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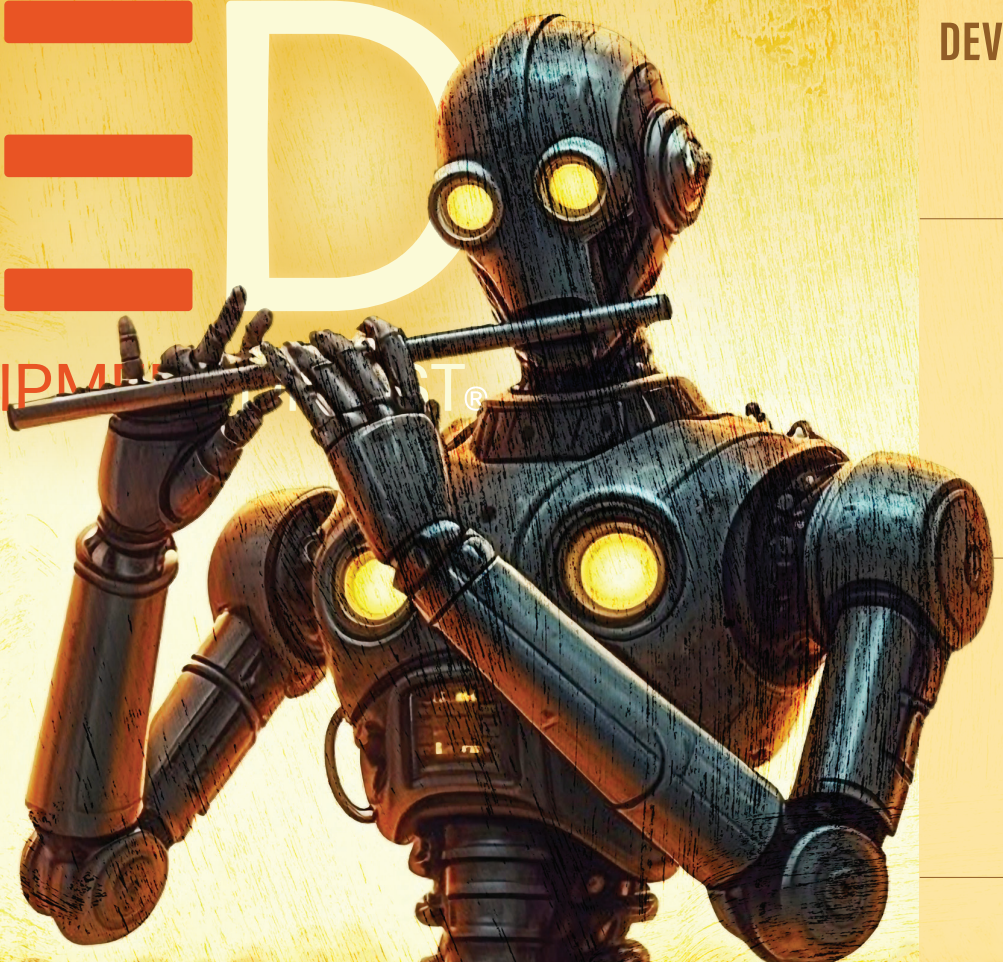

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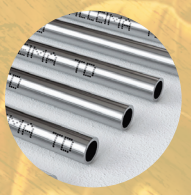

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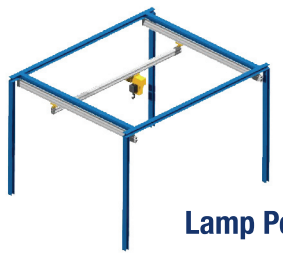
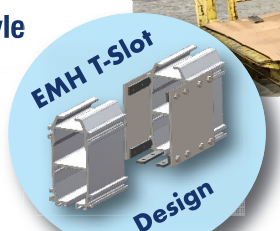


Lamp Post Style

Jib Crane Style



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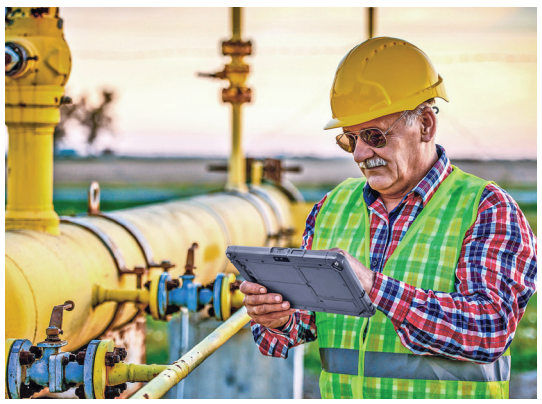

AI Tablet for Fieldwork

The **ZX10** 10-in rugged Android tablet combines a lightweight design with AI performance. It supports advanced AI capabilities and delivers good performance even at low power levels. It also provides lightning-fast data transfer and up to 256GB of Universal Flash Storage for running multiple applications simultaneously. Its sunlight-readable technology and capacitive multitouch display let you keep operating in the rain or while wearing gloves. It includes dual SIM technology for network coverage, while Wi-Fi 6E, Bluetooth 5.2, and optional dual-band GPS offer fast data transfer and location capabilities.

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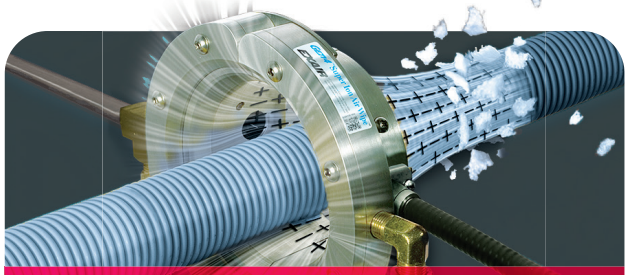

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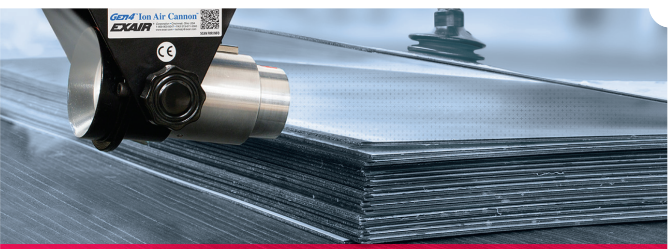
The uniform 360° ionized airstream neutralizes and cleans continuously moving surfaces.

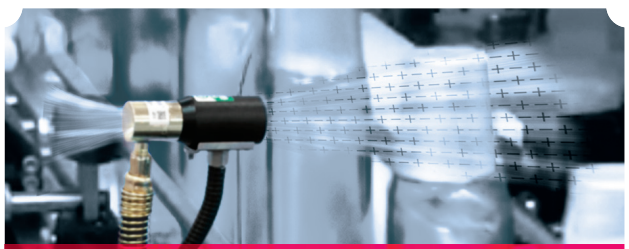
GEN4® Ion Air Gun™

Eliminates static and dust from parts prior to assembly, packaging, painting or finishing.



GEN4® Ion Air Cannon™

Ideal for hard to reach spaces or confined areas that require a concentrated ionized flow.



GEN4® Ion Air Jet™

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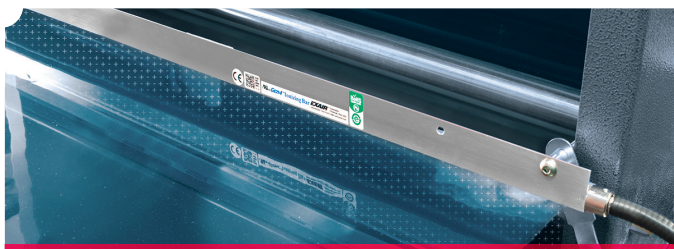

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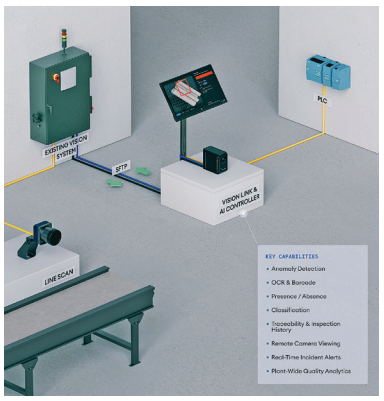

AI Vision Software for Legacy Systems

Easily add AI inspection capabilities to existing vision inspection systems rather than replacing cameras and infrastructure with **Vision Link** software. It connects to any camera system that supports FTP output, including line scan, microscope, X-ray, hyperspectral, thermal, and area scan models from Cognex, Keyence, and others. Supporting up to 8 cameras at once and delivering real-time inference with sub-250 ms processing, the solution is for manufacturers wanting AI benefits without infrastructure changes, reduced manual inspections, and reduced false-positive rates and low accuracy.

Elementary

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Amerikooler

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Jib-Master Forklift Crane

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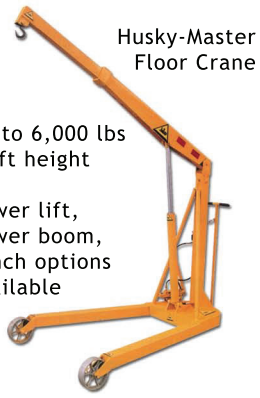

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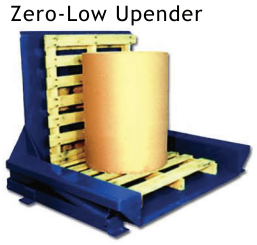

Up to 6,000 pounds
Smooth 90° upending

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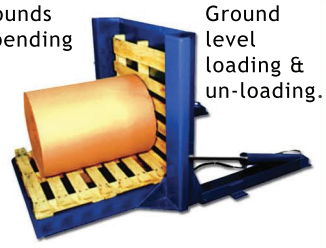

Portable Jib Crane

500 to 2,000 pounds
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Tele-Mast Straddle Crane

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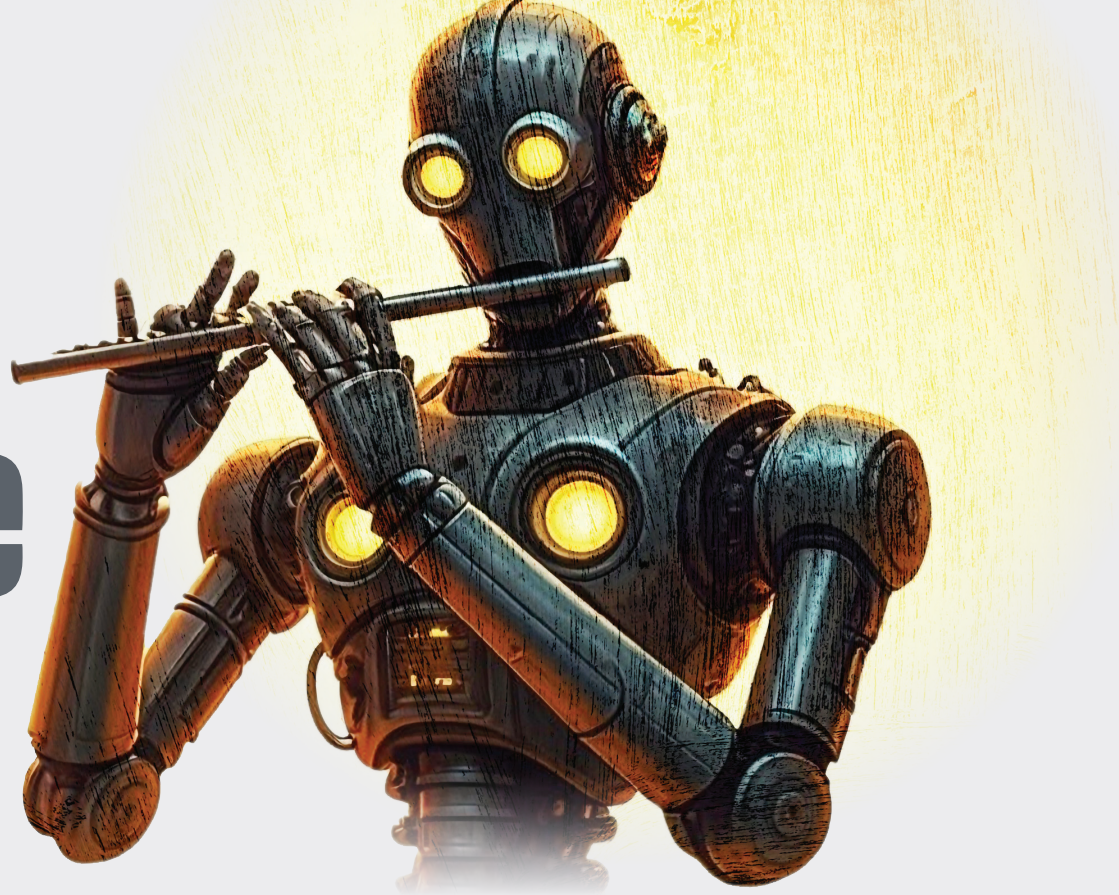
Manufacturing Follows AI's Lead



By **Laura Davis**

Artificial intelligence (AI) will define the 2020s—exploding for every industry worldwide. Its uses offer a lot of convenience and the possibilities as we advance seem endless. The manufacturing industry has historically seen significant efficiency gains when adapting to Industry 4.0 and automation, and AI is the next step forward. Tom Coshow, a senior director analyst at Gartner, predicts that by 2028, AI agents will make 15% of day-to-day business decisions autonomously.

