


WORLDWIDE ENVIRONMENTALLY RESPONSIBLE CLEANING TECHNOLOGIES

KYZEN.COM



METAL FINISHING
TECHNOLOGY

EDITION: AMERICA/ENGLISH



“For our metal parts customers, getting the cleaning science right is the first step, not the last. We understand real problem solving occurs where scientific innovation and genuine care converge.”

- Will Sweet, Regional Manager

Metal parts cleaning demands do not stop with a **“just clean enough”** part. Reliability and performance must be met consistently through a combination of improved cleaning processes, state-of-the-art cleaning agents and technical support. At KYZEN, our experts adapt to meet a wide range of manufacturing requirements and challenges. To do this, we:

- *Develop scientific processes that ensure you get the most dependable and efficient solution for your needs*
- *Provide easy access to cleaning experts who want to understand your specific applications, materials and challenges*
- *Analyze your cleaning problem to provide a well-informed solution*
- *Back up our globally recognized customer service by engineering the most effective metal cleaning technologies that meet production criteria*

This commitment to continuous improvement is what has helped customers around the world succeed in their businesses for more than three decades.

32+ YEARS **CLEANING EXPERIENCE**



PEOPLE STAY IN A
WORK ENVIRONMENT
THAT INSPIRES CARE,
VALUE AND INNOVATION.





ENVIRONMENTALLY FRIENDLY METAL PARTS CLEANING – WHEN AND WHERE YOU NEED IT

KYZEN provides customers around the world with access to cutting-edge cleaning application laboratories. Our experts have evaluated, developed and refined industrial cleaning processes for metal parts of all types, industries and shapes. We take a hands-on approach through on-the-ground support and technical assistance, no matter your location.

CLEANING EXPERTS ACROSS

30 STATES AND PROVINCES

13 COUNTRIES

5 APPLICATION LABORATORIES AROUND THE WORLD

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YOU BUILD THE BEST METAL FINISHING SOLUTIONS WHEN YOU CARE ENOUGH TO TACKLE THE HARDEST PROBLEMS.

The demands of metal finishing are broad and diverse. Whether you need routine parts cleaning, corrosion protection, adherence to MIL-SPEC requirements, automotive parts, the precision cleaning required by space systems or anything in between, KYZEN is here.

Our metal finishing solutions:

- ***Provide high reliability for every part, every time***
- ***Remove oils, coolants, smut, oxides, additives and abrasive compounds***
- ***Ensure surfaces are clean and smooth enough for finishing***
- ***Are designed to meet production criteria for whatever the next step is***

We also have excellent alternatives for banned and soon-to-be banned solvents due to regional EPA regulations. In addition, KYZEN offers a broad range of specialty metal finishing solutions, including stainless steel passivation, corrosion inhibitors for steel and yellow metals, modified alcohols, phosphating chemistry, defoamers, rinse aids and more.



“Your job depends on solving your cleaning problem – so does ours. Together we’ll work to understand and meet your cleaning needs to keep your production running.”

- Haley Reid, Chemist

TO SOLVE NEW PROBLEMS, YOU NEED NEW TECHNIQUES.

We know that parts cleaning processes and demands are not standing still. That’s why we take a custom approach to problem solve each unique application, process and industry.

Others may know you need an aqueous cleaning chemistry, but we also know:

- *Why you need it*
- *How it needs to work within your limitations*
- *The manufacturing requirements it needs to meet*
- *Your comfort level with using it*
- *Where the process problems are occurring*

**THIS KIND OF IN-DEPTH KNOWLEDGE OF YOUR BUSINESS,
TECHNICAL AND MANUFACTURING NEEDS IS ONLY ATTAINED
WHEN SCIENCE AND CARE CONVERGE.**



NEED TECHNICAL CLEANING GUIDANCE?

Whether you're looking to improve existing cleaning operations or start fresh, our cleaning experts are here to help. Contact your local KYZEN technical team for no-cost answers to your metal parts cleaning questions.



