium-ion 15Ah	Honda GX35 4stroke 35.8cc	28v Lithium-ion 3.5Ah
RECHARGE TIME ON DESCENT	240-360min	N/A	-	90min
REMOTE APP CONTROL RANGE			-	91m/300ft -
ON-BOARD CHARGE STATUS			-	
ANCHOR TOP BOTTOM	- 1	- 1	1 1	1 1
NOISE/SOUND LEVELS	n/a	n/a	89dB	n/a
EMERGENCY IMPACT STOP			- -	- -
NO-POWER DESCEND				
TEMP RANGE °C/°F	-20to50°C -4to122°F	-20to50°C -4to122°F	-20to40°C -4to104°F	-20to49°C -4to120°F
IP RATING	N/A	N/A	56 -	54 -
MID/ END ROPE FEED				
WARRANTY GOVT ONLY	n/a	n/a	n/a	12months
CARRY CASE c/w ROPE	- 	- 	- *	
STANDARDS			-	CE ANSI
NOTES	*@90kg/198lb Inc. 20m x14mm rope(order longer lengths), remote control,	*@90kg/198lb Inc. 20m x14mm rope(order longer lengths), remote control, NB: may also be a #7 version?	HD=Steel instead of alloy on high wear components plus rollers and bushings on fairlead.Cost+45%! *Comes with 59m/150ft of rope for US orders only. Price inc CMI Ropewalker	*+800ft descent @91kg/200lb Hot-swap batteries \$380 ea. Price includes wireless remote control, battery, charger, hard case w/foam. MBS >272kg/5000lb
WEBSITE	smart-spider.com	smart-spider.com	ropetek.com	roninpowerascender.com

COSTS: Approx & inc local tax/VAT £\$€ shown in burnt orange are currency conversions only & do not inc shipping, import duty or tax W N/A = info Not Available/not g

POWERED ROPE WINCHES/ASCENDERS

				
RONIN	RONIN	SKYLOTEC	SKYLOTEC	SKYLOTEC
Titan Lift (TL)	Non-HC Lift	Actsafe ACX POA-001	Actsafe ICX POA-030	Actsafe PMX POA-006
				
£3050 \$4735 €3512	£3960 \$3830 €4565	£15320 \$22780 €14450	£6750 \$8550 €7865	£9200 \$11200 €8650
■	■	■	■	■
8.6 2.3kg 19 5lb	11 3kg 24 6.6lb	13 2.5kg 28.9 5.5lb	7.4 1.31kg 16.3 2.9lb	21kg - 28.7lb -
■ ■ ■	■ - ■	■ ■ ■	■ * ■	■ ■ ●
Thumbwheel	Thumbwheel	Throttle	Thumbwheel	Throttle
182kg(272kg-2-person) 400lb (600lb-rescue-only)	182kg(272kg-2-person) 400lb (600lb-rescue-only)	200kg 440lb	185kg 407lb	250kg 551lb
29.8 x 34.3 x 28.6cm 11.75 x 13.5 x 11.25" 24.4 x 11.4 x 9.9cm 9.6 x 4.5 x 3.9"	39 x 34 x 28.8 cm 15.4 x 13.4 x 11.4" 24.4 x 11.4 x 9.9cm 9.6 x 4.5 x 3.9"	33 x 28 x 27cm 13 x 11 x 11" 30 x 12 x 11cm 12 x 4.7 x 4.3"	25.5 x 24.9 x 21.7cm 10 x 9.8 x 8.5" 11.6 x 13.2 x 9.8cm 4.6 x 5.2 x 3.8"	49 x 29 x 28cm 19.3 x 11.4 x 11.1" -
11.5-13mm 7/16-1/2"	11.5-13mm 7/16-1/2"	11mm 7/16"	11mm 7/16"	11-12.9mm 7/16-1/2"
244m 800ft*	244m 800ft*	200m 656ft*	230m 754ft*	750m 2460ft
0-27.4m/min 0-90ft/min	0-27.4m/min 0-90ft/min	0-24m/min 0-78ft/min	0-24m/min 0-78ft/min	1-17m/min 3.3-56ft/min
0-68m/min 0-150ft/min	0-68m/min 0-150ft/min	0-25m/min 0-82ft/min	1-24m/min 3.3-78ft/min	1-18m/min 3.3-59ft/min
48v Lithium-ion 3Ah	28v Lithium-ion 3.5Ah	56.1v Lithium n/a Ah	Husqvarna 36v Lithium 5.2Ah	Honda GX35 4stroke 35.8cc
120min	120min	90min ■	80/90min -	-
91m/300ft* -	91m/300ft -	□150m 492ft ■	■	-
■	■	■	■	-
1 1	1 1	1 1	- 1	1 1
n/a	n/a	76dB	n/a	89dB
■ -	- -	■ -	■ -	- -
■	■	■	■	■
-20to49°C -4to120°F	-20to49°C -4to120°F	-20to40°C -4to104°F	-10to40°C 14to104°F	-20to40°C -4to104°F
54 -	54 -	55	55	56
■	■	■	■	■
12months	12months	12months -	12months -	12months
■ □	■ □	■ □	□ □	□ □
CE ANSI	CE	CE ANSI	CE	CE
*+800ft descent @91kg/200lb Hot-swap batteries \$470 ea. Hands-free braking. MBS >2272kg/5000lb *EMI: Electronic shielding	Material handling only - Can perform human-lifting but certified and marked as material only. Inc 2x batteries MBS >2272kg/5000lb	Replacement battery £3212/\$3900/€2100 * @100kg optional rechargeable driver as power source	Uses 'off-the-shelf' Husqvarna BLi200 batteries * @100kg *not-load-rated for a rescue load but can use remote control to carry out single person rescue.	*@100kg/220lb
roninpowerascender.com	roninpowerascender.com	skylotec.com	skylotec.com	skylotec.com

given. ○ = OK but not ideal ■ □ = Option















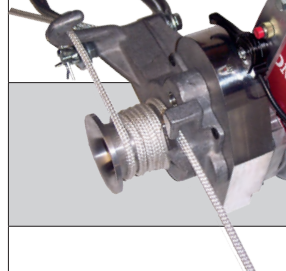







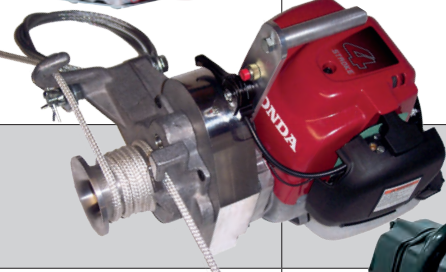





images NOT to scale		MODEL	COMPANY	ORIGIN	COST inc tax <small>currency conversion only</small>	WT	MAX DIMENSIONS <small>CAPSTAN</small>
		VF80 Bolt	DOCMA		£1380 \$1783 €1500	10.5kg 23lb	346 x 350 x 253mm 13.6 x 13.8 x 10" 65mm 2.56"
		VF105 Red Iron	DOCMA		£1500 \$1938 €1615	10.5kg 23lb	346 x 350 x 253mm 13.6 x 13.8 x 10" 65mm 2.56"
		VF900-4 Nippon	DOCMA		£1500 \$1850 €1695	10.85kg 24lb	350 x 350 x 290 mm 13.8 x 13.8 x 11.4" 51mm 2"
		VF155 Auto	DOCMA		£1780 \$2120 €2060	25kg 51.4lb	595 x 360 x 360cm 3.4 x 14.2 x 14.2"
		VF155 Auto-4	DOCMA		£2150 \$2600 €2463	25.35kg 55.8lb	595 x 385 x 360cm 3.4 x 15.1 x 14.2"
		Manual Ultralight VF155	DOCMA		£1600 \$2000 €1850	20.5kg 55lb	560 x 360 x 360cm 22 x 14.2 x 14.2"
		Nordforest 400 Powerwinch 400	EDER /GRUBE		£1554 \$1900 €1450	13kg 28.7lb	340x420x350mm 13.4x16.5x13.8" 51mm 2"
		Nordforest 400-1 Powerwinch 400-1	EDER /GRUBE		£1254 \$1792 €1600	13kg 28.7lb	370 x 330 x 340mm 14.6 x 13 x 13.4" 80mm 3.15"
		Powerwinch 500	EDER		£1512 \$1792 €1600	8.5kg 18.7lb	330 x 290 x 360mm 13 x 11.4 x 14" 65mm 2.56"
		Powerwinch 1200	EDER		£1554 \$1792 €1600	13kg 28.6lb	370 x 330 x 340mm 14.5 x 13 x 13.4" 80mm 3.15"
		Powerwinch 1200 B	EDER		£1800 \$2000 €1850	13kg 28.6lb	400 x 308 x 340mm 15.7 x 12.1 x 13.4" 80mm 3.15"

NOTES COST: Approx & inc tax MENSIONS: height x width x Depth WLL/HAUL SPEED: Direct to load - No Mechanical advantage

POWERED ROPE WINCHES

POWER SOURCE BATTERY PETROL/GAS	ROPE Ø	MAX SOUND LEVEL	IP	STANDARDS	WLL PULL SPEED Both =Max for direct single line pull no-drag	SPEEDS/ VARIABLE	REMOTE CONTROL	HUMAN- RIDING	PROGRESS CAPTURE	LOWERING	DURATION & NOTES	WWW.
Al-Ko Solo 2-stroke 50.8cc	10-12mm 3/8-1/2"	112db	IP44	CE	815kg 26m/min 1797lb 85ft/min	1	-	-	-	■	thermal treatments to extend component life: adaptable acceleration and braking from the operator.	docma.it
Al-Ko Solo 2-stroke 50.8cc	10-12mm 3/8-1/2"	112dB	IP44	CE	1050kg 20m/min 2315lb 66ft/min	1	-	-	-	■	thermal treatments to extend component life: adaptable acceleration and braking from the operator.	docma.it
Honda GX50 4-stroke 48cc	10-12mm 3/8-1/2"	98dB	IP44	CE	865kg 14m/min 1907lb 46ft/min	1	-	-	-	■	thermal treatments to extend component life: adaptable acceleration and braking from the operator.	docma.it
Al-Ko Solo 2-stroke 50.8cc	80m/262ft 5mm 1/4"	112dB	IP44	CE	1485kg 20m/min 3267lb 59ft/min	1	-	-	-	-	Automatic rope rewind when unloaded	docma.it
Honda GX50 4-stroke 48cc	80m/262ft 5mm 1/4"	105dB	IP44	CE	1260kg 19m/min 2772lb 59ft/min	1	-	-	-	-	Automatic rope rewind when unloaded	docma.it
Al-Ko Solo 2-stroke 50.8cc	80m/262ft 5mm 1/4"	112dB	IP44	CE	1485kg 20m/min 3267lb 59ft/min	1	-	-	-	-		docma.it
Kawaski TJ53 2-stroke 65cc	8-10mm 5/16-3/8"	115dB	IP44	CE	400kg 29m/min 882lb 95ft/min	1	-	-	-	■	DISCONTINUED still available while stocks last	eder-maschinenbau.de grube.de
Active 6.5 2-stroke 3.3 KW /4.5 HP	8-10mm 5/16-3/8"	115dB	IP44	CE	400kg 40m/min 882l 131ft/min	1	-	-	-	■		eder-maschinenbau.de grube.de
Honda GX35 4-Stroke 35.8cc 1KW / 1.3HP	8-12mm 5/16-1/2"	106dB	IP44	CE	500kg 12m/min 1102lb 40ft/min	1	-	-	-	■	Rubber grip feet allow direct tree attachment	eder-maschinenbau.de grube.de
Active 6.5 2-stroke 62cc 3.3KW / 4.5 HP	8-10mm 5/16-3/8"	115dB	IP44	CE	1200kg 14m/min 2646lb 46ft/min	1	-	-	-	■		eder-maschinenbau.de grube.de
36v Li-ion Stihl Battery 7.2 or 8.8Ah 1.7kW	8-10mm 5/16-3/8"	n/a	IPX4	CE	1200kg 13m/min 2646lb 42ft/min	1	-	-	-	■		eder-maschinenbau.de grube.de

pulleys. SPEEDS Engine speeds as a number, VARIABLE = ■ LOWERING: Manual lowering = □ Powered lowering = ■ N/A info Not Available/not given

images NOT to scale		MODEL	COMPANY	ORIGIN	COST inc tax <small>currency conversion only</small>	WT	MAX DIMENSIONS <small>CAPSTAN</small>
		Nordforest/ Powerwinch 1800	EDER /GRUBE		£2394 \$2860 €2550	14kg 30.1lb	385 x 365 x 325mm 15.15 x 14.4 x 12.8" 130mm 5.12"
		PCW3000	PORTABLE WINCH CO.		£1559 \$1460* >€1300	9.5kg 20lb	350 x 289 x 261mm 13.8 x 11.4 x 10.3" 76mm 3"
		PCW3000-Li	PORTABLE WINCH CO.		£1320 \$1540* >€1373	9.5kg 21lb	308 x 316 x 309mm 12.1 x 12.4 x 12.2" 76mm 3"
		PCW4000	PORTABLE WINCH CO.		£2159 \$1950* >€2150	12kg 26.5lb	420 x 300 x 285mm 16.5 x 11.75 x 11.25" 76mm 3"
		PCW5000	PORTABLE WINCH CO.		£2400 \$1800* >€1605	16kg 35lb	371 x 366 x 366mm 14.6 x 14.4 x 14.4" 57mm or 85mm 2.25" or 3.35"
		PCW5000 HS (High Speed)	PORTABLE WINCH CO.		£2711 \$2000 €3130	16kg 35lb	371 x 366 x 366mm 14.6 x 14.4 x 14.4" 57mm or 85mm 2.25" or 3.35"
		PCH1000	PORTABLE WINCH CO.		£3600 \$2900 \$2975	19kg 42lb	505 x 366 x 366mm 20x14.4x14.4" 57mm or 85mm 2.25" or 3.35"
		CH2000	PORTABLE WINCH CO.		£4600 \$3700 €5300	34.5kg 76lb	560 x 483 x 356mm 22 x 19 x 14" 108mm 4.25"
		SP1-CW	SIMPSON		£990 \$1200 €1150	8.2kg 18lb	305 x 380 x 205mm 12 x 15 x 12" 64mm 2.5"
		SP2-CW	SIMPSON		£1100 \$1300 €1250	8.2kg 18lb	305 x 380 x 205mm 12 x 15 x 12" 64mm 2.5"
		CS-CW	SIMPSON		£660 \$800 €760	4.1kg 9lb + Chsaw	178 x 203 x 127mm 7 x 8 x 5" + size of saw 64mm 2.5"

NOTES COST: Approx & inc VA/Tax WLL: height x width x Depth WLL/HAUL SPEED: Direct to load - No Mechanical advantage

POWERED ROPE WINCHES

POWER SOURCE BATTERY PETROL/GAS	ROPE Ø	MAX SOUND LEVEL	IP	STANDARDS	WLL PULL SPEED Both =Max for direct single line pull no-drag	SPEEDS/ VARIABLE	REMOTE CONTROL	HUMAN-RIDING	PROGRESS CAPTURE	LOWERING	DURATION & NOTES	WWW.
Active 6.5 2-stroke 62cc 4.5 HP	12-14mm ½-¾"	115dB	IP44	CE	1800kg@12m/min 3968lb@79ft/min	2	-	-	-	■	2-speeds also 900kg@24m/min	eder-maschinenbau.de grube.de
Honda GX35 4-Stroke 35.8cc	10mm* ¾"	108dB	IP44	CE	700kg 10m/min 1543 lb 33ft/min	1	-	-	-	■	*10mm / 3/8" rope ensures that 3 to 4 wraps are possible. With a 12mm fewer wraps are possible. *price inc 50m rope & rigging eqpt.	portablewinch.com
80/82v Li-ion Battery 1KW	10mm* ¾"	n/a	IPX3	CE	1000kg 11.6m/min 2200 lb 38ft/min	3	-	-	-	■	*10mm = 3 to 4 wraps are possible. 12-16mm = fewer wraps. Uses Briggs&Stratton or Cramer batteries. *price inc 50m rope & rigging eqpt.	portablewinch.com
Honda GHX50 4-stroke 50cc	10mm* ¾"	105dB	IP44	CE	1000kg 13.4m/min 2200 lb 44ft/min		-	-	■	■	Improved Integral Progress Capture Cam on '23 model. *10mm/ 3/8" rope = 3 to 4 wraps possible. 12mm= fewer wraps. *price inc 50m rope & rigging eqpt.	portablewinch.com
Honda GHX50 4-stroke 50cc	10-13mm ¾-½"	105dB	IP44	CE	1000kg 12m/min 2200 lb 40ft/min	2*	-	-	-	■	* price inc 50m rope & rigging eqpt. Optional 85mm capstan increases speed to 18m/min / 60ft/min	portablewinch.com
Honda GHX50 4-stroke 50cc	10-13mm ¾-½"	105dB	IP44	CE	350kg 36m/min 771 lb 118ft/min	2*	-	-	-	■	\$2119 with rope/rigging kit. Optional 85mm capstan increases speed to 18m/min / 60ft/min	portablewinch.com
Honda GHX50 4-stroke 50cc	12-13mm ½"	105dB	IP44	CE M3 (ISO)	775kg 12m/min 1710lb 40ft/min LIFT 250kg/550lb*	2*	-	-	■	■	Certified for INDUSTRIAL use Optional 85mm capstan increases speed to 18m/min / 60ft/min	portablewinch.com
Honda GX160 4-stroke 160cc	12-13mm ½"	100dB	IP44	CE M3 (ISO)	1150kg 20m/min 2535lb 66ft/min LIFT 450kg/992lb	1	-	-	■	■	Certified for INDUSTRIAL use M3 is an industrial rating from M1toM6 indicating the hours of use versus the degree of loading	portablewinch.com
Honda GX35 4-Stroke 35.8cc	8-10mm ⅝-¾"	108dB	IP44	-	907kg 6.7m/min 2000lb 22ft/min		-	-	-	■	Same as SP2-CW with GX35 motor. 5 year warranty	capstanropewinch.com
Honda GX50 4-Stroke 50cc	8/10mm ⅝-¾"	105dB	IP44	-	1088kg 6.7m/min 2398lb 22ft/min		-	-	-	■	Same as SP1-CW with GX50 motor. 5 year warranty	capstanropewinch.com
Battery or Petrol/gas chainsaw less than 57cc	8-10mm ⅝-¾"	Depends on CSaw	Depends on CSaw	-	1136kg 7.6m/min 2500lb 25ft/min		-	-	-	■	Attaches to your chainsaw via a 3/8" drive sprocket. 5 year warranty	capstanropewinch.com

pullleys. SPEEDS Engine speeds as a number, VARIABLE = ■ LOWERING: Manual lowering = □ Powered lowering = ■ N/A info Not Available/not given

MINI HAULING KITS >2.5kg/5lb

Casualty Pulley System or *CPS* is a term we've used since the early 1980's but we don't lay claim to it or to the concept - that was primarily down to Dave Allport, then of *Troll Safety Equipment* in the UK. He came up with a combination of tiny yachting pulleys, a hand ascender and small diameter cord that gave you a mini package you could stow on your harness and upon reaching a rope-stranded casualty you could clip on and raise or de-weight their system sufficient to perform a pick-off rescue. Dave may have been more ornery than Yosemite Sam but back then he was often ahead of the game and we bought the first *CPS* model and swore by it for years. Testament to its longevity is that the *Troll* offspring, *SAR Products* sells a virtually unchanged product (pic top right) as did *Troll's* latter day owners *Miller/Daloz* (now *Honeywell Miller*) but we haven't included that because none of the components are theirs and their websites are even harder to get any sense from than *3M's*!

We messed about with the *CPS* through the 80s and 90s - made it smaller by replacing the *Kong Cam Clean* ascender with a *Wild Country Ropeman* - one of those tiny cam-only ascenders, we made it longer using miles of cord or whatever we could squeeze in and still attach to our harness, and eventually swapped out the nylon sheave yachting pulleys for the smallest triple and double alloy pulleys available at that time - I think it was *SRTe* (became *3M/DB Sala* but discontinued along with most of *SRTe's* excellent range). The reason we swapped them was of course because we'd started using it for more and more tasks and eventually overloaded the nylon sheaves, warping them. Heavier duty pulleys were no bad thing

but until recently they lacked the integral progress capture of those original yachting pulleys with their simple 'V' notch into which you jam the cord. *CAMP's Oyssa* represents the latest in yacht pulleys in stark contrast to their reinventing of the traditional ratchet-strap with the *GRAVITY* (right). They've taken the bold step of having a self-contained kit using a steel ratchet to provide up to 73cm of lift on a 3to4:1 ratchet cam- simple, strong and cheap. Meanwhile, *Harken* have arrived on the scene as reputed producers of high quality yacht pulleys and winches with their access-specific *Wingman* (above) with alloy sheaves and swivels. *SRTe's* original *MiniHaul* miniaturized a 'WallHauler' style integral cam but it was still pretty bulky. *ISC* and *Mammut* went one better with custom-designed mini integral cams while the *Bluewater/SMC* model and the iconic *Aztek* (ad opposite) took a simpler approach and use a prusik cord for progress capture but this can increase drag during hauling. For a while *DMM* had the very slick *RPM* which featured modular sheaves that you can swap from single to doubles but they were too slick for the market which wasn't prepared to pay for it. This Guide considers only the smaller pulley systems less than 5lb/2.5kg and generally a 2m/6'7" deployed length. There will therefore

be a fine line between some full size rescue pulley systems with short rope lengths like the *SMC HX* and larger 'mini' systems with extra rope like the *Stein* kit. *Protekt* has 2 kits but neither can be described as 'mini'. We will add larger 'team' kits in a later guide but on the whole, these 'mini' kits should be easily hung off your harness. You should **always have some form of redundant safety when hauling.**

The smallest cord/rope diameter will invariably be the smallest and lightest kits but *Edelrid's KAA* (left) is so far unique in using 25mm/1" webbing instead of cord enabling use of a broad cam as a PCD and an innovative lowering handle. those with an add-on cam, like the *SAR Products* (right), rather than an integrated-cam, can reduce the package weight by fitting a smaller cam or prusik. Even with 4mm cord, a mini pulley system has far more uses than just the originally envisaged rescue pick-off aid. It can be used for self-rescue, tension zip lines, take temporary load for repositioning of anchors, shift heavy weights, provide adjustable guys for shelters or aerials etc. and in storm work can help stabilise or counter the lean of a branch or tree although this will cross over into full size pulley systems so you would need to know your limits. *Skylotec/Climbing Technology* quote the efficiency of their *Lifty 6* as 79% while *Petzl* and *Edelrid* quote 91% for the *Jag* and *KAA*. That has a lot to do with the quality of the bushings or bearing and of the sheaves. Generally speaking, alloy sheaves on stainless bearings will be the most efficient but they will also be the heaviest and most expensive relative to size. If you want the smallest lightest system you'll need something like the *SAR Products CPS* with cord and nylon marine pulleys (the original diminutive *Mammut Rescyou* has been discontinued following a recall). If you want ultra-heavy duty you'll want something like the *CT Lifty* (if *Skylotec* keep it in their range), the *Aztek* system in any of its various guises or perhaps *CAMPS* webbing & ratchet cam *GRAVITY*. If you want compact, special purpose systems it will probably be the *Edelrid KAA* or *ISC Haulerbiner* and for perhaps the best compact all-rounder, the *Petzl Jag* with full strength alloy sheaves.

With the exception of *Lyon Eqpt* and *SAR Products* which is included in this Guide because Dave Allport effectively re-invented mini-hoists for rescue, everyone else is here because they manufacture at least one or more components. In the case of *PMI* and *Bluewater*, they make the rope but not the hardware so you could presumably put these together yourselves from components. Nevertheless, these are all top-end manufacturers who you can trust to produce a kit with all the necessary individual certification and quality as a package. This means you don't need to write your own risk assessments or list components that are 'fit-for-purpose' because they will underwrite the whole kit. No specific standards for these but where CE is listed it will be because EN358 covers PPE as a work positioning/restraint device or there's the European Machinery Directive for non-human lifting. NB: The retracted length often includes the carabiners/maillons. The 2m *Petzl Jag* for instance is 34cm but without carabiners is only 20cm.



rockexotica
GEAR FOR THE Z AXIS

AZTEK | SYSTEM

- Switches from a simple 4:1 (with a change of direction) to a simple 5:1.
- Color-coded asymmetrical prusiks are rope friendly and can be released under light tension.
- Use AZTEK for pick off, load release hitch, high-directional guylines, litter attendant tether, litter scoop, edge restraint and much more.
- AZTEK System length ranges from just 9" to over 13'.
- Features high-efficiency ball bearings and machined aluminum parts.

AZTEK Kit includes:
AZTEK PULLEYS
6mm PRUSIKS (2)
50' 8mm STATIC CORD
44" 6mm PURCELL PRUSIK CORD
PRO OR STANDARD BAG

COLOR CODED



EDGE RESTRAINT



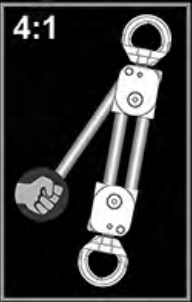
LOW TENSION RELEASE



50' CORD LENGTH



SWIVEL CONNECTION



The AZTEK kit can be configured as a 4:1, 5:1 or 12:1 with the use of an additional pulley.

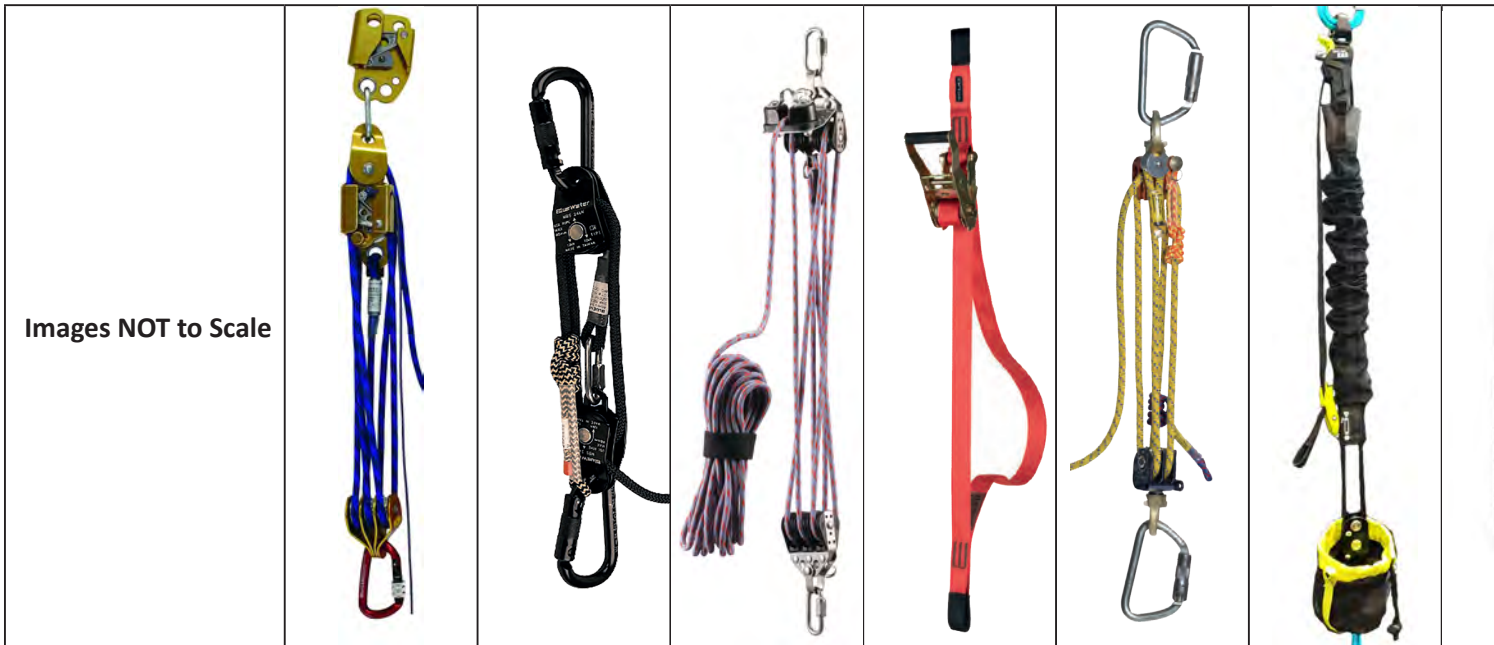
MIN LENGTH
9" (22.8cm)

< WIDE RANGE OF OPERATION >

MAX LENGTH
13' (4m)



EDGE RESTRAINT



Images NOT to Scale

MANUFACTURER	3M/DB SALA	BLUEWATER	CAMP	CAMP	CMC	EDELRID	H
MODEL VARIANT	Rollglis Micro-Haul 8701...	Mini Haul ?	Oyssa ?	Gravity Rescue Ratchet 3122	Aztek Pro Series 500104	KAA 881320800170	4:1 Pulley
ORIGIN							
COST (inc Tax/VAT)	£720 \$900 €823	£200 \$247 €227	£184 \$230 €210	£54 \$70 €55	£390 \$489 €447	£200 \$250 €220	
WEIGHT (for min size option)	2.2kg 4.8lb	1.1kg 2.35lb	370g 13.1oz	720g 1lb 9oz	2.3kg 5lb	500g 5lb	
MAX LOAD- SWL MBS	300kg 8kN 661lb 1798lbf	-kg 13.3kN -lb 2990lbf	120kg 7kN 264lb 1574lbf	120kg 22kN 264lb 1574lbf	800kg 36kN 1760lb 8093lbf	600kg 22kN 1323lb 4947lbf	200kg 9kN 440lb 1960lbf
DEPLOYED LENGTH options	2m 6'7"	8m 27"	1m 3.28'	1.1m 3'7"	3.5m 12'	0.8/1.5/4m 3'3"/4'9"/15'9"	
POUCH/RETRACTED SIZE	36 x 16cm 14 x 7"	23 x 13 x 13cm 9 x 5 x 5"	14 x 10 x 7cm 5.5 x 4 x 2.75"	37cm 14.6"	24 x 15 x 10cm 9.5 x 6 x 4"	20 x 7.6 x 7.5cm 8 x 3 x 3"	
ROPE/CORD LENGTH/ Ø	14m/46' 8mm 5/16"	35m/115' 8mm 5/16"	7.6m/25' 4mm <3/16"	1.1m/3'7" 33mm Plystr Web 1.3"	15m/50' 8mm 5/16"	4m/13' 25mm webbing 1"webbing	
SHEAVE (WHEEL) Ø	Alu 3x 0mm 3x 0"	Alu 2x 30mm 2x 1.2"	Nylon 3x 20mm 3x 0.8"	none (Steel ratchet)	Alu 2x 28mm 2x 1.1"	Nylon 2x 26mm 2x 1.1"	2x 2x
STORAGE/ DEPLOYMENT BAG				none			
FIXED SWIVEL CHEEKS	■	■	■	none	■		
PC CAM PRUSIK	■	■	■	none	■		
BUSHING BEARING PIN	■	■		none	■		
MA EFFICIENCY	6:1	4:1	6:1	>3:1<5:1	4:1 5:1 80%	4:1 5:1 91%	
STANDARDS	CE NFPA			CE EAC		CE	
INCLUDED ITEMS	DISCONTINUED Various rope connection hardware options	1x 6mm Maillon, 2x double pulleys, 2x auto carabiners, 1x sewn prusik Pouch	2x triple pulleys with integrated cleat, 2x 4mm Maillons, 7.6m cord, pouch	73cm of lift using a ratchet cam giving between 3:1 and 5:1 of advantage - greater with less web wound on.	2x swivel pulleys, 2x sewn prusiks, 15m/50ft CMC Aztek cord, pouch	webbing, Mesh, Pouch, Top assembly with handle, Bottom assembly	
NOTES							443 DP
WEBSITE	capitalsafety.com	bluewaterropes.com	camp.it	camp.it	cmcrecue.com	edelrid.com	harker.com

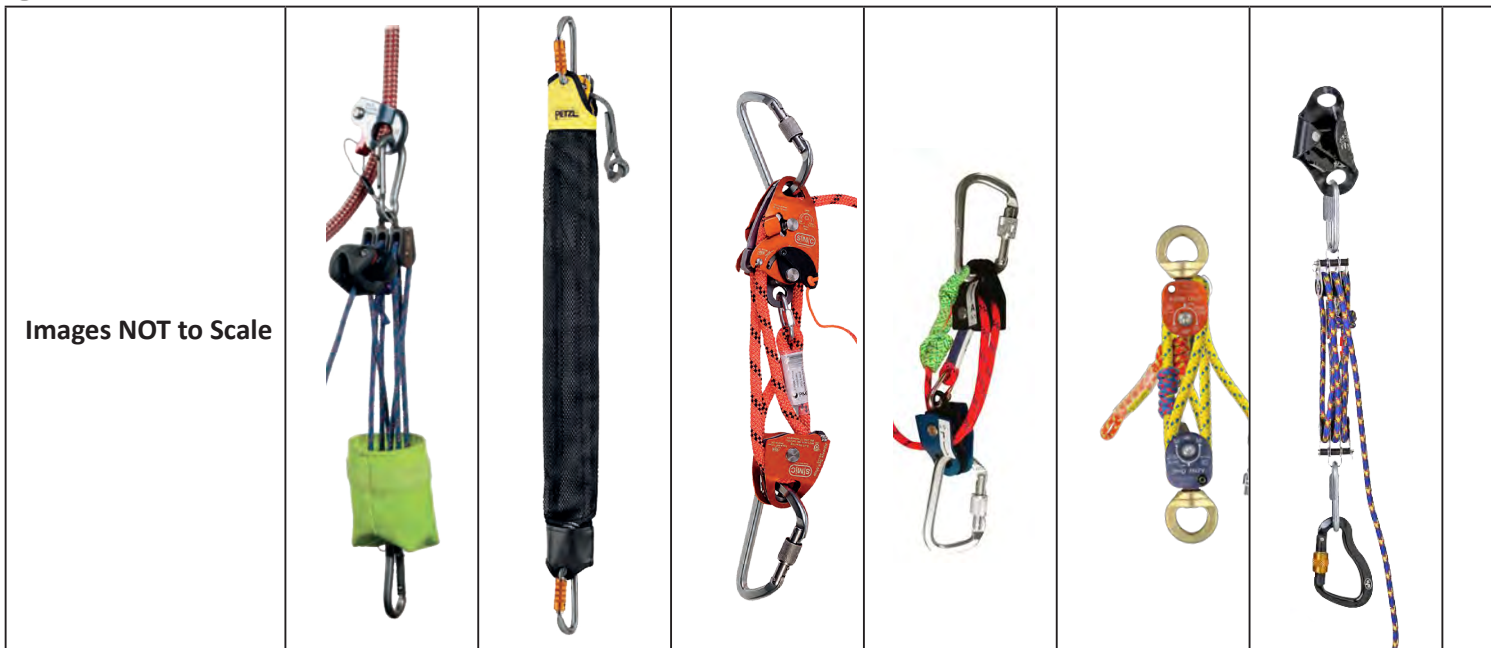
KEY: COST: INCLUDES local taxes/VAT . €\$€ shown in burnt orange are currency conversions only & do not inc shipping, import duty or tax KIT: CE = Captive Eye, PC = Progress 'minimum' due to multiple components INTENDED MA= most pulley systems can be flipped to pull upwards so a 3:1 can become a 4:1 etc. but integrated cam location

MINI HAULING KITS



HARKEN	HARKEN	HEIGHTEC	HEIGHTEC	ISC	KONG	KONG	KONG
Purchase System IN2624/6M	Wingman IN404	Hexan UP15	Vantage P10	HaulerBiner HB165.2	Maxi-Hoist#4 20800	Mini-Hoist#7 208001	Hop (Hoist#5) 20820
\$410 -*	£570 \$525 €580	£232 \$291 €267	£214 \$268 €245	£204 \$320 €0	£312 \$494 €272	£288 \$328 €243	£342 \$430 €392
2.3kg 5lb	2kg 4.4lb	700g 1lb 9oz	750g 1lb 11oz	650g 1lb 7oz	1820g 4lb	680g 1.5lb	1.22kg 2lb 11oz
300kg 10kN 5lb 2248lbf	300kg 45kN 675lb 10115lbf	150kg 25kN 337lb 5620lbf	140kg 14kN 308 3147lbf	140kg 16kN 308 3500lbf	140kg -kN 310lb -lbf	300kg 5.9kN 661lb 1322lbf	140kg 4kN 310lb 899lbf
2m 6'7"	3.5m 12'	2m 6'7"	1/1.5/2/5m 3'3"/4'9"/6'7"/16'3"	1.05/1.65/3m 3'5"/5'4"/9'10"	4m 13'	1.15m 3.9'	1/2m 3.28'/6'7"
35cm 13.75"	20.3" 38x33cm 8" 15x13"	n/a	n/a	32cm 11.8"	55cm 21.6"	30cm 11.8"	32/34cm 11.8/13.4"
15m/50' 8mm 5/16"	15m/50' 8mm 5/16"	15m/50' 5mm 3/16"	4m/13' 8mm 5/16"	15m/50' 6mm 1/4"	15m/50' 10mm 25/64"	6.5m/21' 5mm 3/16"	15m/50' 10mm 25/64"
Delrin 57/35mm 2.25/1.4"	Alu 2x 46/33mm 2x 1.8/1.3"	Nylon 2x 20mm 2x 0.8"	Alu 2x n/a 2x n/a	Nylon 3x 20mm 3x 0.8"	Alu 2x 35mm 2x 1.38"	Nylon 2x 34mm 2x 1.34"	Alu 40.5 & 35mm 1.6 & 1.38"
none			none		none	none	
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
4:1 5:1	4:1 5:1	6:1	4:1 5:1	6:1 7:1	4:1 5:1	6:1 7:1	4:1 5:1
CE	NFPA CE UKCA	CE	CE UKCA	CE	CE	-	CE
*USA-ONLY RPS Discontinued		2x Alloy S/g carabiners 1x Triple nylon pulley 1x Triple sheave/ cleat Pouch	Cut resistant sheath. cord,	Also rebadged by STERLING ROPE as Mini-Hauler and Raise&Rescue Elite kit. Cord, 2x Triple pulley-carabi- ners, mesh, pouch	Rope 2x Twin Evo dbl Pulleys, 1x Cam, 2 carabiners, 1x maillon	Cord 1 dbl pulley, 1xtriple pulley with cam, 2x carabiners	Rope 1x Turbo Roll pulley 1x Futura Miniblock 1x Mini Twin Evo dbl pulley 2x Maillons
harkenindustrial.com	harkenindustrial.com	heightec.com	heightec.com	iscwales.com	kong.it	kong.it	kong.it

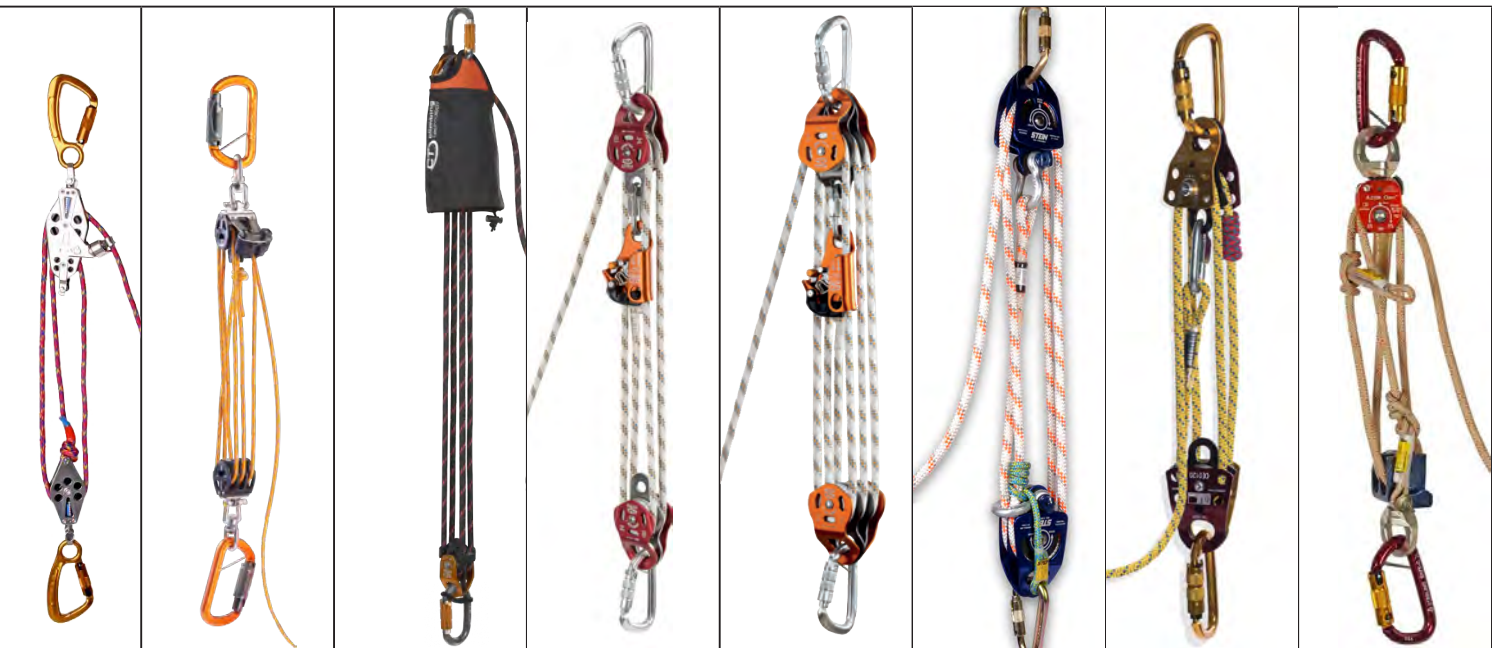
Mass Capture **WVL** Working Load Limit. Safety ratios vary from 5:1 to 15:1 so MBS not quoted so much, instead....**BREAK LOAD** is an approximate failure load NOT a mass can make this impractical.



Images NOT to Scale

MANUFACTURER	LYON EQUIPMENT	PETZL	PMI/SMC	PMI/SMC	ROCK EXOTICA	SAR PRODUCTS	PR
MODEL VARIANT	Cas. Pick-Off Hoist LCH	Jag ?	Adv-Tech Haul System ?	Jr Haul System KT36128	Aztek Pro P41	Casualty Pulley System P0001	Res Sy
ORIGIN							
COST (for min size option)	£319 \$401 €366	£232 \$370 €230	£439 \$550 €502	£213 \$267 €244	£496 \$430 €571	£250 \$314 €287	
WEIGHT (for min size option)	450g 1lb	610g 1lb 5.5oz	1.43kg 3lb 2.4oz	840g 1lb 14oz	2.3kg 5lb	866g 1lb 15oz	
MAX LOAD- SWL MBS	150kg 9kN 330lb 2023lbf	600kg 16kN 1323lb 3597lbf	0 34kN 0 7643lbf	0 34kN 0 7643lbf	800kg 36kN 1760lb 8093lbf	150kg 9kN 330lb 2023lbf	1 33
DEPLOYED LENGTH options	1.3m 4.2'	1/2/5m 3'3"/6'7"/16'3"	2m 6'7"	2m 6'7"	4m 13'	2m 6'7"	
POUCH/RETRACTED SIZE	21cm 8.25"	34 cm 12.5"	36 x 16cm 14 x 7"	30 x 16cm 12 x 7"	24cm 9.52"	20 x 16 x 7cm 8 x 6.25 x 7.25"	4 1
ROPE/CORD LENGTH/ Ø	9m/30' 4mm <3/16"	7.5m/25' 8mm 5/16"	10m/33' 9mm 3/8"	10m/33' 7mm 1/2"	15m/50' 8mm 5/16"	15m/50' 6mm 1/4"	3
SHEAVE (WHEEL) Ø	Nylon 2x 20mm 2x 0.8"	Alu 2x 25mm 2x 1"	Alu 2x 35mm 2x 1.37"	Alu 2x 35mm 2x 1.37"	Alu 2x 28mm 2x 1.1"	Nylon 2x 20mm 2x 0.8"	
STORAGE/ DEPLOYMENT BAG							
FIXED SWIVEL CHEEKS	■	■	■	■	■	■	■
PC CAM PRUSIK	■	■	■	■	■	■	■
BUSHING BEARING PIN	■	■	■	■	■	■	■
MA EFFICIENCY	6:1	4:1 5:1	4:1 5:1	4:1 5:1	4:1 5:1 80%	6:1	
STANDARDS	CE	CE UKCA EAC			CE		
INCLUDED ITEMS	Ascender, cord, 2x snap carbine hooks, 2x triple pulleys, integrated pouch	91% Efficiency Jag Traxion PC pulley, dbl pulley, 2 x Auto Carabiners mesh cover Integrated pouch Also full size rescue kits	HX PC pulley, Dbl pulley, 5mm Maillon 2x carabiners, 3m release cord, pouch. Can use 7-12mm rope	2 SMC JRB dbl pulleys, 2x carabiners, Prusik hitch Maillon, 2m 5mm cord Pouch	2x Omni pulleys, 2x prusiks, AZTEK cord, 6mm travel restraint, Bag,	Ascender, cord, 2x maillons, 2x triple pulleys pouch, carabiner	1x 1x 2x
NOTES							
WEBSITE	lyon.co.uk	petzl.com	pmirope.com	pmirope.com	rockexotica.com	sarproducts.com	sarp

KEY: COST: INCLUDES local taxes/VAT . £€\$ shown in burnt orange are currency conversions only & do not inc shipping, import duty or tax KIT: CE = Captive Eye, PC = Progr 'minimum' due to multiple components INTENDED MA= most pulley systems can be flipped to pull upwards so a 3:1 can become a 4:1 etc. but integrated cam locati



SAR PRODUCTS	SKYLOTEC	SKYLOTEC	SKYLOTEC	SKYLOTEC	STEIN	STERLING ROPE	STERLING ROPE
Rescue Pulley System P0002	Mini Haul System SET-337-23	CT Up-You-Go H251 & 2K117	CT Lifty 2K114	CT Lifty 6 ?	5:1 Hauler Kit SS-8160110020	Pocket Hauler Kit KTPHAULERB	Aztek Elite Arbor KTATZTEKA
n/a	£503 \$600 €549	£237 \$296 €249	£335 \$366 €325	£365 \$386 €355	£270 \$440 €310	£296 \$370 €339	£430 \$530 €500
2kg 4lb 6oz	950g 2lb 1oz	850g 1lb 15oz	1.72kg 3lb 12oz	2.3kg 5lb	3kg 6lb 10oz	1.54kg 3lb 6oz	1.72kg 3lb 13oz
150kg 9kN 30lb 2023lbf	400kg 18kN 880lb 4046lbf	400kg 18kN 880lb 4046lbf	160kg 16.3kN 352lb 3664lbf	240kg 24.5kN 528lb 5507lbf	240kg 22.5kN 528lb 5507lbf	0 22kN 0 5058lbf	800kg 36kN 1760lb 8093lbf
10m 33'	4m 13'	1/2 / 5m 3'3" / 6'7" / 16'3"	2/5m 6'7" / 16'3"	2m 6'7"	2m 6'7"	2m 6'7"	2m 6'7"
10 x 20cm 3.75 x 8"	35cm 13.7"	34cm 12.5"	24 x 26 x 12cm 9.5 x 10 x 4.7"	24 x 26 x 12cm 9.5 x 10 x 4.7"	38cm 15"	14 x 23 x 2.7cm 5.5 x 9x5"	24cm 9.52"
100m/100' 8mm 5/16"	23m/75' 8mm 5/16"	10m/33' 8mm 5/16"	10m/33' 9.5mm 3/8"	15m/50' 9.5mm 3/8"	25m/82' 12mm <1/2"	15m/50' 8mm 5/16"	15m/50' 8mm 5/16"
Nylon 2x 51mm 2x 2"	Nylon 2x 22mm 2x 0.9"	Alu 2x 25mm 2x 1"	Alu 2x 39mm 2x 1.5"	Alu 3x 39mm 3x 1.5"	Alu 2x 50mm 3x 2"	Alu 2x 28mm 2x 1.1"	Alu 2x 28mm 2x 1.1"
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■
3:1 4:1	6:1	4:1 5:1 80%	4:1 86%	6:1	4:1 5:1	4:1 5:1	4:1 5:1 80%
	CE	CE	CE	CE	CE		
Cord, pouch, tandem pulley, single pulley, CE carabiners	Cord, pouch, 1x triple pulley 1x triple with cam, 2x CE carabiners Bag	Dbl & PC cam pulley, 2x Oval CE Carabiners Pouch. climbingtechnology.com	Being Phased out? Cord, PC cam, Maillon, 2x Double pulleys, 2x CE Carabiners Pouch. climbingtechnology.com	Being Phased out? Rope, Separate PC Cam, Maillon, 2xTriple pulleys, 2xCE carabiners, pouch. climbingtechnology.com	Rope 2x ISC RP064 pulleys 1x Stein sewn hitch Bag	2x Dryad double pulleys 50ft rope with sewn eye, 2xAutoLock Carabiners, 1x sewn prusik, 1x6mmMaillon Aztek t pouch	2x Omni pulleys, 2x prusiks, AZTEK cord, (Arbor version lacks the 6mm travel restraint), Waist pouch, 3xCarabiners (2=CE)
products.com	skylotec.com	skylotec.com	skylotec.com	skylotec.com	steininternational.com	sterlingrope.com	sterlingrope.com

ess Capture **WVL** Working Load Limit. Safety ratios vary from 5:1 to 15:1 so MBS not quoted so much, instead.... **BREAK LOAD** is an approximate failure load NOT a
ions can make this impractical.

UPDATED April '24

ARBORIST 10.5-13.5mm

CLIMBING ROPES

NB: PRICES BEING UPDATED Q2 '24

There was a time, mostly in the last century, when a climbing rope for tree work meant 12mm, 3-strand nylon....white when new, grey as old underpants once used a bit and quite elastic compared to modern ropes, in fact 'climbing' ropes can be a misleading term because for the entire sport and industrial sectors, climbing means dynamic (shock-absorbing following multiple FF2 falls) whereas these are mostly low stretch that should aim to stay below FFO. We are seeing a move towards calling the kernmantle SRT ropes 'access' ropes as distinct from climbing implying that SRT/SRS is starting to be differentiated from 'climbing'.

Back to the old days and if you were posher, you might stump up for the less elastic multiplait rope (8 strand) ...also white, maybe with a red or blue fleck if you lived in Monaco or the Hamptons. These days, most of that old laid stuff has been given to the Orang Utan enclosure at the local Zoo and instead the tree world is at the forefront of producing ropes so bright they make your eyes bleed. You can still buy 3-strand as an arborist rope but in the main, arborists now have three distinct choices at the top-end of climbing ropes:

- DOUBLE BRAID (DB) also known as BRAID on BRAID,
- 12,16, 20 & 24 STRAND BRAID
- KERNMANTLE (KM).

As usual, metric gives us a much better defined size than imperial with its overly long and imprecise measurements where 7/16" can be anything from 10.5 to 11.7mm. Climbing ropes are around 11mm (7/16") to 13mm (1/2") with a modern trend towards 11.7-11.8mm ropes specifically designed for use in hybrid (descender/ascender) hardware which we'll discuss shortly. There are some ropes listed as 'suitable for climbing arborists' at 10mm and even 9mm but they're too thin for most devices, difficult to handle and more for special tasks like zip lines so, for the purposes of this guide we've only included **10.5 to 13.5mm** ropes but **we will expand this to include 10mm**.

If you don't want to use your climbing rope for a zipline and rigging ropes are too big, take a look at our guide to low stretch kernmantles for SRT that are also suitable for highlines in the **ROPE EQUIPMENT BUYERSGUIDE**

USES

Simply put..... climbing up, in and around a tree....and perhaps ziplines and rigging if you didn't have any rigging line or have more money than sense. There is a lot of nonsense talked about the relative merits of braided ropes as compared to kernmantle with some making the rather ludicrous statement that arb ropes have to be tougher than rock/mountain climbing ropes because they're being used in trees. I can assure you that there ain't no amount of tree contact that is going to be more aggressive than



L to R: Petzl Flow, Edelrid Woodpecker, FTC TREE Argiope (now updated to the Evo), Cousin Atrax, Sterling Scion, Edelrid X-P*e

a 90 degree concrete, granite or sandstone edge; wood and bark is, in contrast, a walk in the park for most static kernmantle ropes. In fact the toughest rope in this guide is probably the Sterling Tech12, with Technora sheath. Largely aimed at special forces operations, their cut resistance (and heat-resistance) is of particular use to arborists. Virtually every kernmantle rope in our **ROPE EQUIPMENT BUYERSGUIDE** could have been in this guide to Arborist Climbing Ropes but we'll stick to only those kernmantles actively marketed to arborists. Of course this does mean that companies are free to interpret what is and isn't suitable - Bluewater for instance, have most of their ropes listed while Petzl only has two despite having several other ropes that are just as suitable as many that are listed in this GUIDE. The difference is in the handling and knot-tying characteristics since kernmantle is often far stiffer than braided ropes. But not that stiff. I remember reading an article on arborist ropes a few years back that mentioned something about not being able to tie knots in kernmantle which will come as a huge shock to the rope access and rescue community. It also pointed out correctly that Kevlar ropes don't fare too well when bent over a tight radius but don't let that colour your perception of the modern Aramid and Twaron mixed fibre ropes which are much more capable and are daily being bent over small descender cams, carabiners and pulley wheels. The key differences are that KM static and low stretch ropes tend to be less dynamic than braided. This is better when you're ascending and descending when 'bounce' equates to inefficiency but it's not so forgiving in a fall. Otherwise it comes down to personal preference and historical allegiances. We have a differentiation in these tables between SRT (SRS*) and DdRT (MRS) and the manufacturers have dutifully ticked one or the other but this is somewhat misleading because any of the more flexible kernmantles can (and are) used in a doubled (DdRT) or moving rope system (MRS). With the exception of the really hardwearing ropes like *HTP, KMIII Max, Patron Plus* (not included) and *PMI MaxWear* I would have ticked all other kernmantles as DdRt and SRT. The same cannot be said for some braided ropes which are

*The tree industry has implemented a more technically accurate acronym for SRT & DRT or Single/Double Rope Technique. The terms SRS Stationary Rope System and then SRWP Stationary Rope Work Positioning have been introduced and gallantly lauded by industry hierarchy and training establishments but once you start fiddling with replacement acronyms you know you're on the slippery road back to calling it SRT! MRS is Moving Rope System, which used to be DdRT or Doubled Ropes. These are laudable changes but SRT is so engrained in the wider sport and professional rope access & rescue communities that it's always going to be around.

very much softer and not all take to SRT (or more particularly the hardware involved) so kindly. Try ropes, try your mate's ropes and if they let you, try in the shop but remember, it's a personal thing so one person's brilliant will be another person's rubbish.

ROPE DIAMETER can be a contradiction because not only do quoted diameters often vary by a couple of mm either side even before load is applied, but a number of manufacturers seem to have lost their calculators or they are simply rounding the figures off so that you may see a 1/2" rope given as anywhere between 12mm and 13mm when in fact, to be precise it should be 12.7mm. We have quoted most figures as per the manufacturer's spec but if they only list one we've given the conversion figure as well. The key difference for arborists in choosing an 11mm/ 7/16th (or perhaps even a 10mm) over a 1/2" rope is in how it feels in the hand and how it operates in modern devices like pulleys, descenders, ascenders and with prusiks etc. Some brands like *Edelrid*, *Mammut*, *Tendon* and *Marlow* use the runner thread to readily identify diameter so that 9mm would be one marker thread, two threads would be 10 or 10.5mm, three threads is 11mm and four threads is 12mm. This isn't uniform throughout the industry so you cannot simply assume that any 3-marker thread rope is 11mm but within those ranges that adopt this marking it makes life easier, particularly where there could be a difference in standards between two similar sized ropes which could adversely affect your legal position in the event of an accident. Generally speaking, 12 to 16 strand ropes are soft and knobblier than a 24 to 48 strand rope which is smoother and operates well in hardware.

CONSTRUCTION: At the risk of going back to basics just a bit too far, we had better recap exactly what differentiates a kernmantle from a double braid and a static from a low stretch rope and how they differ from your mum's washing line. If they don't differ from your mum's washing line you need to upgrade your life insurance policy. Traditionally rope has been constructed by twisting bundles of fibre together - **LAI D ROPE**. Laid rope is like Rapunzel's hair - pre-twisted strands of fibre (or hair) make a larger bundle of fibre which can then be spiralled or braided so that it forms an interlocking spiral of rope (or hair) fibres. You can see all the 'workings' of a laid rope, you can push stuff through the middle of a laid rope and, in the case of the industry standard **3-STRAND** Nylon, you can cut or contaminate all of your load-bearing fibres because they're all exposed. Oh, and it's quite an elastic rope because all the fibres are spiralled so in any given linear inch of rope there is actually 2 inches of rope (or whatever the figure happens to be) wrapped up in those twists. Variations

ARBORIST CLIMBING ROPES

on 3-strand include **MULTIPLAIT (Solid Braid)** in which some of the bundles are plaited in one direction and others the opposite way - this circumvents the unfortunate inclination of a spiralled rope to want to twist back to its virginal, parallel state. All of the more complex designs attempt to balance the direction of spiralled fibres so that they no longer have the inclination to untwist - this is known as an S-twist and a Z-twist. The next step up from 3-strand and multiplait is to cover all those exposed fibres with a sheath • **BRAIDED** rope. Typically in yachting and your mum's washing line this may be simply to protect the core or even just to add colour to an otherwise bland rope - people with large boats like to colour-coordinate - don't mistake these ropes for a working arb rope - they are NOT the same. In the arb world and in our tables, braided ropes are differentiated by the number of plaits in their weave (also known as 'bobbins' or 'carriers' as we have referred to it in our tables) - either 12, 16 or 24 with 12 and 16-strand covers bearing most of the load. Most, if not all 24-strands are found in our next class of rope; the Double Braids. The outer cover may be woven tighter or looser depending on how you want it to handle with tighter weaves giving a stiffer, more durable rope and looser weave an easier knot tying and handling rope.

BRAID-on-BRAID or **DOUBLE BRAID** are best sellers in the arb industry (or at least the favourites since the best sellers may well still be an industrial bulk purchaser taking several hundred miles of 3-strand). These ropes are either the 16-strand or equally highly coloured 24-strand double braids. Double braids have a woven outer cover and a woven inner which shares the load. In fact, in some cases the sheath and the core are more or less the same thing so you will see sheath percentages in these tables at up to 80% of the total load bearing capacity of the rope.

KERNMANTLE has a single, load-bearing, tightly woven sheath covering and comes from the German for KERN meaning core and MANTLE meaning sheath. A woven protective sheath covers a core of twisted/plaited multiple (separate) fibres. Broadly speaking we talk of static ropes as having a parallel bundle core and dynamic rope as having a spiralled core although even static ropes will have some spiralled fibres and bundles. The job of the sheath is to protect the core from abrasion and heat damage and traditionally this meant that three-quarters or so of the rope's total load bearing capacity remained intact within the core while the sheath took a pummelling. Over the years this has changed somewhat so that sheaths now often constitute around 40% of the total rope strength making them A) an even more vital load-bearing element than they traditionally have been and B) a huge influence on the handling characteristics of the rope. It used to be that a soft, easily tied rope wasn't so good at withstanding abuse and you needed something like the Sterling HTP with its iron bar-like characteristics to withstand a sharp granite edge or to highline the Grand Canyon. Nowadays, it's not so clear cut but manufacturers are always striving to make a rope with the best handling, easiest knot tying and able to take whatever abuse you throw at it. The sheath carrier, plait or bobbin count on more flexible Kernmantles tends to be the higher numbers, typically 40-48 while stiffer, more abrasion resistant ropes will

be around 32 or 24 but in reality it's again not that clear-cut - best to go to your local store and fondle the rope for yourself. If you really want to go all out in the bombproof stakes there's a rope by *Tendon (Lanex)* that has stainless steel fibres as part of its sheath to prevent it being cut. This is a bit of a departure from the more usual Kevlar-Aramid-type fibres and an interesting concept for law enforcement and a possibility for arborists wielding a chainsaw. It is not marketed in any way as an arborist rope by Tendon but if you can put up with the stiffer handling and increased cost we see no reason why you can't have a more cut-resistant rope. It's not as heavy as you might expect at only a couple of grams per metre more than Aramid.

UNIFIED & BONDED SHEATH/CORE ROPES

This is the integration of some core fibres of kernmantle into the weave of the sheath. This is not an attempt to share load but rather to eliminate one of the drawbacks of a separate sheath; slippage, creep or milking which can be exacerbated by a prusik or the cams of a descender squeezing and bunching the sheath as it is pulled through under load. This remains a preoccupation for arborists as braided ropes are generally more susceptible to milking. Kernmantles are now mostly pre-shrunk to help eliminate milking which annoyed cavers used to soaking their new ropes in the bath in an effort to shrink the sheath onto the core and have an excuse not to have a bath themselves. Some ropes have the sheath bonded or glued to the core or, in the case of Arbor-Access, the sheath strands are partially woven into the fibres of the core so that it can no longer move differentially when subjected to high loads using compressing cam hardware. Ropes like *Meetic* from *Courant*, *Link-Tec* from *Edelrid*, *Platinum* from *Teufelberger/ New England* and *Unicore* from *Beal & PMI* are examples. Cost is higher but if you've had problems with sheath slippage this could be the answer but remember that, while this construction can limit milking and may improve durability, there will be some downsides otherwise ALL ropes would be made this way - some ropes may exhibit 'dimpling' under excessive load or the bonding agent may eventually flake off but they are worth a look.

11.4-11.8 Ropes for Hybrid Devices

The best range for hybrid hardware is from 11.4mm or 9/20" to 11.8mm or 15/32" - let's just call it 0.46". This is give or take a mm or two because there are 11.2 and 11.9 ropes that work well. You might have noticed that virtually all of the new climbing ropes in the past few years have been within this magic diameter band. We had the *Cousin Trestec 11.6mm Atrax* on the cover of issue 10 in 2016 and our last three reviews have been the 11.7 & 11.8mm *Teufelberger DrenaLINE & Xstatic*, *FTC TREE's 11.7mm Argiope* (now *Evo* and *Edelrid's 11.7 Woodpecker*). This sounds European driven but the writing was on the wall several years back when *Sterling*, *Bluewater* and



Low profile eyes like this *Teufelberger DrenaLINE* are designed to be able to pass through of thread-thru hardware like the *Petzl ZigZag*.

New England Ropes/Teufelberger started to produce 11.5mm ropes for the access and rescue markets to bridge the gap between the standard 11mm and the US Fire service requirement for heavier duty 13mm ropes. You'd think that might be 12mm since it's smack in the middle but it still needed to be accessible to the plethora of technical hardware without stepping up to completely different models necessary for the 13mm ropes. Ditto arborists who, in the past decade, have seen a steady shift from prussic systems to hardware-based systems. After a generation of using 12mm 1/2" ropes, the switch to SRT/SRS, which most suited 11mm ropes, led to a similar realisation that the crossover hardware from rescue and access didn't really like the much fatter and softer traditional arb ropes but equally most arborists don't really want 10.5mm 'string'. What they wanted was something that would work for BOTH and the 11.7/11.8mm diameters fit that bill. *Yale* immediately stepped up with their 11.7mm *XTC24* ropes

and simultaneously kicked off (or joined) an odd trend among US arb rope manufacturers to produce the same rope as if each colour is a different model. Not sure if that's genius or annoying. *Teufelberger* has just the one *Tachyon* in 5 different colourways while *Yale*, *Samson*, and *All Gear* have what looks like several options for an 11.7mm rope but it's the one model in different colours. These ropes all have the advantage of being the diameter that most future hardware will be designed for (give or take a few mm).

Most of these new hybrid-compatible ropes are intended specifically to be used with hardware - that means some form of constant camming or compressing of the rope which can cause ropes with a looser or coarser braid (sheath) to milk so that you can end up with a whole load of sheath hanging off the end of your rope or a concertina effect as the extra sheath runs up against an end termination. Tighter braids will grip the core more firmly and be less inclined to milk but this is virtually always at the expense of handling and knotability - they're simply stiffer. It's worth noting that the use of sewn terminations is for anchoring only, they're not designed to be used as an end-stop termination to stop you abseiling off the end. Most will be fine but you'll notice that the softer, smaller eyes like *Petzl FLOW* and *Teufelberger's spLIFE FTC TREE's SlimTECH*, *Courant's Japora*, *Cousin's Atrax* and *Edelrid's Woodpecker* shown in the titles are actively designed to go through devices so they're no use as an end-stop! This ability to feed a spliced end through a device like the *Petzl ZigZag* may just influence the design of future devices which might otherwise have avoided the threading option in favour of more complicated opening systems. The *ZigZag* probably has the smallest rope-path so if your rope can get through this it might be quicker to thread mid-line attachable devices like *Akimbo*, *Unicender* and *RopeRunner* than fiddling about opening them. In the rope images on these intro pages you can see the differences in bulk between the high-strength





Introducing

11mm Pro-G

Strong - Supple - Predictable

BlueWater's 11mm NFPA-G rated low elongation line features:

- < 48 carrier sheath
- < Designed to run well in all devices
- < Whopping 9,447 lbf. published tensile strength
- < Polyester sheath with Nylon core
- < Available in 2 highly visible contrasting colors

Diameter:	11mm
Tensile Strength:	9,447 lbf. (42 kN)
Grams Per Meter:	93

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@ 300 lbf. = 2.6%
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sewn eyes like the Sterling Scion in blue and the *Teufelberger drenaLINE* shown above threaded through a *Petzl ZgZag*. *FTC TREE's* second type of splice on *Argiope* (title pic) is sealed beneath a protective black plastic cover which protects the rope marking and helps differentiate the two ends of a double spliced rope. Perhaps the most unusual termination is on *Edelrid's Woodpecker* which is basically a length of webbing sewn onto the rope with a gap at the top for an eye. This has a quoted minimum breaking load of 15kN and *Edelrid* say it is the lowest bulk yet available. Genius.

DEFINITIONS & TABLE CATEGORIES

MATERIALS for arb ropes tend to be the opposite of the rest of the rope industry in that polyester is the dominant material with nylon only getting a look-in because of the increase in kernmantle sales. Nylon or Polyamide has good strength to weight ratio and shock absorption, doesn't melt at too low a temperature (around 460° F or 238° C), can operate in wet and ice (albeit at reduced capacity) and is pretty robust when it comes to being dragged over rough edges. Polyester can withstand abuse from Nylon's nemesis acid which doesn't tend to be a consideration for arborists but it's also a bit tougher than nylon, has a slightly higher melting point (around 480° F or 249° C) and retains more strength when wet. There are some other specialist materials used in rope manufacture - principal amongst these is Aramid/Kevlar/Technora/ Twaron - all variations on the ballistic material theme that can make a rope extremely tough and highly resistant to heat, bullets and chainsaws. Well actually just heat really, bullets go round and chainsaws think about it for a bit longer than with standard ropes and then go straight through the middle. But these toughened ropes certainly have potential and *Sterling* ropes obviously think so since they have 2 or 3 such ropes in their arborist line-up. Since you can't tell a polyester from a nylon just by looking at it some manufacturers like PMI use special marking to denote material - in PMI's case 'barber-pole' sheath runners denote nylon and a cross-pattern denotes polyester content, this is a simple idea that we would like to see adopted more widely. *Teufelberger's* Platinum is currently Green for polyester and blue for nylon with both of their orange Access-Arbor ropes being polyester.

MBL is Minimum Breaking Load (or MBS -Minimum Breaking Strength) and this may be given in kiloNewtons (kN), kilograms (kg), pounds (lbs) or lbs of force (lbf). The units of force are kN and lbf but they pretty much equate to the more recognisable kg and lb. For some reason a lot of arborist ropes are quoted with an **average strength** rather than the minimum strength. This is a figure you'll rarely see us quote in ARBCLIMBER unless we really have to because it's a misleading figure that should never have become standard use. An average is NOT the worst-case scenario figure - the rope could and by definition, has, failed at a lower figure. When dealing with life-support equipment base your calculations on the **minimum** that it will fail (Minimum Breaking Load) and you won't go far wrong but don't forget that even that figure is when the rope is dry, brand new and in a straight line with no bends in it. Some only quote a figure for spliced rope which we can assume

will be less than similar rope quoting an in-line strength. Also, double-check with the manufacturer because we come across an awful lot of distributors with different strength figures for the same rope largely because it's not clear whether they are quoting Average or Minimum Breaking Load. We've included the European favourite of breaking strength in a figure 8 knot; an indication of the strength reduction of tied knots over sewn or spliced terminations which retain much greater strength. For instance *Courant's Komora* rope has an MBL of 30kN in a straight line with no bends but with a splice this figure drops to 19 kN. That's often still better than around 15kN with a tied Expect MBL to reduce by at least 10% when spliced.

ELONGATION/STRETCH

We often see (and use) the terms 'Low-stretch' and 'static' ropes interchangeably but there is technically a difference between 'Static' which the US Cordage Institute describes as having 6% elongation at 10% MBS and 'Semi-static' which has between 6 and 10% stretch at 10% MBS. Arborists didn't take much notice of such terminology until there started to be more crossover with kernmantle access and rescue ropes but it's still not a defining term even though elongation percentages should be. We're showing up to four figures (when given) for elongation or stretch. The first is the industry standard degree of stretch at 10% of the minimum breaking load. This is some harsh treatment and would rarely concern a climbing rope unless you're huge, it's more for rigging ropes being subjected to high loads and, even worse, dynamic loads. The second figure in blue used mostly in Europe is for Static Elongation at 50 to 150kg loading over a set time period. The third figure in burnt orange is the US norm for stretch at 136kg/300lbs and this is much more indicative of a climber's body mass. Finally we've included the US ANSI Z133 driven figure of 540lb in green, not because we necessarily agree that arborists have put on a lot of weight over Christmas but because the operating weight of a climber has generally increased substantially in recent years with all the hardware, full body harnesses, chainsaw protective clothing and even helmets, a *Protos* with accessories is a helluva lot heavier than a 1970's builder's helmet. In rescue, we've increased our figure for a rescue load twice in the last 30 years as average bodyweights and kit increased so 245kg/540lbf could well be the kind of weight that a working arborist might attain when wet and fully kitted but a competition or recreational climber very rarely would!

In Europe, the use of a sub-13mm/ 1/2" rope is nothing new, in fact 1/2" and above was unusual with 12mm being closer to an Arborist norm. In the US this has become such a measure of the minimum that the US standard ANSI specifically states that any arb rope UNDER 1/2" require specialist training before use! That means ALL of the hybrid-specialised ropes. A case of standards not keeping up with developments? Equally the NFPA standard lists rope to within 0.5mm which is why you see such a discrepancy in the definition of a 7/16" rope - some 11mm can be listed as anything from 10.8 to 11.6. *BWII* ropes comply with the updated ANSI Z359.15 standard for a single anchored lifeline which you would think is a definition that could be applied to arb ropes. A whole can o' worms we don't want to open right now!



IN THE FOLLOWING TABLES.....:

The data in these tables is always ridiculously difficult to compile because there is so much conflicting information even within the same company with catalogues or websites saying one thing and the stockists saying another. In the end we've had the various companies sign off their own listings but even so there's a lot of data not given for some of our entries, the best we can do is tell you the ropes exist! Some of the data we list in our rescue titles is not listed here - the US tends not to quote the NUMBER OF FALLS or a KNOTTED BREAKING STRENGTH. The latter because of the arb preference for sewn or spliced terminations. Surprisingly these are often weaker than the knotted figure. *Teufelberger's splIFE* is stronger than the *Slaice* it replaced which, for instance, came in at 16.5kN on the 35kN *drenAline* but 18kN in a knot. The advantage of any splice is much lower bulk than a knot and many can be fed through hardware but there can still be a significant strength loss. The number of Factor 1 falls is rarely quoted in arb so we've omitted it but it can be a telling figure. A large number of falls may mean the rope is more elastic which is obviously safer in a fall but increases 'bounce' during ascending and is generally less abrasion resistant.

COST: Some manufacturers do not give a retail price, in which case we list an approximate retail price based on their key distributors. Not all ropes are sold by the metre invariably because of pre-sewn/spliced eyes so they are sold in set lengths. We've used the cost of the shortest length sold, added 10% and rounded up to get a price. By-the-metre/foot, is the most expensive way to buy rope so these may not be exact but they give you a rough idea. Prices are per metre and **per foot** as an additional US \$Dollar figure. All prices **EXCLUDE Splices/ Sewn eyes** which add around £15/\$20/€17 unless otherwise stated. We usually round the prices up but if it seems a little precise it will be a manufacturers stated retail cost. We also now show a straight currency conversion in **burnt-orange** £\$€ - this NOT an accurate cost because it precludes import duty and bulk shipping but it again gives you a rough idea for comparison. If the cost is not shown in burnt orange it means it is actually sold for that price in either the US, Europe or the UK. We will update and upgrade (accuracy) of prices throughout the year to try and keep pace with any larger fluctuations.

WEIGHT - This is the WEIGHT or MASS per metre and per 100feet. We have made conversions based on a linear mass density conversion rounded to one decimal place (we occasionally sneak in two if it's .25 for a quarter).

MATERIALS: Arborist ropes tend to be primarily Polyester sheath with a polyester or nylon core. Nylon is referred to in Europe as *polyamide* because Nylon is Dupont's trade name and differentiated by some as such or as Nylon 66 or Perlon. Polyester reduces stretch in the sheath and increases durability to some extent. Nylon absorbs more water than Polyester but is stronger when wet and provides more elasticity so it's often used for the core material.

EASE of TYING is really '**FLEXIBILITY**' and should more correctly be defined as the '*coefficient of knotability as a ratio*



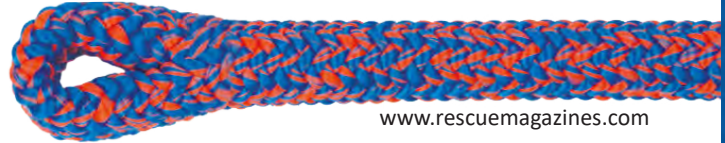
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of 1.1 times the rope diameter' but we couldn't fit that in the header. It refers to deformation of a rope in an overhand knot subjected to a 10kg load but is basically how easy it is to tie a knot. This is again not quoted by everyone but ranges from 0.6 for the easiest to tie to 1.1 for the hardest. Ropes closer to 1 hold their shape well, work well in mechanical devices and are easier to untie. However, we're not sure how much notice to take since the *Argiope* at 1. is far easier to tie than *Drenaline* at 0.6? *SherrillTree* offer a different guide with a 1 to 10 scale where 10 is excellent knotability - this is shown in **burnt orange**.

SHEATH CONSTRUCTION: This is expressed as the number of carriers/threads used to construct the outer 'jacket' or braid. The lower the number, the more flexible the rope will be. Most of the ropes in this category are 24-braid and are **DB** or double braids meaning the core package (comprised of multiple bundles of fibres) has its own woven sheath. The core bundles can be separate from each and parallel or twisted together in a plait or braid. Kernmantle (**KM**) is technically any rope with a sheath over a separate core but is more usually a single 32 or 48 carrier sheath over parallel core fibres with less stretch than traditional arb ropes. One manufacturer describes a *Double Braid Kernmantle* which we would term **DB** rather than **KM**.

SPICEABLE: indicates whether the rope can be self spliced or hand-spliced shown as black square ■, whether it is available with a pre-spliced eye ■ or a sewn eye ■.

SUITABLE FOR:.....

HYBRID HARDWARE indicates a particular suitability for use with hybrids and descenders beyond the norm for all these ropes. This means 1) that it will fit key devices 2) that the sheath won't milk or bunch under compression 3) that the rope stays quite round and doesn't 'squash' and 4) it maintains these attributes through its life. NB: **ALL of the ropes in this GUIDE can be used for abseiling, ascending, hauling and even ziplines** but some do it better than others and with greater safety margins eg. **toothed ascenders are best with 32-48 carriers rather than the knobbler 12-16 carriers**. Equally, all can be used for climbing using Stationary or Moving ropes but again with varying degrees of effectiveness.

Many splices and compact sewn eyes can be **FED THROUGH HARDWARE** but there's a significant strength loss.

SRT/SRS/DRT & DdRT/MRS: generally speaking Single and Double Rope Technique (now called SRS- Stationary Rope Systems) require low stretch rope for which kernmantle semi-static and static ropes are perfect. The more supple 32 and 24 strand double braid can also do that job well but are better suited to Doubled Rope Technique (Moving Rope Systems) than most Kernmantle ropes are.

