PACKAGING SUPPLIERS GLOBAL

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INSIDE

Pharmaceutical & Healthcare packaging

— featuring PHARMAP 2026

AI, sustainability and patient-centricity insights from a leading European pharma event

The Packaging Cooperative: The future of healthcare and pharmaceutical packaging

Ton's take: Pharmaceutical packaging – Looking beyond the pack

PHARMAP 2027

NAVIGATE THE PHARMACEUTICAL WORLD

19-20 APRIL 2027
BERLIN, GERMANY

PHARMACEUTICAL MANUFACTURING AND PACKAGING CONGRESS 2027

KEY TOPICS

- Pharmaceutical manufacturing and packaging operations
- Outsourcing and contract manufacturing models in pharma
- Facility design, engineering and CAPEX-driven modernisation
- Supply chain resilience, procurement and risk management
- Digitalisation, automation and Pharma 4.0 initiatives
- Sustainability, ESG and regulatory developments shaping the industry

AUDIENCE

- Pharmaceutical companies
- CMOs and CDMOs
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- Service companies
- Software companies
- Equipment manufacturers

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Contents
& features

Welcome to our pharmaceutical and healthcare packaging issue, where the spotlight falls on the innovations, regulations and global trends shaping one of the packaging industry's most demanding markets.

As healthcare supply chains become increasingly complex, packaging continues to play a vital role in product protection, patient safety and regulatory compliance. This issue explores key topics influencing the industry, including serialisation, traceability and the impact of geopolitical change on pharmaceutical and medical device development.

Our PHARMAP 2026 post-show feature highlights discussions around AI, sustainability and patient-centricity from one of Europe's leading pharma events, while Ton's take draws on his experience as a speaker to consider pharmaceutical packaging beyond the pack itself. Together, these features reflect an industry focused on innovation, resilience and future readiness.

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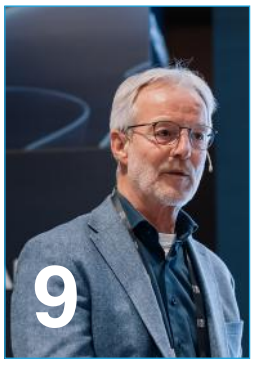

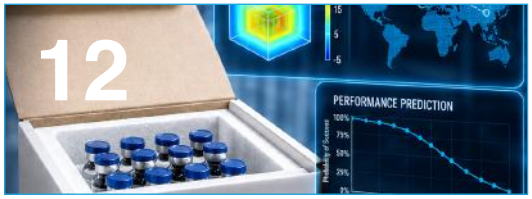

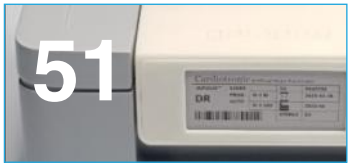

PHARMAP 2026

AI, sustainability and patient-centricity insights from a leading European pharma event

Bayer, Esteve, Roche and 180+ most influential decision-makers of European pharma gathered on 20-21 April in Amsterdam for the 6th edition of PHARMAP Congress. The event focused on the topics currently shaping the sector: Pharma 5.0, outsourcing, continuous manufacturing, sustainable packaging, AI-driven operations, patient centricity and practical case studies from leading pharma companies.

PHARMAP 2026 was supported by Astellas Pharma Europe B.V., GSK, ESTEVE, Laboratoires Théa and Recipharm as Regional Partners, reinforcing the event's role as one of the key European platforms for pharmaceutical dialogue.

Making pharma connected

European pharma is operating in a period of intense transformation. Companies are balancing AI-driven precision, supply chain resilience, personalised medicine, ESG goals, regulatory pressure and financial constraints – often all at once.

For many organisations, the challenge is no longer only about finding the right technology or internal process. It is also about finding the right partners. Outsourcing, strategic collaboration and long-term supplier relationships are becoming essential parts of pharma's operational model with 67% of pharma

companies now outsourcing their operations. PHARMAP 2026 placed this industry imperative front and centre with a dedicated Leaders Talk on forging win-win partnerships. Ulrich Rümenapp, Senior Biotech Program Lead at Bayer, shared Bayer's strategic approach to outsourcing CMC development and GMP manufacturing of biologics, while Sebastian Mueller, Director Specialised Business Development at Vetter Pharma, explored the evolution from transactional vendor to long-term value creator in injectables partnerships.

This urgency for reliable partnerships made PHARMAP one of the key networking events in the pharmaceutical sector, with over 220 facilitated B2B meetings across two days, helping pharma specialists connect around practical operational challenges.

> *"There are quite a lot of companies, and it is good to meet companies that are of particular interest to us. There is a team here that works really hard to make that happen - they introduce and bring to us the people we need to see or take us to meet them.*
>
> **– Simon Cavanagh, Strategic Accounts Executive, Pharmaceutical at Esko.**

Rethinking pharma packaging for patients

Beyond operational partnerships, PHARMAP 2026 turned a sharp focus to the physical interface between patients and products – packaging. With the Packaging and Packaging Waste Regulation (PPWR) reshaping sustainability mandates and patient centricity driving usability demands, the industry is rethinking packaging as a critical touchpoint. The Congress brought together a wide audience of pharma packaging experts - heads of artwork and packaging development, packaging engineers, directors of packaging and labelling to provide a clear overview of the next steps in pharmaceutical packaging.

One of the key messages came from Simon Pickard, Human Factors Director at AstraZeneca UK Ltd, who positioned human factors as the missing link in packaging innovation. His presentation highlighted that true patient-centric design must go beyond the device itself. Packaging, instructions for use and digital touchpoints should not be treated as separate elements, but as one integrated user interface.

In this context, tactile cues, clear labelling, QR codes and app-based guidance can work together to reduce cognitive load, support correct use and prevent errors.

Artificial Intelligence was also discussed as a tool for making pharma packaging more inclusive. Zaida Navarro, Packaging Material Engineer at Ferrer, shared how Ferrer has begun working with optical character recognition technology to support smart, personalised packaging. By adapting how information is presented or accessed digitally, packaging can become easier to use for patients with low vision, cognitive challenges or language barriers.

Navarro also stressed that inclusive packaging should consider Braille, raised symbols, large fonts, bright colours and intuitive opening mechanisms – with AI helping to scale these adaptations more intelligently.

Meeting pharma sustainability deadline

While patient-centric packaging addresses the usability of pharma products, the materials are being rewired by regulations. With the WHO establishing new standards and guidance for sustainable manufacturing and packaging and PPWR demanding all materials to be recyclable by 2030, the deadline for a green industry is nearing.

To move sustainability from a slide deck to the production line, PHARMAP 2026 dedicated a Panel Discussion on *"Driving Sustainability in Pharma: Strategies for a Greener Tomorrow"*.

Jürgen Bodenmüller, Director of Business Development at SÜDPACK Medica AG, shared concrete success stories from the transition to a circular and bioeconomy in pharma. He presented SÜDPACK's advanced mono-PE film for pharmaceutical applications, a breakthrough that delivers PA/PE-like mechanical performance while supporting full recyclability. Crucially, this film is formulated with high focus on eliminating UV stabilisers, slip/antistatic agents, amide-based additives, magnesium-based antiblock additives, BHT and animal-derived calcium stearates.

Complementing the packaging focus, Carlos García, Global EHS Governance Manager at ESTEVE, shifted the lens to manufacturing's broader environmental footprint as the healthcare sector is responsible for 5% of global emissions. García stressed that while 50% of top pharma companies have declared net-zero commitments, the real "ghost in the room" remains Scope 3 emissions. The solution is moving beyond aggregated corporate reporting to Product Carbon Footprint (PCF) metrics, which provide the granularity needed to guide R&D, operations and procurement decisions. The message was clear: design lower-carbon products from the start, change how processes are run even when that means regulatory adaptation, make sustainability a binding requirement in contracts and sourcing and reward faster action rather than penalising early movers.

The panel showed that pharma sustainability has moved beyond pilot projects. The next stage is scaling circular packaging, product-level decarbonisation and lower-carbon decision-making across entire portfolios.

Scaling smart manufacturing – AI, digital twins, serialisation

Pharmaceutical companies in Europe are facing significant hurdles in digitalising their manufacturing processes, with studies indicating

that 73% of digital transformations fail. To equip pharma with the right technologies and expertise, PHARMAP 2026 united IT specialists, quality leaders and manufacturing executives in a focused technology showcase that moved the conversation from theory to practice.

At the Focus Exhibition, Ample Logic took centre stage with live demos of digital Quality Management Systems (QMS), Continued Process Verification (CPV) and Annual Product Quality Review (APQR) platforms. Participants saw firsthand how AI-driven automation can streamline quality operations, reduce manual oversight, and ensure continuous compliance – turning regulatory obligations into competitive advantages.

Identiv showcased the cutting edge of smart packaging and traceability with live demonstrations of NFC, HF, BLE and UHF innovations. From near-field communication tags that authenticate products and engage patients via smartphone, to ultra-high frequency RFID enabling real-time inventory visibility across global supply chains, the demos proved that intelligent packaging is no longer a concept – it's deployable today.

Together, these technologies are building the foundation of Pharma 5.0: a fully connected, intelligent and resilient industry. AI handles the complexity of data, digital twins simulate the consequences of every decision and serialisation ensures that every product is authentic, traceable and safe.

Looking ahead: PHARMAP 2027 in Berlin

The main question across PHARMAP 2026 was not whether European pharma needs to transform. The question was how to make this transformation practical, scalable and sustainable. With PPWR deadlines approaching, AI reshaping operations and geopolitical tensions, the industry needs more than theory – it needs validated, scalable solutions.

PHARMAP 2026 equipped pharma leaders with these actionable strategies as procurement specialists, manufacturing experts, packaging leads, data professionals and quality executives left Amsterdam with new partnerships, tested roadmaps and technology implementation plans.

The success of the 6th edition – over 220 B2B meetings and 45+ expert presentations featuring proven case studies – has set a new benchmark. With that, PHARMAP moves to Berlin in 2027.

On 19–20 April 2027, the German capital will host the next edition of PHARMAP, bringing the European pharma community together once again. The Congress will build on the strongest outcomes of the Amsterdam edition, scale proven cases and address the next wave of challenges in pharmaceutical manufacturing and packaging. The event will be hosted with the support of GSK as a Regional Partner and Bayer AG as the Official Host Sponsor. Early commitments have also come from allpack group, NTC Pharma, RidNova Pharmaceuticals, SUDPACK Medica AG and other industry players.

Registration for PHARMAP 2027 is already open. Join key pharma decision-makers in Berlin on 19–20 April 2027 and be part of the conversations shaping the future of European pharmaceutical manufacturing and packaging.

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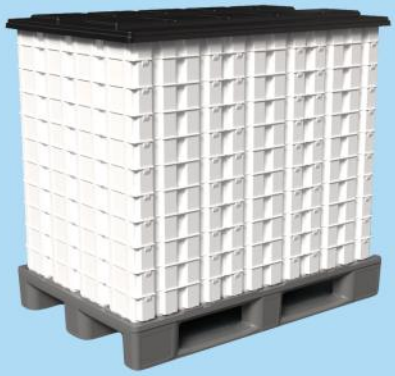

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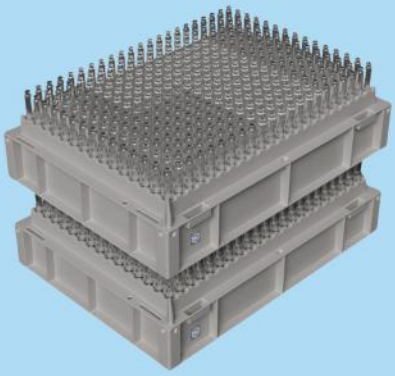

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Ton's take I PHARMAP 2026 Pharmaceutical packaging: looking beyond the pack

Ton Knipscheer, Packaging Consultant, TK Packaging Consulting.

Dear Packaging Suppliers Global reader,

Over the past 35 years, I have had the privilege of seeing the packaging industry from many different perspectives.


Chakravarthi AVPS, Pharma PassionPreneur with Ton Knipscheer.

I have worked for packaging manufacturers, supported global brand owners, collaborated with technology providers, advised investors, worked alongside co-packers and contract manufacturers, and for more than 10 years have been active as an independent packaging consultant through TK Packaging Consulting.

That journey has taken me across Europe and far beyond, working with businesses of all sizes, from family-owned companies to multinational organisations.

One thing I have learned along the way is that every sector believes its challenges are unique. And yet, when you look closely enough, many industries are wrestling with remarkably similar questions.

That thought came back to me during PHARMAP 2026 in Amsterdam, one of Europe's leading events for pharmaceutical manufacturing,

Cédric Colon, Global Process Lead at GSK and Chakravarthi AVPS.

contract manufacturing and pharmaceutical packaging.

I was invited to contribute to a presentation and panel discussion on changing supply chains and the growing role of specialised partners within modern manufacturing networks.

While the setting was pharmaceutical and healthcare packaging, much of what was discussed reflected developments I have witnessed throughout the wider packaging industry for decades.

The sector may be different. The underlying forces are not.

A changing industry

The pharmaceutical and healthcare industries are facing significant pressure.

Regulations continue to expand. Supply chains remain vulnerable to growing geopolitical uncertainty. Product portfolios are becoming increasingly complex. Patient expectations are changing. And organisations are expected to deliver all of this while maintaining the highest possible standards of quality, compliance and safety.

None of these challenges exist in isolation. Together, they create an environment where complexity grows faster than many organisations can comfortably manage.

What struck me during PHARMAP was how frequently conversations moved beyond packaging itself.

The real discussions were about flexibility, resilience, speed and managing uncertainty. In other words, about supply chains.

