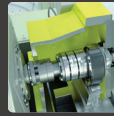




41
High-Output,
Rechargeable Flashlights



43
AI Forklift Platform Gives
Warehouses Extra Help



45
Lightweight Coupling
Cuts Inertia



48
AI Platform Unifies
Warehouse and
Floor Data

PRODUCTS FOR INDUSTRY

September 2026

NED

NEW EQUIPMENT DIGEST®

2026 INDUSTRIAL INNOVATION AWARDS

*From game-changing tools to
industry-disrupting equipment,
meet the standout innovations recognized
in our 2026 NED Innovation Awards.*

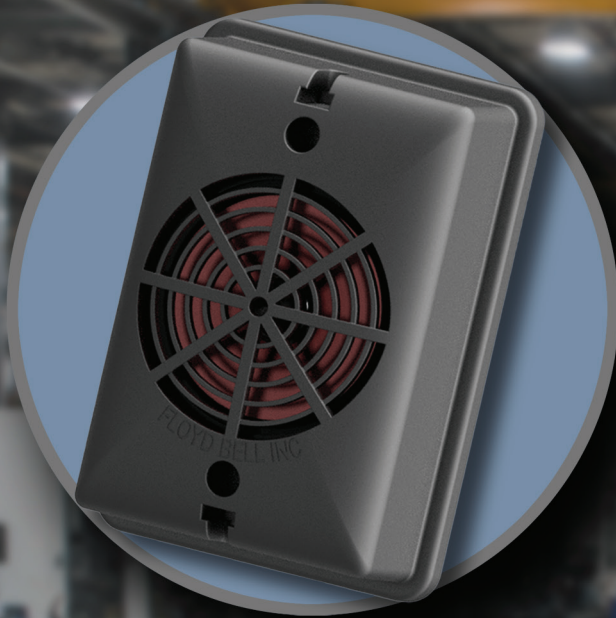
p11

**PLANT
SERVICES** p17

MH&L Material
Handling
& Logistics. p29



LOUD VOICE ANNOUNCEMENTS UP TO 16 SELF-CONTAINED MESSAGES!



The **ALL NEW AN200** is a powerful industrial announcement system for playing pre-recorded voice and audio messages.

- **6 minutes** of (16bit x 44.1Khz) high-output audio via 16MB memory. Upload your own audio via USB.
- Audio can be divided into **16 separate message** locations. Each message is triggered using logic input.
- Also available in RS-485 MODBUS and CAN J1939.
- Sound level can be **user-adjusted** via potentiometer. The AN200 provides an excellent solution for any indoor/outdoor announcements.
- Well-suited for applications where **loud, clear voice and sound effects** are necessary.
- Perfectly sized to **mount directly to any handy box/electrical box** - you can even mount it directly to a wall. Bracket-mountable with one of our accessory packages.

For full specs and pricing, visit www.FloydBell.com or call 888-811-FLOYD-BELL.



All Floyd Bell products are proudly made in the USA since 1972.

 **Floyd Bell Inc**
SOUND SOLUTIONS

COVER STORY

NED 2026 INDUSTRIAL INNOVATION AWARDS

p11

FEATURES

- 18** **PLANT SERVICES: COMPRESSED AIR**
Ask the Experts: Reducing compressed air waste through smarter controls and system design
Compressed air experts explain how controls, storage, pressure management, and operator training reduce industrial energy waste

- 22** **PLANT SERVICES: WHAT WORKS**
Case Study: Berentzen boosts bottling line efficiency with digital traceability and AI-driven production planning
A connected production ecosystem provides greater visibility into downtime, quality issues, changeovers, and material losses

- 26** **PLANT SERVICES: ELECTRICAL SYSTEMS**
Case study: Husqvarna's robotic lawnmower manufacturing plant upgrades outdated electrical system to elevate reliability
Upgrading aging medium-voltage switchgear with new air-insulated switches delivers higher switching capacity and modern arc extinguishing capability.

- 30** **MH&L: FORKLIFTS**
The Effect of Unexpected Downtime on Forklift Cost
Total cost of ownership includes not just purchase price but also fuel, maintenance, downtime, and operator costs, which can significantly impact overall expenses.

- 32** **MH&L: OUTSOURCING**
Beyond Outsourcing: Why Best-Shore Is Reshaping the Future of Industrial Operations
Best-shore strategy evaluates the nature of the work and places it in the location that delivers the greatest overall business value.

- 36** **MH&L: SUPPLY CHAIN RESILIENCE**
Resilient by Design: Why Modern Supply Chains Can't Rely on Efficiency Alone
Future supply chain success depends on integrating resilience into design and operations, ensuring networks remain optimized amid change.

- 38** **MH&L: ENERGY**
When Throughput Meets Grid Constraints
Operators must rethink their energy strategy in light of record import volume.

DEPARTMENTS

From the Editor	4
Editor's Choice	6
IMTS Products	8
New Equipment & Products	41
Product Express	49
Product Guide	50
Ad Index	50

FOLLOW

 [TWITTER.COM/NEWEQUIPMENT](https://twitter.com/NEWEQUIPMENT)
 [FACEBOOK.COM/NEWEQUIPMENT](https://facebook.com/NEWEQUIPMENT)

Cover Image: Kermit Mulkins, generated by Shutterstock AI

p 41

Designed to eliminate floor markers and reflectors, ABB's Flexley Stack F712 is an autonomous forklift using Visual SLAM for markerless navigation handling loads up to 4,409 lb (2,000 kg).



p 44

Eclipse Automation's RealitySync is an immersive collaboration platform placing people, project data, and physical automation systems into one shared environment.



New Equipment Digest is published 4 times per year (March, June, September, December) by Endeavor Business Media, LLC, 30 Burton Hills Blvd, Ste. 185, Nashville, TN 37215. Postage paid at Fort Atkinson, WI, and additional mailing offices. **SUBSCRIPTIONS:** Publisher reserves the right to reject non-qualified subscriptions. Subscription prices: U.S. (\$92 per year); Canada/Mexico (\$120 per year); All other countries (\$146 per year). All subscriptions are payable in U.S. funds. Send subscription inquiries to New Equipment Digest, PO Box 3257, Northbrook, IL 60065-3257. Customer service can be reached toll-free at (877) 498-4668 or at customerservice@ehstoday.com for magazine subscription assistance or questions.