STANDARDS: CE and **ANSI** pretty much cover the arb market in Europe and USA but some ropes crossing

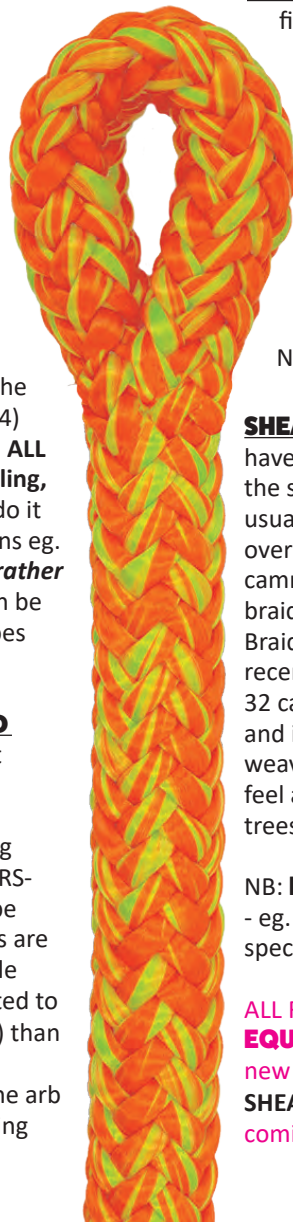
over from rescue may also have an **NFPA** rating. CE in this case is EN1891 and divided into class A and B ropes. While the physical diameter of rope can be the same (8.5-16mm), class A ropes have a higher MBL at min-22kN compared to 18kN for class B but class B can have less sheath slippage at 15mm compared to 30mm for a class A so this can make a class B preferable with some hardware. Class A will tend to be tougher and stronger but class B can be just as good, if not better if you take good care of it. 15kN is a minimum for knot/splice/ sewn strength so where quoted may not be the max strength of that particular rope, just the minimum to meet the standard. **ANSI Z133 requires climbing ropes to be ½" but it does accept 11mm ¾" for arborist 'trained in the use' of this thinner rope**. The 'newly' defined ANSI Z359.15 Single Anchor Lifeline standard may now also be relevant to SRT/SRS applications in arb. The **CI & BERRY** designations are unique to the USA and are not standards as much as compliance to the **US Cordage Institute** and **military** requirements for 100% home produced ropes. These are not mandated for arborists but since many of these ropes cross over to other sectors we have started to list them.

SHRINKAGE in water. Some ropes are pre-shrunk or use fibres that won't shrink which is not necessarily the same as thermo-stabilised or 'heat-set' rope although that process will help reduce overall shrinkage. Untreated Nylon does 'retract' a little unless factory pre-shrunk. This harks back to the days when the first thing you did with a new rope was chuck it in the bath overnight. This figure is not the same as Sheath Slippage which is where the sheath 'milks' some extra length in relation to the core and ends up with a dubious looking end. The ropes listed in the **'HYBRID HARDWARE'** column will specifically NOT do this.

SHEATH %. This is the opposite to CORE percentage so we haven't bothered listing both - do the math(s). The higher the sheath percentage the stiffer the rope. It will therefore usually have a much higher initial resistance to abrasion over an edge or sheath creep under high loads from a camming device. Most arb ropes used a much coarser braid, in fact a braid covering a braided core hence Double Braid and this is anything from 12 and 16 to 24. More recently, as SRT/SRS took hold, the Kernmantle norms for 32 carrier sheaths has provided greater abrasion resistance and inhibits ingress of dirt and debris with its tighter weave. Traditional arb constructions provide a much softer feel and easy knot tying and though less abrasion resistant, trees are far more forgiving than rock, metal and concrete.

NB: **MODEL NAMES** often differentiate the colour options - eg. *ALL GEAR* & *YALE* ropes - each named rope denotes a specific colour and only that colour.

ALL ROPES guides in **ARBORIST, ROPE & BLACK EQUIPMENT BUYERSGUIDES** are being updated to a new layout with additional columns for **TREATED FIBRES/ SHEATH and Ø MARKER THREADS** and including 10mm coming in early 2024





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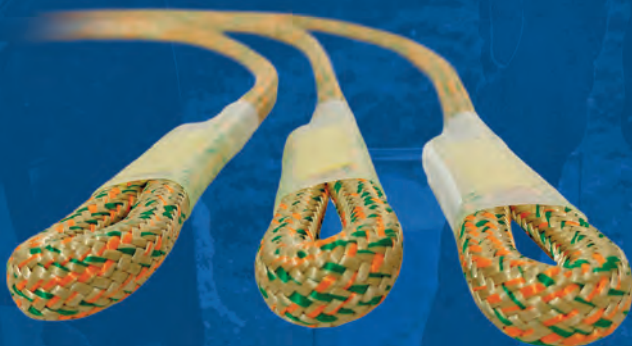
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Choice of different colors
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Eye MBS: 14.2 kN (3192 lbf)
Basket MBS: 27.6 kN (6204 lbf)
Technora/polyester sheath



Rope Tech Gloves

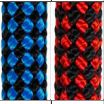

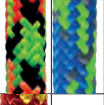



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Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE of TYING Sherrill Ratings	SHEATH OUTER STRANDS	SPICEABLE PRE-SPUN PRE-SEWN
	Arborist 32str KM Crossfire	ALLGEAR		£2.75 \$3.44 \$1.05 €3.15	11 7/16"	89g 6.1lb	Polyester Nylon	ANSI		32 KM	■
	Arborist 32str KM Finish Line, Blue Finish-Line, Red Finish Line,	ALLGEAR		£2.90 \$3.60 \$1.10 €3.30	11 7/16"	89g 6.1lb	Polyester Nylon	ANSI		32 KM	■
	Arborist 32str KM Tower Line	ALLGEAR		£2.90 \$3.60 \$1.10 €3.30	11 7/16"	89g 6.1lb	Polyester Polyester	ANSI		32 KM	■
	Arborist 24str* Rocketline, Ramborista Purple Haze, Blue Craze, CherryBomb, Sunburst	ALLGEAR		£3.40 \$4.25 \$1.30 €3.90	11.2 7/16"	89g 6.1lb	Polyester Polyester	ANSI		24/12 DB	■ ■
	Arborist 24str* CherryBomb2, Inferno, BlueCraze2, MardiGras2, Atlas	ALLGEAR		£4.30 \$5.40 \$1.65 €4.95	11.8 15/32"	89g 6.1lb	Polyester Polyester	ANSI	-	24/12 DB	■ ■ ■
	Arborist 32str KM TowerLine	ALLGEAR		£2.90 \$3.62 \$1.10 €3.30	12.7 1/2"	99g 6.7lb	Polyester Polyester	ANSI		32 KM	■
	Arborist 24str* Neolite II, SafetyLite II	ALLGEAR		£3.05 \$3.85 \$1.18 €3.50	12.7 1/2"	112g 7.5lb	Polyester Polyester	ANSI		24 DB	■ ■
	Arborist 16str* Bazooka, Neolite, SafetyLite	ALLGEAR		£3.25 \$4.10 \$1.25 €3.75	12.7 1/2"	112g 7.5lb	Polyester Nylon	ANSI		16	■ ■ ■
	Arborist 12str* Forestry Pro Glo, Forestry Pro	ALLGEAR		£3.10 \$3.90 \$1.20 €3.60	12.7 1/2"	109g 7.3lb	Polyester Polyester	ANSI		12	■ ■ ■
	Endurance Aya, LuckyLine	ATLANTIC BRAIDS		£2.70 \$3.10 \$1.00 €3.10	11.1 7/16"	89g 6lb	Polyester Nylon	n/a		32 KM	■
	GripFlex-24	ATLANTIC BRAIDS		£2.70 \$3.10 \$1.00 €3.10	11.7 29/64"	98g 6.6lb	Polyester Polyester	ANSI	0.37	24 DB	■ ■
	Antidote Fusion, Fury, Formula	ATLANTIC BRAIDS		£2.35 \$2.95 \$0.90 €2.70	11.8 1/2"	n/a	Polyester Polyester	n/a		24 DB	■
	GripFlex-16	ATLANTIC BRAIDS		£2.80 \$3.40 \$1.10 €3.30	12.7 1/2"	112g 7.5lb	Polyester Nylon	n/a		16	■
	Endurance	ATLANTIC BRAIDS		£2.70 \$3.10 \$1.00 €3.10	12.7 1/2"	118g 7.9lb	Polyester Nylon	n/a		32 KM	■
	GripFlex-12	ATLANTIC BRAIDS		£2.70 \$3.10 \$1.00 €3.10	13 1/2"	134g 9lb	Polyester Polyester	n/a		12	■
	Dynastat	BEAL		£2.40 \$3.10 \$1.00 €2.75	10.5 13/32"	75g 5lb	Nylon Nylon/Vectran	CE A*	0.82	16 KM	■

NOTES: COST: £\$€ = Currency Conversion ONLY exc. eyes unless specified in NOTES. INC local taxes/VAT, Some are not sold by m/ft, price shown

ARBORIST CLIMBING ROPES








SUITABLE FOR			MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION %	SHEATH %	OTHER COLOURS	NOTES	WWW.
EYE CANTHREAD THRU HARDWARE	HYBRID HARDWARE	SRT/SRS MRS/DdRT	MBL MINIMUM Break Load Spliced Sewn Knotted	ABL AVERAGE Break Load Spliced Sewn Knotted							
-	-	■	35.2kN 7920lbf	39.1kN 8800lbf			15%			Model names equates to colour options.	allgearinc.com
-	-	■	31.2kN 7020lbf	39.1kN 7800lbf			3%			*Model names equates to colour options.	allgearinc.com
-	-	■	27.2kN 6120lbf	30.3kN 6800lbf			3%			*Model names equates to colour options.	allgearinc.com
■	-	■	-	28kN 6300lbf			3%			*Model names equates to colour options.	allgearinc.com
■	■	■	-	29.8kN 6700lbf	-		4.9%	-		*Model names equates to colour options. Atlas discontinued	allgearinc.com
-	-	■	32.8kN 7380lbf	26.7kN 8200lbf			3%				allgearinc.com
-	■	■	-	34.7kN 7800lbf			n/a			*Model names equates to colour options.	allgearinc.com
-	-	■	33.4kN 7500lbf	40.9kN 9200lbf			3%			*Model names equates to colour options.	allgearinc.com
-	-	■	29.2kN 6570lbf	36.5kN 7300lbf			3%			*Model names equates to colour options.	allgearinc.com
-	■	■	37.5kN 8300lbf	4000kg 8800lb			7%				atlanticbraids.com
-	-	■	-	30.5kN 6850lbf 27.5kN 6180lbf	0.4%		2.3%	45%			atlanticbraids.com
-	-	■	31.1kN 7000lbf	5170kg 11400lb			n/a	n/a		Status being established Seems widely available but not listed by ATL - Also 11.1 & 12.7mm	atlanticbraids.com
-	-	■	-	40.9kN 9200lbf			n/a	n/a			atlanticbraids.com
-	-	■	48kN 10600lbf	5170kg 11400lb			7%	n/a			atlanticbraids.com
-	-	■	-	3040kg 6700lb			n/a	n/a			atlanticbraids.com
-	-	■	25kN 6744lbf 16/19kN 3597/4271lbf	-	0%	0.8%	2%	44%		DISCONTINUED *Conforms to Semi-static (EN1891) and Dynamic (EN892) Standards	bealplanet.com

is a proportion of shortest length x10% & rounded up. EASEoFTYING: 1-10 from hardest to easiest SHEATH: DB=Double Braid, KM=KernMantle







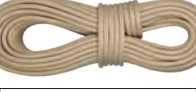





















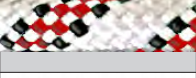


Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE of TYING Sherrill Rating	SHEATH OUTER STRANDS	SPliceABLE PRE-SPliced PRE-SEWn
	Industrial	BEAL		£3.60 \$3.20 \$1.15 €2.90*	11mm 7/16"	74g 5lb	Polyester Nylon	CE A	-	32 KM	■
	Biloba	BEAL		£3.60 \$4.50 \$1.35 €4.10	11.5mm 7/16"	89g 6 lb	Polyester Nylon	CE A	-	DB	■
	Ginko	BEAL		£3.55 \$4.50 \$1.40 €4.10	12mm 1/2"	92g 6.1lb	Polyester Nylon	CE A	-	DB	■
	Bonsai	BEAL		£3.75 \$4.75 \$1.55 €4.30	13mm 1/2"	100g 7.3lb	Polyester Polyester	CE A ANSI	-	DB	■
	Baobab	BEAL		£4.75 \$6.00 \$1.85 €5.45	13.5mm 1/2"	89g 6 lb	Polyester Nylon	CE A	-	DB	■
	Armortech	BLUEWATER		£6.75 \$8.50 \$2.60 €7.80	10.5mm 27/64"	76g 5.1lb	Technora/ Polyester Nylon	ANSI	-	32 KM	■
	Assaultline/ BWII+	BLUEWATER		£3.35 \$4.20 \$1.28 €3.85	10.5mm 27/64"	78g 5.2lb	Polyester Nylon	CE A NFPA	-	32 KM	■
	Protac	BLUEWATER		£3.35 \$4.22 \$1.30 €3.85	10.5mm 27/64"	72g 4.8lb	Polyester Nylon	CE B	-	32 KM	-
	SpecStatic	BLUEWATER		£3.25 \$4.10 \$1.25 €3.75	10.5mm 27/64"	88g 6 lb	Polyester Polyester	NFPA ANSI	-	32 KM	-
	Armortech	BLUEWATER		£6.80 \$8.60 \$2.70 €7.85	11mm 7/16"	91g 6lb	Technora/ Polyester Nylon	ANSI	-	32 KM	■
	DGR	BLUEWATER		£3.10 \$3.90 \$1.20 €3.60	11mm 7/16"	85g 5.7lb	Polyester Nylon	NFPA ANSI	-	KM	-
	Pro G	BLUEWATER		£3.70 \$4.65 \$1.42 €4.25	11mm 7/16"	92g 6.2lb	Polyester Nylon	NFPA	-	48 KM	-
	Protac	BLUEWATER		£3.50 \$4.40 \$1.35 €4.05	11mm 7/16"	80g 5.44lb	Polyester Nylon	CE A NFPA UIAA	-	32 KM	-
	Safeline	BLUEWATER		£3.76 \$4.75 \$1.45 €4.35	11mm 7/16"	88g 5.86lb	Polyester Nylon	CE A NFPA UIAA	-	16 KM	■
	Assaultline/ BWII+	BLUEWATER		£3.00 \$3.80 \$1.15 €3.50	11.4mm 7/16"	89g 6.1lb	Polyester Nylon	CE A NFPA UIAA	-	32 KM	■

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ARBORIST CLIMBING ROPES







SUITABLE FOR		MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION %		OTHER COLOURS	NOTES	WWW.	
EYE CAN THREAD THRU HARDWARE	HYBRID HARDWARE	MBL MINIMUM Break Load Spliced Sewn Knotted	ABL AVERAGE Break Load Spliced Sewn Knotted			@10% MBS	SHEATH %				
-	■	■	34kN 7643lbf 19.5/24kN 4384/5395lbf	-	1.1%	0.8%	2.1%	36%		Also 10.5 & 12mm versions - see Rope Eqpt BUYERS GUIDE. White costs 4% less	bealplanet.com
■	■	■	30.3kN 6812lbf 18/18kN 4047/4047lbf	-	2.8%	0	3.8%	44%			bealplanet.com
-	-	■	27kN 7399lbf 16/22kN 3597/4945lbf	-	2.8%	0	4%	69%		sheath & core bonded	bealplanet.com
-	-	■	34kN 7643lbf 18/25kN 4047/5620lbf	-	4.5%	0	4.2%	61%		sheath & core bonded	bealplanet.com
-	■	■	30kN 6744lbf 19/23kN 4271/5171lbf	-	2%	0	5%	82%		Unicore Rope, sheath and core bonded. Discontinued?	bealplanet.com
-	■	■	35.5kN 8000lbf	-	0%	-	3.2%	48%*		Teflon-coated, double sheath-+core sheath. Technora over polyester sheathed nylon Up to 934 deg F	bluewaterropes.com
-	■	■	28.9kN 6500lbf	-	-	-	3.8%	-			bluewaterropes.com
-	■	■	31.5kN 7081lbf	-	-	-	3.1%	50%			bluewaterropes.com
-	■	■	27.1kN 6092lbf	-	-	-	2.6%	47%		Specially designed for mechanical devices	bluewaterropes.com
-	■	■	37.1kN 8331lbf	-	0%	-	3.6%	53%*		Teflon-coated, double sheath-+core sheath. Technora over polyester sheathed nylon Up to 934 deg F	bluewaterropes.com
-	■	■	33.5kN 7541lbf	-	-	-	3.4%	48%			bluewaterropes.com
-	■	■	40.5kN 9107lbf	-	-	-	3.1%	42%			bluewaterropes.com
-	■	■	35.2kN 7913lbf	-	-	-	1.2%	51.6%			bluewaterropes.com
-	■	■	35.9kN 8061lbf	-	-	-	2.7%	46%			bluewaterropes.com
-	■	■	32.9kN 7399lbf	-	1.9%	-	2.9%	53%			bluewaterropes.com

is a proportion of shortest length x10% & rounded up. EASEofTYING: 1-10 from hardest to easiest SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE of TYING Sherrill Ratings	SHEATH OUTER STRANDS	SPICEABLE PRE-SPUN
	Armortech	BLUEWATER		£7.55 \$9.50 \$2.90 €8.70	11.5mm 7/16"	97g 6.55lb	Technora/ Polyester Nylon	ANSI	-	32 KM	
	Technora Assaultline	BLUEWATER		£3.25 \$4.05 \$1.20 €3.70	11.5mm 7/16"	92g 6.2lb	Technora Polyester	NFPA	-	32 KM	
	SpecStatic	BLUEWATER		£3.45 \$4.35 \$1.35 €4.00	11.5mm 7/16"	100g 7.3lb	Polyester Polyester	NFPA ANSI	-	32 KM	-
	Armortech	BLUEWATER		£8.75 \$11.00 \$3.50 €10.00	12mm 1/2"	98g 6.55lb	Technora/ Polyester Nylon	ANSI	-	32 KM	
	Safeline White Safeline	BLUEWATER		£4.35 \$5.50* \$1.70* €5.05	12.5mm 1/2"	108g 8.21lb	Polyester Nylon	CE A NFPA ANSI UIAA	-	16 KM	
	Protac	BLUEWATER		£4.05 \$5.10 \$1.58 €4.70	13mm 1/2"	114g 8.41lb	Polyester Nylon	CE A NFPA UIAA	-	32 KM	-
	Armortech	BLUEWATER		£9.10 \$11.50 \$3.60 €10.50	13mm 1/2"	127g 8.51lb	Technora/ Polyester Nylon	NFPA ANSI	-	32 KM	
	Assaultline/ BWII+	BLUEWATER		£3.05 \$3.80 \$1.15 €3.50	13mm 1/2"	89g 6.1lb	Polyester Nylon	CE A NFPA	-	32 KM	
	SpecStatic	BLUEWATER		£4.00 \$5.00 \$1.55 €4.60	13mm 1/2"	137g 10.1lb	Polyester Polyester	NFPA ANSI	-	32 KM	-
	Arbor Boss 24	BUCCANEER ROPE CO		n/a	11mm 7/16"	92g 6.2lb	Polyester Polyester	-	-	24 DB	-
	Arbor Boss 16 O-Glow, Blue Thunder, Black Thunder, Red Thunder, Patriot, Green&Ylw	BUCCANEER ROPE CO		£2.00 \$2.50 \$0.75 €2.30	12mm 1/2"	112g 7.5lb	Polyester Polyester	-	-	16 DB	-
	Arbor Boss 12	BUCCANEER ROPE CO		n/a	12mm 1/2"	112g 7.5lb	Polyester Polyester	CI	-	12 DB	-
	Bulwark Safety X Semi-Static	COASTLINE CORDAGE		£2.25 \$2.80 \$0.85 €2.60	11mm 7/16"	82g 5.5lb	Polyester Nylon	NFPA	-	32 KM	-
	Bulwark Safety X Semi-Static	COASTLINE CORDAGE		n/a	12mm 1/2"	98g 6.7lb	Polyester Nylon	NFPA	-	32 KM	-
	Rebel	COURANT		£2.40 \$3.90 \$1.20 €2.75	11mm 7/16"	88g 5.9lb	Polyester Nylon	NFPA ANSI	1.18	32 KM	-

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ARBORIST CLIMBING ROPES


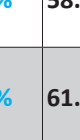



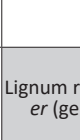
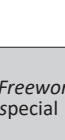
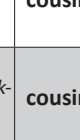

SUITABLE FOR			MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION %		OTHER COLOURS	NOTES	WWW.
EYE CANTHREAD THRU HARDWARE	HYBRID HARDWARE	SRT/SRS MRS/DdRT	MBL MINIMUM Break Load Spliced Sewn Knotted	ABL AVERAGE Break Load Spliced Sewn Knotted			@10% MBS @50-150 kg @300lb/136kg @540 lb/245kg	SHEATH %			
-	■	■	32.1kN 7216lbf	-	0%	-	1.9%	53%*		Teflon-coated, double sheath-*core sheath=39.4%. Technora over polyester sheathed nylon Up to 934 deg F	bluewaterropes.com
-	■	■	40 kN 8993lbf	-	-	-	2.8%	53%		highly abrasion-resistant. Black=military only	bluewaterropes.com
-	■	■	35.1kN 7891lbf	-	-	-	1.2%	41%		Very low elongation, not for MRS/DdRT. Suited to ziplines.	bluewaterropes.com
-	■	■	32kN 7223lbf	-	0%	-	5.3%	53%*		Teflon-coated, double sheath-*core sheath=39.4%. Technora over polyester sheathed nylon Up to 934 deg F	bluewaterropes.com
-	-	■	44.4kN 9983lbf	-	-	-	2.2%	45%		*White with red or blue thread is a whopping 20% cheaper than these figures	bluewaterropes.com
-	-	-	43.4kN 9840lbf	-	-	-	2%	46%			bluewaterropes.com
-	■	■	49.8kN 11203lbf	-	0%	-	2.5%	53%*		Teflon-coatd, double sheath-*core sheath=39.4%. Technora over polyester sheathed nylon Up to 934 deg F	bluewaterropes.com
-	■	■	44.4kN 10000lbf	-	1.9%	-	3.8%	53%			bluewaterropes.com
-	■	■	47.5kN 10677lbf	-	-	-	1%	39%		Very low elongation, not for MRS/DdRT. Suited to ziplines.	bluewaterropes.com
-	■	■	-	16kN 3600lbf	-	-	-	-			bucrope.com
-	-	■	-	31.1kN 7000lbf	-	-	-	-		also available as 5/8" 16mm see rigging ropes	bucrope.com
-	-	■	-	29.8kN 6700lbf	-	-	-	-		also available as 5/8" 16mm see rigging ropes	bucrope.com
-	■	■	37.92kN 8294lbf	-	-	-	2%	-		note that 2 different spec sheets exist for these ropes with different spec.	coastlinegroup.ca
-	■	■	49.56kN 10927lbf	-	-	-	n/a	-		note that 2 different spec sheets exist for these ropes with different spec	coastlinegroup.ca
-	■	■	33kN 7419lbf 23kN 5171lbf	-	2.2%	0	2.5%	41%			cordescourant.com

is a proportion of shortest length x10% & rounded up. EASEoFTYING: 1-10 from hardest to easiest SHEATH: DB=Double Braid, KM=KernMantle







Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE of TYING Sherrill Rating	SHEATH OUTER STRANDS	SPICEABLE PRE-SEWN
	Squir v2	COURANT		£2.20 \$3.77 \$1.15 €2.82	11.5mm 7/16"	91g 6.1lb	Polyester Nylon	CE A	0.74	32 KM	-
	Komora	COURANT		£4.25 \$6.00 \$1.83 €4.90	11.7mm 7/16"	94g 6.3lb	Polyester Nylon	CE A	0.82	16	■
	Kalimba	COURANT		£5.00 \$6.20 \$1.90 €5.60	11.9mm 29/64"	100g 6.7lb	Polyester Nylon	CE A ANSI	0.6	24 DB	■
	Kanopa	COURANT		£4.40 \$5.55 \$1.70 €5.05	12.1mm 1/2"	103g 6.2lb	Polyester Nylon	CE A	0.87	16	■ ■
	Rush	COUSIN-TRETEC		£2.05 \$2.60 \$0.80 €2.30	11mm 7/16"	74g 5lb	Nylon Nylon	CE A	1.1	32 KM	-
	Atrax	COUSIN-TRETEC		£3.65 \$4.75 \$1.45 €4.75	11.6mm 7/16"	102g 6.9lb	Polyester Polyester	CE A	1.03	24 DB	■ ■
	Black Widow	COUSIN-TRETEC		£4.25 \$5.40 \$1.65 €4.55	12.2mm 1/2"	105g 7lb	Polyester Polyester	CE A	0.7	16 DB	■
	Lignum	COUSIN-TRETEC		£4.10 \$5.50 \$1.70 €4.60	12.5mm 1/2"	115g 7.7lb	Polyester Polyester	CE A	0.9	24 DB	■
	Response LSK	DONAGHYS		£2.30 \$3.10 \$0.95 €2.75	11mm* 7/16"	91g 6.1lb	Polyester Nylon	CE A ANSI	1.18	32 KM	-
	Response XT	DONAGHYS		n/a	11mm* 7/16"	91g 6.1lb	Nylon Nylon	CE A ANSI	1.18	32 KM	-
	Cougar Arbor Access	DONAGHYS		£3.40 \$4.40 \$1.35 €3.80	11.7mm 29/64"	93g 6.25lb	Polyester Polyester	CE A ANSI	10	24 DB	■ ■
	NRG	DONAGHYS		£3.40 \$4.40 \$1.35 €3.80	12mm 1/2"	108g 7.2lb	Nylon Nylon	CE A ANSI	-	24 KM	-
	Tango StatX Yellow, Blue	DRAYER		£3.00 \$3.60 \$1.10 €3.30	11.5mm 7/16"	100g 6.7lb	Polyester Nylon	CE A	0.74	32 KM	■
	Tango Vision Fox, Flash	DRAYER		£3.10 \$3.90 \$1.20 €3.50	12.8mm 1/2"	104g 7lb	Polyester Nylon	CE A	-	16	■
	Tango Ergo Brasil	DRAYER		£3.30 \$4.20 \$1.30 €3.80	13.5mm 33/64"	106g 7.1lb	Polyester Nylon	CE A	-	24 DB	■
	PowerStatic II	EDELRID		£3.20 \$4.10 \$1.25 €3.30	11mm 7/16"	81g 5.4lb	Nylon Nylon	CE A	0.9	24 KM	■

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











ARBORIST CLIMBING ROPES

SUITABLE FOR			MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION %	SHEATH %	OTHER COLOURS	NOTES	WWW.
EYE CANTHREAD THRU HARDWARE	HYBRID HARDWARE	SRT/SRS MRS/DOBT	MBL MINIMUM Break Load Spliced Sewn Knotted	ABL AVERAGE Break Load Spliced Sewn Knotted							
-	■	■	30kN 6744lbf 21kN 4721lbf	-	2.7%	0	2%	43%		Pink Dragon version is a limited edition for breast Cancer Awareness	cordescourant.com
■	■	■	30kN 6744lbf 19kN 4271lbf	-	1%	0	2.5%	68%		most don't sell with a splice eye which adds around \$20/£15. Some stockist list as 11.8mm	cordescourant.com
■	■	■	35kN 7868kN 23kN 5171lbf	-	1%	0.1%	1.8%	57%			cordescourant.com
■	-	■	31kN 6969lbf 23.5kN 5283lbf	-	2.8%	0.4%	2.8%	67%		Captive rope marker within splice. Japora/Ozora discontinued	cordescourant.com
-	■	■	34.1kN 7666lbf >15kN 3372lbf	-	2.5%	0.3%	1.8%	39%			cousin-trestec.com
■	■	■	30.7kN 6902lbf >15kN 3372lbf	-	0.5%	0	2.8%	55%			cousin-trestec.com
■	-	■	30.1kN 6767lbf >15kN 3372lbf	-	0.2%	0	2.4%	58.8%			cousin-trestec.com
■	■	■	34.6kN 7778lbf >15kN 3372lbf	-	0.1%	0	3.1%	61.6%		Lignum red is a <i>Freeworker</i> (germany)special	cousin-trestec.com
-	■	■	31.9kN 7171lbf >15kN 3372lbf	34.3kN 7711lbf	0.3%	2.6%	3.2%	51%		'Response LSK' name also used by 2 competitors. Also in black, white with yellow/blue fleck *Actual test diam=11.4mm	donaghys.com
-	■	■	31.9kN 7171lbf >15kN 3372lbf	34.3kN 7711lbf	-	-	3.2%	51%		XT uses heat-set Nylon core. *Actual test diam=11.4mm	donaghys.com
■	■	■	28kN 6300lbf	-	1.5%	0	<3.0%	n/a			donaghys.com
■	■	■	35.2kN 7868lbf	-	-	-	-	n/a			donaghys.com
-	■	■	46.4kN 10431lb	-	2.7%	0	1.2%	43%			drayer.de
-	■	■	36kN 8093lb	-	-	-	2.2%	n/a			drayer.de
-	-	■	36.7kN 8260lbf	-	-	-	<2.2%	n/a			drayer.de
-	-	■	29kN 6520lbf 17kN 3822lbf	-	0.2%	-	4.3%	61%		Thermo-shield coating.	edelrid.de

is a proportion of shortest length x10% & rounded up. **EASEofTYING:** 1-10 from hardest to easiest SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE of TYING Sherrill Rating	SHEATH OUTER STRANDS	SPICEABLE PRE-SPUN PRE-SEWN
	Woodpecker	EDELRID		£4.90 \$5.90 \$1.80 €5.55	11.7mm 2 ⁹ / ₆₄ "	95g 6.3lb	Polyester Nylon	CE A ANSI	1.0	24 KM	
	Bucco	EDELRID		£3.50 \$4.40 \$1.35 €4.00	11.8mm 1 ¹ / ₂ "	96g 6.4lb	Polyester Nylon	CE A ANSI	-	32 KM	
	X-P*E Bahamas, Aruba, Seychelles	EDELRID		£3.75 \$3.90 \$1.20 €4.30	12.3mm 1/2"	118g 7.9lb	Polyester Polyester	CE A	0.8 10	16	
	Jacamar	EDELRID		£4.60 \$6.30 \$1.95 €5.70	12.5mm 1/2"	108g 7.2lb	Polyester Nylon	CE A ANSI	-	24 DB	
	Silva-Tex 24 Light	ENGLISH BRAIDS		n/a	10.5mm 1 ¹ / ₂ "	79g 5.3lb	Nylon Nylon	CE A	-	24 KM	-
	Silva-Tex 24	ENGLISH BRAIDS		£3.55 \$4.50 \$1.40 €4.05	11.5mm 7/16"	93g 6.2lb	Polyester Nylon	CE A	0.9	24 DB	 
	Silva-Tex 16	ENGLISH BRAIDS		n/a	12.4mm 1/2"	131g 8.8lb	Polyester Polyester	CE A	-	16 KM	-
	Silva-Tex 16HD	ENGLISH BRAIDS		n/a	12.7mm 1/2"	114g 7.7lb	Polyester Nylon	CE A	-	16 KM	-
	Argiope Evo Blue, Berry	FTC TREE		£4.05 \$5.15 \$1.60 €4.65	11.7mm 2 ⁹ / ₆₄ "	103g 6.9lb	Polyester Polyester	CE A	0.7	16	 
	Nigma	FTC TREE		£3.20 \$4.00 \$1.25 €3.60	12mm 1/2"	105g 7lb	Polyester Polyester	CE A	1	24 DB	 
	Argiope Acid	FTC TREE		£4.50 \$5.50 \$1.70 €5.00	12.1mm 1/2"	104g 7lb	Polyester Nylon	CE A	0.87	16	 
	GeoStatic NE	GLEISTEIN		£2.40 \$3.00 \$1.00 €2.70	10.5mm 1 ¹ / ₂ "	67g 4.5lb	Polyester Polyester	CE A	-	32 KM	
	GeoArbor Lizard Golden Viper	GLEISTEIN		£2.70 \$3.50 \$1.10 €3.10	11mm 7/16"	82g 5.5lb		CE A	-	DB	
	GeoArbor Twin	GLEISTEIN		£4.00 \$5.00 \$1.55 €4.50	12mm 1/2"	90g 6lb	Nylon Nylon	CE A	-	24 DB	-
	GeoTwin Gemini X	GLEISTEIN		£5.20 \$6.55 \$1.85 €6.00	12mm 1/2"	100g 6.7lb	Polyester Polyester	CE A	-	24 DB	 
	GeoArbor Cougar Cobia, Barracuda	GLEISTEIN		£4.75 \$5.90 \$1.85 €5.35	12mm 1/2"	88g 5.9lb	Polyester Polyester	CE A	-	16 KM	 











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SUITABLE FOR			MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION %		SHEATH %	OTHER COLOURS	NOTES	WWW.
EYE CAN THREAD THRU HARDWARE	HYBRID HARDWARE	SRT/SRS MRS/DdRT	MBL MINIMUM Break Load Spliced Sewn Knotted	ABL AVERAGE Break Load Spliced Sewn Knotted			@10% MBS @50-150 kg @300lb/136k @540 lb/245kg					
■	■	■	25kN 5620lbf 16kN 3597lbf	-	0	-	2.1%	55%			Web-eye termination is virtually the same diameter as rope.	edelrid.de
-	■	■	40kN 8992lbf 22kN 4946lbf	-	0.8%	-	1.9%	47%			Made from recycled yarn	edelrid.de
-	-	■	25kN 5620lbf 23/16kN 5171/3597lbf	-	-	-	2.2%	65%			red/yelw is 'highlight' a Freeworker exclusive colour	edelrid.de
-	-	■	33kN 7400lbf 18.9kN 4249lbf	-	1.2%	-	2.4%	56%			Sheath is 100% recycled material	edelrid.de
-	-	■	22.4kN 5036lbf	-	2.5%	-	-	-				englishbraids.com
■	-	■	31.6kN 7104lbf 25.6kN 5755lbf	-	2.5%	-	2.8%	49%			Model sometimes listed by stockists as 11.7	englishbraids.com
-	-	■	30.4kN 2960lbf 24.1kN 5418lbf	-	0	-	-	-				englishbraids.com
-	-	■	37.4kN 8408lbf 25.4kN 5710lbf	-	0	-	-	-				englishbraids.com
■	■	■	28.9kN 6497lbf 22.12kN 4973lbf	-	1%	0%	2.8%	68%			Original Berry colour discontinued. Evo replaces previous version which had nylon core	ftc-tree.com
■	■	■	35kN 7868lbf 21.9kN 4923lbf	-	1.4%	0%	3.4%	55.7%				ftc-tree.com
-	-	■	34kN 7643lbf 15kN 3372lbf	-	2.8%	0.4%	2.4%	67%				ftc-tree.com
-	-	■	28.8kN 6474lbf 15kN 3372lbf	-	0.6%	0%	2.9%	56.3%				gleistein.com
■	-	-	33kN 7419lbf	-	1.5%	4.5%	4.3%	54%			Has water-repellant treatment	gleistein.com
-	-	■	34.2kN 7693lbf	-	1.6%	0%	3.4%	52%				gleistein.com
-	-	■	32kN 7194lbf 30.6kN 6879lbf	-	-	-	2%	-			Sport version (yachting) has mottled sheath - black mixed with red, blue, green or white.	gleistein.com
-	-	■	29.4kN 6609lbf	-	1.7%	0%	2.6%	69%			Cobia and Barracuda appear to be discontinued?	gleistein.com

is a proportion of shortest length x10% & rounded up. **EASEofTYING:** 1-10 from hardest to easiest SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE of TYING Sherrill Rating	SHEATH OUTER STRANDS	SPICEABLE PRE-SPICED PRE-SEWN
	Trojan	HARKIE		£3.15 \$4.00 \$1.25 €3.65	11.7mm 29/64"	105g 7lb	Polyester Polyester	CE A	-	24 DB	■
	Warrior	HARKIE		£3.15 \$4.00 \$1.25 €3.65	12mm 1/2"	109g 7.3lb	Polyester Polyester	CE A	-	16	■
	Climbing Rope	HUSQVARNA		£7.00* \$8.90 \$2.71 €8.10	11.5mm 7/16"	94g 6.3lb	Polyester Nylon	CE A ANSI	-	24 DB	■ ■
	Climbing Rope	HUSQVARNA		£5.10 \$6.60 \$2.00 €6.00	11.8mm 15/32"	96.5g 6.5lb	Polyester Nylon	CE A ANSI	-	32 KM	■
	Stryka	HUSQVARNA		£4.50 \$5.50 \$1.70 €5.10	11.5mm 7/16"	92.4g 6.2lb	Polyester Nylon	CE A ANSI	-	24 DB	■
	Kalix	HUSQVARNA		£4.75 \$6.00 \$1.85 €5.50	12.9mm 1/2"	118g 7.9lb	Polyester Nylon	CE A ANSI	-	16	■
	Safe Nordic	LIROS		£2.40 \$3.50 \$1.10 €2.75	11.5mm 7/16"	80g 5.4lb	Nylon Nylon	CE A	1	32 DB	■
	Safe Plus	LIROS		£3.25 \$4.00 \$1.25 €3.50	11.5mm 7/16"	100g 6.7lb	Polyester Nylon	CE A	-	32 DB	■
	Safe Vision (Reef)	LIROS		£3.70 \$4.65 \$1.45 €4.25	11.8mm 15/32"	82g 5.5lb	Polyester Nylon	CE A	0.7	24 DB	■ ■ ■
	Safe Vision	LIROS		£4.50 \$5.50 \$1.70 €5.00	12.8mm 1/2"	102g 6.8lb	Polyester Nylon	CE A	-	24 DB	■ ■ ■
	Maverick	MARLOW ROPES		£6.00 \$7.50 \$2.30 €7.00	11.5mm 7/16"	93g 0lb	Polyester Nylon	CE A UKCA	- -	24 KM	■ ■
COMING Q3 2024	Typhoon	MARLOW ROPES		£0 \$0 \$0 €0							
	Vega	MARLOW ROPES		£3.10 \$4.50 \$1.40 €3.60	11.7mm 29/64"	101g 6.8lb	Polyester Polyester	CE B UKCA	0.9 10	24 KM	■ ■ ■
	Venom	MARLOW ROPES		£3.55 \$4.90 \$1.50 €4.10	11.8mm 15/32"	89.7g 6lb	Nylon Nylon	CE A UKCA	0.6	24 DB	■ ■ ■
	Vesper	MARLOW ROPES		£4.45 \$5.60 \$1.70 €5.10	11.8mm 15/32"	107.9g 7.2lb	Polyester Polyester	CE A UKCA	1.0	24 DB	■ ■ ■
	Gecko2 Blue Ocean*	MARLOW ROPES		£4.55 \$5.75 \$1.80 €5.30	13mm 1/2"	125.4g 8.4lb	Polyester Polyester	CE A UKCA ANSI	0.8	16	■ ■ ■

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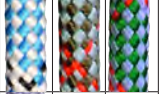


SUITABLE FOR			MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION % @10% MBS @50-150 kg @300L B/136k @540 lb/245kg	SHEATH %	OTHER COLOURS	NOTES	WWW.
EYE CAN THREAD THRU HARDWARE	HYBRID HARDWARE	SRT/SRS MRS/DRRT	MBL MINIMUM Break Load Spliced Sewn Knotted	ABL AVERAGE Break Load Spliced Sewn Knotted							
■	-	■ ■	28.8kN 6474lbf 15kN 3372lbf	-	0.6%	0	2.9%	56.3%			harkieglobal.com
■	-	■ ■	27.7kN 6227lbf 15kN 3372lbf	-	0.35%	0	2.6%	60%			harkieglobal.com
-	■	■ ■	24kN 5395lbf 18/18kN 4047/4047lbf	-	<5%	-	2.2%	58%		*price includes one spliced eye - not available without	husqvarna.com
-	■	■ ■	35kN 7868lbf 18/20kN 4047/4496lbf	-	-	-	2.3%	42%			husqvarna.com
-	■	■ ■		34kN 7643lbf	-	-	3.8%	-			husqvarna.com
-	-	■	36.7kN 8260lbf 24kN 5395lbf	28.9kN 6497lbf	-	-	4.6%	-			husqvarna.com
-	■	■	34kN 7643lbf 22kN 4946lbf	-	-	0%	3.8%	46%			liros.com
-	■	■	46.4kN 10431lbf	-	-	-	1.5%	54%		may be discontinued?	liros.com
-	■	■ ■	37kN 8318lbf 29/24kN 6520/5395lbf	-	-	-	2.5%	54%		Branded as 'Reef' by Honey Brothers UK. Listed as 12mm by some	liros.com
-	-	■ ■	45kN 10116lbf 33/30kN 7400/6744lbf	-	-	-	2.2%	51%		Listed as 13mm by some	liros.com
■	■	■ ■	35kN 7868lbf 18.8/22.9kN 4226/5148lbf	35.7kN 8025lbf 23.3kN 5148lbf	0	-	2.5%	52%			marlowropes.com
-	-	-	-	-	-	-	-	-			marlowropes.com
-	■	■	-	36.8kN 8273lbf 18.9/20.6kN 4249/6755lbf	0	-	1.2%	55.6%		ABL Sewn= 27.8kN 6250 lbf	marlowropes.com
■	■	■ ■	-	33.5kN 7531lbf 17.7/26.2kN 3979/5890lbf	4.5%	0	3.7%	42%		ABL Sewn= 28.3kN 6362 lbf	marlowropes.com
■	■	■ ■	-	20.7kN 4654lbf 16.4/20.3kN 3686/4563lbf	0	-	2.2%	52%		ABL Sewn= 24.9kN 5597 lbf Electric pink is a RockNRescue (USA) special.	marlowropes.com
■	-	■	-	32.1kN 7216lbf 18.4/28.3kN 4136/6362lbf	0	0	1.5%	73%		*Uses recycled blue-Ocean yarn ABL Sewn= 27kN 6069 lbf	marlowropes.com

is a proportion of shortest length x10% & rounded up. EASEofTYING: 1-10 from hardest to easiest SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE of TYING Sherrill Rating	SHEATH OUTER STRANDS	SPICEABLE PRE-SPICED PRE-SEWN
	Dragon	NOTCH		£3.40 \$4.25 \$1.30 €3.90	11.1mm 7/16"	81g 5.4lb	Polyester Nylon		5	32 KM	
	Banshee	NOTCH		£3.30 \$4.00* \$1.25* €3.75	11.7mm 7/16"	95g 6.4lb	Polyester Nylon	-	10	24 DB	■ ■
	Ogre	NOTCH		£3.25 \$3.95 \$1.20 €3.70	12mm 1/2"	113g 7.6lb	Polyester Polyester		9	12 KM*	■ ■
	Sasquatch	NOTCH		£2.50 \$3.00 \$1.00 €2.80	12.8mm 1/2"	112g 7.5lb	Polyester Nylon		9	16	■ ■
	Response LSK	NOVABRAID		n/a	11.7mm 29/64"	107g 7.2lb	Polyester Nylon	CE A ANSI	-	48 KM	■
	Arborist 24 Yellow Jacket	PELICAN ROPE		£3.30 \$4.00 \$1.20 €3.75	11mm 7/16"	83.5g* 5.6lb	Polyester Nylon			24	■ ■ ■
	Arborist Pro	PELICAN ROPE		£3.60 \$4.40 \$1.35 €4.10	11.8mm 1 1/32"	119g 8lb	Polyester Nylon			24	■
	Tree Viper	PELICAN ROPE		£3.80 \$3.45 \$1.05 €3.25	11.8mm 1 1/32"	84.8g 5.7lb	Polyester Nylon	CE A ANSI	-	24	■ ■
	Arborist 16	PELICAN ROPE		£3.10 \$3.75 \$1.15 €3.50	12.7mm 1/2"	125g 8.4lb	Polyester Nylon			16	■ ■ ■
	FLOW	PETZL		£4.30* \$5.35 \$1.65 €5.30	11.6mm 7/16"	102g 6.8lb	Polyester Polyester	CE A ANSI	-	24 DB	■ ■
	CONTROL	PETZL		£4.10 \$5.00* \$1.52* \$5.70	12.5mm 1/2"	115g 7.7lb	Polyester Polyester	CE A ANSI	-	24 DB	■ ■
	Access Pro	PMI		£3.40 \$4.15 \$1.30 €3.90	11mm 7/16"	84g 5.6lb	Polyester Nylon	CE A NFPA	1.1	32 KM	
	EZ Bend 11	PMI		£3.30 \$4.00 \$1.25 €3.75	11mm 7/16"	80g 5.4lb	Nylon Nylon	CE A NFPA ANSI BERRY	0.9	16 KM	
	Extreme Pro	PMI		£3.30 \$4.00 \$1.25 €3.75	11mm 7/16"	100g 6.7lb	Polyester Nylon	ANSI NFPA		32 KM	■
	Patriot	PMI		£4.20 \$5.20 \$1.60 €4.85	11mm 7/16"	80g 5.4lb	Nylon Nylon	CE A NFPA ANSI BERRY	0.9	16 KM	-
	Isostatic 11.5	PMI		£4.00 \$4.50 \$1.40 €4.20	11.5mm 7/16"	96g 6.4lb	Polyester Polyester	ANSI NFPA		32 KM	-

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ARBORIST CLIMBING ROPES

SUITABLE FOR			MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION %	SHEATH %	OTHER COLOURS	NOTES	WWW.
EYE CAN THREAD THRU HARDWARE	HYBRID HARDWARE	SRT/SRS MRS/DdRT	MBL MINIMUM Break Load Spliced Sewn Knotted	ABL AVERAGE Break Load Spliced Sewn Knotted							
	■	■	39.1kN 8800lbf	-	-	-	1.6%	51%			notchequipment.com
■	-	■	37.1kN 8340lbf 28kN 6300lbf	-	-	-	2.1%	54%		Semi-reflective Gold fleck thread. Sherrill list this as a Sterling Rope	notchequipment.com
		■	29.8kN 6700lbf	-	-	-	1.6%	98%		*Not a conventional kernmantle but is unusual in being a 12-braid sheath over a parallel fibre core	notchequipment.com
■		■	35kN 7868lbf	-	-	-	3.4%	72%			notchequipment.com
-	■	■	23.86kN 5360lb 43.6kN 9801lbf	-	-	-	2.8%	-		'Response LSK' is a name used by two other companies. Also 11& 10.5mm see Rope Eqpt-BUYERSGUIDE	novabraid.com
-	-	■	31.1k 7000lbf 24kN 5400lbf	-	-	-	5%	-		*conflicting wt data on some sites & data sheets	pelicanrope.com
■	■	■	31kN 7000lbf 24kN 5400lbf	-	-	0	-	-			pelicanrope.com
■	■	■	-	28kN 6300lb	-	-	-	-			pelicanrope.com
-	-	■	32.4k 7150lbf 24kN 5400lbf	-	-	-	-	-			pelicanrope.com
■	■	■	30kN 6744lbf 15/15kN 3372/3372lbf	-	-	-	2.8%	55%		*Only available with eye	petzl.com
■	■	■	15/19kN 3372/4271lbf	-	-	-	3.1%	62%		*Only available with eye FF 0.3 Impact force 5.2kN. 8x FF1 falls	petzl.com
-	-	■	31.1kN 7000lbf	-	1.8%	1.6%	7.2% 3.4% 5.8%	49.7%			pmirope.com
-	■	■	32.7kN 7209lbf	-	3.2%	-	3.4-4.4% 1.6%	50.4%		Also solid blue and solid red (no fleck)	pmirope.com
-	■	■	42.9kN 9644lbf	-	2%	0	4.7% 1.3%	-		intertwined sheath & core	pmirope.com
-	■	■	32.7kN 7209lbf	-	3.2%	0.1%	3.9%	50.4%		variant of EZ Bend	pmirope.com
-	■	■	32.8kN 7388lbf	-	-	0	1.44-2.2% 1%	-			pmirope.com

is a proportion of shortest length x10% & rounded up. EASEofTYING: 1-10 from hardest to easiest SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE of TYING Sherrill Rating	SHEATH OUTER STRANDS	SPICEABLE PRE-SPLICED PRE-SEWN
	EZ Bend 12.5	PMI		£4.30 \$5.30 \$1.65 €5.00	12.5mm ½"	107g 12.74lb	Nylon Nylon	CE CI ANSI NFPA	-	16 KM	-
	Isostatic 13	PMI		£4.75 \$6.00 \$1.80 €5.55	13mm ½"	125g 8.4lb	Polyester Polyester	ANSI NFPA	-	32 KM	-
	Mercury CE	SAMSON ROPE		£3.00 \$3.75 \$1.15 €3.50	11mm ⅞"	89g 6lb	Polyester Nylon	CE A	8	32 KM	-
	V-24 Cool, Hot	SAMSON ROPE		£3.00 \$3.75 \$1.15 €3.50	11mm ⅞"	85g 5.9lb	Polyester Nylon	CE B	-	24 DB	■ ■
	Velocity Cool, Hot Velocity SD*	SAMSON ROPE		£3.20 \$3.95 \$1.20 €3.65	11mm ⅞"	83g 5.6lb	Polyester Nylon	CE A	10	24 DB	-
	Predator Predator-X	SAMSON ROPE		£3.40 \$4.25 \$1.35 €3.90	11mm ⅞"	83.5g 5.6lb	Polyester Nylon	-	-	24 DB	■ ■
	HyperStatic	SAMSON ROPE		£2.70 \$3.60 \$1.10 €3.30	11.3mm ⅞"	106g 7.1lb	Polyester Polyester	-	-	32 KM	-
	ArborMaster Wildcat, Supersonic	SAMSON ROPE		£2.85 \$3.60 \$1.10 €3.35	11.5mm ⅞"	94g 6.3lb	Polyester Nylon	-	-	16	■ ■
	HyperStatic	SAMSON ROPE		£2.90 \$3.65 \$1.15 €3.35	11.7mm 29/64"	106g 7.1lb	Polyester Polyester	-	-	32 KM	-
	Hyperclimb Hot, Cool	SAMSON ROPE		£2.70 \$3.30 \$1.00 €3.10	11.7mm 29/64"	97g 6.5lb	Polyester Polyester	-	-	24 DB	-
	Voyager Cool, Tangent Voyager SD*	SAMSON ROPE		£3.65 \$4.45 \$1.35 €4.00	11.8mm 15/32"	97g 6.5lb	Polyester Nylon	-	10	24 DB	■ ■
	ArborMaster Hawkeye, Big Foot, B/R/W, Blue Streak	SAMSON ROPE		£3.10 \$3.90 \$1.20 €3.30	12mm 15/32"	115g 7.7lb	Polyester Nylon	-	10	16	■ ■
	V-24 Cool, Hot	SAMSON ROPE		£3.25 \$4.05 \$1.30 €3.75	12mm 15/32"	100g 6.7lb	Polyester Nylon	CE A	-	24 DB	■ ■
	True... Blue, White	SAMSON ROPE		£2.65 \$3.30 \$1.00 €3.05	12mm 15/32"	131g 8.8lb	Polyester -	-	-	12	-
	Arbor-Plex Ascender	SAMSON ROPE		£2.10 \$2.55 \$0.80 €2.35	12mm 15/32"	101g 6.88lb	Polyprop/ Polyester -	-	-	12	-

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ARBORIST CLIMBING ROPES

SUITABLE FOR			MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION % @10% MBS @50-150 kg @300lb/136k @540 lb/245kg	SHEATH %	OTHER COLOURS	NOTES	WWW.
EYE CAN THREAD THRU HARDWARE	HYBRID HARDWARE	SRT/SRS MRS/DdRT	MBL MINIMUM Break Load Spliced Sewn Knotted	ABL AVERAGE Break Load Spliced Sewn Knotted							
-	-	■	-	-	-	-	-	-		Also in solid black	pmirope.com
-	-	■	45.9kN 10319lbf	-	-	0	1.44-2.2% 1.2%	-			pmirope.com
-	■	■	38.25kN 8600lbf	-	-	-	3.7%	-		Heat stabilised nylon core	samsonrope.com
-	■	■	28kN 6294lb	-	-	-	2.9%	-		CE=Unspliced only	samsonrope.com
-	■	■	-	33kN 7400lb 27kN 6000lb	-	-	3%	-		*with DRY treatment to restrict water uptake.	samsonrope.com
-	■	■	-	27kN 6000lb	-	-	2.1%	-			samsonrope.com
-	■	■	28.5kN 6400lb	-	-	-	1.2%	-		Very tough, low stretch rope more suited for rescue or ziplines	samsonrope.com
-	■	■	-	34kN 7500lbf 22.2kN 5000lbf	-	-	3%	-			samsonrope.com
-	■	■	-	30.25kN 6800lb	-	-	1.2%	-		Very tough, low stretch rope more suited for rescue or ziplines	samsonrope.com
-	■	■	32kN 7193lbf	28.9kN 6500lbf	-	-	1.6% 1.3%	50%		Sold by Bartlett as the green Antidote.	samsonrope.com
■	■	■	43kN 9667lbf	41.8kN 9400lbf 36kN 8000lbf	-	*	3% 1.99%	50%		Sold by Bartlett as the green BioHazard. *with DRY treatment to restrict water uptake	samsonrope.com
-	-	■	36kN 8093lbf	29kN 6500lbf	-	-	3%	-		*there is a slight difference between kg/lb and KN/lbf	samsonrope.com
-	■	■	32kN 7193lbf	-	-	-	2.9%	-		CE=Unspliced only *there is a slight difference between kg/lb and KN/lbf	samsonrope.com
-	-	■	32.5kN 7306lbf	-	-	-	2.6%	-			samsonrope.com
-	-	■	32kN 7100lbf	-	-	-	3%	-		Ascender has 50% green fleck \$1/ft	samsonrope.com

is a proportion of shortest length x10% & rounded up. **EASEofTYING:** 1-10 from hardest to easiest SHEATH: DB=Double Braid, KM=KernMantle











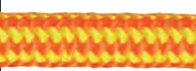



Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE of TYING Sherrill Rating	SHEATH OUTER STRANDS	SPLICABLE PRE-SEWN PRE-SEWN
	Ascender	SAMSON ROPE		£2.65 \$3.30 \$1.00 €3.05	12mm 1/2"	109g 7.3lb	Polyester Nylon	-	10	16	
	Arborfreak	SAMSON ROPE		£3.00 \$3.70 \$1.13 €3.40	12mm 1/2"	115g 7.7lb	Polyprop/ Polyester Nylon	-	-	16	
	Hyperstatic	SAMSON ROPE		£4.00 \$5.00 \$1.54 €4.60	12.5mm 1/2"	121g 8.1lb	Polyester Polyester	-	-	32 KM	-
	Vortex Vortex SD*	SAMSON ROPE		£3.40 \$4.25 \$1.30 €3.90	12.7mm 1/2"	113g 7.6lb 7.9lb	Polyester Nylon	-	10	24 DB	
	V-16 Hot,Cool	SAMSON ROPE		£3.40 \$4.25 \$1.30 €3.90	12.8mm 1/2"	110g 7.4lb	Polyester Nylon	CE A	-	16	-
	V-24 Cool, Hot	SAMSON ROPE		n/a	13mm 1/2"	112g 7.5lb	Polyester Nylon	CE A	-	24 DB	
	PREDATOR PREDATOR-X	SAMSON ROPE		n/a	13mm 1/2"	119g 8lb	Polyester Nylon	-	-	24 DB	
	IVY Silver Ivy, Tango Ivy, Midnight Ivy	SAMSON ROPE SHERRILL TREE		£3.05 \$3.80 \$1.15 €3.50	11.7mm 1/2"	102g 6.8lb	Polyester Polyester	-	10	24 DB	
	Tilia	SINGING ROCK		£4.00 \$4.40 \$1.35 €3.95	11.5mm 7/16"	90g 6lb	Polyester Nylon	CE A UIAA	-	KM	
	Cougar LSK	SOUTHERN ROPES		£1.55 \$2.00 \$0.60 €1.80	11.7mm 29/64"	93g 6.25lb	Polyester Polyester	CE A ANSI	10	24 DB	
	HTP addiction	STERLING		£4.00 \$4.75 \$1.45 €4.60	11mm 7/16"	97g 6.5lb	Polyester Polyester	ANSI NFPA	8	32 KM	
	Work Pro	STERLING		£3.90 \$4.60 \$1.45 €4.50	11mm 7/16"	83.5g 5.6lb	Polyester Nylon	CE A ANSI NFPA	8	KM	-
	TriTech	STERLING		£11.00 \$13.10 \$4.00 €12.00	11mm 7/16"	96g* 6.5lb	Technora/ Spectra Nylon	CE A ANSI NFPA	-	KM	
	Scion Arbor	STERLING		£3.60 \$4.75 \$1.45 €4.50	11.5mm 7/16"	91g 6.2lb	Polyester Nylon	CE A ANSI	10	24 DB	
	Work Pro	STERLING		£4.40 \$5.40* \$1.65* €5.10	12.5mm 1/2"	110g 7.4lb	Polyester Nylon	CE A ANSI NFPA	7	KM	-
	HTP	STERLING		£4.95 \$6.10* \$1.90* €5.75	12.5mm 1/2"	119g 8lb	Polyester Polyester	ANSI NFPA	-	32 KM	

NOTES: COST: excludes eyes unless specified in NOTES. INCLUDES local taxes/VAT, Some are not sold by m/ft, price shown is a propo


ARBORIST CLIMBING ROPES

SUITABLE FOR			MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION %	SHEATH %	OTHER COLOURS	NOTES	WWW.
EYE CAN THREAD THRU HARDWARE	HYBRID HARDWARE	SRT/SRS MRS/DOBT	MBL MINIMUM Break Load Spliced Sewn Knotted	ABL AVERAGE Break Load Spliced Sewn Knotted							
-	-	■ ■	-	29kN 6800lbf	-	-	2.1%	-			samsonrope.com
-	-	■	36kN 8093lbf	-	-	-	3%	-		NEW rope design	samsonrope.com
-	■	■	32kN 7200lbf	-	-	-	-	-			samsonrope.com
-	-	■ ■	46kN 10341lbf	36kN 8000lbf	-	-	3%	-		*with DRY treatment to restrict water uptake	samsonrope.com
-	■	■ ■	36kN 8093lbf	-	-	-	3%	-			samsonrope.com
-	■	■	-	33kN 7418lbf	-	-	2.9%	-		CE=Unspliced only	samsonrope.com
-	■	■	-	36.5kN 8200lbf	-	-	2.1%	-			samsonrope.com
-	-	■ ■	29kN 6520lbf	-	-	-	1.3%	-			samsonrope.com sherrilltree.com
■	■	■ ■	30kN 6744lbf 18/15kN 4047/3372lbf	-	1%	0.5%	3%	-			singingrock.com
■	■	■	28kN 6300lbf	-	1.5%	0	<3.0%	-		See also ROPE EQPT BUYERS GUIDE for Response LSK ropes	southernropes.com
-	■	■	30.5kN 6856b	-	-	-	3.4% 1.9%	-		Also available in White with black fleck. Addition=special colour	sterlingrope.com
-	-	■ ■	36kN 8092lbf	-	-	0.9%	3.6%	-			sterlingrope.com
-	-	■	37kN 8140lbf 24.1kN 5418lb	-	-	0.9%	2.8% 1.9%	-		cut-resistant twin sheath for lanyard climbing/flip-lines rather than full length climbing rope. *approx	sterlingrope.com
■	■	■ ■	30kN 6744lbf 25.5kN 5732lbf	-	3.8%	0.3%	3.8% 1.5% 4%	-			sterlingrope.com
-	■	■ ■	45kN 10116lbf	-	-	-	2.2%	-		*white rope= less 8%	sterlingrope.com
-	-	■	40.4kN 9081lb	-	-	-	2.6% 1.1%	-		*white rope= less 8%	sterlingrope.com

tion of shortest length x10% & rounded up. EASEofTYING: 1-10 from hardest to easiest SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE of TYING Sherrill Rating	SHEATH OUTER STRANDS	SPICEABLE PRE-SPICED PRE-SEWN
	Tech HTP 11	STERLING		£8.50 \$10.00 \$3.30 €9.85	11mm 7/16"	88g 5.9lb	Technora Nylon	CE A NFPA	-	32 KM	-
	Scion Arbor	STERLING		£4.20 \$5.30 \$1.60 €4.90	12.5mm 1/2"	107g 7.2lb	Polyester Nylon	CE A ANSI	10	24 DB	■ ■
	ACR-24 Acuda, Mantra, Outback	STEIN		£4.10 \$5.50 \$1.70 €5.00	11.7mm 29/64"	98g 6.6lb	Polyester Nylon	CE A	-	24 DB	■ ■
	ACR-16 Scorpius, Utility	STEIN		£4.10 \$5.50 \$1.70 €5.00	12.4mm 1/2"	98g* 6.6lb	Polyester Polyester	CE A	-	16 KM	■ ■
	Timber Evo	TENDON (LANEX)		£2.70 \$3.60 \$1.15 €3.20	11mm 7/16"	88g 5.9lb	Polyester Nylon	CE A	-	24 DB	■ ■
	Timber Evo	TENDON (LANEX)		£2.80 \$3.55 \$1.10 €3.25	11.5mm 7/16"	90g 6lb	Polyester Nylon	CE A	-	24 DB	■ ■
	Timber Evo	TENDON (LANEX)		£3.80 \$4.85 \$1.50 €4.40	12.5mm 1/2"	104g 7 lb	Polyester Nylon	CE A	-	24 DB	■


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SUITABLE FOR		MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION %	SHEATH %	OTHER COLOURS	NOTES	WWW.
EYE CAN THREAD THRU HARDWARE	HYBRID HARDWARE	MBL MINIMUM Break Load	ABL AVERAGE Break Load							
-	■	40.1kN 9014lbf	-	-	-	3.6%	-		Cut & heat resistant	sterlingrope.com
■	■	32kN 7193lbf 27.2kN 5732lbf	-	-	0.5%	4.2% 1.7%	-		Element=DISCONTINUED	sterlingrope.com
■	■	>22kN 4946lbf 15/15kN 3372/3372lbf	-	-	-	-	-		MBL Sewn= 15kN 3372lbf	steinworldwide.com
■	-	25kN 5620lbf 15/15kN 3372/3372lbf	-	-	-	-	-		* 12.4mm 16 braid =same wt as 11.7mm 24DB MBL Sewn= 15kN 3372lbf	steinworldwide.com
-	-	30kN 6744lbf	18kN 4047lbf	0.7%	0	3.1%	57%		Embedded RFID chip	mytendon.com
-	■	30kN 6744lbf	18kN 4047lbf	1%	-	3%	54%		Evo replaced the original 'Timber green' Embedded RFID chip	mytendon.com
-	-	39kN 8598lbf	22kN 4946lbf	0.6%	0	3%	48%		Embedded RFID chip	mytendon.com





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Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE OF TYING Sherrill Rating	SHEATH OUTER STRANDS	SPICEABLE PRE-SPICED PRE-SEWN
	KMIII KMII Max	TEUFELBERGER /MAXIM		£3.10 \$3.70 \$1.25* €3.50	10.5mm 13/32"	84g 5.65lb	Polyester Nylon	CE A NFPA	7	32 KM	
	Platinum Arbor Access	TEUFELBERGER		£4.25 \$5.40 \$1.65 €5.00	10.5mm 13/32"	78g 5.2lb	Polyester Nylon	CE A	0.80	32 KM	■
	Chameleon	TEUFELBERGER		£2.40 \$3.20 \$1.00 €2.80	10.5mm 13/32"	72g 4.84lb	Nylon Nylon	CE A		32 KM	-
	Chameleon	TEUFELBERGER		£2.60 \$3.40 \$1.10 €3.10	11mm 7/16"	75g 5.04lb	Nylon Nylon	CE A		32 KM	-
	Patron Tree Access	TEUFELBERGER		£2.65 \$3.40 \$1.10 €3.00	11mm 7/16"	75g 5.04lb	Nylon Nylon	CE A	0.51	32 KM	
	KMIII KMII Max	TEUFELBERGER /MAXIM		£3.55 \$4.45 \$1.35* €4.10	11mm 7/16"	91g 6.12lb	Polyester Nylon	CE A NFPA		32 KM	
	Fly Firefly, Dragonfly	TEUFELBERGER		£5.20 \$5.30 \$1.60 €6.00	11.1mm 7/16"	87g 5.9lb	Polyester Nylon	CE A ANSI	0.5 10	24 KM	■ ■
	Tachyon Ash, Lava Surge,	TEUFELBERGER		£3.45 \$4.45 \$1.35 €5.80	11.5mm	94g 6.3lb	Polyester Nylon/ Polyester	CE A ANSI	0.64 10	24 DB	■ ■
	Xstatic	TEUFELBERGER		£3.80 \$4.90 \$1.50 €4.50	11.7mm 29/64"	105.6g 7.1lb	Polyester Nylon	CE A ANSI	6	32 KM	■
	drenaLINE*	TEUFELBERGER		£3.30 \$4.05 \$1.25 €4.27	11.8mm 15/32"	96.5g 6.5lb	Polyester Nylon	CE A ANSI	0.8 7	32 KM	■
	Arbor Elite	TEUFELBERGER		£3.90 \$5.00 \$1.55 €4.55	12.7mm 1/2"	105.6g 7.1lb	Polyester Nylon	CE A	0.56	16	-
	Braided Safety Blue Ultra Vee, Hi Vee, T-Vee, White	TEUFELBERGER		£4.35 \$5.80 \$1.80 €5.30	12.7mm 1/2"	105.6g 7.1lb	Polyester Nylon	ANSI	0.56 10	16	■
	KMIII KMII Max	TEUFELBERGER /MAXIM		£4.50 \$5.55 \$1.75* €5.10	12.7/13mm 1/2"	117.5g 7.9lb	Polyester Nylon	CE A NFPA	-	32 KM	-
	Nebula/ Liana	TREEHOG BY ARBORTEC		£5.05 \$6.40 \$1.95 €5.90	11.8mm 15/32"	96.5g 6.5lb	Polyester Nylon	CE A	0.8 7	32 KM	■
	Static Climbing	TREERUNNER (GRUBE)		£3.00 \$4.00 \$1.25 €3.40	11mm 7/16"	80g 5.4lb	Polyester Nylon	CE A	-	32 KM	-

NOTES: **COST:** excludes eyes unless specified in NOTES. **INCLUDES** local taxes/VAT, Some are not sold by m/ft, price shown is a propo

ARBORIST CLIMBING ROPES

SUITABLE FOR			MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION % @10% MBS @50-150 kg @300Lb/136K @540 lb/245kg	SHEATH %	OTHER COLOURS	NOTES	WWW.
EYE/CAN/THREAD THRU HARDWARE	HYBRID HARDWARE	SRT/SRS MRS/DRRT	MBL MINIMUM Break Load Spliced Sewn Knotted	ABL AVERAGE Break Load Spliced Sewn Knotted							
-	-	■	32.1kN 7215lbf	-	<5%	-	1.6% 1.4%	48%		KMIII Max has tighter, low friction sheath for improved descent. *White=\$1.15/ft	teufelberger.com
-	■	■	28kN 6290lbf 23/15kN 5170/3372lbf	-	<5%	0	2%	-		intertwined sheath & core. 'Escalator'=discontinued	teufelberger.com
-	-	■	32kN 7190lbf 18/26kN 4047/5845lbf	-	4%	-	3%	46%		Same colours for both rope diameters. Ropes use recycled unused rope	teufelberger.com
-	-	■	33kN 7415lbf 18/27kN 4047/6069lbf	-	4%	-	3%	35%		Same colours for both rope diameters. Ropes use recycled unused rope	teufelberger.com
-	-	■	32kN 7300lbf 18/27kN 4047/6069lbf	-	<5%	-	3%	-			teufelberger.com
-	-	■	33.3kN 7485lbf 30.85kN 6935lbf	-	<5%	-	1.8% 2.2%	45%		KMIII Max has tighter, low friction sheath for improved descent. *White=\$1.30/ft	teufelberger.com
■	■	■	26.8kN 6035lbf 15/15kN 3370/3372lbf	-	<5%	-	1.6% 3%	57%			teufelberger.com
-	■	■	24.45kN 5497lbf 21.85/24kN 4912/5395lbf	-	0.3%	-	2.2%	58%		Double Braid rope. Soft handling.	teufelberger.com
■	■	■	32kN 7194lbf 17kN 3820lbf	-	<5%	-	1.4% 1.5%	54%			teufelberger.com
■	■	■	35kN 7868lbf 18/16.5kN 4047/3709lbf	-	<5%	-	2.3% 2.3%	58%		*+Limited edition colours & some unique to stockists: 'Pink', 'Red', 'Jungle' & 'HBROS' & 'CHARITY-LINE' (€4.50/m)	teufelberger.com
-	-	■	25.8kN 5800lbf 23.5/24kN 5290/5400lbf	-	-	-	3%	79%			teufelberger.com
-	-	■	25.8kN 5800lb 23.5kN 5290lbf	-	<5%	-	3%	82%		Blue core shows through when sheath is abraded	teufelberger.com
-	-	■	43.4kN 9730lbf 36.8kN 8265lbf	-	<5%	-	1.8% 1.4%	47%		KMIII Max has tighter, low friction sheath for improved descent. *White=\$1.50/ft	teufelberger.com
■	■	■	35kN 7868lbf 18/16.5kN 4047/3709lbf	-	<5%	-	2.3% 2.3%	58%			treehog.com
-	■	■	39kN 8767lbf	-	-	-	2.8%	-			grube.de

tion of shortest length x10% & rounded up. EASEoFTYING: 1-10 from hardest to easiest SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	Ø mm Inches"	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	STANDARDS	EASE of TYING Sherrill Rating	SHEATH OUTER STRANDS	SPICEABLE PRE-SEWN
	SafeVision	TREERUNNER (GRUBE)		£3.90 \$4.45 \$1.35 €4.15	11.8mm 15/32"	82g 5.5lb	Polyester Nylon	CE A	0.6	24 DB	■
	Picus	TREERUNNER (GRUBE)		£3.60 \$5.00 \$1.55 €4.45	11.8mm 15/32"	96.5g 6.5lb	Polyester Nylon	CE A	0.8	32 KM	■
	Static Climbing	TREERUNNER (GRUBE)		£3.00 \$3.75 \$1.20 €3.40	12mm 1/2"	80g 5.4lb	Polyester Nylon	CE A		32 KM	-
	Climbing	TREERUNNER (GRUBE)		£4.25 \$5.40 \$1.70 €4.85	12mm 1/2"	117g 7.8lb	Polyester Nylon	CE A		24 DB	■
	XTC-48 R.I.N.G.	YALE CORDAGE		£14.00 \$16.00 \$5.00 €15.00	10.5mm 13/32"	92.5g 6.2lb	Polyester/ Technora Nylon	ANSI		48 DB	■
	XTC-24-CE Blaze, Bandit	YALE CORDAGE		£4.50 \$3.50 \$1.10 €5.20	11mm 7/16"	89g 6lb	Polyester Nylon	CE B ANSI	10	24 DB	■ ■
	XTC-48 Kernmaster Phantom x2, Explore, Scandere x3, Kernmaster Code x2	YALE CORDAGE		£4.40 \$4.20 \$1.30 €5.10	11mm 7/16"	82/97g 5.5/6.5lb	Polyester Nylon	ANSI		48 KM	■ ■
	XTC-48 BiFrost	YALE CORDAGE		£3.10 \$3.85 \$1.20 €3.55	11mm 7/16"	90g 6.1lb	Polyester Polyester	ANSI		48 KM	■
	XTC-48 R.I.N.G.	YALE CORDAGE		£15.00 \$18.50 \$6.00 €17.00	11.5mm 7/16"	92.5g 6.2lb	Polyester/ Technora Nylon	ANSI		48 DB	■
	XTC-24 Xylem, ArborMax Gator/Flame	YALE CORDAGE		£4.65 \$4.10 \$1.25 €4.60	11.7mm 29/64"	97g 6.5lb	Polyester Polyester	ANSI	10	24 DB	■ ■
	XTC-24 Blue Moon, Focus, Prism, Arrow Frog,	YALE CORDAGE		£4.65 \$4.10 \$1.25 €4.60	11.7mm 29/64"	97g 6.5lb	Polyester Polyester	ANSI	10	24 DB	■ ■
	XTC-24-CE Sunburst, BlueTongue, Calamine, Energize	YALE CORDAGE		£4.65 \$4.10 \$1.25 €4.60	11.7mm 29/64"	97g 6.5lb	Polyester Nylon	CE A ANSI	10	24 DB	■ ■
	XTC-24-CE Imori	YALE CORDAGE		£3.10 \$3.90 \$1.20 €4.00	12mm 1/2"	105g 7lb	Polyester Nylon	CE A ANSI		24 DB	■ ■
	XTC-48 Kernmaster Phantom x2, Explore, Scandere x3, Kernmaster Code x2	YALE CORDAGE		£4.50 \$4.50 \$1.40 €5.20	13mm 1/2"	113g 7.6lb	Polyester Nylon	CE A ANSI		48 KM	■ ■
	XTC-16 Fire, Spearmint, Plus Poseidon, Salamander	YALE CORDAGE		£3.00 \$3.75 \$1.15 €4.05	13mm 1/2"	112g 7.5lb	Polyester Nylon	CE A ANSI	10	16	■ ■
	XTC-12 Buzzzline	YALE CORDAGE		£2.10 \$2.60 \$0.80 €2.40	13mm 1/2"	100g 6.7lb 123g 8lb	Polyester	CE B ANSI	8	12	■

NOTES: **COST:** excludes eyes unless specified in NOTES. **INCLUDES** local taxes/VAT, Some are not sold by m/ft, price shown is a proposal

ARBORIST CLIMBING ROPES

SUITABLE FOR			MINIMUM BREAKING LOAD/STRENGTH		SHRINKAGE %	SHEATH SLIPPAGE (MILKING) %	ELONGATION %	SHEATH %	OTHER COLOURS	NOTES	WWW.
THRILL HARDWARE	HYBRID HARDWARE	SRT/SRS MRS/DdRT	MBL MINIMUM Break Load Spliced Sewn Knotted	ABL AVERAGE Break Load Spliced Sewn Knotted							
-	■	■	37kN 8318lbf 22kN 4946lbf		2.5%		2.5%	54%			grube.de
■	■	■	35kN 7868lbf 18/16.5kN 4047/3709lbf		<5%		2.3% 2.3%	58%			grube.de
-	■	■	39kN 8767lbf				2.8%				grube.de
■	■	■	34.5kN 7755lbf				2%			Tornado discontinued	grube.de
-	■	■	30kN 6730lbf				2.4%			Red inner braid highlights wear through the outer sheath	yalecordage.com
-	■	■		25kN 5600lbf			2.2%			CE = slightly more elongation than ANSI so better suited to MRS than SRS	yalecordage.com
-	■	■		31.6kN 7104lbf			3%			Scandere uses higher tenacity sheath	yalecordage.com
-	■	■		30kN 6760lbf			1.5%				yalecordage.com
-	■	■		30kN 6730lbf			2.4%			Red inner braid highlights wear through the outer sheath	yalecordage.com
-	■	■		29.5kN 6600lbf	-	0	1.4%	-		ANSI versions of XTC. Xylem for Pacific NW region. Arbormax Gator/Flame unique to Baileys.	yalecordage.com
-	■	■		29.5kN 6600lbf	-	0	1.4%	-		ANSI versions of XTC. Arbormax Gator/Flame unique to Baileys.	yalecordage.com
-	■	■		29.5kN 6600lbf	-		1.4%	-		CE version of XTC Hedera, Poison Ivy, Poison Hivy, Neon Ivy discontinued	yalecordage.com
-	■	■		28kN 6200lbf			2%			CE =slightly more elongation than ANSI . Texturised surface makes rope feel larger	yalecordage.com
■	-	■	36kN 7920lbf	40kN 8800lbf			3%			Scandere uses higher tenacity sheath	yalecordage.com
-	-	■		28kN 6200lbf			1.4%			Fire, Posoidon & Salamander around 10% dearer eg.€4.40	yalecordage.com
-	-	■		26.7kN 6000lbf 33kN 7400lbf			1.5%			Single (hollow) braid with no core	yalecordage.com

tion of shortest length x10% & rounded up. EASEoFTYING: 1-10 from hardest to easiest SHEATH: DB=Double Braid, KM=KernMantle

UPDATED April '24

ARBORIST 12-18mm 1/2-3/4" Braided/MultiPlait

RIGGING/ LOWERING ROPES

NB: PRICES BEING UPDATED Q2 '24

Also known as Bull ropes. We haven't included traditional 3-strand laid ropes - there are just too many and they do not have the same strength, handling and durability of a braided or even multiplait rope but they are a lot cheaper due to simpler construction and lack of colour options. We have a separate guide to high tenacity winch lines which are super-static, many of which can be used for general rigging. We have tried to include entire size ranges of the 'coloured' ropes where possible which might be 5 or even 6 sizes in some cases. Where the number of sizes offered is much larger, which is often the case with the simpler, cheaper white and solid colour multi-plaits, we have limited entries to a maximum of four mid-range ropes that are the 4 commonest sizes offered by European manufacturers:

12mm, 14mm 16mm and 18mm 1/2", 5/16" 5/8" and 3/4"

this gives a reasonable comparison across all brands but we have also included a column to indicate the number and range of other ropes in each series or family of ropes.