To understand how AI is transforming manufacturing, it's important to recognize that not all AI systems are created equal. There are three distinct types of AI making an impact on the factory floor: Traditional machine learning, Generative AI, and Agentic AI. Each offers unique capabilities that, when properly implemented, can significantly enhance manufacturing efficiency, quality, and innovation. Before diving into specific applications, let's clarify what sets these AI approaches apart and how they complement each other in modern manufacturing environments.

Understanding the Types of AI

There are a couple of terms out there that you've probably heard in relation to AI: Generative AI and Agentic AI. And they're different from each other.

Before either of these two AI types came about to the mainstream, the industry was already working with AI within machine learning. Machine learning was largely limited to predictive models, used to observe and classify patterns in content. It analyzed data to solve a specific task by using preprogrammed rules and algorithms, being used in predictive analytics, natural language processing (NLP), and autonomous systems.

Generative AI, while also able to analyze data to solve tasks, learns patterns from the data to create new content. It's the one that can create text, images, music, and models, and can mimic human work and boost creativity while saving time and effort. Chat GPT, Claude, DALL-E, and MidJourney are all Generative AI tools that pushed Generative AI mainstream.

Agentic AI on the other hand is designed to interact with its environment, make decisions, and take actions to achieve objectives autonomously, without human involvement. Generative AI on the other hand needs prompts from a human to create.

Examples of Agentic AI would be a self-driving car that navigates roads by making real-time decisions based on integrated sensors, a robotic arm that autonomously performs tasks in a warehouse, or a virtual assistant that can proactively manage a schedule. These agentic systems are fitted with sensors, algorithms, and actuators that allow them to perceive their environment, process information, and execute actions.

Agentic AI acts with a purpose, reacting to inputs and considering objectives while making choices to achieve those objectives. The AI that everyone jokes about overtaking us someday? That's Agentic AI. Its autonomy has raised questions about ethics and data accountability: Who is responsible when an autonomous system makes a mistake or goes rogue? There aren't any bumpers making sure these systems continually align with human values. This isn't lost on its developers though. They're finding ways to code stopguards into these systems to prevent the unthinkable from happening.

Another key difference lies in their objectives: Generative typically works on tasks that are narrow and well-defined while agentic often tackles broader, multistep goals that need continuous decision-making and adaptation. In other words, Generative AI generates and Agentic AI acts.

Current Applications

When combining AI with technologies such as machine learning, computer vision, and NLP, it can improve processes at a much more rapid pace than all of the other technologies combined. A huge benefit is its ability to analyze large volumes of data. That might sound unremarkable until you realize "analyzing large data volumes" means parsing through all data, recognizing patterns in that data and continually learning from it, making informed decisions on what the data means, and spitting out a decision or a prompt on what needs to be done next—in seconds. Another big benefit is that due to these algorithms, it can adapt to changing data on the fly. This data can come from sensors, cameras, machines, robots, entire production lines, etc.

One of the areas AI is making a big impact is predictive maintenance due to its ability to analyze large datasets rapidly, saving operators valuable time otherwise spent trying to interpret complex data. By analyzing the data for them, it not only frees up time but also reduces potential human-made errors. Because of this, AI can predict or assume failures before they happen, which as we all know, drastically cuts down on downtime and maintenance, preventing costly repairs. When paired with computer vision systems, AI can offer sophisticated quality control monitoring to identify any type of defect in real time.

In manufacturing, Generative AI is particularly useful in research and development. In product development, Generative AI helps design variations of a proposed prototype. Rather than working in a 3D modeling tool, AI can help engineers realize designs faster, helping them decide on the best variations the first time around instead of spending extra time creating them all up front, freeing up design time. Basically, it's helping to automate the prototyping process. And after designing and prototyping, it can automate the testing process as well as help ensure compliance.

Use cases for the supply chain sector include tracking inventory to streamline procurement, analyzing demand forecasts, analyzing transportation routes, automating warehouses, and undertaking auditing services.

For cybersecurity, AI can be used to identify unusual patterns, flag potential vulnerabilities, and implement threat prevention without requiring constant human oversight to protect from cyberattacks. For example, an AI agent can enhance security by analyzing email metadata and user behavior to detect phishing attempts, automatically blocking suspicious content and alerting IT teams—eliminating the need for constant human monitoring.

In smart factories, agentic systems can address challenges such as bottlenecks in production, equipment downtime, and the growing demand for customized products. It creates smarter, more responsive manufacturing systems. It can also ensure the availability of raw materials while avoiding overstock issues and reducing carrying costs. Manufacturers can maintain lean inventories while meeting production schedules like a well-oiled machine.

When used in robotic assembly lines, AI enables dynamic task allocation and real-time adaptability, with systems learning from their environments and adjusting to new tasks quickly and with precision. This represents a significant advancement over traditional robots that relied solely on preprogrammed instructions, offering manufacturing systems that can adapt to changing production requirements without extensive reprogramming.

Collaborative robots (cobots) using agentic AI further the human-robot working relationship and combine human resourcefulness with AI precision to enhance productivity and safety.

Digital twin technology is increasingly using AI to enhance its simulations, allowing manufacturers to replicate and optimize production processes virtually before implementation.

With the rise in customized products, agentic AI enables manufacturers to produce customized goods at scale without compromising efficiency or precision.

For sustainability initiatives, AI helps optimize energy usage and material efficiency, supporting manufacturers' goals to achieve net-zero operations while maintaining productivity.

Integrating both generative and agentic systems together is another emerging trend. Generative and agentic systems aren't mutually exclusive but often work together to create a more powerful process. For example, an agentic system could use a generative system to help it communicate more effectively or create custom content at any time needed. This could look like an agentic system monitoring and analyzing data continuously from an entire facility to communicate operation statuses or health statuses of equipment. It could look like a development team having an agentic system run on a prototype and having the generative system propose a new design with fewer pitfalls or challenges. Or it could look like a robot in a warehouse, fitted with both types of AI, using the generative one to devise new routes for itself while the agentic system navigates those routes with ease.

Overall, AI brings unprecedented adaptability to manufacturing operations. Whether through robotic systems that learn from their environments and adjust to new tasks quickly and precisely, or through systems that can continuously monitor and optimize processes, AI enables manufacturing facilities to become more flexible, efficient, and responsive.

Challenges and Limitations

Even with all the current uses and future possibilities of AI in all its forms, it's not without its flaws—as we're all aware of. Generative AI has only been trained on so much data and will take time to learn. And it doesn't truly understand what it's creating, which is why it needs constant feedback to help it learn as it's simply predicting what might come next based on patterns it has already seen. Currently, the modern mainstream tools for Generative AI are learning from every person who interacts with its system. But how it's really going to learn is if every person who interacts with it also gives it feedback on how it performed—right or wrong. We are all part of actively growing a technology in real time, worldwide—which is astounding.

Knowledge limitations present a significant challenge. As of now, Claude, the Generative AI tool from Anthropic, offers the most recent knowledge cutoff date of April 2024. The others are still running on knowledge bases that range from the years 2021 to 2023. Keeping these large language models (LLMs) continuously up-to-date is a very intensive process, requiring a significant amount of time and resources, which is why it's not done more frequently. This leaves models with outdated information until a new training cycle begins.

However, when using a generative system in your facility, the model is trained on your data exclusively—a smaller, more focused dataset that allows the model to easily learn faster because it encounters the same repeated operations and processes over and over again.

Data privacy and security pose another major challenge. In a world where there is increasing concern over data breaches and hacks, this is not a light matter. Despite warnings for all businesses that deal with sensitive information, proprietary or not, to implement a strengthened security system for its data, many have chosen to ignore the warnings and procrastinate on investment. While time and costs for implementing these systems aren't inexpensive, it's one of those things that's better to have than to be caught with your pants down. Manufacturing data is sensitive, and often proprietary, which requires cybersecurity measures to prevent breaches.

Workforce adoption represents a significant hurdle. As happens with adopting any new technology or system, it takes careful planning and guidance for workers to help them replace their manual tasks with automated ones. Workers will need to be trained on the new automated processes, what to do when there's a hitch in the process, and how to rectify it. Workers will need to learn to work alongside AI in harmony.

Data quality is also crucial for AI success. In line with training your workforce, you need to make sure your data is true and up to date. If your generative or agentic system is trained on outdated, biased, or incomplete data, the AI's output will offer false or subpar decisions, leading to disaster.

Cost barriers can be prohibitive, especially for smaller manufacturers. If you think cybersecurity measures carry a hefty price tag, be ready because you'll be hit twice when implementing an AI system. Given its power, its abilities, and its novelty in the industry for wide use, agentic AI systems involve significant investment in infrastructure and training, which can easily deter smaller businesses. However, many manufacturers and software developers are increasingly creating new products that are small and compact, and able to fit into existing infrastructure. After all, no one is going to want to buy or invest in a piece of equipment if it's not going to fit into existing operations without a huge overhaul.

Finally, even with perfect data and implementation, AI is not infallible. As mentioned above, AI can still make errors. While this might seem counter-intuitive, regular monitoring is necessary to ensure agent-driven actions align with organizational goals and ethical standards.

Recommendations

Before you take the plunge and invest in AI for your manufacturing operations, make sure you have a solid plan in place for keeping track of data and updating it continually. It's a good idea to have someone on the team who is aware of all the data you own and operate with to be able to fact-check against what the AI is using. Also, this should be standard since AI, as I've mentioned already, is not foolproof. At least not yet. Even if your data is complete and factual, the AI can still make errors. Make sure to have a regular monitoring system in place across all uses of AI in your operations and processes.

Manufacturers looking to implement AI should consider a phased approach. Start with smaller, focused applications where AI can provide immediate value with minimal disruption, such as generative systems. Predictive maintenance often serves as an excellent entry point, as it requires minimal infrastructure changes while delivering measurable returns through reduced downtime and reduced maintenance costs.

It's important to invest in workforce development early as the success of AI implementation depends heavily on your team's ability to work alongside these systems effectively. Create comprehensive training programs that not only teach technical skills but also help employees understand how AI enhances their work rather than threatens it. Building this understanding can significantly reduce resistance to adoption in the long run.

Before deploying any AI system, establish baseline performance measurements and specific goals for improvement. This data-driven approach allows you to accurately assess ROI and make informed decisions about scaling successful implementations or adjusting underperforming ones and course correct.

Consider establishing an AI governance framework within your organization, including policies for data management, ethical guidelines for AI deployment, security protocols, and clearly defined roles and responsibilities. Such a framework helps maintain control as AI applications expand throughout your operations.

Manufacturers can also look for opportunities to partner with AI solution providers, research institutions, or even other manufacturers to share knowledge and resources. Industry consortiums focused on AI in manufacturing are becoming increasingly common and can provide valuable insights and support. The field of AI is evolving rapidly, with new capabilities emerging regularly. Build flexibility into your implementation plans to take advantage of these advancements as they become available.

The journey toward AI implementation in manufacturing isn't without challenges, but with thoughtful planning, careful execution, and ongoing monitoring, the benefits far outweigh the obstacles. By starting small, focusing on data quality, investing in your workforce, and maintaining a commitment to continuous improvement, manufacturers of all sizes can harness the power of AI to drive their operations forward in the decades to come. Those who begin this journey now, learning and adapting along the way, will be best positioned to thrive in the increasingly AI-driven manufacturing landscape of tomorrow. NED

How Material Handling Developments Lift Expectations

By **Sheila Kennedy**, CMRP

The constant movement of goods and materials through industrial plants and warehouses requires reliable, nimble technology designed for safety, efficiency, and accuracy. From robots and cobots to forklifts and conveyor systems, upgraded solutions and new automation opportunities continue to emerge to strengthen material handling and intralogistics processes.

Robotic Systems

Precise robot and cobot solutions elevate material handling safety and performance. **Dynamo autonomous mobile robots (AMRs) from Addverb** transport materials and goods using natural navigation capabilities and can carry loads of up to 5,500+ lb (2,500 kg). For applications that require repetitive material movement, automated guided vehicles (AGVs) are available. A new generative AI assistant for its Zippy sorting robot AGVs facilitates their maintenance by translating verbal requests into commands understood by the AGV.

The company tailors its material handling solutions to the unique requirements of its customers. "By integrating robotics, intelligent software, and real-time data insights, we empower businesses to optimize operations, increase safety, and deliver their products to their customers more efficiently," says Sriram Sridhar, CEO of Addverb Americas.

The new **MC600 from Mobile Industrial Robots (MIR)** unites its MiR600 AMR base with UR20/UR30 cobot arms from Universal Robots. Easy to program and deploy, the MC600 helps to automate workflows such as palletizing, box handling, and machine tending, including heavy payloads up to 1,322 lb (600 kg).

The MC600 unites the MiR600 AMR base with UR20/UR30 cobot arms from Universal Robots to automate a wide range of tasks, from material handling to assembly.

© Mobile Industrial Robots (MiR)

Forty percent smaller than other SCARA robots, the Lexium SCARA is a cost-effective option that optimizes floor space utilization, automating repetitive tasks to drive production line efficiency.

© Schneider Electric

"These mobile cobots also include AI powered by NVIDIA Jetson, enabling intelligent 3D object detection to ensure proper pick-up of the materials as well as safety as the robot moves between its stations," notes Kenneth Bruun Henriksen, global head of MiR Go Ecosystems. The MC600 likewise benefits workers who no longer need to strain to pick up and place heavy objects.