Printed in the USA. Copyright 2026 Endeavor Business Media, LLC. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopies, recordings, or any information storage or retrieval system without permission from the publisher, Endeavor Business Media, LLC does not assume and hereby disclaims any liability to any person or company for any loss or damage caused by errors or omissions in the material herein, regardless of whether such errors result from negligence, accident, or any other cause whatsoever. The views and opinions in the articles herein are not to be taken as official expressions of the publishers, unless so stated. The publishers do not warrant either expressly or by implication, the factual accuracy of the articles herein, nor do they so warrant any views or opinions by the authors of said articles.



What's New, What's Proven

By the time this issue reaches you, IMTS will be underway, or about to be. The show remains the industry's biggest stage for manufacturing technology, and this year's floor is packed with equipment aimed at faster changeovers, tighter tolerances, and

fewer hands needed to run it.

The 12 products we're previewing in these pages were on our radar as we went to print. Equipment like ZOLLER's micBox, which automates indexable insert handling on milling tools and uses AI to decide whether a cutting edge should stay in use, be indexed, or be replaced. And Makino's a630iT, a 5-axis horizontal machining center built to handle large, heavy aerospace and structural parts with a spindle option made specifically for hard-to-cut materials. By now, some of them are already on the show floor, being unboxed, demoed, and picked apart by the people who'll actually decide whether they're worth buying. You can learn more about these products starting on page 8.

Also in this issue, we're announcing the honorees of our revamped Industrial Innovation Awards. Every entry was evaluated by our editorial judging team against the same five-question standard: What's genuinely new about it? What's the substance behind it? How would it hold up on a real plant floor? Is it built for the environment it's meant to serve? And what problem does it actually solve? Honorees earned recognition at the Platinum, Gold, or Silver level, and you'll find them starting on page 11.

Between the two, this issue gives you two different ways of looking at what's out there right now. The IMTS preview is a snapshot of what's showing up on the floor this week. The awards reflect a longer, more deliberate process with entries reviewed over months against a standard built around real-world merit.

If you're headed to Chicago, I hope you find something on that floor worth the trip. And if you're showing a product there, or have one coming next year that you think belongs in this conversation, our 2027 awards program opens for entries early next year. We'd love to see it.

— **Laura Davis**, Editor-in-Chief

NED

NEW EQUIPMENT DIGEST®

New Equipment Digest
2 Summit Park Drive, Suite 300
Independence, OH 44131
(234) 466-0200
www.newequipment.com

Laura Davis | Editor-in-Chief
(815) 348-9052 • LDavis@endeavorB2B.com

Thomas Wilk | Market Content Director
(630) 454-7012 • TWilk@endeavorB2B.com

Kermit Mulkins | Art Director

Edward Bartlett | Production Manager

 **ENDEAVORB2B™**

CEO | **Chris Ferrell**
COO | **Patrick Rains**
CALO | **Tracy Kane**
CDO | **Jacquie Niemiec**
CMO | **Amanda Landsaw**
EVP Manufacturing & Engineering Group | **Lisa Paonessa**
VP of Content Strategy, Manufacturing
& Engineering Group | **Travis Hessman**

Circulation Customer Service
newequipmentdigest@omeda.com
(877) 382-9187

Advertising Sales
U.S. & Canada
Joe DiNardo
(440) 487-8001 | jdinardo@endeavorb2b.com

International
(Italy)
Diego Casiraghi
Casiraghi Global Media SRL
diego@casiraghi-adv.com

(Taiwan)
Charles Yang
Lotus Business Information Co.
medianet@msl3.hinet.net

(Japan)
Shigenori Negatomo
Pacific Business
shigenori.nagatomo@pacific-business.com

(China)
Adonis Mack
ACT International
adonism@actintl.com.hk

For a Media Kit, visit:
www.newequipment.com

Publisher's Notice: We assume no responsibility for the validity of claims in descriptions of new and improved products furnished to New Equipment Digest.

ELEVATE YOUR PLANT MAINTENANCE PROGRAM...

**WITH LUBRIPLATE®
100% SYNTHETIC
ADVANCED TECHNOLOGY
LUBRICANTS.**



Lubriplate's ultra-high-performance, 100% synthetic lubricants have been engineered to provide unsurpassed performance in the most demanding plant environments. They provide a wide range of benefits designed to make your plant run better. Benefits include: extended lubrication intervals, lubrication consolidation through multiple application capability, reduced friction, extended machinery life and reduced downtime. Products include...

HIGH-PERFORMANCE SYNTHETIC GEAR OILS

SYNTHETIC AIR COMPRESSOR FLUIDS

SYNTHETIC HYDRAULIC FLUIDS

HIGH-PERFORMANCE SYNTHETIC GREASES

NSF H1 REGISTERED FOOD GRADE LUBRICANTS

ECO-FRIENDLY SYNTHETIC LUBRICANTS

SPECIALTY LUBRICANTS



Scan the QR Code for More Information
About Lubriplate's Products and Services.



Lubriplate®
SYNTHETIC LUBRICANTS

Newark, NJ 07105 / Toledo, OH 43605 / 800-733-4755
To learn more visit us at: www.lubriplate.com



INCLUDED AT NO ADDITIONAL CHARGE

**Lubriplate's
ESP**

Complimentary Extra Services Package

COLOR CODED LUBE CHARTS & MACHINERY TAGS
PLANT SURVEYS / TECH SUPPORT / TRAINING
FOLLOW-UP OIL ANALYSIS



Funnel Design Eases Tote Refills

Designed for fast, safe transfers into IBC totes, the **Ergonomic IBC Funnel** fits directly over standard totes with rounded edges that eliminate awkward reaching or step-stool use. A domed base channels liquid to a 2 in (51 mm) drain opening, minimizing splashes, while the chemical-resistant polyethylene construction and 15.8 gal (60 L) capacity suit high-volume refilling.