Lowering rope or Bull rope is often distinguished from rigging ropes in the USA but are interchangeable terms in other countries so we have differentiated between three distinct 'rigging' activities in the tables. General '**rigging**' and '**static lowering**' require pretty much the same characteristics - low stretch and robust sheath whereas '**impact lowering**' where the rope arrests a free-falling load, requires a greater degree of dynamic absorbency which can be achieved by the rope's own construction being more elastic or by judicious use of dynamic shock absorbency at the impact block and basal lowering devices - usually requiring a skilled ground crew:

- **CLIMBING** Some ropes can be used for both climbing and rigging and/or impact lowering **BUT only use for one or the other**, once a rope has been used for rigging and/or impact lowering it **SHOULD NOT BE USED** for CLIMBING. We have only listed climbing as a use if it is specifically listed as such by the manufacturer. Most rigging ropes are NOT PPE (for climbing).

- **STATIC RIGGING** 1) **ZIPLINES/Speedlines** very low stretch, where the branches and wood needs to be moved to a precise location away from the tree usually because of an obstruction or structure below or to make onward removal easier. **Most winch lines in our separate guide suit static rigging tasks.**

- 2) **Restraint or directional CONTROL** lines where no impact force is applied and low stretch is again an advantage because you are trying to stop the tree falling in a certain direction.

- **LOWERING** lowering of a static load where no impact force has been applied and in technical rope terms a fall factor 0 has been applied eg. the rope is rigged **and tensioned** above the load so that it only has to contend with stretch caused by the load itself, not shock or impact force of an arrested falling load. Lowering can impart high frictional loading around branches if cambium/friction savers are not used.

All three of these activities often utilise technical hardware which the gnarlier ropes don't run so smoothly through hence a circle for 'OK but not ideal' in some 'Rigging' columns in the tables.

- **IMPACT LOWERING /NEGATIVE RIGGING** where larger diameter

- rope (usually >16mm 5/8" rope)

is initially used as a fall arrest rope because the arrest point is below the cut rather than above it, typically when **sectioning down larger timber. The rope will be subjected to a shock load** as it arrests the weight of the falling timber. The amount of **shock imparted on the rope is determined by the length of rope available to arrest the falling section and the type of deviation hardware.** In climbing this is known as a fall factor

and is given as a fraction of 0, or between 0 and 2 where Fall Factor 2 is the worst case scenario and the highest figure you can 'achieve'. FFO is the usual situation in limb removal where the rope is anchored (or more usually deviated) above the limb and slack taken in so that when you cut the limb it doesn't actually 'fall' anywhere as much as 'stretch away' from the cut. It is always preferable to minimise the impact force, ie. make sure there is virtually no slack between the snatch block and the load but this is much more difficult when sectioning a trunk with no high directional anchor. Instead, the rope (if one is used at all) has to be anchored or deviated beneath the cut. In which case the section will fall a certain distance before being arrested and this will impart shock load. However, since most rigging has the section deviated through an impact or snatch block below the cut and controlled from ground level there is plenty of rope to help absorb the shock. The ground crew can also impart more absorbency by allowing a small amount of run (through gloved hands) before halting the fall of the load ie. dynamic braking.

Lowering ropes are often the poor relation to climbing ropes because they're generally less technical in construction and cheaper. But in fact many arb climbing ropes can be classed as 'utility' or multi-use and may be used as rigging OR climbing ropes, the *Beal Bonsai* and *All Gear's Forestry Pro* for instance. However, **the same rope should NEVER be used for both activities interchangeably.** Don't forget that virtually ALL static abseil ropes whether or not they are marketed to arborists will perform all rigging and static lowering jobs adequately but they will NOT take kindly to impact lowering where a degree of dynamic absorbency is preferable.

Many arborists will rightly treat their arb climbing rope like a fine piece of art taking ridiculous amounts of time to choose it, studying all the data and spec and other peoples reviews



until eventually buying some garishly coloured or conversely ultra camouflaged beauty that replaces your loved one on the comfy chair in front of the TV. But when it comes to rigging and lowering ropes it sometimes seems that any old rubbish will do, got an old climbing rope that you're not using anymore, excellent, I'll have that for lowering and rigging. But hold on there, if you're not happy that it's safe enough to climb on why would it be good enough for rigging? - the loads are much higher, the rope is working much harder and moving around and through tight jams a lot more and it gets thrown in the back of the truck with the wood chips and chainsaws while the pristine looking climbing rope sits up front and gets taken indoors to spend quality time with the family. It's not right is it.

Without wishing to bleat on too much, Dynamic or impact loading is the key thing to consider with rigging or lowering rope. Whenever you apply any load the rope will stretch to some degree and your rope remembers what you've done to it. Cast your mind back to when you first bought those chewing gum grey coloured underpants - they were firm and tight weren't they.

Now after a year or seven of use they're so loose you need a belt to keep them up unless, like me you've expanded your stomach to accommodate the slackening of elastic. Your rope is broadly similar, its elasticity will reduce with age and over-use so that at some point you'll drop a section of timber on it and it will simply snap. Don't forget that ALL loading will stretch the rope fibres. If your rope is more static in construction (more parallel fibres) it will be even less receptive to shock loading and may fail earlier than the equivalent cabled (spiraled) construction.

ELONGATION. Is measured differently in Europe to North America but we have tried to be consistent with elongation at 10% of MBL where possible. Otherwise it is difficult to compare. If the rope is too elastic, your load would hit the ground before its fall is arrested. Not elastic enough and it may simply snap. This useful description (box above) from *Yale Cordage* should make your brain hurt but set you on the right track. For lowering and rigging tasks like ziplines, if you exclude the ultra low-stretch Dyneema etc. winch ropes (covered in a later guide) the toughest ropes are often the biggest ropes and by biggest we mean fat. But it's not quite as simple as choosing a rope thick enough to moor the *Titanic* just because it's going to last the longest. You've got to be able to afford to buy it, have a truck big enough to carry it and the manpower at the job site

Example 1 – We will use 5/8 diameter Yale Double Esterlon line rigged into a tree with a block in such a way that 25 ft. of line is required to arrest a 500 lb section of trunk falling 5 ft. From the Double Esterlon specification table and energy graph we will need its weight of 13.7 lbs/100 ft or .137 lbs/ft, its green working energy absorption maximum of 544 ft lb per lb of rope in use, and its maximum recommended working load of 3,400 lbs. First, we calculate the ft lbs of energy needed to arrest the 500 lb trunk section falling 5 ft. The simple equation of the weight multiplied by the fall will get the result within 1%, so.....

- 500 lb x 5 ft = 2,500 ft lbs.

Next, we calculate the lines energy absorption capacity for a 25 foot length

- 25 ft x 544 ft/lb x .137 lb/ft = 1863 ft lbs.

From these two calculations we can see that in this scenario the maximum recommended energy absorption is exceeded by 637 ft lbs or 34% (2500 ft lbs / 1863 ft lbs). We can also estimate the load reached in the line multiplying the maximum recommended working load by 1.34% or

- 3400 x 1.34 = 4,556 lbs.

To illustrate the importance of energy capacity of ropes we will take a look at using a high energy absorption line.

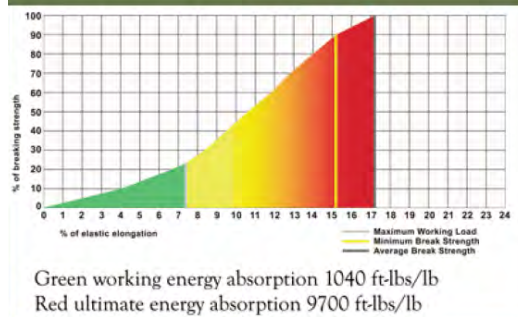
Example 2 – We will substitute a 5/8 diameter Yale Polydyne. Same diameter, but very different energy capacity. Doing the same calculations with Polydyne's physicals we get the following:

- 500 lb x 5 ft. = 2,500 ft lbs, required

- 25 ft x 1040 ft/lb x .133 lb/ft = 3,458 ft lbs. capacity

In this case, we have reserve energy absorbing capacity of 958 ft lbs and the peak load in the line is estimated at:

- (2500/3458) x 3600 lbs = 2,602 lbs.



The more area in the stress strain graphs (green working and red ultimate) the higher the ropes ability to absorb dynamic loads.

RIGGING ROPES

strong enough to move it to the tree. And then you've actually got to get it up the tree and weave it around all those fiddly crotches, pulleys and lowering devices. So maybe you're better off compromising some strength and girth for weight and flexibility. And if you're out of cash perhaps you will use that old climbing rope as a lowering rope after all but be really, really careful about how you use it and what size wood you load it with. Whatever else you skimp on, including the kid's education, don't skimp on that lowering rope. If it fails when you drop a big lump on it or are zip- lining a section over that conservatory you can kiss your insurance no-claims record and your reputation goodbye. And if you're really unlucky you may also need to deal with an injured colleague, customer, or worst still the customer's prize chihuahua. See, not worth skimping is it?

ROPE DIAMETER: Climbing ropes tend to be quite restrictive in range of diameters in order to facilitate easy handling and operation through dedicated pulleys and hardware. Around 11, 12 or 13mm (7/16"-1/2"). Rigging rope on the other hand can be anything from 5mm 3/16" to 64+mm 2 1/2". Most arborists choose a general rigging rope of moderate diameter - 12, 13 or 14mm (1/2"-9/16") and a 'biggun' they bring out for heavy jobs of around 18/19mm to 25mm (3/4"-1") give or take

a few mil or eighths. There is rigging and lowering hardware that is diameter- specific like snatch/Impact blocks/pulleys and Portawrap style lowering devices but they are far more forgiving of varying diameters than some of the technical climbing hardware. As for the true diameter of your rope, if there were some discrepancies between the manufacturers' description and what your ruler or calipers measures for climbing ropes, imagine what differences there will be in ropes ranging from 5mm to 64mm in diameter! Suffice to say that we can only quote the dimensions we're given but expect to find some half inch ropes (12.7mm) that are closer to 5/16" or even 5/8" (14 or 15mm) and expect this to enlarge over the age of the rope except for sections of rope that have been stretched to death. If your rope has sections that are thinner than when you bought it think about getting that moth-infested wallet out again.

MATERIALS for rigging ropes follow pretty much the same pattern as they do for climbing ropes with polyester as the dominant material. Polyester can withstand more abuse than nylon, resists acid better, has a slightly higher melting point (around 480° F or 249°C) and retains more strength when wet. Polyester dominates rigging ropes even though nylon has greater elasticity for the shock absorbency necessary for what we have called Impact lowering. **TREATED FIBRES** crops up with many of these ropes, normally as a surface



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coating that improves abrasion resistance (Marlow quote $\leq 30\%$ improvement) and water resistance. Most indicate that they will last the lifetime of your rope but don't hold your breath. Modern treatments are far superior to the coatings we had in the early days but anything that gets abraded for a living is going to wear off sooner or later.

HMPE (AKA UHMWPE & HPPE) crops up as a core material - it stands for High Modulus Polyethylene and is a super-strong, super static material (like Dyneema) that we see most in winch line. There are several other dual constructions generally with a polyester sheath and a nylon core to give an abrasion resistant outer and a more elastic core.

MBL is Minimum Breaking Load (or MBS -Minimum Breaking Strength). For lowering ropes that are going to be subjected to shock loading, the units of force KiloNewtons (roughly 1kN to 100kg and LB-Force (same as LBs) are more appropriate but for ease of calculations you can still simply think of them in terms of kg or lbs of mass. Working Load Limit (WLL) is a more appropriate figure for lowering ropes than it is for climbing rope which should only ever be carrying a single bodyweight and associated equipment. Rigging and lowering ropes in contrast may be carrying anything from a light branch to a half ton section of timber (or more!) and when you also factor in impact force there is good reason to have a figure for the maximum (static) weight that can be put on the rope. This figure will be a percentage of the Minimum Breaking Load and this varies with industry and manufacturer. It is usually a ratio between 5 and-12:1 for industrial applications or between 10:1 and 15:1 for life support applications. The tree industry seems to have settled on around 7:1 for non-life support activities. We have given the companies' quoted **WLL** if it's available or 7:1 if one is not quoted but if in doubt - simply apply your company's own required safety ratio to the MBL (not to the ABL or Average which is often an artificially higher figure) and remember that for dynamic or impact loads you will need to do some more complex calculations as we discussed earlier to determine whether your rope will actually be able to take the load your putting on it. Static load is radically different to the peak load caused when arresting a falling load.

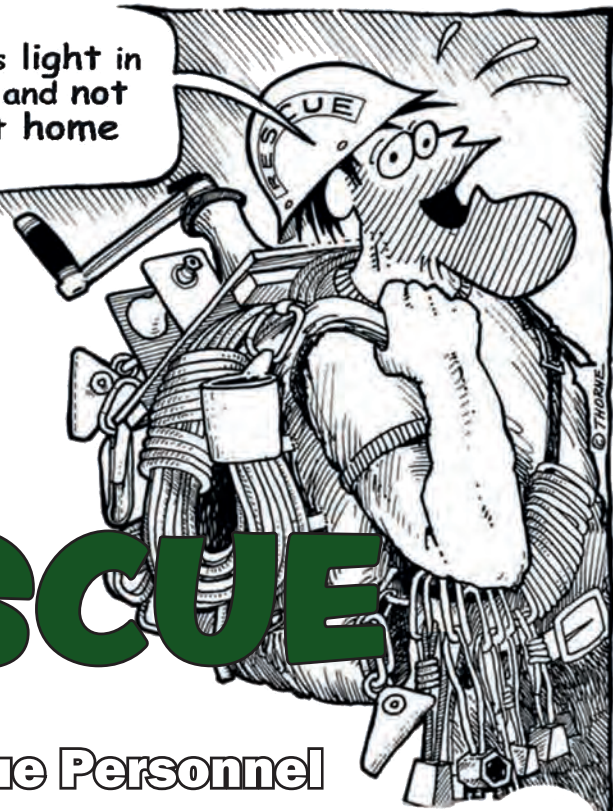
COLOURS: rigging ropes tend to colour coordinate diameters to colours rather than having multiple colours under the same diameter as we see in climbing ropes. Very few offer colour options beyond a specific colour for a specific diameter plus maybe white/no colour.

We haven't given a **FLEXIBILITY** figure this time because the quality of handling is not as essential for rigging as it is for climbing when smaller diameter ropes have to interface with equally smaller proportioned hardware, prusiks and climbing systems. That's not to say that you want an iron re-bar of a rope for rigging and lowering but proportionally speaking the larger diameter ropes have more than enough working flex and tend not to stiffen like some climbing ropes.

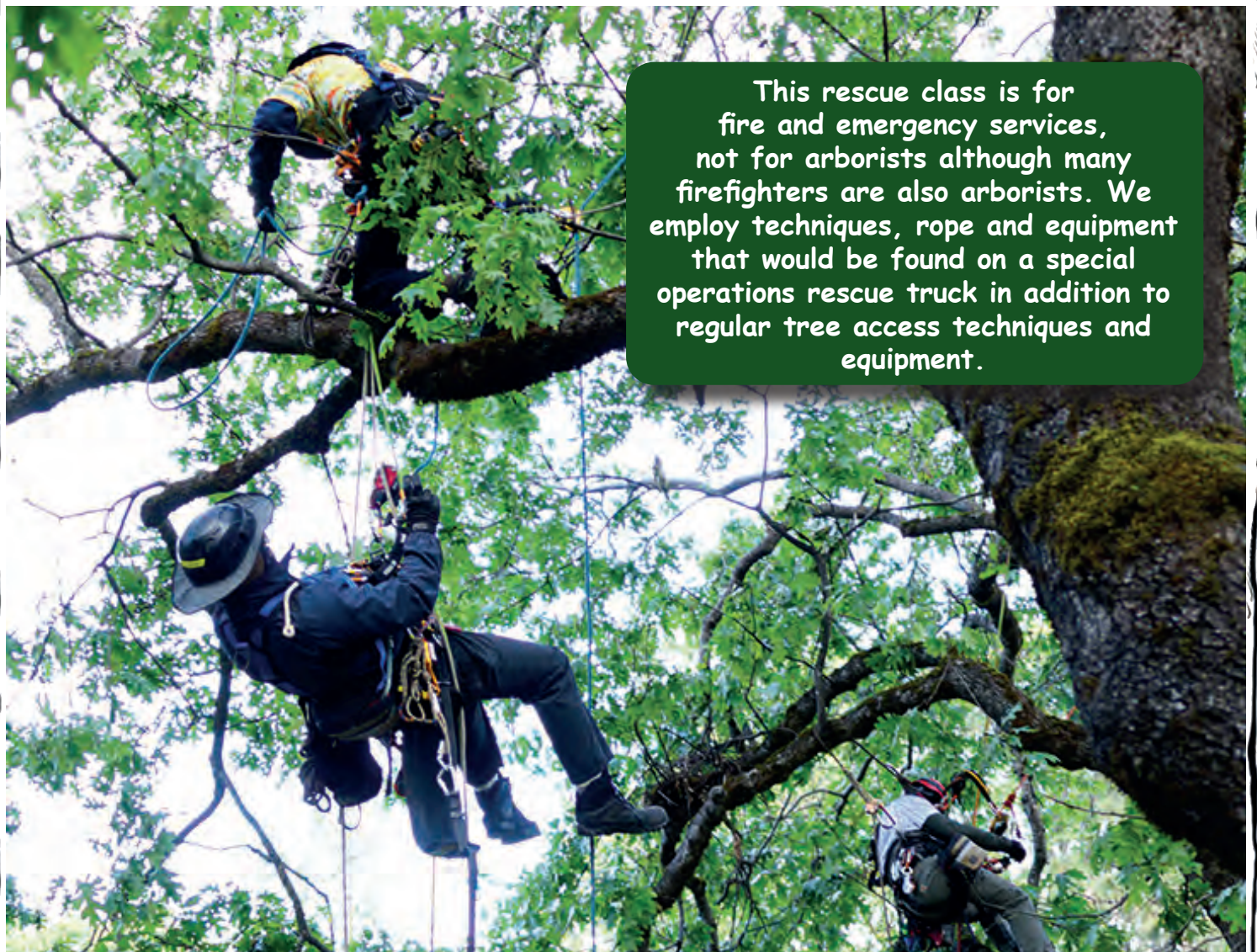
The **STANDARDS** column could have been omitted from this set of tables since rigging and lowering doesn't come under personal protective standards but there is the European Machinery Directive EU 2006/42/EC which does cover some rigging ropes but this is largely applied to crane and hoist ropes. Those arb climbing ropes which are utilitarian enough to be included here with a marker in the 'Climbing' column will meet EN1891 for life support rope.

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Knowledge is light in
the rucksack and not
easily left at home













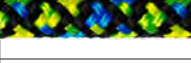









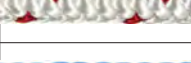













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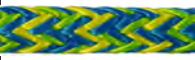
















Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST				Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	CONSTRUCTION
				per Metre	/3.28ft	US\$ per Foot	Currency conversion only					
	Husky .5	ALLGEAR		£3.10	\$3.70	\$1.15	€3.70	13mm ½"	-	127g 8.5lb	Polyester Nylon	
	Husky I	ALLGEAR		£4.00	\$4.60	\$1.45	€4.70	14mm ⅝"	-	164g 11lb	Polyester Nylon	
	Husky II	ALLGEAR		£5.00	\$5.20	\$1.65	€5.50	16mm ⅝"	-	209g 14lb	Polyester Nylon	
	Husky III	ALLGEAR		£6.00	\$6.55	\$2.00	€7.00	19mm ¾"	-	246g 16.5lb	Polyester Nylon	
	Husky IV	ALLGEAR		£8.50	\$10.40	\$3.20	€10.30	22mm ⅞"	-	395g 26.5lb	Polyester Nylon	
	Husky V	ALLGEAR		£9.75	\$11.60	\$3.60	€12.00	25mm 1"	-	574g 38.5lb	Polyester Nylon	
	Husky Multi-Pro Raging Blue	ALLGEAR		£3.60	\$4.50	\$1.40	€4.30	13mm ½"	-	127g 8.5lb	Polyester Nylon	
	Husky Multi-Pro Raging Red	ALLGEAR		£5.40	\$6.50	\$2.05	€6.30	16mm ⅝"	-	188g 12.6lb	Polyester Nylon	
	Husky Multi-Pro Raging Orange	ALLGEAR		£6.55	\$8.50	\$2.65	€7.90	19mm ¾"	-	209g 14lb	Polyester Nylon	
	Forestry Pro	ALLGEAR		£2.90	\$3.60	\$1.10	€3.40	13mm ½"	-	87g 5.8lb	Polyester Polyester	
	Forestry Pro	ALLGEAR		£3.15	\$3.90	\$1.20	€3.70	16mm ⅝"	-	177g 11.85lb	Polyester Polyester	
	Forestry Pro	ALLGEAR		£4.70	\$5.85	\$1.80	€5.50	19mm ¾"	-	239g 16lb	Polyester Polyester	
	Wonder Rope	ALLGEAR		£2.60	\$3.25	\$1.00	€3.00	12.7 ½"	-	91g 6.1lb	Polyester Polyester	
	Wonder Rope	ALLGEAR		£3.90	\$4.90	\$1.50	€4.55	16mm ⅝"	-	177g 11.9lb	Polyester Polyester	
	PRO FORCE	ALL GEAR		£6.05	\$7.65	\$2.35	€7.10	13mm ½"	-	112g 7.5lb	Polyester HMPE	
	PRO FORCE	ALL GEAR		£7.10	\$9.00	\$2.75	€8.35	14mm ⅝"	-	157g 10.5lb	Polyester HMPE	
	PRO FORCE	ALL GEAR		£12.00	\$15.00	\$4.60	€14.00	16mm ⅝"	-	194g 13lb	Polyester HMPE	

COST: £€ = Currency Conversion ONLY exc eyes unless shown in NOTES. INC local taxes/VAT, m/ft, price may be derived from shortest length sold

ARBORIST RIGGING ROPES

ON	TREATED FIBRES ROUNDED SHEATH	SHEATH BRAID/PLAIT	LIFE SUPPORT STANDARDS (only for multi-role ropes)	HAND SPICEABLE PRE-SPICED PRE-SEWN	SUITABLE FOR				MINIMUM/AVERAGE BREAKING LOAD/STRENGTH			ELONGATION @10% MBS @30% MBS @50% MBS @300lbf/136kg @540 lbf/245kg	OTHER COLOURS	NOTES	WWW.
					CLIMBING	LOWERING	IMPACT LOWER	STATIC RIGGING	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average				
■	DB			■ ■	-	■	■	●	46.7kN 10500lbf	2100lb 1890lb	7%			allgearinc.com	
■	DB			■ ■	-	■	■	●	62.2kN 14000lbf	2800lb 2520lb	7%			allgearinc.com	
■	DB			■ ■	-	■	■	●	86kN 19500lbf	3900lb 3510lb	7%			allgearinc.com	
■	DB			■ ■	-	■	■	●	102kN 23000lbf	4600lb 4140lb	7%			allgearinc.com	
■	DB			■ ■	-	■	■	●	142kN 32000lbf	6400lb 5760lb	7%			allgearinc.com	
■	DB			■ ■	-	■	■	●	169kN 38000lbf	7600lb 6840lb	7%			allgearinc.com	
■	DB			■ ■	-	■	■	●	46kN 10500lbf	2100lb 1890lb	7%			allgearinc.com	
■	DB			■ ■	-	■	■	●	86kN 19500lbf	3900lb 3510lb	7%			allgearinc.com	
■	DB			■ ■	-	■	■	●	102kN 23000lbf	4600lb 4140lb	7%			allgearinc.com	
-	12 KM				■	■	■	■	32kN 7300lbf				red/ylw version still sold by some stockists	allgearinc.com	
-	12 KM				-	■	■	■	48kN 11000lbf					allgearinc.com	
-	12 KM				-	■	■	■	80kN 18000lbf					allgearinc.com	
■	12 KM			■	-	■	■	■	32kN 7300lbf					allgearinc.com	
■	12 KM			■	-	■	■	■	48kN 11000lbf					allgearinc.com	
■	DB			■	-	■	-	■	82kN 18500lbf	3700lb 3300lb	0.5% 1%			allgearinc.com	
■	DB			■	-	■	-	■	95kN 21500lbf	4300lb 3870lb	0.5% 1%			allgearinc.com	
■	DB			■	-	■	-	■	137kN 31000lbf	6200lb 5580lb	0.5% 1%			allgearinc.com	
														expansion Row	

x10% & rounded up. ■=Option. ●=OK but not ideal. SHEATH: DB=Double Braid, KM=KernMantle/Single Braid HB=Hollow Braid DS=Double Strand

Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot Currency conversion only	Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	CONSTRUCT
	Husky-12 Multi Pro 9.5	ALL GEAR		£5.70 \$7.20 \$2.20 €6.65	9.5mm 3/8"	-	120g 8lb	Polyester -	
	Husky-12 Multi Pro 13	ALL GEAR		£6.75 \$8.50 \$2.60 €7.80	13mm 1/2"	-	120g 8lb	Polyester -	
	Husky-12 Multi Pro 16	ALL GEAR		£8.40 \$10.60 \$3.25 €9.75	16mm 5/8"	-	228g 15.3lb	Polyester -	
	Husky-12 Multi Pro 19	ALL GEAR		£14.25 \$18.00 \$5.50 €17.00	19mm 3/4"	-	249g 16.7lb	Polyester -	
	Husky-12 Multi Pro 25	ALL GEAR		£29.00 \$37.00 \$11.40 €34.00	25mm 1"	-	358g 24lb	Polyester -	
	Husky-12 9.5	ALL GEAR		£2.30 \$2.95 \$0.90 €2.70	9.5mm 3/8"	-	70g 4.7lb	Polyester -	
	Husky-12 13	ALL GEAR		£3.00 \$3.70 \$1.15 €3.40	13mm 1/2"	-	120g 8lb	Polyester -	
	Husky-12 16	ALL GEAR		£4.40 \$5.50 \$1.70 €5.05	16mm 5/8"	-	209g 14lb	Polyester -	
	Husky-12 19	ALL GEAR		£5.75 \$7.00 \$2.15 €6.45	19mm 3/4"	-	228g 15.3lb	Polyester -	
	Husky-12 25	ALL GEAR		£7.10 \$9.00 \$2.75 €8.25	25mm 1"	-	408g 27.3lb	Polyester -	
	AB-Double (Barb) 13	ATLANTIC BRAIDS		£2.85 \$3.60 \$1.10 €3.30	13mm 1/2"	-	115g 8lb	Polyester Polyester	
	AB-Double (Barb) 14	ATLANTIC BRAIDS		£3.25 \$4.10 \$1.25 €3.75	14mm 9/16"	-	155g 11lb	Polyester Polyester	
	AB-Double (Barb) 16	ATLANTIC BRAIDS		£3.50 \$4.40 \$1.35 €4.05	16mm 5/8"	-	200g 13.5lb	Polyester Polyester	
	AB-Double (Barb) 19	ATLANTIC BRAIDS		£5.15 \$6.50 \$2.00 €6.00	19mm 3/4"	-	260g 17.8lb	Polyester Polyester	
	AB-Double (Barb) 22	ATLANTIC BRAIDS		£7.75 \$9.80 \$3.00 €9.00	22mm 7/8"	-	390g 26lb	Polyester Polyester	
	AB-Double Nylon 13	ATLANTIC BRAIDS		N/A	13mm 1/2"	18 sizes 6.5-64mm 1/4-2 1/2"	97g 6.5lb	Nylon Nylon	
	AB-Double Nylon 14	ATLANTIC BRAIDS		N/A	14mm 9/16"	18 sizes 6.5-64mm 1/4-2 1/2"	142g 9.5lb	Nylon Nylon	
	AB-Double Nylon 16	ATLANTIC BRAIDS		N/A	16mm 5/8"	18 sizes 6.5-64mm 1/4-2 1/2"	180g 12lb	Nylon Nylon	

COST: £\$€ = Currency Conversion ONLY exc eyes unless shown in NOTES. INC local taxes/VAT, m/ft, price may be derived from shortest length sold

ARBORIST RIGGING ROPES




CONSTRUCTION	SHEATH Braid /Plait	LIFE SUPPORT STANDARDS (only for multi-role ropes)	HAND SPliceABLE PRE-SEWN	SUITABLE FOR			MINIMUM/AVERAGE BREAKING LOAD/STRENGTH			WLL Spliced Sewn *Average	ELONGATION @10% MBS @30% MBS @50% MBS @300lbf/136kg @540 lbf/245kg	OTHER COLOURS	NOTES	WWW.
				CLIMBING	LOWERING	IMPACT LOWER	STATIC RIGGING	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn					
■	12 HB		■	-	■	■	■	26.7kN 6000lbf	-	4%			allgearinc.com	
■	12 HB		■	-	■	■	■	49kN 11000lbf	-	4%			allgearinc.com	
■	12 HB		■	-	■	■	■	71.2kN 16000lbf	-	4%			allgearinc.com	
■	12 HB		■	-	■	■	■	93.4kN 21000lbf	-	4%			allgearinc.com	
■	12 HB		■	-	■	■	■	142kN 32000lbf	-	4%			allgearinc.com	
■	12 HB		■	-	■	■	-	26.7kN 6000lbf	-	7%		Used mainly for various types of slings	allgearinc.com	
■	12 HB		■	-	■	■	-	49kN 11000lbf	-	7%		Used mainly for various types of slings	allgearinc.com	
■	12 HB		■	-	■	■	-	71kN 16000lbf	-	7%		Used mainly for various types of slings	allgearinc.com	
■	12 HB		■	-	■	■	-	93.4kN 21000lbf	-	7%		Used mainly for various types of slings	allgearinc.com	
■	12 HB		■	-	■	■	-	32.9kN 7399lbf	178kN 40000lbf	7%		Used mainly for various types of slings	allgearinc.com	
□	DB		■	-	■	-	■	40.5kN 9095lbf	47.6 kN 10700lbf	-			atlanticbraids.com	
□	DB		■	-	■	-	■	50.3 kN 11300lbf	59.2 kN 13300lbf	-			atlanticbraids.com	
□	DB		■	-	■	-	■	70kN 15725lbf	82.3kN 18500lbf	-			atlanticbraids.com	
□	DB		■	-	■	-	■	76.4kN 17170lbf	89.9kN 20200lbf	-			atlanticbraids.com	
□	DB		■	-	■	-	■	109.3kN 24565lbf	128.6kN 28900lbf	-			atlanticbraids.com	
□	DB		■	-	■	■	■	36.9kN 8300lbf	-	-		Yellow fleck	atlanticbraids.com	
□	DB		■	-	■	■	■	52kN 11700lbf	-	-		Yellow fleck	atlanticbraids.com	
□	DB		■	-	■	■	■	67.6kN 15200lbf	-	-		Yellow fleck	atlanticbraids.com	

x10% & rounded up. □=Option. ●=OK but not ideal. SHEATH: DB=Double Braid, KM=KernMantle/Single Braid HB=Hollow Braid DS=Double Strand



Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot Currency conversion only	Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	CONSTRUCT
	AB-Double Nylon 19	ATLANTIC BRAIDS		£000 \$000 \$000 €000	19mm ¾"	18 sizes 6.5-64mm ¼-2½"	202g 13.6lb	Nylon Nylon	
	AB-Double Poly 13	ATLANTIC BRAIDS		£000 \$000 \$000 €000	13mm ½"	19 sizes 5-64mm ¼-2½"	128g 8.6lb	Polyester Polyester	
	AB-Double Poly 14	ATLANTIC BRAIDS		£000 \$000 \$000 €000	14mm ⅙"	19 sizes 5-64mm ¼-2½"	0g 0lb	Polyester Polyester	
	AB-Double Poly 16	ATLANTIC BRAIDS		£000 \$000 \$000 €000	16mm ⅝"	19 sizes 5-64mm ¼-2½"	207g 13.9lb	Polyester Polyester	
	AB-Double Poly 19	ATLANTIC BRAIDS		£000 \$000 \$000 €000	19mm ¾"	19 sizes 5-64mm ¼-2½"	260g 17.8lb	Polyester Polyester	
	Bonsai 13 BCSE13	BEAL		£000 \$000 \$000 €4.70	13mm ½"	-	98g 6.6lb	Nylon Nylon	
	BWII+ 13	BLUEWATER ROPES		£3.95 \$4.85 \$1.50 €4.55	13mm ½"	5 sizes 8-13mm ⅙-½"	124g 9.1lb	Polyester Nylon	
	Safeline 12.5	BLUEWATER ROPES		£4.45 \$5.45 \$1.70 €5.15	12.5mm ½"	4 sizes 9-15.5mm ⅜-⅝"	108g 8.2lb	Polyester Nylon	
	Safeline 15.5	BLUEWATER ROPES		£6.25 \$7.70 \$2.45 €7.25	15.5mm ⅝"	4 sizes 9-15.5mm ⅜-⅝"	164g 12.02lb	Polyester Nylon	
	Power Pull 12	BUCCANEER ROPE CO		n/a	12mm ½"	-	119g 8lb	Polyester Polyester	
	Power Pull 14	BUCCANEER ROPE CO		£3.15 \$4.00 \$1.25 €3.65	14mm ⅙"	-	157g 10.5lb	Polyester Polyester	
	Power Pull 16	BUCCANEER ROPE CO		£3.95 \$5.00 \$1.55 €4.50	16mm ⅝"	-	201g 13.5lb	Polyester Polyester	
	Power Pull 18	BUCCANEER ROPE CO		n/a	18mm ¾"	-	276g 18.5lb	Polyester Polyester	
	Tiger 12	BUCCANEER ROPE CO		n/a	12mm ½"	8 sizes 6-25mm ¼-1"	119g 8lb	Polyester Polyester	
	Tiger 14	BUCCANEER ROPE CO		n/a	14mm ⅙"	8 sizes 6-25mm ¼-1"	151g 10.1lb	Polyester Polyester	
	Tiger 16	BUCCANEER ROPE CO		n/a	16mm ⅝"	8 sizes 6-25mm ¼-1"	188g 12.6lb	Polyester Polyester	
	Tiger 18	BUCCANEER ROPE CO		n/a	18mm ¾"	8 sizes 6-25mm ¼-1"	268g 18lb	Polyester Polyester	

COST: £\$€ = Currency Conversion ONLY exc eyes unless shown in NOTES. INC local taxes/VAT, m/ft, price may be derived from shortest length sold

ARBORIST RIGGING ROPES

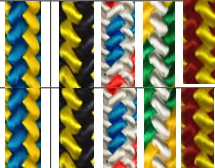
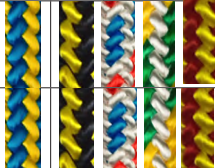




OPTION	SHEATH Braid / Plait	LIFE SUPPORT STANDARDS (only for multi-role ropes)	HAND SPLICEABLE PRE-SPICED PRE-SEWN	SUITABLE FOR				MINIMUM/AVERAGE BREAKING LOAD/STRENGTH			WLL Spliced Sewn *Average	ELONGATION @10% MBS @30% MBS @50% MBS @300lbf/136kg @540 lbf/245kg	OTHER COLOURS	NOTES	WWW.
				CLIMBING	LOWERING	IMPACT LOWER	STATIC RIGGING	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn						
<input type="checkbox"/>	DB		■	-	■	■	-		101.8kN 22890lbf	-			Yellow fleck	atlanticbraids.com	
<input type="checkbox"/>	DB		■	-	■	-	■	44kN 10000lbf	52kN 11750lbf	-			Green fleck	atlanticbraids.com	
<input type="checkbox"/>	DB		■	-	■	-	■	0kN 00lbf	0kN 0lbf	-			Green fleck	atlanticbraids.com	
<input type="checkbox"/>	DB		■	-	■	-	■	69kN 15725lbf	82kN 18500lbf				Green fleck	atlanticbraids.com	
<input type="checkbox"/>	DB		■	-	■	-	■	76kN 17170lbf	89kN 20200lbf				Green fleck	atlanticbraids.com	
	KM	CE-A	■	■	■	■	■	34kN 6743lbf		25kN 5620lbf	4.2%			beal-planet.com	
	32 KM	CE A NFPA	■	●	■	-	■	44.4kN 9983lbf			3.9%			bluewaterropes.com	
	16 KM	CE A NFPA ANSI UIAA	■	●	■	-	■	44.4kN 9983lbf			2.2%		White rope is slightly cheaper	bluewaterropes.com	
	16 KM	NFPA	■	●	■	-	■	58.9kN 13237lbf			1.6%			bluewaterropes.com	
■	DB		■	●	■	●	■	-	43.6kN 9800lbf					bucrope.com	
■	DB		■	●	■	●	■	-	57.8kN 13000lbf					bucrope.com	
■	DB		■	●	■	●	■	-	73.8kN 16600lbf					bucrope.com	
■	DB		■	●	■	●	■	-	82.3kN 18500lbf					bucrope.com	
			■ ■	-	■	■	■	-	44.5kN 10000lbf					bucrope.com	
			■ ■	-	■	■	■	-	66.7kN 15000lbf				very difficult to find any Buccaneer ropes. stocked by very few arb stores	bucrope.com	
			■ ■	-	■	■	■	-	80kN 18000lbf					bucrope.com	
		CE	■ ■	-	■	■	■	-	106.7kN 24000lbf					bucrope.com	

x10% & rounded up. =Option. ●=OK but not ideal. SHEATH: DB=Double Braid, KM=KernMantle/Single Braid HB=Hollow Braid DS=Double Strand
























Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot Currency conversion only	Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE
	Tiger Plus 12	BUCCANEER ROPE CO		n/a	12mm ½"	10 sizes 6-30mm ¼-1¼"	119g 8lb	Polyester HMPE
	Tiger Plus 14	BUCCANEER ROPE CO		n/a	14mm ⅝"	10 sizes 6-30mm ¼-1¼"	151g 10.1lb	Polyester HMPE
	Tiger Plus 16	BUCCANEER ROPE CO		n/a	16mm ⅝"	10 sizes 6-30mm ¼-1¼"	188g 12.6lb	Polyester HMPE
	Tiger Plus 18	BUCCANEER ROPE CO		n/a	18mm ¾"	10 sizes 6-30mm ¼-1¼"	268g 18lb	Polyester HMPE
	Arbor Boss 16 12	BUCCANEER ROPE CO		£2.00 \$2.50 \$0.75 €2.30	12mm ½"	-	112g 7.5lb	Polyester Polyester
	Arbor Boss 16 16	BUCCANEER ROPE CO		n/a	16mm ⅝"	-	161g 10.8lb	Polyester Polyester
	Bulwark Safety X Semi-Static	COASTLINE CORDAGE		n/a	12.5mm ½"	4 sizes 8- 12.5mm ⅜ -½"	98g 6.7lb	Polyester Nylon
	Bulwark Safety X Static	COASTLINE CORDAGE		n/a	12.5mm ½"	3 sizes 9.5- 12.5mm ⅜ -½"	112g 6.6lb	Polyester Polyester
	Cortex 12 790	COUSIN-TRETEC		£2.95 \$3.55 \$1.10 €3.30	12mm ½"	-	108g 7.2lb	Polyester Polyester
	Cortex 14 790	COUSIN-TRETEC		£3.40 \$4.10 \$1.30 €3.80	14mm ⅝"	-	154g 10.3lb	Polyester Polyester
	Cortex 16 790	COUSIN-TRETEC		£3.75 \$4.70 \$1.50 €4.30	16mm ⅝"	-	202g 13.5lb	Polyester Polyester
	Lowering BraidLine 12	COUSIN-TRETEC		£3.30 \$4.10 \$1.30 €3.80	12mm ½"	14 sizes 6-32mm ¼ -1 ¼"	105g 7lb	Polyester Polyester
	Lowering BraidLine 14	COUSIN-TRETEC		£4.35 \$5.40 \$1.65 €5.00	14mm ⅝"	14 sizes 6-32mm ¼ -1 ¼"	136g 9.1lb	Polyester Polyester
	Lowering BraidLine 16	COUSIN-TRETEC		£5.50 \$6.80 \$2.10 €6.30	16mm ⅝"	14 sizes 6-32mm ¼ -1 ¼"	178g 11.9lb	Polyester Polyester
	Lowering BraidLine 18	COUSIN-TRETEC		£6.90 \$9.00 \$2.80 €8.00	18mm ¾"	14 sizes 6-32mm ¼ -1 ¼"	237g 15.9lb	Polyester Polyester
	Maona 12	COURANT		£2.10 \$2.50 \$0.76 €2.20	12mm ½"	-	112g 7.5lb	Polyester Polyester
	Maona 14	COURANT		£2.45 \$3.30 \$1.00 €3.00	14mm ⅝"	-	149g 10lb	Polyester Polyester
	Maona 16	COURANT		£2.70 \$3.75 \$1.15 €3.25	16mm ⅝"	-	184g 12.3lb	Polyester Polyester

COST: £\$€ = Currency Conversion ONLY exc eyes unless shown in NOTES. INC local taxes/VAT, m/ft, price may be derived from shortest length sold

ARBORIST RIGGING ROPES

CONSTRUCTION	TREATED FIBRES ROUNDED SHEATH	SHEATH BRAID /PLAIT	LIFE SUPPORT STANDARDS (only for multi-role ropes)	HAND SPliceABLE PRE-SPliced PRE-SEWn	SUITABLE FOR				MINIMUM/AVERAGE BREAKING LOAD/STRENGTH			ELONGATION	OTHER COLOURS	NOTES	WWW.
					CLIMBING	LOWERING	IMPACT LOWER	STATIC RIGGING	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average				
	?			■	-	■	-	■	36.5kN 8205lbf	85.4kN 19200lbf					bucrope.com
	?			■	-	■	-	■	47kN 10566lbf					very difficult to find any Buccaneer ropes. stocked by very few arb stores	bucrope.com
	?			■	-	■	-	■	59kN 13263lbf	149.5kN 33600lbf					bucrope.com
	?			■	-	■	-	■	?	195.7kN 44000lbf					bucrope.com
	16 DB			-	■	●	●	●		31.1kN 7000lbf					bucrope.com
	16 DB			-	●	■	■	●		44.5kN 10000lbf					bucrope.com
	32 KM	NFPA		-	●	■	●	■	22kN 4956lbf		7.7kN 1724lbf	2%			coastlinegroup.ca
	32 KM	NFPA		-	●	■	-	■	44kN 9862lbf			1.8%			coastlinegroup.ca
	32 KM			-	●	■	-	■	36.5kN 8205lbf						cousin-trestec.com
	32 KM			-	●	■	-	■	47kN 10566lbf						cousin-trestec.com
	32 KM			-	●	■	-	■	59kN 13263lbf						cousin-trestec.com
	16 DB			■	●	■	■	●	29kN 6519lbf						cousin-trestec.com
	16 DB			■	●	■	■	●	44kN 9891lbf						cousin-trestec.com
	16 DB			■	●	■	■	●	59kN 13263lbf						cousin-trestec.com
	16 DB			■	●	■	■	●	78kN 17535lbf						cousin-trestec.com
	24 DB			■	-	■	■	■	37/40kN 8300/ 8999lbf		5.7kN 1281lbf				mycourant.com
	24 DB			■	-	■	■	■	48/52kN 10800/ 11700lbf		7.4kN 1660lbf				mycourant.com
	24 DB			■	-	■	■	■	62/68kN 14000/ 152000lbf		9.85kN 2201lbf				mycourant.com

x10% & rounded up. □=Option. ●=OK but not ideal. SHEATH: DB=Double Braid, KM=KernMantle/Single Braid HB=Hollow Braid DS=Double Strand

Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot Currency conversion only	Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE
	SLR StableBraid 12	DONAGHYS		£000 \$000 \$000 €000	12mm ½"	-	0g 0lb	Polyester Polyester
	SLR StableBraid 14	DONAGHYS		£000 \$000 \$000 €000	14mm ⅝"	-	0g 0lb	Polyester Polyester
	SLR StableBraid 16	DONAGHYS		£000 \$000 \$000 €000	16mm ⅝"	-	0g 0lb	Polyester Polyester
	Rhino 14 (Yachtmaster XS)	DONAGHYS		£000 \$000 \$000 €2.46	14mm ⅝"	-	0g 0lb	Polyester Polyester
	Rhino 16 (Yachtmaster XS)	DONAGHYS		£000 \$000 \$000 €2.95	16mm ⅝"	-	0g 0lb	Polyester Polyester
	Euro Rig 12	ENGLISH BRAIDS		£000 \$000 \$000 €000	12mm ½"	-	0g 0lb	Polyester Polyester
	Euro Rig 14	ENGLISH BRAIDS		£000 \$000 \$000 €000	14mm ⅝"	-	0g 0lb	Polyester Polyester
	Euro Rig 16	ENGLISH BRAIDS		£000 \$000 \$000 €000	16mm ⅝"	-	0g 0lb	Polyester Polyester
	Rig Tex 24 12	ENGLISH BRAIDS		£4.80 \$5.00 \$1.55 €4.70	12mm ½"	7 sizes 10 - 24mm ⅜ - ⅞"	117g 7.8lb	Polyester Polyester
	Rig Tex 24 14	ENGLISH BRAIDS		£5.60 \$6.90 \$2.20 €6.50	14mm ⅝"	7 sizes 10 - 24mm ⅜ - ⅞"	156g 10.5lb	Polyester Polyester
	Rig Tex 24 16	ENGLISH BRAIDS		£7.15 \$8.85 \$2.80 €8.30	16mm ⅝"	7 sizes 10 - 24mm ⅜ - ⅞"	195g 13lb	Polyester Polyester
	Rig Tex 24 18	ENGLISH BRAIDS		£000 \$000 \$000 €000	18mm ¾"	7 sizes 10 - 24mm ⅜ - ⅞"	234g 15.7lb	Polyester Polyester
	Rig Tex 12 12	ENGLISH BRAIDS		£000 \$000 \$000 €000	12mm ½"	-	0g 0lb	Polyester -
	Rig Tex 12 14	ENGLISH BRAIDS		£000 \$000 \$000 €000	16mm ⅝"	-	0g 0lb	Polyester -
	Rig Tex 12 16	ENGLISH BRAIDS		£000 \$000 \$000 €000	20mm ¾"	-	0g 0lb	Polyester -

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Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot Currency conversion only	Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	CONSTRUCT
	Anaconda 12	FTC TREE		£4.60 \$5.35 \$1.65 €4.85	12mm ½"	-	125g 8.4lb	Polyester Polyester	
	Anaconda 14	FTC TREE		£5.25 \$6.65 \$2.10 €5.55	14mm ⅝"	-	175g 11.7lb	Polyester Polyester	
	Anaconda 16	FTC TREE		£7.25 \$8.80 \$2.70 €7.30	16mm ⅝"	-	225g 15.1lb	Polyester Polyester	
	Anaconda 18	FTC TREE		£8.15 \$10.30 \$3.15 €8.60	18mm ¾"	-	335g 22.4lb	Polyester Polyester	
	Katuali 10	FTC TREE		£1.70 \$2.20 \$0.65 €1.80	10mm ⅜"	-	86g 5.7lb	Polyester Polyester	
	Katuali 12	FTC TREE		£1.90 \$2.35 \$0.75 €2.00	12mm ½"	-	119g 8lb	Polyester Polyester	
	Katuali 14	FTC TREE		£2.35 \$3.10 \$0.95 €2.50	14mm ⅝"	-	153g 10.2lb	Polyester Polyester	
	Katuali 16	FTC TREE		£2.80 \$3.55 \$1.10 €2.95	16mm ⅝"	-	203g 13.6lb	Polyester Polyester	
	Katuali 18	FTC TREE		£3.30 \$4.00 \$1.25 €3.45	18mm ¾"	-	256g 17.2lb	Polyester Polyester	
	Light Red 16	GLEISTEIN		£2.95 \$3.25 \$1.00 €3.05	12mm ½"	-	83g 5.6lb	Polyester Polyester	
	Heavy Green 16	GLEISTEIN		£4.95 \$5.35 \$1.65 €5.00	16mm ⅝"	-	170g 11.4lb	Polyester Polyester	
	HeftyFlex 13 H2521	HARKIE		£3.55 \$4.50 \$1.40 €4.20	13mm ½"	-	n/a	?	
	HeftyFlex 16	HARKIE		£4.26 \$5.20 \$1.60 €5.00	16mm ⅝"	-	n/a	?	
	HeftyFlex 19	HARKIE		£6.10 \$8.60 \$2.65 €7.15	19mm ¾"	-	n/a	?	
	Safe Arb 12	LIROS		£2.35 \$3.00 \$1.00 €2.70	12mm ½"	-	125g 8.4lb	Polyester Polyester	
	Safe Arb 14	LIROS		£3.25 \$4.05 \$1.25 €3.80	14mm ⅝"	-	175g 11.7lb	Polyester Polyester	
	Safe Arb 16	LIROS		£4.00 \$5.00 \$1.55 €5.30	16mm ⅝"	-	225g 15.1lb	Polyester Polyester	
	Safe Arb 18	LIROS		£6.85 \$8.50 \$2.70 €8.10	18mm ¾"	-	335g 22.1lb	Polyester Polyester	

COST: £/\$/€ = Currency Conversion ONLY exc eyes unless shown in NOTES. INC local taxes/VAT, m/ft, price may be derived from shortest length sold

ARBORIST RIGGING ROPES









FUNCTION	TREATED FIBRES BONDED SHEATH	SHEATH BRAID / PLAIT	LIFE SUPPORT STANDARDS (only for multi-role ropes)	HAND SPPLICABLE PRE-SEWN	SUITABLE FOR				MINIMUM/AVERAGE BREAKING LOAD/STRENGTH			ELONGATION	OTHER COLOURS	NOTES	WWW.
					CLIMBING	LOWERING	IMPACT LOWER	STATIC RIGGING	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average				
■		20 DB	CE	■ ■	-	■	■	●	45kN 10116lbf		6.4kN 1438lbf	6.5%			ftc-tree.com
■		20 DB	CE	■ ■	-	■	■	●	55kN 12364lbf		7.8kN 1753lbf				ftc-tree.com
■		20 DB	CE	■ ■	-	■	■	●	67kN 15062lbf		9,5kN 2136lbf				ftc-tree.com
■		20 DB	CE	■ ■	-	■	■	●	76kN 17085lbf		11kN 2473lbf				ftc-tree.com
		16 DB	CE	■ ■	-	■	■	■	29 30kN 6520lbf 6744lbf		4.1 4.3kN 922lbf 967lbf				ftc-tree.com
		16 DB	CE	■ ■	-	■	■	■	40 42kN 8992lbf 9442lbf		5.7 6kN 1281lbf 1348lbf				ftc-tree.com
		16 DB	CE	■ ■	-	■	■	■	52 55kN 11690lbf 12365lbf		7.4 7.8kN 1663lbf 1799lbf				ftc-tree.com
		16 DB	CE	■ ■	-	■	■	■	70 72kN 15737lbf 16186lbf		10 10kN 2248lbf 2248lbf				ftc-tree.com
		16 DB	CE	■ ■	-	■	-	■	78 86kN 17535lbf 19333lbf		11 12.2kN 2742lbf 2697lbf				ftc-tree.com
		24 DB	CE	■ ■	-	■	■	●	33kN 7418lb			4.3%			gleistein.com
		24 DB	CE	■ ■	-	■	■	■	67.7/75.2kN 15219lbf 16905lb			2.5%			gleistein.com
■	?			■ ■	-	■	■	■	45kN 10116lbf						harkieglobal.com
■	?			■ ■	-	■	■	■	70kN 15736lbf						harkieglobal.com
■	?			■ ■	-	■	■	■	85kN 19108lbf						harkieglobal.com
■		20 DB		■	-	■	■	●	45kN 10116lbf						liros.com
■		20 DB		■	-	■	■	●	55kN 12364lbf						liros.com
■		20 DB		■	-	■	■	●	67kN 15062lbf						liros.com
■		20 DB		■	-	■	■	●	76kN 17085lbf						liros.com

x10% & rounded up. □=Option. ●=OK but not ideal. SHEATH: DB=Double Braid, KM=KernMantle/Single Braid HB=Hollow Braid DS=Double Strand





















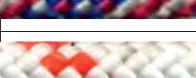



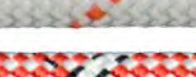











Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot Currency conversion only	Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE
	Draco 12	MARLOW		£2.20 \$2.70 \$2.70 €2.60	12mm ½"		100.6g 6.75lb	Polyester Polyester
	Draco 14	MARLOW		£2.45 \$300 \$3.00 €3.00	14mm ⅝"		130.4g 8.74lb	Polyester Polyester
	Draco 16	MARLOW		£3.10 \$3.85 \$3.85 €3.70	16mm ⅝"		197g 13.21lb	Polyester Polyester
	Raptor Rigging 12	MARLOW		£3.90 \$4.85 \$1.50 €4.60	12mm ½"		111g 7.44lb	Polyester Polyester
	Raptor Rigging 14	MARLOW		£4.20 \$5.25 \$1.65 €5.00	14mm ⅝"		156g 10.43lb	Polyester Polyester
	Raptor Rigging 16	MARLOW		£5.35 \$6.65 \$2.05 €6.30	16mm ⅝"		193g 12.94lb	Polyester Polyester
	Raptor Rigging 18	MARLOW		£6.55 \$8.15 \$2.50 €7.70	18mm ¾"		232g 15.54lb	Polyester Polyester
	Marlowbraid 12	MARLOW		£4.20 \$5.25 \$1.65 €5.00	12mm ½"	10 sizes 6-24mm ¼-⅜"	100g 6.71lb	Polyester Polyester
	Marlowbraid 14	MARLOW		£5.95 \$7.40 \$2.30 €7.00	14mm ⅝"	10 sizes 6-24mm ¼-⅜"	145g 9.72lb	Polyester Polyester
	Marlowbraid 16	MARLOW		£8.10 \$10.10 \$3.10 €9.50	16mm ⅝"	10 sizes 6-24mm ¼-⅜"	190g 12.74lb	Polyester Polyester
	Marlowbraid 18	MARLOW		£9.10 \$11.35 \$3.50 €10.65	18mm ¾"	10 sizes 6-24mm ¼-⅜"	235g 15.76lb	Polyester Polyester
	Doublebraid 12	MARLOW		£000 \$000 \$000 €000	12mm ½"	7 sizes 6-18mm ¼-¾"	0g 0lb	Polyester Polyester
	Doublebraid 14	MARLOW		£000 \$000 \$000 €000	14mm ⅝"	7 sizes 6-18mm ¼-¾"	0g 0lb	Polyester Polyester
	Doublebraid 16	MARLOW		£000 \$000 \$000 €000	16mm ⅝"	7 sizes 6-18mm ¼-¾"	0g 0lb	Polyester Polyester
	Doublebraid 18	MARLOW		£000 \$000 \$000 €000	18mm ¾"	7 sizes 6-18mm ¼-¾"	0g 0lb	Polyester Polyester
	The Ape 12	PELICAN ROPE		£2.25 \$2.80 \$0.85 €2.60	12mm ½"	-	137g 9.2lb	Polyester Polyester
	The Ape 14	PELICAN ROPE		£2.80 \$3.50 \$1.08 €3.25	14mm ⅝"	-	157g 10.5lb	Polyester Polyester
	The Ape 16	PELICAN ROPE		£3.10 \$3.90 \$1.20 €3.60	16mm ⅝"	-	204g 13.7lb	Polyester Polyester

COST: £\$€ = Currency Conversion ONLY exc eyes unless shown in NOTES. INC local taxes/VAT, m/ft, price may be derived from shortest length sold

ARBORIST RIGGING ROPES

CON	TREATED FIBRES ROUNDED SHEATH	SHEATH BRAID /PLAIT	LIFE SUPPORT STANDARDS (only for multi-role ropes)	HAND SPLICEABLE PRE-SPICED PRE-SEWN	SUITABLE FOR				MINIMUM/AVERAGE BREAKING LOAD/STRENGTH			ELONGATION	OTHER COLOURS	NOTES	WWW.
					CLIMBING	LOWERING	IMPACT LOWER	STATIC RIGGING	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average				
		16 DB		■	-	■	●	■	35.2kN 7914lbf	38.4kN 8619lbf					marlowropes.com
		16 DB		■	-	■	●	■	49.4kN 11102lbf	54.9kN 12337lbf					marlowropes.com
		16 DB		■	-	■	●	■	74.1kN 16645lbf	81.9kN 18408lbf					marlowropes.com
■		24 DB		■	-	■	●	■	38.7 43kN 9650lbf	42 46.7kN 10500lbf	5.5kN* 1240lbf*	5% 1.7%			marlowropes.com
■		24 DB		■	-	■	●	■	49.1 54.6kN 12300lbf	53.5 59.4kN 13300lbf	7kN* 1590lbf*	5% 1.7%			marlowropes.com
■		24 DB		■	-	■	●	■	58.8 65.3kN 14700lbf	63.8 70.9kN 15900lbf	8.4kN* 1890lbf*	5% 1.7%			marlowropes.com
■		24 DB		■	-	■	●	■	64.3 71.4kN 16000lbf	69.8 77.6kN 17400lbf	9.2kN* 2060lbf*	5% 1.7%			marlowropes.com
-		16		■	-	■	-	■	40.2kN 9007lbf	43.7kN 9790lbf					marlowropes.com
-		16		■	-	■	-	■	49.3kN 11051lbf	53.6kN 12012lbf					marlowropes.com
-		16		■	-	■	-	■	65.2kN 14630lbf	72.8kN 16324lbf					marlowropes.com
-		16		■	-	■	-	■	92kN 20625lbf	100kN 22419lbf					marlowropes.com
-		24 DB			-	■	■	■	43kN 9650lbf	46.7kN 10500lbf					marlowropes.com
-		24 DB			-	■	■	■	54.6kN 12300lbf	59.4kN 13300lbf					marlowropes.com
-		24 DB			-	■	■	■	65.3kN 14700lbf	70.9kN 15900lbf					marlowropes.com
-		24 DB			-	■	■	■	71.4kN 16000lbf	77.6kN 17400lbf					marlowropes.com
■		DB		■	-	■	●	■	48.9kN 11000lbf						pelicanrope.com
■		DB		■	-	■	●	■	62.3kN 14000lbf						pelicanrope.com
■		DB		■	-	■	●	■	75.6kN 17000lbf						pelicanrope.com

x10% & rounded up. □=Option. ●=OK but not ideal. SHEATH: DB=Double Braid, KM=KernMantle/Single Braid HB=Hollow Braid DS=Double Strand

Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot Currency conversion only	Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	CONSTRUCT
	The Ape 18	PELICAN ROPE		£3.90 \$4.90 \$1.50 €4.55	18mm ¾"	-	271g 18.2lb	Polyester Polyester	
	The Ape 25	PELICAN ROPE		£7.25 \$9.15 \$2.80 €8.45	25mm 1"	-	529g 35.5lb	Polyester Polyester	
	Matador 12	PELICAN ROPE		£2.65 \$3.40 \$1.05 €3.15	12mm ½"		116g 7.8lb	Polyester Nylon	
	Matador 14	PELICAN ROPE		£3.15 \$3.95 \$1.21 €3.65	14mm ⅞"		172g 11.55lb	Polyester Nylon	
	Matador 16	PELICAN ROPE		£3.90 \$4.90 \$1.50 €4.55	16mm ⅝"		293g 19.65lb	Polyester Nylon	
	Matador 18	PELICAN ROPE		£5.00 \$6.35 \$1.95 €5.90	18mm ¾"		385g 25.8lb	Polyester Nylon	
	Access Pro 11	PMI		£2.20 \$2.70 \$0.85 €2.55	11mm ⅞"	-	84g 5.6lb	Polyester Nylon	
	Hudson CI Pro EZ Bend 11	PMI		£3.70 \$4.20 \$1.30 €3.95	11mm ⅞"	5 sizes 9-16mm ⅜-⅝"	80g 5.4lb	Nylon Nylon	
	Hudson CI Pro EZ Bend 12.5	PMI		£4.30 \$5.30 \$1.65 €5.00	12.5mm ½"	5 sizes 9-16mm ⅜-⅝"	104g 7lb	Nylon Nylon	
	Hudson CI Pro EZ Bend Unicore 12.5	PMI		£4.30 \$5.30 \$1.65 €5.00	12.5mm ½"	2 sizes 11-12.5mm ⅞-½"	107g 7.2lb	Nylon Nylon	
	Hudson CI Pro EZ Bend 16	PMI		£5.30 \$6.60 \$2.00 €5.00	16mm ⅝"	5 sizes 9-16mm ⅜-⅝"	145g 10.3lb	Nylon Nylon	
	Hudson CI Pro Max Wear/Pit Rope 11	PMI		£2.90 \$3.60 \$1.15 €3.40	11mm ⅞"	4 sizes 9-12.5mm ⅜-½"	83.46g 5.6lb	Nylon Nylon	
	Extreme Pro Unicore 11	PMI		£3.15 \$3.90 \$1.25 €3.65	11mm ⅞"	2 sizes 11-12.5mm ⅞-½"	100g 6.7lb	Polyester Nylon	
	Extreme Plus Unicore 12.5	PMI		£3.50 \$4.20 \$1.30 €3.95	12.5mm ½"	2 sizes 11-12.5mm ⅞-½"	113g 7.6lb	Polyester Nylon	
	Opus 11	PMI		£1.90 \$2.35 \$0.75 €2.20	11mm ⅞"	-	85g 5.7lb	Nylon Nylon	
	Dura-Shield General Use 12.5	PMI		£10.50 \$13.10 \$4.00 €12.30	12.5mm ½"	3 sizes 8-12.5mm ⅞-½"	110.9g 7.43lb	Technora Nylon	
	Isostatic 11.5	PMI		£4.85 \$6.00 \$1.80 €4.55	11.5mm ⅞"	-	96g 6.4lb	Polyester Polyester	
	Isostatic 13	PMI		£4.85 \$6.00 \$1.80 €4.55	13mm ½"	-	125g 8.4lb	Polyester Polyester	

COST: £\$€ = Currency Conversion ONLY exc eyes unless shown in NOTES. INC local taxes/VAT, m/ft, price may be derived from shortest length sold

ARBORIST RIGGING ROPES









CON	SHEATH BRAID /PLAIT	LIFE SUPPORT STANDARDS (only for multi-role ropes)	HAND SPLICEABLE PRE-SPUN PRE-SEWN	SUITABLE FOR				MINIMUM/AVERAGE BREAKING LOAD/STRENGTH			ELONGATION	OTHER COLOURS	NOTES	WWW.
				CLIMBING	LOWERING	IMPACT LOWER	STATIC RIGGING	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average				
■	DB		■	-	■	●	■	35kN 21000lbf						pelicanrope.com
■	DB		■	-	■	●	■	52kN 40000lbf						pelicanrope.com
■	DB		■	-	■	■	■	44.5kN 10000lbf						pelicanrope.com
■	DB		■	-	■	■	■	54.3kN 12200lbf						pelicanrope.com
■	DB		■	-	■	■	■	71.1kN 16000lbf						pelicanrope.com
■	DB		■	-	■	■	■	11.2kN 25000lbf						pelicanrope.com
-	32 KM	CI CE A NFPA-T		■	■	●	■	27kN 6066lbf		- 3%				pmirope.com
-	16 KM	CI. CE A NFPA-T ANSI BERRY		■	■	●	■	33.3kN 7480lbf		- 1%				pmirope.com
-	16 KM	CI. CE A ANSI NFPA-G		■	■	●	■	45.1kN 10145lbf		- 1%		Also in reflective, solid blue, black, red & OD		pmirope.com
■	16 KM	CI. CE A ANSI NFPA-G		■	■	●	■	44.5kN 10009lbf		3-4.4% 0.7%		CI=Classic Old Glory (shown) may cost more		pmirope.com
-	16 KM	CI CE A ANSI NFPA-G	■	●	■	●	■	69.1kN 16330lbf		3.6-4.8% 0.3%		Blue&Ylw colours=\$.2.30/ft		pmirope.com
-	16 KM	CI. NFPA-T		●	■	●	■	32.4kN 7291lbf		- 1.5%		Pit rope =White stiffer than EZbend. no data yet for 12.5mm version		pmirope.com
■	16 KM	CI NFPA-T ANSI BERRY		■	■	●	■	42.3kN 9521lbf		- 1.7%				pmirope.com
■	16 KM	ANSI. NFPA-G		■	■	●	■	46.4kN 10431lbf		- 1.3%				pmirope.com
-	40 KM	CI CE A ANSI NFPA-T		■	■	●	■	30.6kN 6871lbf		- 2.9%				pmirope.com
-	32 KM	CI NFPA		■	■	■	■	34.3kN 7703lbf		8.8% 2.5%		Cut resistant sheath		pmirope.com
-	32 KM	ANSI NFPA-T		●	■	-	■	32.2kN 7239lbf		1.44-2.2% 0.9%		Unicore =sheath bonded to core		pmirope.com
-	32 KM	ANSI NFPA-T		●	■	-	■	44.2kN 9944lbf		1.44-2.2% 2.1%		Unicore =sheath bonded to core		pmirope.com

x10% & rounded up. ■=Option. ●=OK but not ideal. SHEATH: DB=Double Braid, KM=KernMantle/Single Braid HB=Hollow Braid DS=Double Strand

Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot Currency conversion only	Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	CONSTRUCT
	Mountain Ape 12.7	ROCK'N ARB		£2.40 \$2.95 \$0.90 €0.00	12.7mm ½"	-	115g 8lb	Polyester Polyester	
	Mountain Ape 14	ROCK'N ARB		£3.10 \$3.80 \$1.16 €0.00	14mm ⅝"	-	155g 11lb	Polyester Polyester	
	Mountain Ape 16	ROCK'N ARB		£3.60 \$4.45 \$1.36 €4.20	16mm ⅝"	-	200g 13.5lb	Polyester Polyester	
	Amethyst 12	ROCK'N ARB		£2.65 \$3.25 \$1.00 €3.10	12mm ½"	-	103g 6.9lb	Polyester Polyester	
	Amethyst 16	ROCK'N ARB		£4.65 \$5.70 \$1.76 €5.35	16mm ⅝"	-	0g 0lb	Polyester Polyester	
	Arbor Plex 12	SAMSON		£2.00 \$2.45 \$0.80 €2.30	12mm ½"	3 sizes 12.7-18mm ½-¾"	101g 6.8lb	Polyprop/ Polyester -	
	Arbor Plex 16	SAMSON		£2.90 \$3.60 \$1.10 €2.75	16mm ⅝"	3 sizes 12.7-18mm ½-¾"	179g 12lb	Polyprop/ Polyester -	
	Arbor Plex 18	SAMSON		£4.15 \$5.15 \$1.60 €4.85	18mm ¾"	3 sizes 12.7-18mm ½-¾"	241g 16.2lb	Polyprop/ Polyester -	
	Nystron Coated 12	SAMSON		£3.00 \$3.70 \$1.15 €3.50	12mm ½"	13 sizes 9-48mm ⅜-2"	121g* 8lb	Polyester Nylon	
	Nystron Coated 14	SAMSON		£3.70 \$4.55 \$1.40 €4.30	14mm ⅝"	13 sizes 9-48mm ⅜-2"	156g* 10.5lb	Polyester Nylon	
	Nystron Coated 16	SAMSON		£4.30 \$5.35 \$1.65 €5.05	16mm ⅝"	13 sizes 9-48mm ⅜-2"	196g* 13.2lb	Polyester Nylon	
	Nystron Coated 18	SAMSON		£5.50 \$6.80 \$2.10 €6.40	18mm ¾"	13 sizes 9-48mm ⅜-2"	270g* 18.1lb	Polyester Nylon	
	StableBraid 12	SAMSON		£2.75 \$3.40 \$1.05 €3.20	12mm ½"	16 sizes 6-24mm ¼-1¼"	122g 8.2lb	Polyester Polyester	
	StableBraid 14	SAMSON		£3.15 \$3.90 \$1.20 €3.70	14mm ⅝"	16 sizes 6-24mm ¼-1¼"	164g 11lb	Polyester Polyester	
	StableBraid 16	SAMSON		£3.85 \$4.75 \$1.45 €4.45	16mm ⅝"	16 sizes 6-24mm ¼-1¼"	208g 14lb	Polyester Polyester	
	StableBraid 18	SAMSON		£4.90 \$6.05 \$1.85 €5.70	18mm ¾"	16 sizes 6-24mm ¼-1¼"	268g 18lb	Polyester Polyester	
	True Blue	SAMSON		£2.75 \$3.40 \$1.05 €3.20	12mm ½"		131g 8.8lb	Polyester -	
	Tech HTP 11	STERLING		£8.90 \$11.00 \$3.40 €10.35	11mm ⅞"	-	95g 6.4lb	Technora Polyester	

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ARBORIST RIGGING ROPES

OPTION	TREATED FIBRES ROUNDED SHEATH	SHEATH BRAID /PLAIT	LIFE SUPPORT STANDARDS (only for multi-role ropes)	HAND SPLICEABLE PRE-SPICED PRE-SEWN	SUITABLE FOR			MINIMUM/AVERAGE BREAKING LOAD/STRENGTH			ELONGATION		OTHER COLOURS	NOTES	WWW.
					CLIMBING	LOWERING	IMPACT LOWER	STATIC RIGGING	MBL Minimum Break Load Spliced Green	ABL Average Break Load Spliced Green	WLL Spliced Green *Average	@10% MBS @30% MBS @50% MBS @300lbf/136kg @540 lbf/245kg			
☐	DB			■	-	■	■	40.5kN 9095lbf	47.6 kN 10700lbf						rocknarbor.com
☐	DB			■	-	■	■	50.3 kN 11300lbf	59.2 kN 13300lbf						rocknarbor.com
☐	DB			■	-	■	■	70kN 15725lbf	82.3kN 18500lbf						rocknarbor.com
-	DB				●	■	●		39kN 8767lbf				Overload indicated by misaligned diagonal threads.		rocknarbor.com
-	12 HB			■	●	■	●	71kN 16000lbf							rocknarbor.com
-	12 HB			■	●	■	●	23.5kN 5291lbf	26.6kN 6000lbf	5.3kN 1200lbf	3%				samsonrope.com
-	12 HB			■	●	■	●		40kN 9000lbf	8kN 1800lbf	3%				samsonrope.com
-	12 HB			■	●	■	●		53kN 12000lbf	10.6kN 2400lbf	3%				samsonrope.com
■	DB			■	-	■	●	39.5kN 8900lbf	46.7kN 10500lbf		2.4%		*Wt with coating		samsonrope.com
■	DB			■	-	■	●	49.8kN 11200lbf	58.7kN 13200lbf		2.4%		* Wt with coating		samsonrope.com
■	DB			■	-	■	●	61.8kN 13900lbf	72.5kN 16300lbf		2.4%		*Wt with coating		samsonrope.com
■	DB			■	-	■	●	87kN 19600lbf	10.2kN 2300lbf		2.4%		*Wt with coating		samsonrope.com
☐	DB			■	-	■	■	39kN 8800lbf	46kN 10400lbf		1.1				samsonrope.com
☐	DB			■	-	■	■	50kN 11300lbf	59kN 13300lbf		1.1				samsonrope.com
☐	DB			■	-	■	■	61kN 13900lbf	72kN 16300lbf		1.1				samsonrope.com
☐	DB			■	-	■	■	76kN 17300lbf	90kN 20400lbf		1.1				samsonrope.com
-	12 HB			■	●	-	■		32kN 7300lbf	3.2kN 730lbf	2.6%				samsonrope.com
-	32 KM	NFPA ANSI		●	■	-	■	36kN 8090lbf			2.1%		Super-tough, cut & heat resistant tactical/rescue rope		sterlingrope.com

x10% & rounded up. ☐=Option. ●=OK but not ideal. SHEATH: DB=Double Braid, KM=KernMantle/Single Braid HB=Hollow Braid DS=Double Strand





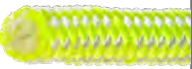

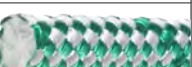







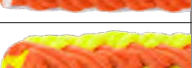



















Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot Currency conversion only	Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	CONSTRUCT
	Tech 11	STERLING		£8.50 \$10.00 \$3.30 €9.85	11mm 7/16"	-	88g 5.9lb	Technora Nylon	
	Atlas 13	STERLING		£3.90 \$4.90 \$1.50 €4.55	13mm 1/2"	-	118g 7.9lb	Polyester Nylon	
	Atlas 14	STERLING		£4.45 \$5.60 \$1.75 €5.20	14mm 9/16"	-	133g 8.9lb	Polyester Nylon	
	Atlas 16	STERLING		£5.30 \$6.70 \$2.05 €6.20	16mm 5/8"	-	202g 13.5lb	Polyester Nylon	
	Atlas 18	STERLING		£6.80 \$8.40 \$2.60 €7.90	18mm 3/4"	-	258kN 17.3lb	Polyester Nylon	
	Kraken 13	STERLING		£2.70 \$3.30 \$1.10 €3.10	12mm 1/2"	5 sizes 13-22mm 3/8-7/8"	130g 8.7lb	Polyester Polyester	
	Kraken 14	STERLING		£3.20 \$3.95 \$1.25 €3.70	14.3mm 9/16"	5 sizes 13-22mm 3/8-7/8"	173g 11.6lb	Polyester Polyester	
	Kraken 17	STERLING		£3.90 \$4.80 \$1.50 €4.50	17mm 5/8"	5 sizes 13-22mm 3/8-7/8"	221g 14.8lb	Polyester Polyester	
	Kraken 19	STERLING		£4.75 \$5.85 \$1.80 €5.50	19.1mm 3/4"	5 sizes 13-22mm 3/8-7/8"	275g 18.4lb	Polyester Polyester	
	HTP (Rig) 11	STERLING		£4.00 \$4.75 \$1.45 €4.60	11mm 7/16"	5 sizes 9-16mm 3/8-5/8"	97g 6.5lb	Polyester Polyester	
	HTP (Rig) 12	STERLING		£4.95 \$6.10 \$1.90 €5.75	12.5mm 1/2"	5 sizes 9-16mm 3/8-5/8"	119g 8lb	Polyester Polyester	
	HTP (Rig) 16	STERLING		£5.35 \$6.50 \$2.10 €6.20	16mm 5/8"	5 sizes 9-16mm 3/8-5/8"	186g 12.5lb	Polyester Polyester	
	Omega 12	STEIN		£3.05 \$3.75 \$1.20 €3.55	12mm 1/2"	-		Polyester Nylon	
	Omega 14	STEIN		£4.35 \$5.40 \$1.65 €5.05	14mm 9/16"	-		Polyester Nylon	
	Omega 16	STEIN		£4.90 \$6.10 \$1.90 €5.70	16mm 5/8"	-		Polyester Nylon	
	Omega 20	STEIN		£7.65 \$9.85 \$3.00 €9.25	20mm 3/4"	-		Polyester Nylon	
	Timber Evo 12.5	TENDON		£3.60 \$4.50 \$1.45 €4.15	12.5mm 1/2"	3 sizes 11-12.5mm 1/4-1 3/4"	104g 7lb	Polyester Nylon	
	Timber 15	TENDON		£4.50 \$5.20 \$1.60 €4.80	15mm 5/8"	-	174g 11.7lb	Polyester Nylon	

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ARBORIST RIGGING ROPES

CONSTRUCTION	SHEATH Braid / Plait	LIFE SUPPORT STANDARDS (only for multi-role ropes)	HAND SPliceABLE PRE-SPliced	SUITABLE FOR				MINIMUM/AVERAGE BREAKING LOAD/STRENGTH			ELONGATION	OTHER COLOURS	NOTES	WWW.
				CLIMBING	LOWERING	IMPACT LOWER	STATIC RIGGING	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average				
-	32 KM	NFPA ANSI		■	■	●	■	40.1kN 9014lbf			3.6%		cut & heat resistant greater stretch than HTP rope	sterlingrope.com
-	32 DB		■ ■	-	■	■	■	48kN 10800lbf 40kN 9000lbf	51kN 11500lbf		0.9% 4.1%			sterlingrope.com
-	32 DB	ANSI	■ ■	-	■	■	■	61.2kN 18000lbf 49kN 11050lbf	61kN 13750lbf		0.8% 4.5%			sterlingrope.com
-	32 DB		■ ■	-	■	■	■	80kN 18000lbf 67.8kN 15250lbf	86.3kN 19400lbf		0.4% 4.5%			sterlingrope.com
-	32 DB		■ ■	-	■	■	■	80.7kN 18147lbf	100kN 22480lbf		0.3% 4.3%			sterlingrope.com
■	24		■ ■	-	■	●	■	47.9kN 10750lbf	56.4kN 12650lbf	5.6kN 1265lbf	1.8%		Previously sold as Notch Kraken	sterlingrope.com
■	24		■ ■	-	■	●	■	56.6kN 12700lbf	66.4kN 14900lbf	6.6kN 1490lbf	1.8%			sterlingrope.com
■	24		■ ■	-	■	●	■	70kN 15700lbf	82.5kN 18500lbf	8.2kN 1850lbf	1.8%			sterlingrope.com
■	24		■ ■	-	■	●	■	29.2kN 20000lbf	104,8kN 23500lbf	10.5kN 2350lbf	1.8%			sterlingrope.com
-	32 DB	ANSI NFPA	■	●	■	-	●	30.5kN 6856lbf		6.1kN 1371lbf	4%			sterlingrope.com
-	32 DB	ANSI NFPA	■	●	■	-	■	40.4kN 9081lbf		8.1kN 1820lbf	2%			sterlingrope.com
-	32 DB	NFPA	■	-	■	-	■	57.8kN 12993lbf	53kN 12000lbf	11.6kN 2495lbf	2.8%		'RIG'=HTP in Black/Pink and White/Pink	sterlingrope.com
	32 KM		■ ■	●	■	■	■	34.4kN 7738lbf	36.3kN 8160lbf		2.4%		May also be 10mm version with red fleck	steininternational.com
	32 KM		■ ■	-	■	■	■	48.5kN 10900lbf	43.7kN 9824lbf		2.4%			steininternational.com
	32 KM		■ ■	-	■	■	■	55.9kN 12560lbf	49.8kN 11195lbf		2.4%			steininternational.com
	32 KM		■ ■	-	■	■	■	75.5kN 16950lbf	68.6kN 15421lbf		2.4%			steininternational.com
	24 DB	CE A		■	■	■	●	39kN 8598lbf			3%		Embedded RFID chip	mytendon.com
	24 DB	CE A		-	■	■	■	61kN 13713lb						mytendon.com

x10% & rounded up. □=Option. ●=OK but not ideal. SHEATH: DB=Double Braid, KM=KernMantle/Single Braid HB=Hollow Braid DS=Double Strand

Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot Currency conversion only	Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE
	Sirius 12	TEUFELBERGER		£2.35 \$3.50 \$1.00 €3.10	12mm ½"		103g 6.92lb	Polyester Polyester
	Sirius 14	TEUFELBERGER		£2.85 \$4.25 \$1.25 €3.80	14mm ⅝"		151g 10.15lb	Polyester Polyester
	Sirius 16	TEUFELBERGER		£3.25 \$5.10 \$1.50 €4.20	16mm ⅝"		185g 12.43lb	Polyester Polyester
	Sirius 18	TEUFELBERGER		£6.45 \$8.15 \$1.80 €7.50	15.9mm ⅝"		227g 15.26lb	Polyester Polyester
	Sirius 20	TEUFELBERGER		£7.65 \$9.65 \$2.05 €8.90	19.1mm ⅜"		285g 19.16lb	Polyester Polyester
	tREX 11	TEUFELBERGER		£4.20 \$5.00 \$1.55 €4.80	11.1mm ⅞"	6 sizes 9.5-22mm ⅜-⅞"	98.2g 6.6lb	Polyester -
	tREX 13	TEUFELBERGER		£4.95 \$5.90 \$1.80 €5.55	12.7mm ½"	6 sizes 9.5-22mm ⅜-⅞"	129.4g 8.7lb	Polyester -
	tREX 16	TEUFELBERGER		£6.75 \$7.50 \$2.30 €7.15	15.9mm ⅝"	6 sizes 9.5-22mm ⅜-⅞"	203.8g 13.7lb	Polyester -
	tREX 19	TEUFELBERGER		£8.00 \$9.50 \$2.95 €8.35	19.1mm ⅜"	6 sizes 9.5-22mm ⅜-⅞"	267.8g 18lb	Polyester -
	Sta-Set	TEUFELBERGER		£4.95 \$5.30 \$1.65 €5.75	12.7mm ½"	6 sizes 12.7-25.4mm ½-1"	150g 10.1lb	Polyester Polyester
	Sta-Set	TEUFELBERGER		£5.50 \$5.75 \$1.75 €6.40	14.3mm ⅝"	6 sizes 12.7-25.4mm ½-1"	177g 11.9lb	Polyester Polyester
	Sta-Set	TEUFELBERGER		£5.00 \$6.00 \$1.85 €5.80	15.9mm ⅝"	6 sizes 12.7-25.4mm ½-1"	253g 17lb	Polyester Polyester
	Sta-Set	TEUFELBERGER		£5.95 \$6.50 \$2.00 €6.90	19.1mm ⅜"	6 sizes 12.7-25.4mm ½-1"	352.6g 23.7lb	Polyester Polyester
	Double Esterlon	YALE CORDAGE		£3.50 \$3.20 \$1.00 €4.10	13mm ½"	9 sizes 6-24mm ¼-1⅝"	122g 7.8lbs	Polyester Polyester
	Double Esterlon	YALE CORDAGE		£4.00 \$4.20 \$1.30 €4.65	14mm ⅝"	9 sizes 6-24mm ¼-1⅝"	164g 9.6lb	Polyester Polyester
	Double Esterlon	YALE CORDAGE		£5.40 \$5.20 \$1.60 €6.25	16mm ⅝"	9 sizes 6-24mm ¼-1⅝"	208g 13.7lb	Polyester Polyester
	Double Esterlon	YALE CORDAGE		£5.80 \$6.20 \$1.90 €6.75	19mm ¾"	9 sizes 6-24mm ¼-1⅝"	268g 16.7lb	Polyester Polyester

COST: £/\$/€ = Currency Conversion ONLY exc eyes unless shown in NOTES. INC local taxes/VAT, m/ft, price may be derived from shortest length sold

ARBORIST RIGGING ROPES

CONSTRUCTION	SHEATH Braid / Plait	LIFE SUPPORT STANDARDS (only for multi-role ropes)	HAND SPliceABLE PRE-SEWN	SUITABLE FOR				MINIMUM/AVERAGE BREAKING LOAD/STRENGTH			ELONGATION	OTHER COLOURS	NOTES	WWW.
				CLIMBING	LOWERING	IMPACT LOWER	STATIC RIGGING	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average				
■	32 DB	CE	■ ■	●	■	■	■	30 35kN 6740lbf 7860lbf						teufelberger.com
■	32 DB	CE	■ ■	●	■	■	■	44.2 52kN 9930lbf 11680lbf						teufelberger.com
■	32 DB	CE	■ ■	●	■	■	■	53.5 63kN 12000lbf 14160lbf						teufelberger.com
■	32 DB	CE	■ ■	●	●	■	■	65.4 66kN 14700lbf 17300lbf					designed primarily for whoopie slings	teufelberger.com
■	32 DB	CE	■ ■	●	●	■	■	91kN 20500lbf					designed primarily for whoopie slings	teufelberger.com
■	12 HB		■ ■	-	■	■	■	30 34kN 6740lbf 7640lbf						teufelberger.com
■	12 HB		■ ■	-	■	■	■	39 44kN 8765lbf 9890lbf						teufelberger.com
■	12 HB		■ ■	-	■	■	■	59 66kN 13260lbf 14835lbf						teufelberger.com
■	12 HB		■ ■	-	■	■	■	81 91kN 18205lbf 20455lbf						teufelberger.com
■	24 DB		■ ■	-	■	■	■	32 37kN 7190lbf 8310lbf						teufelberger.com
■	24 DB		■ ■	-	■	■	■	47 42.2kN 10566lbf 9500lbf						teufelberger.com
■	24 DB		■ ■	-	■	■	■	55 65kN 12360lbf 14610lbf						teufelberger.com
■	24 DB		■ ■	-	■	■	■	74 87kN 16630lbf 19550lbf						teufelberger.com
□	24 DB		■ ■	-	■	■	■	43kN 9720lbf	48kN 10800lbf	9kN 2160lbf				yalecordage.com
□	24 DB		■ ■	-	■	■	■	53kN 11961lbf	59kN 13290lbf	11kN 2658lbf				yalecordage.com
□	24 DB		■ ■	-	■	■	■	68kN 15300lbf	75kN 17000lbf	15kN 3400lbf				yalecordage.com
□	24 DB		■ ■	-	■	■	■	83kN 18720lbf	92kN 20800lbf	18kN 4160lbf				yalecordage.com

x10% & rounded up. □=Option. ●=OK but not ideal. SHEATH: DB=Double Braid, KM=KernMantle/Single Braid HB=Hollow Braid DS=Double Strand

Images NOT to Scale	MODEL & Ø VARIANT	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot Currency conversion only	Ø mm Inches"	Other Ø in series	WEIGHT g/m lb/100'	MATERIALS: SHEATH CORE	CONSTRUCT
	Optimus 10	YALE CORDAGE		£4.75 \$6.00 \$1.80 €5.55	10mm 5/16"	-	00g 4lb	Polyester -	
	Optimus 13	YALE CORDAGE		£3.10 \$3.90 \$1.20 €3.60	13mm 1/2"	-	00g 9.2lb	Polyester -	
	Optimus 16	YALE CORDAGE		£3.90 \$4.90 \$1.50 €4.55	16mm 5/8"	-	00g 11.7lb	Polyester -	
	Optimus 19	YALE CORDAGE		£5.20 \$6.55 \$2.00 €6.05	19mm 3/4"	-	00g 16lb	Polyester -	
	Optimus 22	YALE CORDAGE		£4.75 \$6.00 \$1.80 €5.55	22mm 7/8"	-	00g 25lb	Polyester -	
	Polydyne 12	YALE CORDAGE		£3.10 \$3.90 \$1.20 €3.60	12mm 1/2"	14 sizes 6-36mm 1/4-1 1/2"	113g 7.6lb	Polyester Nylon	
	Polydyne 14	YALE CORDAGE		£4.15 \$5.25 \$1.60 €4.85	14mm 9/16"	14 sizes 6-36mm 1/4-1 1/2"	144g 9.7lb	Polyester Nylon	
	Polydyne 16	YALE CORDAGE		£4.65 \$5.90 \$1.80 €5.45	16mm 5/8"	14 sizes 6-36mm 1/4-1 1/2"	198g 13.3lb	Polyester Nylon	
	Polydyne 18	YALE CORDAGE		£5.95 \$7.50 \$2.30 €6.95	18mm 3/4"	14 sizes 6-36mm 1/4-1 1/2"	250g 16.8lb	Polyester Nylon	
	Portland Braid 13	YALE CORDAGE		£4.00 \$4.90 \$1.50 €4.60	13mm 1/2"	18 sizes 6-63mm 1/4-2 5/8"	118g 7.9lb	Polyester Polyester	
	Portland Braid 14	YALE CORDAGE		£4.60 \$5.65 \$1.75 €5.30	14mm 9/16"	18 sizes 6-63mm 1/4-2 5/8"	149g 10lb	Polyester Polyester	
	Portland Braid 16	YALE CORDAGE		£5.10 \$6.45 \$2.00 €5.95	16mm 5/8"	18 sizes 6-63mm 1/4-2 5/8"	194g 13lb	Polyester Polyester	
	Portland Braid 18	YALE CORDAGE		£6.00 \$7.60 \$2.35 €7.00	19mm 3/4"	18 sizes 6-63mm 1/4-2 5/8"	244g 16.4lb	Polyester Polyester	
	Yalex 13	YALE CORDAGE		£2.60 \$3.20 \$1.00 €3.00	13mm 1/2"	17 sizes 6-50mm 1/4-2"	125g 0lb	Polyester -	
	Yalex 14	YALE CORDAGE		£2.95 \$3.60 \$1.10 €3.40	14mm 9/16"	17 sizes 6-50mm 1/4-2"	153g 0lb	Polyester -	
	Yalex 16	YALE CORDAGE		£3.40 \$4.20 \$1.30 €3.95	16mm 5/8"	17 sizes 6-50mm 1/4-2"	173g 0lb	Polyester -	
	Yalex 18	YALE CORDAGE		£4.75 \$6.00 \$1.80 €5.55	19mm 3/4"	17 sizes 6-50mm 1/4-2"	231g 0lb	Polyester -	

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ARBORIST RIGGING ROPES

CONSTRUCTION	SHEATH Braid / Plait	LIFE SUPPORT STANDARDS (only for multi-role ropes)	HAND SPliceABLE PRE-SEWN	SUITABLE FOR				MINIMUM/AVERAGE BREAKING LOAD/STRENGTH			ELONGATION	OTHER COLOURS	NOTES	WWW.
				CLIMBING	LOWERING	IMPACT LOWER	STATIC RIGGING	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average				
■	12 HB		■	●	■	-	■	24kN 5400lbf	26.7kN 6000lbf	5.3kN 1200lbf	1%			yalecordage.com
■	12 HB		■	-	■	-	■	54kN 12150lbf	60kN 13500lbf	12kN 2700lbf	1%			yalecordage.com
■	12 HB		■	-	■	-	■	00kN 17100lbf	00kN 19000lbf	17kN 3800lbf	1%			yalecordage.com
■	12 HB		■	-	■	-	■	100kN 22500lbf	111.2kN 25000lbf	22.2kN 5000lbf	1%			yalecordage.com
■	12 HB		■	-	■	-	■	144.1kN 32400lbf	160.1kN 36000lbf	32kN 7200lbf	1%			yalecordage.com
	24 DB		■ ■	-	■	■	-	44kN 9900lbf	49kN 11000lbf	9.8kN 2200lbf	3%			yalecordage.com
	24 DB		■ ■	-	■	■	-	60kN 13500lbf	66.7kN 15000lbf	13.3kN 3000lbf	3%			yalecordage.com
	24 DB		■ ■	-	■	■	-	75.7kN 17010lbf	84kN 18900lbf	17kN 3780lbf	3%			yalecordage.com
	24 DB		■ ■	-	■	■	-	104kN 23400lbf	115.7kN 26000lbf	23.1kN 5200lbf	3%			yalecordage.com
□	32 DB			-	■	-	■	44.5kN 10000lbf	40kN 9000lbf	8.9kN 2000lbf	1.1%			yalecordage.com
□	32 DB			-	■	-	■	55.4kN 12450lbf	49.8kN 11205lbf	11kN 2490lbf	1.1%			yalecordage.com
□	32 DB			-	■	-	■	67.5kN 15180lbf	60.8kN 13662lbf	13.5kN 3036lbf	1.1%			yalecordage.com
□	32 DB			-	■	-	■	84kN 18900lbf	75.7kN 17010lbf	16.8kN 3780lbf	1.1%			yalecordage.com
■	12 HB		■	-	■	-	■	61.5kN 13833lbf	68.4kN 15370lbf	13.7kN 3074lbf	1%			yalecordage.com
■	12 HB		■	-	■	-	■	75.5kN 16974lbf	83.4kN 18860lbf	16.8kN 3772lbf	1%			yalecordage.com
■	12 SB		■	-	■	-	■	83.7kN 18810lbf	93kN 20900lbf	18.6kN 4180lbf	1%			yalecordage.com
■	12 HB		■	-	■	-	■	108kN 24300lbf	120.1kN 27000lbf	24kN 5400lbf	1%			yalecordage.com

x10% & rounded up. □=Option. ●=OK but not ideal. SHEATH: DB=Double Braid, KM=KernMantle/Single Braid HB=Hollow Braid DS=Double Strand

UPDATED March '24

ARBORIST climbing

PRUSIK/HITCH CORD

NB: PRICES BEING UPDATED Q2 '24

Probably the most misspelled word in climbing history the prusik is a hitch used for ascending, arresting and positioning. For many, the term 'Prusik' is just generic and these are now often referred to as Hitch cords because the hitch actually being used could be any number of variants:

- Klemheist
- Schwabisch
- Valdotrain Tresse
- Blakes Hitch
- Distal Hitch
- Michoacan
- Machard Tresse
- Tautline Hitch
- Bachman

They are often referred to as a 'knot' but are a hitch because they only function properly when loaded. With no weight applied they can be easily slid up or down a rope with holding power determined by the number of 'wraps' as well as the strength and relative diameters of the cord and main rope. It's highly likely that some type of grabbing hitch has been in use for centuries but since there is no firm evidence, its modern introduction is credited to mountaineer Karl Prusik in 1931. Although it was introduced as an ascending knot on climbing rope it has been used in arborism (has that term taken off yet?) from the get-go. In rescue it is most often used as a fall arrest hitch and for progress capture in pulley systems so tends to require at least three wraps rather than the traditional two wraps. Arborists too seem to have settled on three wraps as the norm but personal preference and applied or potential loadings will have a bearing on how many wraps you decide to use along with some trial and error to ensure that it actually works for your particular application.

Your climbing hitch is now more likely to have a sewn or spliced eye at each end than be a traditional circular loop. When buying your own lengths you either splice your eyes/loop or join the ends with a double or triple fisherman's. A number of cords are ONLY available as manufactured lengths rather than off the roll. Pre-made lengths can be anywhere between 13cm/5" to well over a metre/3ft. The average for an eye to/& eye length is around 75cm/30". There isn't actually a specific standard for arborist prusik cord even though it is considered to be PPE and should be CE marked in Europe so the closest appropriate standards are either for accessory cord (EN564 which has to



be less than 10mm or it's classed as a rope), slings (EN566) or maybe even EN354 which is fall arrest lanyards that don't incorporate an energy absorbing element so are more accurately restraint/work positioning which could describe hitch cord. If they meet any of these as a cord or sewn/spliced item they are marked with a CE in our tables. Some manufacturers including Liros and Donaghys would prefer you opt for sewn items that meet EN566 (slings). 'Prusik cord' may infer its use as an ascending hitch like the Bluewater Dynamic Prusik below, but, not only are there plenty of other friction hitches in common use, there are a host of other applications including pulley systems, control lines and rigging. The traditional prusik hitch is created by wrapping a loop of cord through itself after passing (or wrapping) it around a standing rope. It is made using cord or small diameter rope that has been formed into an endless loop/sling or an eye-to-eye or double-ended sling. Some, including

Jeff Jepson, also refer to these as 'double eye split tails'. It is generally preferable for

hitch cord to be smaller in diameter than the rope onto which it is operating. However, in the arborist world, double eye or eye-to-eye or eye & eye slings are often used on like-sized ropes. In the old days it used to be like-sized laid rope on laid rope instead of the present day kernmantle or braided ropes and some still swear by this. Most eyes have moved towards stitched/sewn as the strongest option but they are much bulkier than a spliced eye.

When considering diameters remember that for climbing, arborists will only ever be using their personal hitch with a single bodyweight whereas in rigging, emergency use and rescue use the prusik may be loaded far beyond a single bodyweight. Consequently, optimum load-holding is essential and this usually requires more wraps and optimum combinations of cord to main rope in terms of diameter and materials. These factors will vary from rope to rope and even with rope colours as dyes and coatings affect the load-holding ability of different combinations. Test your own combination of rope type and diameters before using in anger.

MATERIALS & CORD PROPERTIES

The cord used to create a hitch has evolved over the years into a specialist item and it's no longer acceptable to grab any old scrap from your chainsaw's discarded pull-cord to create a hitch. Tales of mountaineers and escaping pilots improvising with their boot laces will spur you on to continue what you were about to try because your cord is loads thicker than a bootlace but take it from me, some bone-fide hitch cord with 'prusik/hitch cord' written on the label will be much, much safer and easier to use. And don't think that all climber's accessory cord will do. They are often indistinguishable from dedicated prusik cord but with regular nylon sheath and core their

capacity to withstand the heat build up and wear associated with protracted rope-on rope contact will quickly show in your rope and in your wallet. There is no question that the strongest hitch cord is that which contains the specialist fibres and their derivatives - Aramid/Kevlar/Technora, Spectra/Dyneema and Vectran etc. Not only do they improve wear and heat resistance they also withstand chemical and acid contamination far, far better than standard polyester and in particular, nylon. Heat resistance for Technora (800F) and Vectran (620F) is much greater than Nylon (420F) and Polyester (480F) but it is a lot more expensive. Some cords in this list are over **£12./\$16** a metre while the cheapest (non-heat resistant) cord is around **99p/\$1.50 /m**. Back when you only saw Kevlar on sailing yachts we were often warned to avoid them because they were weak when knotted ie.. their strength reduced considerably when bent around a tight radius.

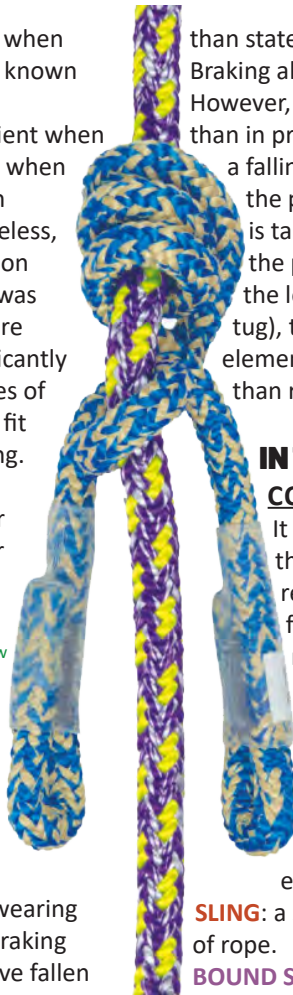
Nothing new there - all rope is significantly weaker when wrapped around a tight radius and we have always known that the knot is a particular weak point. But there was talk of the fibres not being very resilient when it came to a regular bending cycle. Quite surprising when you consider how much stronger these fibres are in tensile than a regular nylon and polyester. Nevertheless, testing 20 years ago indicated that strength reduction in a knot using Aramid, Spectra and Vectran fibres was indeed greater than in equivalent nylon and we were all a bit wary. Luckily, things have progressed significantly and with all manufacturers now using cunning mixes of specialist fibres and testing to ensure that they are fit for purpose we're all a lot happier and more trusting. In fact, the bigger problem might now be that the specialist fibre cords are actually tougher than your main rope and it is therefore your main rope rather than your prusik that is more likely to fail in the event of a high load 'dynamic event'.

BRAKING

We have differentiated use into CLIMBING, BRAKING and HEAT RESISTANCE. All of the cords listed can be used for climbing/ascending in the usual way and of course the myriad of nylon climber accessory cords not listed here may also work adequately. However, as already mentioned, protracted professional use demands a more hardwearing construction and this is particularly the case with braking operations. Traditional braking actions that may have fallen to prusiks are now invariably handled by specialist hardware like Porta Wraps or descenders so the kind of dynamic load arrest that still sees prusiks being used in Rescue for secondary belaying actions are not widely used by arborists. But they are used and nothing stresses your cords and ropes like trying to slow or stop a moving heavy weight by gripping a rope with another rope. There is significant heat build up whenever rope

Be wary of holding onto your prusik cord too long - it takes more abuse than any other part of your safety equipment and you may be lucky to still have even 50% of its original strength when you finally retire it!

Right: FTC TREE's Phoenix cord has now been replaced by the Neon and Argon



rubs across rope such as occurs in regular prusiking/ascending and this will ALWAYS cause melting and degradation of surface rope fibres to some degree. For rock climbers or mountaineers using prusiks relatively infrequently and/or over short distances this heat build up and wear is not too much of a concern but for arborists spending all day sliding a prusik hitch up and down a rope, wear can be significant. This is part of the reason that in the pre-technical ropes era most prusiks were composed of the same 12mm (1/2") 3-strand or multiplait as the main rope. In contrast, tougher, modern prusiks are ideally around 60%

the diameter of the rope they are braking on eg. 6mm cord on 9-10mm rope, 7mm cord on 10-10.5mm rope, 8mm cord on 11mm rope and 9mm cord on 12mm or 1/2" rope.

NB: the EN standard for accessory cord only records whole figures - some cord may be 0.5mm larger

than stated.

Braking also refers to progress capture in pulley systems. However, the loading in a pulley system is significantly less than in prusiks used on a rope connected directly to a load or a falling load in the case of belaying. Depending on where the prusik is located in a pulley system, most of the load is taken in the first two or three lengths of rope between the pulleys so that by the time the prusik kicks in to hold the load (while you reset your pulley system for another tug), the load is three, four or five times less. So this element of 'Braking' rarely, if ever loads the prusik more than regular climbing activities.

IN THE FOLLOWING TABLES:

COST is given per metre or US\$ per foot in brackets. It is also shown in green as a sewn/spliced item with the size listed in the 'NOTES'. Costs are usually the full retail price so you can often expect to pay less. We focus on US\$, UK£ and €Euro but currencies vary as not all ropes are available in all countries. To tie your own prusik loop you'll need double the ultimate length plus about 60cm/2ft for knots.

OFF-REEL: available in long lengths off the reel

1xEYE: Has one sewn or spliced eye on one end only

2xEYES: or EYEtoEYE or SPLIT-TAIL had an eye at each end of a single length of rope/cord.

SLING: a spliced or more usually sewn joint in an endless loop of rope.

BOUND SLING: An endless sling with a sewn joint but with a movable collar or plastic sleeve that can constrict the eye size at one end to help keep it tight on its connector.

•**DIAMETER:** rope diameter conversions from inches to millimetres are a minefield with every company quoting something different because they are generally rounding down or rounding up. There are of course, precise conversion figures for each size (mm x 0.03937 = inches) but some of them don't

really roll off the tongue as you can see from the table below so if you notice a difference in our tables it might be where the manufacturer has converted differently and since we don't know whether they are working from inches or millimetres it's best to quote what they quote even though it means we may have both 9 and 10mm for instance quoted as being 3/8" - so long as you know that it isn't our poor mathematics. In reality 3/8" is closest to 9.5mm so it could quite reasonably be used for both 9 and 10mm ropes. Where only metric OR imperial is quoted you can check our handy conversion table.

A solid circle ● in the 'SUITABLE FOR' columns indicates that the cord is not totally suited to that role but it's OK. In the case of the HEAT-RESIST column you will only see the solid square for cord that is either predominantly sheathed in Technora or similar specialist fibre or there are such fibres mixed into not only the sheath but also the core. Any cord with a circle in this column will still be a very good bet for durability but those with a solid square will be the best in terms of heat-resistance. Don't forget though, this feature alone might not be your key requirement - you may be after a lighter more supple rope or simply less expensive as an initial outlay.

CONSTRUCTION: we show **KM** for Kernmantle, **DB** for Double Braid and **HB** for Hollow Braid or simply the thread count for some single braid cords. It used to be the case that Hollowbraid ropes were the weakest and least heat-resistant of cords but with the advent of Aramid/Technora and Dyneema fibres there are now a number of hollowbraids that are as tough as wire rope! We have generally only shown cords that are actively marketed as arborist cord but there are a number of specialist cords used by firefighters and rescuers that cross the divide if you've got the

spondooleys. You can already see from this list how many have incorporated fibres that were once the sole domain of fire-retardant ropes and these are not only heat-resistant they are extremely abrasion-resistant. However, they are virtually always a mixture of fibres because by themselves, some materials don't exhibit all of the necessary properties - for instance Kevlar has traditionally performed poorly in a knot and along with Dyneema couldn't be dyed so colours were introduced using an additional nylon or polyester thread. Where there are two fibres in the construction, The higher proportion fiber is listed first

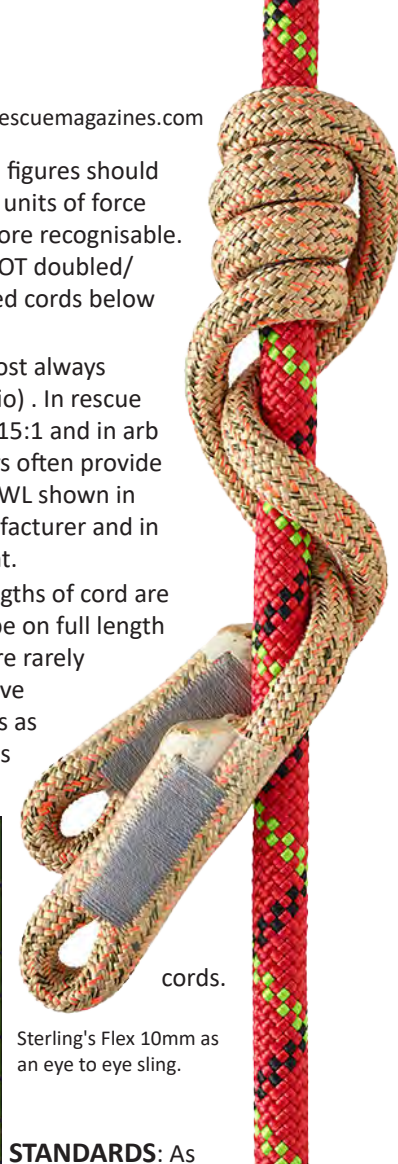
MBL/ABL: As with all rope, some manufacturers only quote Average Breaking Load or ABL shown in **burnt orange**. We use the Minimum Breaking Load or MBL (or MBS where S

=Strength) shown in black. These figures should more accurately be kN and lbf as units of force but the kg and lb equivalent is more recognisable. Figures are for tensile strength NOT doubled/basket. NB: We have NOT included cords below 8kN/800kg/1800 lb in strength.

SWL or safe working load is almost always between 4 & 15% (4:1 to 15:1 ratio) . In rescue it tends to be between 10:1 and 15:1 and in arb circles is often 7:1. Manufacturers often provide their own interpretation so the SWL shown in black is that quoted by the manufacturer and in **burnt orange** is the 7:1 equivalent.

ELONGATION for such short lengths of cord are not the consideration they may be on full length climbing and rigging ropes and are rarely quoted by manufacturers. We have therefore not included this unless as a special note such as Bluewater's dynamic rather than low-stretch

TRUE DIAMETER CONVERSIONS			
mm	Precise inches	Closest Specific Fraction	Generic Fraction
5	0.1969"	13/64	3/16
6	0.2362"	15/64"	just under 1/4"
6.5	0.25"	1/4"	1/4"
7	0.2756"	9/32"	just over 1/4"
7.5	0.2952"	19/64"	even more than 1/4"
8	0.315"	5/16"	5/16"
9	0.3543"	23/64"	just under 3/8"
9.5	0.375"	3/8"	3/8"
10	0.3937"	25/64"	just over 3/8"
11	0.4331"	7/16"	7/16"
12	0.4724"	15/32	just under 1/2"
12.7	0.4999"	1/2"	1/2"
13	0.5118"	33/64"	just over 1/2"



cords.

Sterling's Flex 10mm as an eye to eye sling.

STANDARDS: As usual there are several at play with the more specific European **CE** standards - EN 354 as a lanyard **EN 566** as a climbing sling and **EN 795 Type B** as portable anchor 'device'. Not yet a specific standard as prusik cord!? We've just left it as CE certified in black.

CI, BERRY, ANSI and NFPA are all US 'standards' or compliance. **BERRY** is related to sourcing of all materials in the manufacture of the product and is most often associated with military products. **CI** is Cordage Institute and is a 'prestige' mark. **NFPA** is for the Fire-Rescue industry but is useful to the work sector because it demands high load capabilities. Quite expensive to attain though so unless the arb company also caters to rescue it may not be worth the cost. **ANSI** is the US industrial standard and more broadly applied than CE but in our sector indicates suitability to arborist work. **UKCA** is a UK-only pseudo standard as a separation from European CE and **EAC** pertains to eastern Europe and Russia. UIAA is the original rope-equipment prestige mark and relates to mountaineering equipment . **We have not included the many rigging prusiks not certified for life-support/climbing activities.**



Introducing

11mm Pro-G

Strong - Supple - Predictable

BlueWater's 11mm NFPA-G rated low elongation line features:

- < 48 carrier sheath
- < Designed to run well in all devices
- < Whopping 9,447 lbf. published tensile strength
- < Polyester sheath with Nylon core
- < Available in 2 highly visible contrasting colors

Diameter:	11mm
Tensile Strength:	9,447 lbf. (42 kN)
Grams Per Meter:	93

Elongation








@ 300 lbf. = 2.6%
@ 600 lbf. = 4.7%
@ 1000 lbf. = 6.8%



209 Lovvorn Rd, Carrollton, GA 30117
Tel: (770) 834-7515 > (800) 533-7673
www.BlueWaterRopes.com
email: Info@BlueWaterRopes.com

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	STATE OFF-REEL 1x EYE 2xEYES SLING BOUND LOOP	SEWN/SPLICED EYE COSTS			SIZE Ø mm	WEIGHT g/m lb/100' ITEM	
						COST MANUFACTURED LENGTHS £\$€ = Currency Conversion ONLY Specific Item Weight					
	Friction 8	ALLGEAR		£5.15 \$6.55 \$2.00 €5.95	 	66cm/26" £22 \$28 €25 71cm/28" £23 \$29 €26 76cm/30" £24 \$30 €27 81cm/32" £25 \$31 €28	8mm 5/16"	120g 8lb	Poly		
	Friction 10	ALLGEAR		£5.35 \$6.80 \$2.10 €6.15	 	66cm/26" £24 \$30 €27 71cm/28" £25 \$31 €28 76cm/30" £26 \$32 €29 81cm/32" £27 \$35 €30	10mm 25/64"	149g 10lb	Poly		
	TVP 8	ALLGEAR		£6.50 \$8.20 \$2.50 €7.50	 	66cm/26" £30 \$38 €35 71cm/28" £31 \$39 €36 81cm/32" £33 \$42 €38	8mm 5/16"	89g 6.1lb	Tech		
	TVP 9.5	ALLGEAR		£7.50 \$9.50 \$3.00 €8.50	 	66cm/26" £31 \$39 €36 81cm/32" £36 \$45 €41	9.5mm 3/8"	116g 7.8lb	Tech		
	Prusik 8	ALLGEAR		£6.50 \$8.10 \$2.50 €7.40		-	8mm 5/16"	42g 2.8lb	Tw		
	XS cord 9 XS9.1	ARBPRO		£4.30 \$7.90 \$2.40 €8.25	 	50cm/20" £26 \$32 €29 60cm/24" £27 \$33 €30 70cm/28" £28 \$34 €31 120cm/47" £31 \$39 €35	9.1mm 3/8"	65g 4.4lb	Pol		
	Volcano 8 BV08	BEAL		- - - -		70cm/28" £35 \$40 €34 90cm/35" £36 \$42 €35	8mm 5/16"	70g 2.5oz	Poly		
	Volcano 10 BV10	BEAL		- - - -		70cm/28" £37 \$44 €36 90cm/35" £38 \$46 €37	10mm 25/64"	n/a	Poly		
	Volcano 12 BV12	BEAL		- - - -		70cm/28" £40 \$48 €39 90cm/35" £42 \$50 €41	12mm 1/2"	n/a	Poly		
	Hybrid 7.5	BLUEWATER		£1.00 \$4.00 \$1.25 €1.15		-	7.5mm 5/16"	40g 2.7lb	Tech		
	VT 7	BLUEWATER		- - - -		84cm/33" £27 \$30 €29	7mm 9/32"	98g 3.5oz			
	VT 8	BLUEWATER		- - - -		84cm/33" £31 \$30/34 €33	8mm 5/16"	n/a			
	Dynamic Prusik 6.5	BLUEWATER		£1.60 \$2.00 \$0.65 €1.80	 	28cm/11" £11 \$13 €12 51cm/20" £11 \$14 €13 112cm/44" £13 \$16 €15 173cm/68" £13 \$17 €16	6.5mm 1/4"	26.3g 1oz			
	Dynamic Prusik 7	BLUEWATER		£1.80 \$2.25 \$0.70 €2.05	 	46cm/18" £13 \$16 €15 61cm/24" £13 \$17 €16 173cm/68" £17 \$21 €20	7mm 9/32"	35g 1.24oz			
	Dynamic Prusik 8	BLUEWATER		£1.95 \$2.45 \$0.75 €2.25	 	46cm/18" £12 \$15 €14 61cm/24" £15 \$18 €17 76cm/30" £16 \$20 €19	8mm 5/16"	39g 1.4oz			
	Prusik 6 293011/2	CMC		£2.05 \$2.60 \$0.80 €2.35		-	6mm 1/4"	27.9g 1.87lb			

















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CONSTRUCTION			STANDARDS	SUITABLE FOR			MINIMUM BREAKING LOAD		SWL/WLL	OTHER COLOURS			NOTES	WWW.
MATERIALS: SHEATH CORE	SHEATH BRAID/ PLAIT	HAND SPLICEABLE PRE-SPLICED PRE-SEWN	STANDARDS	CLIMBING	BRAKING	HEAT RESIST	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average	OTHER COLOURS			NOTES	WWW.
Polyester/Technora Vectran	DB	■	ANSI	■	■	■	-	24kN 5400lbf	186kg 410lb					allgearinc.com
Polyester/Technora Vectran	DB	■	ANSI	■	■	■	-	28kN 6300lbf	186kg 410lb					allgearinc.com
Technora/Vectran/ Polyester	16	■ ■	ANSI	■	■	■	-	27.5kN 6200lbf	281kg 620lb					allgearinc.com
Technora/Vectran/ Polyester	12	■ ■	ANSI	■	■	■	-	44.48kN 10000lbf	454kg 1000lb					allgearinc.com
Polyester Aramid (Kevlar)	32 KM	■ ■	ANSI	■	■	●	24kN 5400lbf		245kg 540lb					allgearinc.com
Polyester/Kevlar Polyester	24 DB	■ ■	ANSI	■	■	●	22kN 4945lbf		230kg 506lb			also 65, 75, 80 & 85cm		arbpro.it
Polyester/Aramid Nylon	KM	■	ANSI	■	■	●	18kN 4046lbf							bealplanet.com
Polyester/Aramid Nylon	KM	■	ANSI	■	■	●	22kN 4945lbf							bealplanet.com
Polyester/Aramid Nylon	KM	■	ANSI	■	■	●	18kN 4046lbf							bealplanet.com
Technora/Polyester Nylon	32 KM	■	NFPA	■	■		19.7kN 4428lbf							bluewaterropes.com
Technora Polyester	24 DB	■ ■	ANSI	■	■	■	11.12kN 2500lbf							bluewaterropes.com
Technora Polyester	24 DB	■ ■	ANSI	■	■	■	19.5kN 4400lbf					black=\$34		bluewaterropes.com
Nylon Nylon	32 KM	■	-	■	■		12.4 9.3kN 2800lbf 2100lbf					19.4% elongation @300lbs		bluewaterropes.com
Nylon Nylon	32 KM	■	-	■	■		17.7 10.4kN 4000lbf 2360lbf					17.9% elongation @300lbs		bluewaterropes.com
Nylon Nylon	32 KM	■	-	■	■		17.7 11.1kN 4000lbf 2500lbf					19.8% elongation @ 300lbs		bluewaterropes.com
Polyester Polyester	12	■	-	■	■		8kN 1798lbf							cmcpro.com

Weight shown in kg/m, price shown is a proportion of shortest length x10% & rounded up. SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST	STATE	SEWN/SPLICED EYE COSTS	SIZE	WEIGHT	
				COST per Metre /3.28ft US\$ per Foot €2.70	OFF-REEL 1x EYE 2xEYES SLING BOUND LOOP	COST MANUFACTURED LENGTHS £\$€ = Currency Conversion ONLY Specific Item Weight	Ø mm	WEIGHT g/m lb/100' ITEM	
	Prusik 7 293017/37	CMC		£2.40 \$2.95 \$0.90 €2.70	■	-	7mm 5/32"	75g 5lb	N
	Prusik 8 293018/38	CMC		£3.30 \$2.70 \$1.00 €2.70	■	-	8mm 5/16"	74g 5lb	
	Prusik 9 293039	CMC		£2.95 \$3.75 \$1.15 €3.40	■	-	9mm 3/8"	89g 6.1lb	
	Aztek Prusik 6 295001/2/12	CMC		- - -	■	22.8cm/9" £00 \$16 €00 106.6cm/42" £00 \$24 €00	6mm 1/4"	55.8g 0oz	
	Sewn/Bound Loop Prusik 293083/86/383/386	CMC		- - -	■	46cm/18" £00 \$21 €00 63.5cm/25" £00 \$21 €00		48/62g 1.7/2.2oz	
	Phoenix 8	COURANT		£0 \$4.85 \$1.49 €0	■	65cm/00" £00 \$00 €00 70cm/00" £00 \$00 €00 75cm/00" £00 \$00 €00 80cm/00" £00 \$00 €00 85cm/00" £00 \$00 €00 90cm/00" £00 \$00 €00	8mm 5/16"	0g 0lb	Poly
	Phoenix Elipse 8 1of2	COURANT		- - -	■	40cm/00" £00 \$00 €00 60cm/00" £00 \$00 €00 80cm/00" £00 \$00 €00	8mm 5/16"	0g 0lb	Poly
	Phoenix Elipse 8 2of2	COURANT		- - -	■	120cm/00" £00 \$00 €00 150cm/00" £00 \$00 €00 200cm/00" £00 \$00 €00	8mm 5/16"	0g 0lb	Poly
	Phoenix 10	COURANT		£0 \$5.50 \$1.70 €0	■	65cm/00" £00 \$00 €00 70cm/00" £00 \$00 €00 75cm/00" £00 \$00 €00 80cm/00" £00 \$00 €00 85cm/00" £00 \$00 €00 90cm/00" £00 \$00 €00	10mm 25/64"	0g 0lb	Poly
	Armadillo 10 CT2277	COUSIN-TRETEC		£6.15 \$7.80 \$2.45 €7.05	■	70cm/28" £00 \$00 €00 90cm/35" £00 \$00 €00	10mm 5/16"	59g 3.9lb	Poly
	Armor-Prus Poly 8	DONAGHYS		£0 \$11.40 \$3.50 €0	■	70cm/28" £00 \$00 €39 90cm/35" £00 \$00 €41	8mm 5/16"	69g 4.6lb	Poly
	Armor-Prus Poly 10	DONAGHYS		£0 \$0 \$0 €0	■	00cm/00" £00 \$00 €00 00cm/00" £00 \$00 €00	10mm 25/64"	78g 5.25lb	Poly
	Armor-Prus Performance 8	DONAGHYS		£0 \$13.00 \$4.00 €0	■	00cm/00" £00 \$00 €00 00cm/00" £00 \$00 €00	8mm 5/16"	69g 4.6lb	Poly UH
	Armor-Prus Performance 10	DONAGHYS		£0 \$16.40 \$5.00 €0	■	00cm/00" £00 \$00 €00 00cm/00" £00 \$00 €00	10mm 25/64"	78g 5.25lb	Poly UH
	Tibor Loop 8 8820804/5/602000	EDELRID		£0 \$9.65 \$2.95 €0	■	40cm/00" £00 \$00 €00 50cm/00" £00 \$00 €00 60cm/00" £00 \$00 €00	8mm 5/16"	0g 0lb	Poly Poly

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CONSTRUCTION			STANDARDS	SUITABLE FOR			MINIMUM BREAKING LOAD		SWL/WLL	OTHER COLOURS			NOTES	WWW.
MATERIALS: SHEATH CORE	SHEATH BRAID/ PLAIT	HAND SPLICEABLE PRE-SPICED PRE-SEWN	STANDARDS	CLIMBING	BRAKING	HEAT RESIST	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average	OTHER COLOURS			NOTES	WWW.
Nylon Nylon/Vectran	16 KM	■	-	■	■	■	8kN 1798lbf		0kg 0lb					cmcpro.com
Polyester Nylon	32 KM	■	-	■	■		14kN 3147lbf		0kg 0lb					cmcpro.com
Polyester Nylon	32 KM	■	ANSI	■	■		15kN 3372lbf		0kg 0lb					cmcpro.com
Nylon Nylon	24 KM	■	CE	■	■		13kN 2922lbf		0kg 0lb				42"=blue only	cmcpro.com
		■		■	■		20kN 4496lbf		0kg 0lb				18"=Red 25"=Green	cmcpro.com
Polyester/Aramid Nylon	24 DB	■	CE	■	■	●	24kN 5280lbf		0kg 0lb					vertical-living.mycourant.com
Polyester/Aramid Nylon	24 DB	■	CE	■	■	●	24kN 5280lbf		0kg 0lb				Colour coded lengths 40cm-Black 60cm-Orange 80cm- Blue	vertical-living.mycourant.com
Polyester/Aramid Nylon	24 DB	■	CE	■	■	●	24kN 5280lbf		0kg 0lb				Colour coded lengths 120cm-Green 150cm-Red 200cm- Black	vertical-living.mycourant.com
Polyester/Aramid Nylon	16 DB	■	CE	■	■	●	28kN 6160lbf		0kg 0lb					vertical-living.mycourant.com
Polyester/Technora Nylon	32 DB	■	CE	■	■	●	22kN 4945lbf		0kg 0lb				0.76 knotability	bealplanet.com
Polyester/Technora Polyester	DB	■ ■	ANSI	■	■	●	23kN 0lbf		0kg 0lb					bealplanet.com
Polyester/Technora Polyester	DB	■ ■	?	■	■	●	32kN 0lbf		0kg 0lb					bluewaterropes.com
Polyester/Technora MwPE/Kevlar	DB	■ ■	ANSI	■	■	■	28kN 6160lbf		0kg 0lb					bluewaterropes.com
Polyester/Technora MwPE/Kevlar	DB	■ ■	?	■	■	■	43kN 0lbf		0kg 0lb					bluewaterropes.com
Polyester/Aramid Polyester/Aramid	16 KM	■	CE ANSI	■	■	■	18kN 4840lbf		0kg 0lb					edelrid.com

Load by m/ft, price shown is a proportion of shortest length x10% & rounded up. SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	STATE OFF-REEL 1x EYE 2xEYES SLING BOUND LOOP	SEWN/SPLICED EYE COSTS			SIZE Ø mm	WEIGHT g/m lb/100' ITEM	
						COST MANUFACTURED LENGTHS £\$€ = Currency Conversion ONLY Specific Item Weight					
	Tibor 8 Open 882070702000	EDELRID		£0 \$9.65 \$2.95 €0		70cm/00" £00 \$00 €00 75cm/00" £00 \$00 €00 80cm/00" £00 \$00 €00 85cm/00" £00 \$00 €00 90cm/00" £00 \$00 €00	8mm 5/16"	0g 0lb	Poly Poly		
	Tibor 10 Loop 8820804/5/602000	EDELRID		- - -		60cm/00" £00 \$00 €00 70cm/00" £00 \$00 €00	10mm 25/64"	0g 0lb	Poly Poly		
	Tibor 10 Open 882070702000	EDELRID		- - -		80cm/00" £00 \$00 €00 90cm/00" £00 \$00 €00	10mm 25/64"	0g 0lb	Poly Poly		
	Silva Prusik 9	ENGLISH BRAIDS					9mm 3/8"	66.7g 0lb			
	Prusik Pro 8	ENGLISH BRAIDS					8mm 5/16"	44.8g 0lb			
	Argon 8	FTC TREE		£6.00 \$8.00 \$2.50 €6.85		70cm/28" £26 \$33 €29 90cm/35" £26 \$33 €29	8mm 5/16"	47g 1.7oz	Tech		
	Néon 10	FTC TREE		- - -		70cm/28" £28 \$36 €32 90cm/35" £28 \$36 €32	10mm 25/64"	68g 2.4oz	Tech		
	Inco 10	GLEISTEIN		- - -		70cm/28" £00 \$00 €00 80cm/31" £00 \$00 €00 90cm/35" £00 \$00 €00 100cm/39" £00 \$00 €00	10mm 25/64"		Poly		
	Timber 8	LANEX (TENDON)		£0 \$3.90 \$1.20 €0		80cm/31" £00 \$00 €00 100cm/39" £00 \$00 €00 120cm/47" £00 \$00 €00	8mm 5/16"	54.3g 3.65lb	Poly		
	Timber 10	LANEX (TENDON)		£0 \$5.00 \$1.55 €0			10mm 25/64"	73g	Poly		
	Safe Prusik 8	LIROS		£0 \$0 \$0 €0		60cm/24" £16 \$00 €00 70cm/28" £00 \$00 €00 80cm/31" £00 \$00 €00 90cm/35" £00 \$00 €00 100cm/39" £00 \$00 €00 110cm/43" £00 \$00 €00 120cm/47" £00 \$00 €00	8mm 5/16"		Poly		
	Safe Prusik XTR 9 1of2	LIROS		£0 \$0 \$0 €0		60cm/24" £16 \$00 €00 70cm/28" £00 \$00 €00 80cm/31" £00 \$00 €00 90cm/35" £00 \$00 €00 100cm/39" £00 \$00 €00 110cm/43" £00 \$00 €00 120cm/47" £00 \$00 €00	9mm 3/8"	52g 3.5lb	Poly Dym		
	Safe Prusik 9.1	LIROS		£0 \$0 \$0 €0		60cm/24" £16 \$00 €00 70cm/28" £00 \$00 €00 80cm/31" £00 \$00 €00 90cm/35" £00 \$00 €00 100cm/39" £00 \$00 €00 110cm/43" £00 \$00 €00 120cm/47" £00 \$00 €00	9.1mm 3/8"		Poly		
	Safe Prusik 10	LIROS		£0 \$0 \$0 €0		60cm/24" £16 \$00 €00 70cm/28" £00 \$00 €00 80cm/31" £00 \$00 €00 90cm/35" £00 \$00 €00 100cm/39" £00 \$00 €00 110cm/43" £00 \$00 €00	10mm 25/64"		Poly		




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CONSTRUCTION			STANDARDS	SUITABLE FOR			MINIMUM BREAKING LOAD		SWL/WLL	OTHER COLOURS			NOTES	WWW.
MATERIALS: SHEATH CORE	SHEATH BRAID/ PLAIT	HAND SPLICEABLE PRE-SPICED PRE-SEWN	STANDARDS	CLIMBING	BRAKING	HEAT RESIST	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average					
Polyester/Aramid Polyester/Aramid	16 KM	■	CE ANSI	■	■	■	18kN 4840lbf		0kg 0lb					edelrid.com
Polyester/Aramid Polyester/Aramid	16 KM	■	CE ANSI	■	■	■	22kN 4945lbf		0kg 0lb					edelrid.com
Polyester/Aramid Polyester/Aramid	16 KM	■	CE ANSI	■	■	■	18kN 4840lbf		0kg 0lb					edelrid.com
														englishbraids.com
		■	CE				31.4kN							englishbraids.com
Technora/Polyster Nylon	32 KM	■	CE	■	■	●	18kN 4840lbf						75,80,85 & 110cm available soon. Phoenix Discontinued	ftc-tree.com
Technora/Polyster Nylon	16	■	CE	■	■	●	18kN 4840lbf						75,80,85 & 110cm available soon. Phoenix Discontinued	ftc-tree.com
Polyester/Technora Polyester	24	■	CE											gleistein.com
Polyester/Technora Polyester	KM	■	CE	■	■	●	22kN 4945lbf							mytendon.com
Polyester/Technora Polyester	KM	■	■	■	■	●								mytendon.com
Polyester/Aramid Polyester	20	■	CE	■	■	●	24kN 5390lbf							liros.com
Polyester/Aramid Technora/Aramid	24	■	CE	■	■	■	23kN 5156lbf							liros.com
Polyester/Aramid Polyester	20	■	CE	■	■	●	28.6kN 6424lbf							liros.com
Polyester/Aramid Polyester	20	■	CE	■	■	●	22.2kN 4998lbf							liros.com

Weight shown in kg/lb, price shown is a proportion of shortest length x10% & rounded up. SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	STATE OFF-REEL 1x EYE 2x EYES SLING BOUND LOOP	SEWN/SPLICED EYE COSTS			SIZE Ø mm	WEIGHT g/m lb/100' ITEM	MATERIAL	
						COST MANUFACTURED LENGTHS £\$€ = Currency Conversion ONLY Specific Item Weight						
	Viper 8 KE1230/31 WKE010/1/2	MARLOW ROPE		£0 \$0 \$0 €0		50cm/20" 60cm/24" 70cm/28"	£00 £00 £00	\$00 \$00 \$00	€00 €00 €00	8mm 5/16"	56.9g 3.80lb	Poly Po
	Viper II 8 KE1230/31 WKE250/1/2/3/4/5	MARLOW ROPE		£0 \$0 \$0 €0		50cm/20" 60cm/24" 70cm/28" 80cm/31" 90cm/35" 100cm/39"	£00 £00 £00 £00 £00 £00	\$00 \$00 \$00 \$00 \$00 \$00	€00 €00 €00 €00 €00 €00	8mm 5/16"	49.9g 3.3lb	Poly
	Boa 9 KE0352/4	MARLOW ROPE		£0 \$0 \$0 €0		50cm/20" 60cm/24" 70cm/28"	£00 £00 £00	\$00 \$00 \$00	€00 €00 €00	9mm 3/8"	66g 4.4lb	
	Boa 9 Blue Ocean* KE0379/80	MARLOW ROPE		£0 \$0 \$0 €0		50cm/20" 60cm/24" 70cm/28"	£00 £00 £00	\$00 \$00 \$00	€00 €00 €00	9mm 3/8"	65.5g 4.4lb	Poly Poly
	Wrap Star 8.1	NOTCH EQUIPMENT		£10.55 \$13.10 \$4.00 €12.35		70cm/28" 76cm/30" 81cm/32"	£22 £22 £22	\$27 \$27 \$27	€26 €26 €26	9.1mm 3/8"	55.2g 3.7lb	Poly
	Wrap Star 10.1	NOTCH EQUIPMENT		£10.55 \$13.10 \$4.00 €12.35		70cm/28" 76cm/30" 81cm/32"	£22 £22 £22	\$27 \$27 \$27	€26 €26 €26	10.1mm 25/64"	60g 4lb	Poly
	Bulldog 8	PELICAN ROPE		- - -		71cm/28" 76cm/30" 81cm/32"	£20 £22 £32	\$24 \$27 \$39	€23 €26 €37	8mm 5/16"		Poly
	Bulldog 10	PELICAN ROPE		- - -		71cm/28" 76cm/30" 81cm/32" 86cm/34"	£25 £26 £28 £29	\$30 \$32 \$34 \$35	€29 €31 €32 €33	10mm 29/64"		Poly
	Technora Prusik 6	PELICAN ROPE		£0 \$0 \$0 €0		-	-	-	-	6mm 1/4"	33.7g 2.2lb	
	Technora Prusik 8.7	PELICAN ROPE		£0 \$0 \$0 €0		71cm/28" 76cm/30" 81cm/32"	£30 £33 £35	\$37 \$40 \$43	€35 €38 €41	8.7mm 11/32"	56.5g 3.8lb	
	Segment 8	PETZL		£0 \$0 \$0 €0						8mm 5/16"	43g 2.8lb	
	Prusik 7 single or double stitch	PMI		£1.65 \$2.00 \$0.65 €1.90		48cm/19" 66cm/26" 86cm/34" 173cm/68"	£12-20 £14-20 £15-20 £20	\$15-25 \$17-25 \$18-25 \$24-25	€14-24 €13-24 €17-24 €23-24	7mm 9/32"	58g 3.9lb	
	Prusik 8 single or double stitch	PMI		£2.00 \$2.45 \$0.75 €2.35		40cm/16" 50cm/20" 56cm/22" 66cm/26"	£13-20 £13-20 £13-20 £13-20	\$16-25 \$16-25 \$16-25 \$16-25	€15-24 €15-24 €15-24 €15-24	8mm 5/16"	39g 5.1 lb 75g 2.48oz	
	Lumi-Line 7 CC070UG	PMI		£2.45 \$3.00 \$0.95 €2.85		640cm/25'	£14	\$17	€16	7mm 9/32"	29g 3.9lb 189g 6.7oz	
	Eye & Eye VT 8	PMI		£0 \$0 \$0 €0		66cm/26" 71cm/28" 84cm/33"	£20 £20 £22	\$24 \$25 \$27	€23 €24 €26	8mm 5/16"	? ?	Poly Poly
	Tuff Cord 7	PMI		£2.65 \$3.30 \$1.05 €3.15						7mm 9/32"	38g 10.86lb	


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CONSTRUCTION			STANDARDS	SUITABLE FOR			MINIMUM BREAKING LOAD		SWL/WLL	OTHER COLOURS	NOTES	WWW.
MATERIALS: SHEATH CORE	SHEATH BRAID/ PLAIT	HAND-SPliceABLE PRE-SPliced PRE-SEwn	STANDARDS	CLIMBING	BRAKING	HEAT RESIST	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average			
Polyester/Vectran Polypropylene	24	■	CE UKCA	■	■	●		20.3N 4563lbf 27.2kN 6107lbf				marlowropes.com
Polyester/Vectran Vectran	24	■	CE UKCA	■	■	●		38.16kN 8578lbf 27.4kN 6159lbf				marlowropes.com
Polyester Polyester	16	■	CE UKCA	■	●			25.4kN 5710lbf 27.4kN 6159lbf				marlowropes.com
Polyester (rPET)* Polyester (rPET)*	16	■	CE UKCA	■	●			26kN 5842lbf 27.4kN 6159lbf			*Blue Ocean made from recycled polyester (rPET)	marlowropes.com
Polyester/Technora HMPE	24 DB	■		■	■	●	5560lbf				See also ROPE LOGIC for 9.1mm version of Wrap Star	notchequipment.com
Polyester/Technora HMPE	24 DB	■		■	■	●	6023lbf				same price as 8.1	notchequipment.com
Polyester/Technora Technora	KM	■		■	■	■	5400lbf					pelicanrope.com
Polyester/Technora Nylon	KM	■		■	■	●						pelicanrope.com
Technora Nylon				■	■	■	2900lbf					pelicanrope.com
Technora Nylon		■		■	■	■	6000lbf				Also available as Hip-Prusik Lanyard with integral hook /carabiner options	pelicanrope.com
Polyester Nylon	32 KM	■	CE NFPA UKCA	■	●		13.5kN					petzl.com
Nylon Nylon	KM	■	UIAA	■	●		10.7kN 2405lbf				Both versions are bound slings but Single stitch is more supple, easier to pack down	pmirope.com
Nylon Nylon	KM	■	UIAA	■	●		20kN 4496lbf				Both versions are bound slings but Single stitch is more supple, easier to pack down	pmirope.com
Nylon Nylon	KM		UIAA	■	●		10.7kN 2405lbf				Will glow in the dark for up to 10hrs after exposure to strong light source. 25' sewn cordelette	pmirope.com
Polyester/Technora PP/Dyneema	32 KM	■		■	■	■		14.2kN 3192lbf				pmirope.com
Nylon Nylon	KM		CI	■	■		11kN 2473lbf				Suoper-tight sheath over lower stretch core 5.1%@300lb	pmirope.com











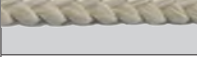



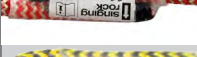











Weight shown in kg/m, price shown is a proportion of shortest length x10% & rounded up. SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST	STATE	SEWN/SPLICED EYE COSTS	SIZE	WEIGHT	
				COST per Metre /3.28ft US\$ per Foot	OFF-REEL 1x EYE 2xEYES SLING BOUND LOOP	COST MANUFACTURED LENGTHS £\$€ = Currency Conversion ONLY Specific Item Weight	Ø mm	WEIGHT g/m lb/100' ITEM	
	ArmorPrus 8	ROPE LOGIC/ DONAGHYS		£10.20 \$13.00 \$4.00 €11.80		60cm/24" £24 \$30 €28 70cm/28" £24 \$30 €28 76cm/30" £24 \$30 €28 81cm/32" £24 \$30 €28	8mm 5/16"	69g 4.6lb	Poly UH
	ArmorPrus 10	ROPE LOGIC/ DONAGHYS		£12.90 \$16.40 \$5.00 €14.85		70cm/28" £26 \$33 €30 76cm/30" £26 \$33 €30 81cm/32" £26 \$33 €30 90cm/35" £26 \$33 €30	10mm 25/64"	78g 5.25lb	Poly UH
	EpiCORD 8	ROPE LOGIC/ TEUFELBERGER		- - -		60cm/24" £24 \$31 €28 70cm/28" £25 \$32 €29 76cm/30" £26 \$33 €30 81cm/32" £27 \$34 €31	9.3mm 3/8"	n/a	Poly Tech
	EpiCORD 10	ROPE LOGIC/ TEUFELBERGER		- - -		70cm/28" £27 \$34 €31 76cm/30" £27 \$34 €31 81cm/32" £27 \$34 €31	10mm 25/64"	n/a	Poly Tech
	Ocean 8	ROPE LOGIC/ TEUFELBERGER		- - -		60cm/24" £23 \$28 €26 70cm/28" £23 \$28 €26 76cm/30" £23 \$28 €26 81cm/32" £23 \$28 €26	8mm 5/16"	n/a	Poly
	Ocean 10	ROPE LOGIC/ TEUFELBERGER		- - -		60cm/24" £33 \$42 €38 70cm/28" £33 \$42 €38 76cm/30" £33 \$42 €38 81cm/32" £33 \$42 €38	10mm 25/64"	n/a	Poly
	Bee Line 8	ROPE LOGIC/ YALE		- - -		60cm/24" £19 \$24 €22 66cm/26" £19 \$24 €22 70cm/28" £19 \$24 €22 76cm/30" £19 \$24 €22 81cm/32" £19 \$24 €22	8mm 5/16"	n/a	Tech
	Bee Line 10	ROPE LOGIC/ YALE		- - -		76cm/30" £30 \$38 €35	10mm 25/64"	n/a	Tech
	Veritas 8	ROPE LOGIC/ YALE		- - -		70cm/28" £22 \$27 €25 76cm/30" £22 \$27 €25 81cm/32" £22 \$27 €25	8mm 5/16"	n/a	Tech
	Veritas 10	ROPE LOGIC/ YALE		- - -		70cm/28" £22 \$27 €25 76cm/30" £22 \$27 €25 81cm/32" £22 \$27 €25	9mm 3/8"	n/a	Tech
	HRC 8	ROPE LOGIC/ TEUFELBERGER		- - -		60cm/24" £23 \$28 €26 70cm/28" £23 \$28 €26 76cm/30" £23 \$28 €26 81cm/32" £23 \$28 €26	8mm 5/16"	n/a	Tech
	Flex 8	ROPE LOGIC/ STERLING		- - -		70cm/28" £20 \$25 €23 76cm/30" £20 \$25 €23 81cm/32" £20 \$25 €23	8mm 5/16"	n/a	Poly
	RIT 9	ROPE LOGIC/ STERLING		- - -		70cm/28" £20 \$25 €23 76cm/30" £20 \$25 €23 81cm/32" £20 \$25 €23	9mm 3/8"	n/a	
	IceTail 8	ROPE LOGIC/ SAMSON		- - -		66cm/26" £19 \$24 €22 70cm/28" £19 \$24 €22 76cm/30" £19 \$24 €22 86cm/34" £19 \$24 €22	8mm 5/16"	n/a	Pol
	Wrap Star 9.1	ROPE LOGIC/ NOTCH		- - -		70cm/28" £23 \$29 €27 76cm/30" £23 \$29 €27 81cm/32" £23 \$29 €27	9.1mm 3/8"	55.2g 3.7lb	Poly

COST: £\$€ = Currency Conversion ONLY excludes eyes unless specified in NOTES. INCLUDES local taxes/VAT, Some are not so

CONSTRUCTION			STANDARDS	SUITABLE FOR			MINIMUM BREAKING LOAD		SWL/WLL	OTHER COLOURS			NOTES	WWW.
MATERIALS: SHEATH CORE	SHEATH BRAID/ PLAIT	HAND SPICEABLE PRE-SPICED PRE-SEWN	STANDARDS	CLIMBING	BRAKING	HEAT RESIST	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average					
ester/Technora MwPE/Kevlar	DB	■ ■	ANSI	■	■	■		28kN 6160lbf					Also available with pre-attached ISC ring	ropelogic.com
ester/Technora MwPE/Kevlar	DB	■ ■	ANSI	■	■	■		43kN 9400lbf						ropelogic.com
ester/Technora nora/Dyneema	32 KM	■	ANSI	■	■	■	24kN 5395lbf							ropelogic.com
ester/Technora nora/Dyneema	32 KM	■ ■	ANSI	■	■	■	40.8kN 9172lbf							ropelogic.com
ester/Aramid Polyester	32 KM	■ ■		■	■	●	18kn 4046lbf							ropelogic.com
ester/Aramid Polyester	32 KM	■ ■		■	■	●	25kn 5620lbf						Spliced version shown	ropelogic.com
nora/Polyester Vectran		■ ■		■	■	■	24kN 5400lbf	35.5kN 8000lbf	362kg 800lbf			also available as 'Old- School' version	ropelogic.com	
nora/Polyester Vectran		■ ■		■	■	■		48.9kN 11000lbf	498kg 1100lbf					ropelogic.com
nora/Polyester Polyester		■ ■		■	■	●	24kN 5400lbf		2.4kN 540lbf				Uses recycled polyester fibres so colours vary	ropelogic.com
nora/Polyester Polyester		■ ■		■	■	●	23.2kN 5220lbf						spliced version shown. Uses recycled polyester fibres so colours vary	ropelogic.com
hnora/Nomex Vectran		■ ■		■	■	■	26.7kN 6000lbf	20kN 4500lbf					spliced version shown	ropelogic.com
ester/Technora Polyester		■		■	■	●	24.1kN 5418lbf							ropelogic.com
Twaron Polyester		■		■	■	●	31kN 6968lbf							ropelogic.com
ester/Aramid -		■		■	■	●		39.1kN 8500lbf	3.1kN 880lbf					ropelogic.com
ester/Technora HMPE	24 DB	■		■	■	●	24.4kN 5500lbf							ropelogic.com

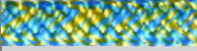




















ld by m/ft, price shown is a proportion of shortest length x10% & rounded up. SHEATH: DB=Double Braid, KM=KernMantle

Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST		STATE	SEWN/SPLICED EYE COSTS			SIZE Ø mm	WEIGHT g/m lb/100' ITEM	
				COST per Metre /3.28ft US\$ per Foot			OFF-REEL 1x EYE 2xEYES SLING BOUND LOOP	COST MANUFACTURED LENGTHS £\$€ = Currency Conversion ONLY Specific Item Weight				
	Prusik Cord 9	SAMSON		£2.35 \$2.95 \$0.90 €2.70		■	-	-	-	9mm 3/8"	61g 4.1lb	
	Bail Out 8	SAMSON		£0 \$8.20 \$2.50 €0		■ ■ ■				8mm 5/16"	0g 3lb	Ara Ara
	Bail Out XL 9	SAMSON		£0 \$11.00 \$3.50 €0		■				9mm 3/8"	0g 4.2lb	Ara Ara
	UltraTech 8	SAMSON		£0 \$0 \$0 €0		■ ■				8mm 5/16"	60g 4lb	Tech
	UltraTech 9	SAMSON		£0 \$0 \$0 €0		■ ■				9mm 3/8"	68g 4.6lb	Tech
	Ice Tail 8	SAMSON		£0 \$13.25 \$4.00 €0		■ ■	60cm/24" £00 \$31 €00 70cm/28" £00 \$28 €00 76cm/30" £00 \$28 €00 81cm/32" £00 \$28 €00			8mm 5/16"	46g 3.1lb	Pol
	Timber 8 W2608	SINGING ROCK		- - -		■	75cm/30" £00 \$00 €00 80cm/31" £00 \$00 €00 85cm/33" £00 \$00 €00 100cm/39" £00 \$00 €00			8mm 5/16"	54.3g 3.65lb	Poly
	Timber 8 W2601R085	SINGING ROCK		- - -		■	38cm/15" £00 \$00 €00			8mm 5/16"	48g 1.7oz	Poly
	Timber 10 W2610	SINGING ROCK		- - -		■	80cm/31" £00 \$00 €00 85cm/33" £00 \$00 €00 90cm/35" £00 \$00 €00 100cm/39" £00 \$00 €00			10mm 25/64"	73g	Poly
	Timber 10 W2602Y085	SINGING ROCK		- - -		■	38cm/15" £00 \$00 €00			10mm 25/64"	70g 2.5oz	Poly
	Prusik Braid 6	SOUTHERN ROPES		£0 \$0 \$0 €0		■				6mm 1/4"		
	Prusik Braid 7	SOUTHERN ROPES		£0 \$0 \$0 €0		■				7mm 9/32"		
	Prusik Braid 8	SOUTHERN ROPES		£0 \$0 \$0 €0		■				8mm 5/16"		

COST: £\$€ = Currency Conversion ONLY excludes eyes unless specified in NOTES. INCLUDES local taxes/VAT, Some are not so

CONSTRUCTION			STANDARDS	SUITABLE FOR			MINIMUM BREAKING LOAD		SWL/WLL	OTHER COLOURS			NOTES	WWW.
MATERIALS: SHEATH CORE	SHEATH BRAID/ PLAIT	HAND SPICEABLE PRE-SPICED PRE-SEWN	STANDARDS	CLIMBING	BRAKING	HEAT RESIST	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average					
Polyester Polyester	DB	■		■	●			23kN 5000lbf	1.9kN 430lbf					samsonrope.com
mid (Technora) mid (Technora)	DB			■	■	■		19kN 4200lbf						samsonrope.com
mid (Technora) mid (Technora)	DB	■		■	■	■		24kN 5300lbf						samsonrope.com
Polyester nnora (Aramid)	DB	■ ■		■	■	●		35kN 7800lbf						samsonrope.com
Polyester nnora (Aramid)	DB	■ ■		■	■	●		45kN 10000lbf						samsonrope.com
Polyester/Aramid -	12 SB	■ ■ ■	ANSI	■	■	■		39.1kN 8500lbf	3.1kN 880lbf					samsonrope.com
Polyester/Technora Polyester	KM	■	CE	■	■	●	18kN 4046lbf							singingrock.com
Polyester/Technora Polyester	KM	■	CE	■	■	●	18kN 4046lbf							singingrock.com
Polyester/Technora Polyester	KM	■	CE	■	■	●	20kN 4496lbf							singingrock.com
Polyester/Technora Polyester	KM	■	CE	■	■	●	18kN 4046lbf							singingrock.com
Polyester Polyester	DB			■	■		7kN 1573lbf					5mm also available		southernropes.com
Polyester Polyester	DB			■	■		9.5kN 2137lbf					5mm also available		southernropes.com
Polyester Polyester	DB			■	■		12.5kN 2823lbf					5mm also available		southernropes.com

Sold by m/ft, price shown is a proportion of shortest length x10% & rounded up. SHEATH: DB=Double Braid, KM=KernMantle


Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST	STATE	SEWN/SPLICED EYE COSTS	SIZE	WEIGHT	
				COST per Metre /3.28ft US\$ per Foot	OFF-REEL 1x EYE 2xEYES SLING BOUND LOOP	COST MANUFACTURED LENGTHS £\$€ = Currency Conversion ONLY Specific Item Weight	Ø mm	WEIGHT g/m lb/100' ITEM	
	Copious Atol 9	STEIN		£2.77 \$3.77 \$1.15 €0		50cm/20" £00 \$31 €00 65cm/26" £00 \$28 €00 70cm/28" £00 \$28 €00 75cm/30" £00 \$28 €00	9mm 3/8"		
	Copious Bee Line 10	STEIN		£0 \$0 \$0 €0		75cm/30" £30 \$33 €00 85cm/33" £30 \$33 €00	10mm 25/64"		
	Copious A-Tec 9	STEIN		£0 \$0 \$0 €0		65cm/26" £24 \$33 €00 70cm/28" £24 \$33 €00 75cm/30" £24 \$33 €00 85cm/33" £24 \$33 €00	9mm 3/8"		
	Copious P-Tec 9	STEIN		£0 \$0 \$0 €0		75cm/30" £24 \$33 €00 85cm/33" £24 \$33 €00	9mm 3/8"		Poly
	HollowBlock2 6.8 HOLB	STERLING		£0 \$6.50 \$2.00 €0		34cm/13.5" £00 \$25 €00 48cm/19" £00 \$26 €00	6.8mm 1/32"	1.8lb	
	RIT 8	STERLING		- - - -		60cm/24" £00 \$31 €00 70cm/28" £00 \$28 €00 76cm/30" £00 \$28 €00 81cm/32" £00 \$28 €00	8mm 5/16"		
	RIT 9	STERLING		£0 \$7.50 \$2.60 €0		70cm/28" £00 \$34 €00 76cm/30" £00 \$34 €00 81cm/32" £00 \$34 €00 91cm/36" £00 \$34 €00	9mm 3/8"	4.2lb	



BlueWater

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CONSTRUCTION			STANDARDS	SUITABLE FOR			MINIMUM BREAKING LOAD		SWL/WLL					
MATERIALS: SHEATH CORE	SHEATH BRAID/ PLAIT	HAND SPICEABLE PRE-SPICED PRE-SEWN	STANDARDS	CLIMBING	BRAKING	HEAT RESIST	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average	OTHER COLOURS			NOTES	WWW.
Polyester Polyester	16 SB	■ ■ ■	CE	■	■			22.5kN						steinworldwide.com
				■	■	■								steinworldwide.com
Polyester Polyester	24 DB	■	CE	■	■									steinworldwide.com
Polyester/Technora Polyester	24 DB	■	CE	■	■	●								steinworldwide.com
Twaron -	HB	■ ■		■	■	■	14 18.4kN 3147lbf 4136lb		1.4kN 314lbf			Off the reel as RIT 900	sterlingrope.com	
Twaron Polyester	HB	■ ■		■	■	■								sterlingrope.com
Twaron Polyester	HB	■	ANSI	■	■	■	31kN 6968lbf					Off the reel as RIT Response Search Rope	sterlingrope.com	





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NYLON CORE & POLYESTER COVER
LOW PROFILE SEWN EYE

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TO WIN A
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Images NOT to Scale	MODEL	COMPANY	ORIGIN	COST per Metre /3.28ft US\$ per Foot	STATE OFF-REEL 1x EYE 2xEYES SLING BOUND LOOP	SEWN/SPLICED EYE COSTS			SIZE Ø mm	WEIGHT g/m lb/100' ITEM	
						COST MANUFACTURED LENGTHS £\$€ = Currency Conversion ONLY Specific Item Weight					
	Flex 8	STERLING		£5.50 \$7.00 \$2.60 €6.50		70cm/28" £25 \$32 €29 76cm/30" £25 \$32 €29 81cm/32" £25 \$32 €29	8mm 5/16"			Poly	
	Flex 10	STERLING		- - -		70cm/28" £26 \$33 €30 76cm/30" £26 \$33 €30 81cm/32" £26 \$33 €30	8mm 5/16"			Poly	
	HRC 8	TEUFELBERGER		£0 \$0 \$0 €0		60cm/24" £23 \$28 €26 70cm/28" £23 \$28 €26 76cm/30" £23 \$28 €26 81cm/32" £23 \$28 €26	8mm 5/16"	49.1g 3.3lb		Tech	
	EPI 8	TEUFELBERGER		£9.30 \$11.80 \$3.60 €0		70cm/28" £22 \$27 €25 76cm/30" £22 \$27 €25 81cm/32" £22 \$27 €25	8mm 5/16"	52.1g 3.5lb		Poly Tech	
	EPI 9.3	TEUFELBERGER		£0 \$14.00 \$4.25 €0		70cm/28" £22 \$27 €25 76cm/30" £22 \$27 €25 81cm/32" £22 \$27 €25	9.3mm 11/32"	59.5g 4lb		Poly Tech	
	EPI 10	TEUFELBERGER		£0 \$15.00 \$4.40 €0		70cm/28" £20 \$25 €23 76cm/30" £20 \$25 €23 81cm/32" £20 \$25 €23	10mm 25/64"	62.5g 4.2lb		Poly Tech	
	Ocean 8	TEUFELBERGER		£0 \$5.70 \$1.75 €0		70cm/28" £20 \$25 €23 76cm/30" £20 \$25 €23 81cm/32" £20 \$25 €23	8mm 5/16"	50.1g 3.37lb		Poly	
	Ocean 10	TEUFELBERGER		£0 \$6.30 \$1.95 €0		66cm/26" £19 \$24 €22 70cm/28" £19 \$24 €22 76cm/30" £19 \$24 €22 81cm/32" £19 \$24 €22	10mm 25/64"	72.1g 4.75lb		Poly	
	Sirius 8	TEUFELBERGER		£0 \$0 \$0 €0			8mm 5/16"	50g 3.36lb			
	Sirius 10	TEUFELBERGER		£0 \$0 \$0 €0			10mm 25/64"	71g 4.77lb			
	TH1154	TREEHOG		£2.25 \$0 \$0 €0		50cm/20" £18 \$23 €21 60cm/24" £18 \$23 €21 70cm/28" £18 \$23 €21	10mm 25/64"	72g 4.7lb		Poly	
	Bee line 10 Poly	YALE		£0 \$6.30 \$1.90 €0			10mm 25/64"	?g ?lb		Tech	
	Bee Line 8 Vectran	YALE		£0 \$7.45 \$2.26 €0			8mm 5/16"	55g 3.7lb		Tech	
	Bee Line 10 Vectran	YALE		£0 \$8.50 \$2.60 €0			10mm 25/64"	71g 4.8lb		Tech	
	Veritas 8	YALE		£0 \$6.50 \$2.00 €0			8mm 5/16"			Tech	
	Veritas 10	YALE		-		70cm/28" £24 \$30 €28 76cm/30" £24 \$30 €28 81cm/32" £24 \$30 €28	10mm 25/64"			Tech	

COST: £\$€ = Currency Conversion ONLY excludes eyes unless specified in NOTES. INCLUDES local taxes/VAT, Some are not so

CONSTRUCTION			STANDARDS	SUITABLE FOR			MINIMUM BREAKING LOAD		SWL/WLL	OTHER COLOURS			NOTES	WWW.
MATERIALS: SHEATH CORE	SHEATH BRAID/ PLAIT	HAND SPICEABLE PRE-SPICED PRE-SEWN	STANDARDS	CLIMBING	BRAKING	HEAT RESIST	MBL Minimum Break Load Spliced Sewn	ABL Average Break Load Spliced Sewn	WLL Spliced Sewn *Average					
Polyester/Technora Polyester		■		■	■	■	24.1kN 5418lbf							sterlingrope.com
Polyester/Technora Polyester		■	ANSI	■	■	■	39kN 8767lbf	24.1kN 5418lbf						sterlingrope.com
Technora/Nomex Vectran	KM	■ ■	ANSI	■	■	■	26.7kN 6000lbf	20kN 4500lbf						teufelberger.com
Polyester/Technora Technora/Dyneema	32 KM	■	ANSI	■	■	■	24kN 5395lbf							teufelberger.com
Polyester/Technora Technora/Dyneema	32 KM	■ ■ ■	ANSI	■	■	■	32.5kN 7305lbf		3.42kN 770lbf				Sherrill-34.2kN?	teufelberger.com
Polyester/Technora Technora/Dyneema	32 KM	■ ■ ■	ANSI	■	■	■	40.8kN 9170lbf		4.32kN 972lbf				Sherrill-43kN?	teufelberger.com
Polyester/Aramid Polyester	32 KM	■	CE ANSI	■	■	●	22kN 4945lbf		2.2kN 500lbf				Sherrill-24str?	teufelberger.com
Polyester/Aramid Polyester	32 KM	■	ANSI	■	■	●	32.9kN 7400lbf		3.2kN 7400lbf					teufelberger.com
Polyester Polyester	32 KM		CE ANSI	■	■		14.4kN 3235lbf							teufelberger.com
Polyester Polyester	32 KM		ANSI	■	■		24kN 5395lbf							teufelberger.com
Polyester/Aramid Polyester	32 KM	■	CE	■	■	●	32.9kN 7400lbf		170kg 374lb					treehog.co.uk
Technora/Polyester Polyester		■ ■ ■		■	■	■		?kN ?lbf	?lbf				Black version = \$2.30/ft	yalecordage.com
Technora/Polyester Vectran		■ ■ ■		■	■	■	24kN 5400lbf	35.5kN 8000lbf	362kg 800lbf					yalecordage.com
Technora/Polyester Vectran		■ ■ ■		■	■	■		48.9kN 11000lbf	498kg 1100lbf					yalecordage.com
Technora/Polyester Polyester	24 DB	■ ■ ■		■	■	●	24kN 5400lbf		2.4kN 540lbf				Uses random lengths of coloured 5KD polyester	yalecordage.com
Technora/Polyester Polyester	24 DB	■ ■ ■		■	■	●							Uses random lengths of coloured 5KD polyester	yalecordage.com

Sold by m/ft, price shown is a proportion of shortest length x10% & rounded up. SHEATH: DB=Double Braid, KM=KernMantle

UPDATED March '24

ARBORIST SIT HARNESSES

with Bridge and/or Sit Strap

Non-bridge SRT harnesses being added in 2024

www.rescuemagazines.com



images NOT to scale

2024: Harnesses was the first GUIDE we had in ARBCLIMBER in issue 1, written in 2011, published in 2012 and in the intervening 12or 13 years it is amazing just how many things *haven't* changed. There have been many new harnesses and updates of course and some have dropped off the production schedules altogether although, even more amazingly the Whillans T from the 70s that we mentioned in the original intro is still being sold! So we thought it would be useful to run our original text and insert update text (in this burnt orange colour) where necessary. We don't have room for both sets of images but again the majority that we used to illustrate the introduction in issue 1 are harnesses that are still familiar today - the Teufelberger Tree Motion, Petzl Sequoia, Buckingham Ergo, CAMP Access and the widely rebadged Protekt TH models. You may need to keep reminding yourself that the text in black is over a decade old. Where a term or date has been updated from the original we have shown the changed word(s) in orange as well as all updated 2024 text. All images are of models available at the start of 2024.