Lexium SCARA from Schneider Electric is a new high-speed, ultra-compact, selective compliance assembly robot arm (SCARA) designed to automate repetitive tasks in manufacturing, warehousing, material handling, and related applications. It integrates into unified machine control systems, and it can be virtually designed and tested before implementation when combined with Schneider's EcoStruxure Machine Expert Twin digital twin solution.

"This simple, compact solution saves space, and its seamless integration saves commissioning time, while its 40% longer z-arm stroke delivers one of the largest work areas available, compared to similar products," observes Gary Zeppetella, senior offer manager for motion and robotics offers at Schneider Electric.

Forklift Technologies

Key advancements transform forklift operations. The lithium-ion powered **E80XNL from Hyster Company** is an 8,000-lb (3,600 kg) capacity electric forklift that offers comfort, energy efficiency, and fast recharging. Compared to lead acid batteries, the legacy electric option, lithium-ion batteries provide consistent power until depletion, require no battery maintenance, and offer a smaller, lighter form factor.

Shorter than usual ICE models, the E80XNL offers an improved turning radius and right-angle stack with multiple battery sizes to reach the run time needed for your task.

© Hyster Company

Global Product Manager Josh Eby says the Hyster E80XNL is "specifically designed to take advantage of the slimmer form factor of its lithium-ion battery pack, creating greater space in the operator compartment." The forklift is also available with Hyster Reaction, the company's new lift truck operator assistance system for demanding

Continental's ContiPT18 tires feature a special tread pattern that provides excellent traction along with a multilayer construction for premium comfort.

© Continental Specialty Tires

Dynamo is a robust AMR powered by natural navigation and enables efficient and seamless material movement of up to 5,500 lb (2,500 kg).

© Addverb Technologies, Inc.

applications that supports site safety processes with forklift proximity sensors, hydraulic function control, and dynamic operator alerts.

The updated **ContiPT18 forklift tire from Continental Specialty Tires** has new tread-wear indicators visible on both sidewalls of the tire to simplify the monitoring of tread depth. The indicators help to maximize tire utilization and increase operating safety by enabling timely replacement decisions.

The tire's two-stage design promotes high mileage and low rolling resistance. "Thanks to the modern tire compounds we use, heat generation is low while wear resistance is high," observes Matthias-Stephan Müller, product manager for material handling tires at Continental Specialty Tires. Additionally, ContiPT18's specific tread pattern optimizes grip and traction, even with heavy loads.

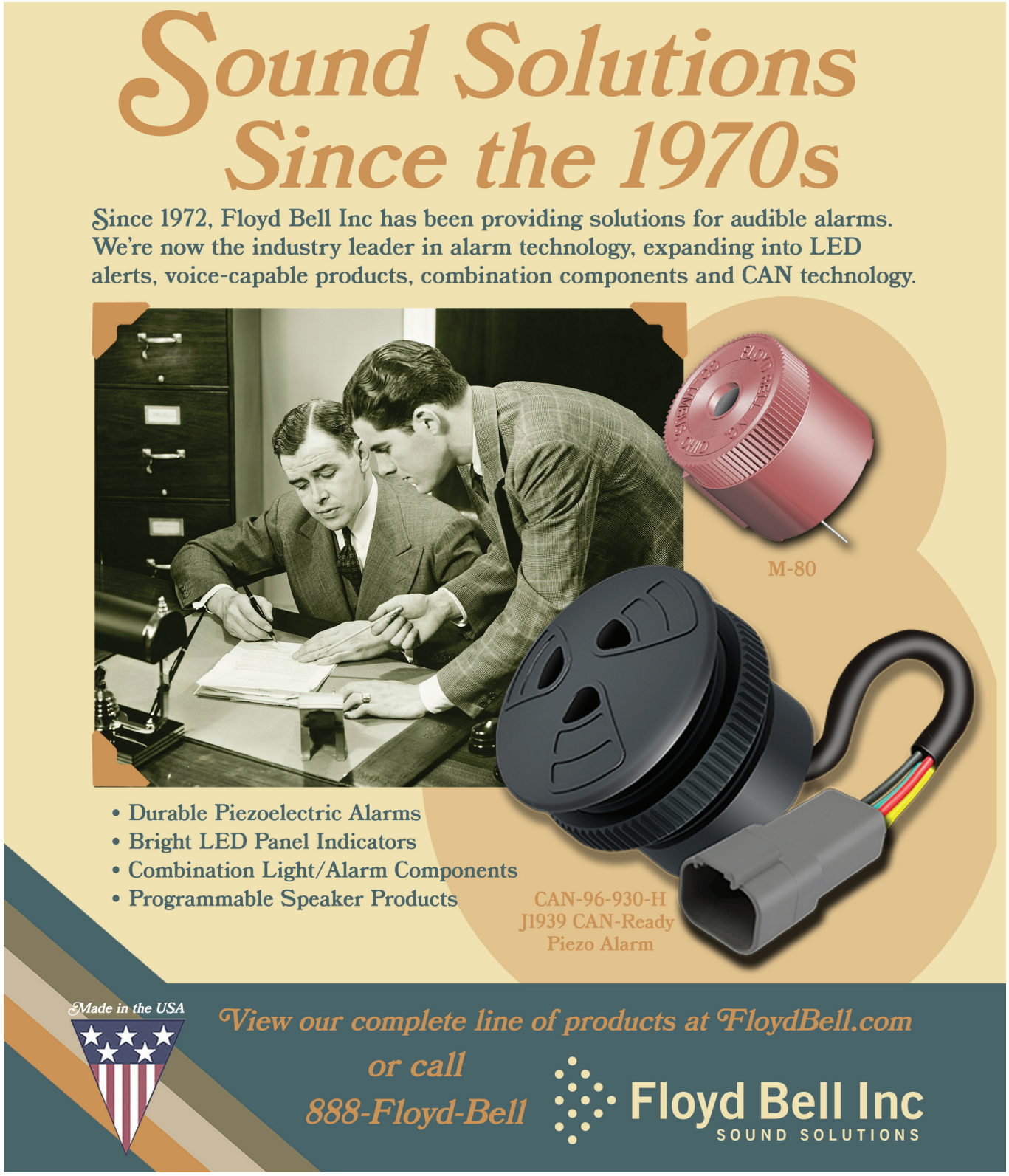
Conveyor Belts

Advanced conveyor systems are essential in industries such as food processing. The patented **KleanTop PacTitan Pro Metal Belt from Regal Rexnord** is now available with a 5/8-in (16 mm) belt pitch option with an increased open area to reduce material build-up. Designed to last "up to six times longer" than the average metal conveyor belt, the belt has dedicated sprocket lanes to reduce bending and distortion within the belt, and it is fully reversible to address wear patterns.

"With the PacTitan Pro, teams spend less time on maintenance and repair, buy fewer replacement belts, and get more production hours out of the day," says Natalie Gray, U.S. strategic account manager for food and beverage at Regal Rexnord.

Technology Toolbox is a monthly feature by Sheila Kennedy, CMRP, that appears in our sister publication Plant Services. Email sheila@addcomm.com with products for consideration. The full Tech Toolbox library is available at: www.plantservices.com/voices/technology-toolbox. NED

Sheila Kennedy, CMRP, is a professional freelance writer specializing in industrial and technical topics. She established Additive Communications in 2003 to serve software, technology, and service providers in industries such as manufacturing and utilities, and became a contributing editor and Technology Toolbox columnist for Plant Services in 2004. Prior to Additive Communications, she had 11 years of experience implementing industrial information systems. Kennedy earned her B.S. at Purdue University and her MBA at the University of Phoenix.



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Colossus: Engineering Heavy-Duty Innovation | 200-Ton Toting Casters

When extreme loads demand extreme solutions, Hamilton delivers. Meet the Colossus—our largest and most powerful caster to date, designed to carry an astonishing 200 tons. Built for a federal contractor, this engineering feat consists of four casters, each rated for 100,000 lbs. Fully assembled, each caster stands 52 inches above the factory floor and weighs over 8,000 lbs.

Colossus casters feature a spring-loaded suspension system to absorb shock, massive flame-hardened to 55-60 HRC raceways, and (96) 1.5-inch diameter ball bearings for smooth movement under intense loads. To ensure superior control, each caster includes an eight-position swivel lock, a 7-inch diameter oscillating axle to navigate uneven surfaces, and a foot-operated braking system. The massive payload required 36-inch diameter, 20-inch-wide extreme-duty press-on tires with 4.5-inch diameter tapered roller bearings. Hamilton's Carts & Trailer Division also engineered a custom 4,500-lb. towing system for precision maneuverability.

Meet the Swiss Army Knife of Workplace Safety—Hamilton's All-New Field Installable Toe Guard

Safety and flexibility come standard with Hamilton's Field Installable Toe Guard, designed to protect workers and enhance operational efficiency. Built from rugged 3/16" steel with a sleek platinum gray finish, it installs easily—no drilling or modifications required.

But this isn't just any toe guard—it's a multi-functional upgrade for enhanced workplace safety. It accommodates heavy-duty contact and ergonomic brakes, giving operators greater control while reducing strain. Need to keep workspaces clean? Add the optional floor brush to sweep away debris and protect casters from damage.

With a precise 1/2" floor clearance and compatibility with 4" to 12" wheels, this guard integrates seamlessly into your existing setup. Order it pre-assembled on a new caster or install it yourself with the included kit—safety on your terms.

Manufactured in-house for faster lead times and superior quality, Hamilton's All-New Field Installable Toe Guard is the ultimate tool for workplace protection. When it comes to safety, there's no room for compromise.

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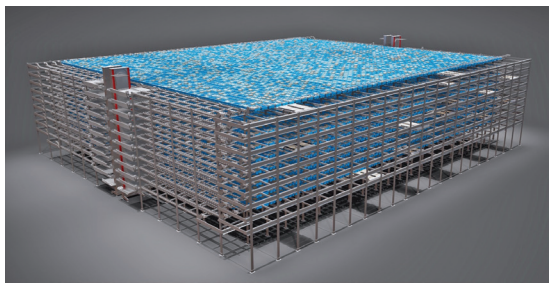
AGV Tugger Takes on Repetitive Tasks

The **TOW300 tugger AGV** can repeatedly move substantial loads with precision whether indoors or outdoors. As part of the wider MasterTow range, this adaptable AGV optimizes workflows in manufacturing, distribution, automotive, and others, taking on risky material and parts movements as well as repetitive tasks and lineside delivery for more efficiency. The TOW300 handles loads up to 6,600 lb (3,000 kg) and slopes up to 10 degrees. As a towing AGV, users can easily create a flexible train system by adding trolleys or carts to the tower.

MasterMover

More online: newequipment.com/55265959

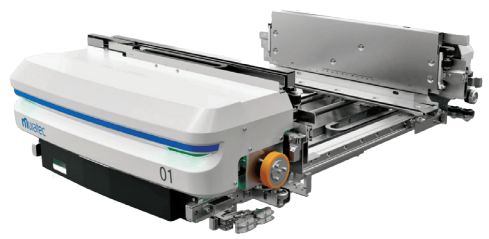


AS/RS Cube Provides True Modularity

The **high-density, dynamic storage cube** uses autonomous robotics to deliver a high-turn, small-footprint, high-rise automated AS/RS that can incorporate conveyor functions—sortation, sequencing, prestaging, each picking, and order buffering—under the control of a WES to combine inbound and outbound material flows together. The system's "carrier" robots clear a 20-tray deep lane in 40 s and simultaneously put away and retrieve product in just one trip. It can also handle standard and large trays, full cases, and individual "each" picks, with trays capable of supporting loads up to 100 lb (45 kg). The modular rack design expands vertically and horizontally, operates on uneven floors, navigates complex layouts, and handles any ceiling height, making it adaptable for a wide range of industries, products, and materials.

Freespace Robotics

More online: newequipment.com/55266272



AS/RS Shuttle System Increases Throughput

The **Double Reach Shuttle** is an advanced AS/RS that maximizes space, improves efficiency, and meets the fast-paced demands of modern supply chains. Its compact design and high speed make it great for warehouses and distribution centers dealing with increasing SKUs and high throughput requirements. The narrow shuttle and double-reach transfer mechanism optimize aisle width, allowing facilities to double storage capacity vertically while reducing manual handling tasks. Able to manage diverse product types with weights up to 66 lb (30 kg), it works for lightweight and heavier goods. The Double Reach Shuttle handles approximately 1,000 cases/h/aisle for combined inbound and outbound operations, making it ideal for fast-paced environments and growing warehouses.

Murata Machinery USA, Inc.

More online: newequipment.com/55265897

Cloud-Based, Anti-Collision Safety Platform

Combining an advanced hardware and software platform to create a complete digital ecosystem, **Amesphere** features high-precision, anti-collision systems to prevent accidents in the warehouse while providing cloud-based connectivity that delivers real-time analytics and notifications. The platform streamlines logistics flows by optimizing forklift fleet routes, reducing operational times, and identifying inefficiencies. Supervising vehicle activities enables better resource planning and ensures accurate monitoring of driver behavior, including the detection of incorrect routes or unauthorized areas. All of this is done through sensors placed around the facility.

Advanced Microwave Engineering (AME)

More online: newequipment.com/55100235

Sustainable Auto-Bagger

The **Rollbag R985 Tabletop Automatic Bagger** is the first-ever compact, tabletop auto bagger designed for sustainable bagging with both paper and poly materials. It handles up to 40 bags/min or 12 bags/min depending on whether poly or paper is used. With the ability to operate with both PAC's Fiberflex preopened paper bags and Rollbag polyethylene preopened bags, the bagger offers flexibility and sustainability. In a time where the industry is facing uncertain regulations on plastic packaging, this machine guarantees that operations will not only meet but exceed expectations.