DENIOS US, Inc.

More online: newequipment.com/55397665

Laser Scanner Doubles Data Speed

Featuring an expanded laser configuration, the **Point II** captures up to 5.8 million points per second, more than double its predecessor's rate, while holding certified 0.0008 in (0.02 mm) accuracy. Three selectable modes—ultra-fast, hyperfine parallel, and single-laser—let operators switch between rapid surface capture and fine detail on deep holes or hard-to-reach features, all in a lightweight, one-handed handheld design.

Artec 3D



More online: newequipment.com/55397043

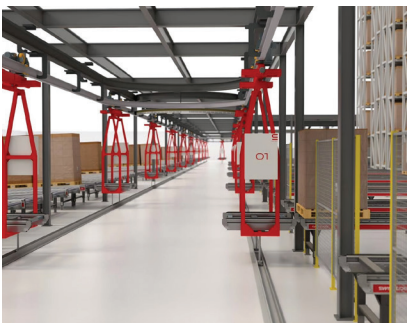


Inline System Spots MAP Micro-Leaks

Designed for high-speed modified atmosphere packaging lines, the **LEAK-MASTER ONE inline system** detects micro-leaks as small as 0.0004 in (10 µm) in individual packages. Twelve automated vacuum chambers test up to 120 packages/min, identifying and documenting leaks package by package. This helps manufacturers reduce waste, avoid customer complaints, and meet retailer quality requirements without slowing production.

Witt Gas Controls LP

More online: newequipment.com/55397980



Monorail Moves 600+ Pallets an Hour

Featuring a modular monorail track design, **FastMove** moves palletized goods across long warehouse distances at speeds up to 6.6 ft/s (2 m/s) and capacities exceeding 600 pallets/h. The system handles loads up to 3,307 lb (1,500 kg), or 6,614 lb (3,000 kg) in twin-load configurations, and operates in temperatures from -22° to 122°F (-30° to 50°C).

Swisslog Logistics, Inc.

More online: newequipment.com/55391099

Wrist-Pivot Head Extends Reach

Designed for manufacturers cutting increasingly complex parts, the **APEX-90 Waterjet Cutting Head** brings a wrist-pivot design that extends reach beyond typical Z-axis limits. It cuts at angles up to ±90°, accessing flanges, overhangs, and deep cavities other 5-axis systems can't reach, while retaining taper compensation for accurate, repeatable cuts across metals, composites, and plastics.

WARDJET, Inc.



More online: newequipment.com/55396540



Two-Vehicle DC Fast Charging

Featuring two CCS1 outlets with dynamic power sharing, the **H60D dual DC fast charger** serves two vehicles simultaneously from a single unit, cutting hardware and footprint needs. Rated at 60 kW with peak efficiency above 96%, it operates from -22° to 131°F (-30° to 55°C) and supports wall, pedestal, networked, or standalone installation.

Heliox

More online: newequipment.com/55397682



KEEP RUNNING AT PEAK PERFORMANCE

Downtime equals dollars and every minute counts

Our local spray experts are located nationwide and readily available – their office is on your plant floor. We are dedicated not just to spray technology but to helping you optimize performance, lower costs, reduce downtime, and improve product quality. With our quick, factory-direct order fulfillment, we can also shorten your supply chain to deliver fast.

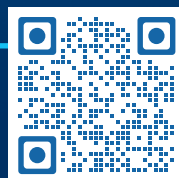
At Spraying Systems Co., we keep the lines of communication open to keep your plant moving.

Make every drop count™

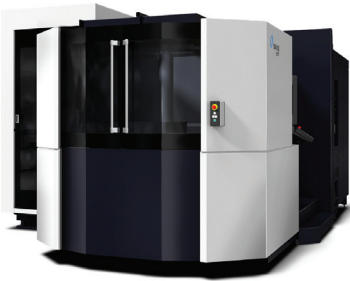


Spraying Systems Co.®

1.800.95.SPRAY | spray.com



LEARN MORE



5-Axis Machining Adds Flexibility

Designed for automated production of complex components, the **a630iT** 5-axis horizontal machining center pairs a trunnion-style kinematic table with three spindle options, including a high-torque unit reaching 1,045 lb-ft (1,416 Nm). Linear axes feed at up to 197 ft/min (60 m/min), while a shared pallet design allows integration into flexible manufacturing systems for heavy structural components.

Makino

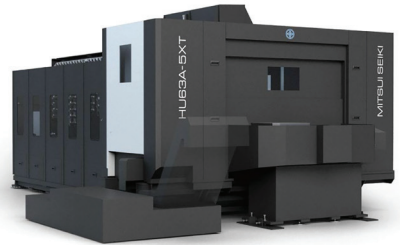
More online: newequipment.com/55395806

5-Axis Milling and Turning in One Setup

Designed for aerospace shops machining engine cases and housings, the **HU63A-5XT** is a 5-axis horizontal machining center combining milling and turning in a single setup. It offers 35.4 in (900 mm) X/Y/Z travels, spindle torque up to 797 ft-lb (1,081 Nm), and positioning accuracy of ± 0.00004 in (± 0.001 mm)—reducing clamping errors and improving repeatability on complex, high-value parts.

Mitsui Seiki USA, Inc.

More online: newequipment.com/55392472

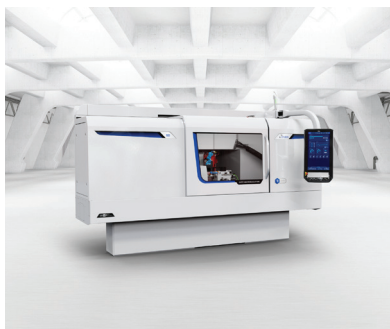


AI Vision Inspects Cutting Tools

Powered by artificial intelligence, **RoboCam** is a robotic camera system that automates cutting tool inspection for gear manufacturing, evaluating tool condition without manual review. The system flags wear or damage early, helping manufacturers optimize tooling performance and maintenance scheduling. Continuous, automated inspection reduces downtime risk and supports more consistent gear-cutting quality across production runs.