The limits of ownership

For many years, success in manufacturing was often associated with ownership.

Own the factory. Own the equipment. Own the capacity. Control the process.

That model worked well in a relatively stable world.

Today's environment is different.

Demand fluctuates more rapidly. Product life cycles are shorter. Markets are becoming increasingly fragmented. Regulatory requirements evolve continuously. And the pace of innovation continues to accelerate.

In such an environment, flexibility often becomes more valuable than ownership.

This is one of the reasons why specialised contract manufacturers, co-packers and external packaging partners are playing an increasingly important role across multiple industries.

The pharmaceutical sector is no exception.

In fact, many pharmaceutical companies are now facing the same strategic questions that food, beverage and consumer goods companies have been addressing for years.

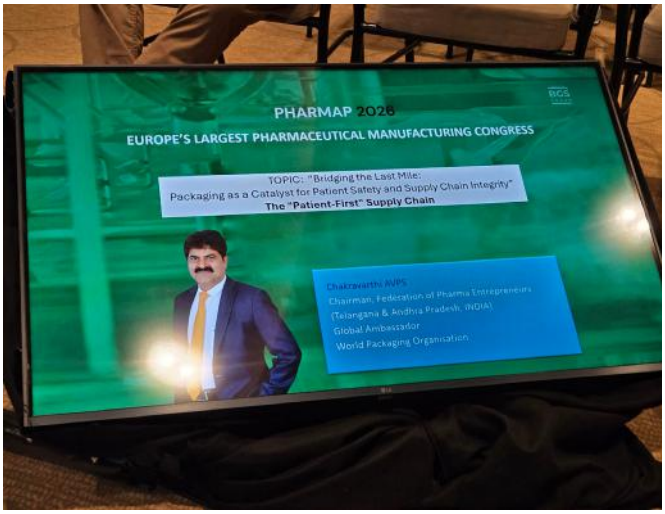
Where should capacity sit? What should remain in-house? Which activities are better managed by specialised partners? How can businesses remain agile without carrying excessive fixed costs?

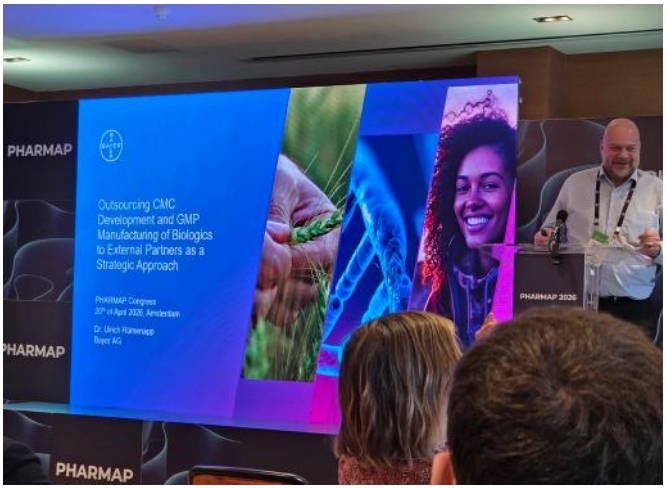
These are no longer operational questions. They are strategic ones.

No material is THE answer

Another lesson reinforced during PHARMAP is one I have often shared throughout my career.

There is no such thing as a perfect packaging material.





Throughout the years I have worked with plastics, fibre-based materials, metals, glass and emerging technologies.

Each material has strengths. Each has limitations. Each performs differently depending on the product, the supply chain, regulatory requirements and commercial objectives involved.

As an independent consultant, I consider myself material agnostic.

Not because materials are unimportant. Quite the opposite.

They are critically important.

But successful packaging decisions are rarely driven by materials alone.

The best solutions emerge when businesses understand the entire system around the package. That includes manufacturing, distribution, regulation, consumer behaviour, sustainability objectives and, increasingly, supply chain resilience.

The package itself is only one part of a much larger equation.

Packaging as a strategic function

One of the most interesting developments I have observed over recent years is the growing recognition that packaging is no longer simply the final stage of production.

Packaging now influences far more than product protection.

It affects operational efficiency, regulatory compliance, patient safety, product security, supply chain performance, sustainability targets and, ultimately, market success.

The most successful organisations increasingly involve packaging expertise much earlier in decision-making processes. Not after the product has been developed. Not after manufacturing decisions have been made. But at the beginning.

Because by that stage, packaging is no longer merely supporting the supply chain. It is helping shape it.

Looking ahead

Having spent decades working across packaging, manufacturing and supply chains, I remain convinced that the future belongs to organisations that can adapt faster than their competitors.

Not necessarily the biggest. Not necessarily the most vertically integrated. But the most agile.

The pharmaceutical sector has always been defined by innovation.

Today, that innovation extends beyond medicines and therapies. It increasingly includes the way products are manufactured, packaged and delivered to patients around the world.

PHARMAP 2026 demonstrated that this transformation is already underway.

The conversations taking place were not simply about packaging technologies or manufacturing processes. They were about building supply chains capable of thriving in a world that is becoming more complex, more regulated and less predictable.

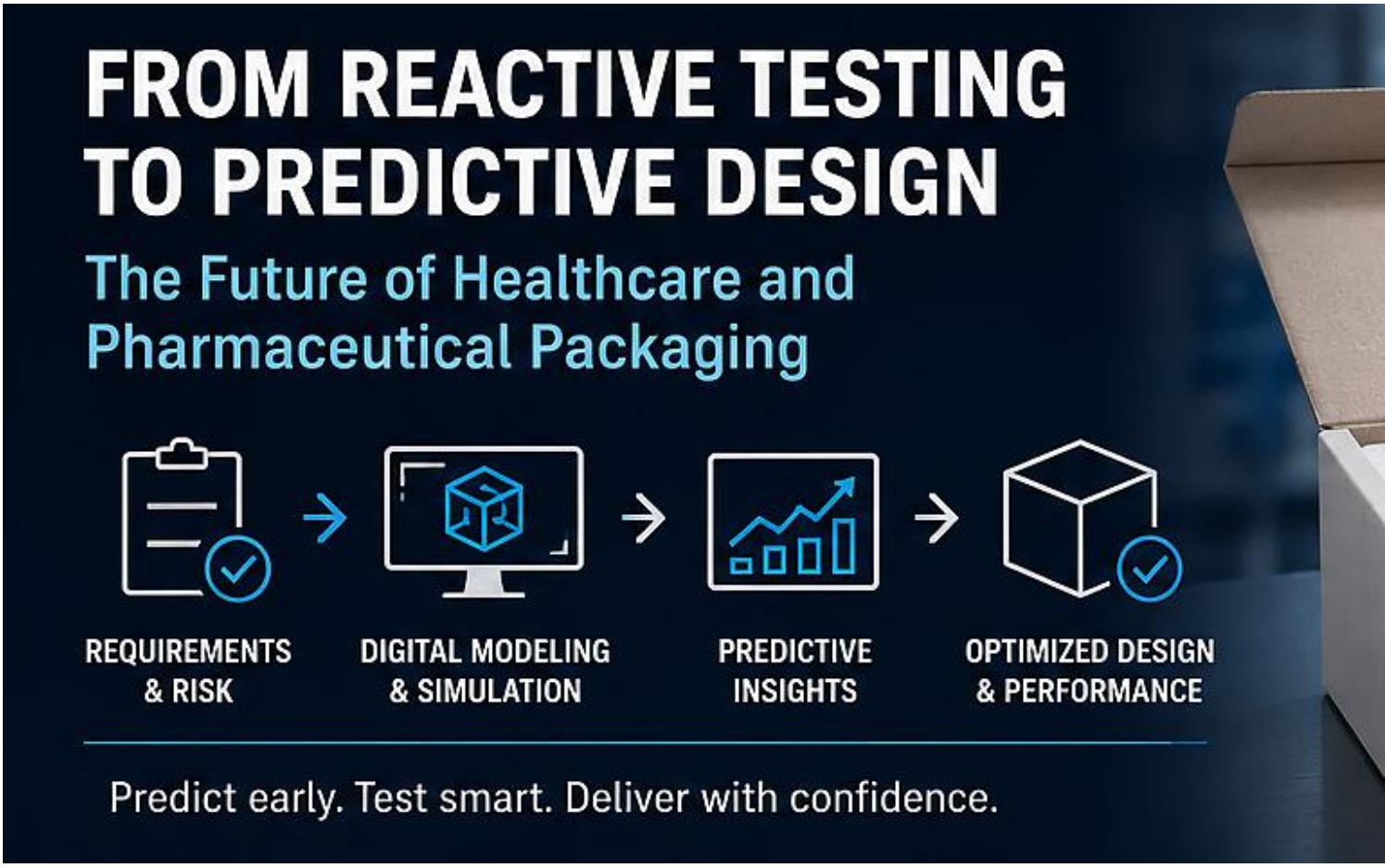
And that may be the most important lesson of all.

Because the future of pharmaceutical packaging is not only about what happens inside the package.

It is about everything that happens around it.

If you have any thoughts or comments on this topic, feel free to reach out to me via LinkedIn: www.linkedin.com/in/tonknipscheer/

Nanne Onland, Founder and Managing Partner at E-Gateway, Cédric Colon, Chakravarthi AVPS and Ton Knipscheer.



The future of healthcare and pharmaceutical packaging

Moving from reactive qualification to predictive design

Healthcare and pharmaceutical packaging is undergoing a significant transformation as advanced therapies, temperature-sensitive products, and increasingly complex supply chains drive the need for more sophisticated packaging systems. As biologics, cell and gene therapies, specialty injectables, and temperature-sensitive products become more complex in design, function, and distribution, the packaging systems that protect them must evolve as well. Traditional development methods based on physical trial-and-error testing are no longer sufficient for modern pharmaceutical supply chains.

Currently, packaging engineers must address multiple challenges simultaneously. These include maintaining product stability, meeting global regulatory requirements, reducing qualification timelines, improving supply chain reliability, lowering environmental impact, and supporting increasingly fragile therapies. The result is a major shift toward predictive packaging development powered by digital engineering, simulation technologies, and data-driven qualification strategies.

For years, pharmaceutical packaging programs followed a reactive development model, designing and building packaging systems after key design decisions had already been made. Then, during qualification or shipping validation, failures occurred, resulting in costly redesigns, delayed

launches, and repeated testing cycles.

The industry is increasingly adopting predictive design methods that incorporate modelling, simulation, and systems engineering early in development. Digital engineering tools help packaging teams assess thermal and mechanical performance before producing physical prototypes. Thermal simulation software can forecast temperature behaviour during shipping, seasonal changes, and specific lane risks. Mechanical modelling allows evaluation of compression strength, vibration response, drop resilience, and material distribution prior to tooling. To unify these efforts, Model-Based Systems Engineering (MBSE) uses formalised digital models to document, manage, and verify complex systems throughout their life cycle, supporting requirements, traceability, and verification activities to ensure design decisions, constraints, and verification measures are consistently applied.

This shift is especially important for cold chain pharmaceutical packaging. Temperature-controlled distribution has become one of the fastest-growing segments in healthcare packaging, driven by the expansion of biologics, GLP-1 therapies, personalised medicine, and direct-to-patient delivery models. Unlike traditional pharmaceutical products, these therapies have narrow temperature stability ranges and limited allowable time outside temperature control.

A single thermal excursion can result in product loss, regulatory risk, and patient impact. As a result, pharmaceutical companies are increasingly using predictive thermal modelling alongside physical testing standards. Rather than relying solely on laboratory qualifications after development is complete, engineering teams can now evaluate packaging configurations, refrigerant quantities, insulation systems, and shipping lane risks during the earliest design phases. This creates significant advantages. Packaging teams can now identify weak points before qualification begins, optimise refrigerant use, reduce package size, and shorten development timelines. Simulation also enables organisations to evaluate “what-if” scenarios that would be difficult or expensive to replicate physically, such as shipping delays, extreme summer conditions, or repeated handling events.

The integration of MBSE is further expanding these capabilities. MBSE platforms create digital frameworks that connect user requirements, qualification protocols, risk assessments, simulations, and testing results into a unified

system. Rather than managing disconnected spreadsheets, protocols, and reports, companies can establish digital traceability throughout the packaging lifecycle, creating the foundation for a digital twin of the packaging system.

For pharmaceutical organisations operating under FDA and global regulatory scrutiny, this level of traceability is becoming increasingly valuable. Digital engineering also supports the broader Pharma 4.0 initiative currently reshaping the healthcare industry. Pharma 4.0 focuses on integrating automation, connected systems, analytics, and digital technologies across manufacturing and supply chain operations. Packaging is becoming a critical part of that transformation.

Smart packaging systems now incorporate real-time temperature monitoring, connected sensors, serialisation, and digital supply chain visibility tools. Combined with predictive analytics, these technologies help organisations proactively detect distribution risks before compromising product integrity.

Sustainability is also influencing healthcare packaging development. Pharmaceutical companies are under increasing pressure to reduce packaging waste, lower transportation emissions, and improve material efficiency without compromising patient safety. This accelerates the development of new cold-chain systems, materials, and optimised distribution strategies.

However, sustainability initiatives in healthcare packaging cannot come at the expense of qualification performance. Engineers must balance environmental goals with strict thermal, mechanical, and regulatory requirements.

The future of healthcare packaging will belong to organisations that successfully integrate predictive engineering, digital qualification strategies, and real-world supply chain data into their development process. Packaging is becoming a connected, engineered system that directly supports product quality, regulatory compliance, operational efficiency, and patient safety.

As pharmaceutical products continue to increase in complexity, packaging technology must evolve at the same pace. Organisations that embrace predictive engineering, digital qualification strategies, and integrated systems modelling will be better positioned to reduce risk, accelerate commercialisation, improve supply chain resilience, and support the next generation of advanced therapies.