CONTACT:
+1 615 219 5107
Tech_Help@kyzen.com





PROCESS CONTROL & OPTIMIZATION

PROCESS CONTROL PRODUCTS

KYZEN PCS

The KYZEN PCS is a true process control system that monitors and automatically reacts to the dynamic changes that occur in wash bath concentration. The PCS will maintain your cleaning system set process parameters and optimize your chemical usage.

KAPTURE

This environmentally friendly recycling system separates soils from the solvent during the degreasing cleaning process. By continuously removing contaminants during normal vapor degreasing operation, this system enhances the overall solvent quality, keeps production interruptions to a minimum, and provides operational cost savings!

KYZEN DEMISTER

The KYZEN Demister significantly reduces the chemical consumption and emissions from your cleaning process. The Demister is specifically designed to combat evaporation and recover the lost cleaning solution, protecting the environment and reducing consumption.

KYZEN CCS

(Conductivity Control System)

Maintain an accurate chemistry concentration throughout your cleaning process and you'll improve performance and quality. Using the Conductivity Control System, you'll also reduce costs and increase safety by eliminating production interruptions and keeping workers' exposure to chemicals to a minimum.

KYZEN CHEMTROLLER

A reliable and simple to use automated chemical control system that works on a special water-driven proportioning pump. Easy to install, the KYZEN Chemtroller requires no electricity or compressed air connections as the incoming water pressure powers the positive displacement pump. The KYZEN Chemtroller is a high-quality stainless steel chemical proportioner that is compatible with all KYZEN chemistries.

PROCESS OPTIMIZATION SERVICES

CLEANING VALIDATION

KYZEN experts are here to help troubleshoot your cleaning process through any change to meet your end result requirements. Millipore testing, surface tension, visual and FTIR testing available in the KYZEN lab by experts in cleaning.

CONTRACT CLEANING

Expert cleaning services for unexpected production increases, new product implementation, or when you just don't have a cleaning process in place.

RISK-FREE TRIALS

Let our process engineers determine the best process parameters and chemistry to help achieve desired results.

ON-SITE PROCESS AUDITS

We come to you and review your cleaning process from start to finish. During an On-Site Process Audit, KYZEN's engineering and field support team will come to your facility and review chemistry usage, rinse water quality, nozzle pressures and alignment, exhaust balancing, amperage draw for motors and blowers and more.

CORROSION TESTING

Our Atmospheric Control Chamber creates tightly controlled, programmable hot/cold and humid atmospheres that may induce corrosion, rust and/or failure for clean parts for any end use. During testing, each metal part is checked for rust or corrosion. KYZEN corrosion inhibitors are thoroughly tested for long-term protection, so you have peace of mind.

CORROSION INHIBITORS

CORROSION INHIBITORS	MATERIAL			PROTECTION TYPE	
	STEEL	ALUMINIUM	BRASS / COPPER	AQUEOUS - DRY FILM	SOLVENT - DRY FILM
KYZEN® CP81	•	•	•		•
KYZEN® CP86	•	•	•		•
KYZEN® CP90N*	•			•	
KYZEN® CP90K	•			•	
KYZEN® CP90SA*	•			•	

CORROSION INHIBITORS

KYZEN® CP81 *(Corrosion Preventative Additive for Hydrocarbon Solvent)*

KYZEN CP81 is a heavy-duty dry film corrosion preventative. CP81 is a blend of organic inhibitors explicitly designed to be used with METALNOX® M6381 or other hydrocarbon solvents. KYZEN CP81 offers short term and long term protection on a variety of metal parts for indoor storage.

KYZEN® CP86 *(Corrosion Preventative Additive for Modified Alcohol Solvents)*

KYZEN CP86 is a heavy-duty blend of organic inhibitors specifically designed to be used with METALNOX® M6386 or other modified alcohol solvents. KYZEN CP86 offers short term and long term protection on a variety of metal parts for indoor storage.

KYZEN® CP90N* *(Amine-Free Aqueous Dry Film Corrosion)*

KYZEN CP90N is an amine free aqueous nitrite blend of inhibitors specifically designed for long term protection from oxidation during in-door storage. For long term protection, add 1-5% to the final rinse.