Nidec America Corporation

More online: newequipment.com/55398013



Compact Grinder Adds Flexibility

Featuring an automatically swiveling B-axis wheelhead, the **S23** cylindrical grinder holds up to three grinding tools in a single clamping for complex workpieces. Distance between centers ranges from 25.6 to 39.4 in (650 to 1,000 mm), with a center height of 6.9 in (175 mm). Optional C-axis and swiveling table configurations adapt the machine to varied production requirements.

Studer

More online: newequipment.com/55395350

Compact Turning Center Adds Milling

Featuring milling capability, a second turning spindle and Y-axis functionality, the **QRX-50MSY** CNC turning center handles high-volume production of small, intricate parts such as EV input shafts and valve fittings. Its 15% smaller footprint, 119.3 by 86.6 in (3,030 by 2,200 mm), supports a 2 in (50 mm) maximum bar diameter without sacrificing throughput or cycle times.

Mazak Corporation

More online: newequipment.com/55395661

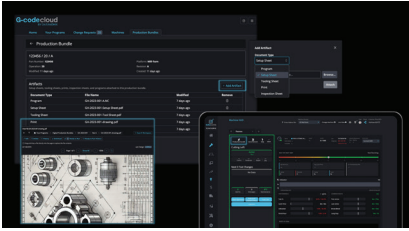


CMM Skips Compressed Air Lines

Providing zero-maintenance linear motors, the **iSF shop floor coordinate measuring machine** skips compressed air and lubrication points, running on a single-cable connection. Its rigid portal and movable granite table support manual or robotic loading, while an integrated Renishaw controller and one-click program execution keep measurement speeds up to 31.5 in/s (800 mm/s) consistent from prototype runs through full production.

LK Metrology, Inc.

More online: newequipment.com/55392615



Platform Delivers Paperless Shop Floor Files

Featuring **Digital Production Bundles**, a system pairs prints, setup sheets, tooling sheets, and inspection plans directly to the correct machine and part number. Delivered through the Machine Heads Up Display, bundles eliminate outdated revisions and paper

documents, while logging every change with user, action, timestamp, and reason for a single source of truth on the floor.

Datanomix, Inc.

More online: newequipment.com/55392948

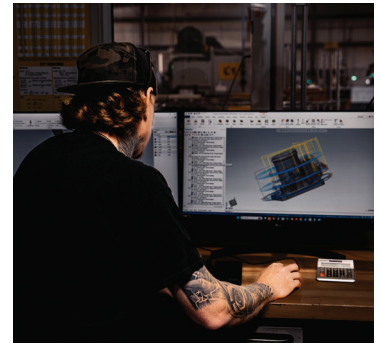
High-Speed Spindle, Small Footprint

Featuring a high-speed, high-torque spindle for heavy-duty cutting in high-speed machining, the **GENOS M4000H-e** horizontal machining center delivers precision in a compact 22.05 x 22.05 x 24.61 in (560 x 560 x 625 mm) envelope. Thermo-Friendly Concept technology maintains thermal stability for consistent accuracy, while a 64-tool magazine and quick tool changes minimize non-cutting time.



Okuma America Corporation

More online: newequipment.com/55399108



Mastercam Speeds Simulation With AI

Mastercam 2026.R2 introduces GPU-accelerated simulation that runs up to 10x faster than CPU verification while preserving accuracy. The update also adds voice and text-controlled AI programming assistance through Mastercam Copilot, supporting toolpath adjustments and automation across roughly 200 toolpath types to reduce repetitive machining tasks. Multiaxis milling and probing workflows are also streamlined.

CNC Software, LLC

More online: newequipment.com/55360437



System Uses AI to Check Insert Wear

Featuring automated indexable insert handling for milling tools, the »micBox« manages tool identification, indexing, rotating, flipping, replacement and fastening-screw changes in one system. An optional AI-supported wear-check feature evaluates each cutting edge, determining whether an insert should remain in use, be indexed or replaced, reducing manual insert sorting for high-volume machining operations.

Zoller

More online: newequipment.com/55396018

Multitasking Machine Adds Grinding

With turning, milling, and grinding combined in a single setup, the **INTEGREX i-350S NEO** multitasking machine finishes parts to tight tolerances and superior surface finishes. The main spindle accommodates a 10 in chuck with a 26.38 in (670 mm) maximum part diameter, while parts up to 98 in (2,489.2 mm) long can be processed on the 2500U bed.

Mazak Corporation



More online: newequipment.com/55395670



Waterjet Cuts Multiple Materials

Designed for shops cutting metal, plastic, glass, ceramic, stone, and composites, the **MAXIEM X Series JetMachining Centers** deliver finishes precise enough to often skip secondary machining. IntelliMAX software adds the IntelliVISOR Mobile app for remote cut monitoring, alerts, and pause control. A patent-pending abrasive hopper holds 7 lb (3.2 kg) and includes advanced filtering.

OMAX Corporation

More online: newequipment.com/55395364



IndustryWeek

OPERATIONS LEADERSHIP SUMMIT™

ACCELERATING MANUFACTURING PERFORMANCE

PERFORMANCE
SOLUTIONS BY
MILLIKEN
HEADQUARTERS
SPARTANBURG, SC

LOCATION

OCTOBER
20-22, 2026

WWW.IWOPERATIONSSUMMIT.COM



SCAN THE
QR CODE
TO REGISTER

PRESENTED BY:

Performance Solutions
by Milliken

PRODUCED BY:

IndustryWeek
SmartIndustry
EHS Today

SUPPORTED BY:

AutomationWorld
CHEMICAL PROCESSING
CONTROL
control design
FOOD PROCESSING
NED
pharma
PLANT SERVICES
PMM
Processing

OWNED &
PRODUCED BY:

ENDEAVORB2B™

NED 2026 INDUSTRIAL INNOVATION AWARDS ≡



Introducing the 2026 Industrial Innovation Awards Honorees

Manufacturing doesn't stand still, and the products built to keep it moving shouldn't have to fight for attention. The Industrial Innovation Awards, presented by *New Equipment Digest* and *Plant Services*, exist to put a spotlight on the equipment and technology actually doing the work: closing gaps, cutting downtime, and making plants, and the people who run them, better at their jobs.