PAC Machinery

More online: newequipment.com/55263146

Loading Dock Vehicle Restraint System

The **POWER CHOCK AUTO** secures loading docks to increase safety. Using a patented combination of a chock and a restraining plate to immobilize the wheel, it provides up to 50,000 lb (23,000 kg) of restraining force to prevent trailer movement. Operators can secure trailers from inside the warehouse in under 30 s, while an interlock mechanism keeps warehouse doors closed until the trailer is safely secured. Visual and audible communication systems provide real-time feedback for workflow management and safety. The design works with any vehicle type—from semi-trailers to delivery vans.

GMR Safety

More online: newequipment.com/55267543

Wearable Picking Assistant

The **Wearable Task Assistant** is a wearable device that provides step-by-step guidance for users throughout the picking process with an E-Ink display that fits comfortably on the wrist. It displays all information, such as pick cart details, quantities, and put locations, while validating each step with a built-in scanner. This double-confirmation system helps employees reduce mistakes and improves order accuracy. By offering simple prompts, from scanning to placing, it reduces the need for memorization, allowing workers to focus on task completion rather than process details, freeing up valuable time.

Kardex Remstar

More online: newequipment.com/55266308

Transport AMR for Small Loads

AMY, a compact AMR that transports loads of up to 55 lb (25 kg), offers full flexibility, autonomy, and easy integration into larger fleets. Perfect for handling small parts, it's able to exchange loads with conveyor systems or transfer stations. AMY can be used individually or in a swarm and drives at speeds of up to 6 ft/s (2 m/s) using laser scanners at the front and rear with 360-degree visibility. Thanks to the three different models, AMY can be used for numerous applications.

DS Automotion, LLC

More online: newequipment.com/55266001

Height-Adjustable, Ergonomic Workstations

Apex Series Powered Workstations are height-adjustable, ergonomic mobile-powered carts for easier mobility and safety in the facility. These workstations can power multiple devices at the same time—including laptops, tablets, LCDs, touchscreens, barcode printers, and scanners—for over eight hours of continuous use. With an adjustable height range of 30/33 to 48 in (80/84 to 120 cm), these workstations cater to all operators, promoting comfort and minimizing physical strain. The sit-stand functionality allows users to switch between sitting and standing positions.

Newcastle Systems

More online: newequipment.com/55270358

Electric Forklifts With Integrated Batteries

The **Integrated Mid & Large Electric Pneumatic Forklifts** are for heavy-duty applications, particularly outdoor environments. The Integrated Mid Electric Pneumatic Forklift can lift loads to 11,000 lb (5,000 kg). The Integrated Large Electric Pneumatic Forklift can lift loads to 17,500 lb (8,000 kg) and was designed for applications such as lumber yards, construction sites, and heavy-duty manufacturing facilities. Both models combine the lithium-ion battery and the forklift into one package making operation, ergonomics, and productivity easier. They also both provide the same power and performance as an internal combustion forklift, but they're completely electric.

Toyota Material Handling, Inc.

More online: newequipment.com/55266606

WMS Provides Predictive View of Warehouse Operations

eLogic, a cloud-based warehouse management system (WMS), combines all information in one, easy-to-use dashboard. This platform helps warehouses optimize performance, prevent downtime, and scale operations. The base offering provides productivity, system health, and storage utilization modules. Since the platform centralizes all information in one place, users receive real-time visibility with data-driven insights and predictive analytics for their entire operation. The Proactive Uptime Management function uses machine learning to predict and prevent robot failures. Able to integrate with any other WMS to increase flexibility, businesses can also add additional modules to tailor the platform to their specific needs.

Element Logic

More online: newequipment.com/55267476

Presence Sensing for Lift Trucks

The **iWAREHOUSE ObjectSense Detection & Notification System** uses audible and visual alerts to alert operators to obstructions while traveling in lift trucks. With controlled slowdown and stopping functionalities, operators remain in full control at all times. It can be used as a training reinforcement tool and is easily incorporated into existing Raymond fleets without layout or infrastructure changes. Relying on dynamic detection that automatically adjusts with lift truck speeds, it lengthens and shortens detection areas as needed.

The Raymond Corporation

More online: newequipment.com/55270314

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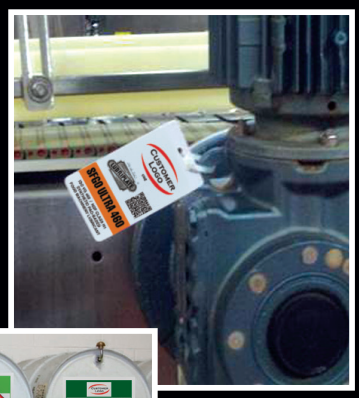

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FMO-150 AW* PART NO. L0879-060 / 5 GALLON PAIL	HYDRAULIC SYSTEMS	ISO 32 GRADE USP WHITE MINERAL OIL *NSF H1 FOOD MACHINERY GRADE
SFGO ULTRA 46* PART NO. L0916-060 / 5 GALLON PAIL	AIR COMPRESSORS	ISO 46 GRADE SYNTHETIC PAO-BASED AIR COMPRESSOR FLUID *NSF H1 FOOD MACHINERY GRADE
RCO-68FG* PART NO. L0818-060 / 5 GALLON PAIL	REFRIGERATION COMPRESSOR	ISO 68 GRADE SYNTHETIC PAO-BASED REFRIGERATION COMP FLUID *NSF H1 FOOD MACHINERY GRADE
FMO-350 AW* PART NO. L0882-060 / 5 GALLON PAIL	CHAIN OIL	ISO 68 GRADE USP WHITE MINERAL OIL *NSF H1 FOOD MACHINERY GRADE
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SFGO ULTRA-220* PART NO. L0985-062 / 55 GALLON DRUM	HELICAL GEAR BOXES	ISO 220 GRADE SYNTHETIC PAO-BASED LUBRICATING OIL *NSF H1 FOOD MACHINERY GRADE
SFGO ULTRA-460* PART NO. L0985-062 / 55 GALLON DRUM	WORM GEAR BOXES	ISO 460 GRADE SYNTHETIC PAO-BASED LUBRICATING OIL *NSF H1 FOOD MACHINERY GRADE
GREASES		
SYNXTREME FG-2/220* PART NO. L0309-098 / CARTRIDGE	GENERAL GREASE BEARINGS	NLGI #2 GRADE MULTI-PURPOSE, SYNTHETIC CALCIUM SULFONATE GREASE *NSF H1 FOOD MACHINERY GRADE
CLEARPLEX 1* PART NO. L0350-035 / 35 lb PAIL	CENTRALIZED GREASE SYSTEMS	NLGI #1 GRADE USP MINERAL OIL BASED ALUMINUM COMPLEX GREASE *NSF H1 FOOD MACHINERY GRADE

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Navigating Supply Chain Disruptions: Then And Now

Learn how AI can solve century-old procurement issues.

By **Edmund Zagorin**

Historically, procurement and supply chain teams react to crises only after they have already begun. A crisis starts and suddenly the team goes into fire-fighting mode. After the situation is remedied, teams return to business as usual, only to await the next crisis. Balancing strategic imperatives with solving these short-term crises is the key to effective supply management.

Simply reacting to supply disruptions may reduce immediate challenges, but it often fails to drive strategic value for the organization. This reactive posture can take a toll on the supply chain team's morale, as their efforts to minimize disruption often go unrecognized.

For years, procurement and supply chain professionals have been forced to play defense, constantly reacting to minimize disruptions as they arise. This approach not only diminishes employee productivity by forcing them to constantly switch between projects and contexts, but it also undermines the perception of the function's strategic importance.

When procurement is focused solely on putting out fires, it can seem like the team is only able to solve immediate problems rather than drive long-term value. This perception becomes a self-fulfilling prophecy, as business stakeholders may hesitate to involve procurement early in the decision-making process—right when the team could deliver the most strategic impact.

But what if this could change? What if procurement could identify opportunities with strategic value for stakeholders and proactively bring them to the table to solve century-old supply chain issues?

Moving from Defense to Offense

If procurement and supply chain teams could move from a reactive posture to a proactive, predictive position, they could focus on strategic planning for future growth and innovation, as well as building supplier relationships to enable business growth. That's why AI and predictive analytics are essential to improving procurement technologies.

New technology is transforming the way supply chains are managed. Instead of addressing problems as they arise, procurement professionals can identify opportunities for strategic value early and often, developing proactive response plans for dealing with predictable disruption events.

While the specific timing and severity of disruption events like hurricanes, port closures, labor strikes, or country shutdowns are difficult or perhaps even impossible to predict, there are a finite number of event types each year that can disrupt supply chains, and thus a finite number of response plans that can assure resilient continuity of supply.

With the advent of new predictive procurement orchestration tools, supply planners, procurement and purchasing teams now have the capacity to reduce the chaos of unexpected disruptions. These tools also transform procurement into a strategic business function by avoiding harm and predicting value-creating opportunities. By leveraging these new technologies, teams are orchestrating smoother business operations, identifying additional sources within their existing supply base, and navigating challenges with greater agility.

Addressing age-old industry constraints with these advancements can transform procurement from a reactive firefighter into a proactive business partner and trusted advisor to stakeholders. The result is not just improved efficiency, but a shift toward a future where procurement leads the way in maintaining business continuity and seizing opportunity—even amid uncertainty.

A History Of Difficulty For The Panama Canal

Consider a recent real-world example: The Panama Canal, a well-established cargo route, is no stranger to challenges and complexities brought about by natural disasters, geopolitical tensions, or technical failures, to name a few. To the untrained eye, the Panama Canal is a constructed waterway acting as a reliable "shortcut" for goods being transported across the Atlantic and Pacific oceans. However, experienced suppliers know the canal is wrought with disruptions

from droughts that make it difficult to depend on, leading carriers in certain cases to cut their losses and opt to go around South America—a much longer, more costly route.

The increasing frequency and severity of these droughts, likely driven by climate change, compound these challenges and raise concerns about the canal's long-term sustainability. As concerns around the Panama Canal's reliability escalate, carriers and shippers must contend with the daunting task of pricing that uncertainty into contract negotiations. Even when a disruption does not take place, uncertainty itself can create additional costs.

A clear indicator of market response can be seen in the rising prices of container shipping contracts for 2025. Experts estimate that roughly 80% of all global goods are transported via ocean freight, making disruptions to key routes like Panama, the Red Sea and Taiwan a critical concern. If the COVID-19 pandemic has taught us anything, disturbances in one region often trigger a ripple effect throughout the global supply network.

Predictive Procurement for Supply Chain Resilience

In today's turbulent geopolitical environment, simply reacting to supply chain issues as they arise is no longer sustainable for businesses. End consumers are accustomed to instant access to goods and services, no matter the surrounding context. To weather these volatile times, organizations must take proactive steps, which begin with building a strong, resilient supplier network that's able to re-route orders or create new agreements at a moment's notice.

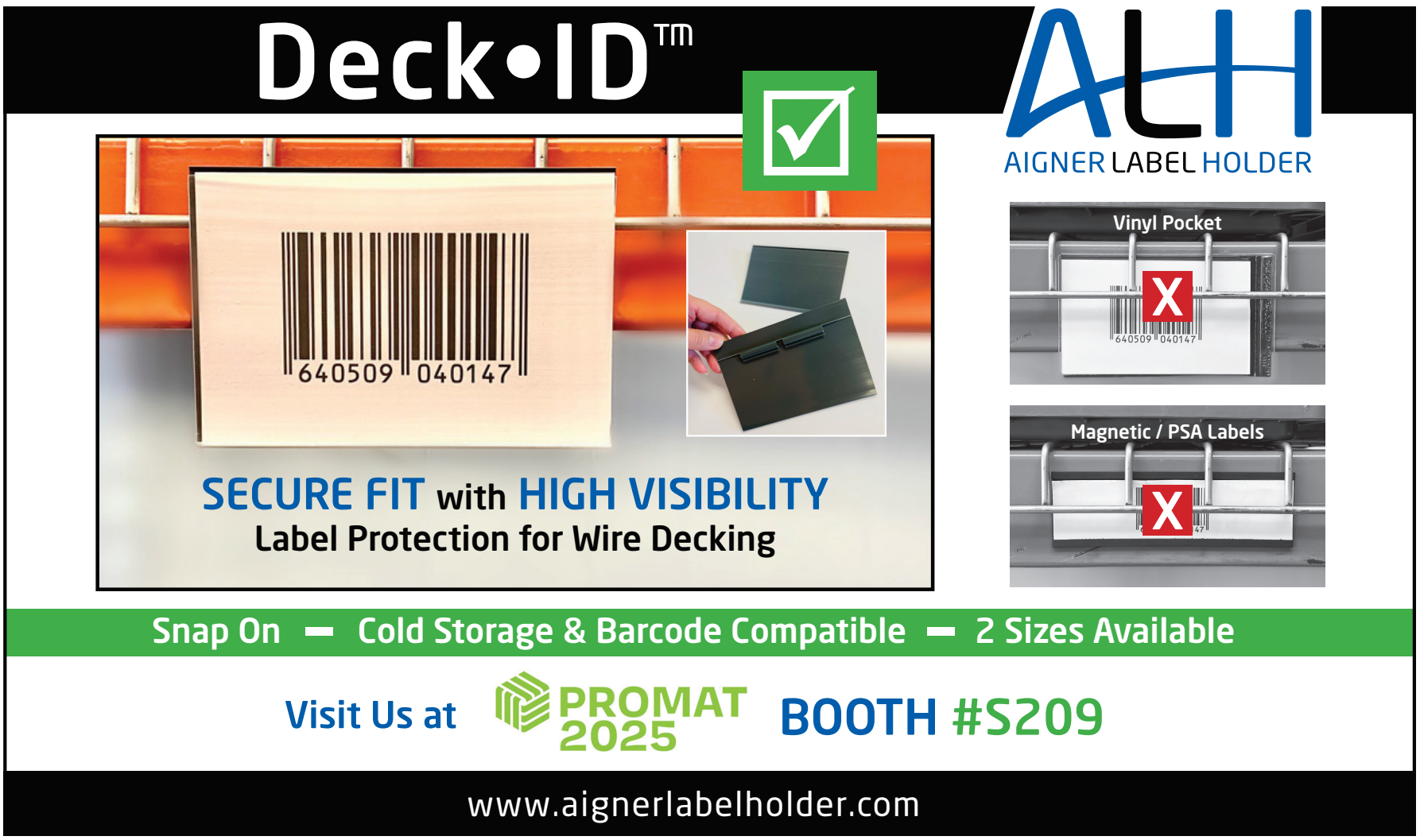
That's why AI-powered predictive procurement technologies have the potential to revolutionize how companies address and prepare for supply chain challenges. Traditionally, procurement involved a great deal of manual effort, from sourcing and qualifying suppliers to negotiating contracts. This slow, reactive process left organizations vulnerable to disruption and created long lead times to deliver solutions. However, AI-driven tools are now helping to streamline and automate these labor-intensive tasks, allowing procurement teams to quickly identify alternative suppliers and manage spot-market opportunities when unexpected challenges arise.