KYZEN® CP90K *(Aqueous Long-Term Dry Film Corrosion Preventative)*

KYZEN CP90K is an aqueous blend of organic and inorganic inhibitors specially designed for long term protection from oxidation during indoor storage. To prevent flash rusting of ferrous parts, add 1-3% CP90K to all wet stages.

KYZEN® CP90SA* *(Long Term Dry Film Corrosion Preventative)*

KYZEN CP90SA is a long term corrosion protection product proven effective in preventing rust or oxidation on all ferrous parts in the most humid environment, even during ocean freight shipment. KYZEN CP90SA also ships safely via airfreight.

*Approvals by one or more of the following: IMDS, ASTM, as well as various Aerospace and Automotive OEMs. Please contact your KYZEN representative for more details.

CLEANER & CORROSION INHIBITORS

CLEANERS WITH CORROSION PROTECTION	PROCESS			SOIL TYPE				MATERIAL		
	SPRAY SYSTEMS	ULTRASONIC CLEANING	IMMERSION WITH AGITATION	OILS/COOLANTS (POLAR)	OILS (NON-POLAR)	CARBON/SMUT/OXIDES	LAPPING BUFFING COMPOUNDS	STEEL/TITANIUM	ALUMINUM/ZINC/DIE CAST	BRASS/COPPER/BRONZE
METALNOX® M6310*	•	•	•	•	•	•	•	•	•	•
METALNOX® M6314CP	•	•	•	•	•	•	•	•	•	•
METALNOX® M6324CP*	•	•	•	•	•	•	•	•	•	•

CLEANERS WITH CORROSION PROTECTION

METALNOX® M6310* *(Mild Alkaline Cleaner with Aluminum/Brass Protection)*

METALNOX M6310 is a mild alkaline, aqueous cleaning chemistry designed to remove machining oils, burned on carbon and other manufacturing soils from all types of metal substrates. M6310 provides flash corrosion protection for steel and long term protection for aluminum, brass and copper alloys. METALNOX M6310 is highly effective on tungsten carbide and other metals susceptible to chemical attack.

METALNOX® M6314CP *(Aluminum-Safe, Mild Alkaline Parts Cleaner with Steel Rust Protection)*

METALNOX M6314CP is a multi-metal, alkaline cleaner/ inhibitor formulated to remove a variety of manufacturing oils used in a wide range of machining, stamping, and deep draw operations. M6314CP meets the demands of a cleaning process where aluminum and steel are cleaned in the same wash tool. METALNOX M6314CP is built with effective steel corrosion inhibitors to provide long term protection for both mild steel and cast steel.

METALNOX® M6324CP* *(Heavy-Duty Alkaline Industrial Parts Cleaner with Rust Protection)*

METALNOX M6324CP is a heavy-duty, alkaline cleaner/inhibitor formulated to remove chlorinated, paraffinic oils used in a wide range of machining, stamping, and deep draw operations. M6324CP is built with effective steel corrosion inhibitors to provide long term protection from rust. METALNOX M6324CP can also be added to both the wash and rinse stages of multi-stage cleaning systems.

**Approvals by one or more of the following: IMDS, ASTM, as well as various Aerospace and Automotive OEMs. Please contact your KYZEN representative for more details.*



AQUEOUS CLEANERS

METALNOX® M6040 (*Chelator / Silicate Free Aqueous Cleaner*)

METALNOX M6040 is a mild alkaline, multi metal safe cleaner used to remove manufacturing lubricants and similar contaminants used in typical metal machining and forming applications. METALNOX M6040 is free of chelators and silicates to provide an environmentally friendly solution. A versatile aqueous solution used in spray and immersion processes.

METALNOX® M6093‡ (*Safe Citric Acid Cleaner / Oxide Remover / SS Passivation*)

METALNOX M6093 is a citric acid formulation designed to be effective on metal oxides, scale, rust, carbonaceous soils and other industrial soils. It can be used on a variety of metals including steel and aluminum.