Every entry in this year's program was judged against the same five measures: What's genuinely new here? Is the value backed by data, specs, or documented results? Would this work on a real plant floor, under real conditions? Is it built for the environment it's meant to operate in? And does it solve a problem manufacturers face every day?

Products that delivered on those measures rose to the top, earning recognition at the Platinum, Gold, or Silver level. Each tier reflects a different degree of that same standard, rewarding real innovation, real value, and real fit for the plants and people using it.

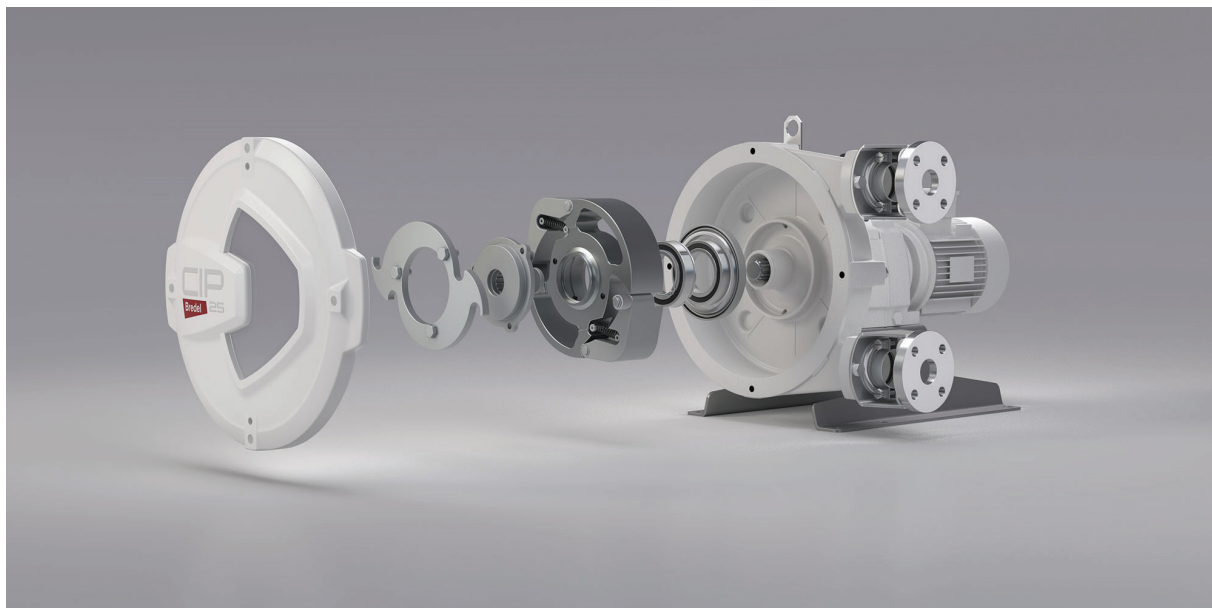
What follows in these pages is a list of products built to matter.

To every honoree: congratulations! Researching, developing, and bringing a product to market is long, demanding work, and you deserve recognition for helping move this industry forward.

We hope you enjoy this year's honorees. Whatever your operation looks like, there's something in these pages worth your attention.

Submissions for the 2027 Industrial Innovation Awards open early next year. We hope to see you in these pages again, or for the first time. NED

Laura Davis, Editor-in-Chief, New Equipment Digest
Anna Townshend, Editor-in-Chief, Plant Services



Platinum Honoree: Watson-Marlow Fluid Technology Solutions

Bredel CIP Pump Redefines Clean-in-Place Efficiency

Clean-in-place has always been treated as a cost of doing business in hygienic manufacturing, not an opportunity. Plants tolerate the downtime, the energy draw, and the wear on components because the alternative of cutting corners on sanitation isn't an option in food and beverage, biopharma, or cosmetics production. The Bredel CIP pump is one of the more convincing arguments in recent memory that this tradeoff doesn't have to be permanent.

The design centers on a patented rotor with automatic retractable shoes. During CIP cycles, the shoes retract and allow the hose to fully open, delivering optimal flow velocity, more than 6.6 ft/s (2 m/s), without the pump running at all. That mechanism does double duty by eliminating hose compression at elevated cleaning temperatures, extending hose life, and removing one of the most common failure points in hygienic pump systems in the process.

Where that mechanical shift really shows its value is on the plant floor. In applications such as brewing, facilities running the Bredel CIP pump have cut cleaning time by roughly 4 h/day by reversing the pump to retract the shoes and power down during CIP, while achieving energy savings of up to 16% annually. Fewer maintenance interventions and lower replacement costs follow from the same design change. For an industry that has long treated CIP inefficiency as unavoidable, those are hard numbers to ignore.

Hygienic assurance is built into the pump's fundamentals rather than bolted onto it. Fluid contact is limited exclusively to the interior of the hose, which protects product integrity and removes cross-contamination risk between batches. The pump complies with FDA, EC1935, and 3-A standards, simplifying validation for operators in regulated environments where documentation is as important as performance.

The combination of hygienic assurance and process continuity is what separates the Bredel CIP pump from conventional hygienic pumps, which typically require the line to stop for cleaning. Because the Bredel pump stays fully integrated within the process line, operators can run faster, more frequent CIP cycles without sacrificing uptime, which is a balance that's historically been difficult to strike.

The pump is built for operators handling sensitive or abrasive fluids, including yeast, fruit purées, and biopharmaceutical ingredients, where gentle and accurate handling is essential. Its peristaltic technology delivers consistent dosing without degrading the product. For plants looking to upgrade rather than replace existing equipment, the pump's retrofit-ready design allows on-site installation into current lines, keeping capital disruption to a minimum.