By analyzing data trends, such as historical supplier performance metrics and environmental factors, these predictive procurement systems enable businesses to make more informed decisions proactively. Identifying alternative sources of supply within a company's existing supplier base is key, since qualifying new suppliers can be time-consuming, and expanding the total number of suppliers may introduce unnecessary complexity. Qualified alternatives can step in with primary suppliers facing delays and shortages. Additionally, securing carriers with secondary capacity is equally important, as logistical challenges often arise when transport routes are disrupted.

This level of adaptability will be crucial for safeguarding business continuity, ensuring that when one part of the supply chain falters, the entire operation does not come to a standstill. Predictive procurement empowers companies to have contingency plans in place, allowing them to pivot quickly and keep operations running smoothly when unforeseen challenges arise. Moreover, by leveraging AI-driven insights, organizations can optimize inventory levels, negotiate more favorable contracts, and better manage fluctuating demand.

As supply chain challenges persist with no clear end in sight, leveraging AI-driven predictive models will be essential for controlling costs, ensuring on-time deliveries and mitigating risk. Predictive technologies can help businesses navigate disruptions like those we have seen plague the Panama Canal by identifying alternative routes and evaluating cost trade-offs, easing century-old issues like never before. The future of supply chain management depends on how effectively organizations can adapt to these evolving complexities, using technology to build resilience and maintain a competitive edge. **MH&L**

Edmund Zagorin is co-founder and chief strategy officer at Arkestro, provider of a predictive procurement platform that uses data science, machine learning and behavioral science. Prior to founding Arkestro, he worked as a consultant focused on data-driven supplier negotiations for large healthcare providers, contract manufacturers and multi-campus retail brands.



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Planning for the Next Shift

AI-based predictive analytics offer companies a way to future-proof their warehouse operations.

By **Keith Moore**

In today's fast-paced business environment, particularly in supply chain management, the ability to react quickly is critical—but it's no longer enough. Companies are under increasing pressure to predict and prevent disruptions before they occur. While many organizations focus on managing the immediate execution window of warehouse operations, planning for tomorrow's challenges can yield far greater results in terms of efficiency, cost reduction and overall performance. Advanced warehouse orchestration platforms are designed to do just that: they go beyond managing present tasks to predict future bottlenecks and operational challenges, allowing companies to take proactive measures and maintain smooth, uninterrupted workflows.

This forward-thinking approach, fueled by artificial intelligence (AI) and predictive analytics, is revolutionizing the way businesses operate. It provides them with the tools and insights to anticipate disruptions and optimize their processes in real-time. Here's a closer look at how this predictive approach works and why planning for tomorrow is the key to future-proofing warehouse operations.

Moving Beyond the Current Execution Window

Traditionally, many companies have managed their warehouse and supply chain operations reactively, focusing on addressing challenges in the current execution window. For example, when a warehouse experiences delays in shipping or inventory shortages, immediate measures are taken to resolve these issues as they arise. While this reactive approach is necessary in fast-moving environments, it often leads to inefficiencies, unnecessary costs and missed opportunities to prevent similar problems from happening in the future.

AI-powered orchestration solutions shift the focus from simply managing present operations to actively predicting and preventing future issues. By analyzing vast amounts of operational data, these solutions identify patterns and trends that may indicate potential bottlenecks in the days ahead. This allows companies to foresee issues such as labor shortages, equipment breakdowns, or delayed shipments before they occur, giving them time to adjust and implement preventive strategies.

This shift from reactive to proactive management enables businesses to maintain smoother operations, improve throughput and enhance labor efficiency, all while reducing the risk of costly disruptions.

The Power of Predictive Analytics

At the heart of this proactive approach is predictive analytics. Predictive analytics uses historical data, machine learning algorithms and statistical models to forecast future events and behaviors. By applying these methods to warehouse operations, predictive analytics can identify potential bottlenecks and performance issues well before they impact the supply chain.

For example, predictive analytics can forecast future labor shortages by analyzing past labor trends, seasonal fluctuations and upcoming order volumes. If a shortage is predicted, the system can recommend adjusting staffing levels or reallocating resources to avoid delays. Similarly, predictive analytics can predict when certain equipment may require maintenance or inventory levels are likely to drop below critical thresholds, allowing businesses to take preventive actions and avoid disruptions. This level of insight enables businesses to stay ahead of challenges, minimize risk and make data-driven decisions that ensure continuous operational efficiency.

Preventing Bottlenecks and Operational Disruptions

Bottlenecks related to labor, equipment, or inventory are among the most significant threats to warehouse efficiency.

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- *Easily lift freight that has shifted off of the deck or rack*
- *Skids can be lifted off the deck bar or rack to adjust beams*
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These disruptions can lead to delays, increased costs and missed deadlines, impacting customer satisfaction and long-term profitability.

Predictive analytics allows businesses to foresee bottlenecks before they become critical. By continuously monitoring data streams from various sources, a warehouse orchestration platform provides real-time visibility into the warehouse's performance and identifies areas where potential issues might arise.

For example, suppose predictive analytics indicate that a certain shipping lane will be delayed due to increased demand or reduced capacity. In that case, a warehouse orchestration platform can suggest rerouting goods to avoid congestion. If labor constraints are forecasted for an upcoming shift, the system can automatically adjust schedules, reassign workers, or deploy automation solutions to mitigate the impact.

This proactive approach not only reduces the likelihood of bottlenecks but also optimizes resource allocation and workflow prioritization, allowing businesses to maintain high levels of operational efficiency even during periods of stress or high demand.

The Benefits of Proactive Warehouse Management

The shift from reactive to proactive warehouse management brings several significant benefits. Here are some of the key advantages of using warehouse orchestration solutions to plan for tomorrow's challenges:

Improved Resource Allocation

Predicting future bottlenecks enables businesses to allocate resources—such as labor, equipment and space—more effectively. Instead of scrambling to find solutions in the midst of a disruption, companies can adjust staffing levels, deploy additional equipment, or optimize space usage in advance.

Increased Labor Efficiency

Labor is one of the most significant costs in warehouse operations, and inefficiencies in labor management can lead to wasted time and resources. By predicting future labor needs, a warehouse orchestration solution helps businesses ensure they have the right number of workers assigned to the right tasks at the right time. This not only reduces downtime but also improves overall productivity and employee satisfaction.

Reduced Downtime and Delays

Unplanned downtime can be costly, whether due to equipment failures, labor shortages, or inventory mismanagement. Predictive analytics help prevent downtime by identifying potential issues before they escalate. By proactively scheduling maintenance or adjusting workflows, businesses can minimize disruptions and keep operations running smoothly.

Enhanced Decision-Making

One of the most powerful aspects of predictive orchestration is its ability to provide actionable insights. With real-time data and forward-looking forecasts, warehouse managers can make better, more informed decisions about handling day-to-day operations and long-term strategies. This leads to better outcomes and improved performance across the entire supply chain.

Future-Proofing Operations

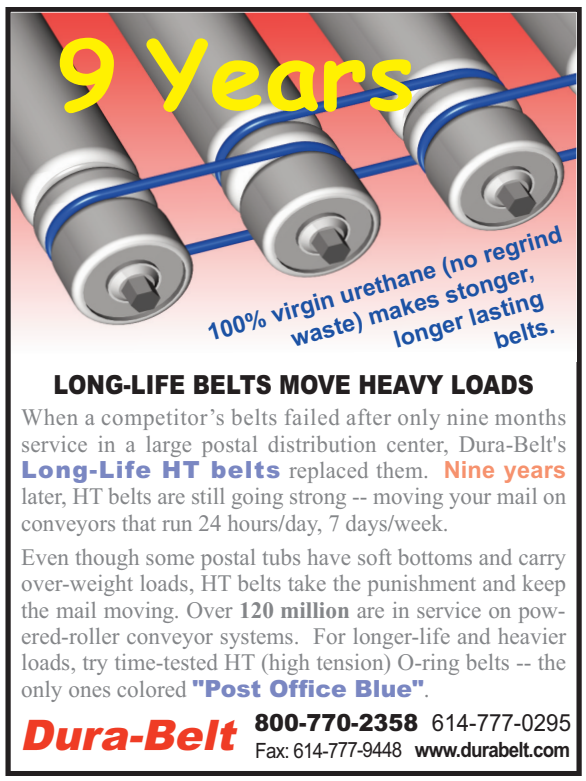
Planning for tomorrow's challenges helps businesses build resilience against future disruptions. Whether it's a sudden surge in demand, a labor shortage, or an unexpected equipment failure, companies that use predictive analytics are better prepared to adapt and overcome these obstacles. Staying ahead of challenges makes it easier to scale operations, meet customer expectations and remain competitive in an ever-changing market.

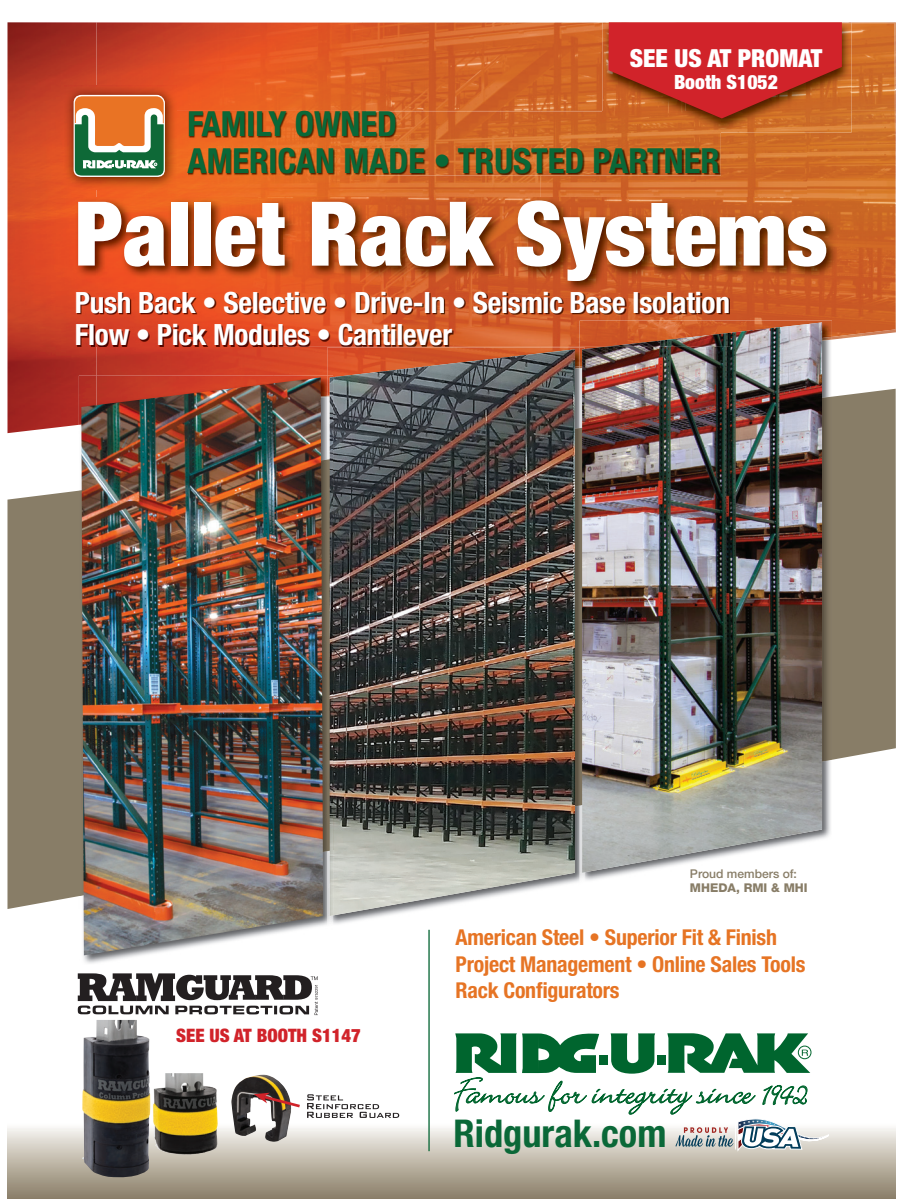
Real-World Applications of Predictive Orchestration

Proactive orchestration solutions have been successfully implemented by several industry leaders, demonstrating the effectiveness of this forward-looking approach. For instance, at large-scale operations like food and beverage giant PepsiCo, predictive orchestration has helped significantly reduce trailer dwell time, optimize labor allocation and streamline inventory management. By predicting potential disruptions before they occur, these organizations have improved throughput, reduced costs and delivered better service to their customers.