METALNOX® M6094 (*Heavy-Duty Citric Acid Cleaner / Oxide Remover*)

METALNOX M6094 is a mild citric acid formulation designed to be effective in the removal of metal oxides from yellow metals. It can be used in both spray and immersion cleaning systems. It's safe and can be used on a variety of metals including steel, aluminum, brass, and copper.

METALNOX® M6314 (*Mild Alkaline All-Metal Cleaner*)

METALNOX M6314 is a safe, all-purpose aqueous cleaner, specifically designed to clean a broad range of both water soluble and insoluble oils. It is a very low solids product and is often used without a rinse, even prior to coating.

METALNOX® M6319NA (*Aqueous Alkaline Industrial Parts Cleaner*)

METALNOX M6319NA is a heavy-duty, low foaming mild alkaline chemistry designed to clean a wide range of machining oils and greases from metal parts for steel, ferrous, copper and many alloys.

METALNOX® M6321 (*High Alkaline Cleaner for Carbonaceous Soils*)

METALNOX M6321 is an aqueous blend specially designed for heavy-duty cleaning of carbonaceous soils resulting from deep draw, laser cutting, welding, brazing and other similar operations.

METALNOX® M6324R (*Heavy-Duty Aqueous Alkaline Cleaner*)

METALNOX M6324R is a high alkaline, aqueous cleaner specially designed for heavy-duty cleaning of oils, greases, oxides and carbon. METALNOX M6324R is effective in high speed stamping and deep draw applications.

METALNOX® M6324US (*Heavy-Duty Alkaline Immersion and Ultrasonic Cleaner*)

METALNOX M6324US is a high strength, high alkaline, aqueous cleaning chemistry which contains chemical components designed for ultrasonic and other immersion cleaning systems.

METALNOX® M6440 (*Neutral pH Ultrasonic Immersion Cleaner for Buffing / Lapping Compounds*)

METALNOX M6440 is a safe, neutral pH cleaning chemistry designed for removal of buffing compounds and metal oxides. METALNOX M6440 is safe for all of the metals commonly found in the medical implant and device industries.

‡Product meets in-vitro cytotoxicity acceptance criteria



AQUEOUS CLEANERS

AQUEOUS CLEANERS	PROCESS			SOIL TYPE				MATERIAL		
	SPRAY SYSTEMS	ULTRASONIC CLEANING	IMMERSION WITH AGITATION	OILS/COOLANTS (POLAR)	OILS (NON-POLAR)	CARBON/SMUT/OXIDES	LAPPING BUFFING COMPOUNDS	STEEL/TITANIUM	ALUMINUM/ZINC/DIE CAST	BRASS/COPPER/BRONZE
METALNOX® M6040	•	•	•	•	•			•	•	•
METALNOX® M6093‡	•	•	•			•			•	•
METALNOX® M6094	•	•	•	•	•	•			•	•
METALNOX® M6314	•	•	•	•	•			•	•	•
METALNOX® M6319NA	•		•	•	•			•		•
METALNOX® M6321	•		•	•	•	•		•		•
METALNOX® M6324R	•		•	•	•	•	•	•		•
METALNOX® M6324US		•	•	•	•	•	•	•		•
METALNOX® M6440		•	•	•			•	•	•	•

‡Product meets in-vitro cytotoxicity acceptance criteria



SPECIALTY APPLICATIONS

METALNOX® M6060 *(Iron Phosphatizing Solution and Cleaner)*

METALNOX M6060 is an effective, pre-coating treatment chemistry for both aluminum and steel. It is used prior to coating operations for cleaning and phosphatizing, or strictly phosphatizing.

METALNOX® M6091 *(Strong Mineral Acid Rust / Scale Remover and Tank Neutralizer)*

METALNOX M6091 is a strong aqueous acid blend with a pH of 1. METALNOX M6091 has a specially selected blend of organic and mineral acids, inhibitors and surfactants designed to be effective on metal oxides, scale, lime deposits, particulates, and other inorganic soils.