Downtime, energy use, component life, product quality: few CIP solutions move the needle on all four at once. The Bredel CIP pump is a clear exception, and a look at where hygienic process equipment is headed.

Gold Honoree: LeanDNA

APEX Brings Prioritized Action to Supply Planning

Discrete manufacturers now have more data than ever and, often, less clarity to show for it. ERP, MES, supplier portals, and quality systems generate constant streams of inventory and production data, but that information sits in silos and forces buyers and planners to interpret static dashboards rather than act. The result is familiar to most plant floors: reactive firefighting, chasing shortages, and missing commitments despite constant effort.

APEX by LeanDNA targets that gap directly. Built for buyers, planners, and supply chain leaders at discrete manufacturers, the platform analyzes millions of part-supplier-plant combinations, flags emerging risk



early, and prescribes prioritized actions ranked by financial and operational impact. Rather than a dashboard requiring interpretation, APEX tells teams what to work on and why.

The distinction lies in its manufacturing-specific training. APEX works from real operational constructs, including bills of material, supplier constraints, safety stock,

and Clear-to-Build readiness, allowing it to distinguish a shortage that halts production tomorrow from one that resolves within lead time.

The results from named customers back up the approach. Siemens Querétaro increased material availability by 10% and reclaimed 80 hours of buyer time weekly. Daher cut critical shortages by 53% in a single month; Husky Shanghai cut them by 59%. Modine lifted Clear-to-Build performance from 40% to 95%. Johnson Controls eliminated more than 700,000 manual ERP updates.

For manufacturers navigating tariffs, reshoring, and constant demand swings, APEX points toward supply chain software built to prioritize and execute, not just report.

Gold Honoree: Chemelex

Raychem Elexant 3500i Closes the Gap in Heat-Tracing Control

Industrial heat tracing has long forced a choice between two extremes: mechanical thermostats offering only basic on/off control, or advanced controllers priced and built for applications that don't need the full feature set. Facilities running mechanical units get a step up from no control at all, but little else: no alarming, no remote visibility, no diagnostic insight.

The Raychem Elexant 3500i Electronic Thermostat is built for the space in between. A compact, full-featured family of electronic thermostats for freeze protection and process temperature maintenance, it's designed for oil and gas, LNG, chemical processing, power generation, and pharmaceutical facilities. Built on a common hardware platform, it ships in



five variants, from Standard to Ground Fault Detecting, so operators can specify the right functionality without overbuying and upgrade later through interchangeable electronic modules rather than replacing the enclosure.

Reliability is where the design shows its intent most clearly. The unit's hybrid switching relay is rated to 250,000 power cycles, 2.5x the typical 100,000-cycle life of a mechanical thermostat,

which translates directly into fewer maintenance interventions over the life of an installation. Approval up to 32 A and 277V AC supports longer cable runs and fewer circuits overall.

On the connected variants, Bluetooth and RS-485 connectivity bring configuration and monitoring into the Raychem Elexant Connect App, with integration into existing DCS and PLC systems. Automated self-tests every 24 hours and low-current alarming down to 0.1 A give operators a way to catch developing issues before they become failures, rather than finding out after the fact.

Rated for hazardous locations with Type 4X/IP66 enclosure protection and an operating range of -67° to 140°F (-55° to 60°C), the Elexant 3500i is built to hold up in the same environments it's monitoring.

Gold Honoree: LUDECA, Inc.

CRY8128 Pinpoints Leaks and Faults in Real Time

Industrial inspections built around leak detection, partial discharge, and mechanical wear have traditionally meant separate tools and separate passes across a facility. LUDECA's CRY8128 Ultra-sonic Imager collapses that into a single handheld unit, and does it roughly 10x faster than traditional detection methods.

The camera pairs 200 microphones and 100 kHz bandwidth with what the company describes as the fastest processor in the industry, allowing it to pinpoint gas leaks and estimate leakage volume and economic loss in real time. On the electrical side, it displays Phase Resolved Partial Discharge charts as they happen, helping identify



discharge type without waiting on post-processing.

What separates the CRY8128 from a standard acoustic imager is its integration of infrared with the ultrasonic acoustic feed, displaying thermal and acoustic imaging simultaneously rather than requiring two separate inspections.

In high-temperature applications

such as steam trap monitoring, that combination lets operators confirm a finding thermally and acoustically in the same pass, with a measurement range of -4° to 932°F (-20° to 500°C) and infrared resolutions up to 640x512.

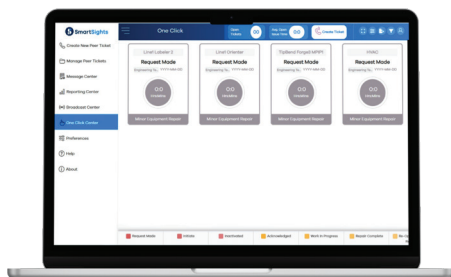
The hardware is built for the field with a rubber-molded housing weighing 3 lb, a detection range up to 656 ft (200 m), and up to 10 h of runtime on a replaceable battery, so packs can easily be swapped during inspection. Wireless transfer sends data directly to LUDECA's reporting software, which handles both ultrasound and infrared analysis for post-processing and report generation.

Gold Honoree: SmartSights

Peer Closes the Gap Between Alarm and Resolution

MES and OEE systems excel at collecting shop floor data, but most stop short of tracking what happens after an alarm fires. Knowing a line went down is one thing; knowing what was actually done to fix it, and whether that knowledge carries forward, is another. This gap is where a lot of continuous improvement programs tend to stall.

Peer, from SmartSights, is built to close it. The issue management and resolution platform keeps workers and managers connected from the moment an alert triggers through full resolution, capturing not just that a problem occurred but what corrective action resolved it. Integrated with existing MES or ERP systems, and built on the company's WIN-911



alarm notification software, Peer extends beyond downtime logging into full issue accountability, building a searchable knowledge base of corrective actions as it goes.