This article was contributed by The Packaging Cooperative, a specialist consultancy focused on packaging engineering and innovation. Learn more at: www.pkgco-op.com

TPC | The Packaging Cooperative

Advanced manufacturing process for EZ-fill® cartridges

Stevanato Group and Syntegon join forces to drive innovation

By Markus Burkert, Product Manager Cartridges at Syntegon Technology

Primary packaging provider Stevanato Group has teamed up with equipment supplier Syntegon to develop an advanced manufacturing process for Stevanato Group's EZ-fill® cartridges. The result: containers of the highest possible quality, which support pharmaceutical manufacturers in complying with Annex 1 requirements.

Type 2 diabetes and obesity are not only widespread and increasing continuously; they are also partly interrelated.

According to the International Diabetes Federation, 589 million people worldwide are currently living with diabetes, more than 90 percent of whom have type 2. In parallel, the World Obesity Federation estimates that around four billion people – half of the world's current population – could be severely overweight by 2035. Fortunately, the market for Glucagon-like peptide-1 (GLP-1) agonists is expanding considerably and offers patients more effective control options. These pharmaceuticals are usually administered via auto-injectors or pens with ready-to-use containers, i.e. syringes or cartridges. Consequently, the demand for these RTU containers is also rising considerably.

RTU containers on the rise

This is not surprising, as pharmaceutical manufacturing companies benefit from simpler processing procedures, reduced total cost of ownership, and greater flexibility. While pre-filled syringes paved the way as early as the 1980s, RTU vials and cartridges are also becoming increasingly popular. Numerous upstream steps, such as cleaning, depyrogenation, and sterilisation of components, are outsourced to the primary packaging suppliers, who make sure that all processes are qualified and validated according to current global requirements. One of these suppliers is Stevanato Group.

Founded in 1949, Stevanato Group is a leading global provider of drug containment, drug delivery, and diagnostic solutions to the pharmaceutical, biotechnology, and life sciences industries. With the EZ-fill® platform, Stevanato Group offers its customers a fully integrated pre-sterilised solution for aseptic manufacturing, including vials, cartridges, and syringes.

> *"We strive to support our customers in achieving the highest possible product quality. Hence, we are constantly looking to improve our own manufacturing to match the standards of their fill-finish processes.*
>
> **– Daniel Martinez, Senior Director Product Management DCS at Stevanato Group.**

Cartridge crimping in an isolator environment

Stevanato Group and Syntegon have been working together for many years. Syntegon has long-term experience in both fill-finish and barrier technologies, which is crucial for the current project: Stevanato Group is advancing its next-generation manufacturing lines for its EZ-fill® cartridges. To date, the primary packaging supplier is crimping its RTU cartridges within a restricted access barrier system (RABS) environment. In the future, Stevanato Group will perform this process under an isolator, elevating it to the same sterility assurance level (SAL) used by pharmaceutical manufacturers in their fill-finish process.

At the core of this innovative manufacturing process is Syntegon's isolator technology based on the proven MLD platform. It features an integrated air handling system. Unlike external air treatment, the integrated version draws air directly from the clean room and returns it without the need for additional conditioning. Ventilation technology ensures a positive overpressure to protect the aseptic production core during the crimping process. This is followed by bio-decontamination cycles with the industry's shortest cycle times. The result: RTU cartridges with a level of sterility and quality above current industry standards.

Meeting Annex 1 requirements

It is this set of characteristics that makes the EZ-fill® cartridges particularly apt for meeting the revised EU GMP Annex 1 requirements. Among other aspects, the guideline puts more emphasis on the pharmaceutical manufacturers' contamination control strategy to ensure that the final medication is safe for patients. Although Annex 1 classifies both RABS and isolator technology as suitable barrier systems for attaining this contamination control, isolators have a lower aseptic risk by providing the highest physical barrier between operators and the process zone in grade A conditions.

Since the cartridges are fully siliconised and crimped, pharmaceutical manufacturers can focus on their core expertise: filling and stoppering the final containers. This further reduces manual tasks and hence contamination risks in classified areas, which in turn increases product and process safety in line with Annex 1. Moreover, gentle handling and several further safety measures ensure that the EZ-fill® cartridges are delivered in the highest quality. Thanks to a special clip system, the cartridges are held at a distance from each other, avoiding glass-to-glass contact. Camera-based inspection systems make sure that no damaged cartridge arrives at the outfeed.

Cooperation for future-proof pharmaceutical production

From a commercial point of view, both pharmaceutical manufacturers and primary packaging suppliers face higher initial investments compared to bulk containers and RABS technology.

However, the operational costs will be significantly lower in the medium term and will pay off for everyone involved.

> *"We believe that both auto-injectors and pens will remain at the forefront of GLP-1 delivery in the foreseeable future. This potential blockbuster treatment for diabetes and obesity presents considerable opportunities for our pharma partners. We see it as our mission to supply them with high-quality RTU containers to answer the growing demand and fulfil the highest product quality requirements.*

EZ-fill® cartridges from the new line will be available in late 2026.

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Adelphi Manufacturing XYZ Distributor II: Precision in every fill

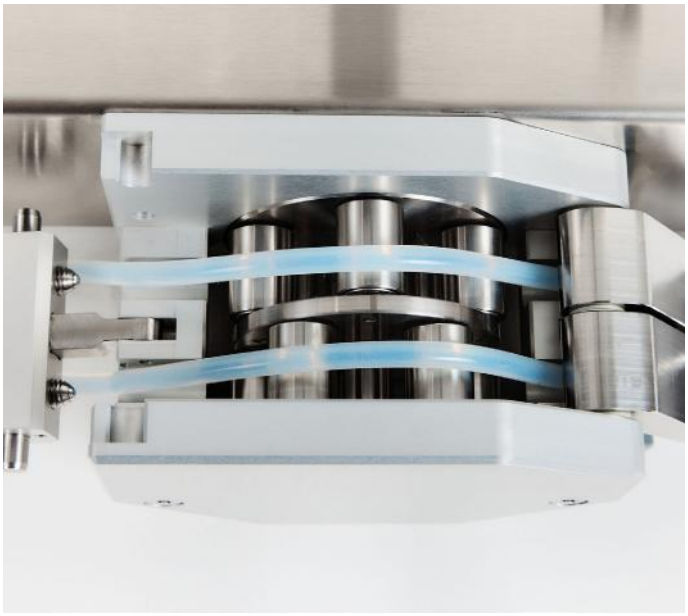
The new XYZ Distributor II from Adelphi Manufacturing represents a significant advancement in precision liquid filling and dispensing technology. Engineered to meet the evolving demands of modern production environments, this next-generation system integrates the filling head within base unit into a single, compact platform delivering highly accurate, repeatable filling giving a clean, controlled and reliable process.

Built around the core principles of integration, precision and contamination-free operation, the XYZ Distributor II streamlines workflows while enhancing overall performance.

Whether deployed in laboratories, cleanrooms or small-scale manufacturing, the new system combines advanced engineering with user-friendly design to ensure consistent, high-quality results.

Integrated, accurate and clean filling solution

At the core of the XYZ Distributor II is its fully integrated architecture, which combines the peristaltic filling head and XYZ plotting base unit into a unified system. This eliminates the need for separate machinery, reducing setup complexity while improving alignment, stability and process control and minimal area usage.



The result is a clean, contamination-controlled filling environment with minimal potential contamination points. This ensures the system is ideal for applications requiring high levels of hygiene and precision, including pharmaceutical, biotech and high-value liquid products.

High-precision filling with robust engineering

Precision is a defining feature of the XYZ Distributor II. The system utilises a dual-channel, multi-roller peristaltic filling mechanism, ensuring accurate dosing while maintaining a smooth and consistent flow of product.

By removing impulse filling at the nozzle, the system significantly reduces splashing and foaming, which is particularly beneficial when handling sensitive formulations.

A rigid, vibration-free nozzle arm, combined with precision linear guides, ensures accurate positioning across all axes off the filling area. This robust mechanical design guarantees repeatable and precise fill accuracy, even during continuous or higher-speed operations.

User-friendly interface and modern control

Ease of operation is central to the XYZ Distributor II. A modern HMI allows operators to quickly configure, monitor, and adjust filling processes with minimal training.

Operators can store and recall recipe-based filling programs, enabling rapid changeovers and ensuring consistency between production runs. This is particularly valuable in environments where multiple product formats are handled.

Additionally, USB connectivity supports software updates, recipe transfer, and system backups, providing flexibility across multiple units and simplifying ongoing system management.

Compact design and cost efficiency

The XYZ Distributor II has been designed considering space and cost efficiency along with its compact footprint, allowing integration into isolators and space-constrained production areas, making it suitable for both R&D and production environments.

A standout feature is its flatpack design, allowing the system to be packaged at approximately one-third of the volume of previous configurations. This innovation reduces shipping, storage and handling costs, while simplifying installation.

Despite its reduced size, the system maintains a full working tray capacity, ensuring productivity is not compromised.

Clean, low-maintenance operation

The system incorporates a high-precision, non-particulate generating lead screw mechanism, delivering consistent positioning accuracy without the need for frequent maintenance. This reduces particulate generation and supports ability to use in cleanroom environments.

The improved tube management system ensures that pump tubing is securely held in place, preventing unwanted movement or contact with containers. This reduces the risk of cross-contamination, product loss and operational errors, further enhancing process reliability.

Reliable and safe performance

Designed for long-term use, the XYZ Distributor II utilises high-quality components and robust construction to ensure reliable operation. Its design minimises mechanical stress and enhances repeatability, delivering consistent results across batches.

Safety enhancements, including controlled tubing pathways and stable nozzle positioning, help reduce the likelihood of operator error while improving overall process control.

Market-ready with comprehensive support

The XYZ Distributor II offers a competitive, accessible solution for businesses seeking advanced filling technology without compromising on performance.

Adelphi Manufacturing provides comprehensive after-sales support, including readily available spare parts, clear maintenance documentation, and remote technical assistance. Built-in tools such as system backup and factory reset capabilities help minimise downtime and ensure operational continuity.

A smarter step forward in liquid filling technology

The Adelphi XYZ Distributor II represents a clear evolution in precision liquid filling systems. By integrating critical components into a single, intelligent platform, it delivers accuracy, efficiency, and contamination control in one compact solution.

With its combination of high-precision filling, user-friendly operation and space-saving design, the XYZ Distributor II is built to meet the demands of modern production providing a reliable, scalable solution meeting today's challenges and future growth.

For more information:
w: www.adelphi.uk.com/product/xyz-distributor-ll
e: sales@adelphi.uk.com | **t:** +44 (0) 1444 472300

ADELPHI MANUFACTURING

Logistics without side effects

Craemer TC plastic pallets support hygienic and disruption-free flow of materials in pharmaceutical logistics

Hardly any industry places such strict legal requirements on hygiene throughout the logistics chain as the pharmaceutical sector. Sensitive raw materials, intermediate products and finished goods must be handled, stored and transported under controlled conditions. The load carriers used in these processes must also support cleanliness, reliability and process safety at every stage. With its cleanroom-compatible TC plastic pallet, Craemer offers a robust, durable plastic load carrier designed to meet the sector's demanding requirements.

The Craemer Group is a pioneer in plastics processing and one of the world's leading manufacturers of durable logistics solutions made from high-quality polyethylene (PE). Its portfolio includes plastic pallets, pallet boxes and containers for a wide range of hygiene-sensitive applications — from highly sensitive cleanroom areas and production lines to internal logistics, storage and dispatch.

Completely closed for perfect hygiene

For the pharmaceutical and chemical industries, plastic load carriers make a vital contribution to process reliability. A prime example from Craemer's product portfolio is the TC plastic pallet range.

With their fully enclosed design (TC stands for Totally Closed) and smooth surface finish, TC pallets set a high standard for hygienic load carriers. A patented weld-seam geometry between the top and bottom decks ensures that

The fully enclosed TC pallet is a versatile, robust load carrier designed to meet the high hygiene standards of the pharmaceutical industry © Craemer Group

the pallet body remains securely sealed even under heavy-duty use.

The stable runner connection, cavity-free and rib-free construction, and excellent cleaning properties help prevent contamination and water ingress. As they do not absorb moisture and leave no room for bacterial growth, the pallets are suitable for use as hygiene pallets in cleanroom environments. In line with Good Manufacturing Practice (GMP) principles, they can also be washed after each cycle.

Proven and tested quality

Extensive practical testing has shown that the Craemer TC pallet body remains fully intact and closed all around. Key quality features include extreme impact resistance thanks to the honeycomb structure, solid wall thicknesses and the patented welding geometry that joins the top and bottom decks. The result is consistently high processing quality, no cracks appear after ageing tests and the pallets are leak-tight up to an internal pressure of 4 bar.