METALNOX® M6093‡ *(Safe Citric Acid Cleaner / Oxide Remover / SS Passivation)*

METALNOX M6093 is a citric acid formulation designed to be effective on metal oxides, scale, rust, carbonaceous soils and other industrial soils. METALNOX M6093 can also be used on a variety of metals including steel and aluminum.

METALNOX® M6422 *(Safe, Non-Acid / Thermal Deburr Oxide Remover)*

METALNOX 6422 is an aqueous blend chemistry designed to clean and prepare extruded aluminum surfaces. M6422 effectively cleans and removes machining contaminants, and aluminum oxide, in order to enhance subsequent automated welding, and coating operations.

METALNOX® M6318* *(Mil-Specification Compliant Alkaline Precision Cleaner)*

METALNOX M6318 is designed to clean aluminum, titanium and other materials commonly used in the military and aerospace industries. METALNOX M6318 was tested and conforms to many ASM and ASTM specifications including ASTM F-1110 (Sandwich Corrosion).

METALNOX® M6353‡ *(Aqueous Cleaner for Remanufacturing)*

METALNOX M6353 is a heavy-duty cleaning chemistry designed to meet the stringent demands of automotive remanufacturing operations. M6353 effectively removes heavily burned-on oils and carbon from aluminum and steel parts without damaging or discoloring. METALNOX M6353 is highly concentrated and provides for an exceptionally long bath life.

METALNOX® M6355‡ *(Multi-Metal Safe Aqueous Cleaner)*

METALNOX M6355 is a heavy duty cleaning chemistry that effectively removes oils and carbon from heavily soiled parts in remanufacturing operations without damaging or discoloring them. M6355 is formulated to be compatible with both steel and aluminum parts. M6355 is designed for spray-in-air, rotary basket and immersion cleaning systems. M6355 is a concentrated solution providing an exceptionally long bath life.

METALNOX® M6431* *(Aqueous Immersion Cleaner Concentrate)*

METALNOX M6431 is designed to replace caustic degreasers. Safely cleans ferrous and non-ferrous alloys including aluminum, and titanium. M6431 is an approved cleaner used in the manufacture and overhaul of aircraft parts. METALNOX M6431 is an environmentally friendly water based cleaner with excellent rinse-ability and worker safety benefits.

**Approvals by one or more of the following: IMDS, ASTM, as well as various Aerospace and Automotive OEMs. Please contact your KYZEN representative for more details.*

‡Product meets in-vitro cytotoxicity acceptance criteria



SPECIALTY APPLICATIONS

SPECIALTY APPLICATIONS

PROCESS TREATMENT

SOIL TYPE

MATERIAL

	SS PASSIVATION	PHOSPHATING	AEROSPACE / MIL-SPEC	RUST / SCALE REMOVER	REMANUFACTURING	THERMAL DEBURRING	PRE WELDING/ COATING	OILS/COOLANTS (POLAR)	CARBON/SMUT/ OXIDES	ABRASIVE COMPOUNDS	STEEL/TITANIUM	ALUMINUM/ZINC/ DIE CAST	BRASS/COPPER/ BRONZE
METALNOX® M6060		•					•	•	•		•	•	
METALNOX® M6091				•	•	•			•	•	•		
METALNOX® M6093‡	•			•					•			•	•
METALNOX® M6422	•						•	•	•		•	•	•
METALNOX® M6318*			•				•	•			•	•	•
METALNOX® M6353‡					•	•	•	•			•	•	•
METALNOX® M6355‡					•	•	•	•		•	•	•	•
METALNOX® M6431*			•				•	•			•	•	•

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‡Product meets in-vitro cytotoxicity acceptance criteria



SOLVENTS / MODIFIED ALCOHOLS

METALNOX® M6900* (*Engineered Vapor Cleaning Solvent*)

METALNOX M6900 is an engineered vapor cleaning solvent designed to clean a variety of oils, wax, pitch, greases and additional soils common to aerospace and other precision optical and metal manufacturing applications. METALNOX M6900 is a safe alternative drop in replacement for nPB, TCE and other similar solvents in many cleaning applications.