That resolution-tracking piece is what separates Peer from standard alarm notification tools. Many systems can tell a team something is wrong; fewer connect that alert to a documented, repeatable fix, and fewer still make that history available the

next time a similar issue comes up.

The impact shows clearly at Cook Medical's Vandergrift, Pennsylvania, facility. After shifting a Pipette assembly line from batch to continuous processing, the medical device manufacturer needed faster response to unplanned downtime without redundant equipment to fall back on. Configured with wireless Andon lights and real-time facility-wide displays, Peer cut response time on the line from 19 minutes to 5, a 75% reduction, with a return on investment within 4 months.

For frontline teams under pressure to move faster than traditional reactive maintenance allows, Peer represents a shift toward connected, accountable problem-solving, one where every issue closes with a record of how it got solved.

Gold Honoree: Sandvik Coromant

CoroDrill DE10 Simplifies High-Volume Hole-Making

Exchangeable-tip drills promise less downtime than solid carbide tools, but that promise only holds if the tip change itself is fast, reliable, and doesn't introduce its own inconsistency. The CoroDrill DE10 is built around getting that exchange right.

The drill pairs a replaceable solid carbide tip with a high-strength steel body through a patented pre-tension clamping interface, one engineered to hold high clamping force and stability even at elevated feed rates and cutting speeds. The tip itself is produced through advanced injection molding of solid carbide, a manufacturing approach that allows for precise geometry, reinforced cutting edges, and consistent



centering, without relying on a pilot drill to get there.

What separates the DE10 from conventional exchangeable-tip drills is how little the tool asks of the operator. Tip changes are tool-free and require no spare parts, and a universal -M5 geometry performs across a wide range of materials rather than requiring a different tip for every job. That

combination, Sandvik Coromant reports, has produced tool life and durability improvements of more than 40% in testing conditions, along with improved hole accuracy and surface finish straight out of the cut.

Internal coolant channels manage heat removal and chip evacuation during operation, while the rigid tip-to-body interface holds dimensional accuracy through the life of each tip. When a cutting edge wears out, replacement takes seconds rather than a full reconditioning cycle, keeping a high-volume line closer to running than waiting.

For shops making the same hole thousands of times a shift, the DE10 offers a simpler equation: fewer variables between setup and finished part, and less dependency on operator skill to get there consistently.



DURABLE. RELIABLE.
HOSE, CORD, & CABLE
PRO GRADE REELS

- ✓ Eliminate dangerous whipping hazards.
- ✓ Requires no external power source.
- ✓ Wide array of reel models & options to increase worksite efficiency & safety.



SAFEST REELS
IN THE INDUSTRY.

EZ-COIL
PATENTED REWIND SYSTEM

WWW.COXREELS.COM



UP TO 80% SLOWER RETRACTION

INNOVATING
SAFETY



Silver Honoree: SAB



Ruffian EMP 270G Packs Full-Power Welding Into a Field-Ready Rig

Field welders have long sacrificed output, portability, or ease of setup on engine-driven rigs. The EMP 270G, built on ESAB's next-gen inverter and a 23.5-hp Kohler engine, delivers 270 A at 100% duty cycle and 11 kW of generator power at 425 lb (193 kg). With a 7-in TFT display, synergistic lines, tool-free maintenance access, and multiple 120/240V AC outlets, the Ruffian doubles as job-site power for other tools, offering a true mobile shop.

Silver Honoree: SmartSights

ABLE Turns Line Data Into a Shared Picture

Most OEE systems watch one machine in isolation, missing how a stop on one asset ripples across the rest of the line. SmartSights' ABLE connects every asset instead, building time-synchronized production records in real time rather than the next-day guesswork many plants still run on. At G&J Pepsi, manual logs showed 5 weekly stops on one line; ABLE revealed more than 375, and deployment lifted production 15% while cutting engineering time up to 70%. A fault-learning subsystem gets sharper over time, turning recurring problems into documented, actionable patterns instead of tribal memory.



Silver Honoree: Innovatools, Inc.



Modular Brake Rethinks Portable Metal Fabrication

Portable bending brakes tend to be either short enough to move or long enough to be useful, but rarely both. Innovatools' Modular Aluminum Brake System breaks that constraint with a patented modular architecture that lets fabricators configure bending capacity by adding modules as needed rather than replacing the entire machine. Built from high-strength aluminum with integrated transport wheels, the system breaks down into sections for hauling and storage while holding the rigidity of a fixed-length brake. Paired with modular trim coil holders and cutting accessories, it turns any jobsite into a functioning fabrication platform, producing custom components on demand.

Silver Honoree: EXAIR



Ultra Duty Line Vac Holds Up Where Standard Units Wear Out

Abrasive bulk solids, sand, blasting media, glass, and grinding waste tend to shorten the life of standard pneumatic conveying equipment fast. EXAIR's Ultra Duty Line Vac is built specifically to outlast them, pairing a hardened alloy body with a precision

ceramic insert that resists wear from the harshest materials in blasting and finishing environments. That construction pushes throughput up to 50% higher than EXAIR's standard Line Vac, with no moving parts, no electricity, and airflow tunable through a simple pressure regulator. Available in 3 sizes and offered as a complete kit, it's built for facilities that need maximum durability without giving up performance.

Silver Honoree: Phoenix Contact

BLUEMARK E.CARD Speeds Up High-Volume Marker Printing

Industrial card marking asks for speed, durability, and adaptability all at once, rarely an easy combination. The BLUEMARK E.CARD delivers by automatically sensing whether a card is plastic or metal and adjusting its ink combination accordingly, printing at 600 dpi in under 53 s/card. Its thermal inkjet and UV LED-curing process produces markers built to hold up in harsh industrial environments, while a 40-card autoloader magazine keeps jobs running without interruption. Intuitive marking software organizes projects and catches misordered cards before they print, and swapping ink cartridges replaces the print head automatically, keeping maintenance low.