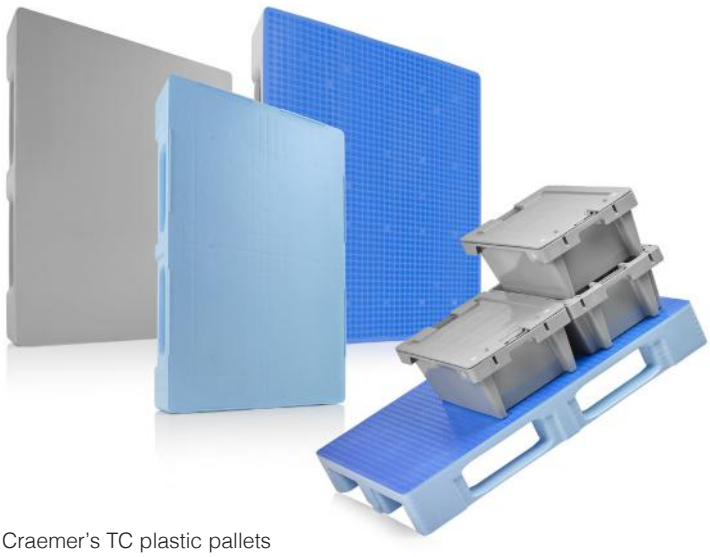
The TC series is available in both industrial and Euro pallet formats. The TC3 and TC3-5 industrial pallets measure 1200 x 1000 x 160 millimetres and are available with three or five runners respectively. With optional reinforcement profiles, they can support loads of up to 7,500 kg static and 2,000 kg dynamic and in high-rack storage. The TC1 Euro pallet measures 1200 x 800 x 160 millimetres and has three runners. It is compatible with third-party plastic pallets of the same format, and with three reinforcement profiles it offers load capacities of up to 7,500 kg static and 1,750 kg dynamic and in high-rack storage. The pallets can also be equipped with outer rims and RFID transponders as an option. All TC pallet models are designed to withstand temperatures from -30 °C to +40 °C and up to +90 °C briefly.

Palgrip®: reliable load securing, even in challenging conditions

For applications requiring particularly reliable load securing, the TC can be fitted with Craemer's full-surface Palgrip® anti-slip top deck. This option is designed to help prevent goods from slipping during transport, handling and storage — even in damp conditions or at an incline.

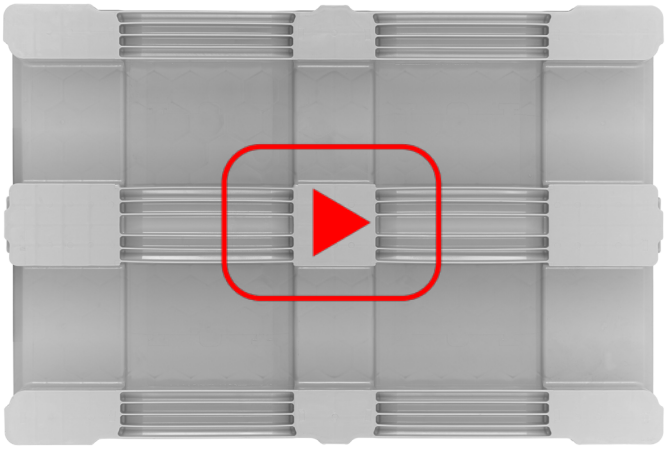
The Palgrip® anti-slip material is permanently bonded to the pallet body during the production process. This creates a robust connection between the anti-slip surface and the pallet itself, supporting a long service life and reliable performance in everyday logistics operations.

In pharmaceutical and chemical logistics, where safe handling and process stability are essential, it helps to secure bagged goods, containers, boxes and other packaged products, while contributing to smoother and safer material flow.



Craemer's TC plastic pallets are available in a range of sizes and designs – including models with a Palgrip anti-slip deck for reliable load securing © Craemer Group

For bulk handling under strict hygiene conditions, Craemer's HB3 pallet box is a particularly strong option © Craemer Group



The underside of the TC plastic pallet is completely sealed. This makes it easy to clean and prevents the build-up of germs © Craemer Group

Broad hygienic load carrier portfolio for pharma and chemicals

Craemer's offering to the pharmaceutical and chemical industries extends beyond the TC pallet range. The company provides a comprehensive selection of hygienic PE load carriers, including pallet boxes, large load carriers and containers designed for sensitive production, storage and distribution processes.

For bulk handling under strict hygiene conditions, the HB3 pallet box is a particularly strong option. Like Craemer's TC pallets, the HB3 is designed without cavities or ribs, to reduce the risk of contamination and prevent water ingress. Its double-walled construction above the entry openings provides added resistance to forklift-tine impact and the reduced entry height and robust design support reliable use in automated high-rack warehouses.

Smooth inner walls and welded runners facilitate emptying, cleaning and drying, and the almost invisible contour-milled weld seam, clean lines, minimal ribbing and rounded contours simplify handling and support hygienic logistics processes.

www.craemer.com/uk

Supporting pharmaceutical packaging integrity from development to production

Sepha solutions for container closure integrity testing

The gap between what a packaging integrity test is supposed to tell a manufacturer and what it actually reveals is where product quality risk lives. Closing that gap has become increasingly important as regulatory expectations around container closure integrity, data integrity, and package validation continue to evolve.

For more than four decades, Belfast-based Sepha has worked with pharmaceutical manufacturers to address these challenges through packaging integrity testing, product recovery, and low-volume packaging technologies used across development and commercial production environments. Operating in more than 70 markets worldwide, the company supports pharmaceutical and medical device manufacturers across research and development, quality assurance, and production functions.

The challenges associated with packaging integrity extend across the entire product lifecycle, from package development and clinical studies through to commercial manufacture. Sepha's equipment portfolio addresses each of these stages through integrity testing, product recovery, and low-volume packaging solutions.

Understanding the shift towards deterministic testing

Most pharmaceutical manufacturers already understand that packaging needs to be tested. The more difficult question is whether the chosen method is providing the level of assurance the organisation believes it is. Dye ingress testing has remained a familiar part of pharmaceutical quality systems for decades, not because it is necessarily the most capable option available, but because it is established, validated, and operationally embedded.

Quality teams know what a pass looks like. They have built sampling plans around it, written procedures for it, and defended it during audits. Replacing it can involve significant technical and organisational effort.

USP <1207> has played a major role in shaping industry thinking around container closure integrity testing by promoting quantitative, deterministic methods in place of older probabilistic approaches such as dye ingress and bubble emission testing. PDA Technical Report No. 27 similarly emphasises the importance of evaluating package integrity throughout the product lifecycle rather than treating it solely as a release testing activity.

The move towards deterministic testing reflects a broader shift towards objective, measurable evidence of packaging performance. A range of deterministic technologies are now used across the pharmaceutical industry, including vacuum decay, pressure decay, force decay, vacuum deflection, high voltage leak detection, helium leak detection, and headspace gas analysis. Different methods are suited to different packaging applications and quality objectives, and the transition from a probabilistic method is often more than a simple equipment change. It typically requires method development, validation, and integration into existing quality systems.

The benefits extend beyond regulatory compliance. Quantitative results provide manufacturers with objective evidence of package performance and a clearer understanding of process capability over time. Because many deterministic methods are non-destructive, they also allow testing to be performed closer to production while reducing product waste.

Applying deterministic testing in practice

Sepha's CCIT and leak testing portfolio supports a broad range of pharmaceutical and medical device packaging formats, from blister packs and parenteral containers to bottles, BFS strips, sachets, pouches, medical devices, and other flexible and rigid packaging applications. The systems utilise deterministic methods including vacuum decay, pressure decay, force decay, and vacuum deflection in accordance with USP <1207>, ASTM test methods where applicable, and 21 CFR Part 11 requirements.

Sepha Multi-Q deterministic CCIT

For parenteral applications, the Sepha Multi-Q system is designed to detect leaks in vials, ampoules, bottles, pre-filled syringes, BFS strips, medical devices, and other containers, with sensitivity as low as 1µm. The method is aligned with ASTM F2338-24.

For blister packaging applications, the Sepha VisionScan 3D utilises vacuum deflection in line with ASTM F3169-16(2024) to detect leaks in individual blister pockets as small as 5µm. The system operates across all foil types and text patterns, requires no tooling, and allows multiple packs to be tested simultaneously within a 297 × 210 mm test area.

Both systems are designed for regulated production environments, with automated documentation, clear pass/fail outputs, and test cycles that support rather than disrupt routine manufacturing operations. Results are captured electronically, providing traceability, secure audit trails, and support for 21 CFR Part 11 compliance.

For manufacturers, the impact of deterministic testing is often felt first on the production floor. A global CDMO that implemented Sepha's VisionScan 3D and Multi-Q systems across its North American oral solid dose packaging operations reported more frequent testing closer to the line, reduced product waste, and improved batch release efficiency. Longer term, the ability to meet customer expectations around deterministic CCIT strengthened the organisation's commercial position in regulated markets, with the approach now being evaluated across its wider manufacturing network.

Sepha VisionScan 3D blister leak detection

When batches are rejected, product does not have to be lost

Good integrity testing does not eliminate rejects. It helps identify problems earlier, which changes the decisions manufacturers can make.

A batch identified at the packaging stage presents a very different challenge from one identified after distribution. For rejected blister packs, the practical question becomes whether the product inside can be recovered safely and economically or whether it must be discarded entirely.

Recovering tablets and capsules from rejected packs can deliver significant savings, particularly for high-value products. It can also reduce the hidden costs associated with disposal, including waste handling, incineration, recycling processes, and the resources required to manufacture replacement product.

Sepha's deblistering range is used globally to recover product from all types of blister pack, including push-through, child-resistant, and peelable formats. The systems use controlled extraction processes designed to minimise product damage while preventing foil contamination of recovered product. The range includes manual bench-top and semi-automatic solutions.

For manufacturers under increasing pressure to reduce waste and improve resource efficiency, recovering usable product can provide both commercial and environmental benefits.

Supporting packaging from development to production

Integrity testing is most effective when considered early in the packaging lifecycle. Decisions made during package development regarding materials, sealing parameters, and cavity design influence both packaging performance and the testing strategies that will be required throughout commercial manufacture.

Sepha EZ Blister+ low-volume blister packaging

At the same time, not every pharmaceutical product progresses to high-volume production. Clinical supplies, radiopharmaceuticals, orphan drugs, personalised medicines, and specialist therapies are often produced in relatively small batches where flexibility is more important than throughput.

Sepha's EZ Blister range was developed to support these applications. The systems are used for clinical trials, stability studies, package development, marketing samples, and low-volume commercial production. By combining production-scale blister formats with a compact footprint, the equipment provides development and manufacturing teams with a practical route from early-stage packaging activities through to specialist production environments. For applications requiring electronic records and audit trail functionality, the EZ Blister+ includes 21 CFR Part 11 capability.

A consistent requirement across the packaging lifecycle

Although integrity testing, product recovery, and low-volume packaging address different operational challenges, they share a common requirement. The equipment involved must operate within the data integrity frameworks expected of regulated pharmaceutical manufacturing.

Across its product range, Sepha incorporates secure audit trails, role-based access controls, validated software architecture, and structured electronic records to support operation within regulated pharmaceutical manufacturing environments and broader cGMP requirements.

Regulatory expectations around packaging integrity have increased significantly in recent years. USP <1207>, EU Annex 1, and related guidance have all contributed to growing industry expectations around the use of validated, deterministic integrity testing methods in place of traditional probabilistic approaches such as dye ingress and bubble emission testing, alongside robust electronic record management.

Manufacturers that integrate packaging integrity into development, production, and quality activities are often better positioned to meet these expectations than those attempting to address them only during inspections or remediation programmes.

Sepha works with pharmaceutical and medical device manufacturers across research and development, quality assurance, and production functions. For further information, visit sepha.com.

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**Compared with a specified reference structure.

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*Where suitable collection and recycling infrastructure exists.
**Compared with a specified reference structure.

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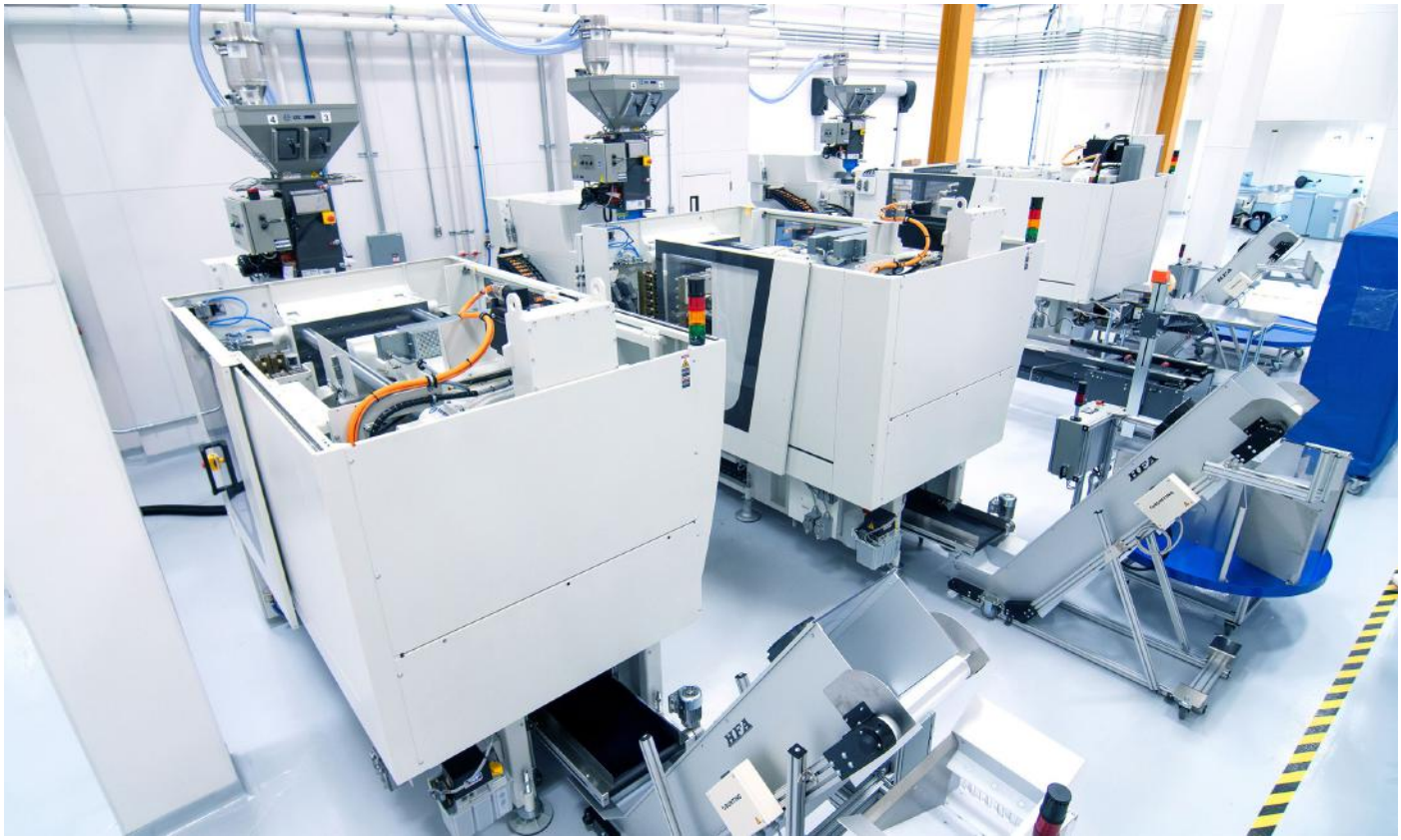
LET'S SAVE LIVES TOGETHER.