METALNOX® M6920*‡ (*VOC Free – Green and Clean – Solvent*)

METALNOX M6920 is a VOC-Free, highly effective and nonflammable cleaning solution, with low global warming potential of 1. With these exceptional environmental properties and good solvency, this is an excellent choice for a variety of cleaning applications. NASA approved (SPEC-3709) as a Grade B commercial standard NVR level for general use.

METALNOX® M6922* (*VOC Compliant – Green and Clean – Solvent*)

METALNOX M6922 is a highly effective cleaning solution that is non-flammable, has favorable toxicity properties and has low global warming potential. METALNOX M6922 effectively solubilizes ionic contaminants in hydrocarbon-based oils and water soluble soils. It is an azeotropic mixture that provides superior cleaning performance with environmental and safety attributes. In addition it has low VOC content of <25 grams per liter.

Honeywell Solstice® PF-HP* (*Environmentally Safe HFO Solvent Cleaner*)

Honeywell's Solstice PF-HP (High Performance) is an ultra-clean (very low non-volatile residue content (<2 ppm NVR), highly-effective, nonflammable cleaning solution, with a favorable toxicity profile and low environmental impact. Solstice PF-HP is a pure component solvent that contains no stabilizers or additives. NASA approved (SPEC-3709) as a Grade A "preferred replacement solvent" for cleaning and non-volatile residue (NVR) verification sampling of NASA propulsion oxygen systems hardware.

METALNOX M6381*‡ (*Precision Hydrocarbon Solvent Cleaner*)

METALNOX M6381 is an aliphatic hydrocarbon blend specially designed for heavy-duty cleaning of oils, waxes, grease and shop dirt while being safe on ferrous, copper alloys, magnesium, aluminum, plastics rubbers, glass and ceramics.

PROCESS SUPPORT PRODUCTS AVAILABLE: KYZEN Booster 81 is designed to be added to the wash solution to stop the formation of and neutralize acidic materials that may form in degreasing systems as needed based on acid acceptance values measured via the **KYZEN Acid Stabilizer Kit 81**.

METALNOX M6386*‡ (*Modified Alcohol Solvent for Polar and Non-Polar Soils*)

METALNOX M6386 is a modified alcohol based solvent cleaning blend designed to clean a wide range of polar and non-polar oils and coolants, from steel, brass, aluminum and all other metals.

PROCESS SUPPORT PRODUCTS AVAILABLE: KYZEN Booster 86 is designed to be added to the wash solution to stop the formation of and neutralize acidic materials that may form in degreasing systems as needed based on acid acceptance values measured via the **KYZEN Acid Stabilizer Kit 86**.

**Approvals by one or more of the following: IMDS, ASTM, as well as various Aerospace and Automotive OEMs. Please contact your KYZEN representative for more details.*

‡Product meets in-vitro cytotoxicity acceptance criteria



SOLVENTS / MODIFIED ALCOHOLS

SOLVENTS / MODIFIED ALCOHOLS	PROCESS		SOIL TYPE		MATERIAL		
	VACUUM DEGREASING	VAPOR DEGREASING	OILS/COOLANTS (POLAR)	OILS (NON-POLAR)	MAGNESIUM/STEEL/ TITANIUM	ALUMINIUM/ZINC/DIE CAST	BRASS/COPPER/ BRONZE
METALNOX® M6900*		•		•	•	•	•
METALNOX® M6920*‡		•	•	•	•	•	•
METALNOX® M6922*		•	•	•	•	•	•
HONEYWELL SOLSTICE® PF-HP*		•	•	•	•	•	•
METALNOX® M6381*‡	•			•	•	•	•
METALNOX® M6386*‡	•		•	•	•	•	•

*Approvals by one or more of the following: IMDS, ASTM, as well as various Aerospace and Automotive OEMs. Please contact your KYZEN representative for more details.

‡Product meets in-vitro cytotoxicity acceptance criteria





Because we want you to achieve the highest levels of performance, we connect care with leading science to continuously improve, problem solve and create the most effective cleaning solutions to suit your specific needs.



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