2011: In the US, the type of harness we're looking at in this article is still more commonly described as a 'saddle' with the term 'harness' often reserved for lightweight, full-body, fall-arrest harnesses. To avoid any misunderstandings we refer to all webbing, load-support harnesses, whether they be sit, full body or sit-strap harness asharnesses.

Do you remember the original Whillans harness? If you do, you're probably from the UK and probably getting on a bit. Don Whillans, bless him, was a god in the mountaineering world and his Troll Whillans harness was, throughout the seventies and early eighties, the pinnacle of climbing harness design. As a mountaineer myself I felt that my trusty Whillans was just the thing for tree work since the Willans was already a renowned brand. Imagine my consternation on discovering that not only did I have the wrong Mr Whillans but that my version had a wicked, and I do mean wicked, central tie-in eye that came up between your legs [rather than having round leg-loops] and consequently had the very uncomfortable tendency to trap a testicle or two (if you were male) and didn't tie into the two attachment eyes emanating from the top of the waist belt. It was also not very forgiving if you were in an unusual position and in arbwork an 'unusual' position is the norm. So, far from the mountains where Don Whillans plied his trade another Willans, Major 'Dumbo' Willans without the 'h' developed, amongst many other things the Willans tree harness which had a sit (or butt) strap that coddled the buttocks like a leg loop

never could, at least not in those days. The sit strap eyes then formed the central hardpoint and hey-presto your testicles could breathe again. Having glossed over my harness faux pas by insisting that I was trialling mountaineering gear for tree surgery I was mighty relieved when Troll produced their full body Manchester harness with sit strap which, though a messy pile of webbing, I actually could use for tree work without risking sterilisation. The venerable Willans is still made by the original Willans Harness Manufacturing company founded by 'Dumbo' in 1972 and now in its RW59 or T22 guise. But it now has lots of competition because by the mid nineties several climbing and industrial



harness manufacturers had realised that they were missing a trick not catering for the tree industry and started producing arborist harnesses that combined the best features of the original Willans with the original Whillans. Well, OK maybe not the original Whillans but a modern mountaineering harness with all its gear attachments and padded, safely fitting leg-loops etc. Of course the Willans didn't have the field to itself because the standard for most arborists, especially in the US was (and still is) the part-leather 'saddle' as exemplified by the Buckingham, Weaver and Bashlin Classic saddles and still made by these same companies for their traditional clientele (Weaver pin & hole belts shown on the right) alongside their more modern designs but there's no doubt that both Weaver and Buckingham continue to design 'out of the box' to cater specifically for the US market but all are moving more towards Euro-style technical leg-loop harnesses. The Weaver Denali for instance has water buffalo leather and an unusual double waist belt arrangement utilising 4 roll bar buckles in addition to the central AustriAlpin Cobra buckle. On the right are three of Weaver's current product range, the insets are traditional leather saddles with pin & hole belt and leg loops while the main image (and this issue's front cover) is their latest model, the Stratus. This is particularly interesting because it not only follows the trend in North America towards technical leg-loop harnesses, this particular model is clearly a much lighter and trimmed down harness with minimalist webbing at the front but huge padded areas on the back of the legs and waist belt where they are needed when load is applied. It uses simplified lightweight rings for the 'pole-strap D-rings' and a minimalist multi-ring (4-hole rigging plate) as the bridge union.

THE FLOATING (SUSPENSION) BRIDGE

With any single-central hardpoint harness, as soon as you manoeuvre off the vertical you are fighting both the pendulum effect of the rope and the restriction of the harness giving a forced rather than balletic, transitional action. In the mid to late nineties a veritable revolution in arborist harnesses saw the introduction of the floating bridge also known back then as a glide or butterfly strap which connects two widely spaced eyes or rings. A round ring or D-ring can slide the width of this bridge allowing a huge amount of lateral rotation of the hips in continued comfort. If you compare the three Weaver harnesses on the right you will notice that there are three very different tie-in options. The top harness is Weaver's new Stratus with the now common rope bridge, in this case tied off with a double fisherman's knot. Most modern harnesses allow you to add a second bridge to give redundancy and/or quick access to a different length bridge. This is often tied into one end of the first bridge with a Fisherman's so that it looks like you have a quadruple Fisherman's on the same rope ends. (see inset pic above of Edelrid's Tree Rex). You can do the same on the other end or have the two ends separated so that you can more easily adjust the length on one or both. Some use a single rope length that is doubled using a girth hitch on one end and a Fisherman's on the other. The two D-Rings on a length of unusually wide



ARBORIST HARNESSES

Back to some traditional designs sold in the US and the Weaver harness above integrates sit-strap D-rings into the leg loops while the version below has joined the two ends to create a single bridge and then slides the D-rings along its length. Contrast these with their latest designs the Stratus (top) and the Denali



webbing is an early (and still popular) design for use with the Split Tail System but most harnesses now use a much narrower double layer of webbing or rope for the bridge. This is always connected to D-ring or shackle unions between both the leg loop risers and the waist belt and ensures that the meaty thighs as well as padded waist are each sharing some of the load some of the time.

As you can probably guess, this design has very much taken a back-seat though there are still a number of US models and the venerable old UK Willans offering the D-rings on a sit-strap arrangement. Instead, virtually all modern harnesses have made the bridge union into an attachment eye for both the bridge or multiple bridges and additional SRT (SRS), DRT (MRS) and lanyard attachments. The use of double lanyards in particular has become the

norm since the first article making use of both side D's and bridge union eyes or D-rings as can be seen in the Vega harness above. The

sit-strap style connection has been sidelined because of its restrictive loading forcing the legs together instead of being able to stretch and reach as demanded by modern arb gymnastics but it's interesting to note that the prominent bridge union D-rings like Petzl's SRT version of the Sequoia opposite enable the same use as that traditional sit-strap design.

A component we are seeing more and more is the openable ring which can be used as a sliding bridge ring but with increased cost over a standard ring is better used at the bridge union for multi-directional loading as distinct from the more traditional shackle. This is Courant's version, Odin.

The bridge on all harnesses receives a lot of wear, much more than any other component since it has a continually moving connection and is a textile rather than hardware fixing. Some are user-replaceable as they are connected by shackles and some use a tied length of rope rather than webbing. This has the enormous advantage of being cheap and easy to replace and of being able to incorporate rigging plates, swivels or pulleys

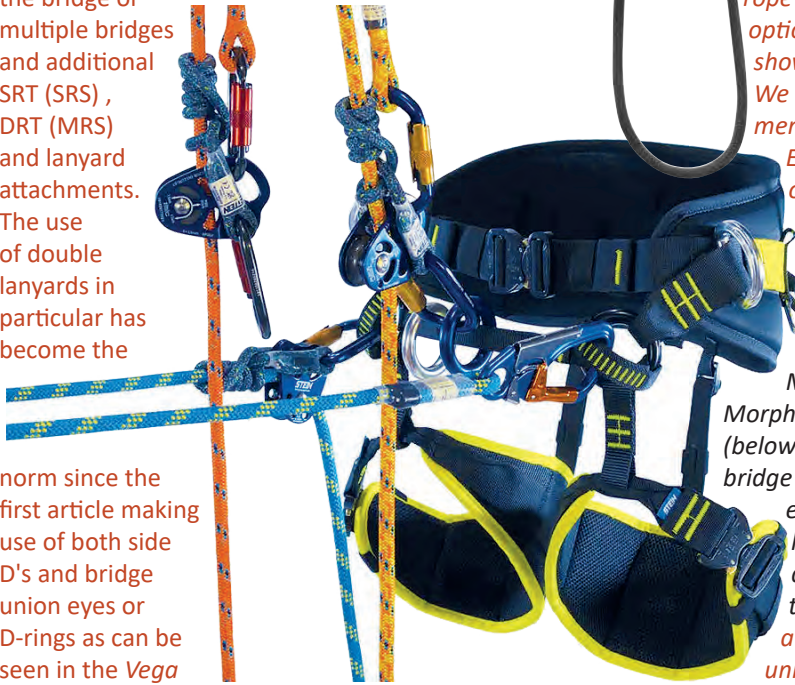
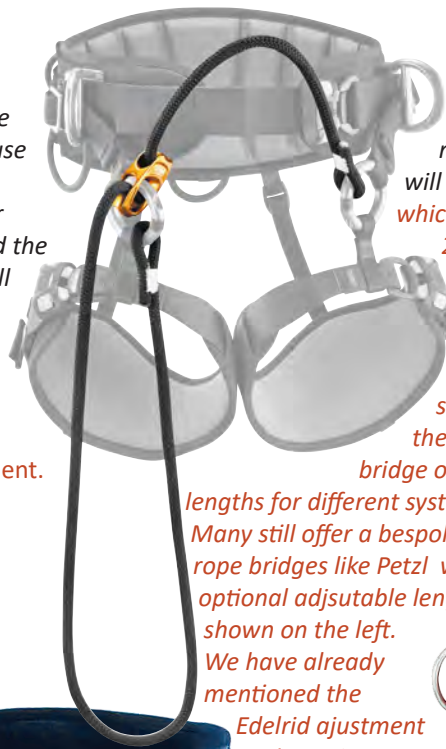
as a link between the bridge and your main line(s). Of course, these things will also work well enough on webbing which is often double thickness and around 20mm wide so hardware slides easily on it. Those using rope bridges offer you the option of simply replacing the bridge with your own and tying off with a fisherman's each end. Indeed since the first article it is common for the harness to come with a tied rope bridge or even two bridges offering different lengths for different systems and for double lanyard working. Many still offer a bespoke sewn end or special termination rope bridges like Petzl who also offer an optional adjustable length bridge shown on the left.

We have already mentioned the Edelrid adjustment option using a small aramid prusik. Another interesting design is the Komet or Miller/Sperian Morpho. This harness (below) has placed the bridge shackles into a captive

eye created by twisting the leg loop-to-waist belt riser into a kind of figure 8. This allows you to adjust the position of the bridge up towards the waist or down towards the legs. The Morpho is still available (pic below) and this form of dual-usage bridge union has evolved to become the norm with more and more harnesses unifying the leg riser adjustment with a bridge length adjustment tied back to the waistbelt instead of the Morpho's ingenious but less adjustable twisted length of webbing. Its use of a shackle was also ahead of its time though present on the Polish Protekta models rebadged by a number of arb companies. This is still seen on some models and on others has evolved into 'multi-rings' which are large D-rings with a number of additional eyes for tying in your rope bridge(es). Still others are making more and more use of openable rings like Petzl, Edelrid and Courant and these can be bridge unions, bridge rings or even Side D's or side O's would be more accurate.

SIT-COMFORT

Whether you use a wide sit strap, (a bosun's chair/batten seat) or you use individual leg loops in the climbing style is largely a matter of personal preference. Virtually all harnesses now offer both, but some leg loops are intended to be primarily loaded like the Ergovation and Tree MOTION harnesses (Figs3&8) and some are simply a safety back up like the Willans (fig 5) and the Petzl Swing variant of the Sequoia (Petzl



now has just the two Sequoia models - regular and SRT versions but both can accommodate the rigid Petzl bosuns seat). The latter is an interesting design that doesn't appear to compromise the size/width of the leg-loop webbing while integrating the sit strap. The original sit-strap-only harnesses did, and do, have the distinct disadvantage of squeezing your legs together and limiting your movement dexterity in the canopy, they also had an alarming safety drawback in that you could fall through it if the sit strap is not properly in place and you don't have a Bluto-style barrel chest. A more common problem was that of falling out of it if you inverted. Leg loops therefore became the norm to improve safety but many arborists still insisted on the extra perceived comfort of the sit strap because it spreads the load across a wider area and tends to support higher up the thighs or even up to the buttocks. A trend adopted by Harkie and Komet and shown on the Dragon is an enhanced support leg loop which extends like a fore-sail further up the thigh and acts as a kind of 'bucket' -seat this was exemplified by New Tribe with their ProGear2 harness and then all of their later harnesses like the Onyx which is still available while stocks last but New Tribe ceased trading from January 2023 after owner and rec-climbing pioneer Sophia Sparks decided to take a well-earned retirement. The Courant Koala shown on the title page has elasticated loops in its leg loops that allows very simple insertion of a wooden bosun's chair, which can be fixed using webbing with buckles

BELT HARDWARE

A high proportion of aerial tree work requires you to lean into the harness while restrained by the rope or pole strap rather than supported in it vertically and this latter function is common to all arb harnesses. Pole strap D-rings are mounted on each side of the waist band and allow connection of a pole strap or cinching rope that goes around the trunk and clips into each ring. Climbers can either lean against the pole strap/flip line using spikes for purchase or stand on a branch or platform. In fig 10 the use of a flip line enables this arborist to lean away from the cut while his mainline provides essential safety back up and further enhances his balance. Note that using an intermediate swivel allows plenty of rotation without applying torquing pressure which might destabilise your stance. Pole strap D-rings in themselves are not intended for full abseil/rappel loading but they do lend themselves to side-



Edelrid's TREE REX

and the new TREERAPTOR that came out in March 2024, have a number of interesting features that serve to illustrate modern trends in arb harnesses and in some cases has yet to make it onto other designs. The first aid or trauma kit, which, like so many now is stowed around the back and could be tricky to access in a dire emergency so Edelrid have installed a quick-release on the front - that small yellow toggle above the bridge union. This pulls the first aid kit off it's mounts but remains attached via a length of thin webbing and a retaining eye for that toggle.

You can easily access the contents but to detach the kit altogether you simply rotate the toggle and push it through the eye. On the bridge there is a prusik cord length adjuster connected through 2 of the 6 eyes on their comprehensive Bridge union plate. This is simply a shortener NOT a means to connect the bridge rope(s) which will ALWAYS be tie with a double Fishermen's on BOTH ends. If you were to use the prusik as as the attachment there is a chance your bridge ring could slide down to contact the prusik and not only allow your bridge to inadvertently increase in length but perhaps release altogether. Edelrid advise using the prusik adjuster on one bridge but have the ring around both rope bridges simultaneously to negate accidental release of the prusik. While we're on this prusik it has another fairly unique feature - it's a 6 mm Aramid so it's super-tough and can instead of a prusik be run as a backup bridge if you wanted to run with a single full size rope bridge. In the event you cut into your bridge this thin back-up offers you a good chance of survival but doesn't bulk up your front working area.

On the rear is a grey coloured, reinforced eye that is rated for fall-restraint NOT fall arrest - it's a means to limit your ability to fall over an edge if working at height although many are utilising that huge strength as their chainsaw attachment point! The TREEREX also has an embedded RFID chip, something that, as of 2023 was in around 10% of harnesses but will likely be in virtually all life-safety equipment by the end of 2024. The huge number of gear attachment points started by the Teufelberger Tree Motion range with its myriad of eyelets and carried on by the likes of Husqvarna has been modified on the TREEREX as small sewn web loops (eyes) capable of holding a small gear carabiner or to thread cord for a customized gear rack ala rock climbing harnesses of the 1980's. Finally the rope has a wear indicator thread in red to really show up when it's time to renew your bridge, however a white core to any coloured sheath would count as a wear indicator for rope bridges.

loaded work positioning despite manufacturers comments to the contrary. In rescue we have seen the advent of side-Ds that fold back flush to the waist-belt when not in use and in arb-work this is a particularly useful feature in avoiding snagging while climbing/descending or getting out of the way of a falling section. The most recent and prolific change to harness hardware is use of the Austrianpin style Cobra buckle - this is a push-clip design. It requires the top and bottom of the buckle to be depressed at the same time in order to release and is therefore a very safe design. Variations of this include Petzl's two stage release where a button is depressed for initial release then a hook



arrangement has to be manually unhooked to fully separate. *Since the first GUIDE, the Cobra style quick-release buckle has become the commonest means of securing the waist belt and leg loops. We have termed this design as Fast-Clip and they all require two buttons to be depressed to release. Many use the Cobra original (shown in our tables as AA Cobra) but there are now branded alternatives from the likes of ISC and Skylootec's Oktalock as well as many unbranded versions which we have termed 'Fast-Clip'.*



CHEST HARNESSSES

You may notice that none of the harnesses in the tables later in this article feature a chest harness or chest section. This transforms a sit harness into a full body harness capable of being used for SRT-style ascending with a Croll or frog-rig and as mentioned earlier, of meeting the EN361 safety standards because it makes the harness much safer in a vertical fall but importantly for arborists, not necessarily in a 'swinging' or pendulum fall. Nevertheless this perception of safety has caused full body harnesses to be mandatory in some organisations.

We have therefore included a row to show which models have some form of integration for a purpose-built chest harness or top section and this will, more often than not, correlate with EN361 even if the model hasn't gone through the test process necessary to obtain that standard. *Two words of warning though, firstly some chest harnesses like the Courant and Petzl models shown here are dedicated to the fittings on their harness and not necessarily able to be used on other sit harnesses and secondly 'tool suspenders' are NOT necessarily load bearing though confusingly some are. They are an American product intended to support your sit harness if you have a narrow waist or to help transfer the equipment load from your harness to the shoulders. The fact that the vast majority of arborists insist on a sit-only harness*

is partly a question of taste and function since mobility is essential but full bodies can restrict movement and increase snag hazards. However, as with all roping activities at height there are times when a chest section can be a life-saver.... literally and it can certainly assist in difficult cuts or rigging locations that require prolonged inversion.

MORE SIT COMFORT

Padding on the waist belt, sit strap and leg loops has become progressively more pronounced as our asses have evolved from leathery old saddle thumpers to soft, pudgy, lazy boy recliner occupants. but it's safe to say that the days of the unpadded leather belt have been waning for some considerable time and padding is like a Friday night beer, the more you have the more you want and you don't care how embarrassing it gets. To be fair, modern padding no longer entails stuffing your mum's pillow between you and the hard, rough belt or sit-strap. Now it is mostly all about thermo-moulding that puts the padding into neat little sections just where you want them without adding unduly to the bulk and weight and allowing the belt to bend without bunching up the padding. That's not to say that you can't still find the odd sprung mattress sewn to the waist belt and that these aren't actually still more comfortable but it does now clearly differentiate a modern harness. Another feature that has increased in size, apart from some of your bellies, which is the lumbar section of the waist belt. This is the physical width of load bearing webbing, not necessarily padding. This gradual widening is not unique to the arb world, we first saw a radical change in the size of the back section of waist belts when CMC Rescue brought out their Instructor harnesses in the last century and many now emulate that. You only have to spend some quality time manoeuvring around a tree to realise that efficient padding and a wide support belt make life much more bearable on a protracted job. Teufelberger's TreeMOTION recognised this trend and is currently the widest lumbar section of all Arb Harnesses but you can be sure that others will follow. And indeed they did though many have stuck with strategic widening and padding rather than super-sizing the waist and leg loops. Singing Rock's Arbo Master in the ad opposite for instance has kept things simple but greatly widened the very rear of the waist and leg loops without carrying the width on all the way round. It became obvious very early on that when loaded the front parts of the waist and leg loops are pulled away from the body and don't need the same degree of comfort width or padding.

FEMALE HARNESSSES

There are two harnesses in this guide that are specifically designed for women. What? the third decade of the 21st century and we're still only peripherally catering to 51% of the population? Is it pink? Nope, did you know that in Victorian times pink was for boys and blue was for girls? Apart from Bo Hammerstein, Female arborists don't need a variation



ADJUSTABLE COMFORTABLE DURABLE USA-CRAFTED

Designed for the ultimate in comfort and support, the Denali rises to the occasion when you need a saddle that you can depend on for all-day performance. Premium quality materials pair with reliable craftsmanship, ensuring this is the saddle that you'll reach for time and time again.



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based only on pink, they need better ergonomics. Recreational climbing and mountaineering have had 'female' designs since the 1980's but usually only in terms of sizing. Prolific harness designer Sophia Sparks of New Tribe, as a tree climber of many decades, also never saw the need for a gender-specific harness but this may well have been because



CHEST TIE-IN FRONT
CHEST TIE-IN REAR



WEB EYE

GEAR LOOPS

BASIC RINGS

ATTACH POUCH/FIRST AID KIT

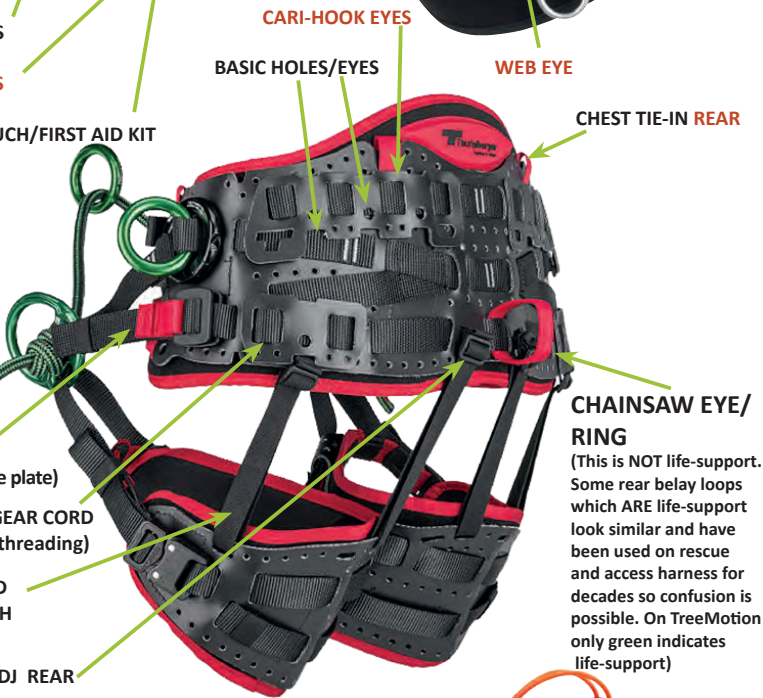
CHAINSAW HOOK

BRIDGE LENGTH ADJ
BRIDGE UNION (4-hole plate)

CUSTOM GEAR CORD (eyes for threading)

ELASTICATED REAR ATTACH

LEG RISER ADJ REAR



CARI-HOOK EYES

BASIC HOLES/EYES

WEB EYE

CHEST TIE-IN REAR

CHAINSAW EYE/RING
(This is NOT life-support. Some rear belay loops which ARE life-support look similar and have been used on rescue and access harness for decades so confusion is possible. On TreeMotion only green indicates life-support)

loadings are primarily vertical. With a noticeable increase in female arborists in just the last 10 years the different needs of modern gymnastic arborism has highlighted some ergonomic inefficiencies in the standard leg-loop designs. The *Simarghu Gemini* incorporates an additional set of pelvic straps that cross to the inside of the usual leg risers to alter the way load is applied. In the vertical plane it's still the leg loop taking the load but when you move into more horizontal (pole-strap) and diagonal (limb-walking) modes as well as rotational leaning, the pelvic straps give much better support between the lower abdomen and groin. Now defunct UK manufacturer *ChampionGear* also used these additional pelvic straps in their female version. Neither harness is/was available in pink.

GEAR STORAGE (see separate GUIDE)

This is a very personal thing as it is in all harness oriented trades; you've got all those carabiners, pulleys, slings, tethers, flip-lines, ascenders, prusiks, first aid kit, pruning saw, chainsaw etc. to think about. Many harnesses come with a good array of gear loops and the ability to add more yourself as well as

attachment points for tool clips like the *Petzl CariTool* (latest EVO version shown here) which spawned a host of similar resin and alloy, carabiner-style hooks (shown opposite). These include *Courant*, *CT*, *Edelrid* and *Protekt* but also more complex metal alloy wizardry from *Rock Exotica* (*TransPorter* shown below) & *C.A.M.P.* *CMI* now produce the *Shembiner* which is a simple but extremely robust and easy to use chainsaw hook while *Buckingham* went down the even simpler route of a resin clothes-peg style clip. *DMM* have embraced the concept of organising gear more than most with three sizes of their *Vault* carabiner as well as fold-flat clips as shown in the insets opposite and their *Parking Lot* adapter plate for fixing all kinds of hardware in the orientation to suit you - we've shown a regular gear clip but this could just as easily have been angled using different attachment holes. Some harnesses, and again we'll use the *TreeMOTION* as an example, give you an infinite range of connection and carrying options, as you might expect of just about the most arb-engineered harness on the market. Some arb harnesses like the *Weaver Cougar*, *Edelrid TREEREX*, *DMM Kinsi*,



TreeMotion Pro & Essential (but NOT the original TreeMotion shown opposite) have a rear belay loop in high vis red which is a fully load-bearing connection on which you could hang though it is more useful as a work restraint attachment but don't confuse a non-load bearing gear or suspender loop with this or there will be dire consequences and not for the first time.

There are basically 5 types of gear attachment:

- *the rock climbing harness style gear loop which can take a whole line of carabiners, hardware and software. This might be rigid and stand proud for easier clipping (as indicated in our tables) or hang more conventionally flush with the harness.*
- *the metal ring or eyelet which, in a larger size, may be used for connecting your chainsaw, but we now see a number of smaller rings positioned around the waist and even on the leg-loops for attaching gear. None of these are live-load-bearing and are always in standard silver whereas life-support rings are often (though not always anodized to avoid confusion.*
- *the integrated metal clip or hook often with a sprung gate and with a larger load capacity to carry the weight of a chainsaw - this is usually situated around the very back of the harness.*
- *the webbing, leather or plastic 'slot' which will hold a carabiner or Caritool which in turn gives you more space into which gear can be clipped. Most harnesses now cater for such Carritool hooks and these have the gate clearance and load capacity to be used for a chainsaw so many in our tables do not show an entry in the dedicated Chainsaw Eye/Hook row since the Carritools enable you to position your chainsaw exactly where you want it.*
- *Smaller web eyelets on some harnesses which are just large enough for a small carabiner or a cord. The eyelets restrict movement of a gear carabiner and are ideal for attaching a snap gate carabiner into which you can quickly clip pretty much anything. If you use a bent gate rather than straight gate carabiner you can also take advantage of the original rock-climbing purpose which is rapid location and 'capture' of whatever you need to clip but conversely, beware of trailing your rope across the gate. Individual web eyes are also good for direct attachment of accessory bags like throwlines and first aid kits or for attaching cord and making more gear loops. The Edge harness from Sherrill Tree and the Edelrid Tree Magic (initially replaced by the Tree Core and now by the TREEREX) maximise use of wide gear loops making pretty much the entire width of the waist belt a clippable area so there should never be any excuse for fumbling. However, bear in mind that if you overload a gear loop with too many carabiners full of ascenders, descenders, pulleys flip-lines etc. it can become difficult to locate let alone unclip your required item - good management is key...now go and tidy your bedroom.*

Some folk prefer to climb 'clean' with little or no attachments other than an integral metal clip for the chainsaw while others are ready for an assault on the North face of the Eiger.

The TreeMotion sparked a move towards both customisable gear attachments and LOADS of gear attachments. In Teufelberger's case they were sensible enough to realise that having such a complex range of options needed improved organisation so they colour-coded their integral attachment points as GREEN for primary life-support (bridge, side-D's

and Bridge Union Rings) and red for secondary life support or more accurately, restraint and chest harness attachment points. Nevertheless, many harnesses using black as their base material on the waist belt would benefit from better contrast colouring even allowing for the fact that you are meant to customise your own attachment points using the various holes and eyes BEFORE you start climbing. The ArbPro Tree Access3 above and its 'parent' the CAMP Tree Access Evo have used contrast colours on their gear loops and webbing eyes that greatly clarify where to clip - compare these to the Sherrill Tree Edge and the Notch Sentinel. Both are predominantly black with black fittings.



STANDARDS

Leg loops are also the only way your harness will meet certain relevant safety standards like Europe's EN (European Norms) and the US's ANSI. In fact the numerically challenging **ANSI A10.14-1991** quoted here by some manufacturers was withdrawn a few years ago in favour of a 2004 version but that too is a far more generic standard relating to a number of components in addition to the harness. But I think you'll find **ANSI Z359.0** and it's numerous offspring are starting to cover things. **EN813** on the other hand is quite specific in its requirement for a sit harness to maintain a 100kg mass safely upright after a 2m free fall on a 1m lanyard and for its load-bearing components to withstand a 15kN pulling force for 3 minutes, fairly easy for many it has to be said. That's if a manufacturer is inclined enough towards the European market to go through the expensive procedures required to acquire EN certification. Virtually all of the models in this guide could meet both **EN358** and **EN813** even if they don't say so. 'Standards' is actually a whole 'nuther article but since we're on the subject you won't see **EN361** quoted in the following tables because that's a fall-arrest standard requiring the addition of a chest harness to pass the drop test. Many of these harnesses have the option of a chest harness which is vital for some SRT systems and would thus meet the requirements of EN361.

EN358 refers to the ability of the side D-rings to act in a work positioning role and to also not impart more than 15kN of force to your dainty waist after a 1m fall -always assuming that, even after all those doughnuts you still only weigh 100kg or 220lbs.

ASTM F887 is for personal climbing equipment and is a useful and detailed standard which includes a section specific to harnesses rather than being generic. **EAC** is for eastern Europe.

CHINESE HARNESSSES

We have not included any because we cannot yet verify the certification. They often mention CE certification but there's nothing to stop them saying this when it isn't true - it is up to the importer. So, none are included here despite the fact that one or two appear to have decent components and stitching. A description as a 'Half-Body' harness and a price tag too good to be true should cause you to be wary but expect to see properly certified, verified, rebadged models soon.

IN THE FOLLOWING TABLES:

....we have shown most harnesses from the front and the back. Prices are for the specific version listed and normally shown in the currency of the country of origin. Some models, have so many variants that we would need an entire Market Guide just to list their range. Similarly, so many older designs are still popular that they remain in production but we have only shown key, generally padded, legloop harnesses.

Prices and weight etc, are for the base model with standard features NOT options. Any feature that is an option is shown as an outline squares □ □

ORIGIN: The manufacturer's country but not always where it's made in which case, if we know, there is an inset flag.

COST: approximate, rounded up and inclusive of local taxes which are generally 20% in Europe. Costs are the Recommended Retail Price and can often be found for less at your stockist. **Prices in orange are a currency conversion only (as of May 2023) not necessarily the selling price because they do not include import costs and duty.**

CHEST HARNESS: None of these harnesses includes a chest harness. If the same company supplies a chest harness it will be shown as □

NB: suspenders NOT for life-support but will stop you coming out when inverted. **ATTACH PTS(Points):** Not always necessary.

Integrated attachment points for a chest harness- or suspenders, usually rings or sewn loops on the top edge which can also be used as gear attachment points.

BUCKLES: The specific type of buckle used for the waist and leg-loops. Many use the quick attach/release AustriAlpin Cobra as the gold standard but if they are a similar principle but unbranded we have called them 'Fast-Clip'. ISC has its own version and Petzl has a bespoke hook and push-fit combination buckle. Some US harnesses use a traditional pin & hole waist belt but these are not directly attached to.

BRIDGE TYPE: The number and type of bridge which will be rope or webbing or a double layer of webbing - some are stitched into place but most are **REPLACEABLE** referring to the ability to self-replace once worn.

BRIDGE LENGTHS If a bridge is tied rope it will be **ADJUSTABLE** but some that have a sewn termination like the Petzl or ArbPro model opposite, can also be self-replaced so there may still be a green square in the above row. Webbing is always sewn so not adjustable for length but may still be replaceable.

CONNECTION TO BRIDGE: The attachment method from your bridge to your climbing/descending system as supplied with the harness. May be an optional purchase from the same manufacturer (shown as an outline square) or you can simply attach direct with a carabiner, but most are a ring(s)

BRIDGE UNION: is the means by which the bridge is secured to the harness - this may be a rigging plate, shackle or ring offering additional bridge attachment points or it may be sewn in and fixed though that is unusual these days. LENGTH ADJ: refers to the ability to alter the distance between the bridge union and the sides of the harness, in essence, to tighten the bridge.

SRT D-RING EYE REAR BELAY: a centrally mounted D-ring or **WEB EYE** that is fully load-bearing and often used for SRT/SRS or as an ascender rig attachment point. Occasionally there may also be a load-bearing **belay** loop or sewn eye on the **REAR** but in arborist harnesses these are too easily confused chainsaw eyes that are not load bearing in terms of human weight..

POLE STRAP D's: large, load-bearing D-rings mounted on each side for attachment of pole-straps/flip-lines or lanyards. Many will **FOLD FLAT** to the waist to stop being snagged while working but this can also hinder clipping in.

GEAR LOOPS: are wide, integral attachment loops, often stiffened and together with **SEWN EYES** for attaching gear carabiners are generally rated to around 5kg each -

CUSTOM GEAR CORD EYES: are usually smaller than the sewn eyes mentioned above but can be one and the same if sufficiently spaced. They may be sewn loops or punched eyes capable of around 1-5kg loading on each eye.

BASIC HOLES/EYES: smaller attachment points for small accessory carabiners, may simply be a hole or t-shape

punched in the waist belt. **RINGS** may be metal or reinforced plastic(resin) usually rated from 1 to 10kg but those intended as chainsaw lanyard eyes may be stronger.

CARI-HOOK CARI-HOOK EYES: We've modified the Petzl trade name for a specialist tool carrying 'carabiner' (Cari-Tool) simply because its a good description and the only way we could get to fit! This could equally be called a Carry Hook or Tool Carabiner but it does refer specifically to the carabiner style hooks which can also be used for chainsaw attachment. **CARI-HOOK EYE** refers to slots or pouches in the webbing into which a Cari-Tool type hook can be slotted and are a strong option most often capable of taking a chainsaw. **CHAINSAW EYE/RING HOOK:** A dedicated higher load capacity webbing eye or ring or a hook typically able to hold 15-30kg/33-66lb but the CariTool style hooks take the place of a dedicated chainsaw ring or hook on most modern designs and many standard rings or sewn eyes can also do the job as they're often used as a chainsaw lanyard attachment point but verify the load capacity first.

WAIST PADDING SWAMI: All of these harnesses are padded so they will all have a black square but then a description which is basically mesh lined, single sheet foam or thermoform foam which looks segmented and ensures the harness padding doesn't bunch up and stays firm. **SWAMI** is a second inner belt sometimes elasticated, that holds your harness on while you adjust the main load bearing waist buckles.

ATTACH POUCH/FIRST AID: Adjustable strapping, eyes or elasticated cord, normally on the centre-top of the rear waist belt, to attach a first aid pouch (or anything other equipment you want to hand but a first aid kit is essential).

WAIST BELTPADDING HEIGHT: The width of the waist belt webbing - usually less than 2"/50mm. The max height of the padding is shown in orange and is not the same all the way round - most padding tapers from the back of the waist to quite low at the front. **WAIST ADJUST:** The method of adjustment of the waist belt based on the position of the buckles. Some are centrally mounted, most are on one side and you pull the end of the webbing then stow the loose end, some have a buckle on each side and you pull both sides simultaneously (or alternately as you wiggle your hips).

LEGS LOOP HEIGHT PADDING: As above except on the leg loops **ELASTICATED REAR ATTACH:** There is a ■ if the straps connecting the back of the leg loops to the waist section are elasticated rather than normal webbing. Also refer to

LEG RISER ADJ REAR: The Rear leg loop straps on the back of the harness can be adjusted for length and may also be elasticated (see above). **FRONT** The Leg riser at the front connecting the leg loops to the bridge union or direct to the waist belt can be adjusted for length -many will have bridge adjustment which secondarily affects the leg loop position but not a separate leg loop adjustment.

RFID CHIP: The harness has an embedded chip which can be read by a reader to provide inspection or inventory details.

WEAR INDICATE: Primarily Pertaining to the bridge and indicates a warning colour showing through when the bridge becomes worn and needs replacement. In reality, most rope bridges have a white core and coloured sheath so will ALL have wear indication!























































FIRST AID TRAUMAKIT: Indicates that this manufacturer supplies (or can supply as an option □ □) a first aid kit and/or a trauma kit - a **trauma** kit includes a CAT (Combat Application Tourniquet) and Cellox or similar clot-forming dressing/sachet.

SIT STRAP BOSUNS CHAIR (Batten seat): A sit strap is a continuous fabric strip that replaces or augments the leg loops. It can be integral to leg loop or run around to the front of the harnesses and be connected into via rings/D-rings. a Bosun's Chair is similarly a support eat but is stiffened/reinforced or may simply be a covered plank of wood. These also connect to the load support elements at the front of the harness and may have their own additional accessory loops/hooks/pouches. None in this list are integral, any shown are options-only.

OTHER SRT MODELS: This company has non-bridge models that will be added throughout 2024

IMAGES NOT TO SCALE	
FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST	
MANUFACTURER	
MODEL VARIANT	
ORIGIN	
COST inc VAT/tax conv-only	
WEIGHT	
MAX LOAD	
WAIST SIZES	
LEG SIZES	
STANDARDS	
LIFE SUPPORT	CHEST HARNESS ATTACH PTS
	BUCKLES WAIST/LEGS
	BRIDGE TYPE REPLACEABLE
	BRIDGE LENGTHS ADJUSTABLE
	CONNECTION to BRIDGE
	BRIDGE UNION LENGTH ADJ
	SRT D-RING/EYE REAR BELAY
GEAR ATTACH	POLE STRAP D's FOLD FLAT
	GEAR LOOPS SEWN EYES
	CUSTOM GEAR CORD EYES
	BASIC HOLES/EYES RINGS
	CARI-HOOK CARI-HOOK EYES
WAIST	CHAINSAW EYE/RINGHOOK
	ATTACH POUCH/FIRST AID
	WAIST PADDING SWAMI
LEG	WAIST BELT HEIGHT PADDING
	WAIST ADJUST
EXTRAS	LEG LOOP HEIGHT PADDING
	ELASTICATED REAR ATTACH
	LEG RISER ADJ REAR FRONT
RFID CHIP WEAR INDICATE	
FIRST AID TRAUMA KIT	
SIT STRAP BOSUNS CHAIR	
OTHER SRT MODELS	
NOTES	
WEBSITE	
COST: Approx inc local tax £\$€=curr	

ARBORIST SIT HARNESSES

				
ARB PRO	BASHLIN	BASHLIN	BUCKINGHAM	BUCKINGHAM
Tree Access 3.0	639 BBL 640 BBL	639 BBS 640 BBS	Agility ¹⁴⁸⁰	BuckTree Alto Verde
				
£295 \$377 €341	£323 \$360 \$402 €368	£323 \$360 \$402 €368	£685-760 \$867-962 €805-890	£525-690 \$662-870 €615-805
1.96-2.03kg/4.3-5.5lb	2.3-2.6kg/5.15-5.75lb	2.4-2.7kg/5.2-5.9lb	2.5kg/5.5lb	2.3kg/5lb
140kg/310lb	159kg / 350lb	159kg / 350lb	159kg / 350lb	159kg / 350lb
sizes 80-140cm/31.5-55"	5 sizes 71-112cm/28-44"	5 sizes 71-112cm/28-44"	5 sizes 61-112cm/24-44"	4 sizes 71-112cm/28-44"
sizes 50-75cm/19.7-29.5"	5 sizes 40-101cm/16-40"	5 sizes 40-109cm/16-43"	n/a	n/a
				
	- -	- -		- -
STS Fast-Clip	Pin&Hole/Fast-Clip	Pin&Hole/DblBack	ISC Fast-Clip	Fast-Clip
20mm Webbing 	Fixed 44mm Webbing no	Integrated sit strap no	Sewn segmented Rope 	Tied Rope 
25/30cm no	30cm/12" no	51cm/20" no	30cm/12" 	30cm/12" 
Sliding Ring	2x Sliding AlloySteel D-Rings	2x Fixed AlloySteel D-Rings	Sliding Ring	Sliding Ring
Shackle 	Sewn/Fixed no	Sewn/Fixed no	4-hole + D-ring plate 	4-hole plate 
-  -	- - -	- - -	- - -	- - -
				
8 4+2*	- -	- -	3 4	8 1
-	-	-	-	-
- 2	- 2(sliding)	- 2(sliding)	- 4	- 2
- -	4* (sliding) -	4* (sliding) -	 4	 4
 -	- 2 (sliding)	- 2 (sliding)	- 	- 2 x6.8kg/15lb
	-	-		
Thermo-Form 	Mesh/Foam 	Mesh/Foam 	Mesh/Foam 	Thermo-Form 
44mm/1.75" 19cm/7.5"	44mm/1.75" 20.3cm/8"	44mm/1.75" 20.3cm/8"	45mm/1.75" 25.4cm/10"	45mm/1.75"17.8cm/7"
Double Sided	Central	Central	1x Front + 2x side	Central
33mm/1.5" 14cm/5.5"	44mm/2" 10cm/4"	44mm/2"10cm/4"	25mm/1" 17.8cm/7"	45mm/1.75"17.8cm/7"
-	-	-		
 -	- -	- -	 	- 
- 	- -	- -	- -	- -
- -	- -	- -	- 	- 
- 	- -	 -	- -	- -
-	-	-	-	-
*sewn load-bearing eyes on bridge union shackle	639 orange stitch=Alu *Not designated eyes but 4 to 8 Carri-Hooks can be installed on belt	640 white stitch=Steel *Not designated eyes but 4 to 8 Carri-Hooks can be installed on belt	Bridge can be clipped into or length adjusted via separated sewn 'eyes' along its length. Hook&Loop on all web tails	
arbpro.it	bashlin.com	bashlin.com	buckinghammfg.com	buckinghammfg.com

currency conversion only OPTION=  or  or  N/A: info Not Given STANDARDS: EN358 =  EN813=  ANSI Z133=  ASTM F887=

	IMAGES NOT TO SCALE				
	FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST				
	MANUFACTURER	BUCKINGHAM	BUCKINGHAM	BUCKINGHAM	BUCKINGHAM
	MODEL VARIANT	Buck Craft 17911	Ergovation SRT 16906/2/4	ErgoLite 17906 J17906	Ergo Pro 17905
	ORIGIN				
	COST inc VAT/tax conv-only	£390 \$487 €449	£802 \$1001 \$1240 €923	£754 \$942 €869	£651 \$813 €750
	WEIGHT	2.1kg/4.6lb	2.95kg/6.5lb 6.8lb	2.3kg/5.1lb	2.6kg/5.8lb
	MAX LOAD	159kg / 350lb	140kg/310lb	159kg / 350lb	159kg / 350lb
	WAIST SIZES	4 sizes 71-112cm/28-44"	4 sizes 71-112cm/28-44"	4 sizes 71-112cm/28-44"	4 sizes 71-112cm/28-44"
	LEG SIZES	n/a	n/a	n/a	n/a
	STANDARDS				
LIFE ATTACH	CHEST HARNESS ATTACH PTS	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	BUCKLES WAIST/LEGS	AA Cobra Fast-Clip	Fast-Clip	Fast-Clip	Double D
	BRIDGE TYPE REPLACEABLE	2x 3/8" Tied Ropes	7/16" Tied Rope (6 other options)	Jacketed Rope	11mm Tied Rope
	BRIDGE LENGTHS ADJUSTABLE	102cm/40"	44cm/17.25"	30cm/12" no	n/a
	CONNECTION to BRIDGE	Sliding Ring	Sliding Ring (6 other options)	-	Sliding Ring
	BRIDGE UNION LENGTH ADJ	3-hole+D-ring plate	3-hole plate	Shackle	4-hole plate
	SRT D-RING/EYE REAR BELAY	- - -	- -	- - -	-
	POLE STRAP D'S FOLD FLAT			*	
	GEAR LOOPS SEWN EYES	3 -	6 3*	5 1	4 -
	CUSTOM GEAR CORD EYES	-	-	-	-
GEAR ATTACH	BASIC HOLES/EYES RINGS	- 2 (+2 waist attach rings)	- -	- 2	- 2
	CARI-HOOK CARI-HOOK EYES	<input type="checkbox"/> 2	<input type="checkbox"/> -	<input type="checkbox"/> 4 +8 on seat	- 4
	CHAINSAW EYE/RINGHOOK	- 2 x6.8kg/15lb	- -	- -	- <input type="checkbox"/>
	ATTACH POUCH/FIRST AID				
WAIST	WAIST PADDING SWAMI	Thermo-Form -	Drilex foam	Drilex foam	Drilex foam
	WAIST WEB HEIGHT PADDING	45mm/1.75" 20.3cm/8"	45mm/1.75" 22.9cm/9"	45mm/1.75" 19cm/7.5"	45mm/1.75" 17.5cm/7"
	WAIST ADJUST	Central(ish)	Central +2 side	Central +2 side	2x side
LEG	LEGS WEB HEIGHT PADDING	45mm/1.75" 12cm/5"	45mm/1.75" 15cm/6"	45mm/1.75" 15cm/6"	45mm/1.75" 14cm/5.5"
	ELASTICATED REAR ATTACH	-	-	-	-
EXTRAS	LEG RISER ADJ REAR FRONT	-	-	-	
	RFID CHIP WEAR INDICATE	- -	- -	- -	- -
	FIRST AID TRAUMA KIT	- <input type="checkbox"/>	- <input type="checkbox"/>	- <input type="checkbox"/>	- <input type="checkbox"/>
	SIT STRAP BOSUNS CHAIR	- -	- <input type="checkbox"/>	-	- -
	OTHER SRT MODELS	-	-	-	-
	NOTES	Lightest Buckingham Arb Harness	Waist padding can be removed. SRT version uses a bridge conversion strap. *1 sewn eye (intended for the chest harness)+2 eyes on legs	*additional Smaller side-D on each side connects to the bridge union.	
	WEBSITE	buckinghammfg.com	buckinghammfg.com	buckinghammfg.com	buckinghammfg.com

COST: Approx & inc local tax/VAT £\$€=currency conversion only **OPTION=** or or **N/A:** info Not Given **STANDARDS:** EN358 =

BUCKINGHAM	BUCKINGHAM
Master 5.0 1490 1490T	Navigator 1470
£460 \$574 \$771 €530	£539 \$673 €621
2.3kg/5.05lb	2.8kg/6.15lb
159kg / 350lb	159kg / 350lb
4 sizes 71-112cm/28-44"	4 sizes 71-112cm/28-44"
n/a	n/a
Fast-Clip Pin&Hole	AA Cobra Fast-Clip
Sewn Dyneema Tape	2xTied Ropes
n/a no	102cm/40"
Sliding Ring	Sliding Ring
Sewn eyes	3-hole plate
- 4*x -	- 4x -
4 2 (on legs)	4 -
-	-
- 7	- 6
- 4	- 4
2 x 2 x6.8kg/15lb	- 2 x6.8kg/15lb
Drilex foam -	Thermo-form -
25mm/1" 17.5cm/7"	45mm/1.75" 20.3cm/8"
2x side	1x Side
45mm/1.75" 10cm/4"	45mm/1.75" 15cm/6"
-	-
- -	- -
-	-
- -	- -
-	-
*DRT & SRT soft eyes for various work and positioning options	*DRT & SRT soft eyes for various work and positioning options
buckinghammfg.com	buckinghammfg.com

EN813= ANSI Z133= ASTM F887= CANADA=




SEQUOIA New 2023 versions


When on the move, always travel first class.

Seat harness for tree care
Ascending, moving through the tree, hanging, cutting, the SEQUOIA harness provides maximum comfort thanks to an extra-wide, semi-rigid and padded waistbelt, and large adjustable padded leg loops. The practical adjustments as well as the ability to easily carry and organize tools on the waistbelt make this harness an ergonomic masterpiece. Enhance with a wide range of accessories, including a seat harness and shoulder straps... www.petzl.com/SEQUOIA

PETZL Access the inaccessible



EYOLF
TECHNICAL CLIMBING EQUIPMENT
#VEGETYOUTHERE



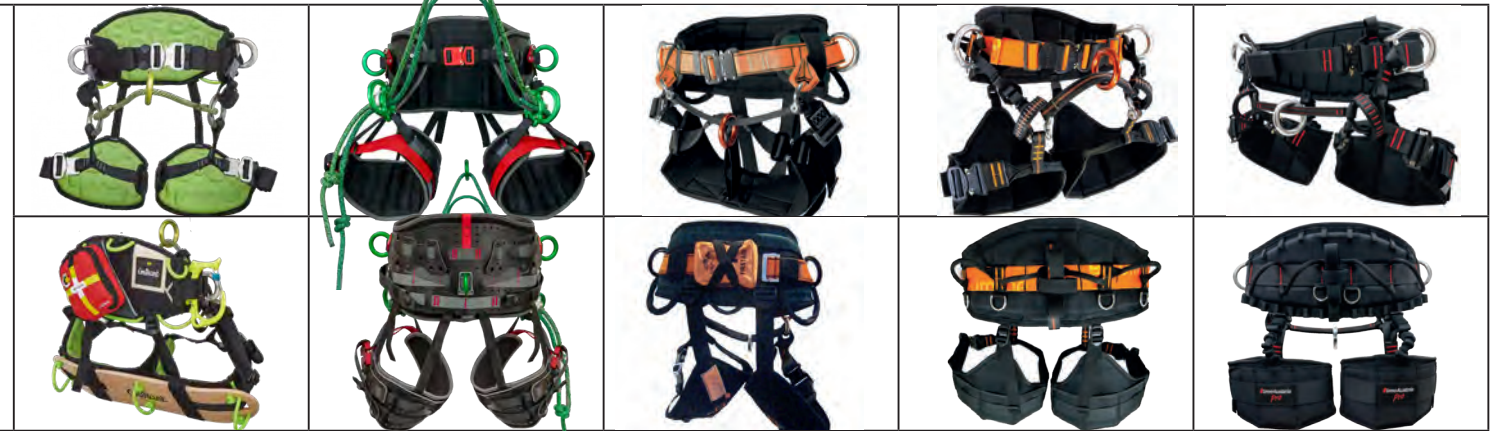
Looking for a multifunctional harness?
Our Viking Gen5 with rope bridge is the solution.

www.EYOLF.ca

IMAGES NOT TO SCALE					
FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST					
MANUFACTURER		CAMP	CAMP	CHAMPION	CLIMAX
MODEL VARIANT		Tree Access Evo	Tree Access ST <small>(was ANSI)</small>	Female Male	Atlas Tree Basic
ORIGIN					
COST incVAT/tax conv-only		£384 \$420 €380	£374 \$450 €420	£405 \$515 €475 £366	£140 \$174 €159
WEIGHT		1.96-2.03kg/4.3-5.5lb	2.23kg / 4.9lb	1.7kg / 3.7lb	1.52kg/3.3lb
MAX LOAD		140kg/310lb	140kg/310lb	120kg/264lb	140kg/310lb
WAIST SIZES		2 sizes 80-135cm/31-53"	2 sizes 80-135cm/31-53"	2 sizes 65-130cm/25-51"	1 size 80-127cm/31-50"
LEG SIZES		2 sizes 50-75cm/20-30"	2 sizes 50-75cm/20-30"	2 sizes 45-75cm/18-29"	1 size 65-80cm/25-31"
STANDARDS					
LIFE SUPPORT	CHEST HARNESS ATTACH PTS	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> -	<input type="checkbox"/> <input type="checkbox"/>
	BUCKLES WAIST/LEGS	3-Bar/STS Fast-Clip	3-Bar/STS Fast-Clip	Fast-Clips	Fast-Clips
	BRIDGE TYPE REPLACEABLE	Sewn Jacketed Rope <input checked="" type="checkbox"/>	*2xSewn Jacketed Ropes <input checked="" type="checkbox"/>	Tied Rope <input checked="" type="checkbox"/>	Jacketed webbing <input type="checkbox"/>
	BRIDGE LENGTHS ADJUSTABLE	25/30* 32/37/42cm <input type="checkbox"/>	25/30* 32/37/42cm <input type="checkbox"/>	n/a <input type="checkbox"/>	n/a <input type="checkbox"/>
	CONNECTION to BRIDGE	Sliding Ring	Sliding Ring	Sliding Ring	Sliding Ring
	BRIDGE UNION LENGTH ADJ	Shackles+ Rope eyes <input checked="" type="checkbox"/>	Shackles+ Rope eyes <input checked="" type="checkbox"/>	3 hole Plates <input checked="" type="checkbox"/>	Rings
	SRT D-RING/EYE REAR BELAY	- <input checked="" type="checkbox"/> -	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> -	- - -	- <input checked="" type="checkbox"/> +swivel -
	POLE STRAP D's FOLD FLAT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> *	<input checked="" type="checkbox"/>
	GEAR LOOPS SEWN EYES	8* 4	8* 1	3 x5kg 2 x5kg	3
	CUSTOM GEAR CORD EYES	-	-	<input checked="" type="checkbox"/> x5kg	-
GEAR ATTACH	BASIC HOLES/EYES RINGS	- 2*	- -	4* 2 x10kg	- -
	CARI-HOOK CARI-HOOK EYES	<input type="checkbox"/> 6	<input type="checkbox"/> 6	- 6	- -
	CHAINSAW EYE/RINGHOOK	- -	1 x15kg	1 x35kg	- -
	ATTACH POUCH/FIRST AID	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-
WAIST	WAIST PADDING SWAMI	Mesh/Foam -	Mesh/Foam -	Mesh/Foam -	Mesh/Foam -
	WAIST WEB HEIGHT PADDING	44mm/1.75" 19cm/7.5"	44mm/1.75" 19cm/7.5"	40mm/1.5" 20cm/8"	45mm/1.75" 15cm/6"
	WAIST ADJUST	Double Sided	Double Sided	Single Side	Double Sided
LEG	LEGS WEB HEIGHT PADDING	33mm/1.5" 14cm/5.5"	44mm/1.75" 14cm/5.5"	40mm/1.5" 15cm/6"	45mm/1.75" 10cm/4"
	ELASTICATED REAR ATTACH	-	-	-	<input checked="" type="checkbox"/>
	LEG RISER ADJ REAR FRONT	<input checked="" type="checkbox"/> -	<input checked="" type="checkbox"/> -	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> -
EXTRAS	RFID CHIP WEAR INDICATE	<input checked="" type="checkbox"/> -	<input checked="" type="checkbox"/> -	- -	- -
	FIRST AID TRAUMA KIT	<input type="checkbox"/> -	<input type="checkbox"/> -	<input type="checkbox"/> -	<input type="checkbox"/> -
	SIT STRAP BOSUNS CHAIR	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	- -	- <input type="checkbox"/>
	OTHER SRT MODELS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>
NOTES		*inc 2 small loops *Metal rings are on leg loops web* or 10.5mm Rope bridge	*bridge is 10.5mm rope &/or web* & can have 3-way swivel *2 gear loops are on leg loops	DISCONTINUED *Two additional eyes on each pole-strap D-Ring	Comes with integral swivel on SRT eye
WEBSITE		camp.it	camp.it	champion-gear.com	productosclimax.com

COST: Approx & inc local tax/VAT £\$€=currency conversion only OPTION= or or N/A: info Not Given

ARBORIST SIT HARNESSES



COURANT

DMM

DRAGON ARB

DRAYER/HABERKORN

DRAYER/HABERKORN

Koala

Kinsi

Dragon 2 TH030B

TREE AUSTRIA 3.2

TREE AUSTRIA Pro

£333 \$543 €372	£650 \$850 €770	£215 \$268 €247	£375 \$466 €430	£420 \$500 €480
1.5-1.7kg/ 3.3-3.74lb	2.4-3kg/5.5-6.6lb	2.6kg/5.7lb	1.9kg/4.2lb	1.75kg/3.9lb
150kg/330lb	150kg/330lb	100kg/220lb	150kg/330lb	150kg/330lb
3 sizes 60-120cm/23-47"	3 sizes 65-123cm/25-48"	2 sizes 66-96cm 26-38"	3 sizes 77-135cm/30-53"	3 sizes 77-135cm/30-53"
3 sizes 55-100cm/21-39"	3 sizes 44-73cm/17-29"	2 sizes 59-69cm 23-27"	n/a	n/a
		- -		
AA Cobra Fast Clips	AA Cobra Fast-Clip	Fast-Clip	AA Cobra Fast-Clips	AA Cobra Fast-Clips
Sewn Rope	1or2 Tied&Sewn Rope	Sewn 20mmWebbing	Sewn 20mm Web	1or2 Sewn 20mm Web
1 or 2x 25/30/35cm no	123/180cm Cam-	25/30/35cm no	23/25/30cm no	23/25/30cm no
Sliding Ring	Sliding Ring2	Sliding Ring	Sliding Ring	1or2 Sliding Ring(s)
Openable Rings	2x Hole + D plates	Shackles	Shackles+ web eyes	Openable rings+web eyes
- - -	- -	- - -	- - -	- - -
8 x10kg 4	- -	3 -	4 14	4 x5kg 14 x5kg
-	many!	-		x 10kg
- -	14 +2 on legs -	- -	- 4	- 2 x5kg
4 x15kg	- 11	2to4	- 4	- 4 x5kg
- -	1 x35kg	-		- -
		-		
Thermo-form -	Thermo-form	Mesh/Foam	Mesh/ Foam -	Mesh/Foam -
45mm/1.75" 19cm/7.5"	25mm/1" 23cm/9"	44mm/1.75" 20cm/7.9"	45mm/1.75" 20cm/7.9"	45mm/1.75" 20cm/7.9"
Central+both sides	1x Central	1x Central	Central+both sides	Single Side
25mm/1"18cm/7.25"	25mm/1" 14.5cm/5.7"	44mm/1.75" 15cm/6"	45mm/1.75" 24m/9.4"	45mm/1.75"12cm/5"
			-	-
- (bridge rope)	- -	- -	- -	- -
	- -	-	- -	- -
-	-	-	-	-
	-	-	-	-
2 of the gear loops are on the leg loops. Primary & secondary bridges (Milo) available	Bridge adjusts via twin-cams. Virtually all components replaceable. Wholly made in Wales			
mycourant.com	dmmwales.com	buxtons.net/dragon	drayer.de	drayer.de

STANDARDS: EN358 = EN813= ANSI Z133= ASTM F887= CANADA= AUS/NZ = EAC =

	IMAGES NOT TO SCALE				
	FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST			COMING SOON	
	MANUFACTURER	EDELRID	EDELRID	EYOLF	HARKIE
	MODEL VARIANT	Tree Rex Triple Lock	TreeRaptor	Yggdrasil	Ascend A1
	ORIGIN				
	COST inc VAT/tax conv-only	£354 \$525 €406	£330 \$420 €350	£000 \$000 €000	£253 \$315 €288
	WEIGHT	1.4-1.6kg/3-3.5lb	1.5kg/3.3lb	0kg	1.94kg/4.3lb
	MAX LOAD	150kg/330lb	150kg/330lb	0kg/0lb	100kg/220lb
	WAIST SIZES	2 sizes 68-121cm/26-47"	2 sizes 68-121cm/26-47"		3 sizes 75-132cm/30-52"
	LEG SIZES	2 sizes 50-72cm/20-29"	2 sizes 50-72cm/20-29"		3 sizes 40-100cm/16-39"
	STANDARDS				
LIFE ATTACH	CHEST HARNESS ATTACH PTS				- -
	BUCKLES WAIST/LEGS	Edelrid Hook&Fast-Clips	Edelrid Buckles		AA Cobra Fast Clip
	BRIDGE TYPE REPLACEABLE	2x Tied Ropes	2x Tied Ropes		DbI Web
	BRIDGE LENGTHS ADJUSTABLE	145cm/57"	110cm/44" no		25/30/35cm no
	CONNECTION to BRIDGE	Sliding Ring	Sliding Ring		2x Sliding Rings
	BRIDGE UNION LENGTH ADJ	6-hole+D-ring Plates	3-hole+D-ring Plates		Shackle -
	SRT D-RING/EYE REAR BELAY	-	- -		- - -
	POLE STRAP D's FOLD FLAT				
	GEAR LOOPS SEWN EYES	4x 25kg -	4x 25kg -		3 -
	CUSTOM GEAR CORD EYES	x 10kg	x 10kg		-
GEAR ATTACH	BASIC HOLES/EYES RINGS	14x 25kg	3x 10kg		- -
	CARI-HOOK CARI-HOOK EYES	6*	2-4*		1x L Caritool 2
	CHAINSAW EYE/RINGHOOK	- -	- -		- -
	ATTACH POUCH/FIRST AID				-
	WAIST PADDING SWAMI	Mesh/ Foam -	Mesh/ Foam -		Mesh/Foam -
	WAIST WEB HEIGHT PADDING	28mm/1.1" 20cm/7.9"	45mm/1.75" 20cm/7.9"		45mm/1.75" 20cm/7.9"
	WAIST ADJUST	Both sides	Centre		Central
	LEGS WEB HEIGHT PADDING	28mm/1.1" 16cm/6.3"	28mm/1.1" 15cm/5.9"		45mm/1.75" 23.5cm/9.25"
	ELASTICATED REAR ATTACH				
	LEG RISER ADJ REAR FRONT				
EXTRAS	RFID CHIP WEAR INDICATE				- -
	FIRST AID TRAUMA KIT				
	SIT STRAP BOSUNS CHAIR	- -	- -		- -
	OTHER SRT MODELS				-
	NOTES	*Can be purchased without SRT insert. Primary bridge adjusts via prusic (included). *2 on legs	COMING MARCH 2024 *2 on legs	COMING early 2024	DISCONTINUED. Hi-Viz panels on leg loops
WEBSITE	edelrid.com	edelrid.com	eyolf.ca	harkieglobal.com	

COST: Approx & inc local tax/VAT £\$€=currency conversion only OPTION= or or N/A: info Not Given

ARBORIST SIT HARNESSES



HONEYWELL/KOMET Butterfly II	HONEYWELL/KOMET DragonFly II	HONEYWELL/MILLER Morpho1 & 2	HUSQVARNA Climbing Harness	JMP INTER Trewor C U UC
£275 \$432 €313	£350 \$436 €352	£376 \$468 €431	£600 \$650 €555	£294 \$366 €337
2.3kg/5lb	2.35kg/5lb	1.76kg/3.9lb	2.5kg / 5.5lb	1.4-1.6kg/3-3.5lb
140kg / 308lb	140kg / 308lb	140kg / 308lb	150kg / 330lb	150kg/330lbs
3 sizes 76-138cm/28-54"	3 sizes 76-138cm/28-54"	3 sizes 76-138cm/28-54"	1 size	2 sizes 70-110cm/
3 sizes 40-100cm/16-39"	3 sizes 40-100cm/16-39"	3 sizes 40-100cm/16-39"	1 size	2 sizes 45-70cm/
			- -	
Fast Clip	Fast Clip	Fast Clip	AA Cobra Fast Clip	Fast Clip
Webbing	Webbing	Webbing or Cleated Rope	2x Tied Rope	Sewn webbing
25/30/35cm/ no	25/30/35cm no	25/30/35cm 90/110/130cm no	123/180cm	25 30 35cm/ no
Sliding Ring	-	Sliding Ring	Sliding Ring	Sliding Ring
Shackle	Shackle	Shackle	5-hole + D-ring Plate	Openable Ring
- - -	- - -	- - -	- - -	- - -
4 -	4 -	4 x5kg or 8 plastic eyes -	- 4	4
-	-	-		-
- 2	- 2	- 2	-12	- 2
- 2	- 2	- 2	- 12	- 2
-	-	-	1 -	- -
-	-	-		
Thermo-form -	Thermo-form -	Thermo-form -	Mesh/Foam	Mesh/Foam -
45mm/1.75" 17.5cm/7"	45mm/1.75" 17.5cm/7"	45mm/1.75" 17.5cm/7"	25mm/1"24cm/9.5"	44mm/1.75" 17.5cm/7"
Single Side	Single Side	Single Side	Central	Central
45mm/1.75"15cm/6"	45mm/1.75"15cm/6"	25mm/1"15cm/6"	25mm/1" 17.5cm/7"	44mm/1.75"15cm/6"
	-			
- -	- -	- -	- -	- -
- -	- -	- -	- -	- -
- -			- -	- -
-	-	-	-	-
sps.honeywell.com	sps.honeywell.com	sps.honeywell.com	husqvarna.com	jmpinter.com

STANDARDS: EN358 = EN813= ANSI Z133= ASTM F887= CANADA= AUS/NZ = EAC =

IMAGES NOT TO SCALE					
FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST					
MANUFACTURER		JMP INTER	NEOFEU	NOTCH	PETZL
MODEL VARIANT		Treeman SRT	ARB'O	Sentinel	Sequoia
ORIGIN					
COST inc VAT/tax conv-only		£227 \$283 €261	£281 \$350 €325	£415 \$450 €540	£365 \$450 €386
WEIGHT		1.43-1.64kg/3.2-3.6lb	1.75kg/3.8lb	1.8-2kg/4.1-4.2lb	1.48-1.6kg/
MAX LOAD		150kg/330lbs	140kg/308lb	140kg/308lb	140kg/308lb
WAIST SIZES		2 sizes 70-110cm/27-43"	4 sizes 65-135*cm/25-53"	2 sizes 71-112cm/28-44"	3 sizes 65-120cm/25-47"
LEG SIZES		2 sizes 45-70cm/18-27"	4 sizes 45-90*cm/18-35"	2 sizes 58-94cm/23-37"	3 sizes 44-65cm/17-26"
STANDARDS					+UKCA
CHEST HARNESS ATTACH PTS					
BUCKLES WAIST/LEGS		Fast Clip	Fast Clip	Hooked Fast Clip	Petzl FAST & FAST LT+
BRIDGE TYPE REPLACEABLE		Tied Rope	2x Tied *Rope	1x Tied Rope	1 or 2 Sewn Rope
BRIDGE LENGTHS ADJUSTABLE		35/45cm	35/45cm	24/27"	25/30/35cm no
CONNECTION to BRIDGE		Sliding Ring	2 x Sliding Rings	Sliding Ring	*
BRIDGE UNION LENGTH ADJ		3-hole plate	3 hole Rig-Plates	3 hole Rig-Plates	2 holes +D-ring Plates
SRT D-RING/EYE REAR BELAY		- -	- - -	- - -	- - -
POLE STRAP D'S FOLD FLAT					
GEAR LOOPS SEWN EYES		4 -	2 1	8 1	9 2
CUSTOM GEAR CORD EYES		-	-	-	-
BASIC HOLES/EYES RINGS		- 2	- 6 + 4 on legs* (x10kg)	- 2	- -
CARI-HOOK CARI-HOOK EYES		- 4	- 6	- 4	5
CHAINSAW EYE/RINGHOOK		- -	-	-	- -
ATTACH POUCH/FIRST AID			-		
WAIST PADDING SWAMI			Mesh/Foam	Mesh/Foam	Thermo-form
WAIST WEB HEIGHT PADDING		45mm/1.75" 24cm/9.5"	44mm/1.75" 24cm/9.5"	45mm/1.75" 20cm/7.9"	44mm/1.75" 19cm/7.5"
WAIST ADJUST		Single Side	1x Side	1x Side	1x Side
LEGS WEB HEIGHT PADDING		45mm/1.75" 16cm/6.3"	44mm/1.75" 11cm/4.3"	25mm/1" 14.6cm/5.7"	25mm/1" 16cm/6.3"
ELASTICATED REAR ATTACH					
LEG RISER ADJ REAR FRONT		-		-	-
RFID CHIP WEAR INDICATE		- -	- -	-	- -
FIRST AID TRAUMA KIT		- -	- -	- -	- -
SIT STRAP BOSUNS CHAIR		- -	-	- -	-
OTHER SRT MODELS		-	-	-	
NOTES			*reinforced Plastic rings 10kg *largest XXL size on request *Aramid & Nylon bridges included	Also Black/Lime Green. Chainsaw hook can be moved to either side.	* Option Ring or Swivel 180cm Adjustable bridge option
WEBSITE		jmpinter.com	neofeu.com	notchequipment.com	Petzl.com

COST: Approx & inc local tax/VAT £\$€=currency conversion only OPTION= or or N/A: info Not Given

ARBORIST SIT HARNESSSES



PETZL Sequoia SRT	PROTEKT Tree Up TH-020	PROTEKT Tree Up TH-030mX	PROTEKT Tree Up TH-050mX	R-EASY CLIMBER Fox Fox Leather
£389 \$520 €440	£110 \$135 €120	£115 \$145 €130	£135 \$170 €153	£309 \$385 €354 €384
1.58-1.7kg/ 140kg/308lb	1.45kg/3.2lb 100kg/220lb	1.94kg/4.3lb 140kg/308lb	2.6kg/5.7lb 140kg/308lb	1.6kg/3.5lb 1.7kg/3.7lb 140kg/308lb
3 sizes 65-120cm/25-47"	3 sizes 75-132cm/30-52"	4 sizes 75-150cm/ 30-59"	4 sizes 75-150cm/ 30-59"	3 sizes 65-120cm/25-47"
3 sizes 44-65cm/17-26"	3 sizes 40-90cm/16-35"	4 sizes 40-100cm/16-39"	4 sizes 40-100cm/16-39"	3 sizes 44-65cm/17-26"
Petzl DblBack & FAST LT+	AA Cobra Fast Clip	AA Cobra Fast Clip	AA Cobra Fast Clip	Fast Clip
1 or 2 Sewn Rope	Double 20mm Web	20mm Webbing	20mm Webbing	1/2 Sewn Rope(s)
25/30/35cm no	25/30/35cm no	25/30/35cm no	25/30/35cm no	25/30/35cm no
*	Sliding Ring	Sliding Ring	Sliding Ring	Sliding Ring
2 holes +D-ring Plates	Shackles	Shackles	Shackles	Openable rings
9 2	- 3	- 3	- 3	11*
-	-	-	-	-
- -	- -	- -	- -	- -
- -	- -	- -	- -	- -
Thermo-form	Mesh/Foam	Mesh/Foam	Mesh/Foam	Thermo-form
44mm/1.75" 19cm/7.5"	45mm/1.75" 20cm/7.9"	45mm/1.75" 20cm/7.9"	44mm/1.75" 20cm/7.9"	45mm/1.75" 20cm/7.9"
double sided	Central	Central	Central	1x Side
25mm/1" 16cm/6.3"	45mm/1.75" 23.5cm/9.25"	44mm/1.75" 23.5cm/9.25"	44mm/1.75" 23.5cm/9.25"	25-45mm/1-1.75" 16cm/6.3"
- -	- -	- -	- -	- -
- -	- -	- -	- -	- -
* Option Ring or Swivel 180cm Adjustable bridge option	Bridge attachment webbing length adjusted via rear buckle	Bridge attachment webbing length adjusted via rear buckle. Replaced X & 030	Integrated sit-strap. Bridge attachment webbing length adjusted via rear buckle. Replaced X & 050	Leather version=belt and leg loop outers are LEATHER. *5 'loops' are separated sections of one cord. 2 on leg loops
Petzl.com	protekt.pl	protekt.pl	protekt.pl	r-eshop.com

STANDARDS: EN358 = EN813= ANSI Z133= ASTM F887= CANADA= AUS/NZ = EAC =

IMAGES NOT TO SCALE					
FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST					
MANUFACTURER	MODEL VARIANT	ROCK EMPIRE	SHERRILL TREE	SIMARGHU	SIMARGHU
ORIGIN					
COST inc VAT/tax conv-only		£220 \$275 €250	£385 \$480-510 €440	£380 \$474 €436	£380 \$474 €436
WEIGHT		1.79kg/3.94lb	1.9kg/4.2lb	2.5-2.6kg/5.5-5.7lb	2.3kg/5lb
MAX LOAD		140kg/308lb	159kg/350lb	140kg/308lb	140kg/308lb
WAIST SIZES		2 sizes 70-130cm/27-51"	4 sizes 71-112cm/28-44"	2 sizes 69-107cm/27-42"	1 size 66-86cm/26-34"
LEG SIZES		2 sizes 54-80cm/21-31.5"	n/a	1 size 43-69cm/17-27"	1 size 43-69cm/17-27"
STANDARDS					
LIFE CRITICAL	CHEST HARNESS ATTACH PTS	- -	- -	-	-
	BUCKLES WAIST/LEGS	Fast-Clip	AA Cobra Fast Clip	Fast-Clip	Fast-Clip
	BRIDGE TYPE REPLACEABLE	1x 11mm Tied Rope	1x Tied Rope	1x Tied Rope	1x Tied Rope
	BRIDGE LENGTHS ADJUSTABLE	130cm/51"	102cm/40"	130cm/51"	130cm/51"
	CONNECTION to BRIDGE	Sliding Ring	Sliding Ring	Sliding Ring	Sliding Ring
	BRIDGE UNION LENGTH ADJ	2 hole Plates	3 holes +D-ring	3 holes +D-ring	3 holes +D-ring
	SRT D-RING/EYE REAR BELAY	- - -	- - -	- - -	- - -
	POLE STRAP D's FOLD FLAT			2x pairs	
	GEAR LOOPS SEWN EYES	6 2	5 3	4 2	2 2
	CUSTOM GEAR CORD EYES	-	-	-	-
GEAR ATTACH	BASIC HOLES/EYES RINGS	- 2	- 2	- -	- -
	CARI-HOOK CARI-HOOK EYES	11	- 4	- 2	- 4
	CHAINSAW EYE/RINGHOOK	- -	- -		
	ATTACH POUCH/FIRST AID	-			
	WAIST PADDING SWAMI	Mesh/Foam	Mesh/Foam	Thermo-form	Thermo-form
WAIST	WAIST WEB HEIGHT PADDING	44+30mm/1.25" 17.5cm/7"	45mm/1.75" 20cm/7.9"	45mm/1.75" 20cm/7.9"	45mm/1.75" 20cm/7.9"
	WAIST ADJUST	1x Side	1x Side	1x Central	1x Central
	LEGS WEB HEIGHT PADDING	44mm/1.75" 12.5cm/5.5"	25mm/1" 14.6cm/5.7"	25mm/1" 14.6cm/5.7"	25mm/1" 14.6cm/5.7"
LEG	ELASTICATED REAR ATTACH	-		-	-
	LEG RISER ADJ REAR FRONT		-		
EXTRAS	RFID CHIP WEAR INDICATE	- -	- -	-	-
	FIRST AID TRAUMA KIT	- -	- -		
	SIT STRAP BOSUNS CHAIR	- -	- -	- -	- -
	OTHER SRT MODELS		-	-	-
NOTES		Also in Black/Blue	The smaller size has the same gear attach options as the Gemini. Bridge union adjust via buckle on waist-rear	Has two additional pelvis straps waist to legs. Bridge union adjust buckle on waist-rear	
WEBSITE		rockempire.com	sherrilltree.com	simarghu.com	simarghu.com

COST: Approx & inc local tax/VAT £\$€=currency conversion only OPTION= or or N/A: info Not Given STANDARDS: EN358 =