Beyond borders

How geopolitical shifts are redefining pharma and medical device development



By Tom Oakley, VP Strategic Partnerships at Sanner

The global healthcare industry is entering a period of profound transformation. Geopolitical realignment, economic pressure, and regulatory change are reshaping how pharmaceutical and medical device companies design, develop, manufacture, and distribute products. For pharmaceutical and medtech innovators and their partners, anticipating these shifts is no longer optional, it is a prerequisite for sustainable growth.

Several powerful macro trends are converging at once. Ageing populations, the rise of chronic diseases, and the continued growth of biologics are driving long-term demand for innovative drug delivery and medical devices. At the same time, the boundary between consumer products and medical devices continues to blur, with usability and patient experience becoming critical differentiators.

Overlaying these trends is an accelerating shift toward outsourcing. Pharmaceutical and biotech companies are increasingly relying on external partners to provide integrated capabilities, from early-stage design and development through industrialisation and commercial manufacturing. Speed, flexibility, and regulatory confidence are now decisive competitive advantages. While global in scope, these changes are being interpreted very differently across regions, particularly between the United States and Europe.

Diverging perspectives

The US is prioritising domestic production through tariffs, government pressure, and large-scale investment programs aimed at reshoring critical manufacturing. At the same time, healthcare affordability has become a central political issue, with cost pressure increasing across Medicare,

employer-based insurance, and public healthcare programs.

One of the most consequential developments is the US policy of Most Favored Nation (MFN) pricing. Under this policy, prices for certain single-source drugs in the US will be benchmarked against the lowest prices in other developed markets. In 2021, the US paid three to eight times the price for the same drugs compared to other advanced economies. While still evolving, MFN pricing has the potential to significantly compress margins and alter global launch strategies with ripple effects across suppliers and development partners.

In a separate but concurrent change, the US market is seeing a rise in Direct to Customer (DTC) sales of medicines. They cut out the powerful Pharmacy Benefit Managers (PBMs), third-party companies hired by health insurers, employers, and government programs to manage prescription drug benefits. They were originally created to simplify prescription drug administration, but over time have become major intermediaries influencing drug pricing, access, and pharmacy reimbursement. The most striking example of the rise in DTC sales is in weight management drugs: the global DTC weight-loss medication market size is valued at USD 8.64 billion in 2025 and is estimated to reach USD 35.61 billion by 2034.

Part of the trend is fuelled by new and growing DTC schemes such as Lilly Direct and TrumpRx. The DTC trend has important implications for the medicine and drug delivery device supply chain. The value proposition and marketing will need to be aimed more than ever at the end user rather than intermediaries such as PBMs. Advertising and social media will be used to promote products differently, packaging will need to adapt to be more compelling and similar to the consumer market, and supply chains may need to adapt to become more like “Amazon fulfilment centres” rather than traditional pharmacies.

Meanwhile, the European Union is trying to balance the competing requirements of maintaining access to the lucrative US healthcare market, keeping the option open of retaliatory tariffs, assuring regulatory compliance for the health of its citizens (which tempers completely free trade), and protecting its own industries from low-cost competition, principally from India and China. For medical device and drug delivery companies, the message is clear: pricing pressure is no longer limited to pharma alone. It increasingly influences budgets, timelines, and risk tolerance across the entire value chain.

What does this mean for medical device companies?

In this environment, medical device companies, particularly those supporting drug delivery, combination products, and diagnostics, must rethink how they position themselves.
Supply chain resilience has become a strategic differentiator. Nearshoring, dual sourcing, and strong regional supply chains help mitigate geopolitical risk while improving continuity, agility, and environmental sustainability. Customer diversification is equally critical. While large pharmaceutical companies remain essential partners, mid-sized biotech, diagnostics, and

emerging digital health players often operate with faster innovation cycles and less direct exposure to pricing mechanisms. Serving these segments requires rapid development grounded in fundamental science, technical depth, and the ability to scale quickly.

Regulatory expertise is now a value-creating capability, not just a compliance requirement. As regulatory complexity increases, especially for combination products and advanced drug delivery systems, partners that can guide clients from design through market authorisation stand out. For example, the EU Medical Devices Regulation introduced substantial additional regulatory work for medical device manufacturers, and updates to the US 21CFR Part 4 (Combination Product cGMP requirements) indicate increased scrutinisation ensuring that cGMP systems satisfy both drug (21CFR210/211) and device (QMSR 2026) requirements.

Growth through partnership and anticipation

Against a backdrop of tighter budgets and heightened scrutiny, growth depends on smart investment and collaboration. Strategic partnerships and targeted M&A allow companies to rapidly expand capabilities, access new technologies, and enter high-growth therapeutic areas such as neurostimulation, wearable injectables, and smart drug delivery systems. These platforms not only support clinical outcomes but also improve adherence, reduce

waste, and align with sustainability goals.
At the same time, value-driven innovation is paramount. Modular designs, scalable platforms, and manufacturing-ready solutions help customers manage cost while maintaining performance and regulatory robustness.

The winners in this new environment will not be those who simply react to geopolitical and economic change, but those who anticipate it. For medical device companies with end-to-end CDMO models focused on design, development, and manufacturing, the opportunity lies in becoming strategic partners instead of just suppliers. By combining resilient operations, regulatory excellence, and innovation aligned with real-world constraints, medtech companies can help their customers navigate uncertainty and bring life-changing therapies to market faster, safer, and more efficiently.

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Importance of serialisation in pharma packaging

Serialisation in pharma packaging: Rising importance and global trends

Serialisation in pharma has become an increasingly critical aspect of pharmaceutical packaging. As supply chains grow more complex and the risk of counterfeit medicines continues to rise, manufacturers are seeking ways to ensure every unit of medication can be reliably identified and traced. Track and trace systems are no longer optional; they are integral to protecting patients, maintaining regulatory compliance, and enhancing supply chain visibility.

Globally, regulators are driving this shift through stringent requirements. Initiatives such as the European Union Falsified Medicines Directive (FMD) and the U.S. Drug Supply Chain Security Act (DSCSA) mandate serialisation at the unit level and require comprehensive track and trace capabilities throughout the distribution network. These frameworks are pushing pharmaceutical companies to adopt robust, technology-enabled solutions that safeguard both product integrity and patient trust.

By embedding serialisation and track and trace capabilities into primary and secondary packaging, Romaco helps manufacturers meet regulatory expectations while optimising operational efficiency. Their equipment enables accurate coding, verification, and data management, forming the backbone of a modern, traceable packaging ecosystem.

What is serialisation in pharma packaging?

Serialisation in pharma refers to the process of assigning a unique identifier to each individual medicine pack. This unique code, often a combination of numbers and/or QR/DataMatrix codes, allows every unit to be tracked throughout the supply chain. Each code is generated and recorded in a centralised system, linking the physical product to digital information such as manufacturing details, batch numbers, and expiration dates.

These unique codes are tightly connected to track and trace systems, which monitor the journey of each pack from production to distribution to the pharmacy or hospital. By enabling real-time verification and authentication, serialisation ensures that every unit can be traced back to its origin. It is mandatory in many markets, including the European Union (FMD), the United States (DSCSA), India (DAVA), and others, reflecting a global regulatory push to prevent counterfeit medicines and protect patient safety.

An example? A pack of tablets leaving a manufacturing facility in Germany receives a unique DataMatrix code. At every checkpoint—warehouse, distributor, pharmacy—the code can be scanned to verify authenticity and confirm its origin, ensuring only legitimate medicines reach patients.

Why serialization matters for pharmaceutical packaging

Serialisation brings several tangible benefits for pharmaceutical manufacturers, healthcare providers, and patients:

- Ensuring patient safety – Serialisation supports anti-counterfeit technologies and ensures that only verified medicines reach the market.
- Meeting compliance & regulations – Helps companies adhere to requirements from authorities like the FDA, EU FMD, India DAVA, and other local agencies.
- Building supply chain transparency – Enables detailed visibility of product movement, improving recall management and operational efficiency.
- Enhancing trust – Patients, pharmacists, and healthcare providers gain confidence in the authenticity of medicines.

Track and trace in pharmaceutical packaging

Track and trace systems are the backbone of serialisation in pharma, enabling end-to-end visibility of every medicine pack as it moves through the supply chain.

Once a unique code is applied at the unit level, it can be scanned and verified at multiple stages—production, warehouse, distribution, and dispensing—ensuring that only authentic products reach patients.

A critical element of track and trace is aggregation, which links smaller packaging units to larger transport units. For example, individual blister packs are grouped into cartons, cartons are loaded into cases, and cases are placed on pallets.

Each level carries a unique identifier that connects to the identifiers of the units it contains. This hierarchy allows manufacturers and distributors to scan a single pallet or case and instantly verify all the packs within, streamlining logistics, reducing manual handling, and supporting rapid recalls if necessary.

Example: A batch of capsules is packed into blisters, divided into 100 cartons, which are then consolidated into 10 cases on a pallet. By scanning the pallet code at the distribution centre, the system automatically recognises all cartons and individual packs it contains, verifying authenticity and confirming shipment details. This not only enhances supply chain transparency but also ensures compliance with regulatory track and trace requirements, giving healthcare providers and patients confidence in the integrity of the medicines they receive.

The Romaco advantage in serialisation

Romaco offers a comprehensive portfolio of serialisation and track & trace solutions designed to meet the evolving demands of pharmaceutical packaging. Central to this portfolio is the PTT machine, which enables precise printing, verification, and recording of unique codes on primary and secondary packaging, plus tamper evident. On the tertiary packaging side, PAK case packers with Case Carry modules support aggregation, linking cartons, cases, and pallets seamlessly for full supply chain traceability.

Key features of Romaco's serialisation solutions include:

- High-speed printing & verification – Supports accurate application of DataMatrix codes and integrates easily with the printer, software, and camera system of the customer's choice.
- Tamper-evident packaging integration – Combines serialisation with patient-centric, anti-tamper designs for added safety and compliance.
- Modular and adaptable systems – Equipment can be updated or reconfigured to meet new regulatory requirements or market-specific standards.
- Aggregation-ready technology – Ensures efficient case and pallet-level traceability, enabling rapid scanning, verification, and supply chain transparency.

Globally, pharmaceutical manufacturers trust Romaco for its combination of innovation, flexibility, and regulatory compliance support. By embedding advanced serialisation and track & trace capabilities into proven equipment platforms, Romaco helps companies secure their products,

improve operational efficiency, and maintain confidence with healthcare providers and patients alike.

The future of serialisation in pharma packaging

The landscape of serialisation in pharmaceutical packaging continues to evolve rapidly as global regulations become more comprehensive and technologically sophisticated. Authorities in Europe, North America, and Asia are expanding requirements for unit-level traceability, aggregation, and real-time verification, reflecting a growing emphasis on patient safety and supply chain integrity. Manufacturers must stay ahead of these changes by adopting adaptable, forward-looking packaging systems.

Emerging technologies are playing a transformative role in the next generation of track and trace solutions. Digital twins allow virtual simulations of packaging lines to optimise efficiency and detect potential errors before they occur. Blockchain provides secure, immutable records of every transaction in the supply chain, strengthening anti-counterfeit measures and improving transparency. Artificial intelligence and predictive analytics are increasingly used to anticipate supply chain disruptions, verify authenticity, and detect anomalies in real-time, enabling smarter, data-driven decision-making.

These innovations point to a future where serialisation is not just a regulatory requirement but a strategic tool to enhance safety, efficiency, and trust throughout the pharmaceutical ecosystem.

Take the next step with Romaco

Partnering with Romaco empowers pharmaceutical companies to implement comprehensive serialisation and track & trace solutions that are flexible, compliant, and ready for future innovations. From high-speed primary packaging to aggregation-ready PAK case packers and modular PTT machines, Romaco combines patient-centric design, anti-tamper technology, and advanced traceability to protect products and build confidence across the supply chain.

Discover how Romaco can help your organisation stay ahead of regulations, enhance operational efficiency, and safeguard patient trust. Contact us today to explore the full range of serialisation and pharmaceutical packaging solutions.

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Rethinking pressure-sensitive sealing

An Interview with Renette Rier, Global Product Director – Sealing, TekniPlex

As brands across food, health, and consumer goods categories look for more reliable and regulatory-ready packaging solutions, pressure-sensitive liners are receiving renewed attention. TekniPlex has introduced ePressSeal, a new polyethylene-based sealing solution engineered to address both performance and regulatory challenges.