Moreover, this type of platform integrates seamlessly with existing warehouse management systems (WMS), making it a valuable addition to any business looking to enhance its operational capabilities without needing a complete system overhaul. This integration ensures businesses can continue using their current systems while benefiting from AI-driven technology's advanced predictive insights. MH&L

Keith Moore is the CEO of AutoScheduler.AI, a WMS accelerator created to help orchestrate poorly coordinated facilities. He was previously chief product officer.





FROM THE COVER

Small Diameter Deburring

A small mechanical deburring tool for 1 to 2.1 mm bores, the **DL2** works with a wide range of materials including steel, stainless steel, titanium, aluminum, composites, and others. Designed for CNC operation, the DL2 provides high efficiency and process reliability on even and slightly uneven bore edges.

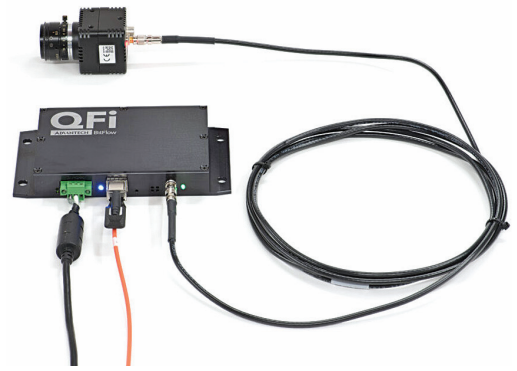
With the simple construction of 4 components, the carbide blade is integrated into the spring to form a single unit, ensuring proper spring tension for guiding and cutting forces of the blade and making it easy to change blades. The DL2 features internal blade cooling where the coolant is supplied through the tool and guided directly to the cutting edge of the carbide blade.

DL2 tooling is ideal for deburring watch cases, medical & surgical components, and other precision micromachining applications. Heule DL2 tooling is available for bores from 1 to 2.1 mm with a maximum deburring capacity of 0.15 to 0.2 mm, with common sizes available from stock.

Heule Tool Corporation

More online: newequipment.com/55270398

Copper-to-Fiber Module Simplifies Data Transmission



The **QFi** is a copper-to-fiber module that supports long-distance data transmission from a single-link CXP camera to a host PC. With link speeds up to 10 Gb/s and cable lengths of 0.5+ mi (1+ km), it provides a cost-effective way to extend CXP transmission. The QFi outputs camera data via an SFP+ fiber cable assembly and into a Claxon quad-link CoaXPress over Fiber frame grabber in the host PC. A max of 4 QFi modules can connect to a Claxon frame grabber, offering single or multicamera configurations to deliver speeds up to 40 Gb/s.

BitFlow, Inc.

More online: newequipment.com/55261633

AI Accelerates Digital Transformation Through Data

Kinsmen AI solves demanding data challenges for asset-heavy companies. By cleaning, contextualizing, and organizing data across all sources and systems, it bridges the gap between legacy and modern systems to help leverage advanced tools like visualization, digital twins, and analytics. It streamlines acquisitions by aligning and standardizing industrial data, simplifies divestitures through organized and cleansed information transfers, ensures error-free system migrations, enables digital transformation readiness, and provides compliance confidence with audit-ready data.

Kinsmen Group, LLC

More online: newequipment.com/55265614

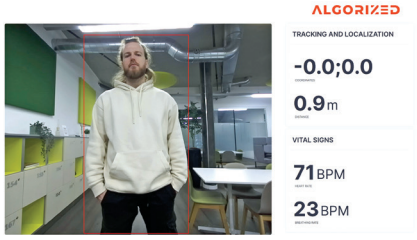
Battery-Powered AI Module

A coin-cell battery-powered AI module named the **Sparsh-board** for on-device AI applications such as predictive maintenance, wearables, acoustic event detection, and more is capable of running on a coin-cell battery for months of always-on AI operation. With motion sensors, a digital microphone, a BLE module, and several other components, the Sparsh module enables rapid prototyping of battery-powered AI applications. Product makers can enable accurate AI applications without compromising on performance, battery life, form factor, and flexibility.

Ambient Scientific, Inc.

More online: newequipment.com/55262424

AI-Powered Multimodal Sensing Platform for Human-Machine Interaction



The **Multimodal People Sensing Software Platform** is designed with a hardware-agnostic approach, to empower users with human detection technology which offers capabilities in vital signs monitoring, precision positioning, and space utilization through patented AI-driven sensor fusion algorithms. Using machine learning and advanced sensor fusion techniques, including UWB and wireless sensors, it enables real-time human presence sensing and vital sign monitoring for automotive, industrial, and indoor navigation. The platform enables safe human-machine interaction, detecting where humans are within space; provides real-time occupancy monitoring to enable better optimization of space usage; and can reveal contactless heart and breathing rates of humans.

Algorized

More online: newequipment.com/55269680

Lead-Free Machinable Steel

Lead-free machinable steel, **11SMn30+BX**, is great for the precise manufacturing of components and is easy to cut and mill without causing excessive wear on tools. Traditionally, lead was added to improve the machinability of these steels but the Swiss Steel Group has replaced lead with the more environmentally friendly element boron. Its consistent quality reduces maintenance intervals and increases uptime, lowering production costs.

Swiss Steel Group

More online: newequipment.com/55271726

Chemical Metering Pumps for Full Control

The **TD Series Chemical Metering Pump with FLUXDRIVE technology** features a range of control features. From optional manual speed adjustment to its compatibility with SCADA systems for full remote control, the series offers a great level of flexibility. MODBUS and Bluetooth connectivity enable these pumps to integrate into modern industrial environments. The liquid ends have integrated double-ball check valves and over-molded diaphragms for better durability, operating continuously for up to 40 million strokes. Coupled with FASTPRIME technology, these pumps guarantee quick commissioning and priming. The TD Series is available in three models: Basic, Advanced, and COMMs.

LMI Metering Pumps

More online: newequipment.com/55264462

No-Programming Safety Control Module

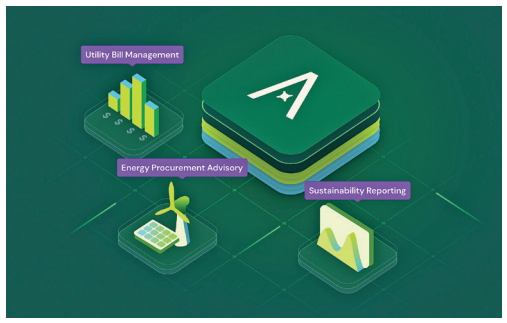
The **FS1B Safety Controller**—an upgrade of the popular FS1A device—lets designers create streamlined machine safety systems with multiple safety channels by using any of 24 preset safety logic strategies selected with DIP switch configuration with no programming. DIP switches and a single "enter" pushbutton provide a quick and easy setting of the safety logic strategy, inputs, and power-off delay time. Colored LEDs and 7-segment numeric displays provide clear at-a-glance device and input/output status.

IDEC Corporation

More online: newequipment.com/55260067

AI-Powered Solutions for Energy Management

Arcadia Enterprise Solutions helps companies ensure energy is consistently affordable, reliable, and clean. It uses Arcadia's utility data platform, AI analytics, an expansive partner network, and industry expertise to help with end-to-end energy management. The main offering is the Arcadia Platform—a utility data, tariff, and payments software that consolidates energy data from 10,000 utilities and third-party sources into a single, actionable view. The platform offers three core solutions: Utility Bill Management, Energy Procurement Advisory, and Sustainability Reporting.



Arcadia

More online: newequipment.com/55264312

Antivibration Gloves With High-Dexterity and Cut Protection

Antivibration High-Dexterity Nitrile Dipped Gloves protect from harmful tool vibrations, providing protection while maintaining high dexterity. Designed for applications such as drilling, sanding, grinding, cutting, chipping, breaking, and demolition work, the gloves provide a Cut Level 4 rating to protect from lacerations and meet safety requirements on the job site. With a soft and comfortable liner, the 18-gauge material provides total hand mobility when working with small fasteners. With back-of-hand protection to shield against bumps and scrapes, the nitrile dip ensures holds up to abusive job site conditions. They also have SMARTSWIPE for a touchscreen-compatible fingertip.

Milwaukee Tool

More online: newequipment.com/55253460

No-Rinse Alkaline Cleaner for Food & Beverage Plants

RAF NO FOAM Cleaner is an alkaline cleaner for clean-in-place systems within food, beverage, and dairy processing plants. It has a high percentage of available chlorine in a medium-duty, highly sequestered formulation for maximum performance. It's low foaming even at high concentrations and high circulation velocities. Ideal for hard or soft water environments, it doesn't need to be rinsed, doesn't leave spots, and leaves no residue or odor after use.

Madison Chemical

More online: newequipment.com/55259782

Digital Filter Lens for Auto-Darkening Helmets

A **true-color digital variable auto-darkening filter lens replacement** for auto-darkening helmets allows users to have a light shade of 3 to a dark shade of 5-9/9-13 to be used in different applications. The design fits all 2 x 4.25-in (5 x 11 cm) welding helmets and has a stainless-steel frame to reflect infrared heat and light. The filter lens features a true-color blue HD technology that alleviates eye and neck fatigue while providing enhanced visibility and clarity. The filter is powered by solar and a rechargeable battery.

Weldcote

More online: newequipment.com/55269341

Compact Metal Laser Cutters

The **FC-22** and **FC-22C Fiber Laser Cutters** are small, powerful, and precise—perfect for businesses venturing into professional metal cutting. Both laser cutters offer 1,500 W of laser power, easily slicing through tough metals with a cutting speed of 27.5 in/s (700 mm/s). The fully enclosed structure with an observation window ensures protection from laser leaks. The laser cutters offer a 24 x 24-in (610 x 610 mm) cutting area and have built-in water chillers. The FC-22 even includes front/back pass-throughs accommodating materials up to 25 in (630 mm) wide for more versatility.

OMTech Laser

More online: newequipment.com/55253470

DC Power Supplies With 3U Form Factor

The HPS Series 20 kW DC Power Supplies offers two models: **HPS20K800** (800 V/25 A) and **HPS20K1500** (1500 V/13.4 A). Models can be combined to increase output to 160 kW. The touchscreen displays set and measured values as well as simulated internal resistance. The front panel USB host port is available for logging voltage and current data. Standard interfaces include LAN and RS232 for remote PC control and monitoring. The galvanically isolated analog interface provides output control and monitoring using an external voltage source.

B&K Precision Corporation

More online: newequipment.com/55264449

Sensor Prevents Excess Moisture

The **AVENTICS DS1 dew point sensor** monitors dew point, temperature, humidity levels, quality of compressed air, and other non-corrosive gases from one device. It helps operators detect and mitigate excess moisture in its early stages and prevent moisture-related equipment damage. Measurement values include pressure dew point, temperature, relative humidity, absolute humidity, moisture content, moisture content V/V, water vapor partial pressure, and atmospheric dew point. The DS1 is also suitable for other non-corrosive gases, including nitrogen, oxygen, argon, helium, and sulfur hexafluoride.

Emerson Electric Co.

More online: newequipment.com/55260056

Dry Cooler for Water-Efficient Cooling

The **TrilliumSeries dry cooler** is a high-capacity cooler for sustainable, water-efficient cooling for customers in water-stressed areas. The dry cooler reduces reliance on water while providing reliable heat rejection which is particularly vital for data centers and manufacturing facilities where uptime and operational efficiency are paramount while minimizing water usage. Delivering a high cooling capacity in a small footprint, it's a good choice for space-constrained environments. Additionally, its features minimize maintenance, reduce installation costs, and lower noise levels.

Baltimore Aircoil Company

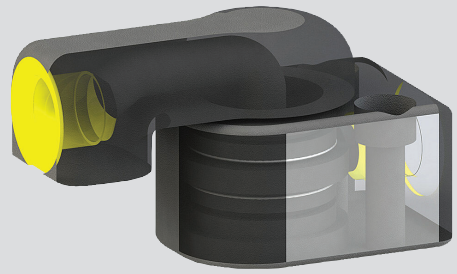
More online: newequipment.com/55265248

FROM THE COVER

Hose Joint for Unrestricted Rotation

The **Flex-Guard Hydraulic Hose Joint** is a new hydraulic hose swivel designed to eliminate wear issues associated with flexible hoses. The custom hose swivel fitting integrates into existing hydraulic systems, allowing hoses to rotate freely, preventing wear and reducing hose damage. Whether you need an in-line swivel or a rotating joint swivel, the Flex-Guard fits easily into your machinery without the need for modifications.

It's Ideal for machinery where hoses are subject to significant wear or sharp bends, locations that are difficult to access for maintenance, or 4-wire braided hoses used in high-pressure applications. United Equipment Accessories can tailor the hose to fit specific mounting, size, number of hoses, pressures, and spatial constraints of your application.