SINGING ROCK	SKYLOTEC
Arbo Master	Ignite Arb
£270 \$340 €310	£415 \$520 €476
1.7kg/3.7lb	2.47-3.48kg/5.4-7.7lb
120kg/264lb	150kg/330lb
2 sizes 65-130cm/25-51"	2 sizes 60-125cm/24-49"
2 sizes 45-75cm/18-29"	2 sizes 60-85cm/24-33"
<input type="checkbox"/> -	<input type="checkbox"/> -
Fast-Clip	Fast-Clip
2x Tied Ropes	Sewn Webbing
130cm/51"	20/25/30cm
Sliding Ring	Sliding Ring
1 hole +D-ring Plate	Inverted D-Ring
- - -	- - -
4 x5kg 2 x5kg	6 4
x5kg	-
- 2 x10kg	- -
<input type="checkbox"/> 6	<input type="checkbox"/> 6
1 x35kg	
Mesh/Foam	Thermo-form
40mm/1.5" 20cm/8"	44mm/1.75" 22cm/8.7"
Single Side	Single Side
40mm/1.5" 15cm/6"	44mm/1.75" 15.5cm/6.1"
-	
- -	- -
<input type="checkbox"/> -	<input type="checkbox"/> -
- -	- <input type="checkbox"/>
additional neoprene pouch on leg loops for small items	Replaced the celebrated Kolibri
singingrock.com	Skylotec.com

EN813= ANSI Z133= ASTM F887= CANADA=

EDELRID

TREERAPTOR

Tree climbing harness with excellent price-performance ratio

- Double Lock buckles on the leg loops
- 45 mm Triple Lock buckle on the waist belt
- Padding on the back and hips
- Ability to attach the TREEREX FIRST AID KIT
- 4 large gear loops
- Stretchy waist belt with a VCR strap for a comfortable fit

Find out more about the TREERAPTOR

	IMAGES NOT TO SCALE				
	FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST				
	MANUFACTURER	STEIN	TEUFELBERGER	TEUFELBERGER	TREE HOG
	MODEL VARIANT	Vega Plus VS2	TreeMOTION Essential	TreeMOTION Pro	Razorback TH5000
	ORIGIN				
	COST inc VAT/tax conv-only	£431 \$595 €545	£356 \$500 €440	£472 \$625 €582	£252 \$314 €289
	WEIGHT	1.9kg/4.2lb	2kg/2.2lb	2.3kg/5lb	2.5kg/5.5lb
	MAX LOAD	150kg/330lb	150kg/330lb	150kg/330lb	100kg/220lb
	WAIST SIZES	3 sizes 76-98cm/	3 sizes 69-129cm/27-50"	3 sizes 69-129cm/27-50"	3 sizes 76-140cm/26-52"
	LEG SIZES	N/A	3 sizes 38-87cm/15-34"	3 sizes 38-87cm/15-34"	3 sizes 50-90cm/20-35"
	STANDARDS				
LIFE CRITICAL	CHEST HARNESS ATTACH PTS	- -			- -
	BUCKLES WAIST/LEGS	AA Cobra Fast-Clip	Small Double Ds	AA Cobra Fast-Clip	Fast-Clip
	BRIDGE TYPE REPLACEABLE	Sewn 20mm Webbing	1or2 Tied or sewn Rope	1or2 Tied or sewn Rope	Sewn 20mm Webbing
	BRIDGE LENGTHS ADJUSTABLE	25/30/35cm no	123/180cm 40/45/50cm	123/180cm 40/45/50cm	25/30/35cm no
	CONNECTION to BRIDGE	2x Sliding Rings	Sliding Ring	Sliding Ring	2x Sliding Rings
	BRIDGE UNION LENGTH ADJ	Openable Ring -	2x Hole + D plates	2x Hole + D plates	Shackles
	SRT D-RING/EYE REAR BELAY	- - -	- - -	- - -	- - -
	POLE STRAP D'S FOLD FLAT				
	GEAR LOOPS SEWN EYES	3 8 +2 on Leg Loops	- -	- -	3 -
	CUSTOM GEAR CORD EYES				-
GEAR ATTACH	BASIC HOLES/EYES RINGS	- 2	14 -	14 -	- -
	CARI-HOOK CARI-HOOK EYES	- ?	- 12	- 12	2to4
	CHAINSAW EYE/RINGHOOK				-
	ATTACH POUCH/FIRST AID				-
	WAIST PADDING SWAMI	Mesh/Foam	Mesh/Foam	Thermo-form	Mesh/Foam
WAIST	WAIST WEB HEIGHT PADDING	45mm/1.75" 20cm/8"	25mm/1" 23cm/9"	25mm/1" 23cm/9"	44mm/1.75" 20cm/7.9"
	WAIST ADJUST	Double Central	1x Central	1x Central	1x Central
	LEGS WEB HEIGHT PADDING	45mm/1.75" 15cm/6"	25mm/1" 14.5cm/5.7"	25mm/1" 14.5cm/5.7"	44mm/1.75" 23.5cm/9.25"
LEG	ELASTICATED REAR ATTACH				
	LEG RISER ADJ REAR FRONT	-			
EXTRAS	RFID CHIP WEAR INDICATE	-	- -	- -	- -
	FIRST AID TRAUMA KIT	-	- -	- -	-
	SIT STRAP BOSUNS CHAIR	- -	- -	- -	- -
	OTHER SRT MODELS	-	-	-	-
	NOTES		Virtually all components replaceable. Openable side ring for replacement of hip/leg webbing	Virtually all components replaceable. Openable side ring for replacement of hip/leg webbing	Bridge union length adjusted via rear buckle. Updating late 2023. Also with yellow trim
	WEBSITE	steinworldwide.com	teufelberger.com	teufelberger.com	treehog.co.uk

COST: Approx & inc local tax/VAT £\$€=currency conversion only OPTION= or or N/A: info Not Given



TREE HOG	TREE RUNNER	WEAVER	WEAVER	WEAVER
TH7000	Tree Rider	Denali	Stratus 08100	WLC-790
£300 \$374 €345	£279 \$348 €320	£417 \$520 €475	£361 \$450 €411	£420 \$523 €478
2.6kg/5.7lb	1.53kg / 3.4lb	2.95kg/6.5lbs	2kg /4.5lbs	3.63kg/8lbs
100kg/220lb	140kg/308lb	140kg/308lb	140kg/308lb	140kg/308lb
3 sizes 76-140cm/26-52"	3 sizes 65-115cm/26-45"	1 size 26-48"	3 sizes 28-46"	4 sizes 30-48"
3 sizes 50-90cm/20-35"	3 sizes 55-80cm/21.6-31.5"	61cm/ <24"	51-86cm/20-34"	61cm/ <24"
- -				
Fast-Clip	AA Cobra Fast-Clip	AA Cobra Fast-Clip/Rollbar	ISC Fast-Clip	Pin&Hole/Fast-Clip
Sewn 20mm Webbing	50mm Webbing	Double Rope	Tied Rope	Tied Doubled Rope
25/30/35cm	Fixed 50mm Web	35cm/14"	35cm/14"	35cm/14"
2x Sliding Rings	Sliding D-Ring	Sliding Ring	-	-
Shackles	sewn-fixed	4-hole Rig plates	4-hole Rig plates	4-hole Rig plates
- - -	-2x	- - -	- - -	- - -
3 -	2 (Dyneema) -	- 6*	3 - *18 + 6 on legs	2 -
-	4	- 2	- 4	- 6
- -	- 6	- 2	- (use the 24 sewn eyes)	- 2
	- 2	- 4	- (use the 24 sewn eyes)	- 2
-	-	-	-	2 2
-	-			
Mesh/Foam	Moulded Foam	Moulded Air-Flex Foam	Reinforced Mesh/Foam	Memory Foam
44mm/1.75" 20cm/7.9"	50mm/2" 20cm/7.9"	DbI-50mm/2" 23cm/9"	25mm/1" 23cm/9"	50mm/2" 23cm/9"
1x Central	1x Side	1x Central + 4x side adj	1x Central	1x Side
44mm/1.75" 23.5cm/9.25"	50mm/2" 8.5cm/3.4"	50mm/2" 17.8cm/7"	25mm/1" 23cm/9"	50mm/2" 10cm/4"
	-			
- -	- -	-	- -	- -
	- -			
	- -	- -	- -	-
-	-	-	-	-
Bridge union length adjusted via rear buckle. TH7000 has an integrated sit-strap. Updating late 2023		*arranged as a daisy chain	*arranged as daisy chains	Also in all-black
treehog.co.uk	grube.eu	weaverarborist.com	weaverarborist.com	weaverarborist.com

STANDARDS: EN358 = EN813= ANSI Z133= ASTM F887= CANADA= AUS/NZ = EAC =

	IMAGES NOT TO SCALE				
	FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST				
MANUFACTURER	WEAVER				
MODEL VARIANT	WLC-760		WLC-700 730		WLC-530 560
ORIGIN					
COST inc VAT/tax conv-only	£362 \$451 €412		£297 \$370 \$410 €338		£242 \$302 \$305 €276
WEIGHT	3.2kg/7lb		3.63kg/8lbs		2.72kg/6lbs
MAX LOAD	140kg/308lb		140kg/310lb		140kg/310lb
WAIST SIZES	5 sizes 66-122cm/26-48"		5 sizes 66-122cm/26-48"		4 sizes 76-122cm/30-48"
LEG SIZES	61cm/<24"		61cm/<24"		51-68cm/20-27"
STANDARDS					
CHEST HARNESS ATTACH PTS					
BUCKLES WAIST/LEGS	Pin&Hole/Fast-Clip		Pin&Hole/Fast-Clip		Pin&Hole
BRIDGE TYPE REPLACEABLE	Tied Doubled Rope		Web-covered rope		Fixed 50mm Webbing no
BRIDGE LENGTHS ADJUSTABLE	35cm/14"		25cm/10"		12" no
CONNECTION to BRIDGE	-		-		1 (2)x Sliding D-Rings
BRIDGE UNION LENGTH ADJ	4-hole Rig plates		ISC Al ring		Sewn no
SRT D-RING/EYE REAR BELAY	- - -		- - -		- - -
POLE STRAP D'S FOLD FLAT					
GEAR ATTACH	2 -		2 -		2 -
CUSTOM GEAR CORD EYES	-		-		-
BASIC HOLES/EYES RINGS	- 6		- 6		- 6
CARI-HOOK CARI-HOOK EYES	- 2		- 2		- 2
CHAINSAW EYE/RINGHOOK	2 2		2 2		2 2
ATTACH POUCH/FIRST AID					*
WAIST PADDING SWAMI	Memory Foam		Memory Foam		Leather/Memory Foam
WAIST WEB HEIGHT PADDING	50mm/2" 23cm/9"		50mm/2" 17.8cm/7"		50mm/2" 15.2cm/6"
WAIST ADJUST	1x Side		1x Side		1x Side
LEGS WEB HEIGHT PADDING	50mm/2" 10cm/4"		50mm/2" 10cm/4"		50mm/2" 7.6cm/3"
ELASTICATED REAR ATTACH					-
LEG RISER ADJ REAR FRONT					
EXTRAS	-		-		-
RFID CHIP WEAR INDICATE	-		-		-
FIRST AID TRAUMA KIT					
SIT STRAP BOSUNS CHAIR	-				-
OTHER SRT MODELS	-		-		-
NOTES	Endura braid rope bridge. Also in all-black		the 730 has an integrated sit strap		WLC-560 has two sliding D-Rings WLC530 has one. £ cost increases with size of harness
WEBSITE	weaverarborist.com		weaverarborist.com		weaverarborist.com

COST: Approx. inc local tax £\$€=currency conversion only OPTION= or or N/A: info Not Given STANDARDS: EN358 = EN813=



WEAVER

WILLANS

WLC-330

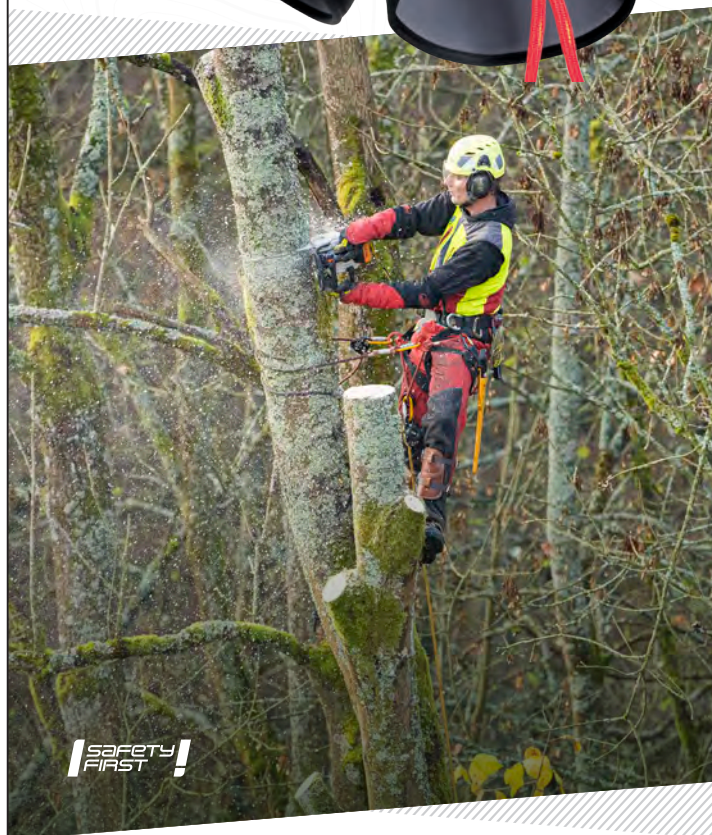
T22/2 WP

	£225 \$280 €256	£210 \$262 €239
	2.72kg/6lbs	4kg/8.8lb
	140kg/310lb	n/a
8"	5 sizes 66-122cm/26-48"	3 sizes 61-142cm/24-56"
	n/a	n/a
	<input type="checkbox"/> <input type="checkbox"/>	NO
	Pin&Hole	Fast-Clip+Roll-bar buckle
o	Fixed 50mm Webbing no	Integrated sit strap no
	12" no	- -
	Sliding D-Ring	2x fixed D-Rings
	Sewn no	Sewn no
	- - -	- - -
	2 -	- -
	-	-
	- 5	- 4
	- 2	- -
	2 2	- -
		-
m	Leather/Foam	Basic
	50mm/2" 15.2cm/6"	50mm/2" 12cm/5" 28cm/11"
	1x Side	1x Side adjust
	50mm/2" None	50mm/2" NO
	-	-
	- -	-
	<input type="checkbox"/>	- -
	- -	
	-	-
ness. ouch	£ cost increases with size of harness. *2 of the rings are intended for pouch stowage.	WP version has reinforced wider padding on the waist than standard version
	weaverarborist.com	willansltd.co.uk
	ANSI Z133= ASTM F887= CANADA= EAC =	



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ARBORIST CLIMBING HELMETS

Fully or partly meeting **EN12492** (mountaineering) and/or **ANSI z89.1 type 2** or **EN397 (industrial) & ANSI type 1** with additional side-impact & lateral deformation tests & accept Eye & Ear protection



This GUIDE does not cover general forestry/ground work helmets (generally ANSI type 1 and/or EN397) unless they also function as a climbing helmet (ANSI type2/EN12492) and in fact, as we'll see, this whole genre is tricky to reconcile even between European standards let alone between European and North American standards. For instance there are ANSI type 1 and EN397 helmets that have top-only impact tests but may also test for side impact and/or lateral deformation. All-around impact tests and/or lateral deformation are the minimum guarantee of protection we want to see for climbers as an addition to just top impact. EN397 and ANSI Type 1 by themselves are not enough to get in this GUIDE because working at height is NOT the same as Climbing, HOWEVER, there are two helmets in this GUIDE from Kong and CT that don't meet our criterion, at least not on paper, but others in their range do and they specifically state these models as being suitable for climbers/climbing arborists so we have highlighted these with a red 'no' in the EN12492/Lateral tests column. Depending on the type of worksite, OSHA defines working at height as 4, 6 or 8 feet off the ground - that could be a 4-rung stepladder!

need to discuss the various structural and design differences between helmets. In tree work we can differentiate three work types:

- 1) **GROUND-CREW/CHIPPER** (ANSI type1/EN397)
- 2) **WORK At HEIGHT** eg. Cherry picker (ANSI type1/EN397)
- 3) **CLIMBING** (on-rope) (ANSI Type 1-2/EN12492)
 - 3a) Recreational Climbing/Competitions/Inspections
 - 3b) Climbing and use of a saw/chainsaw
 - 3c) Climbing & working around electricity (ANSI/EN397 + side-impact and/or Lateral Deformations tests)

The technical specifics of visors and ear defenders are not included here as they would each need their own GUIDE. We have a full GUIDE to Climbing and Multi-Role Helmets in the **PPE & CASEVAC** and **USAR/EXTRICATION BUYERSGUIDES** for competition and recreational climbers and arb inspectors these would be useful GUIDES to check out. In this GUIDE for climbing arborists using chainsaws, handsaws and other power equipment however, we are specifically looking at helmets that meet climbing standards and can provide eye and hearing protection often sold under the banner of 'Combination' helmets. That means various types of visors to protect from wood chips and dust and protection of the ears from the potentially damaging sound of a petrol/gas chainsaw but these days is just as likely to incorporate a communications system. Pretty much all such work helmets can be used as stand-alone climbing helmets simply by removing the click-on ear defenders and visor mounts or the visor may stow within the helmet shell. Ear defenders can be swung back onto the helmet shell when not needed as the arborist in this image obviously feels is the case in using a battery powered saw, although, it has to be said, that even electric saws have a sustained level of noise all the while you're pressing the trigger. We'll get to the details of fixtures and fittings later, we first

'Working At Height' is NOT the same as 'Climbing'

Some helmets are specifically designed and marketed towards arborists while others are modified sport or industrial helmets that are coincidentally useful for arborists. Some elements of climbing-specific standards do not take into account the need for arborists to work around electricity, especially for post-storm work so there are many overtly industrial climbing helmets without vents here that meet dielectric standards but are not actively aimed at arborists - *CT's Aries* for example as compared to their *Aries Tree* and *X Arbor*. The key difference between a climbing and a ground-work helmet is that climbers need all around impact protection (rather than just on the top) and a stronger chin strap to ensure the helmet stays on your head. Competition climbers don't need the associated safety accessories although a headtorch and flip-up goggle visor can be useful. All three of these groups can use the non-accessorised climbing helmets in **WSAR** magazine #11's GUIDE.

US & EUROPEAN STANDARDS

Unfortunately, as with most products, there is no fully international safety standard. Europe and North America have competing and slightly different standards and requirements that requires most manufacturers to produce a different version for each regional market - ANSI in the US and EN in Europe and most Pacific countries. There is much greater emphasis in the US on working around electricity because of the way the utilities are structured and the sheer number of damaging storms. ANSI z89.1 Type1&2 helmets have the higher strength chin strap and are class 1 for top-only impact or class 2 for all-around impact. **This GUIDE only includes ANSI Class 1/EN397 helmets if they are also tested for lateral impact and/or deformation (LD).** LD is an addition to EN397 that tests the resistance to 'squeezing' of the sides of the helmet but not as relevant as side, rear and front *impact* tests. ANSI also specifies

electrical conductivity as Class C, G or E which we'll come to shortly.

ANSI does not delineate the chin strap strength for ground and climbing as the European standards do. Consequently North American arborists could choose either the mountaineering (EN12492) or industrial (EN397)-standard helmets because their shells are virtually identical. This is also true in Europe given that arborists may need an unvented EN397 helmet that doesn't conduct electricity and negates the vent aspect of EN12492. There are three key differences between EN397 and EN12492 helmets which are otherwise identical: EN397 requires less vent area, a chin strap that releases at a much lower load (15- 25daN) and clearance between the shell and the cradle that doesn't allow for any lining in direct contact with the shell. It uses a 5kg test load from 1metre above which must exert no more than 5kN of force to the head whereas climbing helmets use a 5kg mass falling 2metres but exerting no more than 10kN to the head and of course, they include impact loading to the side, front and rear of the shell. Vent size must be less than 4.5cm² of total shell area for EN397 whereas for climbing it needs to be well ventilated in excess of 4cm² of area. However, that does mean there is crossover if a shell has between 4 and 4.5cm² of vent area - that would meet both standards.

ELECTRICAL CONDUCTIVITY

ANSI specifies three electrical conductivity classes: Class G, (General) hard hats are rated for 2,200 volts. Class E (Electrical) hard hats are rated for 20,000 volts and Class C (Conductive) hard hats offer little or no electrical protection. Electricity protective helmets are NOT vented or are minimally vented and this directly contradicts the main climbing helmet standard in Europe EN12492 which requires a certain area of vents for airflow. ANSI class E precludes vents and G has smaller vents than for C-type helmets. Utility arborists and anyone tasked with a job near power cables will need a helmet that will NOT conduct electricity to your head. In practice this means no vents and more clearance between the shell and your head. Many climbers will think that ventilation is a must-have to keep the head cooler in hot weather and during heavy work and this is a requirement of the EN12492 climbing standard. But an electrical arc will kill you quicker so if storm and/or utility work is on your radar you may well need both options. For US ANSI standards this is covered by class G and E helmets where class E rated for 20,000 volts is for high tension pylon style cables (E & HT in our tables) and the General 2,200v rating will see you though all domestic-feed power lines. In Europe this is covered primarily by EN50365 but this is only for lower voltage systems up to 1000v Ac or 1500Vdc and can be as low as the 440vAC that we have listed as LT so is less stringent than ANSI class G. Many EN50365 helmets also comply with ANSI G so are actually higher rated than their EN50365 adherence implies. Some helmets like CAMP's *Ares* and Petzl's *Vertex* have closable vents and can meet EN50365 though some only meet this electrical-protection standard if used on the ground like JSP's *Evo5*. The similarly equipped *Petzl Stratos* fails on non-conductivity because there is not enough clearance between the head and the shell.

CHIN STRAPS

And then there's chin strap strength which in climbing helmets requires it to keep the helmet in place during a fall and when resisting an impact. Industrial helmets in Europe, which often

PETZL STRATO
Vent Hi-Viz



CLIMBING HELMETS



STIHL Advance X

include 'arborist' models, requires the chin strap to separate or break at less than 25daN because, oddly, it is felt that there is a greater risk of being strangled if the helmet gets hung up on an obstruction during work. You would think that those at the greatest risk of hang-up would be arborists and yet they are specifically mandated towards EN12492 helmets with high-strength chin straps and NOT EN397's breakaway straps. This is because the helmet needs to stay on AFTER an impact/fall because the climber may well still be exposed at height and can't afford to have the helmet detach completely. It would be interesting to know how often a fall that results in being hung up by the helmet strap such that you are strangled to death has occurred versus being hit on the head because your helmet has come off after an impact from the first piece of falling debris or branch? A number of manufacturers like *Petzl* and *Uvex* provide both types of chin strap which can be swapped in and out but this might still result in falling foul of local protocols if you had the wrong one on. While it's impossible to meet both standards at the same time, the helmet as a 'package' is able to meet both EN397 and EN12492 and these helmets are often called 'hybrids', not to be confused with 'hybrid' as a type of helmet construction. Many more helmets, especially outside of Europe, will meet the impact resistance (including sharp-object penetration) requirements of EN12492 but not necessarily the chin strap requirement. It's a strange dilemma since we're not at all convinced of the validity of a lower strength breakaway chin strap for climbers. *Heightec's Duon* and *JSP's EVO* series have gone some way to solving this dilemma by using a chin-strap buckle that adjusts between weak and strong. The enhanced EN14052 standard that requires better top, side and frontal impact tests for industrial helmets effectively mimics EN12492 impact testing but has the lower strength EN397 chinstrap so climbing helmets will rarely be fully EN14052 compliant and vice versa. This standard is far from widely adopted so only relatively few including *Kask*, and *Team Wendy* have it.

HELMET CONSTRUCTION

in the fourth quarter of the last century, sport climbers were progressing from very round, glass-fibre, water melon-style helmets with a foam lining and a chin strap to plastic ovals with a spider-web cradle and a chin strap. Meanwhile, arborists were just about progressing from a plastic building site helmet to a plastic building site helmet with a chin strap. Some of us wore certified climbing helmets with accessories but it wasn't until this century that arborists really began to see the need for a 'proper' climbing helmet that was firm and comfortable

UPDATED Feb '24

1



2



- 1 Hard Shell
- 2 Hard-Shell Hybrid
- 3 Soft Shell (not shown)
- 4 Hybrid (hard shell-In-Mold)
- 5 In-Mold (In-Mould)

4



5



in all orientations that a climber might find him/herself in, able to withstand impacts from multiple directions (ANSI Class 2) not just from the top (as ANSI Class 1 requires) and also able to take all the safety trimmings necessary for chainsaw use. By 2010 virtually all climbing helmet manufacturers producing high quality mountaineering helmets were also producing a more 'industrial' version able to be fitted with visors and ear defenders for both the rope access and arborist markets. Europe mostly embraced the climbing helmet model with arborist helmets from the likes of *Petzl*, *Kask*, *Edelrid*, *Kong*, *CT* and *C.A.M.P.* while North America continued to develop the site-helmet theme incorporating a peak (primarily driven by the ANSI helmet standard requiring a peak) from companies like *Klein Tools*, *Americana*, *3M*, *PMI*, *Studson* and imports from *Pacific* and *JSP*. This has led to many Arb stockists in North America majoring on European models which, in turn, has caused some European manufacturers to ensure that their helmets either meet both ANSI and EN standards like *Petzl* or they have two versions, one meeting EN and one meeting ANSI standards, like *Kask*. Also this century we

charities having to cope with devastation caused to civilians and civilian infrastructure by the 2022 invasion by Russia.

Back to past history and after an initial flirtation with motorcycle helmets for climbing it became clear that helmet linings had to be improved. The answer initially was to keep the glass fibre shell and increase the clearance between the head and the shell. Building site helmets had something of an answer with their adjustable plastic head band and concentric plastic 'spokes' joined at the crown but more comfort was needed and this included improving ventilation or airflow to the head which was otherwise encased in a hot and sweaty goldfish bowl. Enter the age of substantial sized air vents and a webbing cradle initially riveted around the shell and with an inch or two of clearance between the top of your head and the inner shell. In the event of a lump of wood hitting the top, the shell can deform to absorb some impact before the shell reached your crown. This allowed superior materials to creep into helmet production - lighter, stronger and more resilient to wear than glass-fibre, mostly plastics, thermoplastics and polymer mixes. The next couple of decades saw various combinations of hard-shell plastics that deformed to absorb impact and cradles that tried their best to keep your crown clear of the shell. Some shells began to re-incorporate fibres into the plastics to improve durability, not quite back to the traditional glass-fibre days and certainly a feature of the more robust shells. Meanwhile, some cradles were replaced by a full 'cap' or dome of polystyrene instead of webbing straps to improve comfort, all the while making the helmet lower in profile than the original pimple-on-your-head like the *Joe Brown* and original *Edelrid Ultralight*. Carbon fibre came and went and still appears every now and then but perhaps the most obvious modern change has been more extensive use of EPS (Expanded Polystyrene) and latterly the slightly denser EPP (Expanded Polypropylene) leading to three new classes of helmet in addition to the existing hard-shells. Good luck differentiating some of the 'hybrids' from some of the 'in-Molds'. See **PPE& CASEVAC BUYERSGUIDE** for a full explanation of the 5 helmet types. For arborists we only really have to worry about Hard-Shells and Hard Shell Hybrids. Again difficult to tell apart. They both have a full dome of material - mostly ABS and ABS/Polycarbonate (as dictated by EN397) but basic Hard Shell has a web cradle with internal clearance (often with a small insert of polystyrene in the crown while the hybrid has a much more expansive 'lining' of expanded foam/polystyrene. Hard shell is the traditional design with a web cradle and/or small EPS crown insert in a full ABS or polycarbonate shell. A few that are more suited to rescue but are sold by some arb stockists like *Pacific* use a kevlar

saw perhaps the biggest driver in arborist helmet evolution, the *Protos* Helmets by Austrian Forestry giant *Pfanner*. The *Protos* was the first to fully integrate eye and ear protection into the one shell but and is renown for its vast range of colours, designs and customizations. The version right for instance is a Ukraine Special edition with money from every sale donated by *Pfanner* and the stockist (in this case *Honey Brothers* in the UK) to Ukraine



North America vs European

Only one of these three helmets is available to European climbers - spot the differences? These first two are the *Spire* without vents and the *Elevation* intended for North America-only. The bottom helmet is the *Spire Vent* for Europe.

The *Spire Vent* adheres to EN12492 while the *Spire* and *Elevation* adhere to ANSI z89.1 Type 1 Class C and E respectively but with extra Lateral Deformation tests for both. You'll find this same North American/European differentiation with many of the key brands *Stihl*, *Petzl*, *Kask*, *MSA* etc. and while some are fully compliant across both sets of standards most are only partially compliant. If you take electricity out of the equation the choice of European climbing helmets is huge in comparison to their US-counterparts and US stockists obviously agree since they all sell far more EN-compliant helmets to arborists than they do than ANSI.

320

CLIMBING HELMET

reinforced composite so are renowned for being tough but are fairly heavy and not cheap. What looks like polystyrene is now carefully crafted as EPS and EPP and is used as a shell liner in addition to a mesh in place of the traditional web cradle. EPP and EPS are very light, they insulate and are soft allowing thicker cross-sections to absorb impact well. It can be shaped to fit pretty much anything you like allowing intricate designs to improve air flow, follow the shell contours, cut around ears and extend down at the nape all while allowing enough deformation/compression to absorb impact and protect your head. The initial problem with these materials is durability - as an outer shell it's a weak material when it comes to resisting having chunks knocked or scraped out of it, which is one reason you don't see many as arborist helmets.

MIPS & KOROYD

Of special mention in helmet construction is the MIPS enhanced head protection we see most often in ski-helmets that code-share as climbing helmets. **MIPS** stands for **M**ulti-directional **I**mpact **P**rotection **S**ystem and is basically a licensed element to helmet linings from the Swedish inventors that limits rotational impact because the special liner allows the head to rotate within the shell. Companies basically buy in the MIPS expertise in helmet safety and incorporate it into their helmet designs like the *Centurion Nexus MIPS* on the left (yellow section). It's a bit like clothing manufacturers adding *GoreTex* as a key and prestigious feature. One of the newest helmets on the market is the *Studson* helmet which purports to have merged the best of



sport helmets with industrial to produce a sleek and well featured model. It uses a similar system to MIPS called *Brainsield* made by *Shield-X*. The *Studson* also uses another safety addition which is the *Koroyd* honeycomb liner most notably used by *Pfanner* in their *Protos* and by New Zealand's *Zero Height Safety* in their *Pinnacle* series. *Koroyd* crumples on impact to absorb far more energy than a solid liner or web cradle.

VISORS

It used to be that a helmet visor was a dark wire mesh that occluded vision by about 30% but didn't 'occlude' dust at all - just the larger particulates and chips most likely to damage your eyes. Back in the 80's when some colleagues were mocking my use of SRT systems for tree work I also got some stick for having a clear plastic visor instead of the standard mesh; this was probably acetate back then rather than the much harder-wearing polycarbonate visors we mostly see today. The advantages as I saw it were that the clear visor kept out water and dust and gave me much, much better visibility especially since mine didn't have a frame - it was a bit like the hospital covid masks. The downside was that it scratched easily and with no reinforcing frame you had to look after it a bit more and it fogged up in certain weather. This latter problem is why the modern goggle-style visor have found favour over full 'square' visors- you're not breathing your heated, foetid fumes on it all day long and even if you were, most have anti-fog and anti-scratch treatments to prolong their usable life in the tree. Goggle-visors have therefore become the standard eyewear protection in most modern arborist helmets, practically to the exclusion of full face 'square' visors which are largely the



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SAFETY FIRST

domain of ground crew and those tending the chipper. Many of the goggles supplied directly by the helmet manufacturer have unique sizing and fittings for that helmet - *Climbing Technology* for instance has a different visor for their *X-Arbor* than to their *Aries Tree*. However, the vast majority of helmets in this GUIDE have the 30mm Uni or Euro slot that will take industry standard ear-defenders and visor mounts so you can supplement the goggles to some of these with an additional full/half size visor or mesh visor. Some of the images show the helmet with a visor that doesn't necessarily come from that helmet manufacturer and has to be purchased separately. Refer to the UNI-SLOT column to ensure that the helmet can be retro-fitted with various other general-market visors and ear defenders. High quality, anti-fog/anti-scratch goggle-visor can be as much as, if not more expensive than the helmet itself at between £/\$20 and £/\$100+. You can also get full visors with an integral curved chin or as a quadrant-shaped attachment (for clear and mesh) to help stop debris blowing up under the visor. Those that stow inside the shell are obviously better protected but some like Petzl do also offer visor guards for externally stowed visors to protect from damage.

EAR DEFENDERS

Sometimes called ear-muffs, this is another area where the climbers helmet may vary from ground-crew/chipper team helmets because the chipper is a lot noisier than a tree-chainsaw and especially a battery saw. It's not quite as simple as using the greater noise insulation of a 31SNR ear defender over a climbing standard 26SNR (SNR=Single Number Rating and is equivalent to the percentage noise that is absorbed and

therefore not making it through to your delicate ear holes) because a climber may need to have at least some background hearing to be aware of any hazard warnings. Although the same could be said for ground-crew since they're more likely to get a branch on the head. That's why an **alarm whistle** is a useful item to carry and only use in the event of a hazard to life because it will cut through any ear defender's noise baffle. The ear defender market is dominated by *MSA*, *Sordin*, *Sperian* and *3M Peltor* and these can have an independent head band so that you can use them under *any* helmet or, more usually they will be directly mounted to the helmet as a detachable element often in conjunction with the visor mount. Whether it's a visor or ear defenders, you need to ensure that it fits the helmet properly because so-called universal slots and fixings only need to be a half a millimetre out and there will be play in the mount. A uni-slot (in Europe a standard *Euro-slot* is 30mm wide) allows visor and ear defender mounts to simply push in and click into place. Some, like *Petzl* have their own system called *Easy-Clip* which means that *Petzl* accessories will only fit *Petzl* helmets although the helmets themselves will take other *Euro-slot* accessories and some like *Husqvarna* are even more confusing because they have accessories that will fit some in their helmet range but not others at least not without an adaptor but that pretty cheap at just a few quid/bucks. There are also helmet designs that don't suit certain accessories - peaks will block visors and side brims/flares similarly stop ear defenders from fitting to your ear properly. As with visors you'll pay for the better quality and hearing protection is also something worth preserving expect an average of £40/\$55 rising to £/\$100+ for high end models.





INTEGRAL HELMET FEATURES

VENTS This is one of the two key features that differentiates a climbing arborist's helmet from an industrial helmet or ground-worker's helmet. Aside from utility climbers working around electricity, climbers mostly want vents to help cool the head when working hard. But it would be nice to have the option so helmets like *Petzl's Vent* models, *CAMP's Ares* and *Pfanner's Protos* have the useful provision of a sliding vent that can be closed. Others have separated vent covers that you can push into place to provide a closed shell. Industrial helmets tend not to be vented at all in order to adhere to additional electrical conductivity and molten metal ingress requirements. Vents may be comprised of a few large openings like *Petzl's Vertex* or many smaller ones. Some have mesh covering the vents (shown as ● in our tables) so that air gets through but not much else because the disadvantage of larger openings is the possibility of twigs and stones getting in. In some models this risk is countered by offsetting the internal lining to partially occlude the opening. Helmets with only minimal vents are indicated by ◆ in the tables.

Some helmets have a small rubber D or ring on the chin strap which is for carrying your helmet on your harness or the outside of a pack. We always simply clipped around the chinstrap or yoke section but this method ensures you don't inadvertently stress and damage the buckle or any stitching.

SIZE ADJUSTMENT

There are three main options for adjusting the fit of a helmet: Headband, Chin Strap and what we'll call the Yoke Union. The first two are self-explanatory but the yoke union is where the chin strap meets the Y-shaped helmet attachments and there is often a plastic buckle here that can adjust the chin strap forward and backwards in relation to the shell. The headband is generally padded for comfort and sweat retention and often detachable and washable. It needs to fit snugly around your head and, together with the chin-strap, ensures the helmet won't fall off or tip forwards/backwards when you look up or down. Originally, tightening was achieved with a simple belt-style pin and hole adjustment later modified to much safer and lower profile plastic lugs on one end of the headband pushing into a set of holes in the other end, what we have called Slide Adjust and indicated by a ■ in the tables. We did see *Velcro* for a time but that quickly evolved back to a more substantial lug and hole or zip-tie/cable-tie style ridges of plastic. This gave rise to the idea of using a knob, cog or dial to drive the two sections over each other and lock into place wherever you stopped the ratcheting. These ratchet adjusters were originally seen only on fire-rescue and industrial helmets and it was decades before they started to appear on climbing helmets. This may have been because they were perceived to be too heavy or because the knob was deemed a hindrance or even a hazard to the back of the head in the event of a fall. Either way, ratchet adjust cogs/wheels have now well and truly evolved into the design of virtually all climbing helmets in this GUIDE and shown in our tables as ■. If you work in cold climates you will need to ensure that the headband sizing and internal clearance is sufficient to allow wearing a balaclava or fleece head-covering and that this is close-fitting with no extraneous buttons and lumps that can affect impact forces. Unlike sport climbing helmets, 'female-specific' versions of arborist helmets are much rarer - this is usually perceived as being pink/magenta

or having a cut-out for a pony-tail or having a smaller head-size though there are plenty of males to which all three of these options might apply. ArbClimber#22 showed our own local celebrity climber Jo Hedger wearing Husqvarna's helmet with enough size adjustment to be well-fitting and with a 'pony-tail' cut-out (pic top).

MULTI-ROLE HELMETS

Arborist climbing helmets pretty much ARE multi-role helmets as exemplified by the *Pfanner Protos* and even this non-climbing, forestry helmet (above) from Husqvarna shows the way things will go with their very nifty rechargeable *HL1200* 1200Lumen light mounted on it. But in this case we mean **certified for a range of other uses**. For those undertaking tree work as part of a wider remit that encompasses either rescue, forestry, ATV driving, firefighting or shooting people, there are multi-role helmets where one model fulfils a number of different activities. At present that means it's bigger, heavier and more expensive but that will change. Military style 'rails' allow attachment of cameras, night vision, laser-pointers as well as more regular headlamps using a slot-in adapter and we will see rails catch on more in civilian rope activities rather than just military or law enforcement but it's a rare beast at the moment.



CONCLUSIONS

Ultimately, ALL of the helmets in this GUIDE are suitable as an arborist climbing helmet but aside from weight, cost and comfort (which is subjective) the key decision is on standards and whether you need to work near electricity. Don't forget that **'Working At Height' is NOT the same as 'Climbing'**. Fitting plumbing or electrical cables on the upper floors of a high rise construction is working at height but is quite unlike hanging off a rope. For climbing, arborists should be choosing a helmet tested for impact and/or deformation to the top, sides and front/back of the shell and preferably with the higher strength chin strap >50daN, which will stay on in the event of a big fall or impact - this being more important and more likely than the industrial/ground-helmet 'concern' of being hung up such that you might be strangled. Some offer both options in the same helmet such as *Petzl*, *Heightec* & *JSP* and we will see more of this because, for electrical work, you need to juggle with EN397's conflicting chin-strap strength requirement and internal head clearance and lack of vent openings. **Climbers must take note of their helmet's specific standards because some look exactly like climbing helmets but only meet top-impact (ANSI class1/EN397) standards** like the *Stihl's X-Ergo*, *Klein Tools*, *Defender Safety's H1CH* and the *Milwaukee's Bolt* which are therefore not included in this GUIDE. The *CAMP Ares Air Pro* and *Kong Spin* which might otherwise seem to be the perfect climber's helmets only meet EN397 but are specifically marketed as climbers helmets so we have included them with a red flag in the EN12492/Lateral column.

For pure climbing It is likely that we will see more military rail- style models creeping into arborism if only because some arborists will think it looks cool. The lighter 'foam' hybrids and in-mold climbing helmets that you can find in WILDERNESS SAR#11's HELMET GUIDE only get one mention here (*Kong's Leaf*) because they are far less robust than the hard shell and hard shell hybrid helmets but they do still have a place for tree climbing, competitions and inspections as we saw on the cover of ARBCLIMBER#21 with the Edelrid Salathe which would otherwise not be considered a typical arborist helmet. *Kong's Leaf* however, takes ear defenders and visors and is easily the lightest in this GUIDE.

There is again no overt Chinese representation here as they continue to be difficult to extract details from and to blatantly copy identifiable models but they can and do produce quality models including companies like *Portwest* so we will see more Chinese own-branding in future.

IN THE FOLLOWING TABLES:.....

The figures in this Guide are verified by the manufacturer but you often see different spec on some supplier websites and for rebadged models. No idea why!

ORIGIN: The main flag refers to the manufacturer's home country, this may not be where the helmet is made. If we know, we show an inset flag.

COST: Recommended Retail Price. Often sold for less so a rough guide only - varies due to exchange rates, taxes etc. and we usually round the price up. In the UK, helmets have no VAT when purchased for personal use. **Prices in £/\$ are currency conversion only** with no bulk shipping or import duty etc.

The price in black is for a bare helmet. The price in green is for a basic combo or kit as supplied by that specific manufacturer so

it varies with visor and ear defender type

WEIGHT: for the bare helmet MINUS any accessories. As a rough guide, add 3/450g for ear defenders, 160-250g for a mesh visor, 250g+ for a full clear visor & 100g+ for goggle visors.

STANDARDS: ■=full compliance, ◆◆=partial compliance - the type of chin-strap and lateral deformation tests will generally be the cause of partial compliance - eg. the shell will be to EN397 to allow for electrical protection with additional lateral deformation tests and a chinstrap to EN12492.

✓ **EN50396 ELECTRICAL INSULATION** (in addition to indications under ANSI - C, G & E) where EN50396 =<1000vAC, **LT** = Low Tension domestic/<440vAC and **HT**=High Tension/>1500vDC.

A ■ indicates **LT** <440vAC as a max voltage but is also an addition to EN397 so may not have the ■ denoting EN50396 **CSA / AUSNZ/ EAC:** Specific **Canadian**, Australian/New Zealand And **Russian/East European** industrial standards but **CSA** mainly follows ANSI while **AS/NZ** mainly follows EN standards.

ANSIZ89.1: North American industrial standard - Type 2 has all around impact protection but many Type 1 have additional lateral impact and/or deformation testing to better suit climbers needs as indicated in the **EN12492/+Lateral column**. ANSI is defined by 3 classes of electrical conductivity **C, G & E**. **BS/EN14052:** an enhancement of EN357 for impact tests with top, side, front and rear impact tests but seems to be largely ignored by most manufacturers.

(BS)EN397 Industrial-oriented standard - shells may be the same general structure as an EN12492 shell but vents may be less or absent altogether and the chin strap must be able to detach/break at **15-25daN** (effectively <25kg of force) to avoid the risk of strangulation in a hang-up. Associated requirements for electrical resistance precludes the use of sizeable vents.

(BS)EN12492/+Lateral: Climbing Specific helmets with Lateral



more info

CLIMBING HELMETS

(side/front/rear) impact or deformation (LD) testing and vents greater than 4cm² of the shell area. Chin strap retention should be **greater than 50 daN (50kg)** loading for 2minutes. **+LD** = additional Lateral Deformation (not impact) tests supplementing EN357 and ANSI type1 top impact tests indicated by an orange diamond ◆

MATERIALS: PP=Polypropylene (for the outer shell and some components). EPS=Expanded Polystyrene (especially for the shell liner). EPP=Expanded Polypropylene (especially for the crown insert). ABS= Acrylonitrile Butadiene Styrene (thermoplastic polymer) for the outer shell.

UNI-SLOTS/RAILS: Goggles/visors and ear protection are as supplied by the specific company - ANY helmet with a black square ■ in the UNI-SLOTS column can have visor/goggle/ear defenders fitted from any other manufacturer. 30mm slots in Europe ('Euro-Slots') & similar 1" in North America but double check for a firm fit. **RAILS** are military style (Picatinny) attachment points for lighting, cameras, night-vision etc.

EYE PROTECTION]: **INT**=Internal (Integrated) -the goggle-visor and/or 'square' visor stow INSIDE the shell not outside.

GOGGLE/VISOR: Simply indicates the colour of polycarbonate goggles and/or visors available from this manufacturer - Clear, Smoked/tinted or mirror.

VENTS CLOSE /MESH: Many of these helmets have obvious air holes (vents) in the shells shown as a black square ■ but some have less than others, particularly the more industrial oriented helmets. Those with minimal vents are shown with a black diamond ◆. **CLOSABLE** vents are shown as a magenta square ■ and if these are separate push-in covers there will be an asterisk and a note to that affect. Those that are permanently

open but have a **MESH** cover to restrict the ingress of twigs and debris are shown as a magenta circle ●.

ID/LOGO REFLECT: Customised decals are available from some manufacturers while other helmets may have a specific ID badge area which might simply be a clean, flat rectangular area or may be a plastic housing allowing an ID to be slid in. If it is a standard feature it will be shown as ■ if it is an option it will be a black outline square. **Reflective decals** are standard on one or two indicated by ■ but most provide them as an option shown as an orange outline square □.

NAPEGUARD UV: A shroud that comes down from the rear of the helmet shell and down to your shoulders. This helps stop wood chippings, dust and water from going down your neck. Almost always an option rather than standard. **UV** is a UV indicator on the helmet. Most helmets will be retired due to sheer abuse and unsightliness with no real regard for its performance capabilities years after its purchase, which may be significantly reduced. One thing you can keep a eye on is UV exposure which is a silent helmet killer also largely ignored by most. We are now seeing red UV indicators embedded into the rear like this *Stihl Advance X-Climb* to tell you exactly when it's seen its fair share of damaging UV rays (it changes colour, in this case it bleaches white).

LAMP CLIPS BRKT where **BRKT** refers to *an elastic retainer or a solid bracket* at the front or rear of the helmet **COLOURS** different colour options are shown as the main colour with trim or secondary colours shown in the box outline.



KONG USA

SPIN

images <u>NOT</u> to scale	VISORS AND EAR DEFENDERS ARE SHOWN AS AN EXAMPLE OF WHAT CAN BE FITTED TO THE HELMET, NOT NECESSARILY WHAT YOUR STOCKIST SUPPLIES	MODEL Variant/ AKA	COMPANY	ORIGIN	COST	WEIGHT (BARE HELMET)	SIZES	CONSTRUCTION SHELL INNER STRAPS/HEADBAND
					BARE HELMET COMBO inc Tax £/\$/€ currency conversion only			
		Ares 0747 Ares MIPS 3258	C.A.M.P.		£70 \$110 €76 N/A	475g 16.8oz 500g 17.6oz	54-62cm 21.3-24.4"	HARD SHELL ABS/Polycarbonate HD EPS Nylon
		Ares Air 0748 Ares Air Plus 2641	C.A.M.P.		£70 \$110 €76	475g 16.8oz 480g 16.9oz	54-62cm 21.3-24.4"	HARD SHELL ABS/Polycarbonate HD EPS Nylon
		Ares Air Pro 2643	C.A.M.P.		£70 \$110 €76	480g 16.9oz	54-62cm 21.3-24.4"	HARD SHELL ABS/Polycarbonate HD EPS Nylon
		Armour Pro 2644	C.A.M.P.		£50 \$80 €58	360g 12.7oz	54-62cm 21.3-24.4"	HARD SHELL HYBRID ABS HD EPS Nylon
		Skylor Plus 0209	C.A.M.P.		£40 \$60 €50	495g 17.5oz	55-62cm 21.7-24.4"	HARD SHELL ABS HD EPS Polyester
		Nexus Heightmaster Extreme MIPS	CENTURION		£54 \$75 €75 £110	378-505g 553g	53-63cm 20.9-24.8"	HARD SHELL ABS EPS Terylene/LDPE
		Serius Height Work	EDELRID		£115 €60 \$100	469g	54-64cm 21.3-25.2"	HARD SHELL ABS EPS Polyester
		Manta 4 MH4-Forestry Tactical/Extreme MH4-Tactical	FUTURE SAFETY		£114 £143 £83 \$220 €150	500g 17oz 670g 23.6oz	53-62cm 20.9-24.4" 63-65cm 24.8-25.6"	HARD SHELL HYBRID ABS EPP Polyester/Nylon
		Duon Air MH02 Duon (unvented) MH02	HEIGHTEC		£83 £80 \$104 €96	350g 12.3oz 550g	52-66cm 20.7-26"	HARD SHELL ABS Polyester Web-only Polyester/Nylon
		Elevation	HUSQVARNA		£121 \$170 €160	450g 15.9oz	51-62cm 20-24.4"	HARD SHELL HYBRID ABS EPS Nylon/Nylon

COST: Approx. Inc local tax/no VAT in UK £/\$/€ =Currency Conversion Only **STANDARDS:** = partial adherence **VENTS:** = closable = m

TEMP RANGE °C °F	STANDARDS				EYE PRO			Goggle Visor		EAR	FEATURES				CRADLE		CHIN		COLOURS	NOTES	WEBSITE		
	ANSI Z89.1 / CGE	CSA AUS/NZ EAC	EN14052 / UKCA	EN397 (Industrial)	EN12492 / Lateral	GOGGLES INT	FULL VISOR INT	MESH VISOR INT	CLEAR	SMOKED	MIRROR	UNI SLOTS/RAILS	VENTSCLOSE/	ID/LOGO REFLECT	NAPE GUARD UV	LAMP CLIPS BRKT	SLIDECOG ADJUST	REPLACE PADDING				<25dan Release	>50dan Release
-20 -4 +50 122	■	■	■	■	◆	■	■	■	■	■	■	no	■	■	4	■	■	■	■	■	■	*+ Lateral deformation tests ●MIPS not yet EAC MIPS version has enhanced anti-rotational head cradle. ●only Red, White or Yellow Has NFC Track/ID tag	camp.it
-20 -4 +50 122	■	■	■	◆	■	■	■	■	■	■	■	■	■	■	4	■	■	■	■	■	■	PLUS was originally called Ares Air ANSI. Has NFC Track/ID tag	camp.it
-20 -4 +50 122	■	■	■	■	no	■	■	■	■	■	■	■	■	■	4	■	■	■	■	■	■	Same construction as Ares and listed as suitable for rop climbing but only has EN397 certification/additional tests. Has NFC Track/ID tag.	camp.it
-20 -4 +50 122	■	■	■	◆	◆	■	■	■	■	■	■	■	■	■	4	■	■	■	■	■	■	Mesh visor is outsourced. Has NFC Track/ID tag	camp.it
-20 -4 +50 122	■	■	■	■	◆	■	■	■	■	■	■	no	■	■	4	■	■	■	■	■	■	Mesh visor is outsourced. Has NFC Track/ID tag	camp.it
-40	■	■	■	◆	◆	■	■	■	■	■	■	◆	■	■	4	■	■	■	■	■	■	*Internal goggle option (shown) needs to be pre-installed. *Also full cold-weather hood system & cooling pads. *Also Hi-Viz yellow and Hi-Viz Orange	centurionsafety.eu
-30 -22 +50 122	■	■	■	◆	◆	■	■	■	■	■	■	no	■	■	4	■	■	■	■	■	■	Edlerid don't supply any visors or ear defenders but takes all standard accessories. Includes a set of replacement padding	edelrid.com
	■	■	■	■	■	■	■	■	■	■	■	■	■	■	2 1	■	■	■	■	■	■	Standards for Forestry also include FS/ATV1 Quad/ATV for military include NFPA, Marine, firefighting, & Technical Rescue *COLOURS: Forestry also navy blue. Military=Black only	future-safety.com
	■	■	■	■	■	■	■	■	■	■	■	no	■	■	4	■	■	■	■	■	■	*the same chin strap buckle can be switched between hi & low strength to fully or partially meet both standards.	heightec.com
-30 -22 +50 122	■	■	■	■	◆	■	■	■	■	■	■	■	■	■	4	■	■	■	■	■	■	adaptor needed for Husqvarna ear defenders on Elevation.	husqvarna.com

mesh covers ◆ = minimal openings EAR: ◆ = Will fit most accessories but check ■ ■ ■ = OPTION VARIANT = blue or ■ ◆ ● if it's an option

images <u>NOT</u> to scale	VISORS AND EAR DEFENDERS ARE SHOWN AS AN EXAMPLE OF WHAT CAN BE FITTED TO THE HELMET, NOT NECESSARILY WHAT YOUR STOCKIST SUPPLIES	MODEL Variant/ AKA	COMPANY	ORIGIN	COST	WEIGHT (BARE HELMET)	SIZES	CONSTRUCTION SHELL INNER STRAPS/HEADBAND
					BARE HELMET COMBO inc Tax £\$€ currency conversion only			
		Spire	HUSQVARNA		£121 \$170 €160	470g 16.6oz	52-63cm 20.7-24.8"	HARD SHELL HYBRID Polypropylene EPS Nylon/Nylon
		Spire Vent Spire Vent X	HUSQVARNA		£135 £180 \$170 €126	470g 16.6oz	52-63cm 20.7-24.8"	HARD SHELL HYBRID Polypropylene EPS Nylon/Nylon
		EVO 5	JSP		£79 \$101 €95	480g 16.9oz	53-64cm 21-25"	HARD SHELL ABS EPP Polyester/HDPE
		EVO (ASCEND) Vista Shield Vista Lens	JSP		£110 \$136 €130	415g 14.6oz	53-64cm 21-25"	HARD SHELL ABS EPP Polyester/HDPE
		EVO Lite Skyworker AJS260	JSP		£32 \$41 €38	382g 13.5oz	53-64cm 21-25"	HARD SHELL ABS EPP Polyester/HDPE
		Superplasma PL WHE00108/109-201 Superplasma AQ WHE00104/105	KASK		£86 \$130 €80	420g 14.8oz 390g 13.75oz	51-62 ⁶³ cm 20-24.4 ^{24.8} "	HARD SHELL HYBRID Polypropylene EPS Nylon/Nylon
		Superplasma HD WHE00036/37 Superplasma HP /HP Visor WHE00106/107	KASK		£105 \$130 €120	450g 13.3oz	51-62 ⁶³ cm 20-24.4 ^{24.8} "	HARD SHELL HYBRID ABS EPS Nylon/Nylon
		Primero (EN) WHE00111/12 Primero Air (EN) WHE00113/24	KASK		£70 £86 \$90 €80 €95	460g 13.3oz	52-63cm 20.7-24.8"	HARD SHELL HYBRID Polypropylene EPS Nylon/Nylon
		PrimeroPL WHE00115/16	KASK		£70 \$90 €80	420g 14.8oz	52-63cm 20.7-24.8"	HARD SHELL HYBRID Polypropylene EPS Nylon/Nylon
		Primero (US) WHE00117/18 Primero Air (US) WHE00119/20	KASK		£107 \$135 \$150 €125	460g 13.3oz 430g 15.2oz	Universal	HARD SHELL HYBRID Polypropylene EPS Nylon/Nylon

COST: Approx. Inc local tax/no VAT in UK £\$€ =Currency Conversion Only STANDARDS: = partial adherence VENTS: = closable = m

TEMP RANGE °C / °F	STANDARDS				EYE PRO			Goggle Visor		EAR	FEATURES				CRADLE	CHIN		COLOURS	NOTES	WEBSITE		
	ANSI 389.1 / CGE	CSA AUS/NZ EAC	EN14052 / UKCA	EN397 (Industrial)	EN12492 +Lateral	GOGGLES INT	FULL VISOR INT	MESH VISOR INT	CLEAR	SMOKED	MIRROR	UNI SLOTS/RAILS	VENTS/CLOSE/MESH	ID/LOGO REFLECT	NAPE GUARD UV	LAMP CLIPS BRKT	SLIDECOG ADJUST				REPLACE PADDING	<25dan Release
-30 -22 +50 122	-	■	-	-	◆	■	-	-	■	■	■	■	-	-	■	■	■	-	■	■	adaptor needed for Husqvarna ear defenders on Spire. Spire Vent=EN model in Grey Spire=unvented ANSI model in Orange	husqvarna.com
-30 -22 +50 122	-	-	-	-	■	■	■	■	■	■	■	◆	-	-	4	■	■	-	■	■	ear defender adaptor shown on Spire Vent is standard on Spire Vent X Spire VentX=EN model in Grey Spire=ANSI model in Orange	husqvarna.com
-40	■*	■	-	◆*	■*	■	■	■	■	■	■	◆	■	■	■	■	■	■*	■*	■*	*chin strap 'switches' from high to low strength to meet both standards.*Only meets 50365 when used on the ground. Optional Evospec goggles store internally but not the same as the Vista models.	jpsafety.com
-40	-	■	-	◆*	■*	■	■	■	■	■	■	◆	■	■	■	■	■	■*	■*	■*	Branded as 'Ascend in USA. CR2 versions have hi-viz reflective as standard add \$12. *chin strap has a 'switch' to change from hi to low strength to meet both standards.	jpsafety.com
-40	■	■	-	◆	■	■	■	■	■	■	■	■	■	■	■	■	■	-	■	■	*meets some EN397 impact requirements. NB: EvoLite Forestry is not a climbing helmet	jpsafety.com
-30 -22 +50 122	-	-	■	■	◆	■	■	■	■	■	■	■	■	■	5	■	■	-	■	■	*Also in Hi-Viz + ■ (Lime EU) with fluorescent shell, luminous clips,reflective decals -add10% to cost. AQ= EU-Only EN12492 version Aluminium mesh vent guards..	kask-safety.com
-30 -22 +50 122	-	■	■	◆	■	■	■	■	■	■	■	■	■	■	5	■	■	-	■	■	*Also in Hi-Viz + ■ (Lime US) with fluorescent shell, luminous clips,reflective decals-add10% to cost. HP= EU-only, NOT ANSI. White, Yellow or Red HP VISOR has Hi-Viz decals & goggles.	kask-safety.com
-30 -22 +50 122	■	-	-	■	◆	■	■	■	■	■	■	■	■	■	4 2	■	■	-	■	■	*Also in Hi-Viz (+Air=fluro Yellow) with fluorescent shell, luminous clips,reflective decals -add10% to cost. AIR is vented version of <i>Primero</i>	kask-safety.com
-30 -22 +50 122	-	■	-	◆	■	■	■	■	■	■	■	■	■	■	5	■	■	■	■	■	<i>Primero PL</i> is Europe only. *Also in Hi-Viz (white shown in pic) + fluro Yellow EU -add10% to cost.	kask-safety.com
-30 -22 +50 122	■	■	-	◆	■	■	■	■	■	■	■	■	■	■	4 2	■	■	-	■	■	*Also in Hi-Viz + ■ (Lime US) with fluorescent shell, luminous clips,reflective decals -add10% to cost. AIR is vented version of <i>Primero</i>	kask-safety.com

mesh covers ◆ = minimal openings EAR: ◆ = Will fit most accessories but check ■ ■ ■ = OPTION VARIANT = blue or ■ ◆ ● if it's an option

images <u>NOT</u> to scale	VISORS AND EAR DEFENDERS ARE SHOWN AS AN EXAMPLE OF WHAT CAN BE FITTED TO THE HELMET, NOT NECESSARILY WHAT YOUR STOCKIST SUPPLIES	MODEL Variant/ AKA	COMPANY	ORIGIN	COST BARE HELMET COMBO inc Tax £/\$ currency conversion only	WEIGHT (BARE HELMET)	SIZES	CONSTRUCTION SHELL INNER STRAPS/HEADBAND
		Zenith X WHE00073/4/7	KASK		£90 \$135 \$330 €102	490g 17.3oz	52-63cm 20.7-24.8"	HARD SHELL HYBRID Polypropylene EPS Nylon/Nylon
		Zenith X Air WHE00075/6/8 Zenith X PL WHE00079/80/81	KASK		£100 \$115 \$150 \$330 €103	490g 17.3oz	52-63cm 20.7-24.8"	HARD SHELL HYBRID Polypropylene EPS Nylon/Nylon
		Zenith X2 Air WHE00099/100 Zenith X2 WHE00097/98	KASK		\$154 \$150	470g 16.6oz 460g 16.1oz	52-63cm 20.7-24.8"	HARD SHELL HYBRID Polypropylene EPS Nylon/Nylon
		Leef 997002.....	KONG		£100 \$139 €130	230g 8.1oz	54-61cm 21.3-24"	IN-MOLD polycarbonate EPS Nylon/Nylon
		Mouse (Sport/Tactical) 99716.....	KONG		£62 £116 \$95 €64	380g 13.4oz	52-64cm 20.7-25.2"	HARD SHELL ABS Web/EPS Polyester
		Spin 99720.....	KONG		£60 \$85 €70	385g 13oz	52-62cm 20.7-24.4"	HARD SHELL ABS EPS/Web/Foam Polyester

SALES SERVICE

**ARBOR
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TOP BRANDS

ArbClimber Stockist

TEMP RANGE °C / °F	STANDARDS				EYE PRO			Goggle Visor			EAR	FEATURES				CRADLE	CHIN		COLOURS	NOTES	WEBSITE		
	ANSI 289.1 / CGE	CSA AUS/NZ EAC	EN14052 / UKCA	EN397 (Industrial)	EN12492 / Lateral	GOGGLES INT	FULL VISOR INT	MESH VISOR INT	CLEAR	SMOKED	MIRROR	UNI SLOTS/RAILS	VENTS CLOSABLE	ID/LOGO REFLECT	NAPE GUARD UV	LAMP CLIPS BRKT	SLIDE COG ADJUST	REPLACE PADDING				<25dan Release	>50dan Release
-30 -22 -20 -4 +50 122	■	■	■	■	◆	■	■	■	■	■	■	no	■	□	4	■	■	■	■	■	*Zenith X unvented and technically an ANSI type 1 but meets EN12492. *Also in Hi-Viz versions (cost = 15-20% higher than shown) ⊗3x Pre-fitted Combo colours. NB Std Zenith DISCONTINUED	kask-safety.com	
-30 -20 +50	■	■	■	■	◆	■	■	■	■	■	■	■	■	□	4	■	■	■	■	■	*Also in Hi-Viz versions (cost = 15-20% higher than shown) ⊗3x Pre-fitted Combo colours (pic shown)	kask-safety.com	
-20 -4 +50 122	■	■	■	■	■	■	■	■	■	■	■	no	■	□	4	■	■	■	■	■	*X2 = unvented and technically an ANSI type 1 but meets EN12492. *Also in Hi-Viz versions (cost = higher prices shown) ⊗3x Pre-fitted Combo colours	kask-safety.com	
-30 -22 +50 122	■	■	■	■	■	■	■	■	■	■	■	■	■	■	4	■	■	■	■	■	Kong Accessory slot required for ear defenders and visors	kong.it	
-30 -22 +50 122	■	■	■	■	■	■	■	■	■	■	■	■	■	■	2	■	■	■	■	■	*Yellow is Hi-Viz version. ⊗Gloss black or Tactical version=matt black. □Also available as WORK industrial version with EN397 chin strap	kong.it	
-30 -22 +50 122	■	■	■	■	no	■	■	■	■	■	■	◆	■	■	4	■	■	■	■	■	Listed as suitable for climbing arborists but only has EN397 certification/additional tests.	kong.it	
																					expansion row		
																						expansion row	

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images <u>NOT</u> to scale	VISORS AND EAR DEFENDERS ARE SHOWN AS AN EXAMPLE OF WHAT CAN BE FITTED TO THE HELMET, NOT NECESSARILY WHAT YOUR STOCKIST SUPPLIES	MODEL Variant/ AKA	COMPANY	ORIGIN	COST BARE HELMET COMBO inc Tax €/\$ currency conversion only	WEIGHT (BARE HELMET)	SIZES	CONSTRUCTION SHELL INNER STRAPS/HEADBAND
		F2-X-Trem	MSA-GALLET MSA-CAIRNS		£177 \$175 €160	700-750g 24.7-26.5oz	52-65cm 20.5-25.6"	HARD SHELL FR Thermoplastic Polyester/Nylon/ Plastane Flame-retard mix
		F2XR	MSA-GALLET MSA-CAIRNS		£160 \$235 €150	700-750g 24.7-26.5oz	52-65cm 20.5-25.6"	HARD SHELL FR Thermoplastic Polyester/Nylon/ Plastane Flame-retard mix
		V-Guard H1 TriVent Non-Vented	MSA		£96 \$95 €85	515g 18.2oz	52-64cm 20.5-25.2"	HARD SHELL HD PolyEthylene EPS Polyester/Nylon
		MP2	PAB		£150 \$170 €160	820g 29oz	52-64cm 20.5-25.2"	HARD SHELL FR Thermoplastic Heat Resist Foam Flame retardent
		R5SLV	PACIFIC HELMETS		£195 \$230 €215	n/a	52-65cm 20.5-25.6"	HARD SHELL Kevlar composite None (Web Cradle) Polyester/Nylon
		R6V Dominator	PACIFIC HELMETS		£290 \$350 €325	1003g 36.2oz	52-65cm 20.5-25.6"	HARD SHELL Kevlar composite None (Web Cradle) Polyester/Nylon
		Strato Hi Viz A020BA..	PETZL		£77 £87 \$130 \$140 €95 €107	415-425*g 14.6-15oz	53-63cm 20.9-24.8"	HARD SHELL HYBRID ABS EPP/EPS Polyester/Nylon
		Strato Vent Hi Viz A020BA..	PETZL		£77 £87 \$130 \$140 €95 €107	415-425*g 14.6-15oz	53-63cm 20.9-24.8"	HARD SHELL HYBRID ABS EPP/EPS Polyester/Nylon
		Vertex Hi Viz A010CA..	PETZL		£93 £100 \$100 \$110 €83 €102	490-495*g 17.3-17.5oz	53-63cm 20.9-24.8"	HARD SHELL ABS None (Web Cradle) Polyester/Nylon
		Vertex Vent Hi Viz A010CA..	PETZL		£93 £100 \$100 \$110 €83 €102	490-495*g 17.3-17.5oz	53-63cm 20.9-24.8"	HARD SHELL ABS None (Web Cradle) Polyester/Nylon

COST: Approx. Inc local tax/no VAT in UK €/\$ = Currency Conversion Only STANDARDS:  = partial adherence VENTS:  = closable  = m

TEMP RANGE °C/°F	STANDARDS				EYE PRO		Goggle Visor		EAR	FEATURES				CRADLE	CHIN		COLOURS	NOTES	WEBSITE			
	ANSI 289.1 / CGE	CSA AUS/NZ EAC	EN14052 / UKCA	EN397 (Industrial)	EN12492 / Lateral	GOGGLES INT	FULL VISOR INT	MESH VISOR INT	CLEAR	SMOKED	MIRROR	UNI SLOTS/RAILS	VENTS CLOSABLE	ID/LOGO REFLECT	NAPE GUARD UV	LAMP CLIPS BRKT				SLIDECOG ADJUST	REPLACE PADDING	<25dan Release
-30 -22 +60 122	-	*	*	-	◆	■	■	■	■	-	■	■	■	■	■	2+	■	■	-	■	* Unvented version meets NFPA & EN Technical Rescue standards with offset impact testing * Also Hi-Viz Yellow, Orange and Photoluminescent. Actual Goggles not visor-goggles	msasafety.com
-30 -22 +60 122	-	*	*	-	◆	■	■	■	■	-	■	■	■	■	■	2+	■	■	-	■	* Unvented version meets NFPA & EN Technical Rescue standards with offset impact testing * Also Hi-Viz Yellow, Orange and Photoluminescent. * integrated rear & optional front lighting. Clip-in ear guards	msasafety.com
-30 -22 +50 122	-	■	■	-	◆	■	■	■	■	-	■	◆	■	■	■	3	■	■	-	■	Unvented version meets electrical insulation requirements. * Also Hi-Viz Yellow. Rescue whistle integrated into chin-strap.	msasafety.com
-30 -22 +50 122	-	◆	-	-	◆	■	-	-	-	-	■	◆	■	■	■	1+	■	■	■	■	Technical Rescue Helmet NBL MP1 Pro does not have ear defender slots/mounts. * Luminous * Option Velcro light fixtures	pab.hr
-30 -22 +50 122	-	■	■	-	■	■	■	■	■	-	■	■	■	■	■	3	■	■	■	■	Simplest R55 version has a clean shell, no vents and no accessories. R57 version has integral lighting mount. Shell (only) will withstand >250°C /500°F	pacifichelmets.com
-30 -22 +50 122	-	■	■	-	◆	■	■	■	■	-	■	■	■	■	■	*	■	■	-	■	Fully modular -specify fitting like Rails, lighting clips, colours, decals, water drainage/air vents etc. * Custom options for 7 headlamp retainers/clips. Shell (only) will withstand >250°C /500°F	pacifichelmets.com
-30 -22 +50 122	■	-	■	-	■	■	■	■	■	-	■	-	■	■	■	4	■	■	■	■	* Hi-Viz Yellow & Orange with luminous clips. * Supplied with both EN397&12492 chinstraps. Meets EN12492 except vent requirements	petzl.com
-30 -22 +50 122	■	-	■	-	■	■	■	■	■	-	■	-	■	■	■	4	■	■	■	■	* Hi-Viz Yellow & Orange with luminous clips. * Supplied with both EN397&12492 chinstraps.	petzl.com
-30 -22 +50 122	■	-	■	-	■	■	■	■	■	-	■	-	■	■	■	4	■	■	■	■	* Hi-Viz Yellow & Orange with luminous clips. * Supplied with both EN397 &12492 chinstraps. Meets EN12492 except vent requirements	petzl.com
-30 -22 +50 122	■	-	■	-	■	■	■	■	■	-	■	-	■	■	■	4	■	■	■	■	* Hi-Viz Yellow & Orange with luminous clips. * Supplied with both EN397 &12492 chinstraps. * Vents must be closed to meet ANSI C, then does not fully meet EN12492.	petzl.com

mesh covers ◆ = minimal openings EAR: ◆ = Will fit most accessories but check ■ □ = OPTION VARIANT = blue or ◆ if it's an option

images NOT to scale	VISORS AND EAR DEFENDERS ARE SHOWN AS AN EXAMPLE OF WHAT CAN BE FITTED TO THE HELMET, NOT NECESSARILY WHAT YOUR STOCKIST SUPPLIES	MODEL Variant/ AKA	COMPANY	ORIGIN	COST BARE HELMET COMBO inc Tax £/\$/€ currency conversion only	WEIGHT (BARE HELMET)	SIZES	CONSTRUCTION SHELL INNER STRAPS/HEADBAND
		Protos Integral Arborist Integral Climber	PFANNER		£235 £144 \$330 \$215 €261-342 €170	629g 22.2oz	54-62cm 20.9-24.4" 56-64cm 22-25.2"	HARD SHELL HYBRID ABS EPS/Koroyd Polyester/Nylon
		Dynamo Hybrid RC05H.. Dynamo/Plus RC05/P..	ROCK HELMETS		£54 £85 \$56 €55	460g 14.5oz 410-420g 14.5-14.8oz	54-62cm 21.3-24.4"	HARD SHELL HYBRID ABS EPS Polyester/Nylon
		Flash Aero W9602 Flash W9601	SINGING ROCK		£51 \$60 €54	455g 16oz	53-63cm	HARD SHELL HYBRID ABS/Polycarbonate web cradle Polyester/Nylon
		Inceptor GRX Mnt BE590.. GRX Mnt HighVoltage BE592..	SKYLOTEC		£110 \$145 €111	470g 16.6oz	54-63cm 21.3-24.8"	HARD SHELL Polycarbonate/ABS EPS/web cradle Polyester/Nylon
		CT Aries Tree CT Aries	SKYLOTEC		£75 \$90 €85	400g 14.1oz	53-63cm 20.9-24.8"	HARD SHELL ABS EPS Polyester/Nylon
		CT X-Arbor 6X946	SKYLOTEC		£60 £86 \$65 €57	365g oz	50-61cm 19.7-22"	HARD SHELL HYBRID ABS EPS Polyester/PP
		Advance X-Climb	STIHL EUROPE		£145 \$185 €179	495g 17.5oz	53-59cm 20.9-23.2" 58-63cm 22.8-24.8"	HARD SHELL ABS EPS/Koroyd Nylon
		Arborist	STIHL USA		n/a \$130 \$164 n/a	630g 22.2oz 720g 25.4oz	53-63cm 20.9-24.8"	HARD SHELL HYBRID Lexan Polycar- bonate Copolymer EPS 5/8" Nylon
		Special Vent Plus	STIHL INTERNATIONAL		£56 £70 n/a €98 €150	450g 15.9oz 440g 15.5oz	54-62cm 21.3-24.4"	HARD SHELL HYBRID ABS EPS/Koroyd* Nylon

COST: Approx. Inc local tax/no VAT in UK £/\$/€=Currency Conversion Only STANDARDS: = partial adherence VENTS: = closable = m

images <u>NOT</u> to scale	VISORS AND EAR DEFENDERS ARE SHOWN AS AN EXAMPLE OF WHAT CAN BE FITTED TO THE HELMET, NOT NECESSARILY WHAT YOUR STOCKIST SUPPLIES	MODEL Variant/ AKA	COMPANY	ORIGIN	COST	WEIGHT (BARE HELMET)	SIZES	CONSTRUCTION SHELL INNER STRAPS/HEADBAND
					BARE HELMET COMBO inc Tax £/\$/€ currency conversion only			
		SHK-1 Vented SHK-1 Unvented	STUDSON		£115 \$140 €130	495g 17.5oz	53-59cm 20.9-23.2" 58-63cm 22.8-24.8"	HARD SHELL ABS EPS/Koroyd Nylon
		EXFIL SAR Back Country	TEAM WENDY		£245 \$221* €250	630g* 22.2oz	53-63cm 20.9-24.8"	HARD SHELL HYBRID Lexan Polycarbonate Copolymer EPS 5/8" Nylon
		SecureFit x5000	3M		£90-115 £149 €140 \$110-145 €106-135	400g 14.1oz	50-63cm 19.7-24.8"	HARD SHELL ABS EPS/web cradle Nylon/HDPE
		Pheos Alpine	UVEX		£75-85 \$95-105 €84-96 €150	490g 17oz	52-62cm 20.5-24.4"	HARD SHELL ABS web cradle Nylon/PP
		Perfexxion	UVEX		£115 €145 €130	550-570g 19.4-20oz	52-58cm 20.5-22.8" 59-63cm 23.3-24.8"	HARD SHELL ABS EPS/mesh cradle Nylon/PP
		Pronamic Alpine MIPS	UVEX		£130 \$165 €148	480g 16.9oz 490g 17.3oz	51-63cm 23.2-24.8cm	HARD SHELL ABS EPS / MIPS Nylon/PP
		Apex X2 ZAX201HV/202HV Apex Exo APX05	ZERO HEIGHT SAFETY		£65 \$80 €62	425g 15oz 430g 15.2oz	54-62cm 21.3-24.4" 51-62cm 20-24.4"	HARD SHELL HYBRID ABS Polypropylene EPS Nylon
		Pinnacle Zertec ZPZK01/01M/02 Pinnacle Exo ZPE01/02/A02/HV	ZERO HEIGHT SAFETY		£118 £78 \$140 \$90 €132 €85	445-465g 15.7-16.4oz 410-440g 14.5-15.5oz	54-62cm 21.3-24.4"	HARD SHELL HYBRID ABS EPS/Koroyd* Nylon
		Zone/Zone MIPS Zone Electro	ZEKLER		£85 \$105 €95	419g 14.8oz	53-63cm 20.9-24.8"	HARD SHELL HYBRID Polypropylene EPP/web cradle Nylon/HDPE

COST: Approx. Inc local tax/no VAT in UK £/\$/€ =Currency Conversion Only **STANDARDS:** = partial adherence **VENTS:** = closable = mo

TEMP RANGE °C/°F	STANDARDS				EYE PRO			Goggle	Visor	EAR	FEATURES			CRADLE	CHIN		COLOURS	NOTES	WEBSITE				
	ANSI 289.1	CGE	CSA AUS/NZ EAC	EN14052 / UKCA	EN397 (Industrial)	EN12492 / +Lateral	GOGGLES INT	FULL VISOR INT	MESH VISOR INT	CLEAR	SMOKED	MIRROR	UNI SLOTS/RAILS	VENTS CLOSABLE	ID/LOGO REFLECT	NAPE GUARD UV				LAMP CLIPS BRKT	SLIDECOG ADJUST	REPLACE PADDING	<254mm Release
-30 -22 +50 122	■	■	■	■	◆	■	■	■	■	■	■	■	■	■	■	■	4	■	■	■	■	Includes a MIPS style enhanced impact system called <i>Brainshield</i> . Non-vented version in white, grey ylw or orange. Embedded NFC chip with emergency information	studson.com
-20 -4 +54 130	■	■	■	■	◆	■	■	■	■	■	■	■	■	■	■	■	1*	■	■	■	■	*Weight & cost is without rails. Add £€40 and 90g for rails. *Buckle is a magnetic clip * requires £€10 adapter. Peltor ear defender adaptor	teamwendy.com
-30 -22 +50 122	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	4	■	■	■	■	Add approx 10% for reflective on standard helmet, Hi-Viz comes with reflective in price.	3m.com
-30 -22 +50 122	■	■	■	■	◆	■	■	■	■	■	■	■	■	■	■	■	4	■	■	■	■	Version shown is the <i>Forestry</i> to illustrate visor and ear defenders but shows the basic <i>Pheos</i> not <i>Pheos Alpine</i> .	uvex-safety.com
-30 -22 +50 122	■	■	■	■	◆	■	■	■	■	■	■	■	■	■	■	■	1*	■	■	■	■	*Rear clip recesses flush to the shell when not in use	uvex-safety.com
-30 -22 +50 122	■	■	■	■	◆	■	■	■	■	■	■	■	■	■	■	■	4	■	■	■	■	MIPS version =enhanced anti-rotational impact protection	uvex-safety.com
-40 -40 +50 122	■	■	■	■	◆	■	■	■	■	■	■	■	■	■	■	■	4	■	■	■	■	Apex Exo is EN12492 only *Fluoro Orange & Lime *Direct fit half face visors available EN166	zeroheightsafety.com
-40 -40 +50 122	■	■	■	■	◆	■	■	■	■	■	■	■	■	■	■	■	4	■	■	■	■	<i>Zertec 02</i> =unvented & ANSI E (20,000v) + EN50395 <1500vDC. <i>Zertec</i> has NFC chip with emergency contact details. <i>Exo</i> does NOT use <i>Koroyd</i> and has mesh vents.*Fluoro Orange & Lime, luminous white	zeroheightsafety.com
-30 -22 +50 122	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	4	■	■	■	■	Also rebadged by CRESTO *Hi-Viz yellow. ELECTRO in Blue, White Yellow & Hi-Viz yellow	zekler.com
																			expansion row				

mesh covers ◆ = minimal openings EAR: ◆ = Will fit most accessories but check ■ □ = OPTION VARIANT = blue or □◆ if it's an option

UPDATED April '24

CLIMBING SPIKES/ SPURS

The newest model on the market is *FTC TREE's Klik 'n Ka* with push button strap adjustment and an optional branch grip under the foot plate

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The more environmentally-minded recoil at the sight of a set of tree-spikes (or 'climbers' as they're known in the US utilities industry), because it either means that another tree has bitten the dust and is being dismantled in its entirety or the wearer is not too concerned for the health and appearance of a tree in carrying out routine maintenance work. I had a friend in the business many moons ago who, brilliant though he was and indeed the best I've ever seen, used to wear spikes for virtually every job despite us all pointing out the woodpecker-attack appearance of the trees he left behind. That had changed by the 90's as the realisation of how many disease entry points were being created quite aside from the disfigurement which clients were presumably assured was perfectly normal! Of course, if you're working on timber that's being removed or the whole tree is being felled, it doesn't matter. Tree health and cosmetics aside, tree spikes/climbers are essential to the safety of the climbers for many types of job, rope-safety will get you so far but not all the way, all the time.