We spoke with Renette Rier, Global Product Director – Sealing at TekniPlex, about what makes this innovation different and why it matters for manufacturers and brands.

Q1: Renette, what industry challenges led TekniPlex to develop ePressSeal?

Pressure-sensitive liners have traditionally relied on polystyrene foam structures, which are increasingly facing regulatory scrutiny and supply volatility. At the same time, brands want packaging components that deliver consistent sealing performance while simplifying production processes.

With ePressSeal, TekniPlex set out to create a more advanced solution built on expanded polyethylene (EPE). This material provides greater flexibility and compression performance than traditional PS foam, helping manufacturers achieve better production speed and overall seal reliability.

Ultimately, our goal was to provide customers with a future-ready sealing solution that improves performance while addressing regulatory and supply concerns.

Some additional benefits we have seen with ePressSeal include improved print quality for end use needs.

Q2: What makes ePressSeal technically different from conventional pressure-sensitive liners?

The key innovation lies in the EPE material structure, which is a change from the standard polystyrene foam.

Expanded polyethylene offers improved cohesive strength and compression characteristics, which translates into a more reliable seal across a wide range of containers. In addition, our torque-activated adhesive system forms a strong bond

when the cap is applied, without the need for additional sealing equipment.

This combination allows manufacturers to achieve secure product protection while maintaining simple, efficient operations.

Q3: How does ePressSeal benefit manufacturers on the production line?

One of the biggest advantages is ease of integration. Because ePressSeal does not require significant change from the current polystyrene based materials in the marketplace. As a pressure sensitive seal, it can be implemented within existing capping processes – no need for expensive Induction Heat Sealing equipment. That means manufacturers can adopt the solution without major capital investment or operational disruption.

Q4: What types of products and industries are best suited for ePressSeal?

ePressSeal is designed for dry and powdered products, where protection against spills and contamination is essential. Typical applications include protein powders, vitamins, OTC medicine, spices, home and garden products, and arts and crafts materials.

Because the liner creates a reliable seal on both glass and plastic containers, it offers flexibility for manufacturers working across multiple packaging formats.

Q5: How does ePressSeal fit into TekniPlex's broader approach to consumer healthcare solutions?

Consumer healthcare is a strong example of where packaging needs to do more than simply contain a product. Whether supporting nutraceuticals, OTC medicines, daily wellness products, diagnostics, or preventative care, brands need solutions that help protect product integrity, support consumer safety, improve convenience, and strengthen trust at the point of use.

That is very much aligned with how we approach innovation at TekniPlex. We combine materials science expertise, market insights, consumer behavior, and R&D to create practical solutions that address real-world healthcare packaging needs. In consumer healthcare, that can mean improving dosing and dispensing accuracy, enhancing portability, supporting shelf life, enabling tamper evidence, or helping brands meet sustainability goals.

ePressSeal fits into that broader strategy because it was developed to solve multiple challenges at once: regulatory readiness, supply reliability, production efficiency, and consumer confidence. In addition, brands can incorporate custom printing on the liner, enabling communication, authentication, or branding elements directly within the package closure system.

Ultimately, ePressSeal reflects the way TekniPlex works with brand owners, converters, CDMOs, pharmaceutical companies, and medical device organizations to develop solutions that protect, deliver, and enhance the everyday health products people rely on.

For us at TekniPlex, it's about delivering solutions that combine materials science expertise with real-world manufacturing practicality, helping our customers bring safer, smarter solutions to market.

For more information: tekni-plex.com/en/consumer-products/products/seals-and-liners

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The rise of timber packaging in the pharmaceutical industry

There is an upcoming revolution happening in pharmaceutical packaging and timber is at the heart of it. At Rowlinson Packaging, we have spent decades designing, developing and delivering sustainable timber packaging solutions across a broad range of industries including; electronics and communications, aerospace, robotics and autonomous vehicles ,food, automotive and battery, military defence and munitions, AI infrastructure and self storage.

One of those industries, the pharmaceutical sector, is exploring opportunities to replace traditional plastic and metal packaging with timber, after discovering some of the tangible benefits of utilising timber packaging in their supply chain.

It is not hard to see why due to all of timbers benefits. According to Fortune Business Insights, 'In terms of end-use industry, the market is segmented into automotive & transportation, packaging, consumer goods/lifestyle, infrastructure & construction, healthcare & pharmaceutical, electrical & electronics, textile, and others.'

In fact, the packaging segment will hold the highest plastics market share by 44.9% in 2025 and grow at the highest CAGR (Compound Annual Growth Rate) during the forecast period. This growth is driven by the rising demand for rigid and flexible packaging solutions in the personal care, food and beverage and pharmaceutical industries.

The growth is attributed to the durability, versatility and cost-effectiveness of plastics, which make them preferable for various packaging applications. However the increasing search for new, sustainable and durable options is more demanding now than ever, in an effort for companies to reduce their carbon footprint.

Sustainability is no longer optional

Sustainability is not just a trend, it's a business priority, pharmaceutical companies are under growing pressure to reduce their environmental footprint. Timber packaging offers a genuinely sustainable and viable alternative. Over the past 20 years, the emissions purely from pharmaceutical companies have risen over 77% and are trending upward.

When timber is sourced responsibly it is; renewable, recyclable and biodegradable. Substituting metal and plastic for timber will contribute to pharmaceutical businesses lowering their overall carbon footprint which demonstrates a real commitment towards recycling whilst meeting their sustainability goals.

Timber, metal and plastic packaging have been competing against each other for years and continues the ongoing argument of which is the most beneficial for industries and protective transport. From executing my own extensive research, I have collated together the comparison between these three popularly used materials.

Protecting sensitive products

Pharmaceutical products are often delicate, high-value and/or are highly regulated. Damage in transit is often very costly, timber packaging offers bespoke transportation via the use of wooden cartons/crates and pallets purpose build to individual product requirements.

Timber packaging's strength lies in it's inherent strength and durability, with statistics showing

its suitability for heavy and fragile goods, safe transportation of pharmaceuticals, and reusability. In the UK, according to Timber Trades Journal (TTJ Online), timber packaging, especially wooden pallets and crate usage demonstrate a strong trend towards re-use in the UK and Europe, with significant figures of 97% in the UK recovery/repair rate.

At Rowlinson Packaging we manufacture containers that are secured by a clip lock or a lid which can be bolted down for the security. Our modular packaging range can also be disassembled allowing for easy storage and re use later in the supply chain.

Meeting strict industry standards

A common myth is that timber can't meet the pharmaceutical industry's strict hygiene and safety standards. However, modern timber packaging is now required to meet international regulations.

All timber used for export can be heat treated according to ISPM15 standards, eliminating pests and pathogens and making it safe for international shipping. Unlike some plastics, timber doesn't release harmful chemicals, which is crucial for keeping pharmaceutical products uncontaminated.

Tailored packaging for unique needs

No two pharmaceutical products are quite the same. As there are different shapes, weights, and protective needs demand custom timber packaging solutions.

Timber is incredibly versatile as it can be cut, shaped, and engineered into crates, boxes and pallets designed precisely for specific products.

At Rowlinson Packaging, we specialise in creating bespoke solutions for the pharmaceutical sector, helping our clients keep their products transported in a safe manner.

A smart investment

When investing in equipment, materials or packaging solutions, businesses need to make decisions that deliver both operational and financial benefits. For many industries, transport packaging is an important consideration when assessing long-term value and efficiency.

Timber packaging is increasingly being used to support the export of goods and can offer a cost-effective solution for businesses. Timber crates and pallets are durable enough to be reused multiple times, helping to reduce replacement costs and minimise waste. In addition, timber packaging can often be repaired rather than replaced entirely, providing a significant advantage over many single-use alternatives.

Timber's role in the future of pharmaceutical businesses

With sustainability, compliance and product protection more critical than ever, it's clear that timber packaging has a growing role in the pharmaceutical industry. It offers a rare combination of environmental benefits, strength and customisation, all while meeting industry demands.

At Rowlinson Packaging, we're proud to partner with pharmaceutical businesses across the UK with timber packaging solutions built to protect products and additionally help to reduce CO2 emissions.

Whether you are shipping delicate medical equipment, bulk active pharmaceutical ingredients, or finished goods, we are here to help you find the right timber packaging for your needs.

Explore our timber packaging range to discover what will best meet your industry requirements? Alternatively, you can request a bespoke design to perfectly fit your specific products.

Get in touch with us today and let's start the conversation.

Automated packing system reduces labour requirements for pharmaceutical supplier

A pharmaceutical supplies company is now operating with reduced packing staff, thanks to investment in an automated packing system.

The system comprises of two Max 12 vertical bagging machines, fed by bowl and swab feeders, and was supplied by automated packaging specialists Yorkshire Packaging Systems (YPS).

The system was delivered to the UK-based operation of a global healthcare provider which is focussed on speeding up the diagnosis and treatment journey of its customers. Automation of its operations allows it to respond to orders quickly, while ensuring pack accuracy, which is vital in the pharmaceutical industry.

The company is using the new packing system to collate and bag anti-obesity medications. Both swabs and needles are delivered from the feeder systems into the pack via the same small bag aperture, requiring a complex infeed system.

Differing collations can be accommodated by the system, changing pack contents for each order, when needed.

Overall, the company has gained:

- **Significant cost reductions:** with costly labour reduced to a quarter of the previous level, employees were redeployed into other areas of the business.
- **Consistency:** finished pack quality is the same every time, with no variability.
- **Speed:** the automated systems achieve high packing speeds which can be scaled over time, if required.

YPS will continue to support the customer by supplying compatible bagging materials as well as delivering scheduled maintenance visits from the YPS engineering team.

Sharp Max 12 Bagging Machine

The Max 12 bagging system represents a fast and efficient bagging solution for your mail fulfilment needs, with high throughput, quick changeovers and low downtime.

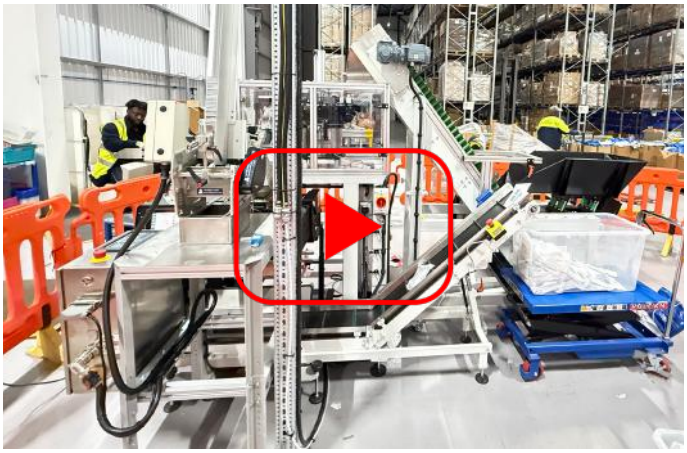
Our Max 12 machine boasts an integrated thermal transfer printer capable of printing product descriptions, company logos and barcodes directly onto the front of the bag.

This feature negates the need for secondary labels, thus improving pack presentation and ensuring the packaging can be recycled.

Guaranteed to slash the labour requirements of any manual packing operation without the hassle of a high-maintenance solution, the Max 12 is simple to operate, ergonomic and portable.

Benefits of the Sharp Max 12 Bagging Machine include:

- **Seamless integration:** Integrates with upstream and downstream equipment for a full packing system.
- **Easy to use:** Includes an intuitive smartphone style interface, hosting how-to videos and saved product & packing details.
- **Impressive speed:** Achieves an unrivalled 50 packs per hour, increasing throughput accurately and consistently.
- **Accommodates a wide range of bag sizes:** Can run a wide variation of bag dimensions, ranging from 50mm-305mm wide and 100mm-1062mm long, to accommodate the ideal bag for your products.



- **Optional extras:** Choose from bag deflators, product support shelves, seal flatteners, light curtain or optical finger switches for quick cycling, handheld or tabletop scanners, as well as various infeed scoops and funnels.

Award-winning support

We support customers at every step of their automated packaging journey, a commitment recognised by YPS being two-time winners of Automate UK's prestigious Customer Service award.

To learn more about the Sharp Max 12 bagging machine, contact the YPS team.

YPS YORKSHIRE PACKAGING SYSTEMS 50 Years

Key Features & Benefits

- **Printer:** Integrated thermal transfer printer, delivering a consistently high-resolution on-bag print. You can incorporate logos, barcodes, etc. at high-speeds, negating the need for secondary labels
- **User-friendly touchscreen:** Intuitive HMI with pre-programmable memory.
- **Bag opening:** Opening guaranteed via 'bag open fingers' mechanism.
- **Frame:** Height adjustable ergonomic frame.
- **Product load shelf:** Supports heavier items.

Sustainable packaging for pharma and medical technology

Between regulation, innovation and competitive advantage

Sustainability is no longer just a matter of corporate image. With the European PPWR, companies in the pharmaceutical and medical technology industries are also facing concrete requirements regarding recyclability, material reduction and circular economy concepts. Especially in highly regulated markets, however, the new regulations are proving to be more than just an additional compliance burden — they also create opportunities for innovation and differentiation.

The PPWR replaces the previous EU Packaging Directive and pursues a clear objective: reducing packaging waste and accelerating the transition towards a functioning circular economy. In the future, packaging must be recyclable and gradually contain increasing amounts of recycled content. Although exemptions and transition periods apply to contact-sensitive applications — including many pharmaceutical and medical products — pressure throughout the supply chain to demonstrate more sustainable solutions continues to grow.

For pharmaceutical and medtech companies, this creates a new area of tension: packaging must meet the highest standards regarding product protection, sterilisability, documentation and regulatory compliance, while simultaneously

becoming more resource-efficient. This is precisely where major innovation potential lies.