United Equipment Accessories, Inc.

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Groundwater Sampling Pump

The **MicroPurge MP100** peristaltic pump system for low-flow groundwater purging and sampling produces flow rates of up to 1,500 ml/min and lifts up to 30 ft (9 m) using standard silicone tubing sizes. Granting full control over the purging and sampling process, it's ideally suited for sampling PFAS due to the water sample only making contact with the drop tubing in the well. The MP100 is offered with disposable pump tubing and drop tubing for portable applications or can be configured with an available well cap and tubing weights for dedicated applications.

QED Environmental Systems

More online: newequipment.com/55262830

Mini Linear Servo Motor

The **SDLM-016-032-01-01-M (Metric) Direct Drive Linear Motor** with an integrated encoder and temperature sensor features zero backlash, zero cogging, high acceleration, high speed, high resolution, and long life. This motor has a stroke length of 0.25 in (6 mm), a continuous force rating of 1.14 N (4 oz), a peak force of 3.6 N (13.0 oz), and 1.08 N/A (4 oz/A) force constant. It has a quiet long life, plain linear bearings, and connections are easily made via a flex cable terminated in a 10-pin female connector.

Moticont

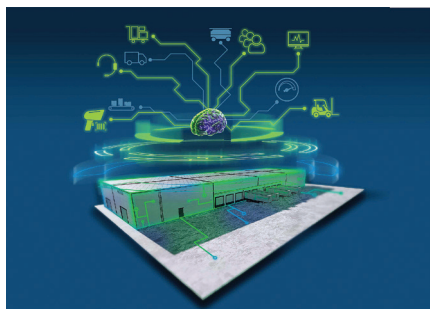
More online: newequipment.com/55263967

Quarter-Turn Pin-Holding Clamps

Fixtureworks now offers two varieties of quarter-turn pin-holding clamp fasteners: The **QCPC** and heavy-duty **QCPCS**, as well as corresponding clamping pins **QCPC-M** and **QCPCS-M**. With either plastic or stainless-steel knobs, the clamps provide positive locking in quick change applications for frequent insertion and removal of a fixture or top plate. They allow for consistent fastening force eliminating the chance for under or over-tightening. The QCPC clamps are designed to be used with the QCPC-M pins and the QCPCS clamps are designed to be used with QCPCS-M pins for use on plates.

Fixtureworks

More online: newequipment.com/55259735



Optimize Your Warehouse Travel

Helping warehouses make quicker and more effective decisions for order batching & prioritization, warehouse worker travel, and slotting, the next-generation **Dynamic Work Optimization** (DWO) platform considers order priority, SKU clustering, proximity, and warehouse layout to reduce travel time by optimizing pick paths. A virtual model of your facility is used to define the best travel path, considering aisle directions, item designations, and other factors. All available work assignments are prioritized based on rules that can be configured and adjusted such as ship dates, routes, carriers, order types, and more.

Lucas Systems, Inc.

More online: newequipment.com/55265409

Keep AI Security Threats at Bay

Cyberhaven for AI is a comprehensive solution that enables enterprises to securely adopt generative AI while protecting sensitive data. See every AI tool used by your organization, who's using them, and what kinds of data are interacting with them. Record all data flows to the internet without any configuration needed and trace data from its origins. Protect against the accidental use of copyrighted material from AI, reduce the risk of decisions made on AI hallucinations, and guard against malicious code by identifying the source of data.

Cyberhaven

More online: newequipment.com/55263903

Take Multiple Images at Lightning Fast Speeds

The **allPIXA evo 16k line scan camera** with a CMOS multiline sensor with 16,384 5 x 5 µm pixels, is capable of scan rates of 200 kHz in monochrome or 73 kHz in color. The camera's CoaXPress-12, 4-lane interface achieves lightning-fast data transmission with each of the lanes has a top speed of 12.5 Gbit/sec. The camera also supports Power over CoaXPress, supplying power over the same cable transmitting data, and eliminating the need for a separate cable. It has a multifield feature that allows up to 4 images to be acquired in a single pass.

Chromasens GmbH

More online: newequipment.com/55264784

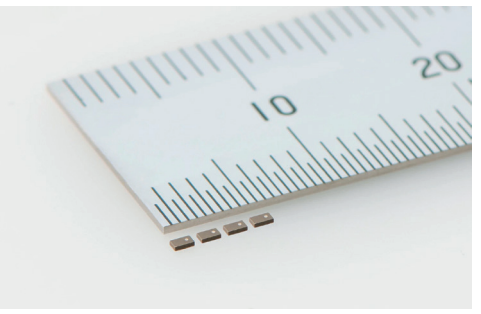
Quick Release Ball Lock Pin Shafts

Quick release pins are offered in a variety of shaft materials to meet any demand. The pins are available in a variety of lengths and diameters and the shaft/shank materials are available in heat-treated 17-4 stainless steel, 300 series stainless steel, and heat-treated/plated 4130 alloy steel. The positive-locking pins will not release until the button on the handle is depressed, which causes the balls to retract into the pin and allows the pin to be removed from the hole.

Fairlane Products

More online: newequipment.com/55263135

Multilayer Metal Power Inductors



Part of the MCOIL LSCN series of multilayer metal power inductors, the **LSCND1005CCTR47MH** (1 x 0.5 x 0.33 mm) inductor can be used as choke coils in the power supply circuits of wearable devices, such as smartphones, AR/VR glasses, TWS devices, and smartwatches. The inductor offers a low height and has a thickness of 0.33 mm. The MCOIL LSCN series uses metallic magnetic materials with high DC saturation and provides superior characteristics for achieving miniaturization and thinness.

Taiyo Yuden

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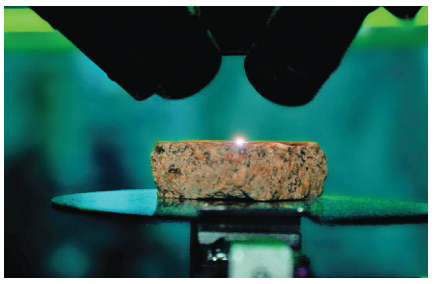

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Ablatom

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Multifunctional Leak Tester

The **Sentinel IX5** is a multifunctional leak test platform for pressure, flow, and vacuum leak testing. The first instrument in the fifth generation of the Sentinel family, it features an entirely new design. The touchscreen offers simplified menus, customizable screen views, real-time data, and more. Users can easily tap, build, and visualize all steps in test sequences and preview and sequence a test before running it. Choose from 9 different test methods and combine multiple methods on one instrument. The instrument can replace a PLC to control test operations.

Cincinnati Test Systems, Inc.

More online: newequipment.com/55261334

Spatial Audio Sensor for Wearables

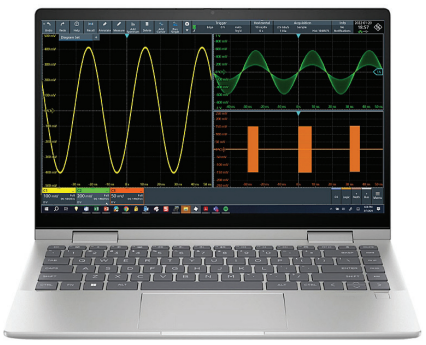
The **InvenSense VibeSense360** sensor for spatial audio head tracking gives customers more design flexibility by adding more UI gestures specially designed for true wireless stereo applications. It also runs multiple features including machine learning concurrently on the IMU. It can be used for in-ear buds, over-ear headphones, and wearables. It detects when the user is speaking and shifts from noise cancellation to transparency mode, as well as pauses any audio that may be playing—even in noisy environments. Always-on gesture detections include tap, double tap, triple tap, wide-area tap, head gestures, and activity/inactivity detection.

InvenSense | TDK Corp.

More online: newequipment.com/55271627

PC-Based Oscilloscope Software

ScopeStudio software brings the functionality of an oscilloscope to a PC, allowing engineers to visualize, analyze, document, and share oscilloscope measurements, making development teams more efficient. Since users can view and analyze previously acquired data away from the instrument, it leaves the oscilloscope free for others to use. The standard features of the application include R&S SmartGrid, cursors, 40+ automated measurements, mathematical functions, filters, and spectrum viewing of time-domain signals.



Rohde & Schwarz USA, Inc.

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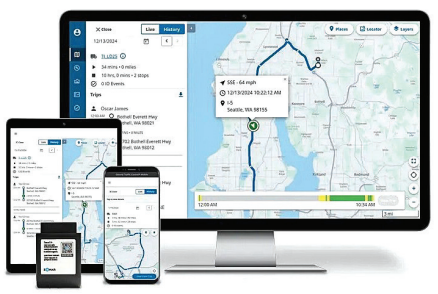
Fleet Tracking Device

Zonar LD Telematics Control Unit delivers fast vehicle intelligence and security data for fleets. Vehicles receive device performance enhancements over the air, including expanded vehicle, engine control module, odometer, and diagnostic trouble code coverage. More fleets can also benefit from Zonar due to the increased range of supported vehicle types and models. Operators gain visibility into towing events and with cold-start event tracking, it's easy to identify device tampering, improving the security of vehicles and assets.



Zonar Systems

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Streamline Barcode Labeling Tasks

The **BX410T Series** thermal printer uses the company's A-BRID ecosystem, which merges multifunction printers with label printers, so organizations can track packages, connect to the cloud, clone tasks, manage printer fleets from any location, control all aspects of label production, remove extra software, and eliminate workstations. Printing 4-in labels at 14-in/s (10 cm at 35 cm/s) with up to 305 dots/in label resolution, the series features label near-end detection, proprietary Ribbon Save technology, a full-color LCD, and QR code functions for support.

Toshiba America Business Solutions

More online: newequipment.com/55271714

FROM THE COVER

Live Streaming Camera Series

The **uEye Live camera series** creates an easy and quick integrated camera solution for visualizing machine processes without any programming or an additional PC.

The GigE cameras are designed for standalone operation. In addition to easy access via the web front end (HTTP), users benefit from video streaming, hardware-accelerated video encoding, and event-based recording in the camera memory. This function allows complete documentation of machine malfunctions or failures. As a result, potential process errors can be analyzed and possible reasons identified.

They can deliver multiple video streams at the same time, and thanks to Sony Starvis 2 technology and the integrated image signal processor, they provide impressive image quality in low-light situations. The camera can directly edit, process, filter, or evaluate image data. Instead of sending single raw images, the camera transmits up to three parallel video streams to various end devices.

Two of IDS' camera series incorporate live streaming: The uEye SCP series and the uEye SLE series. The uEye SCP series has a completely closed, 29 x 29 x 29 mm (1 x 1 x 1 in) housing. The uEye SLE line consists of board-level models for embedded applications with different mounting options. As of now, the first uEye SCP camera with the 8.3 MP rolling shutter sensor IMX678 from the Sony Starvis 2 series is available. The board-level version and additional sensors will follow later this year.

IDS Imaging Development Systems, Inc.

More online: newequipment.com/55265377

Speedy Area & Line Scan Cameras

Part of the Zenith series of 100GigE area scan cameras, the **HZ-12000-G**, **HZ-14000-G**, and the **HZ-25000-G** feature back-side illuminated sensors, color and monochrome options, and support for zero-copy imaging and GPUDirect. Joining the Pinnacle series, the **LZT-8KG5** and **LZT-16KG5** monochrome line scan cameras feature advanced time delay integration sensors, can synchronize to the movement of a conveyor or web for applications, enable higher speeds with the same lighting, and support zero-copy imaging and GPUDirect

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ELGi Compressors USA, Inc.

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K-Tool International's line of metal, air-pressurized oil drains (**KTI74552HD** and **KTI74553HD**) are both designed for use as mobile waste containers and drain tanks during oil changes. The 18-gal oil drain (74552) features a discharge hose with a shut-off valve, fluid level gauge, and air pressure valve. The 30-gal oil drain (74553) has a heavy-duty collection funnel and a 16-in (40 cm) diameter filter screen. Both accept air pressure up to 7 psi and come with an evacuation hose, an NPT air coupler, and an oil level sight gauge.