Spikes are quite literally leg-irons with a sharp spur or gaff on the inside that digs into the wood (through the bark or just into bark if it's thick enough) as you either 'walk' up a tree or stabilize your stance in readiness for cutting. In the absence of suitable side branches to stand on or a suitable rope anchor above (because you're dismantling/sectioning the tree as you descend), they provide a stable grip and platform with your pole-strap providing some security and helping to pendulum your weight into the spur or gaff. The spur itself has become a replaceable component and more on this vital element shortly but just to say that most companies offer a short and long spur with some offering a medium or hybrid size. The short spur tended to be used more for pole-work but there are many species of tree with thin bark that warrant use of the short rather than medium or long spurs so you would do well to have size options available for varied domestic or parkland work.

The US has three of the world's oldest spike manufacturers in *Klein Tools*, *Bashlin* and *Buckingham Manufacturing*, all of whom were originally catering much more to pole climbing than to arborists and consequently still target at least 50% of



Photo by James Fairfield

CLIMBING SPIKES/SPURS

their equipment ranges to utility pole climbers (telegraph and electric poles). *Buckingham Mfg* in Pennsylvania are without doubt the oldest climbing spike company

in the world so it's not surprising that they have the largest range and like most companies has many variations on frame materials, shapes, widths, gaffs and bindings. They provide the useful chart on frame designs overleaf which obviously doesn't apply to all or indeed many manufacturers,

some of which like *Panther*, *Distel* and *Edelrid* have simplified things entirely with just one or two frames but different gaff and binding options. The other huge player in this market is *Bashlin*, very much a utility lineman company that caters to arborists more as a sideline than their core business. They have stuck with the more traditional brown leather straps favoured by many a US arborists in particular and still offer

all-in-one frames with non-replaceable spurs/gaffs (as do *Buckingham*). You will often see *Weaver* leather straps offered as an option because they are widely regarded as the premier leather-meisters but even they offer artificial 'leather' straps. However, even though well stitched leather is a thing of beauty and remains an extremely hardwearing and comfortable material especially when

it is faced with softer calf-skin, there is no doubt that the most progressive models are thermo-foam padded with contoured reinforced/protective cuffs secured by Velcro or push-fit buckles.

We have NOT included the '*Bistel*' Talons as they are a very poor quality imitation of the *Distel* and do not come even close to meeting the ASTM load test and we have also omitted *Tomchy* and one from *Amazon* and *Walmart* - *Cohu* brand

because it looks too poorly made to be a professional item using cable-ties to attach the bindings and padding! In

the case of *Tomchy* they may be OK but we can't verify their specifications. All three appear to be Chinese made.

FRAME /SHAFT/SHANK DESIGN

Traditionally made from iron and brought up to date with carbon steel at the heavier but less expensive end rising in cost

with one or two stainless steel models and reduction in weight with aluminium and carbon fibre models. Even lighter (though not by much), sturdy and more expensive, are a few titanium models. Regardless of material there may be two or three distinct components to a climbing spike frame and this does NOT include the actual pointy bit, the gaff or spur. The shaft or shank is the upright section attaching to the stirrup at the bottom and the shaft may be further subdivided into a third component if it has length adjustment which most do. Some models may have an alloy stirrup and lower frame but a steel



top

CLIMBER STYLES

Designed to be used by a person with a maximum weight of 350 lbs. when fully equipped.

Non Contoured Shank	Contoured Shank	Twisted Shank*	Offset Stirrup	Stirrup Width
	 <small>Provides ankle bone relief</small>	 <small>Designed to follow the muscle contour</small>	 <small>Places stirrup in center of foot</small>	 <small>4 1/2" 4"</small>
*Available on all Buckingham pole climbers. Add a 'T' suffix; e.g. T94089AT.				
Comfort & Fit for Narrow or Standard Width Stirrup				
STIRRUP TYPE	STIRRUP WIDTH	SHORT SLEEVES	LONG SLEEVES	
Standard	4 1/2"	15 3/4" to 18 1/2"	18 3/4" to 21 1/2"	
Narrow	4"	14 1/2" to 17 1/4"	17 1/4" to 20 1/4"	

TO SIZE CLIMBERS

- Measure boot upper at the widest part of arch for correct stirrup width.
- With climber sleeve and pad attached, locate climber 1/2" below inside knee bone, mark location on the climber with a pencil (never scribe a line into the climber) & secure each sleeve with two screws per climber.

Note: For maximum mobility, pull pant leg up before fastening straps.

adjustment to the frame. In the *Buckingham* Table above, the second frame (listed here as CONTOURED but in our tables as PROFILED) is the commonest construction for a modern climbing spike. The traditional straight shaft doesn't really follow the calf and ankles natural shape and is consequently less comfortable without padding at the top to bridge the calf's normal inward curve towards the knee but many offset the stirrup to compensate. You can see this padding in the *Harkie* model on the right where soft leather padding extends down the shank. Some designs follow the legs contours more closely with an indented shape at the bottom like this *Edelrid* model. Others, like the *Distel* flatten the cross-section of the shaft and then twisted it to face slightly forward and better fit the angle

ABOVE RIGHT: Representative of a number of modern developments in spikes is *Protek's R100* with a preformed plastic shell covering thermo-formed foam padding with a breathable mesh on the inside. The straps on both the calf cuff and the foot are secured with Velcro or 'hook&loop' if the manufacturer isn't stumping up for the real thing. This model uses a small D-Ring on the foot strap instead of the more usual ring to provide three-way attachment to the foot straps.

OPPOSITE: Alongside the traditional leather of the *Bashlin* 'climber' is *Buckingham's* homage to US line workers with their latest hydra-transfer Stars & Stripes livery on a model with high-end push-fit buckles on the foot straps. A number of the frames, pads and straps from *Bashlin*, *Buckingham* and *Klein* are interchangeable.

of the calf muscle and inhibit the shaft digging in. A further refinement not seen on many is to offset the stirrup a little bit forward of the shaft because your heel-rebate, into which the stirrup sits, isn't actually directly in line with the calf bone which is the line most frames follow. This design purports to direct more load to the gaff/spur without the need for so much driving force, in other words, it makes your climbing more efficient. If that is true, not many have adopted the offset stirrup - perhaps the increased production cost outweighs the benefits? Another design that hasn't caught on is *Antec's* (now owned by *Honeywell*) articulated shaft model. This may be discontinued but is still being sold in France and has lateral articulation just above the achilles area. It effectively gives you an adjustable offset rather than the fixed angle of conventional offsets like this other *Antec* model providing better direction of force to the gaff but you had better make sure those bolts are tightened well.



comfort. At the top end of their range the plastic is replaced by carbon-fibre - lighter and tougher but more expensive. Uli Distel wasn't the first to come up with this preformed cuff idea but he did perfect the design to make it the best compromise in terms of weight, comfort and cost. If you look at Jim Fairfield's title picture, the climber is using a pair of *Wolf Claws* which we think never made it much past 2010. These have a full-length nylon 'cuff', more like the best part of a boot, which incorporates the metal frame within the moulding. It's a bit like an Ice Hockey leg pad without the articulation but it obviously never caught on much, possibly because it weighs as much as the tree being climbed. *Distel* too had a prototype along the same lines (pic right) albeit with much smoother curves than the *Wolf Claw*.



CUFF

This is the top attachment to the leg securing the shaft around the calf. It comprises of padding to the frame and then to the inside of the securing strap that goes around the calf. Traditionally the upper cuff has incorporated a regular leather strap with pin and hole adjusted just like a trouser belt and this is still the case with many models today except that many replace the more expensive leather with man-made fabrics less inclined to absorb unsavoury body fluids etc. The *Harkie* model on the left, which has now been discontinued pending an updated model, is a typical variation with leather 'T-shaped' padding beneath a leather or 'pleather' strap securing it around the calf. Some use Velcro straps like the *Edelrid Talon* on the previous page, which has the advantage that it is infinitely adjustable but the disadvantage that its hook and loop fastening can get 'gummed' up by sawdust and debris. The most recent trend is towards push-fit buckles for speed which can be further finitely adjusted by pulling the tail of the webbing-see the *Buck* model on the title page. Pin and hole straps on the other hand, have set adjustment and while both options keep things simple and light using spikes demands the straps be quite tight to stop movement of the top part of the frame, in effect, to stop it flapping against the calf during climbing if not properly secured. To counter this possibility *Bashlin* and *Buckingham* started putting curved metal plates in or around the top plate that would not only increase protection from the intrusive metal frame but also grasp the calf even if the straps weren't overtly tight. Some still use alloy cuffs but models like the ground-breaking *Distel* models from Germany started using a much longer, contoured plastic cuff curved around a foam or thermo-moulded EVA to provide protection and

STIRRUP

The boot support under the heel is important in working comfort. Most use a curved inside face that allows some leeway on the width of boot it will fit and some offer a narrow or wide-fit option. It's often difficult to know where they are measuring width from since the straight section across the bottom can be half the width of the curved section higher up so assume that the average width is around 100mm/4" with narrow options at around 75mm/3". Before we talk about the sharp bit, it's worth mentioning a couple of stirrup design additions that might seem like an obvious enhancement but will very much depend on your climbing style and type of job. Grip on the underside of the stirrup to make branch walking in between vertical spiking a safer and easier operation. Some have serrations or ribs forged or cast into the underside of the stirrup while others use a rubber grip, in the case of *Distel* this is the world-leading *Vibram* rubber used on mountaineering boot soles. This is taken further by *FTC TREE* with their *Sting&Stay* spike which has a full metal spike set mounted beneath the stirrup - akin to an instep crampon, indeed many European stockists anglicise the name of the range of products as 'crampons'. On the right you can see the detachable two-spiked plate with the spikes facing outward while the regular spur faces inwards.



SPIKES/GAFFS/SPURS

The first thing to note about the pointy-end of your climbing 'leg-iron' is that it's imperative to keep it sharp and properly profiled. It needs to penetrate the bark to find a solid purchase in wood though there are some trees that have bark so thick and tough that this is impractical. It's all about penetration which requires it to be sharp with a precise cross-section - usually triangular or square. The efficiency of the spike is further enhanced with a slick surface - a rusty spike is far harder to push in and pull out than a teflon-style coating like *Distel's* PTFE and anodizing in



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the case of many others. However, once the need to sharpen arises you obviously begin to lose this more efficient and protective coating. BUCKINGHAM have what they call GRIP technology on some models. This stands for Gaff Ridge Positioning and is purportedly specific engineering that improves the security of placement of the gaff, ie. it digs in better with less effort. This is something that a few others have strived to achieve to help decrease the fatigue of climbing in spikes.

Shorter spikes for utility poles (CCA poles in the US are particularly tough and some will mention CCA in the title of the product), medium or hybrid for trees with average density bark and long spikes for thick bark; trees like pines and sequoia. One oddity to mention is again the Antec (now Honeywell/Miller) which has a single or double gaff option, like a bull's horns. It's unclear what, if any advantage this offers since nobody else makes them? Regardless of whether you have one or two, being so sharp, you will want to cover your gaffs both as a safety precaution against impale and to preserve the keen point. Many offer a simple leather or plastic cap but

some offer something a little different - Buckingham have a visually bright, magnetic plastic gaff-cover on a retractable lanyard (pic left) so it stows out of the way when not in use but is immediately to hand when you want to cover them, unlike most loose gaff covers which will have been lost two minutes after you take them off.

Perhaps the best protection, and a means to keep hold of those loose gaff covers is a protective bag like the Protekt and Stein models below which are supplied with your spikes.

SPIKING TECHNIQUES

Try not to snag your chainsaw trousers. KleinTools are one of the oldest manufacturers so we'll steal their sound advice on spur choice and use.....
When using pole climbers, remember that poles are not all alike. Different wood species, climate and pole age, as well as different preservative treatments (Creosote, Penta, CCA) affect climbability. Since these factors can result in significant differences in gaff penetration, visually check gaff penetration with your full weight on the climber before starting any climb. if penetration is shallow, use extreme caution, because the gaff could "cut-out", or the increased stress on



the gaff tip could cause the tip to break. To allow for proper penetration, the minimum acceptable length for the underside of a pole climber gaff is 1-7/16" (37 mm). avoid gaff contact with metal objects when climbing (such as pole ID tags, nails, poster staples, metal pole hardware, or any other metal on the pole). When using tree climbers, remember that trees are not all alike. Different species and bark thickness affect climbability. Visually check gaff penetration in the same manner described for pole climbers before starting any climb. To allow for proper penetration: Use a tree-climber gaff with a minimum underside length of 2-1/4" (57 mm). When the bark thickness measures more than 2-1/2" (64 mm), make sure the gaff is long enough to properly penetrate the wood under the bark. Avoid gaff contact with metal objects when climbing (such as nails, poster staples, or any other metal on the tree).

NB: The Wolf Claw and Harkie have been discontinued although some Harkie spikes are still available from some stockists. In our tables we have limited the entries to the generic 'head-of-family' so to speak, and in particular any that have a structural difference in the frame like a twist or offset or permanent rather than replaceable gaffs/spurs. Companies like Buckingham, Bashlin and Protekt have a vast number of models but they are a variation on those 'head-of-family' models so we have tried to picture different cuff options for different models. In reality the same cuff and strapping options are often available for ALL of the models listed.



IN THE FOLLOWING TABLES:

Prices and weight etc, are for a model with specific features as shown by solid black or orange squares. Options are shown as outline squares or in green with alternate variants shown in blue. We have generally shown the Velcro (or equivalent) closure for bindings as the basic design.

ORIGIN:

The manufacturer's country but not always where it's made in which case, if we know, there is an inset flag.

COST: approximate, rounded up and inclusive of local taxes which are generally 20% in Europe. \$ prices in orange are a currency conversion (as of May 2022) for reference not necessarily the actual selling price.

MATERIALS: for the main frame/shank and separately for the gaff/spur. ALU means Aluminium Alloy unless otherwise specified. STEEL means carbon steel and we assume this unless the manufacturer specifically states Alloy-Steel which includes elements like Molybdenum and Nickel to improve corrosion resistance and strength etc. Gaffs available in more than one material are listed as an option in the notes.

FRAME SHAPE: The shank or upright section of a frame can be straight, twisted, or profiled (contoured) to match the leg's shape more accurately. As the frame becomes the stirrup, this may be straight (in line) or **offset** shown in orange or blue for a different version in the same group of products.

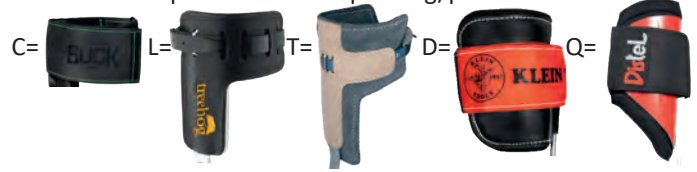
HEIGHT ADJUST Increments: Adjustable height is shown as a or an actual figure for the range of adjustment is shown with optional size ranges in green. Some provide the increments by which you can make adjustments.

STIRRUP FITS FOOT WIDTH.... A measurement across the width of the stirrup that your boot sits in. The width of the straight section on the bottom is less than a width measurement taken higher up on the curved section.

GAFFS/SPURS: The default spur size is shown in black with other length options shown in green. The vast majority are replaceable so the few that are not are indicated by an asterisk and a note. The lengths quoted are from the manufacturer and should indicate just the spike element of the gaff/spur but some may have included the complete length including the bolted section - this is usually obvious and we will have double checked but one or two may have crept through if they are a credible (but nevertheless incorrect) length.

CUFF SHELL & SHAPE: The material used in the 'protective shell' which may cover padding at the top/calf end of the frame with the binding often sitting over or through the shell/pad. Some have obvious plastic or glass-fibre shells but most are leather pads often with a softer facing leather on the inside. The shell/padding may be contoured to curve around the calf and extend further down to cover more of the metal or they may be a simpler square band like a giant bracelet. They might be a modified L-shape extending down the frame and around the 'bracelet'. Most offer a range of options for the cuff and bindings/straps with the simpler leather cuff often cheaper than the more complex shell-type cuffs. Our coding is shown below where C is the simplest and narrowest square/bracelet shape (this may have extra L-shape padding beneath and some, like *Bashlin* offer angled or straight 'legs' for shaft insertion), L is an inverted L-shape where the top part wraps around to join the vertical section. T-shape has the cuff wrapping around from both side of the upright section. D-shape is a longer version of the C-cuff extending further down the shank. Q-shape is a variation of the D-shape with a more sculpted inner edge tapering towards the shank. Bear in mind that some T and L shapes can be broad enough to be almost indiscernible from the Q-shape. Sometimes the cuff

and the padding are one and the same but our chart only relates the shape of cuff to the padding/protective element.



WEIGHT Pair: for a pair of spikes including the binding, padding and gaff as indicated by *not* being an option.

MBS / WLL/SWL: The MBS or Minimum Breaking Strength or Load will always be a much higher figure than the Working Load Limit or Safe Working Load which is usually calculated at around 10% of the MBS. As with all systems the load figure is limited by the weakest component because the spikes themselves may be rated several times higher than the quoted WLL. Note that any load figure means the TOTAL load applied during wear - if you're a 114kg/250lb climber, unless you're climbing naked, there is going to be significant additional weight to add with boots, harness, hardware, helmet etc. that will increase in weight in rain so you will get close to the 350lb SWL of a lot of these spikes exceed the limits on one or two. Remember, it's the TOTAL weight not just your body weight.

FASTENING

This refers to the upper (cuff) strap shown as a solid black square and for the lower stirrup strap as an orange square . Options are shown as an outline square.

VELCRO: Velcro or Hook&Loop fastening

CLICK BUCKLE: A push-fit buckle like the Austrianpin Cobra that speeds up donning and doffing.

THREAD BUCKLE: webbing is threaded through a ladder of D buckles

LEATHER/EYELETS: Some straps that look like leather are actually artificial like the Distal Weaver straps and therefore listed as 'plastic'

PLASTIC/EYELETS: not necessarily 'plastic' but a catch-all for nylons and man-made materials

CUFF CONSTRUCTION

LEATHER/FELT: Usually a softer calf leather and sometimes with a suede like inner face. **WOOL** or fleece was traditionally used for padding but not seen so much any more but retro is the new modern and wool is a timeless performer.

THERMO-FOAM/EVA: a foam lining that may be shaped with rounded edges in the case of thermo-foam. EVA is a type of foam, all are harder-wearing than simply a soft foam.

MESH LINER: a wicking mesh line on foam that moves sweat away from the skin

METAL INSERT: A thin band of alloy or steel that helps retain the shape and curve of the pad or increased support between the frame and the cuff

GAFF COVER: Protective cover for the sharp bit. We haven't included it but *Bashlin* also sell a protective heel cover to stop you spiking yourself.

STORAGE BAG: Some like *Protekt* and *Stein*, include a handy storage bag for a set of spikes in with the price quoted which will often be large enough to cram other stuff in. An outline square indicates that you can buy a 'spikes' bag separately from this manufacturer.

OTHER COLOURS: Colours available other than the ones shown - usually for the top cuff but some have frame-colour options. Note that many stockists sell colour and pad options that are no longer sold by the manufacturer eg. *Bashlin* now have 3 leather pad/cuff options but we often see variations in stockists that are not now sold.

images show one of a range of options and are NOT to scale		MODEL	COMPANY	ORIGIN	COST inc Tax/VAT	MATERIAL Frame/Shaft Gaff/Spur	SHAPE Shaft/ Stirrup	HEIGHT ADJUST Option Increments
		BD14B BD14BOD BD14BX	BASHLIN		£746-£792 \$546-\$826 €505-760	ALLOY Steel	Straight Offset	15-18" 18-21"
		BD16B	BASHLIN		£285-445 \$306-\$560 €285-515	STEEL Steel	Profiled Offset	15-18" 18-21"
		BD16BC	BASHLIN		£255-500 \$325-\$580 €310-540	STEEL Steel	Twisted Offset	15-18" 18-21"
		Permanent-Gaff BD12	BASHLIN		£225-425 \$280-\$540 €260-500	STEEL Steel	Straight Offset	15-18" 18-21"
		Permanent-Gaff BD12C	BASHLIN		£225-425 \$285-\$540 €260-500	STEEL Steel	Twisted Offset	15-18" 18-21"
		Permanent-Gaff BD12L	BASHLIN		£205 \$260 €240	STEEL Steel	Profiled Offset	15-18" 18-21"
		BuckAlloy A94089AV +94...variants	BUCKINGHAM		£610-660 \$775-\$835 €715-770	ALLOY Steel	Straight Offset	16½-18¾" 19%-21¾"
		BuckAlloy A94K2FG +94..variants	BUCKINGHAM		£755 \$955 €880	ALLOY Steel	Straight Offset	16½-18¾" 19%-21¾"
		BuckAlloy A95089 +95..variants	BUCKINGHAM		£575 \$730 €675	ALLOY Steel	Straight Offset	16½-18¾" 19%-21¾"
		BuckLite TBG95K2V-SG TBG94K2V-BL TB94K2V-BL	BUCKINGHAM		£584 \$990 €915 \$1121 \$1048	TITANIUM Steel	Profiled Offset	16½-18¾" 19%-21¾"
		BuckLite Twisted Shank-Pole TBG94K1VT-BL	BUCKINGHAM		£815 \$1035 €995	TITANIUM Steel	Twisted Offset	16½-18¾" 19%-21¾"
		BuckLite Permanent Gaff TB81429R TB87479	BUCKINGHAM		£745 \$940 €890 \$883	TITANIUM Steel	Profiled Offset	16½-18¾" 19%-21¾"

NOTES COST: Approx & inc local tax/VAT \$=currency conversion only FASTENING: Top Cuff = Bottom/Foot Strap =

CLIMBING SPIKES/SPURS

GAFF/SPUR Option			CUFF SHAPE Option	WEIGHT PAIR	WLL/ SWL MBS	FASTENINGS						CUFF PADDING				OTHER COLOUR		NOTES	WWW.
SHORT	MED/ HYBRID	LONG				VELCRO	CLICK BUCKLE	THREAD BUCKLE	LEATHER/ EYELETS	PLASTIC/ EYELETS	LEATHER/ FELT/ WOOL	THERMO-FOAM/EVA	MESH LINER	METAL INSERT	GAFF COVER	STORAGE BAG	CUFF		
41mm 1.6"	-	63mm 2.5"	C T, L	2.2-3.86kg 4.75-8.5lb	-	<input type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Price & wt vary with colour strap/pad options. Velcro C pads=3.5lbs Basic L pads=0.5lbs Inc gaff gauge	bashlin.com
41mm 1.6"	-	63mm 2.5"	C T, L	2.7-4.5kg 6-10lb	-	<input type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Price & wt vary with colour strap/pad options. Velcro C pads=3.5lbs Basic L pads=0.5lbs Inc gaff gauge	bashlin.com
41mm 1.6"	-	63mm 2.5"	C T, L	2.7-4.5kg 6-10lb	-	<input type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Price & wt vary with colour strap/pad options. Velcro C pads=3.5lbs Basic L pads=0.5lbs Inc gaff gauge	bashlin.com
41mm 1.6"	-	63mm 2.5"	C T, L	2.5-4.3kg 5.5-9.5lb	-	<input type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Price & wt vary with colour strap/pad options. Velcro C pads=3.5lbs Basic L pads=0.5lbs Inc gaff gauge	bashlin.com
41mm 1.6"	-	63mm 2.5"	C T, L	2.5-4.3kg 5.5-9.5lb	-	<input type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Price & wt vary with colour strap/pad options. Velcro C pads=3.5lbs Basic L pads=0.5lbs Inc gaff gauge	bashlin.com
41mm 1.6"	-	63mm 2.5"	C T, L	2.5-4.3kg 5.5-9.5lb	-	<input type="checkbox"/>	-	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Price & wt vary with colour strap/pad options. Velcro C pads=3.5lbs Basic L pads=0.5lbs Inc gaff gauge	bashlin.com
44mm 1.75"	54mm 2.1"	62mm 2.4"	C D, L	1.45kg 3.2lb	159kg 350 lb	<input checked="" type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All frames , pads, straps and gaffs are interchangeable between models *Europe	buckinghammfg.com
44mm 1.75"	54mm 2.1"	62mm 2.4"	D L, C	1.86kg 4.1lb	159kg 350lb	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All frames , pads, straps and gaffs are interchangeable. GRIP gaffs, see intro for discussion.	buckinghammfg.com
44mm 1.75"	54mm 2.1"	62mm 2.4"	L C D	1.3kg 2.8lb	159kg 350lb	<input type="checkbox"/>	<input type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All frames , pads, straps and gaffs are interchangeable between models. *GRIP gaffs, see intro for discussion.	buckinghammfg.com
44mm 1.75"	41mm 1.6"	71mm 2.75"	D L, C	1.6kg 3.5lb	159kg 350 lb	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	'SG' in product Code=Safety Green Hi-Viz GRIP gaffs, see intro for discussion.	buckinghammfg.com
44mm 1.75"	41mm 1.6"	71mm 2.75"	C D, L	1.4kg 3.1lb	159kg 350lb	<input checked="" type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All frames , pads, straps and gaffs are interchangeable between models	buckinghammfg.com
38mm 1.5"	-	79mm 3.1"	L C D	1kg 2.3lb	159kg 350lb	-	-	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All frames , pads, straps and gaffs are interchangeable between models	buckinghammfg.com

OPTION= or N/A: info Not Available/not given COLOURS: =Predominant colour

images show one of a range of options and are NOT to scale		MODEL	COMPANY	ORIGIN	COST inc Tax/VAT	MATERIAL Frame/Shaft Gaff/Spur	SHAPE Shaft/ Stirrurp	HEIGHT ADJUST Option Increments
		Buck Steel Offset SB95059/ SB94089A SB95K2V-BL SBG95089Q2	BUCKINGHAM		£410 \$405 €375 \$737 \$577	STEEL Steel	Profiled Offset	16¼-18¾" 19¼-25¾"
		Buck Steel Straight Stirrup SB93059	BUCKINGHAM		£360 \$400 €370	STEEL Steel	Profiled	16¼-18¾" 19¼-21¾"
		Buck Steel Permanent Gaff 81429R (Tree) 87479 (Pole)	BUCKINGHAM		£310 \$390 €360 \$370	STEEL Steel	Profiled	16¼-18¾" 19¼-21¾"
		Alu Classic* Alu3 Alu Comfort	DISTEL		£375 \$420 €355	ALU PTFE-coated Steel	Slight Profile	34.3-47.8cm 6mm/¼"
		Alu Comfort Plus Alu DMM	DISTEL		£335 \$395 €375	ALU PTFE-coated Steel	Slight Profile Offset	34.3-47.8cm 12mm/½"
		Tree Punk	Distel		£371 £525 €375	ALU PTFE-coated Steel	Slight Profile Offset	34.3-47.8cm 12mm/½"
		Carbon	DISTEL		£582 \$723 €700	CARBON FIBRE PTFE-coated Steel	Slight Profile Offset	34-37.8cm 6mm/¼"
		Talon	EDELRID		£375 \$625 €400	powder-coated STEEL Steel	Profiled Offset	35.5-45.7cm 14-18" 5mm /¼"
		Sting & Stay	FTC TREE		£260 \$315 €300	STAINLESS STEEL Stainless Steel	Profiled	S-15.5" L=16.5" none
		Klik 'N Ka	FTC TREE		£475 \$605 €520	ALU Stainless Steel	Profiled	42-48cm 16.8-19.2" 12mm/½"
		Griffe 1	HONEYWELL MILLER/ KOMET		£255 \$315 €300	ALU Stainless Steel	Profiled	?
		1014991	HONEYWELL MILLER/ KOMET		£555 \$685 €650	ALU Stainless Steel	Profiled Offset	■ 3

NOTES COST: Approx & inc local tax/VAT \$=currency conversion only FASTENING: Top Cuff = Bottom/Foot Strap=

SHORT	GAFF/SPUR Option		CUFF SHAPE Option	WEIGHT PAIR	WLL/ SWL MBS	FASTENINGS						CUFF PADDING						OTHER COLOUR	NOTES	WWW.
	MED/HYBRID	LONG				VELCRO	CLICK BUCKLE	THREAD BUCKLE	LEATHER/EYELETS	PLASTIC/EYELETS	LEATHER/FELT/WOOL	THERMO-FOAM/EVA	MESH LINER	METAL INSERT	GAFF COVER	STORAGE BAG	CUFF			
44mm 1.75"	41mm 1.6"	71mm 2.75"	C L, D	2.2kg 4.8lb	159kg 350lb	■ □	-	-	-	□	■	□	-	■	■	-	■	Hi Viz Safety Green option with Big-Buck Pads	buckinghammfg.com	
44mm 1.75"	41mm 1.6"	71mm 2.75"	L C D	2.8kg 6.2lb	159kg 350lb	□ □	-	-	-	■	-	□	-	□	□	-	-	All frames , pads, straps and gaffs are interchangeable between models. 23 deg gaff angle	buckinghammfg.com	
40mm 1.6"	-	78mm 3.1"	L C D	2.8kg 6.2lb	159kg 350lb	□ □	-	-	-	■	■	□	-	□	□	-	-	All frames , pads & straps are interchangeable between models	buckinghammfg.com	
31mm 1.2"	40mm 1.6"	47mm 1.85"	FibreGlass Q	2.04kg 4.5lb	330kg	■ □	□	-	-	■*	-	■	-	-	-	-	-	*Alu Classic has been DISCONTINUED *Weaver straps	distelforst.de	
31mm 1.2"	40mm 1.6"	47mm 1.85"	FibreGlass Q	2.08kg 4.6lb	330kg	■ ■	□ □	-	-	□*	-	■	-	-	-	-	■	Vibram rubber on underside of stirrup. *Weaver straps	distelforst.de	
31mm 1.2"	-	47mm 1.85"	FibreGlass Q	2.08kg 4.6lb	330kg	■	-	-	■	□*	-	■	-	-	-	-	■	Vibram rubber on underside of stirrup. *Weaver straps	distelforst.de	
31mm 1.2"	40mm 1.6"	47mm 1.85"	Plastic Q	1.66kg 3.6 lb	330kg	■ ■	□ □	-	-	□*	-	■	-	-	-	-	-	Vibram rubber on underside of stirrup. *Weaver straps	distelforst.de	
43mm 1.7"	-	70mm 2.75"	Plastic D	2.5kg 5.5lb	-	■ ■	-	-	-	-	■	-	-	-	-	-	-	Plastic is recycled rope scraps	edelrid.de	
-	50mm 2"	-	Leather T	3kg 6.6lb	-	■	-	-	■	-	■	-	■	-	□	-	-	2 sizes available for < or > than 1.75m height. Has instep spikes	ftc-tree.com	
-	50mm 2"	-	FibreGlass Q	1.8kg 4lb	-	-	-	-	-	-	■	-	-	-	-	-	-	New for 2024	ftc-tree.com	
40mm 1.6"	-	-	Leather T	2.4kg 5.3lb	-	-	-	-	□	■*	□*	-	■	-	□	-	■	*Image shows Cam-'buckles' on calf and foot straps	sps.honeywell.com	
40mm 1.6"	-	■	Leather D	N/A	-	-	-	-	■	□	■	■	-	■	-	-	-	Miller Komet now owned by Honeywell. Good luck finding spikes on the Honeywell website	sps.honeywell.com	

OPTION= ■ or □ N/A: info Not Available/not given COLOURS: =Predominant colour

images show one of a range of options and are NOT to scale		MODEL	COMPANY	ORIGIN	COST inc Tax/VAT	MATERIAL Frame/Shaft Gaff/Spur	SHAPE Shaft/ Stirrup	HEIGHT ADJUST Option Increments
		Axess/Axis 1014990	HONEYWELL MILLER/ANTEC		£565 \$690 €662	ALU Stainless Steel	Profiled Offset	NO
		Twin Spikes 3139/1/2 Articulated 3358	HONEYWELL MILLER/ANTEC		\$412 €392 \$480 €457	ALU Steel Twin Steel	Profiled articulated	■ 2
		K2	KIWIKLIMBER		£430/75 \$540/99 €500/55	CARBON- FIBRE Titanium*	Profiled	34.3-47.8cm 6mm/¼"
		Klein-Claw & Hydra-Cool 2214..variants	KLEIN TOOLS		£425 \$330 €305	STEEL Steel	Profiled	38-48cm 15-19" 43-53cm 17-21" 6mm/¼"
		1907..variants	KLEIN TOOLS		£320 \$300 €395	STEEL Steel	Slight Profile	38-48cm 15-19" 43-53cm 17-21" 6mm/¼"
		1972..variants	KLEIN TOOLS		£300 \$280 €275	STEEL Steel	Slight Profile	38-48cm 15-19" 43-53cm 17-21" 6mm/¼"
		1986..variants	KLEIN TOOLS		£301 \$270 €250	STEEL Steel	Slight Profile	38-48cm 15-19" 43-53cm 17-21" 6mm/¼"
		Carbon Fiber	NOTCH GECKO		£750 \$950 €875	CARBON FIBER Steel	Slight Profile Offset	37.5-53cm 14¾-21" 6mm/¼"
		Aluminium 2.0 DMM*	NOTCH GECKO		£435 \$550 €510	ALU Steel	Profiled	37.5-53cm 14¾-21" 6mm/¼"
		Steel	NOTCH GECKO		£276 \$350 €270	powder- coated STEEL Steel	Profiled Offset	37.5-53cm 14¾-21" 6mm/¼"
		Panther Spikes	PANTHER		£288 \$375* €305	ALU AlloySteel	Profiled	41-47cm 16-18½" 20mm/¾"
		Panther Spikes	PANTHER		£420 \$474 €451	CARBON FIBRE AlloySteel	Profiled	41-47cm 16-18.5" 20mm/¾"

NOTES COST: Approx & inc local tax/VAT FASTENING: Top Cuff = □ Bottom/Foot Strap= ■

CLIMBING SPIKES/SPURS

SHORT	GAFF/SPUR Option		CUFF SHAPE Option	WEIGHT PAIR	WLL/SWL MBS	FASTENINGS						CUFF PADDING				GAFF COVER	STORAGE BAG	OTHER COLOUR		NOTES	WWW.
	MED/HYBRID	LONG				VELCRO	CLICK BUCKLE	THREAD BUCKLE	LEATHER/BUCKLE	PLASTIC/EYELETS	LEATHER/LEATHER/FEEL/WOOL	THERMO-FOAM/EVA	MESH LINER	METAL INSERT	CUFF			FRAME			
40mm 1.6"	-	-	ABS D	2.6kg 5.8lb	-	■	-	-	■	-	-	■	-	■	-	-	-	-	-	sps.honeywell.com	
-	-	-	Cordura C	3.2kg 7 lb	-	-	-	-	□	■*	□	■*	-	■	-	-	-	-	*Cam-'buckles' on calf & foot straps. May be discontinued but still being sold.	sps.honeywell.com	
48mm 1.8"	-	60mm 2.3"	FibreGlass Q	2kg 4.4lb	95kg 210lb	■	□	-	-	-	-	■	-	-	□	□	*	-	*Titanium gaffs lightest on the mkt Cost \$159 MBS 700-1600kg *+Custom graphics	kiwiklimbers.com	
38mm 1.5"	40mm 1.6"	70mm 2.75"	Leather C	3.9kg 8.6lb	136kg 300lb	■	-	-	-	■	■	■	-	□	-	-	-	-	Hydra-Cool pads. All frames , pads, straps and gaffs are interchangeable between models	kleintools.com	
38mm 1.5"	40mm 1.6"	70mm 2.75"	Leather D C,L	3.5kg 7.7lb	136kg 300lb	■	□	-	□*	■	■	-	■	□	-	-	-	-	*Weaver leather All frames , pads, straps and gaffs are interchangeable between models	kleintools.com	
38mm 1.5"	40mm 1.6"	70mm 2.75"	Leather C,L	2.7kg 6lb	136kg 300lb	-	-	-	-	■	■	-	-	□	-	-	-	-	All frames , pads, straps and gaffs are interchangeable between models	kleintools.com	
39mm 1.6"	40mm 1.6"	70mm 2.75"	Leather C,L	2.7kg 6lb	136kg 300lb	-	-	-	-	■	■	-	-	□	-	-	-	-	All frames , pads, straps and gaffs are interchangeable between models	kleintools.com	
43mm 1.7"	-	63mm 2.5"	Fiber-Glass Q	2kg 4.4lb	159kg 350lb	■	□	■	-	-	-	■	■	-	□	□	-	-	-	notchequipment.com	
43mm 1.75"	-	63mm 2.5"	Fiber-Glass Q	2.4kg 5.3lb	159kg 350lb	■	□	□	-	■	■	-	-	□	□	-	-	-	ASTM F887 *DMM forged shaft version to be discontinued	notchequipment.com	
43mm 1.75"	-	63mm 2.5"	Fiber-Glass Q	2.7kg 5.9lb	159kg 350lb	■	□	□	-	■	■	-	-	□	□	-	-	-	ASTM F887	notchequipment.com	
43mm 1.7"	53mm 2"	63mm 2.5"	Fiber-Glass Q	2.1kg 4.6 lb	150kg 330lb	■	■	-	□	□	■	-	□	-	■	□	-	-	*Sold as RC1 Climbers by Rock'nArb	pantherspikes.com	
43mm 1.7"	53mm 2"	63mm 2.5"	Fiber-Glass Q	1.67kg 3.67 lb	150kg 330lb	■	■	-	□	□	■	-	□	-	■	□	-	-	35-48cm calf	pantherspikes.com	

OPTION= or N/A: info Not Available/not given COLOURS: =Predominant colour - may indicate frame or Cuff.

images show one of a range of options and are NOT to scale		MODEL	COMPANY	ORIGIN	COST inc Tax/VAT	MATERIAL Frame/Shaft Gaff/Spur	SHAPE Shaft/ Stirrup	HEIGHT ADJUST Option Increments
		TREEUP Iron Spikes DR100	PROTEKT		£160 \$205 €185	powder-coated STEEL Steel	Profiled	33-48cm 13-19"
		TREEUP DR1/DR4 SP501/SP504	PROTEKT		£205 \$255 €235	powder-coated STEEL Steel	Profiled offset	45cm NO
		TREEUP DR2/DR3 SP505/SP506	PROTEKT		£230 \$290 €265	powder-coated STEEL Steel	Profiled	45cm ■7
		TREEUP DR2A/DR3A SP502/SP503	PROTEKT		£265 \$335 €305	ALU Steel	Slight Profile	45cm ■7
		TREEUP DR3A SP503	PROTEKT		£265 \$340 €310	ALU Steel	Slight Profile	■7
		Climb Right Ultra-Lite 91225	SPYDER		£225-270 \$286-340 €265-315 \$417	ALU Steel	Straight offset	40-47.6cm 15.75-18.75"
		Elevate	STEIN		£385 \$500 €470	ALU Steel	5° Offset	37.5-53cm 14¾-21" 6mm/¼"
		X2	STEIN		£323 \$480 €445	ALU Steel	Straight	■7
		TH1000	TREEHOG/ ARBORTEC		£240 \$310 €295	STEEL Steel	Slight Profile	45cm NO
		TH1005 TH1003	TREEHOG/ ARBORTEC		£360 \$415 €380 £354	ALU Steel	Slight Profile	45cm ■7
		Alu Plus 71-284	TREERUNNER (GRUBE)		£380 \$480 €440	ALU STEEL	Slight Pro- file & Twist	37-47cm

NOTES COST: Approx & inc local tax/VAT \$=currency conversion only FASTENING: Top Cuff = Bottom/Foot Strap =

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ROPE/GEAR BAGS TRANSPORT & ORGANISERS PACKS

The first part of this guide covers and bags over 30 liters which more 'complex' transport or organiser packs followed by less complex but larger duffles. Both are designed to house your entire day's climbing kit. Organisers have easier access to the kit and with more pockets, Molle/attachment eyes, mesh and clear pouches etc. on the inside and outside while duffles mostly have some organisation on the outside cavernous but less well organised interior. Regular rope/tackle bags and buckets follow on with more simplified data but some, like the *Arbortec Cobra* bag far right are more of a really well-endowed rope bag than a true organiser so all of these bucket-style bags, even though quite complex are in the **ROPE/GEAR BAGS** section. For many more bags from access, rescue and climbing which can all cross over into arb, see the **ROPE EQPT BUYERSGUIDE**. There will also be separate guides for **THROWLINE BAGS/BOXES** in this **BUYERSGUIDE**, **TRAUMA PACKS** in the **MEDEVAC/PPE BUYERSGUIDE** and watertight **WATER RESCUE BAGS** in the **WATERRESCUEBUYERSGUIDE**. This introduction and the KEY to the tables covers *all* organiser bags. A separate KEY to Duffles and basic rope/gear bags with fewer data rows is on pages **370 & 374**.

Rope bags have been around as canvas 'buckets' and bags since humans first took to the sea but in the modern era we have covers to thank for the original hard-wearing, water and mud resistant tackle bags. They were usually in bright yellow, blue or red PVC in Europe or blue and orange Cordura in North America, with a draw-cord closure and single 25mm/1" shoulder strap or two if you were posh and could afford a longer rope. This is pretty much the template for bags even now, some 50 or so years on. PVC and Cordura are still common fabrics, yellow is still a thing and a simple web shoulder strap or straps are also just as functional today as they always were. Covers rarely looked at anything more sophisticated because it meant more to get wet and dirty, more to snag and too large for a tight squeeze. So it was climbers and rescuers who took bags to the next level.



Mountaineers were using rucksacks all along of course and these large, carry-all products naturally organised your kit pretty well with exterior pockets and interior compartments so the obvious thing for rope-heavy activities that weren't restricted by tiny cave entrances was to marry the rope/tackle bag with a rucksack and have a tackle bag with shoulder straps, hauling eyes and with an array of pockets, pouches and loops. This would allow you to organise all your carabiners/hardware and software around your well-stowed rope and harness. Even more sophisticated was the rescue industry's further development of these bags into larger (team) packs and allow them to open fully to be laid out on the ground so that you could see everything clearly and work quickly rather than arriving on scene and tipping out whole piles of kit to find the one item you needed.

We first moved up from simple tackle bags using *CMC's Heavy Rescue Organiser* which they still make (pic above). This is a kind of saddle bag that has a stiff top with a handle from which two sets of pockets hang down on each side and the whole assembly is strapped to a regular rope bag which provides the shoulder straps for back-carry. On arrival you simply disengage your rope bag with your organiser pockets sat next to it like a collapsed calf. We're not sure of the exact evolution but we began seeing (and using) rock-climbing bags with a pull out ground tarpaulin as an ad-hoc organiser of sorts because it

allowed us to tip out our kit more safely and cleanly and quickly organise the necessary equipment groups so that anyone could see what was what. Not long after that the true, aforementioned transport/organiser packs appeared that had all your kit already clipped into eyes and daisy chains - inside and outside - and arranged into pockets, see-through and semi-see-through mesh pockets and you simply arrived on scene, unzipped or unbuckled the entire bag and laid it in some kind of crucifix shape on the ground. And that's pretty much how things remained for the next twenty or thirty years. Loads of great bags but all a variation on the same themes. Lyon's pack on p366 is a 'roll' rather than bag intended for rescue, but trust me it's an excellent arb organiser as well. The *Lotus* opposite is CMC's most recent incarnation of their excellent bags that have been market leaders since the seventies. Daisy chains and Molle style individual attachments adorn all organiser bags and *CAMP's SpaceStation* (right) uses dozens of eyelets around the frame of the case. Above that is CMC's *RigTech* interior with two rows of eyes along the base and velcro sealed pouches around the side walls.



See-through pockets in mesh or plastic are again a feature of most some back systems. like the *Lotus*, are as good as any long-range expedition pack. Load bearing (hauling/carrying) handles/eyes are clearly marked in red on this one. Rope access became a much bigger market than rescue and so was able

to drive production of a wider range of products than we might otherwise have had but it was the adoption of technical hardware and 'SRT' techniques in the arb industry that kick-started a whole new drive to produce rope/tackle bags, duffles and organisers for a burgeoning and willing market.

Teufelberger's Mule packs (pic right-this one has the additional *Gear Mule* attached to the front) embraces gear organisation from a mostly external perspective with no less than 81 external attachment points and a virtually clear inside space - this one has a serious back-carrying system but also has a wheeled version

called the *Lazy Mule* and you presumably used the roll-top closure as a kind of pull-handle though that would seem to be a little more cumbersome than the extendible handle you get on most wheeled luggage? This would otherwise be more like a duffle and duffles (or duffels) are the most common transport format, not least because a duffles and bags from just about any work or sport sector works in the same way and could be used by arborists. Most have some organising features like *Koompasia's* helmet pouch-right but the most complex organisers, in a lay-flat or cabinet configuration are still produced by the old guard like *CMC* in the US, *Courant* in France and *CAMP* and *Kong* in Italy. As long established rope bag producers they now have



TRANSPORT PACKS

virtually every climbing/arb producer in the world to compete with because bags are relatively easy to make and don't have quite the same safety and standards concerns as most other access-related equipment. Many of the established rope rescue and rope access manufacturers are now well known to arborists but one overt mountaineering/sport company, *Mont-Bell* from Switzerland also produce a very odd diversion from their regular market - the *Logger* frameright which is a tough aluminium frame housing an organiser bag at the bottom and either a large gear bag on top or a chainsaw storage system for a large ground saw, fuel, tools and subsistence supplies. This is obviously aimed more at forestry but there will be many an arborist who could make use of this kind of system. We see these a lot in **WILDERNESS SAR**



magazine because they are the domain of wildland firefighting and we will begin to bring across some more of these to this guide because they may well be of interest to arborists who work more remotely.



Some companies like *Silver Bull* have based their entire company on bag production and carved out a great niche in the arb industry as a name you can trust because that is literally all that they make. Their *Climber 'Day'* bag above highlights one of the unique features of arb bags compared to access and rescue bags - **saw pouches**. These are open-top outside pouches to house long-bladed pruning saws and in some cases like the *ArbPro Transporter*, a pouch and straps to secure your climbing spikes. Others have diversified more recently into bags from their main specialisations like *Teufelbereger* who have bags that are clearly related to their innovations with the *Tree Motion* harness like the bucket (pic right). This uses a base material that has hundreds of holes and shapes cut-out to accommodate carabiners, cord and loops meaning you have infinite attachment options. Despite their organisational capabilities these are mostly smaller volumes and listed in the Rope Bag s section.



Many bags have a drain hole in the bottom to let out water that can accumulate on your rope after a day of working in the wet. We used to use these as a tie-off hole for our ropes with a double fisherman's tied as a barrel termination. Frowned upon now as not only blocking



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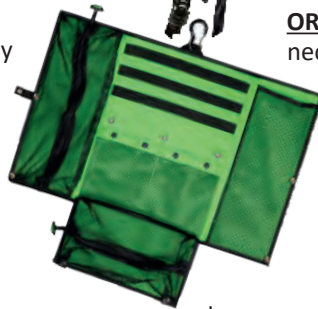
the drainage hole but also exposing the knot to loads of abuse - can't say we were ever affected by either concern, we were more worried about losing our bag and marking the end of the rope with that bag should an incident push the limits of our bagged rope lengths (ie. we're about to ab off of the end!) Unlike tree work, it's not always so easy to judge distances on a long-drop, in the dark and doing it in a rush and on the fly so to speak!. There have always been drawstring lidded bags that could deploy rope through their rectal-style opening but some models have a sealable hole in the lid to allow rope deployment but keep water out when not in use.

Some like the afore mentioned *Mule* and the *Big Backpack* add optional integral wheels to an existing design but others, like this *ArbPro Rolly* are used with an optional *Eckla*-style trolley if you intend to move it off the truck! It is a partitioned 'cabinet' with a large rope bag in the top shelf and smaller tackle bags in the bottom. In fact the shelf even comes out to provide a firm, clean work surface. Hardware is housed in a detachable case sat on the top. The large 'box' can accommodate much longer pole equipment like pole-saws and line-launchers nestled into pouches on the side and secured with straps. The majority of arborists are working within a few hundred yards of their vehicles so this cart approach is the definition of taking the weight off....



Something overlooked by most bags including the organisers in this guide, is the incorporation of a pocket with a range of pen-style pouches for chainsaw tools, screwdrivers, sharpeners etc. like these on the *West Coast Climbers Pro Gear Bag 70L*. This would work well as a lid-organiser easily accessible without having to open the whole pack. The cabinet-style approach is exemplified by *Silver Bull's Multituse* which can be suspended as if it were a cupboard (with inclined shelves to stop roll-out) and *Buckingham's BuckPack Pro* (right) which is a stand-up backpack with compartments that unzip to clearly show what's inside. This pack demonstrates quite a few nifty features that can be found spread around the other bags in our guides. Kevlar reinforcement of the bottom and side pouches allows climbing spikes to be safely stored and these clip to their own little hooks. The top compartment is for your helmet or your sandwiches or whatever else you want to get to quickly. The middle compartment can be configured as a dry-box to keep your warm clothing separated from a wet rope and this can accept an add-on 'Garage' which is a detachable Molle board with pouches better store and present your hardware. This adds around \$65 to the base cost of \$415 making this one of the more expensive on the market but also the most complex. On the right you can see how the rucksack straps can be stowed out of snags way and immediately behind this padded back panel is another slim pocket to house a laptop or similar, delicate electronics.

to



Finally, we should mention the **WHEELED PACKS**. We mentioned *Tuefelberger's Lazy Mule* earlier with low-profile, luggage-style wheels common to many mass-market bags. On the right, *Singing Rock's Movement* show's the familiar extendible handle on a duffel-style pack. Then there is the cart-style. This may have originated with freshwater anglers in Europe who have, for decades, moved their mountains of kit from car to lake as a stack of boxes/cases/bags on light alloy trolleys.



IN THE FOLLOWING TABLES:.....

A large, modern transport pack is quite sophisticated with a whole load of different features that are not always apparent from simply looking at it.

COST: Approximate. Includes local taxes but can vary due to exchange rates, other taxes etc. We generally round up the cost to the nearest Pound£, US Dollar\$ or Euro€ **Simple currency conversions are shown in orange** - they are lower than the actual price because it does not take into account import duty, shipping or tax.

ORIGIN: Is the country of the company selling the item, not necessarily the same as the origin of the product itself which is shown as an inset flag where we know.

STYLE/FUNCTION: The bags in this guide can be defined as one or two of the following

- **BUCKET/ROPE BAG** - an upright, top-feeder that holds its shape to allow rope to be fed in or out.
 - **BACKPACK:** two shoulder straps and maybe a waist belt but either way- carried on the back giving both hands free to carry even more stuff. Often a combo with a rope bucket.
- **DUFFLE/DUFFEL:** a horizontally carried bag with handles on the top. May also has hidden rucksack straps in the base to convert to vertical orientation.
- **TRANSPORTER:** a multi-compartmented pack - usually a rucksack style - that will either present the equipment in a cabinet style or will open out entirely on the ground to show everything in pockets/pouches or attached.

VOLUME: in Litres/liters nobody uses gallons for these any more!

Market Origin: Bags are either specifically designed for arborists (Pro Arb), or for the Rope Access and/or rescue markets - both requiring tough equipment. Sport can be equally tough if its caving and canyoning but tends not to be used all day every day.

NOMINAL/INTENDED ROPE CAPACITY: As provided by the manufacturer but varies with the diameter. In organiser packs, rope storage may only be part of the overall volume whereas it may be all of the internal volume in a dedicated rope bag/duffel.

46m/150ft x 12.7mm/1/2" = 76m/250' x 11mm 7/16" = 91m/300' x 9mm 3/8"

WEIGHT: empty with no optional extras included
MAX DIMENSIONS: Height and the width and maybe depth front-to-back. These figures are for the body of the bag and do not include extraneous handles or external pouches that are stuffed to bursting. Most bags will end up much wider!
2xBACK STRAPS=rucksack style carrying straps
1xSHOULDER=a single strap for slinging over your shoulder
WAIST BELT=rucksack style waist belt to keep the pack tight to your body when walking any distance
[PADDED]=in brackets [] indicates straps padded for comfort.
BACK/LUMBAR PADDING=padding on the pack itself rather than straps, again for improved comfort carrying a heavy load. Lumbar is lower back, behind the waist belt if there is one.
DETACH/STOW CARRY STRAPS: refers to rucksack style straps that can either be ditched entirely or can be stuffed into an integral pocket so that no straps are exposed to snagging.
REINFORCED SIDES (Free-standing)=the pack has stiffened panels or bars that keep the bag upright during rope feed.
CARRY HANDLES WLL ENDS SIDE dedicated carrying handles with ergonomic adjuncts to make carrying a heavy weight more comfortable. Mounted on the top or for duffle-style side-carry. Can also be used to clip on kit. **WLL**=the max weight you can carry via these handles or an additional haul eye.....
ADDITIONAL HAUL WLL SEWN EYES RINGS Top handles can be used for hauling but there is often a sewn loop between the top of shoulder straps or there may be metal eyes around the top.
BAG OPENS FLAT to DISPLAY KIT The whole bag unzips or unbuckles to expose the interior. Can also include organisers with detachable, opening display panels/boards.
HELMET [SAW] POCKET/POUCH CORD Designated for use with a helmet or saw but can obviously be used for anything that will fit. Climbers packs often use bungee cord on the outside front or top of the pack but some have a separated helmet pocket on the top as it should be the first thing you put on. **INTERNAL PARTITION** a means to divide internal space eg. for 2 ropes or to keep clothes dry-not just a pocket. Some packs come with their own **ROPE TOOL BAG** or are an option
GEAR (individual) EYES EXTERNAL INTERNAL These can be daisy chain eyes, Molle eyes or individual plastic eyelets but all are intended to clip one carabiner and/or clippable hardware
GEAR LOOPS [STRAPS] EXTERNAL INTERNAL harness-style larger semi-circles of cord or plastic that allow multiple items to be clipped into the same loop. All handles could be used as a gear loop! **[STRAPS]** [in brackets] is securing web with buckles
TOTAL POCKETS EXTERNAL INTERNAL The total number of closable pockets and open pouches outside and inside the bag. This does not include saw pockets/pouches listed separately.
of which.. MESH/CLEAR EXTERNAL INTERNAL of the total number of pockets those which are clear plastic or open mesh allowing free drainage but more importantly visibility of the contents. Mesh makes the bag lighter than a full, heavy duty enclosure.
CLOSURES Velcro POP Zipped Draw-Cord Buckle Referring ONLY to the outside pockets - a colour square indicates the type of closure and the number is the pockets that have that specific closure.
WATERPROOF VENT HOLES DRAIN HOLES All of these packs are water resistant to a degree unless they have mesh panels but some are more waterproof than others and particularly so if they have a roll-top closure. The most water resistant

are marked with a blue square ■, less water resistant - usually because they are a drawcord closure, is marked with a ● Being waterproof does not preclude having vent and drain holes as the term 'waterproof' refers to rain from the top not complete submersion. See our **WATER RESCUEBUYERS GUIDE** for completely waterproof bags.

LID POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP Referring ONLY to the top lid and compartment doors if it is an organiser type pack.
LOCKABLE: the main compartment(s) can be locked with a small padlock (not usually supplied). Usually needs a chunky YKK style zip large enough to clip in a padlock clasp but may be a tougher, bespoke element like the *FTC-Tree Koompsonia*.
ID PANEL: a small-see-through rectangle for a luggage style label or large enough for an inventory or risk assessment sheet.
END/SIDE STRAPS: in addition to the carry straps these are adjustable webbing straps on the sides that can either act to compress the bag to a smaller size if it's not fully filled or you can secure items behind them. Side straps are often set above open pouches that can house a saw, pole or spikes or end straps can be used to secure a hank of rope or a tarpaulin etc.
REFLECTIVE TRIM: not seen as much on arb packs as they are on rescue packs- light reflective to provide high visibility.
TARPAULIN: a separate or integral ground sheet. =if an option
RAINCOVER: a separate cap or complete cover. =if an option
MATERIALS: just the main body panel materials
OTHER COLOURS: colours available OTHER than the colour shown in the product image at the top of the column.

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MANUFACTURER		ARBORTEC	ARBPRO	ARPRO	BEAL
MODELS litres/liters VARIANT		Python 50 AT104-50	Transporter 50 APT50	Rolly Box	Combi-Pro 40 BSAC
ORIGIN					
COST (inc Tax/VAT) (currency conversion only)		£120 \$146 €115	£125 \$160 €137	£290 \$469	£130 \$155 €145
STYLE/FUNCTION		RUCKSACK	RUCKSACK	CABINET ORGANISER	ORGANISER
SPECIFICATIONS	VOLUME Market Origin	50L Pro Arb	*50-60L Pro Arb	225 + 30L Pro Arb	40L Pro access
	NOMINAL/INTENDED ROPE CAPACITY	45m x 11mm 100' x ½"	0m 0'	2x 80m+1x160m x 11mm 2x 160'+1x320' x ½"	40m x 10.5mm 80' x ½"
	WEIGHT empty	2.1kg 4.6lb	1.5kg 3.3lb	n/a	1.96kg 4.3lb
	DIMENSIONS (unfilled)	70 x 37 x 20cm 27.6 x 14.6 x 7.9"	70 x 30 x 25cm 27.6 x 12 x 9.8"	75 x 60 x 50cm 29.5 x 23.6 x 19.6" 45x 40 x 15cm	60 x 21cm 24 x 8"
TRANSPORT	2x BACK STRAPS 1x SHOULDER WAIST BELT [PADDED]				
	BACK/LUMBAR PADDING				
	DETACH STOW CARRY STRAPS				
	REINFORCED SIDES (Free-standing)				
	CARRY HANDLES WLL ENDS SIDE	1 -	2 -	--	1+1 1
	ADDITIONAL HAUL WLL SEWN EYES RINGS		1 -	--	1 -
STOW EQUIPMENT	BAG OPENS OUT to DISPLAY KIT	NO	NO	PARTIAL	YES
	HELMET/BOOT [SAW] POCKET/POUCH CORD/WEB				
	INTERNAL PARTITION + ROPE TOOL BAG				
	GEAR (individual) EYES EXTERNAL INTERNAL	?	11	--	-10+popper loops
	GEAR LOOPS [STRAPS] EXTERNAL INTERNAL	--	--	--	2* 7*
	TOTAL POCKETS EXTERNAL INTERNAL	2 1	*3 3*	6 1 + 30L pouch	0 4
	of which..MESH/CLEAR EXTERNAL INTERNAL	?		- 1*	
FEATURES	CLOSURE VELCRO POP ZIPPED DRAW-CORD BUCKLE	?	--		- 3
	WATERPROOF VENT HOLES DRAIN HOLES				
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP				
	LOCKABLE ID PANEL END/SIDE STRAPS				
	REFLECTIVE TRIM TARPAULIN RAINCOVER				
OUTER MATERIALS		PES/PVC	PVC	680 g/m ² PVC	PVC 1100g/m ²
COLOURS IN SERIES			-		
NOTES			*inc slide-in pouch on each side. *Side straps allow variable volume *Sml zipped security pocket	Wheeled trolley optional. 30L pouch has 2 dividers Clear sleeve in back of box	80L=pull-out rope tarp. *sturdy enough to be a light handle. *6-loops detachable *1 clear pouch can be for water
WEBSITE		arbortec.com	arbpro.it	arpro.it	beal-planet.com

TRANSPORT ORGANISER PACKS



BEAL	BUCKINGHAM	BUCKINGHAM	CAMP SAFETY	CAMP SAFETY	
Combi-Pro 80 BSAC	Backpack Pro Garage 4377 4378	Eqpt Bag Wheels 41333	Hold 40 2789	Spacecraft 45 2790	
£145 \$220 €173	£328 \$415 €382	£0 \$614* €0	£75 \$110 €67	£210 \$286 €258	
ORGANISER	CABINET ORGANISER	BACKPACK	BACKPACK	ORGANISER	
80L Pro Access	90L Pro Arb	0L Pro Arb	40L Pro Access	45L Pro Access	
60m x 10.5mm 120' x 1/2"	300m x 11mm 600' x 1/2"	0m 0'	100m x 11mm 200' x 1/2"	150m x 11mm 300' x 1/2"	
2.5kg 5.5lb	3.36-4.5kg 7.4-10lb	1.1kg 2.4lb	650g 1.4lb	2.6kg 5.7lb	
72 x 26cm 28 x 10"	81 x 41 x 26mm 32 x 16 x 10"	48 x 36cm 18.75 x 14"	56 x 30 x 20cm 22 x 12 x 8"	62 x 32 x 23cm 24 x 13 x 9"	
1+1 1	*5 -	2 -	3 1	- 1	
2 -	1 -		1x50kg -	1x50kg -	
YES	PARTIAL	PARTIAL	PARTIAL	YES	
- -		[2]2-	- -	- -	
		---	---	---	
-15+7	16 35	- 1	14 -	3 30	
2* 7*	*5 -	---	- 2	- -	
0 4	*7 4	3 1	3 -	3 *	
	- -	1 -	1 -	- -	
- 3					
PVC 1100g/m ²	Vinyl, Cordura, Kevlar	44oz Vinyl	500D PVC	500D PVC	
	-		-	-	
80L=pull-out rope tarp, sturdy enough to be a light handle. *6-loops detachable clear pouch can be for water	*Inc padded laptop pocket *carry handles = gear loops. GearGarage is a detachable hardware board with numerous eyes & pouches.	Hi-viz version is \$401		Comes with 2.5L detachable gear bag-clips inside main bag.	
beal-planet.com	buckinghammfg.com	buckinghammfg.com	camp.it	camp.it	

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Images NOT to Scale
No Kit included



MANUFACTURER		CMC RESCUE	CMC RESCUE	CMC RESCUE	CMC RESCUE
MODELS litres/liters VARIANT		H.R. Organiser 13 77040.	Rope & Eqpt 37 44100.	Lotus Tech Pack 37 441120	Rigtech Pack 42 44110.
ORIGIN					
COST (inc Tax/VAT) (currency conversion only)		£140 \$177 €163	£142 \$180 €166	£162 \$205 €176	£202 \$256 €236
STYLE/FUNCTION		ORGANISER	BAG/BACKPACK	ORGANISER	ORGANISER
SPECIFICATIONS	VOLUME Market Origin	13L Pro Rescue	37L Pro Rescue	37L Pro Rescue	42L Pro Rescue
	NOMINAL/INTENDED ROPE CAPACITY	25m x 11mm 50' x 1/2"	100m x 11mm 200' x 1/2"	122m x 11mm 400' x 7/16"	100m x 11mm 200' x 1/2"
	WEIGHT empty	879g 1.9lb	998g 2.25lb	2.37kg 5.2lb	2.8kg 6.2lb
	DIMENSIONS (unfilled)	48 x 44 x 15cm 19 x 17 x 6"	53 x 33 x 20cm 21 x 13 x 8"	50 x 33 x 23cm 20 x 13 x 9"	56 x 46 x 21cm 22 x 18 x 8"
TRANSPORT	2x BACK STRAPS 1x SHOULDER WAIST BELT [PADDED]	- - -			
	BACK/LUMBAR PADDING	- -	- -		
	DETACH STOW CARRY STRAPS	- -	-	(waist belt)	- -
	REINFORCED SIDES (Free-standing)		-	-	-
	CARRY HANDLES WLL ENDS SIDE	1 -	1 2	1 2	- 1
	ADDITIONAL HAUL WLL SEWN EYES RINGS	- -	- -	- -	- -
POCKETS STOW EQUIPMENT	BAG OPENS OUT to DISPLAY KIT	PARTIALLY	PARTIALLY	YES	YES
	HELMET/BOOT [SAW] POCKET/POUCH CORD/WEB	- -	- -	- -	- -
	INTERNAL PARTITION + ROPE TOOL BAG	- - -	- - -	- - -	- - -
	GEAR (individual) EYES EXTERNAL INTERNAL	3 -	16 ?	12 +16 web eyes 20	6 24
	GEAR LOOPS [STRAPS] EXTERNAL INTERNAL	2 -	- 2	- 1	1 2
	TOTAL POCKETS EXTERNAL INTERNAL	4 -	1 2	4 7	2 7
	of which..MESH/CLEAR EXTERNAL INTERNAL	1 -	- -	- 6	- -
FEATURES	CLOSURE VELCRO POP ZIPPED DRAW-CORD BUCKLE	3 1	3	10	2 6
	WATERPROOF VENT HOLES DRAIN HOLES	- -	- -	- -	-
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	-			
	LOCKABLE ID PANEL END/SIDE STRAPS	-	- - -	-	- * -
REFLECTIVE TRIM TARPAULIN RAINCOVER	- - -	- - -	-	-	
OUTER MATERIALS		1000D Cordura	1000D Cordura	PU-coated 840D Ripstop	1000D Cordura
COLOURS IN SERIES				-	
NOTES		Rope bag not included. Pockets: 48x13x10cm/19x5x4" 30x13x10cm/12x5x4" 13x13x10cm/5x5x4" H.R.= Heavy Rescue	2x Internal zipped pockets - 1 for keys etc, one is fleece-lined for glasses/phone		*Lid buckles act as end-to-end compression straps. Padded side pockets. Whistle on sternal buckle. 3 lash panels. 2x toggled bungs on lid.
WEBSITE		cmcpro.com	cmcpro.com	cmcpro.com	cmcpro.com

Cavern Gear Bag
08410-00



ONE TRIP WONDER

CAVERN & CHASM GEAR BAGS

The heavy-duty Cavern (70L) and Chasm (40L) Gear Bags are designed to let you easily and comfortably carry everything you need from truck to tree—in a single trip! These durable tarpaulin bags feature specialized storage for all of your gear, plus a set of top handles and a reinforced side handle for additional carrying options.



Chasm Gear Bag 08411-40-00



WEAVERARBORIST.COM

50 ANNIVERSARY
1973-2023

NEW Compiling N

Images NOT to Scale
No Kit included



MANUFACTURER		COURANT	COURANT	COURANT	COURANT
MODELS litres/liters VARIANT		Cross Pro 54 PSCPBYA	Cross Pro XL 75 PSCPBYA	Cross Evo 45 PPLSSCC4	Dock 60
ORIGIN					
COST (inc Tax/VAT) (currency conversion only)		£164 \$230 €188	£225* \$300* €259*	£143 \$170 €146	£92 \$0 €102
STYLE/FUNCTION		ORGANISER	ORGANISER	ORGANISER	BUCKET/BACKPACK
SPECIFICATIONS	VOLUME Market Origin	54L (inc. 17L rope bag) Pro Access	75L (inc 17L rope bag) Pro Rescue	45L (inc 17L rope bag) Pro Access	60L Pro Access
	NOMINAL/INTENDED ROPE CAPACITY	75m x 11mm 150' x ½"	75m x 11mm 150' x ½"	75m x 11mm 150' x ½"	0m 0'
	WEIGHT empty	2.7kg 6lb	3.4kg 7.5lb	3.25kg 7.15lb	1.6kg 3.5lb
	DIMENSIONS (unfilled)	76 x 32 x 25cm 30 x 13 x 10"	88 x 36 x 27cm 35 x 15 x 11"	59 x 42cm 23.3 x 16.5"	82 x 32 x 25cm 33 x 13 x 10"
TRANSPORT	2x BACK STRAPS 1x SHOULDER WAIST BELT [PADDED]				
	BACK/LUMBAR PADDING				
	DETACH STOW CARRY STRAPS	- -	- -	- -	-
	REINFORCED SIDES (Free-standing)				
	CARRY HANDLES WLL ENDS SIDE	1 x 200kg 4 x 200kg	2 x 200kg 4 x 200kg	1 2	1 -
	ADDITIONAL HAUL WLL SEWN EYES RINGS	1 x 300kg -	1 x 300kg -	- 1 x 210kg	0 -
STOW EQUIPMENT	BAG OPENS OUT to DISPLAY KIT		YES		NO
	HELMET/BOOT [SAW] POCKET/POUCH CORD/WEB	-	-	-	- -
	INTERNAL PARTITION + ROPE TOOL BAG	YES +	YES +	YES +	- - -
	GEAR (individual) EYES EXTERNAL INTERNAL	6+4 20+19molle	5+4 29+19molle	- 13 +4 popped)	10 + 2 3
	GEAR LOOPS [STRAPS] EXTERNAL INTERNAL	- [2]	2 [2]	- 3	2 [*2] -
	TOTAL POCKETS EXTERNAL INTERNAL	*1 11	*1+*2+*1 11	- 5	2 -
	of which..MESH/CLEAR EXTERNAL INTERNAL	- 8	- 8	- 5 elasticated	2 -
POCKETS	CLOSURE VELCRO POP ZIPPED DRAW-CORD BUCKLE				
	WATERPROOF VENT HOLES DRAIN HOLES				
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP				
	LOCKABLE ID PANEL END/SIDE STRAPS	-	-	-	-
	REFLECTIVE TRIM TARPAULIN RAINCOVER				
OUTER MATERIALS		1680D Ballistic nylon YKK zips	1680D Ballistic nylon YKK zips	PVC	1680D Ballistic nylon YKK zips
COLOURS IN SERIES					
NOTES		Zipped lids both ends. Internal pocket sizes can be adjusted with poppers. *Internal key pocket zipped from outside. Kit ID labels.	*Blk 10% less. Zipped lids both ends. Adj internal pocket sizes. *Key pocket zips from outside *Bottle Holders. *Padded for phone/glasses. Kit ID labels.	unzips at both ends. Includes the Cross Light rope bag.	Extra rpe/gear bags can be attached to all Cross & Dock bags. *draw-cord bungy for securing saw/bottle/cylinder in mesh pockets
WEBSITE		mycourant.com	mycourant.com	mycourant.com	mycourant.com

TRANSPORT/ORGANISER PACKS



EDELRID	HUSQVARNA	KONG
PE Backpack 45 883101000170	Gear Pack 70 534 10 18-02	Convoy 56 982002N00KK
£108 \$160* €110	£185 \$260 €250	£240 \$325 €286
BACKPACK	BACKPACK	ORGANISER
45L Pro Rescue	70L Pro Arb	56L + 19L rope bag Pro Access
90m x 11mm 180' x 1/2"	75m x 11mm 150' x 1/2"	100m x 10.5mm 150' x 1/2"
950g 2.1lb	2kg 4.4lb	2.6kg 5.8lb
66 x 36 x 10cm 26 x 14 x 4"	76 x 36cm 29.5 x 14.2"	80 x 35 x 26cm 31.5 x 13.8 x 10.2"
☐--	☐--	☐--
- -	■	■
- ■	■ -	- ■
-	-	-
1 -	1 2	1 2
1 x40kg -	- -	1 -
PARTIAL	PARTIAL	YES
- -	■ -	- □
- - -	- □ -	- □ -
20+2* 20	2016	5 24
- 2		- -
2 6	5 1	6 6
- 3	- 1	2 6
■ 2 ■ 3	■ 4 ■ 1	■ 5 ■ 4
● ?	● - -	■ - ■
■	■ + ■	■ + ■ & ■ + ■ top
- - - -	- - ■ * -	■ ■ - -
■ - -	■ - -	- - -
Ballistic Nylon	900D	-
■ *		
2 metal rings if not used to attach shoulder straps Black version lacks reflective - 12% cheaper	Additional zipped side entry. Integral first aid pocket. *Lid buckles act as end-to-end compression straps	Optional 19L rope bag and helmet securing straps
edelrid.com	husqvarna.com	Kong.it



EDELRID

TREERAPTOR

Tree climbing harness with excellent price-performance ratio

- Double Lock buckles on the leg loops
- 45 mm Triple Lock buckle on the waist belt
- Padding on the back and hips
- Ability to attach the TREEREX FIRST AID KIT
- 4 large gear loops
- Stretchy waist belt with a VCR strap for a comfortable fit



Find out more about the TREERAPTOR

NEW Compiling Now

Images NOT to Scale
No Kit included



MANUFACTURER		LYON EQUIPMENT	LYON EQUIPMENT	MONTBELL	NOTCH EQPT
MODELS litres/liters VARIANT		First Response 50 LSBMOD..	First Response 50 LS35.2X20.	Logger Gear Chainsaw System	Pro Large 43 40082
ORIGIN					
COST (inc Tax/VAT) (currency conversion only)		£271* \$340 €315	£326 \$414 €382	£460 480 \$0 €0	£97 \$0 €0
STYLE/FUNCTION		ORGANISER	ORGANISER	FRAMED CARRIER	-
SPECIFICATIONS	VOLUME Market Origin	50L Pro Rescue	50L Pro Rescue	63+12.7L Pro Arb	43L Pro Arb
	NOMINAL/INTENDED ROPE CAPACITY	80m x 11mm 160' x ½"	2x 80m x 11mm 2x 160' x ½"		75m x 13mm 0'
	WEIGHT empty	1.91kg 4.2lb	1.91kg 4.2lb	2.47kg 5.5lb	1.2kg 2.7lb
	DIMENSIONS (unfilled)	65 x 55cm 26 x 22"	65 x 55cm 26 x 22"	73.5 x 39 x 28cm 28.9 x 15.3 x 11"	48 x 33cm 19 x 13"
TRANSPORT	2x BACK STRAPS 1x SHOULDER WAIST BELT [PADDED]	---	---		---
	BACK/LUMBAR PADDING	--	--		--
	DETACH STOW CARRY STRAPS	--	--		--
	REINFORCED SIDES (Free-standing)	-	-		-
	CARRY HANDLES WLL ENDS SIDE	1 -	1 -	1 44kg/88lb -	0 -
	ADDITIONAL HAUL WLL SEWN EYES RINGS	--	--	--	0 -
POCKETS STOW EQUIPMENT	BAG OPENS OUT to DISPLAY KIT	YES	YES	NO/YES	NO
	HELMET/BOOT [SAW] POCKET/POUCH CORD/WEB	--	--	-	--
	INTERNAL PARTITION + ROPE TOOL BAG	-	-	---	---
	GEAR (individual) EYES EXTERNAL INTERNAL	- 20	- 18	??	13 -
	GEAR LOOPS [STRAPS] EXTERNAL INTERNAL	--	--	??	--
	TOTAL POCKETS EXTERNAL INTERNAL	- 7	- 4	2 - /2 3	6 -
	of which..MESH/CLEAR EXTERNAL INTERNAL	- 1	- 2	--	2 -
FEATURES	CLOSURE VELCRO POP ZIPPED DRAW-CORD BUCKLE				
	WATERPROOF VENT HOLES DRAIN HOLES				
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP				
	LOCKABLE ID PANEL END/SIDE STRAPS	---	---		
REFLECTIVE TRIM TARPAULIN RAINCOVER			---		
OUTER MATERIALS		PVC	PVC	420D Ballistic Nylon Aluminium Frame	900D Polyester
COLOURS IN SERIES					
NOTES		Fully modular version with detachable bags & pockets *Empty modular pack=£120	inc 2x20L rope bags	Modular Carry System with two bags or organiser for chainsaw and fuel can. Also available as separate components.	
WEBSITE		lyonequipment.com	lyonequipment.com		notchequipment.com

TRANSPORT/ORGANISER PACKS



NOTCH EQPT	NOTCH EQPT	PROTEKT	SILVER BULL	SKYLOTEC	
Approach 50 99327	Pro Access 60 53444	Trans Backpack 40 Ax075	Multiuse 63 -	Actsafe SAR ACS-0914	
£156 \$160 €0	£192 \$250 €235	£0 \$0 €0	£162 \$203 €156		
BUCKET/BACKPACK	ORGANISER	ORGANISER	CABINET ORGANISER		
50L Pro Arb	60L Pro Arb	40L Pro Access	63L Pro Arb		
0m 0'	75m x 11mm 150' x 1/2"		100m x 11mm 200' x 1/2'		
0kg 5lb	2.63kg 5.8lb	1.88kg 4.2lb	2.5kg 5.5lb	2.75kg 6.1lb	
7.1 x 35.5 x 35.5cm 22.5 x 14"	69 x 36cm 27x 14"	60 x 38 x 19cm 23.6 x 15 x 7.5"	63 x40 x 25cm 25 x 15.75 x 10"		
1 1	2 1	2 1	2 2		
0 -	--	--	- 1*		
NO	YES	YES	PARTIAL		
- -			- -		
- - -	- - -	- - -	■* - -		
- -	6+2* 21	6+2* 21	10 -		
6 -	--	--	8 -		
6 -	2 6	2 6	- 1		
1 -	- 5	- 5	- 1		
1680D Nylon	900D Polyester	PNC	PVC-coated canvas		
Luxe 60 discontinued but still available while stocks last	*a sewn eye on each back-strap. Pro Gear 70 discontinued but still available while stocks last		Orang-utan=Ltd edition. *1,2 or 3 partitioned shelves *3xLarge eyelets allow bag to be hung as a 'cabinet'		
notchequipment.com	notchequipment.com	protekt.com	n/a		

NEW Compiling No

www.reser...es.com

Images NOT to Scale
No Kit included



MANUFACTURER	STERLING ROPE	STERLING ROPE	STERLING ROPE	TEUFELBERGER
MODELS litres/liters VARIANT	WonderWall 23	Vertac 40 MDBAGVERTAC40BK	Vertac 60 MDBAGVERTAC60BK	Baby Mule 23
ORIGIN				
COST (inc Tax/VAT) (currency conversion only)	£0 \$0 €183	£142 \$180 €166	£158 \$200 €185	£0 \$0 €183
STYLE/FUNCTION	BACKPACK	BUCKET/BACKPACK	BUCKET/BACKPACK	ORGANISER
VOLUME Market Origin	23L Pro Access	40L Pro Access	60L Pro Access	23L Pro Access
NOMINAL/INTENDED ROPE CAPACITY		>75m x 11mm >150' x ½'	>100m x 11mm >200' x ½'	
WEIGHT empty	1.85kg 0lb	1.35kg 3lb	1.55kg 3.41lb	1.85kg 4.1lb
DIMENSIONS (unfilled)	50 x 23 x 20cm 19.6 x 9 x 7.8"	56 x 34 x 22.5cm 22 x 13.3 x 9"	72.5 x 33.2 x 26.4cm 28.5 x 13 x 10.3"	50 x 20 x 23cm 19.6 x 7.8 x 9"
2xBACK STRAPS 1xSHOULDER WAIST BELT [PADDED]				
BACK/LUMBAR PADDING				
DETACH STOW CARRY STRAPS				
REINFORCED SIDES (Free-standing)				
CARRY HANDLES WLL ENDS SIDE	22.7kg/50lb 0 -	2* 50lb -	2* 60lb -	1 -
ADDITIONAL HAUL WLL SEWN EYES RINGS		0 -	0 -	1 -
BAG OPENS OUT to DISPLAY KIT		PARTIAL	PARTIAL	PARTIAL
HELMET/BOOT [SAW] POCKET/POUCH CORD/WEB		- -	- -	
INTERNAL PARTITION +ROPE TOOL BAG	- - -	- - -	- - -	- - -
GEAR (individual) EYES EXTERNAL INTERNAL		- 6	- 6	22 -
GEAR LOOPS [STRAPS] EXTERNAL INTERNAL		- -	- -	1 [2]
TOTAL POCKETS EXTERNAL INTERNAL		1 4	1 4	3 3
of which..MESH/CLEAR EXTERNAL INTERNAL		- 3	- 3	- -
CLOSURE VELCRO POP ZIPPED DRAW-CORD BUCKLE				
WATERPROOF VENT HOLES DRAIN HOLES				
LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP				
LOCKABLE ID PANEL END/SIDE STRAPS				
REFLECTIVE TRIM TARPULAIN RAINCOVER				
OUTER MATERIALS	recycled 600D Ripstop	recycled 600D Ripstop	recycled 600D Ripstop	600D PVC, 600D PU
OTHER COLOURS				
NOTES	NFC Chip	*+Rucksack straps can join to become duffel carry handles Integral NFC Chip. Keys clip in top pocket	*+Rucksack straps can join to become duffel carry handles Integral NFC Chip. Keys clip in top pocket	Includes rain cover
WEBSITE	sterlingrope.com	sterlingrope.com	sterlingrope.com	teufelberger.com

TRANSPORT/ORGANISER PACKS



TEUFELBERGER	TEUFELBERGER	TREERUNNER	WEAVER ARBORIST	WEAVER ARBORIST	WEST COAST CLIMBER
Mule 80	Lazy Mule 80		Chasm 40 08411-00	Cavern 70 08410-00	Pro Gear 70
£325 \$275 €314	£338 \$324 €326		£119 \$135 €0	£135 \$0 €0	£177 \$220 €206
ORGANISER	WHEELED ORGANISER		BACKPACK	-	BUCKET/BACKPACK
80L Pro Access	80L Pro Access	Pro Access	40L Pro Arb	70L Pro Arb	70L Pro Arb
>2x 75m x 11mm >2x 150' x ½'	>2x 75m x 11mm >2x 150' x ½'		0m 200' x ¾"	0m 0'	150m x 11mm 300' x ½"
3.5kg 7.7lb	3.74kg 8.23lb		0kg 0lb	0kg 0lb	3.4-4.5kg 7.4-10lb
65 x 45 x 38cm 18 x 15"	68 x 45 x 38cm 27 x 15"		61 x 38 x 28cm 24 x 15 x 11"	61 x 38 x 28cm 24 x 15 x 11"	56 x 30.5cm 22 x 12"
1 2	1 2		2 1	2 1	2 1
--	--		0 -	1 -	--
NO	NO		NO	NO	NO
-	-		--	--	-
-	-		--	--	--
70+4 4	70+4 4		22 0	20 6	10+10* -
7 -	7 -		--	--	--
2 -	2 -		4 -	4 -	4 -
--	--		--	--	--
1	1		4	3* 1	4
--	--		*	*	
			+ *	+ *	
-- -	-- -		-- -	-- -	--
--	--		- *	- *	
600D PVC, 600D PU	600D PVC, 600D PU		0	0	1680D Ballistic Nylon
					-
Additional zipped side entry. 80L Gear Mule pack can be attached. 30L Optional rope buckets fit tube profile	Additional zipped side entry. 20L Gear Mule pack can be attached. 30L Optional rope buckets fit tube profile		*Separate waterproof cap held on with buckles which double as "top compression straps	*inc 1x buckle securing strap for saw pocket *Separate waterproof cap held on with buckles	*5 on each shoulder strap
teufelberger.com	teufelberger.com		weaverarborist.com	weaverarborist.com	nugreenstore.com

NEW Compiling Now



DUFFLE / DUFFEL BAGS





Usually the largest clear, usable space of any of the bags and often in a form where the bag itself can be folded down to a much smaller size when not in use. like the Husqy on the left. Duffles were traditionally a cylinder with a shoulder strap in vertical orientation - think military kit bag - which then morphed into a horizontally carried bag with two long carry handles - think sports bag. Many also have shoulder straps enabling vertical carry but if they don't have horizontal carry and a cavernous, mostly uncluttered interior, it's not a duffel. Because of their relatively large size most have 'lift & shift' handles on the ends - not for carrying but for pulling and/or lifting and to tip out the contents. For rope-related activities many have adopted external and internal daisy chains for clipping on gear and a variety of pockets, mostly relatively low profile to preserve the large internal space. It is otherwise a fine line of distinction between a duffel and organisers like *Sliver Bull's Multi-Use*, *Singing Rock's Movement* and *Sterling's Vertac* except to say that you can tell a duffel just by looking at it - it's a big rectangle or a big barrel with shopping bag handles - a European carrier bag shopping bag not a US paper bag that you cradle in your arms! It's lighter and less complex than organiser and transport packs and it sits lengthways on the ground while you access the interior via a top, longitudinal lid or full length opening. Because these things are intended to carry literally everything from clothes to climbing gear, boots to a flask of soup the rope capacity has been replaced by the sheer weight that it will carry.