Manufacturers such as PEKU Folien GmbH in Bavaria have been working on sustainable film packaging concepts for demanding applications for many years. A key focus is the “Design for Recycling” approach. The aim is to develop packaging solutions from the very beginning in such a way that they can be recycled as efficiently as possible at the end of their lifecycle.

One important trend is recyclable mono-material packaging. In many applications, difficult-to-recycle composite films can now be replaced by mono-PE solutions without compromising product protection or processability. At the same time, film thicknesses can often be significantly reduced. This saves resources, lowers transport weight and volume, and improves the overall carbon footprint.

The use of recycled materials is also gaining importance. While post-industrial recyclates (PIR) from production waste are already widely established, attention is increasingly shifting towards post-consumer recyclates (PCR), meaning materials recovered from used packaging. In regulated markets, however, their use remains challenging: traceability, consistent material properties and regulatory approvals are essential.

In addition, bio-based plastics are becoming increasingly relevant and are now also available as medical-grade materials. Based on renewable resources or biogenic waste streams, they can significantly reduce the carbon footprint of packaging solutions. Due to strict quality and documentation requirements, their use is currently focused mainly on high-value medical devices and specialised applications.

Sustainability in the pharmaceutical and medical technology sectors therefore cannot be achieved through standard solutions alone. What is required are individually developed packaging concepts that combine environmental responsibility with regulatory reliability.

At the same time, it is becoming clear that sustainability does not end with the material itself. Companies will increasingly need to consider the entire lifecycle of their packaging — from raw material sourcing and production to transportation, recyclability and documentation. This represents a major opportunity for the pharma and medtech industries. Companies that implement sustainable packaging solutions today not only improve their future regulatory readiness but also strengthen their position with customers, investors and in tender processes.

Especially in regulated markets, sustainability is increasingly becoming a quality attribute. The challenges remain considerable.

Mechanical recycling still reaches its limits in highly sensitive medical-grade applications. Chemical recycling is therefore considered an important future building block. Although the process is currently energy-intensive and expensive, technological development is progressing rapidly. Experts expect high-quality recycled plastics to become significantly more available for pharmaceutical and medical technology applications in the medium term.

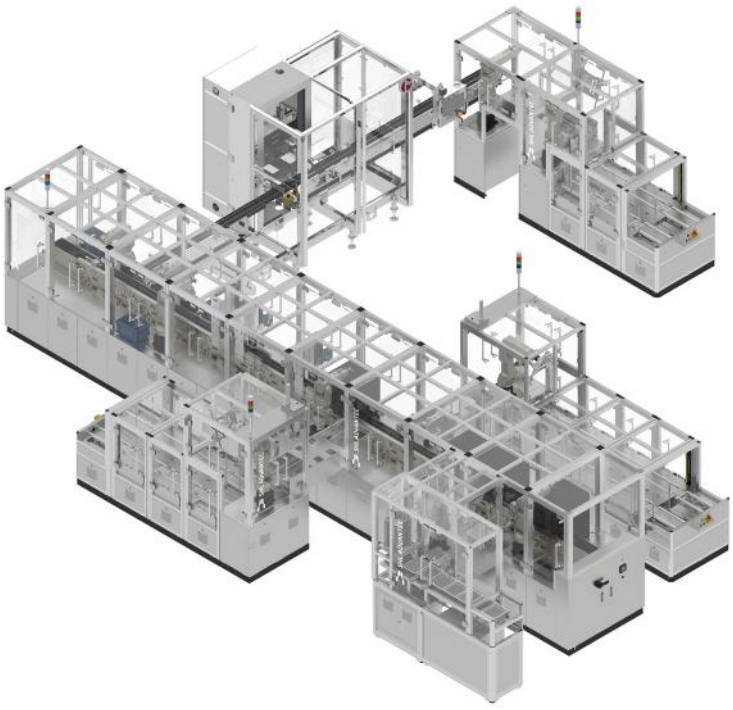
Initial closed-loop projects already demonstrate that circular economy concepts are feasible. The next crucial step will be scaling these pilot projects into industrial production processes with stable quality, reliable availability and regulatory compliance.

One thing is certain: the PPWR is fundamentally changing the packaging market. Companies that understand sustainability as a driver of innovation at an early stage can turn it into a genuine competitive advantage. For packaging manufacturers such as PEKU Folien GmbH, this means not only supplying safe packaging solutions, but actively supporting customers on their path toward future-proof and regulatory-compliant packaging concepts.

www.peku.com/en/

Autoinjector assembly and packaging

Früh builds new production line for cold chain-dependent biologics



Assembly, labelling, cartoning, serialisation, and case packing – Früh is building a complete production line for an autoinjector, which will measure about 900m² and feature three packaging configurations.

Since March 2026, Früh Verpackungstechnik AG has been working on a new project to build a complete assembly and packaging line for an autoinjector with a cold chain-dependent biologic. The kickoff meeting with the client was held on April 16.

What happens on the line

The autoinjector consists of three main components, which are assembled on an assembly machine from SHL Medical in a fully automated process. SHL Advantec is providing both the autoinjector and the production platform. The assembly machine is directly connected to a labeller, which prints, verifies, and applies labels – at a rate of up to 20 autoinjectors a minute.

The next step is performed by the Dividella cartoning line from Körber Pharma. Cartons are automatically prepared and transported via a conveyor belt, ready for any items to be inserted by hand. The machine then inserts the information leaflet, closes the folding box, and performs serialisation with a laser printer. The project comprises three packaging configurations, designed to accommodate packs with single items, packs of four, and multiple packs containing 12 items. The Dividella platform from Körber Pharma is perfect for this as it supports format changes with little conversion work.

The closing step is taken care of by a case packer from Christ in an automated process where folding boxes are packed into transport boxes, labelled, sealed, and aggregated. Palletisation is performed manually.

For this project, assembly and packaging have been deliberately designed as separate lines. The Dividella cartoning line from Körber Pharma runs at up to 45 units per minute twice as fast as the assembly machine. This creates capacity that Früh can also utilise for other orders. Together, the entire process from individual components to ready-to-ship transport boxes, including serialisation and aggregation is part of the growing pharmaceutical portfolio that Früh is strategically building out.

The importance of cold chain conditions

The product must be stored between 2 and 8°C throughout the process. The maximum hold time is 26 hours at below 30°C. These requirements apply across the whole of the production process and must be documented and monitored in accordance with GMP. Früh has the necessary infrastructure and processes for this.

Where the project currently stands

The cartoning line from Körber Pharma and the case packer from Christ have been ordered.

As regards the assembly machine from SHL Medical, the final URS points are still being thrashed out – with site visits and regular meetings at the supplier's own premises. Meanwhile, new test equipment for in-process control of autoinjectors is currently being assessed The rough planning phase for the production room is complete.

Next steps before production starts

Over the coming months, the rest of the equipment will be ordered, planning of the room will be finalised, processes will be defined, and onboarding will be arranged for the remaining suppliers. FAT and SAT tests for the assembly machine and Dividella are scheduled for mid-2027, with process validation due by the end of 2027. Production will start in Q2 2028. A further update will follow in the fall.

www.fruh.ch/en

NEOPAC
THE TUBE

Neopac receives multiple industry awards for sustainable and high-performance tube solutions

Neopac was recognised in May 2026 with awards LUXE PACK in Green, the FIPSA Awards and the Tube Council Awards.

Neopac Group, a global provider of tube packaging solutions for the pharmaceutical, cosmetics and oral care markets, was recognised with three prestigious industry awards in May 2026. Presented in Europe, North America and Asia, these awards highlight Neopac's ability to address key industry challenges such as reducing material usage, advancing circularity, and ensuring the protection of sensitive products through value-creating innovations for brands.

These distinctions highlight three key pillars of Neopac's innovation strategy. They focus on the protection and performance of sensitive products, the optimisation of resource use through advanced technologies, and the development of solutions with a higher share of renewable materials. Together, they demonstrate the company's ability to meet technical brand requirements, address consumer expectations, and respond to the evolving regulatory landscape in sustainability.

A reward for healthcare and oral care applications

Neopac received the Tube Council Gold Award in the category "Best Dental Tube" for its collaboration with CariFree, a brand of Oral BioTech. The award recognises packaging solutions that meet the specific requirements of oral care applications.

PaperX FiberTop: World's first paper tube designed for full recyclability in the paper stream

PaperX FiberTop is Neopac's fibre-based tube solution designed to reduce plastic content while maintaining product protection and functionality. Manufactured using FSC-certified paper materials, the tube incorporates a thin EVOH barrier layer in both the body and shoulder to support product compatibility and performance requirements.

According to Neopac, the solution reduces plastic content by up to 87% compared with conventional tube formats. The company also describes it as the first paper-based tube to combine a barrier-equipped shoulder with food-grade performance while remaining compatible with paper recycling processes.

Earlier this year, the PaperX FiberTop tube was certified by the PTS Institute as technically recyclable within the conventional paper recycling stream, following evaluation against the latest CEPI and 4evergreen recyclability protocols.

These include reliable product protection, high user convenience and strong brand presence at the point of sale.

An innovation focused on material efficiency

Neopac also received an award at the FIPSA Awards for the Polyfoil® MMB Mini Tube. The tube combines the proven barrier performance of Polyfoil® technology with reduced material usage for small tube diameters. It is suitable for applications that require high product protection while optimising resource efficiency and focusing on small packaging sizes.

A new generation of sustainable tubes

At LUXE PACK New York, Neopac received the LUXE PACK in Green Award in the Sustainability category for the PaperX FiberTop solution. By integrating fibre-based materials into the tube structure, the plastic content is significantly reduced while maintaining product protection and functionality. The solution contributes to the development of packaging concepts based on renewable materials.

For more infomratoin visit: www.neopac.com/en/

"This first paper tube certification confirms that our PaperX technology enables us to strike the right balance between product protection, design, and sustainability — even under the most stringent recyclability requirements.

It is an important step on the way to genuine paper-based alternatives for tube packaging.

– Dr Philippe Kern, Director of R&D and QM at Neopac.

"These awards reflect our focus on packaging solutions that combine performance, material efficiency and regulatory requirements.

With solutions such as PaperX FiberTop, Polyfoil® MMB Mini and our dental applications, we continue to expand our portfolio in line with evolving market expectations and upcoming regulatory requirements such as the PPWR.

– Bernd Steiner, CSO at Neopac.

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Alphacath GaiaPod™: Reusable smart packaging infrastructure for medical implants and pharma

Healthcare supply chains continue to depend heavily on single-use secondary and tertiary packaging for transporting medical devices, implants and pharmaceuticals. While sterile barrier systems remain essential and highly regulated, the outer protective packaging used for logistics, handling, transportation and storage is typically discarded after a single use despite retaining significant functional value.

Alphacath Ltd has developed a strategic approach to transform this packaging from a disposable consumable into a reusable and durable smart packaging system that is digitally connected with logistics infrastructure. This is supported by digital chain-of-custody infrastructure, reverse logistics and refurbishment operations, as well as lifecycle and sustainability analytics.

Importantly, the Alphacath GaiaPod™ system preserves existing validated sterile barrier systems where applicable, avoiding interference with approved sterile packaging configurations. By focusing on reusable secondary and tertiary packaging layers, regulatory disruption is minimised while enabling measurable sustainability, operational and economic benefits.

Industry challenges and opportunities

Medical implants, high-value medical devices and speciality pharmaceuticals move through highly controlled supply chains requiring traceability, sterility assurance, cold chain control, reliable logistics and strict regulatory compliance.

Current packaging systems typically include primary sterile barrier packaging, secondary protective packaging, tertiary transport packaging, cushioning systems, environmental protection measures and, in some cases, logistics containers.

Although sterile barrier systems necessarily remain highly controlled and are often single-use, the external transport and protective packaging is frequently engineered to withstand substantial mechanical stress and transport conditions. Despite this durability, most secondary and tertiary packaging is discarded after only one logistics cycle.

This creates significant operational and environmental challenges, including packaging waste, recurring packaging procurement costs, limited shipment visibility, loss and recovery inefficiencies, poor lifecycle traceability and higher Scope 3 emissions.

At the same time, healthcare systems and manufacturers face growing pressure to reduce environmental impact and improve ESG performance. Packaging regulations continue to evolve, increasingly transferring responsibility for environmental impacts to manufacturers. The value of improving supply chain resilience and logistics transparency is also becoming more widely recognised.

Emerging regulatory frameworks, including the EU Packaging and Packaging Waste Regulation (PPWR), Extended Producer Responsibility (EPR) schemes and broader sustainability disclosure requirements, are likely to increase the long-term cost and operational burden associated with disposable packaging systems.

Alphacath ™ GaiaPod ™ Solution

Alphacath Ltd proposes the implementation of a reusable smart packaging ecosystem for medical device and implant logistics.

The system comprises reusable protective secondary and transport packaging with electronic tracking and labelling modules.

GaiaPod for cardiac pacemaker.

These are supported by reverse logistics and refurbishment operations, together with digital asset management infrastructure, analytics and the potential for future intelligence integration.

The reusable packaging solution does not replace sterile barrier packaging and therefore does not interfere with sterility validation. This approach is designed to minimise regulatory implications and simplify integration into existing supply chains, supporting faster commercial adoption.

Reusable packaging is designed to circulate from manufacturers, through logistics networks and ultimately to hospitals and clinics. Once opened, units can be returned to regional facilities for cleaning, disinfection, refurbishment and reset before being returned to manufacturers for reuse.

This establishes a circular logistics infrastructure while maintaining compatibility with existing clinical and regulatory workflows.