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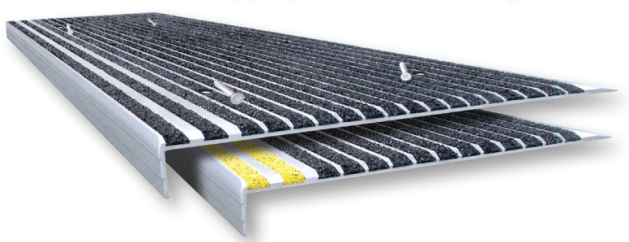

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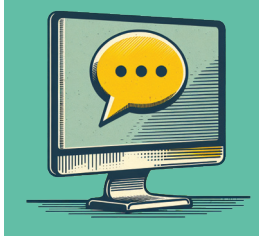

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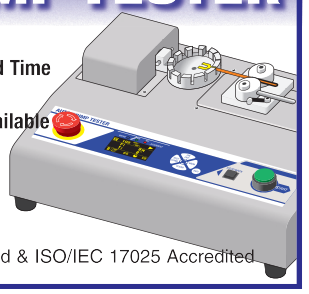

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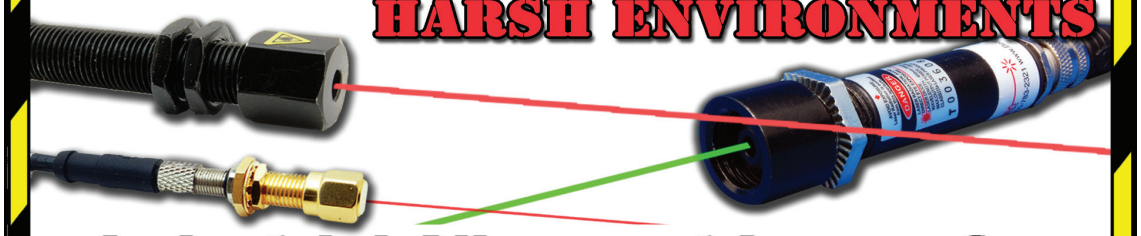

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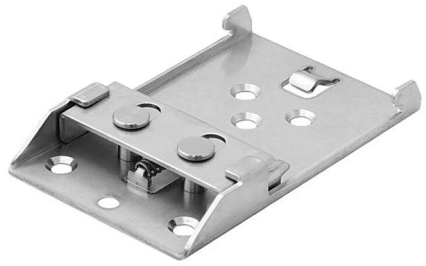

Reimagined DIN-Rail Clips

Antaira's **patented DIN-Rail clips** use a reimagined mounting design for a more secure attachment for Ethernet switches and routers onto any 35 mm (1 in) metal rail. Replacing the standard clips that come with its devices, the new clips have a spring-loaded latch that enables easy snap-on attachment and can be removed just by lifting and releasing the clasp. Two packages are available to upgrade existing DIN-Rail clips: The DIN-RAIL-KIT-2, an ultra-secure solution that fits all LNX, LMX, LNP, and LMP switch families, and the tool-free "press-and-click" DIN-RAIL-KIT-3.

Antaira Technologies, LLC

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No Scanning, No Waiting, No Kidding

Manufacturing professionals are constantly evaluating automation technologies that promise efficiency gains. The retail sector's struggles with checkout automation offer valuable lessons about innovation implementation that translate across industries.

I've been on both sides of the checkout counter. Years ago, I worked as a grocery cashier before modern scanning technology existed. These days, I'm a self-checkout convert simply because it's faster than waiting on a cashier, especially since modern checkout lanes aren't designed for customers to help with bagging.

Even with my checkout efficiency, Walmart trips still took at least an hour. So when I heard about "Scan & Go," I was intrigued. After two frustrating months with Walmart's version, I gave up. The $14 monthly fee was just the start—I had to use my phone instead of a store scanner, deal with an app that couldn't reliably read barcodes, and endure random security checks that left employees confused. Ironically, "Scan & Go" increased my time in the store.

This experience made me curious about Amazon's more ambitious "Just Walk Out" stores that promised truly automated shopping: Enter, grab what you need, and leave. No scanning whatsoever.

Well, Amazon recently abandoned this model due to unsustainable technology costs, relying on human reviewers despite claims of AI automation, limited deployment across half of its 52 stores, and many shoppers were uncomfortable with the tracking involved. Instead, Amazon retreated to "Dash Carts" (its version of "Scan & Go"), suggesting automated grocery shopping was just another fantasy, but the industry keeps trying.

At NRF 2025 this January, European company Sensei unveiled yet another approach to autonomous supermarkets with "Real-time Virtual Basket Technology" that promises no scanning or checkout lines.

What sets Sensei apart is its proprietary system that uses computer vision, machine learning, and advanced sensors to achieve a claimed "99% accuracy in tracking product interactions". It has already launched a 13,000+ square-foot autonomous supermarket in Portugal that doesn't rely on apps, store cards, or subscriptions, including a large product selection and frictionless checkout.

Is this truly groundbreaking? Not in concept, but maybe in execution. Success will depend on whether:

- Its technology actually delivers that 99% accuracy in daily operation
- The cost structure makes sense (even Walmart charges $14 monthly for partial automation)
- Shoppers see genuine benefits beyond the novelty

As you evaluate automation opportunities in your own facilities, retail's cautious progress reminds us that technological capability alone doesn't guarantee successful implementation. The best innovations deliver real, measurable advantages while addressing genuine pain points rather than creating new ones. Sensei's approach seems promising, but like many retail innovations, I'll believe it when I see it in my local grocery store.

— **Laura Davis**, Editor-in-Chief

Selecting the Perfect Push-to-Connect Fitting: 10 Key Factors

By **Michael Nick**

When choosing a fitting, ease of installation is a key factor to consider to reduce labor time on the job, which is why push-to-connect fittings (also referred to as quick disconnects, quick couplings, push-to-connect/push-on/push-fit, plug-in fittings, quick manifolds, and quick release couplings) have become popular over the past 20+ years.

Some experts in the industry estimate the labor reduction to be as high as 90% when using push-to-connect fittings as no tools are required. However, not all push-to-connect fittings are the same, and it's important to choose the right one to ensure optimal performance and avoid premature failures.

1. Remember STAMPED

Choosing the right fitting comes down to what's known as the STAMP(ED) method of selection. For years, the acronym was known as STAMP. The "ED" was added in recent years where "E" refers to ends (thread type) and "D" refers to delivery.

The core part of the acronym stands for: Size, Temperature, Application, Material/Media, and Pressure. STAMPED is an industry-wide practice used by professionals as a guide when replacing or determining specs for new hydraulic or pneumatic hoses and fittings. Following the STAMPED guidelines will help ensure you install the best push-to-connect fitting for your application.

2. Size Considerations

When calculating size, consider the inside and outside diameter (ID & OD) of the fitting.

The ID must be able to keep pressure loss to a minimum and maintain adequate flow while avoiding damage to the system as a result of heat generation or excessive turbulence. The ID, flow rate, and design of the fitting will determine the fluid velocity through the fitting. If the fitting is too small, you may experience a reduced flow rate and loss of pressure, as well as additional noise and increased temperatures. If the flow and pressure remain restricted for too long, the system could be damaged.

3. Temperature Considerations

There are two different variables when evaluating temperature: The temperature of the material conveyed and environmental temperature.

It's important to choose a fitting that's appropriate for the temperatures to not cause damage. Fittings will have a longer service life if they're not continually used at working pressures or temperatures beyond manufacturer specifications.

Temperature can have a significant impact on the overall working pressure because maximum working pressures will decrease as temperatures increase. When choosing a fitting, keep in mind that push-to-connect fittings are often rated for average, minimum, and maximum operating temperatures.

4. Application Considerations

In this case, application refers to conditions in which the push-to-connect fitting will be used, including environment, industry, equipment type, cycle life, indoor/outdoor use, maintenance requirements, and the potential for exceeding the maximum pressure ratings. You should take into consideration anything that could compromise the life of the fitting, whether it's aggressive chemicals, abrasion, vibration, or extreme temperatures.

5. Material/Media Considerations

Typical media include fluids, inert gas, chemicals, and compressed air which are commonly used in pneumatic and hydraulic processes. You should pay special attention to applications that use toxic or caustic media to ensure that the materials of your push-to-connect fitting (metal, rubber, plastic, composite, nickel/electroless brass, or stainless steel) are compatible and survive the aggressiveness of the media regardless of prolonged contact or contact under extreme pressures or temperatures.

6. Pressure Considerations

Pressure ratings for push-to-connect fittings should be equal to or greater than the system pressure. Pressure spikes, even ones that occur for short intervals, can shorten the life of the fitting if they extend beyond the maximum working pressure of the fitting. Remember that temperatures inside and outside the system can affect the pressures within the systems and should be considered when evaluating the fitting's ability to withstand pressures during normal operating conditions, as well as pressure spikes.

7. Ends Considerations

When considering the various ends of a fitting, think about the coupling design, style, type, and any relevant safety features. Remember that the ends on either side of the fitting are not always the same. For example, on one side there may be a compression end and the other side may have a bar. Other common thread types include hose barb, gladhand, hose clamp, and jubilee clip, among others. The pressures and volume flow demand of the system will dictate the best thread types and connection methods.

The area where the hose and fitting meet is often the weakest point and most vulnerable to failure and leaks, so choosing the right end is important. The integrity of the connection can be strengthened by adding a safety locking mechanism.

8. Delivery Considerations

The delivery phase includes multiple steps, including testing, packaging, and delivery. Various industry standards and relevant certifications often dictate how this phase should be addressed.

9. Improvements in Push-to-Connect Offerings

Parker Hannifin first developed and patented the original push-to-connect technology 30+ years ago when most push-to-connect fittings were made from thermoplastics. Since then there have been a number of improvements, including grab rings that enhance tube retention and newer versions that have higher tube tension and hold strength. Some of the newer designs are even faster and easier to install than the original styles.

Advanced materials, such as nylon, and value-added engineering have created lighter-weight fittings.

As a result of stricter regulations and certification requirements in recent years, there's an increased focus on flame retardance. This has opened the door to the use of glass-filled nylon which is known for providing greater flame resistance. Options have been developed to handle higher pressures, and today, Parker offers the highest pressure rating of up to 290 psi for compressed air and up to 435 psi with stainless tubing.

10. Alternatives to Push-to-Connect Technologies

There are a few applications where push-to-connect fittings are not recommended. For example, the Department of Transportation insists that air brake fittings for vehicles must be copper-based. In addition, push-to-connect fittings should not be used with propane, gas, or other explosive media. Another vulnerability is tuber tension which causes fitting failures at higher pressures as the tubing can pull out and get soft at higher temperatures and pressures. NED

Michael Nick is a product sales manager for Parker Hannifin.

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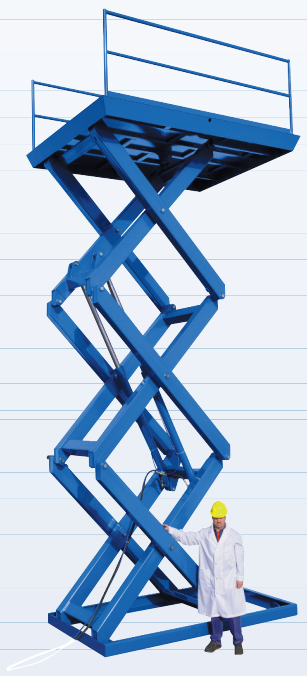

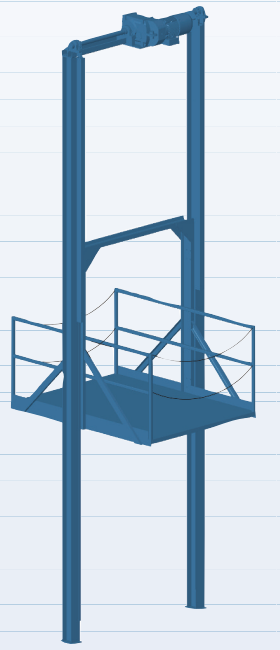

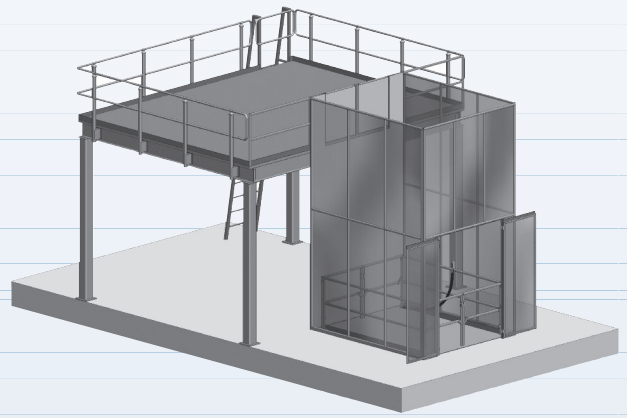

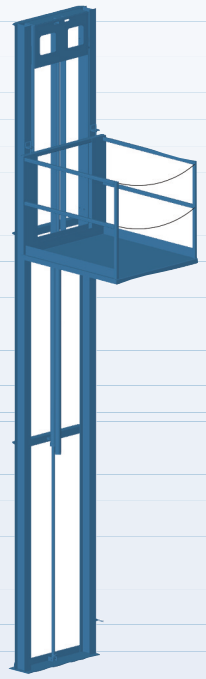

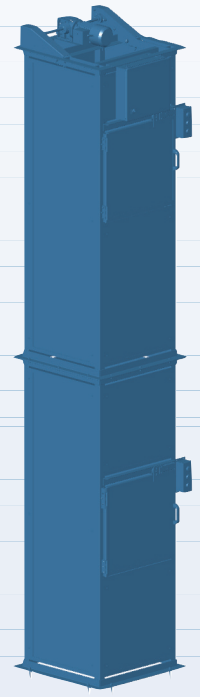

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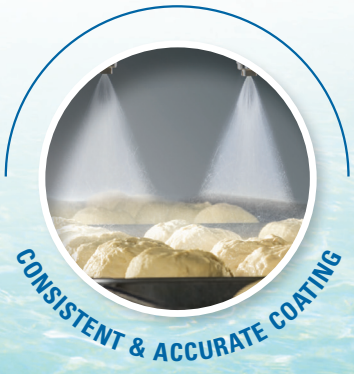

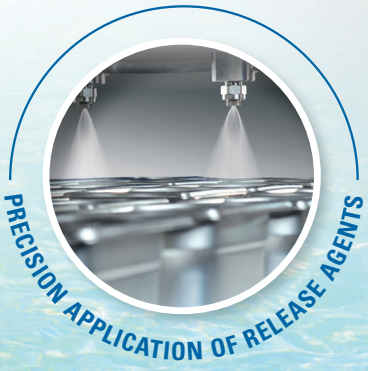

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