IN THE FOLLOWING TABLES...as per p356..

COST: Approximate. Includes local taxes. We round up the cost to the nearest Pound£, US Dollar\$ or Euro€ **Simple currency conversions are shown in orange** exc import duty, shipping etc

Images NOT to Scale		
MANUFACTURER		AAK SAFETY
MODEL litres/liters VARIANT		Transport 80 29104
ORIGIN		
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0
SPECIFICATIONS	VOLUME Market Origin	80L Pro Rescue
	LIFTED LOAD CAPACITY	0kg 0lb
	WEIGHT empty	1.4kg 0lb
	DIMENSIONS ht x w x depth	62 x 32 x 32cm 0 x 0
FEATURES	BACK STRAPS HANDLES COMP-STRAPS	24-
	POCKETS Ext/Int EYES Ext/Int STORE SAW	----
	WATERPROOF IDPANEL DRAIN/VENT HAUL	■--
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	■
OUTER MATERIALS REFLECTIVE TRIM		PVC -
OTHER COLOURS		
NOTES		
WEBSITE		aaksafety.no

Images NOT to Scale		
MANUFACTURER		FTC TREE
MODEL litres/liters VARIANT		Koompassia
ORIGIN		
COST (inc Tax/VAT) Currency conversion only		£140 \$178 €160
SPECIFICATIONS	VOLUME Market Origin	90L Pro Arb
	LIFTED LOAD CAPACITY	0kg 0lb
	WEIGHT empty	2.1kg 4.62lb
	DIMENSIONS ht x w x depth	70x35x30cm 28 x 14 x 12"
FEATURES	BACK STRAPS HANDLES COMP-STRAPS	---
	POCKETS Ext/Int EYES Ext/Int STORE SAW	----
	WATERPROOF IDPANEL DRAIN/VENT HAUL	----
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	----
OUTER MATERIALS REFLECTIVE TRIM		800D ripstop coated Pol-
OTHER COLOURS		
NOTES		*1 pocket = helmet but could be used for anything.* max-if no other internal contents
WEBSITE		ftc-tree.com

DUFFLE/DUFFEL BAGS

					
ARBORTEC	ARBORTEC	ARBORTEC	ARBORTEC	BUCKINGHAM	CAMP SAFETY
Anaconda 90	Mamba 40	Mamba 70	Mamba 90	Big Mouth <i>Wheels</i>	Shipper 90
					
£126 \$0 €127	£83 \$0 €0	£104 \$125 €107	£117 \$141 €120	£0 \$409500* €0	£125 \$232 €147
0L Pro Arb	40L Pro Arb	70L Pro Arb	90L Pro Arb	0L Pro Arb	67L Pro Access
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
2.1kg 4.6lb	0kg 0lb	2.6kg	2.88kg 6.3lb	3.4 4.5kg 7.5 10lb	900g
75 x 40 x 40cm 0 x 0"	0 x 0cm 0 x 0"	60 x 35 x 30cm 24 x 14 x 12"	60 x 35 x 30cm 24 x 14 x 12"	56 x 51 x 48cm 22 x 20 x 19"	81 x 25 x 27cm 32 x 10 x 11"
-24	---	---	---	2 2-	---
3-10+4	---	---	---	-1	---
					
Welded PES/PVC	680 g/m ² PVC	Polyester/PVC	Polyester/PVC	44oz Vinyl	--
					
even version is £6 less but NOT reflective		*when duffel handles used as backstraps. *reinforced/detachable	*when duffel handles used as backstraps. *reinforced/detachable	available as a non-lockable, non-wheeled model	-
arbortec.com	arbortec.com	arbortec.com	arbortec.com	buckinghammfg.com	camp.it
					
FTC TREE	FTC TREE	HUSQVARNA	HUSQVARNA	NATIVE ARB	PETZL
Duffel 60	Duffel 80	Xplorer Duffel	Xplorer Trolley 90	Kit Bag 100	Duffel 65
					
£64 \$0 €0	£68 \$0 €0	£114 \$0 €91	£156 \$0 €91	£82 \$103 €96	£144 \$140 €150
60L Pro Arb	80L Pro Arb	70L Pro Arb	90L Pro Arb	100L Pro Arb	65L Pro Access
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
1kg 2.2lb	1.2kg 2.6lb	0kg 0lb	0kg 0lb	2.2kg	1.35kg 3lb
68 x 33 x 33cm 26.8 x 13 x 13"	73 x 36 x 36cm 28.7 x 14.2 x 14.2"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	75 x 45 x 30cm 26 x 22"	58.5 x 40 x 28.5cm 23 x 15.75 x 11.2"
---	---	---	---	---	244
---	---	---	---	---	3-8--
					
1680D PVC -	1680D PVC -	Ripstop TPU-	Ripstop TPU -	1000D Phthalate-free	TPU (PVC-free)
-	-	-	-	Internal zip pocket for keys/ phone etc.	*4 of which are needed for rucksack straps. (if used, inc inside helmet/boot pouch)
ftc-tree.com	ftc-tree.com	husqvarna.com	husqvarna.com	nativearb.co.uk	petzl.com

Images NOT to Scale					
MANUFACTURER		PETZL	PROTEKT	PROTEKT	ROCKnARB
MODEL litres/liters VARIANT		Duffel 85	AX028 50	AX301 50	Tech Duffel 60
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£156 \$160 €160	£0 \$0 €0	£0 \$0 €0	£0 \$84 €0
SPECIFICATIONS	VOLUME Market Origin	85L Pro Access	50L Pro Access	50L Pro Access	0L
	LIFTED LOAD CAPACITY	0kg 0lb	0m 0'	0m 0'	0kg 0lb
	WEIGHT empty	1.55kg 3.4lb	0kg 0lb	0kg 0lb	0kg 2.2lb
	DIMENSIONS ht x w x depth	70 x 40 x 32cm 27.6 x 15.75 x 12.6"	60 x 30 x 30cm 23 x 12 x 12"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
FEATURES	BACK STRAPS HANDLES COMP-STRAPS	2 4 4	- 4 -	[1] 2 -	---
	POCKETS Ext/Int EYES Ext/Int STORE SAW	6-8 --	---	13 ---	---
	WATERPROOF IDPANEL DRAIN/VENT HAUL	---	---	---	---
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---	---	---	---
	OUTER MATERIALS REFLECTIVE TRIM	TPU (PVC-free)	PVC -	Polyester	1000D coated nylon-
OTHER COLOURS					
NOTES		*4 of which are needed for rucksack straps (if used).			
WEBSITE		petzl.com	protekt.pl	protekt.pl	rocknarbor.com
Images NOT to Scale					
MANUFACTURER		SINGING ROCK	SINGING ROCK	SINGING ROCK	SINGING ROCK
MODEL litres/liters VARIANT		Dry Duffel 60 C0046BB90	Tarp Duffel 70 C0046BB70	Tarp Duffel 90 C0046BB90	Tarp Duffel 120 C0046BB120
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
SPECIFICATIONS	VOLUME Market Origin	60L	70L 20kg/40.4lb	90L 23kg/50.6lb	120L 23kg/50.6lb
	LIFTED LOAD CAPACITY	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
	WEIGHT empty		1.82kg 0lb	2.27kg 0lb	2.65kg 0lb
	DIMENSIONS ht x w x depth		59 x 35 x 34cm 23 x 13.8 x 13.4"	69 x 40 x 33cm 27 x 15.7 x 13"	85 x 42 x 38cm 33 x 12.5 x 15"
FEATURES	BACK STRAPS HANDLES COMP-STRAPS		[2] 4 4	[2] 4 4	---
	POCKETS Ext/Int EYES Ext/Int STORE SAW	---	4 ---	4 ---	4 ---
	WATERPROOF IDPANEL DRAIN/VENT HAUL	---	---	---	---
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---	---	---	---
	OUTER MATERIALS REFLECTIVE TRIM		--	--	--
OTHER COLOURS					
NOTES					
WEBSITE		singingrock.com	singingrock.com	singingrock.com	singingrock.com

DUFFLE/DUFFEL BAGS

					
ROCKnRESCUE Tech Duffle 60	ROCKnRESCUE Classic Duffle ?	SAR PRODUCTS Transport	SAR PRODUCTS Transport 60	SAR PRODUCTS Transport 63	SINGING ROCK Dry Duffle 40
					
£0 \$109 €0	£0 \$50 €0	£0 \$50 €0	£0 \$50 €0	£0 \$50 €0	£0 \$0 €0
0L	0L	63L Pro Rescue	60L Pro Rescue	63L Pro Rescue	40L
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
0kg 2.1lb	0kg 0lb	1.4kg 0lb	1.5kg 0lb	1.4kg 0lb	
61 x 30 x 30cm 24 x 12 x 12"	68.6 x 29.2cm 27 x 11.5	0 x 0cm 0 x 0	0 x 0cm 0 x 0	0 x 0cm 0 x 0	
---	---	22-	[2]4-	24-	---
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
1000D coated nylon-	1000D coated nylon-	PVC -	PVC -	PVC -	
					
-	-	Hi- viz ylw or orange on request	Hi- viz ylw or orange on request	Hi- viz ylw or orange on request	
rocknrescue.com	rocknrescue.com	sar-products.com	sar-products.com	sar-products.com	singingrock.com
					
SINGING ROCK Movement 110	SIP PROTECTION Atlas 90	SKYLOTEC Duffle M ?	SKYLOTEC Duffle L ?	STEIN Metro 40	STEIN Metro 70
					
£159 \$0 €0	£0 \$0 €91	£0 \$0 €102	£01 \$0 €108	£51 \$90 €0	£61 \$100 €0
110L Pro access	0L	40L	40L	40L	70L
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
4.6kg 10.1lb	0kg 0lb	0kg 0lb	1.4kg 0lb	0kg 0lb	0kg 0lb
77 x 39 x 38cm 30.3 x 15.4 x 15"	0 x 0 x 0cm 0 x 0 x 0"			0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
---	---	---	---	[2]44	[2]44
21 ---	---	---	---	1 ---	---
---	---	---	---		
---	---	---	---		
PVC	--			PVC -	PVC -
reinforced edges/corners	-			-	-
singingrock.com	-	skylotec.com	skylotec.com	steinworldwide.com	steinworldwide.com

NEW Compiling Now

ROPE / GEAR BAGS

These are less complex **ROPE & GEAR BAGS** than the organisers but may still have attachment eyes/ daisy chains and one or two pockets. Indeed many of these, like the *Recoil* bag on the right have far more 'organisation' than Duffle bags in the previous section. But on the whole, the bags in this section are simpler (and less expensive) than the organiser/transport packs. They are virtually all top-loading cylinders in design and intended mostly for rope storage/ transport rather than your entire day's climbing paraphernalia.



No Working Load Limits are given because these are mostly lower volume bags for rope but beware of overloading with too much hardware! Those with a drawstring top closure will often fold back over the lip of the bag to give unimpeded access to the interior like this *Petzl 45*.

IN THE FOLLOWING TABLES:...

COST: Approximate. Includes local taxes but can vary due to exchange rates, other taxes etc. We round up the cost to the nearest Pound£, US Dollar\$ or Euro€ **Simple currency conversions are shown in orange** for reference - this does not take into account import duty, shipping or tax.

STYLE/FUNCTION: The bags in this guide can be defined as one or both of the following

- **(SIMPLE) ROPE BAG** - an upright, flexible bag with few additional features but greater rope storage volume.
- **BUCKET** an upright, top-feeder that holds its shape to allow rope to be fed in or out. Usually shorter in stature than a simple cylinder bag and often has extra storage features like eyes and/or pockets but lower overall volume.
- **BACKPACK:** single or double shoulder straps making it more suitable for longer distance transport. Still a simple rope bag with few other features but can be carried on the back giving both hands free to carry even more stuff.

NOMINAL/INTENDED ROPE CAPACITY:

46m/150ft x 12.7mm/½" = 76m/250' x 11mm 7/16" = 91m/300' x 9mm 3/8" = 100m/328' x 11mm = 60m x 11.7mm =

FREE STANDING the pack has enough rigidity to keep the bag upright during rope feed - most buckets have integral rigidity. **POCKETS Ext/Int EYES Ext/Int STORE SAW** The number of pockets on the outside and inside **excluding** ID/Document pouches and saw pouches listed separately. This number may include a small security or key pocket on the inside.

Images NOT to Scale		
MANUFACTURER		AAK SAFETY
MODEL litres/liters VARIANT		Backpack 35 29104
ORIGIN		
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0
VOLUME intended market		35L Pro Access
NOMINAL ROPE CAPACITY		0kg 0lb
WEIGHT empty		0kg 0lb
DIMENSIONS		0 x 0 x 0cm 0 x 0
SPECIFICATIONS	BACK STRAPS HANDLES LOAD EYES	---
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	---
	WATERPROOF ID-PANEL DRAIN/VENT	---
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---
OUTER MATERIALS REFLECTIVE TRIM		PVC -
OTHER COLOURS		
NOTES		
WEBSITE		aaksafety.no
Images NOT to Scale		
MANUFACTURER		ARBORTEC
MODEL litres/liters VARIANT		Cobra 65 AT107
ORIGIN		
COST (inc Tax/VAT) Currency conversion only		£221 \$295 €252
VOLUME intended market		65L Pro Arb
NOMINAL ROPE CAPACITY		45m x 11mm 100' x ½"
WEIGHT empty		3.6kg 7.9lb
DIMENSIONS		61.5 x 37cm 24.2 x 14.6"
SPECIFICATIONS	BACK STRAPS HANDLES LOAD EYES	- 7 -
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	3 1 44 - -
	WATERPROOF ID-PANEL DRAIN/VENT	■ - ■ 4
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	■ + ■
OUTER MATERIALS REFLECTIVE TRIM		PES/PVC
OTHER COLOURS		
NOTES		Rope feed hole in lid
WEBSITE		arbor-tec.com

ROPE/GEAR BAGS

ARS	ARS	ARBORTEC	ARBORTEC	ARBORTEC	ARBORTEC
Breakout	Breakout	00 AT105	Viper 60 AT102	Cobra 35 AT105	Cobra 55 AT106
£205 \$0 €0	£220 \$0 €0	£0 \$0 €0	£74 \$0 €0	£108 \$142 €122	£184 \$213 €209
0L Pro Rescue	0L Pro Rescue	0L Pro Arb	60L Pro Arb	35L Pro Arb	55L Pro Arb
200' x 1/2'	300' x 1/2'	0m 0'	0m 0'	45m x 11mm 100' x 1/2"	45m x 11mm 100' x 1/2"
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	1.5kg 3.3lb	2.4kg 5.3lb
0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	34 x 36cm 13.4 x 14.2"	48.5 x 37cm 19.1 x 14.6"
---	---	21-	21-	-4-	-7-
---	---	---	---	3 1 3 2--	3 1 3 6--
---	---	■ ---	■ ---	■ - ■ -	■ - ■ 4
---	---	■ + ■	■ + ■	■ + ■	■ + ■
1000D Cordura	1000D Cordura	PES/PVC	PES/PVC	PES/PVC	PES/PVC
Bag opens out as a ground tarp for rope/gear	Bag opens out as a ground tarp for rope/gear			Rope feed hole in lid	Rope feed hole in lid
andersonrescue.com	andersonrescue.com	arbortec	arbortec	arbortec.com	arbortec.com

ARBPRO	ARBPRO	ARBPRO
Bucket Bag Air 28	Bucket Bag Air 40	Bucket Bag Air 60
£0 \$0 €64	£0 \$0 €64	£0 \$0 €107
0L Pro Arb	0L Pro Arb	0L Pro Arb
0m 0'	0m 0'	0m 0'
906g 0lb	0kg 0lb	1.54kg 0lb
40 x 30 x 30cm 15.7 x 12 x 12"	0 x 0 x 0cm 0 x 0 x 0"	50 x 35 x 35cm 19.6 x 13.7 x 13.7"
12 ■	12 ■	22 ■
1-8--	1-8--	1-8--
- ■ ■ 1	- ■ ■ 1	- ■ ■ 1
■	■	■
680 g/m² PVC+ Mesh	680 g/m² PVC+ Mesh	680 g/m² PVC+ Mesh
AIR has mesh sides	AIR has mesh sides	AIR has mesh sides
arbpro.it	arbpro.it	arbpro.it

Breakout Rope Bag

Rigging Reimagined


ARS www.andersonrescue.com

Images NOT to Scale					
MANUFACTURER		ARBPRO	ARBPRO	ARBPRO	ARBPRO
MODEL litres/liters VARIANT		Bucket Rucksack 40 2P654	Bucket Rucksack 60	Bucket Rucksack 75	Bucket Bag 28
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£98 \$0 €106	£101 \$0 €0	£108 \$0 €118	£0 \$0 €64
SPECIFICATIONS	VOLUME intended market	40L Pro Arb	60L Pro Arb	75L Pro Arb	0L Pro Arb
	NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg	0kg 0lb	3.4kg 0oz	906g 0lb
FEATURES	DIMENSIONS	0 x 0cm 0 x 0"	0 x 0cm 0 x 0"	0 x 0cm 0 x 0"	40 x 30 x 30cm 15.7 x 12 x 12"
	BACK STRAPS HANDLES LOAD EYES	2 2	2 2	2 2	1 2
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	2-8--	2-8--	2-8--	1-8--
	WATERPROOF ID-PANEL DRAIN/VENT	■-1	■-1	■-1	●-1
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	--■---	--■---	--■---	-----
OUTER MATERIALS REFLECTIVE TRIM		680 g/m ² PVC	680 g/m ² PVC	680 g/m ² PVC	680 g/m ² PVC+ Mesh
OTHER COLOURS					
NOTES				Rope feed hole in lid	AIR has mesh sides
WEBSITE		arbpro.it	arbpro.it	arbpro.it	arbpro.it
Images NOT to Scale					
MANUFACTURER		BEAL	BEAL	BEAL	BEAL
MODEL litres/liters VARIANT		Genius Bucket 20	ProWork 35 BSAC	ProWork 45 BSAC	ProWork 60 BSAC
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0	£101 \$0 €110	£131 \$0 €131	£137 \$0 €137
SPECIFICATIONS	VOLUME intended market	0L Pro Access	35L Pro Access	0L Pro Access	0L Pro Access
	NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
FEATURES	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
	BACK STRAPS HANDLES LOAD EYES	---	-4-	---	---
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	-----	4-----	-----	-----
	WATERPROOF ID-PANEL DRAIN/VENT	-----	---4	-----	-----
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	-----	-----	-----	-----
OUTER MATERIALS REFLECTIVE TRIM		--		PVC	PVC
OTHER COLOURS					
NOTES		-	Rope feed hole in lid		
WEBSITE		beal-planet.com	beal-planet.com	beal-planet.com	beal-planet.com












ROPE/GEAR BAGS

ARBPRO Bucket Bag 40	ARBPRO Bucket Bag 60	ARBPRO Bucket Bag 75	ARBSESSION RopeTote 28	ARBSESSION Rope bag 28	ARBSESSION RopeTote 28
£98 \$0 €106	£101 \$0 €0	£108 \$0 €118	£45 \$55 €52	£0 \$25 €0	£0 \$35 €0
40L Pro Arb	60L Pro Arb		28L Pro Arb	28L Pro Arb	28L Pro Arb
0m 0'	0m 0'	0m 0'	76m/250' x 12.7mm/1/2"	60m/200' x 12.7mm/1/2"	76m/250' x 12.7mm/1/2"
0kg 0lb	0kg 0lb	2kg 4.4lb	0kg 0lb	0kg 0lb	0kg 0lb
0 x 0cm 0 x 0"	0 x 0cm 0 x 0"	60 x 45 x 30cm 23.6 x 17.7 x 12"	40.6 x 30.5cm 16 x 12"	40.6 x 30.5cm 16 x 12"	43 x 33 cm 17 x 13"
-2	-2	22	-2-	-2-	-2-
--8--	--8--	2----	--7--	-----	-----
-----	-----	-----	-----	-----	-----
680 g/m ² PVC	680 g/m ² PVC	680 g/m ² PVC	900D Vinyl -	600D Polyester -	600D Polyester -
			reinforced base	reinforced base	reinforced base
arbpro.it	arbpro.it	arbpro.it	arbsession.com	arbsession.com	arbsession.com

BUCKINGHAM 0000	BUCKINGHAM 0000	BUCKINGHAM 0000
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
0L Pro Arb	0L Pro Arb	0L Pro Arb
0m 0'	0m 0'	0m 0'
0kg 0lb	0kg 0lb	0kg 0lb
0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
---	---	---
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-----	-----	-----
---	---	---
buckinghammfg.com	buckinghammfg.com	buckinghammfg.com



ARBSESSION
awaiting ad copy

Images NOT to Scale					
MANUFACTURER	BUCKINGHAM	BUCKINGHAM	BUCKINGHAM	BUCKINGHAM	BUCKINGHAM
MODEL litres/liters VARIANT	BuckpackWheels 4470	Big BackpackWheels 4471	Buck Haul Bag 4380	Buck Haul Bag XL 4370	Buck Haul Bag 4370
ORIGIN					
COST (inc Tax/VAT) Currency conversion only	£0 \$365 506 €0	£0 \$395 535 €0	£0 \$382* €0	£0 \$478 €0	£0 \$478 €0
VOLUME intended market	0L Pro Arb	0L Pro Arb	0L Pro Arb	0L Pro Arb	0L Pro Arb
NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'	0m 0'
WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
BACK STRAPS HANDLES LOAD EYES	---	---	---	---	---
POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	---	---	---	---	---
WATERPROOF ID-PANEL DRAIN/VENT	---	---	---	---	---
LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---	---	---	---	---
OUTER MATERIALS REFLECTIVE TRIM	Canvas/Vinyl & Rubber	Vinyl-coated Nylon	44oz Vinyl	44oz Vinyl	44oz Vinyl
OTHER COLOURS					
NOTES	Black bag is vinyl-higher cost. *Optional set of wheels with	*Wheels are a detachable option- Solid handle with	Hi-viz version is \$401		
WEBSITE	buckinghammfg.com	buckinghammfg.com	buckinghammfg.com	buckinghammfg.com	buckinghammfg.com

Images NOT to Scale					
MANUFACTURER	CAMP SAFETY	CAMP SAFETY	CAMP SAFETY	CAMP SAFETY	CAMP SAFETY
MODEL litres/liters VARIANT	Cargo 40 2785	Trucker 30 43115	Trucker 45 43115	Trucker 60 43115	Trucker 60 43115
ORIGIN					
COST (inc Tax/VAT) Currency conversion only	£60 \$80 €0	£105 \$0 €124	£119 \$0 €139	£129 \$0 €162	£129 \$0 €162
VOLUME intended market	40L Pro Access	0L Pro Access	0L Pro Access	0L Pro Access	0L Pro Access
NOMINAL ROPE CAPACITY	0m 0'	0m x 0mm 0' x 1/2"	0m x 0mm 0' x 1/2"	0m x 0mm 0' x 1/2"	0m x 0mm 0' x 1/2"
WEIGHT empty	0kg 2.1lb	00g 0lb	00g 0lb	00g 0lb	00g 0lb
DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
BACK STRAPS HANDLES LOAD EYES	2-1	---	---	---	---
POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	-1-2-	---	---	---	---
WATERPROOF ID-PANEL DRAIN/VENT		---	---	---	---
LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP		---	---	---	---
OUTER MATERIALS REFLECTIVE TRIM	500D PVC 	- 	- 	- 	-
OTHER COLOURS					
NOTES					
WEBSITE	camp.it	camp.it	camp.it	camp.it	camp.it

ROPE/GEAR BAGS

					
BUCKINGHAM	BUCKINGHAM	CAMP SAFETY	CAMP SAFETY	CAMP SAFETY	CAMP SAFETY
RopePro Deluxe L	RopePro Deluxe XL	SuperCargo 40	Super Cargo 70	Transport 20	Transport 30
4374	4373	43115	43115	43115	43115
					
£96 \$159 €0	£0 \$183 €0	£220 \$245 €0	£246 \$270 €0	£0 \$0 €0	£0 \$0 €0
0L Pro Arb	0L Pro Arb	30L Pro Access	45L Pro Access	20L Pro Access	30L Pro Access
5m x 12.7mm 250' x 1/2"	152m x 12.7mm 500' x 1/2"	0m x 0mm 0' x 1/2"	0m x 0mm 0' x 1/2"	0m 0'	0m 0'
1.1kg 2.4lb	0kg 0lb	0g 0lb	0g 0lb	0kg 0lb	0kg 0lb
41 x 41 x 36cm 16 x 16 x 14"	59 x 56 x 36cm 23 x 22 x 14"	63 x 34 x 28cm 24.8 x 13.4 x 11"	70 x 40 x 30cm 24.8 x 15.7 x 12"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
		4500D TPU	4500D TPU	--	--
Top, closeable rope feed hole	Top, closeable rope feed hole	* Handles have 4 reinforced hauling loops which double	* Handles have 4 reinforced hauling loops which double		
buckinghammfg.com	buckinghammfg.com	camp.it	camp.it	camp.it	camp.it
					
COURANT	COURANT	COURANT	COURANT	COURANT	
Cross Rope Light 17	Host 36 PSECBVA	Cross Rope 36	Cargo 40	Cargo 50	
					
	£58 \$0 €64	£66 \$98 €89			
0L Pro Access	36L Pro Access	23-36L Pro Access	0L Pro Access	0L Pro Access	
0m x 0mm 0' x 1/2"	45m x 12mm	0m 0'	0m x 0mm 0' x 1/2"	0m x 0mm 0' x 1/2"	
00g 0lb	0.91kg 2lb	1.1kg 2.4lb	00g 0lb	00g 0lb	
0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	45 x 32 x 19cm 18 x 13 x 7.5"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	
---	---	---	---	---	
---	---	---	---	---	
---	---	---	---	---	
---	---	---	---	---	
	1680D nylon & mesh	1680D Ballistic nylon			
	Buckles/straps for clipping to Cross/Dock bags	Expandable (upwards). Zips open top and bottom to			
mycourant.com	mycourant.com	mycourant.com	mycourant.com	mycourant.com	

Images NOT to Scale					
MANUFACTURER		DMM	DMM	DMM	DMM
MODEL litres/liters VARIANT		Transit 30	Transit 45	Porter 40	Porter 70
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£60 \$0 €0	£70 \$0 €0	£90 \$0 €90	£100 \$0 €100
SPECIFICATIONS	VOLUME intended market	30L Pro Access	45L Pro Access	40L Pro Access	70L Pro Access
	NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
FEATURES	BACK STRAPS HANDLES LOAD EYES	---	---	---	---
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	---	---	---	---
	WATERPROOF ID-PANEL DRAIN/VENT	---	---	---	---
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---	---	---	---
OUTER MATERIALS REFLECTIVE TRIM		600D PVC	600D PVC	600D PVC	600D PVC
OTHER COLOURS					
NOTES		-	-	-	-
WEBSITE		dmmwales.com	dmmwales.com	dmmwales.com	dmmwales.com
Images NOT to Scale					
MANUFACTURER		EDELRID	EDELRID	EDELRID	EDELRID
MODEL litres/liters VARIANT		Kask 28 721860552210	Kask 55 721860552210	DryBag 20	DryBag 35
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
SPECIFICATIONS	VOLUME intended market	55L Pro Access	55L Pro Access	55L	55L
	NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
FEATURES	BACK STRAPS HANDLES LOAD EYES	---	---	---	---
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	---	---	---	---
	WATERPROOF ID-PANEL DRAIN/VENT	---	---	---	---
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---	---	---	---
OUTER MATERIALS REFLECTIVE TRIM		44oz Vinyl	44oz Vinyl	44oz Vinyl	44oz Vinyl
OTHER COLOURS					
NOTES		-	-	-	-
WEBSITE		edelrid.com	edelrid.com	edelrid.com	edelrid.com

WWW.FTC-TREE.COM

WORK HARD. CLIMB HARD. PLAY HARD.

To gear up for a hard day's work and end our day with a smile. That's our chance as arborists: to have a unique and thrilling job, the opportunity to mix working, climbing and playing!



FTC TREE 



Images NOT to Scale


		EDELRID	FTC TREE	FTC TREE	HARKIE
MANUFACTURER		Kurthaulbag 55 721860552210	Cylindric 40	Cylindric 60	Champion 38 H2240
ORIGIN					
COST (inc Tax/VAT) <i>Currency conversion only</i>		£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£151 \$0 €0
SPECIFICATIONS	VOLUME <i>intended market</i>	55L Pro Rescue	40L Pro Arb	60L Pro Arb	38L Pro Arb
	NOMINAL ROPE CAPACITY	0m 0'	60m x 14mm 0'	90m x 14mm 0'	0m 0'
	WEIGHT empty	0kg 0lb	600g 1.3lb	900g 2lb	0kg 0lb
FEATURES	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	83 x 23 x 23cm 32.7 x 9.1 x 9.1"	92 x 32 x 32cm 36.2 x 12.6 x 12.6"	50 x 30 x 25cm 19.7 x 12 x 13.8"
	BACK STRAPS HANDLES LOAD EYES	---	21-	21-	22-
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	---	---	---	---
	WATERPROOF ID-PANEL DRAIN/VENT	---	---	---	---
LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP		---	---	---	---
OUTER MATERIALS REFLECTIVE TRIM		44oz Vinyl	1680D PVC	1680D PVC	PVC
OTHER COLOURS					
NOTES		-	-	-	-
WEBSITE		edelrid.com	ftec-tree.com	ftc-tree.com	harkieglobal.com

Images NOT to Scale



		HUSQVARNA	HUSQVARNA	KONG	KONG
MANUFACTURER		Rope Bag 28 596 93 63-11	Xplorer Backpack 596 93 63-11	RopeTube 17 982525000KK	Lirung 25 982521000KK
ORIGIN					
COST (inc Tax/VAT) <i>Currency conversion only</i>		£61 \$0 €0		£0 \$0 €0	£0 \$0 €0
SPECIFICATIONS	VOLUME <i>intended market</i>	28L Pro Arb		0L Pro	0L Canyoning
	NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	155g 0oz	750g 0lb
FEATURES	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
	BACK STRAPS HANDLES LOAD EYES	---	---	---	---
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	---	---	---	---
	WATERPROOF ID-PANEL DRAIN/VENT	---	---	---	---
LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP		---	---	---	---
OUTER MATERIALS REFLECTIVE TRIM		--	--	--	--
OTHER COLOURS					
NOTES		-	-	-	-
WEBSITE		husqvarna.com	husqvarna.com	Kong.it	Kong.it


		
HARKIE Champion 55 H2240	HARKIE Sentry 47 H2260	HARKIE Sentry 60 H2265
		
£201 \$0 €0	£221 \$0 €0	£246 \$0 €0
55L Pro Arb	47L Pro Arb	60L Pro Arb
0m 0'	70m x 12mm 0'	90m x 12mm 0'
0kg 0lb	0kg 0lb	0kg 0lb
50 x 38 x 29cm 19.7 x 15 x 11.4"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
---	22 ■	22 ■
---	2-6--	2-6--
---	■-■-	■-■-
---	carabiner	carabiner
PVC	PVC	PVC
		
-	-	-
harkieglobal.com	harkieglobal.com	harkieglobal.com























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www.gaparboristsupply.com

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At Rock Bottom Prices



					
KONG RopeBag 28	KONG Genius II 30	KONG Linnhà 40 98252200KK	KONG RopeBag 43	KONG WorkBag 50 982528N00KK	KONG OmniBag 60
					
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
28L Pro	30L Pro	40L Canyoning	43L Pro	50L Pro	60L Pro Access
0m 0'	0m 0'	0m 0'	0m 0'	0m 0'	0m 0'
0kg 0lb	0.85kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
---	PVC	--	--	PVC	--
-	-	-	-	Being phased out	-
Kong.it	kong.it	Kong.it	Kong.it	Kong.it	Kong.it

Images NOT to Scale					
MANUFACTURER		LYON EQUIPMENT	LYON EQUIPMENT	LYON EQUIPMENT	LYON EQUIPMENT
MODEL litres/liters VARIANT		Rope Bag 20 LSB 20..	Rope Bag 30 LSB 30..	Rope Bag Lid 40 LSB 40..	Essentials 30 LSB ES30..
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£70 \$0 €0	£78 \$0 €0	£82127 \$0 €0	£65 \$0 €0
SPECIFICATIONS	VOLUME intended market	20L Pro Access	0L Pro Access	0L Pro Access	30L Pro Access
	NOMINAL ROPE CAPACITY	80m x 10.5mm 0'	120m x 10.5mm 0'	0m 0'	100m x 11mm / 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0g 0lb
	DIMENSIONS	51 x 0 x 0cm 20 x 0 x 0"	56 x 0 x 0cm 22 x 0 x 0"	51 x 22 x 22cm 20 x 8.6 x 8.6"	0 x 0 x 0cm 0 x 0 x 0"
FEATURES	BACK STRAPS HANDLES LOAD EYES	---	21-	---	21-
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	---	---	---	---1-
	WATERPROOF ID-PANEL DRAIN/VENT	---	---	  --	  --
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP			 +  Lid	 +  Lid
OUTER MATERIALS REFLECTIVE TRIM		---	---	---	---
OTHER COLOURS					
NOTES		* Hi-vis Orange. Cushioned base	* Hi-vis Orange & green. Cushioned base	* Hi-vis Orange & green. Cushioned base	-
WEBSITE		lyonequipment.com	lyonequipment.com	lyonequipment.com	lyonequipment.com
Images NOT to Scale					
MANUFACTURER		PETZL	PETZL	PETZL	PETZL
MODEL litres/liters VARIANT		Bucket 15	Bucket 30	Bucket 45	Bug 18
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$50 €0	£0 \$70 €0	£0 \$90 €0	£0 \$0 €0
SPECIFICATIONS	VOLUME intended market	15L Pro Access	30L Pro Access	45L Pro Access	18L Sport
	NOMINAL ROPE CAPACITY	45m x 11mm	110m x 11mm	180m x 11mm	0m
	WEIGHT empty	465g 1lb	735g 1.6lb	890g 2lb	525g 1.2lb
	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
FEATURES	BACK STRAPS HANDLES LOAD EYES	---	---	---	---
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	---	---	---	---
	WATERPROOF ID-PANEL DRAIN/VENT	---	---	---	---
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---	---	---	---
OUTER MATERIALS REFLECTIVE TRIM		TPU (PVC-free)	TPU (PVC-free)	TPU (PVC-free)	-
OTHER COLOURS					
NOTES		*two loops intended for tieo-ing in the rope ends.	*two loops intended for tieo-ing in the rope ends.	*two loops intended for tieo-ing in the rope ends.	top strap for securing rope coil rep
WEBSITE		petzl.com	petzl.com	petzl.com	petzl.com

ROPE/GEAR BAGS

					
LYON EQUIPMENT	LYON EQUIPMENT	LYON EQUIPMENT	NATIVE ARB	NATIVE ARB	
Essentials 40 LSB ES40..	Essentials 60 LSB ES60..	Industrial Access 55 LSB 55..			
					
£56 \$0 €0	£80 \$0 €0	£108 \$0 €0	£0 \$0 €0	£0 \$0 €0	
40L Pro Access	60L Pro Access	55L Pro Access	0L Pro Arb	0L Pro Arb	
150m x 11mm 0'	200m x 11mm 0'	220m x 10.5mm 0'	0m 0'	0m 0'	
620g 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	
0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	59x 38 x 15cm 13.2 x 15 x 5.9"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	
21-	22-	22-	---	---	
---1-	---1-	---	---	---	
 --	 --	 --	 --	 --	
 +  Lid	 +  Lid	 +  Lid	 +  Lid	 +  Lid	
--	--	--	--	--	
					
-	-	-	-	-	
lyonequipment.com		lyonequipment.com	nativearb.co.uk	nativearb.co.uk	

		
PETZL	PETZL	PETZL
Transport 30	Transport 45	Transport 60
		
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
30L Pro Access	45L Pro Access	60L Pro Access
0m 0'	0m 0'	0m 0'
1.3kg 2.86lb	1.53kg 3.37lb	1.78kg 3.924lb
54 x 0 x 0cm 21 x 0 x 0"	58 x 0 x 0cm 22 x 0 x 0"	62 x 0 x 0cm 24 x 0 x 0"
[2] 3+1 inside-	[2] 3+1 inside-	[2] 3+1 inside-
1-22-	1-22-	1-23-
 --	 --	 --
 +  Lid	 +  Lid	 +  Lid
TPU (PVC-free)	TPU (PVC-free)	TPU (PVC-free)
replaced the 'Portage' range. 50kg load limit	replaced the 'Portage' range. 50kg load limit	replaced the 'Portage' range. 50kg load limit
petzl.com	petzl.com	petzl.com



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Images NOT to Scale					
MANUFACTURER		PROTEKT	PROTEKT	PROTEKT	PROTEKT
MODEL litres/liters VARIANT		Arborist Basket 15 AX701	Arborist Basket 30 AX701	AX011T/K 42	AX011N/D 42
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
SPECIFICATIONS	VOLUME intended market	15L Pro Access	30L Pro Access	42L Pro Access	0L Pro Access
	NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	720 /650g 0lb	600/850g 0lb
FEATURES	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	60 x 30 x 30cm 23.6 x 12 x 12"	60 x 30 x 30cm 23.6 x 12 x 12"
	BACK STRAPS HANDLES LOAD EYES	1 2 1	1 2 1	2-1 / 2-2	2 1-
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	--6--	--6--	----	--3--/----
	WATERPROOF ID-PANEL DRAIN/VENT	●-■	●-■	●-■	●-■/■-■
LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP		■	■	■/■	■
OUTER MATERIALS REFLECTIVE TRIM		PVC & Mesh -	PVC & Mesh -	Reinforced PVC-	Reinforced PVC-
OTHER COLOURS					
NOTES		Solid Plastic base with air-vents	Solid Plastic base with air-vents	T- zip closure & D-ring K=Drawstring & 2 haul loops	AX011D = lid-flap +ID pocket Also AX011 plain bag
WEBSITE		protekt.pl	protekt.pl	protekt.pl	protekt.pl

Images NOT to Scale					
MANUFACTURER		PROTEKT	PROTEKT	REECOIL	REECOIL
MODEL litres/liters VARIANT		Arborist Backpack 80 Ax080	AX012 ARBO 100	Rope Bag 28	Rope Bag 45
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0	£0 \$0 €0	£94 \$131 €0	£123 \$167 €0
SPECIFICATIONS	VOLUME intended market	80L Pro Arb	100L Pro Access	28L Pro Arb	45L Pro Arb
	NOMINAL ROPE CAPACITY		0m 0'	100m 0' x 11mm 0"	200m 0' x 11mm 0"
	WEIGHT empty	2.6kg 5.7lb	1.48kg 0lb	1.7kg 0lb	0kg 0lb
FEATURES	DIMENSIONS	80 x 35 x 35cm 31.5 x 13.8 x 13.8"	80 x 40 x 40cm 31.5 x 15.7 x 15.7"	50.5 x 35cm 19.9 x 13.8"	0 x 0 x 0cm 0 x 0 x 0"
	BACK STRAPS HANDLES LOAD EYES	---	2--	2 2 ■	2 2 ■
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	----	-16--	--16/2 ■	--16/2 ■
	WATERPROOF ID-PANEL DRAIN/VENT	■----	----	■-■-■	■-■-■
LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP		■	■	■ ■	■ ■
OUTER MATERIALS REFLECTIVE TRIM		--	Reinforced PVC-	--	--
OTHER COLOURS					
NOTES		-	Also AX012 plain bag	-	-
WEBSITE		protekt.pl	protekt.pl	rockempire.com	rockempire.com










ROPE/GEAR BAGS



PROTEKT AX011SP /S 45	PROTEKT AX040	PROTEKT AX070	PROTEKT AX070L	PROTEKT AX074	PROTEKT AX071
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
0L Pro Access	0L Pro Access	0L Pro Access	0L Pro Access	0L Pro Access	0L Pro Access
0m 0'	0m 0'	0m 0'	0m 0'	0m 0'	0m 0'
1.64/1.2kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
38 x 38/36 x 25/22cm 15 x 14.2 x 9.8/8.6"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
[2] 1-	---	---	---	---	---
2- - - - / - - - -	---	---	---	---	---
Reinforced PVC- 	Reinforced PVC-	Reinforced PVC-	Reinforced PVC-	Reinforced PVC-	Reinforced PVC-
AX011S has no pockets	-	-	-	-	-
protekt.pl	protekt.pl	protekt.pl	protekt.pl	protekt.pl	protekt.pl



ROCK EMPIRE Cargo Reep 30	ROCK EMPIRE Cargo 35 CWW035	ROCK EMPIRE Cargo 55 CWW055	ROCK EMPIRE Cargo Roll 55 CVR055		
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0		
30L Pro Access	0L Pro Access	0L Pro Access	0L Pro Access		
0m 0'	0m 0'	0m 0'	0m 0'		
390g 0lb	805g 0lb	805g 0lb	805g 0lb		
0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"		
- 2 -	11 -	11 -	32 -		
- - 3 - -	---	---	---		
-	-	-	-		
singrock.com	singrock.com	singrock.com	singrock.com		

Images NOT to Scale					
MANUFACTURER		ROCKnARB	ROCKnARB	ROCKnARB	ROCKnARB
MODEL litres/liters VARIANT		Mnt Ape Bull 30 RMA001	Plain Jane II ? RPJ015	Arborist Storage ? RBA00..	Arborist Storage ? RBA00..
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$46 €0	£0 \$30 €0	£0 \$36 €0	£0 \$38 €0
SPECIFICATIONS	VOLUME intended market	30L Pro Arb	0L Pro Arb	0L Pro Arb	0L Pro Arb
	NOMINAL ROPE CAPACITY	0m 200'x3/4"	0m 200' x 1/2"	0m 150'x 1/2"	0m 200'x 1/2"
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 1.5lb	0kg 0lb
	DIMENSIONS	43 x 33 x 33cm 17 x 13 x 13"	40-52 x 30 x 30cm 16-20.5 x 12 x 12"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
FEATURES	BACK STRAPS HANDLES LOAD EYES	- 2 1	- 2 -	- - -	- - -
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	- - - -	- - - -	4 - - -	4 - - -
	WATERPROOF ID-PANEL DRAIN/VENT	- - -	- - -	- ■ -	- ■ -
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	■	■	■	■
OUTER MATERIALS REFLECTIVE TRIM		600D Polyester -	600D Polyester -	1000D coated nylon-	1000D coated nylon-
OTHER COLOURS					
NOTES		Dbl reinforced bottom	Dbl reinforced bottom	-	-
WEBSITE		rocknarbor.com	rocknarbor.com	rocknarbor.com	rocknarbor.com
Images NOT to Scale					
MANUFACTURER		SILVER BULL	SILVER BULL	SILVER BULL	SILVER BULL
MODEL litres/liters VARIANT		Basic Med 28	Basic lg 35	Basic XL 43	scabbard Bag
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£40 \$0 €0	£42 \$0 €0	£50 \$0 €0	£0 \$0 €90
SPECIFICATIONS	VOLUME intended market	44L Pro Arb	33L Pro Arb	44L Pro Arb	L Pro Arb
	NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
	DIMENSIONS	40 x 30cm 15.7 x 12"	50 x 30cm 19.7 x 12"	60 x 33cm 23.6 x 13"	79 x 39cm 31 x 15.4"
FEATURES	BACK STRAPS HANDLES LOAD EYES	- - -	- - -	- - -	- - -
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	- - - -	- - - -	- - - -	- - - -
	WATERPROOF ID-PANEL DRAIN/VENT	- - -	- - -	- - -	- - -
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	- - - -	- - - -	- - - -	- - - -
OUTER MATERIALS REFLECTIVE TRIM		- -	- -	- -	- -
OTHER COLOURS					
NOTES		-	-	-	-
WEBSITE		-	-	-	-

ROCKnARB	SILVER BULL	SILVER BULL
oseidon Rigger ? RPB093	Net Sml 21	Basic Sml 21
£0 \$215 €0	£40 \$0 €0	£36 \$0 €0
0L Pro Rescue	21L Pro Arb	21L Pro Arb
0m 200'x 1/2"	0m 0'	0m 0'
0kg 2.2lb	0kg 0lb	0kg 0lb
0 x 0 x 0cm 0 x 0 x 0"	35 x 28cm 13.8 x 11"	30 x 30cm 12 x 12"
[2] 1-	---	---
2-10 14-	---	---
000D coated nylon-	---	---
rocknarmor.com	-	-

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SILVER BULL	SILVER BULL	SILVER BULL	SILVER BULL	SILVER BULL	SILVER BULL
Mesh	Rig	Rig 44	(Pro) Rig 60	Day Pack	Twinline
£78 \$0 €113	£66 \$0 €90	£69 \$0 €94	£83 \$0 €113	£0 \$0 €0	£68 \$0 €113
0L Pro Arb	33L Pro Arb	44L Pro Arb	60L Pro Arb	0L Pro Arb	0L Pro Arb
0m 0'	0m 0'	0m 0'	0m 0'	0m 0'	60+45m 0'
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
46 x 34cm 18.1 x 13.4"	35 x 28 cm 13.8 x 11"	40 x 32cm 15.7 x 12.6"	46 x 45cm 18 x 17.7"	0 x 0 x 0cm 0 x 0 x 0"	46 x 34cm 18 x 13.4"
---	---	---	---	---	---
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---	---	---	---	---	---
-	-	-	-	-	-
-	-	-	-	-	-

Images NOT to Scale					
MANUFACTURER		SINGING ROCK	SINGING ROCK	SINGING ROCK	SINGING ROCK
MODEL litres/liters VARIANT		Carry Bag 28	Rescue Bag 30	Gear 35	Drybag 40
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
SPECIFICATIONS	VOLUME intended market	28+10L Pro Access	28+10L Pro Rescue	35L Pro Access	50/11gal Pro Access
	NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
FEATURES	BACK STRAPS HANDLES LOAD EYES	---	---	---	---
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	---	---	---	---
	WATERPROOF ID-PANEL DRAIN/VENT	---	---	---	---
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---	---	---	---
	OUTER MATERIALS REFLECTIVE TRIM	--	--		--
OTHER COLOURS					
NOTES	-	-	-	-	
WEBSITE	singingrock.com	singingrock.com	singingrock.com	singingrock.com	
Images NOT to Scale					
MANUFACTURER		STEIN	STEIN	STEIN	STEIN
MODEL litres/liters VARIANT		Utility 15	Utility 25	Vault 25	Vault 30
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£24 \$0 €0	£48 \$0 €0	£0 \$0 €0	£60 \$0 €0
SPECIFICATIONS	VOLUME intended market	15L/3.3gal Pro Arb	25L Pro Arb	25L Pro Arb	30L/6.6gal Pro Arb
	NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	40 x 30 x 30cm 15.7 x 12 x 12"	50 x 30 x 30cm 19.7 x 12 x 12"	0 x 0 x 0cm 0 x 0 x 0"
FEATURES	BACK STRAPS HANDLES LOAD EYES	---	---	---	---
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	---	1-24--	---	---
	WATERPROOF ID-PANEL DRAIN/VENT	---			
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---			
	OUTER MATERIALS REFLECTIVE TRIM	PVC-	PVC-	PVC-	PVC-
OTHER COLOURS					
NOTES	-	-	-	-	
WEBSITE	steinworldwide.com	steinworldwide.com	steinworldwide.com	steinworldwide.com	

ROPE/GEAR BAGS

					
SINGING ROCK Gear 50	SINGING ROCK Drybag 40	SKYLOTEC Classic 22	SKYLOTEC Classic 30	SKYLOTEC Classic 38	SKYLOTEC -
					
£0 \$0 €0	£0 \$0 €0	£24 \$0 €0	£26 \$0 €0	£29 \$0 €0	£0 \$0 €0
0L/11gal Pro Access	50L/11gal Pro Access	22L Pro Access	30L/6.6gal Pro Access	38L Pro Access	0L
0m 0'	0m 0'	0m 0'	0m 0'	50m x 11mm 0'	0m 0'
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0cm 0 x 0 x 0"	0 x 0cm 0 x 0 x 0"	0 x 0cm 0 x 0 x 0"	0 x 0cm 0 x 0 x 0"
---	---	-2-	-2-	-2-	---
---	---	---	---	---	---
---	---	---2	---2	---2	---
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---	---	---	---	---	---
					
singingrock.com	singingrock.com	-	-	-	-
					
STEIN Utility 50	STEIN Voyager 60	STEIN Utility 70	STERLING ROPES RopeBag 31 MDBAGROPEBM31	STERLING ROPES Rope Bag 45 MDBAGROPEBL45	-
					
£60 \$0 €0	£108 \$140 €0	£90 \$0 €0	£0 \$70 €0	£0 \$80 €0	£0 \$0 €0
50L/11gal Pro Arb	60L/13.2gal Pro Arb	70L/13.4gal Pro Arb	31L/6.7gal Pro Access	45L Pro Access	0L
0m 0'	0m 0'	0m 0'	0m 0'	0m 0'	0m 0'
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
48 x 38 x 38cm 18.9 x 15 x 15"	0 x 0 x 0cm 0 x 0 x 0"	60 x 40 x 27cm 23.6 x 15.7 x 10.6"	100 x 31 x 30 cm 39.4 x 12.2 x 12"	41 x 27 x 15cm 16.1 x 10.6 x 5.9"	0 x 0cm 0 x 0 x 0"
---	---	---	---	---	---
1- ---	1- ---■	1- ---■	---	---	---
 	 	 	---	---	---
	 	 	---	---	---
PVC-	Ballistic Nylon-	PVC-	--	--	--
-	Will fit 3xVault 15L in a stack. 2L front pocket	Will fit 3xVault 15L+ bleed control in a stack.	-	-	-
steinworldwide.com	steinworldwide.com	steinworldwide.com	sterlingrope.com	sterlingrope.com	-

Images NOT to Scale					
MANUFACTURER		TEUFELBERGER	TEUFELBERGER	TEUFELBERGER	TEUFELBERGER
MODEL litres/liters VARIANT		Rope Bucket 25	Rope Bucket 30	Rope Bucket 50	Rope Bucket 80
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$210 €170	£0 \$225 €185	£0 \$330 €0	£0 \$370 €276
SPECIFICATIONS	VOLUME intended market	25L/5.5gal Pro Access	50L/11gal Pro Access	50L/11gal Pro Access	80L/17.6gal Pro Access
	NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 0'	0m 0'
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
	DIMENSIONS	35 x 35 x 35cm 13.8 x 13.8 x 13.8"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
FEATURES	BACK STRAPS HANDLES LOAD EYES	-2-	-2-	22-	22-
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	--NumerousNumerous-	--NumerousNumerous-	--NumerousNumerous-	--NumerousNumerous-
	WATERPROOF ID-PANEL DRAIN/VENT	--■	--■	--■	--■
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	■	■	■	■
	OUTER MATERIALS REFLECTIVE TRIM	44oz Vinyl	--	--	--
OTHER COLOURS					
NOTES		Can be customised for any ext/int gear carriage	Can be customised for any ext/int gear carriage	Can be customised for any ext/int gear carriage	Can be customised for any ext/int gear carriage
WEBSITE		teufelberger.com	teufelberger.com	teufelberger.com	teufelberger.com
Images NOT to Scale					
MANUFACTURER		TREERUNNER	WEAVER ARBORIST	WEAVER ARBORIST	WEAVER ARBORIST
MODEL litres/liters VARIANT		Spring Bag 54	Basic 26	DeLuxe 22 08-07185	Bull Rope Deploy 52 08-07161.
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €44	£41 \$0 €0	£73 \$0 €0	£71 \$0 €0
SPECIFICATIONS	VOLUME intended market	54L/12gal Pro Arb	26L/5.7gal Pro Arb	- Pro Arb	- Pro Arb
	NOMINAL ROPE CAPACITY	0m 0'	0m 0'	0m 150' x ½"	0m 200' x ⅝"
	WEIGHT empty	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
	DIMENSIONS	42 x 39 x 39cm 16.5 x 15.4 x 15.4"	35.6 x 30cm 14 x 12"	73.7 x 38 cm 29 x 15"	45.7 x 38 cm 18 x 15"
FEATURES	BACK STRAPS HANDLES LOAD EYES	12-	---	- 2-	[1] 2-
	POCKETS Ext/Int EYES/LOOP Ext/Int STORE SAW	1--4-	---	---	---
	WATERPROOF ID-PANEL DRAIN/VENT	--■	●■	●■	●■
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	■	■	■	■
	OUTER MATERIALS REFLECTIVE TRIM	Tarpaulin(PVC) -	--	1200D Polyester	1200D Polyester
OTHER COLOURS			■	■	
NOTES		3 height adjustments straps. Mesh lid	-	* one eye is for shoulder strap to clip to store bag	held closed by 2 small fastex buckles *in
WEBSITE		grube.de	-	weaverarborist.com	weaverarborist.com

ROPE/GEAR BAGS

					
TEUFELBERGER	TREERUNNER	TREERUNNER	TREERUNNER	TREERUNNER	TREERUNNER
Bucket Mule	Rope Bag 28	Vented Rope Bag 31	Rope Tarp Bag 24	Rope Tarp Bag 28	Rope Tarp Bag 32
					
£45 \$0 €0	£0 \$0 €35	£0 \$0 €40	£0 \$0 €42	£0 \$0 €44	£0 \$0 €48
0L Pro Access	28L/6.2gal Pro Arb	31L/6.8gal Pro Arb	24L/5.3gal Pro Arb	28L/6.2gal Pro Arb	32L/7gal Pro Arb
0m 0'	0m 0'	0m 0'	0m 0'	0m 0'	0m 0'
0kg 0lb	570g 0lb	600g 0lb	0kg 0lb	0kg 0lb	0kg 0lb
100 x 31 x 30cm 39.4 x 12 x 12"	19 x 18 x 18cm 7.5 x 7.1 x 7.1"	50 x 28 x 28cm 19.7 x 11 x 11"	35 x 30 x 30cm 13.8 x 12 x 12"	40 x 30 x 30cm 15.8 x 12 x 12"	45 x 30 x 30cm 17.7 x 12 x 12"
---	-21	22-	-21	-21	-21
---	4---	1--1-	2-6--	2-6--	2-6--
---					
---					
---	---	Ballistic Nyon -	Tarpaulin(PVC) -	Tarpaulin(PVC) -	Tarpaulin(PVC) -
-	-	-	-	-	-
teufelberger.com	grube.de	grube.de	grube.de	grube.de	grube.de
					
WEAVER ARBORIST	WEST COAST CLIMBER	WEST COAST CLIMBER	WEST COAST CLIMBER		
All Purpose 84	Rocket Mini 36	Classic 45	Rocket 55		
					
£73 \$0 €0	£101 \$125 €117	£42 \$52 €49	£117 \$146 €137		
Pro Arb	36L/7.9gal Pro Arb	0L Pro Arb	55L/12gal Pro Arb		
	75m x 11mm >150' x ½"	150m x 11mm 300' x ½"	150m x 11mm >300' x ½"		
	0kg 0lb	0kg 0lb	0kg 0lb		
	35.6 x 30.4cm 14 x 12"	45.7 x 30.4cm 18 x 12"	69 x 38cm 27 x 15"		
	21-	- 2-	2 1-		
---	---	--1--	1-1--		
					
					
1200D Polyester	1680D Ballistic Nylon	1000D Cordura	1680D Ballistic Nylon		
					
c 1x buckle securing strap for saw pocket	-	-	-		
weaverarborist.com	nugreenstore.com	nugreenstore.com	nugreenstore.com		

TOOL BAGS & PACKS






Most tool bags, pouches, buckets and packs are designed to be clipped to your harness or to a full size rope bag and were originally used primarily by the rope access industry for conventional tools and accessories like drills, drivers and hand tools but quickly migrated to arborists who had always used some form of small pouch for their own hand tool, spares and water etc. These dedicated tool bags tend to have much smaller pen and screwdriver-sized compartments as well as pouches or dividers originally designed for nuts & bolts and similar loose material but clearly these can all be used for just about anything you can stuff in there. With one or two exceptions (*Teufelberger Gear Mule*, *Edelrid Beaker*) we have only included actual bags that would be capable of stuffing in a short rope length NOT the myriad of flat, tool holsters and pouches. That said, there are a number of simple draw-cord pouches in this list because they are produced by the same companies as the rope bags in the previous section but even Walmart probably sell something similar! The more complex tool pouches have holsters for handled tools and eyes/loops to connect kit, internally and externally and often to allow multiple lanyards to be connected to heavier items that you really do not want to drop. Indeed there is an ANSI standard listed in the notes for some of these that refers not so much to the actual bag as the measures it has to stop you dropping kit.

Many of these bags are as useful for short lengths of ropes/lanyards as they are for tools and hardware so some, like the *Edelrid Drybag* and *Beal Command 9* and indeed any of the cylinders with enough internal space could equally be in the ROPE BAGS section except that they will only house around 5-10m of rope.

Of particular note are the see-through Glass bucket from *Beal* which enables you to see all of the contents- and the organiser nature of clip on-open-out packs like *Edelrid's Beaker* which opens out as a organiser exposing all the tools you might need. *Teufelberger's Gear Mule* intended to be clipped to their large *Mule* organiser bags rather than direct to your harness. At 15L this is a little larger than the majority of these tool packs but, as a case rather than bag, it is clearly only for tools and hardware and not doubling as short rope storage.



Images definitely NOT to Scale			
MANUFACTURER		AAK	
MODEL litres/liters VARIANT			
ORIGIN			
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0	
SPECIFICATIONS	VOLUME intended market	0L Pro Access	
	ROPE or LOAD CAPACITY	0m 0'	
	WEIGHT empty	0kg 0lb	
FEATURES	DIMENSIONS	28 x 21cm 11.4 x 8.3"	
	HOLSTERS ONE-HAND USE FIT TO HNSS	-- 1	
	POCKETS Ext/Int EYES Ext/Int LOOPS	-- 6 --	
	WATERPROOF IDPANEL DRAIN/VENT HAUL	● ---	
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	■	
	OUTER MATERIALS REFLECTIVE TRIM	PVC -	
	OTHER COLOURS		
NOTES		-	
WEBSITE			
Images NOT to Scale			
MANUFACTURER		BEAL	
MODEL litres/liters VARIANT		00	
ORIGIN			
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0	
SPECIFICATIONS	VOLUME intended market	0L Pro Access	
	ROPE or LOAD CAPACITY	0m 0'	
	WEIGHT empty	0kg 0lb	
FEATURES	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	
	HOLSTERS ONE-HAND USE FIT TO HNSS	---	
	POCKETS Ext/Int EYES Ext/Int LOOPS	- - - -	
	WATERPROOF IDPANEL DRAIN/VENT HAUL	- - - -	
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	- - - -	
	OUTER MATERIALS REFLECTIVE TRIM	--	
	OTHER COLOURS		
NOTES		-	
WEBSITE		beal-planet.com	

TOOL BAGS<10L/PACKS<15L

					
AAK	AAK	ARBORTEC	ARBORTEC	ARBPRO	ARBPRO
		oo AT105 	oo AT105 	oo 	oo 
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
0L Pro Access	0L Pro Access	0L Pro Arb	0L Pro Arb	0L Pro Arb	0L Pro Arb
0m 0'	20kg 44lb	0m 0'	0m 0'	0m 0'	0m 0'
0kg 0lb	650g 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
0 x 0 x 0cm 0 x 0 x 0"	33 x 25 x 25cm 13 x 9.8 x 9.8"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
--1	--1	--	--	--	--
5-6--	---	---	---	---	---
 --	---	---	---	---	---
 --	---	---	---	---	---
PVC -	PVC -	--	--	--	--
-	-	-	-	-	-
		arbortec.com	arbortec.com	arbpro.it	arbpro.it
					
BEAL	BEAL	BEAL	BUCKINGHAM	BUCKINGHAM	BUCKINGHAM
oo	oo Commande 9	oo	oo	oo	oo
					
£0 \$0 €0	£25 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
0L Pro Access	9L Pro Access	0L Pro Access	0L Pro Arb	0L Pro Arb	0L Pro Arb
0m 0'	0m 0'	0m 0'	0m 0'	0m 0'	0m 0'
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
--	--	--	--	--	--
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
--	--	--	--	--	--
-	-	-	-	-	-
beal-planet.com	beal-planet.com	beal-planet.com	-	-	-

NEW Compiling Now






































Images definitely NOT to Scale					
MANUFACTURER		CAMP SAFETY		CAMP SAFETY	
MODEL litres/liters VARIANT		Trailer 15 2781.		Back Carry 15 2782	
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£30 \$38 €34		£20 \$25 €23	
SPECIFICATIONS	VOLUME intended market	15L/3.3gal Pro Access		15L/3.3gal Pro Access	
	ROPE or LOAD CAPACITY	0kg 0lb		0kg 0lb	
	WEIGHT empty	0kg 0lb		680g 1.5lb	
	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"		61m/200' x 12.5m/½"	
FEATURES	HOLSTERS ONE-HAND USE FIT TO HNSS	---		---	
	POCKETS Ext/Int EYES Ext/Int LOOPS	---		---	
	WATERPROOF IDPANEL DRAIN/VENT HAUL	---		---	
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---		---	
	OUTER MATERIALS REFLECTIVE TRIM	---		---	
OTHER COLOURS					
NOTES					
WEBSITE		camp.it		camp.it	

Images definitely NOT to Scale					
MANUFACTURER		EDELRID		EDELRID	
MODEL litres/liters VARIANT		Dry Bag 1		Dry Bag 5	
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0		£0 \$0 €0	
SPECIFICATIONS	VOLUME intended market	0L Pro Access		0L Pro Access	
	ROPE or LOAD CAPACITY	0kg 0lb		0kg 0lb	
	WEIGHT empty	0kg 0lb		0kg 0lb	
	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"		0 x 0 x 0cm 0 x 0 x 0"	
FEATURES	HOLSTERS ONE-HAND USE FIT TO HNSS	---		---	
	POCKETS Ext/Int EYES Ext/Int LOOPS	---		---	
	WATERPROOF IDPANEL DRAIN/VENT HAUL	---		---	
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	---		---	
	OUTER MATERIALS REFLECTIVE TRIM	---		---	
OTHER COLOURS					
NOTES					
WEBSITE		edelrid.com		edelrid.com	



TOOL BAGS <10L / PACKS <16L

COURANT	CRESTO	CRESTO	CRESTO	DMM	DMM
	Tool Bag 4	Tool Bag 4	Tool Bucket 13 012260213	Tool Bag 4	Tool Bag 6
£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£20 \$0 €25	£30 \$0 €35
0L	0L	0L	0L	4L Pro Access	6L Pro Access
0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
0kg 0lb	0kg 0lb	0kg 0lb	20kg 44lb	0kg 0lb	0kg 0lb
0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	21 x 16 x 13cm 8.3 x 6.3 x 5.1"	31 x 16 x 13cm 12.2 x 6.3 x 5.1"
---	-■1	-■1	1■1	---	---
---	5-5--	5-6--	--12-4inside	---	---
---	●■1	●■1	●■2	---	---
---	■	■	■	---	---
--	Polymar 8205 -	Polymar 8205 -	Polymar 8205 -	--	--
-	-	-	-	-	-
-	crestosafety.com	crestosafety.com	crestosafety.com	dmmwales.com	dmmwales.com
EDELRID	EDELRID	KONG	KONG	LYON EQUIPMENT	LYON EQUIPMENT
Beaker 9 883150001380	Rope Pouch 11	ToolBag 4 982530N01KK	MiniBag 8	OO AT105	OO AT105
£43 \$75 €51	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
9L /2gal Pro Access	0L Pro Access	4L Pro Access	8L /1.8gal Pro Access	0L Pro Access	0L Pro Access
15m x 11mm 70' x 1/2"	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
390g 13.75oz	370g 0lb	160g 0oz	0.25kg 0oz	0kg 0lb	0kg 0lb
31 x 22 x 16.5cm 12.2 x 8.7 x 6.5"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	50 x 26 x 6cm 19.7 x 14.2 x 2.4"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
---	---	---	---	---	---
PVC	--	--	--	--	--
bag reverses inside out so that internal pockets/eyes	-	-	-	-	-
edelrid.com	edelrid.com	Kong.it	Kong.it	lyonequipment.com	lyonequipment.com

Images definitely NOT to Scale					
MANUFACTURER		PETZL	PETZL	PETZL	PROTEKT
MODEL litres/liters VARIANT		Tool Bag 1.5 S047BA00	Tool Bag 3 AT105	Tool Bag 6 AT105	AX800 8 -
ORIGIN					
COST (inc Tax/VAT) Currency conversion only		£0 \$0 €0	£0 \$0 €0	£0 \$0 €0	£0 \$0 €0
SPECIFICATIONS	VOLUME intended market	1.5L / 0.33gal Pro Access	3L / 0.7gal Pro Access	6L / 1.1gal Pro Access	8L / 1.8gal Pro Access
	ROPE or LOAD CAPACITY	6kg 13.2lb	0kg 0lb	0kg 0lb	00g 0lb
	WEIGHT empty	100g 0lb	0kg 0lb	0kg 0lb	800g 0lb
FEATURES	DIMENSIONS	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	37 x 20 x 20cm 14.6 x 7.8 x 7.8"
	HOLSTERS ONE-HAND USE FIT TO HNSS	-  2	-  2	2  2	---
	POCKETS Ext/Int EYES Ext/Int LOOPS	---	---	2 ---	1 ---
	WATERPROOF IDPANEL DRAIN/VENT HAUL	 ---	 ---	 ---	 -2
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP				
	OUTER MATERIALS REFLECTIVE TRIM	PVC-free TPU -	PVC-free TPU -	PVC-free TPU -	Polyester 
	OTHER COLOURS				
NOTES	ANSI/ISEA	ANSI/ISEA	-	-	
WEBSITE	Petzl.com	Petzl.com	Petzl.com	protekt.pl	
Images definitely NOT to Scale					
MANUFACTURER		SKYLOTEC	STEIN	TEUFELBERGER	WEST COAST CLIMBER
MODEL litres/liters VARIANT		Classic 5	Vault 4	Gear Mule 15	Ditty ?
ORIGIN					
COST (inc Tax/VAT) Currency conversion only			£18 \$0 €0	£54 \$0 €0	£21 \$26 €25
SPECIFICATIONS	VOLUME intended market		4L / 0.9gal Pro Arb	15L / 3.3gal Pro Access	0L Pro Arb
	ROPE or LOAD CAPACITY		0kg 0lb	0kg 0lb	0kg 0lb
	WEIGHT empty		0kg 0lb	0kg 0lb	0kg 0lb
FEATURES	DIMENSIONS		0 x 0 x 0cm 0 x 0 x 0"	41 x 27 x 15cm 16.1 x 10.6 x 5.9"	0 x 0cm 0 x 0 x 0"
	HOLSTERS ONE-HAND USE FIT TO HNSS		---	---	--1
	POCKETS Ext/Int EYES Ext/Int LOOPS		---	0 -	--2
	WATERPROOF IDPANEL DRAIN/VENT HAUL		 ---	 ---	 
	LID VELCRO POP ZIPPED DRAW-CORD BUCKLE ROLL-TOP		 ---	 ---	
	OUTER MATERIALS REFLECTIVE TRIM		--	600D PVC	1000D Cordura
	OTHER COLOURS				
NOTES		-	Can attach to Gear Mule 80L	100'x10mm	
WEBSITE		steinworldwide.com	teufelberger.com	nugreenstore.com	

TOOL BAGS <10L / PACKS <15L

					
PROTEKT	RECOIL	ROCK EMPIRE	ROCK EMPIRE	SILVER BULL	SILVER BULL
AX026 10		Cargo Reep 2 VWV002	Cargo Reep 10 VWV005	Hip Bag	Hip Bag
					
£0 \$0 €0		£0 \$0 €0	£0 \$0 €0	£34 \$0 €0	£35 \$0 €0
0L / 2.2gal Pro Access	0L Pro Arb	2L / 0.4gal Pro Access	10L / 2.2gal Pro Access	0L Pro Arb	0L Pro Arb
00g 0lb	0kg 0lb	0m 0'	0m 0'	0kg 0lb	0kg 0lb
960g 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb	0kg 0lb
30 x 30 x 10cm 12 x 12 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"	0 x 0 x 0cm 0 x 0 x 0"
4-3straps	---	--1	--2	---	---
224*3-	---	---	--3--	---	---
---	---	---	---	---	---
	---			---	---
Reinforced PVC -	--	--	--	--	--
					
of 4 attachment D-rings be used to clip to harness	-	-	-	-	-
protekt.pl		rockempire.com	rockempire.com		



WHITNEY PACK™ 2.0
Made for Multi-day Missions
cmcpro.com