Core technical solution – GaiaPod™

Alphacath Ltd's packaging containers, known as GaiaPods™, incorporate varying levels of patented functionality depending on the use case. The name combines Gaia, the personification of Earth in Greek mythology, and Pod, a protective casing. GaiaPod™ is intended to represent a protective casing designed in harmony with the planet.

Reusable protective packaging

GaiaPods™ have been engineered for multiple reuse cycles and comprise protective cases with integrated impact protection systems, including cushioning, dunnage and inserts where appropriate.

The boxes are stackable and collapsible when empty, helping to reduce transport volume during return logistics operations. Materials have been selected with microbial resistance in mind, while also maintaining brand visibility through repeated cleaning and disinfection cycles.

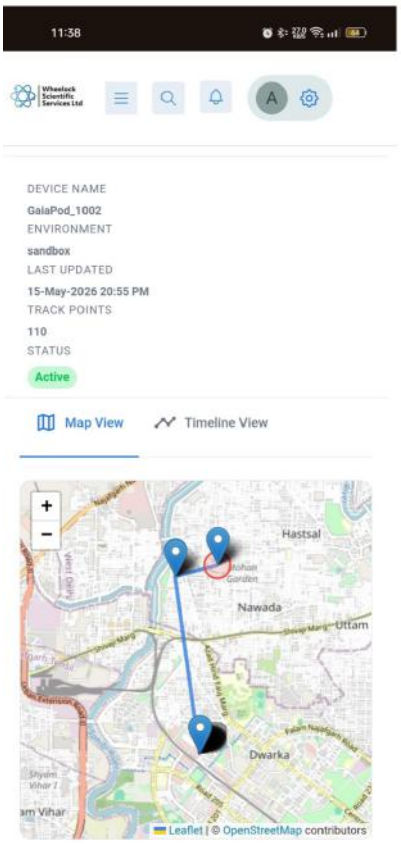
The design priorities are durability, modularity and operational simplicity to support repeated circulation within healthcare logistics environments.

Embedded electronics

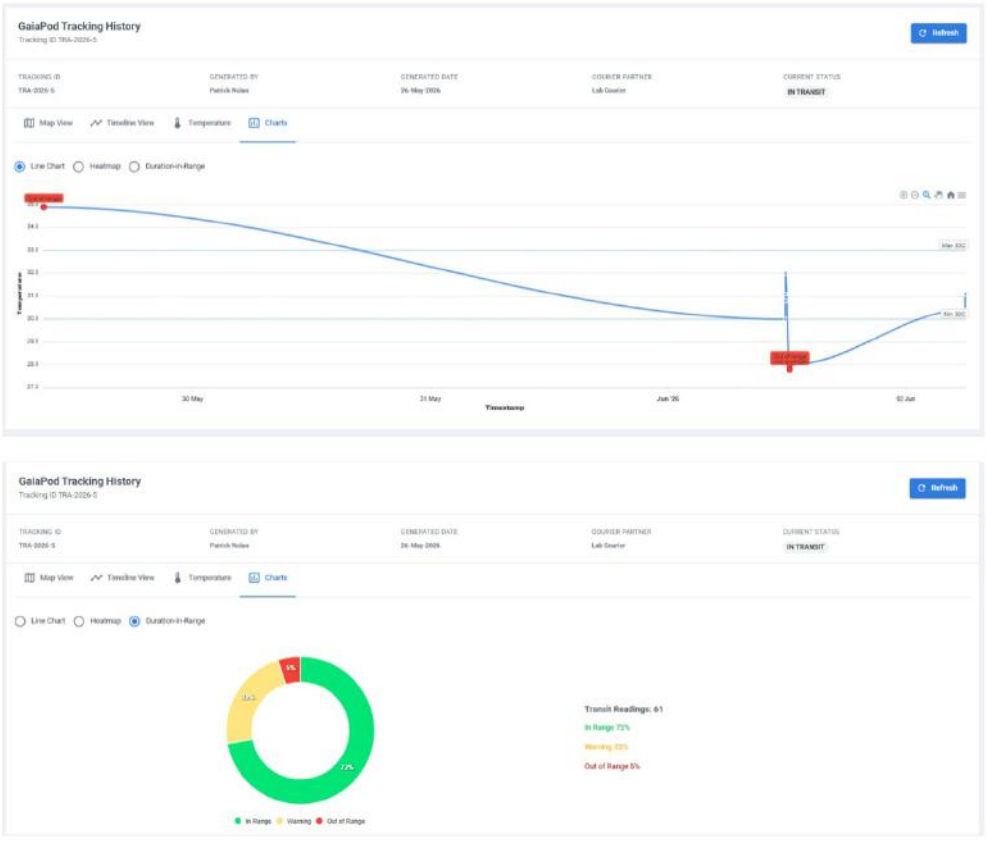
A key innovation is an electronic module integrated into the reusable packaging system. This enables each package to function as an IoT device, providing digital information relating to shipment tracking, chain of custody and asset identity.

Depending on the use case, the module may incorporate Bluetooth Low Energy (BLE)

Geolocation tracking of GaiaPod.



Cloud control system showing package temperature monitoring through transit.



connectivity, LTE-M/NB-IoT communication, GNSS positioning, environmental sensing, tamper detection, secure identity management and event logging.

Cloud-based platform and SCADA

All operations, hardware components, information flows, workflow logic and interoperability with enterprise and third-party systems are orchestrated and managed through a cloud-based platform.

Systems incorporating aspects of this infrastructure have already been developed to production-grade standard as part of Alphacath's capacity-building programme, with some commercial deployments already generating revenue. The platform has been built using a microservices architecture to support reliability, resilience and information security.

Sustainability and ESG benefits

The environmental and operational case for reusable packaging is becoming increasingly compelling, particularly within the medical device sector, where recyclable materials are often incinerated, resulting in a higher carbon footprint than initially estimated.

The GaiaPod™ system reduces corrugated packaging waste and can reduce or eliminate the need for packaging inserts.

As healthcare systems increasingly seek measurable sustainability improvements, reusable logistics infrastructure represents a potentially valuable opportunity.

The integrated electronic module adds further functionality by enhancing visibility, traceability and asset management throughout the supply chain.

Alphacath Ltd believes reusable smart logistics packaging represents a practical and commercially viable pathway towards more sustainable, resilient and transparent medical device supply chains.

The integration of smart electronics, reverse logistics infrastructure and digital asset management transforms packaging from a disposable shipping consumable into a durable, connected logistics platform.

About Alphacath Ltd

Alphacath Ltd is a company registered in England & Wales (Company No. 09303231). For more information, contact: srv@alphacath.com.

gaiapod reuse

Johnson & Johnson invests $1bn in vision care manufacturing and packaging

Johnson & Johnson has announced plans to invest more than $1 billion in Jacksonville, Florida, as part of an expansion of its vision care manufacturing, packaging and distribution capabilities in the United States.

The investment will support the construction of a new distribution facility and the introduction of advanced manufacturing and packaging technologies aimed at increasing production capacity for the company's ACUVUE contact lens portfolio.

According to the company, the expansion is intended to help meet growing demand for contact lenses while strengthening its domestic supply chain and operational footprint.

Construction of the new facility is already underway, with operations expected to commence in 2028.

The project forms part of Johnson & Johnson's previously announced plan to invest $55 billion in US manufacturing, research and development, and technology activities through early 2029.

"This investment reinforces our long-standing conviction that advanced manufacturing in the United States is essential to delivering innovative, high quality healthcare solutions to patients at home and around the world. By further strengthening our Vision operations in Jacksonville with next-generation manufacturing, packaging and distribution capabilities, we are enhancing the resilience of our U.S. supply chain while helping more people see better and live better. This commitment reflects the confidence we have in our people, our technology, and our more than 40-year legacy of advancing eye health globally.

– Joaquin Duato, Chairman and Chief Executive Officer of Johnson & Johnson.

The company said the investment will build on its existing presence in Florida, where its operations currently generate an estimated annual economic impact of $6 billion. Johnson & Johnson employs approximately 3,500 people in the Jacksonville area, and the latest investment is expected to support the continued development of its local operations.

The expansion focuses on increasing manufacturing, packaging and distribution capacity for vision care products as demand for eye health solutions continues to grow.

Johnson & Johnson has maintained operations in Jacksonville since 1981, supporting eye health innovation and manufacturing in the region for more than four decades. Today, the company produces more than 1.7 billion ACUVUE® contact lenses each year for patients across the United States.

Over the years, Johnson & Johnson has expanded its footprint in Jacksonville, which now includes more than 1.5 million square feet of manufacturing, research, distribution and operational facilities. According to the company, its activities contribute approximately $6 billion annually to Florida's economy.

"Johnson & Johnson's commitment is a strong vote of confidence in Jacksonville, our workforce, and our future.

– Mayor Donna Deegan.

Events & exhibitions

Stay ahead with our global round-up of packaging events and exhibitions, conveniently colour-coded by location.

Have an event to share? Get in touch to add it to our calendar.

Europe | United Kingdom | Asia | Americas

June/July 30-31
SPECIAL EDITION by Luxe Pack
Paris, France

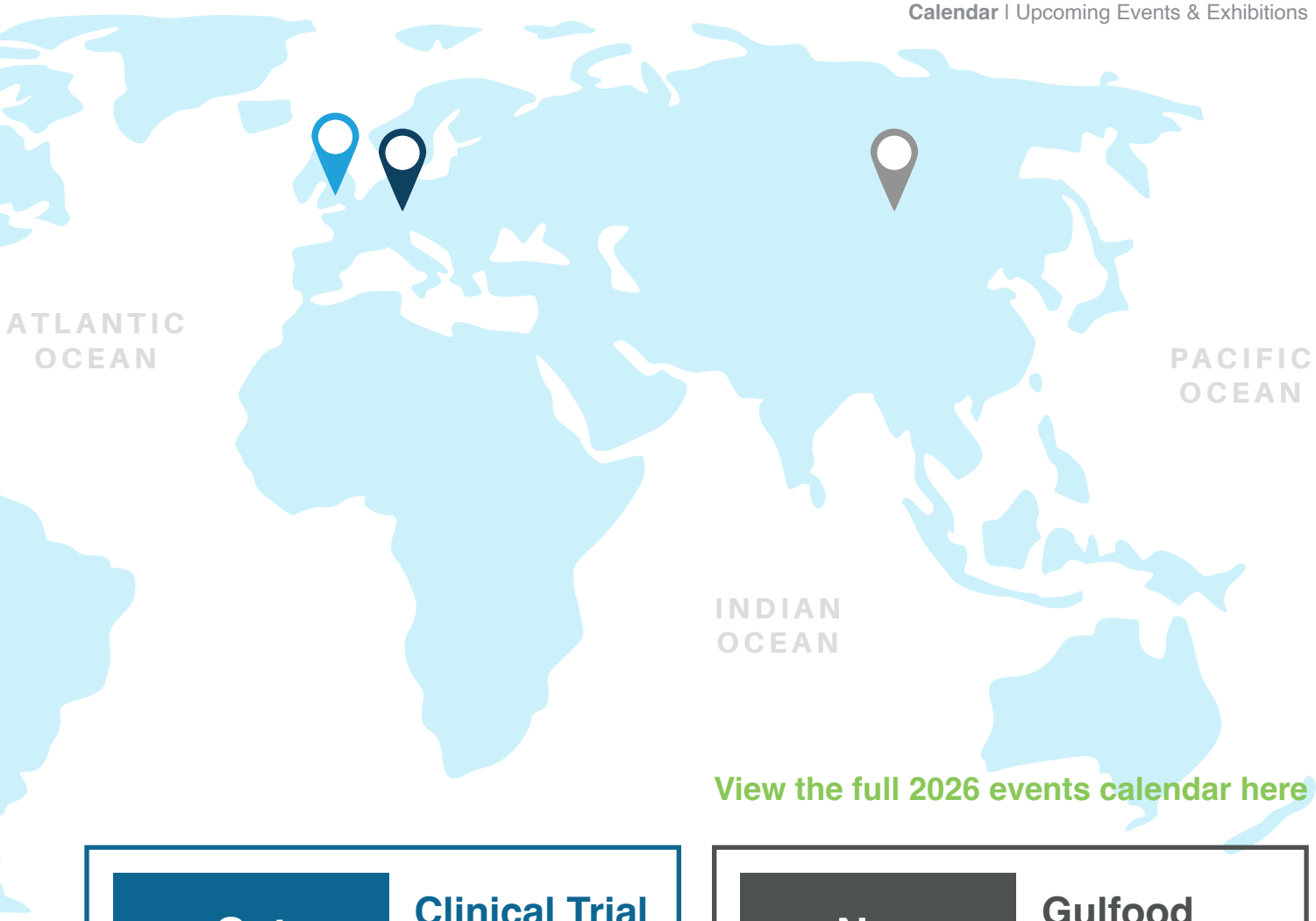
Sept 22-24
PPMA Show® 2026
Birmingham, UK

July 13-15
Cosmopack North America
Las Vegas, USA

Sept/Oct 29-01
LUXE PACK Monaco
Monaco, France

Sept 16-17
London Packaging Week
London, UK

Sept/Oct 30-01
E-commerce Packaging & Labeling Expo
New York, USA



View the full 2026 events calendar here

Oct 06-07
Clinical Trial Supply Forum
California, USA

Nov 03-05
Gulfood Manufacturing 2026
Dubai, UAE

Oct 15-17
Asia Ink Expo 2026
Guangzhou, China

Nov 10-11
UK-Packaging Expo
Liverpool, UK

Oct 18-21
PACK EXPO Int. 2026
Chicago, USA

Nov 10-12
Sustainable Packaging Summit
The Netherlands

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We hope you enjoyed this issue. Stay connected for the latest packaging news and innovations.

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