From the editors of

PLANT SERVICES®

September
2026

Smart Solutions for Reliable Operations

BEYOND LEAKS

The overlooked sources of compressed air waste that drive up energy costs.



- 18 Ask the Experts: Reducing compressed air waste through smarter controls and system design
- 22 Case study: Berentzen boosts bottling line efficiency with digital traceability and AI-driven production planning
- 26 Case study: Husqvarna's robotic lawnmower manufacturing plant upgrades outdated electrical system to elevate reliability

Ask the Experts: Reducing compressed air waste through smarter controls and system design

Compressed air experts explain how controls, storage, pressure management, and operator training reduce industrial energy waste.

By Compressed Air Challenge experts



In this *Ask the Experts* feature, which runs regularly in Plant Services, expert instructors from the Compressed Air Challenge (CAC) tackle questions on compressed air systems and associated technology.

The Compressed Air Challenge, an educational foundation administered by the Compressed Air & Gas Institute, is a voluntary collaboration of industrial end-users; manufacturers, distributors, and their associations; trade organizations; consultants; state research and development agencies; energy efficiency organizations; and utilities. The CAC has one purpose in mind—helping facilities enjoy the benefits of improved performance of compressed air systems.

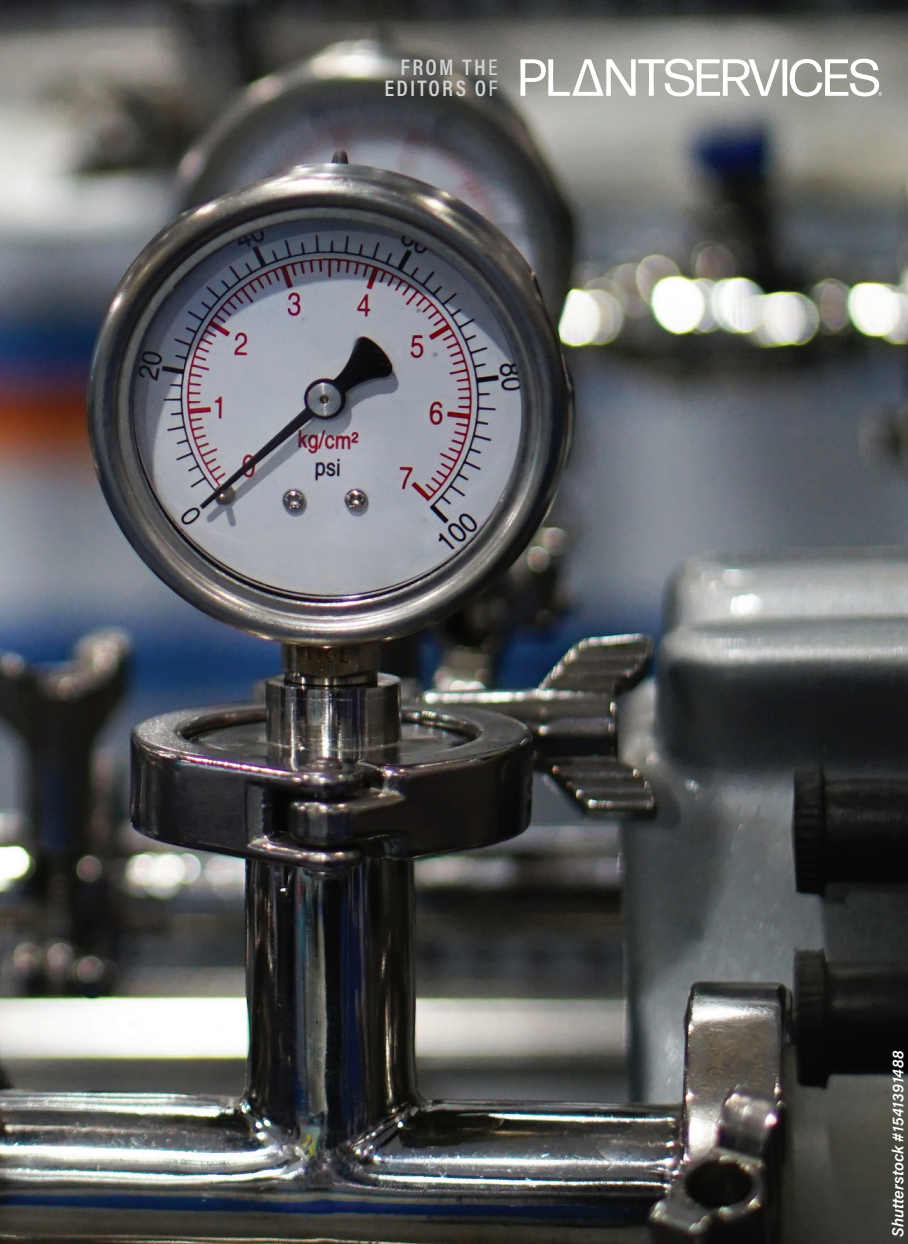
Question: Besides leaks, what is the most overlooked source of compressed air system waste in industrial plants?

1. Compressor Control Paul Shaw, Middletown, CT:

In my opinion, one of the most overlooked sources of energy waste in large compressed air systems is part-load operation,

both in single and multiple compressor systems. I frequently see systems with too many compressors running at part load, whether in modulation, or load/unload mode without adequate storage to support efficient operation. In many cases, customers don't recognize they have an issue. Their primary focus is maintaining plant pressure and avoiding downtime. While that's understandable, it often leads to significant and unnecessary energy penalties. Either they aren't aware of the inefficiency, or they lack the knowledge or controls needed to manage it effectively.

For example, I visited a plant that required three 150 hp compressors to meet demand, yet they were running five units, with two additional compressors kept online "just in case." That extra capacity came at a high cost, those two additional units consumed \$200,000 per year including the cost of maintaining them. A system review revealed that the root issue was insufficient storage receiver capacity, which limited the system's ability to maintain pressure during events like a compressor starting or a sudden demand spike.



Shutterstock #1541391488

Because there wasn't enough storage to bridge these gaps, the operators relied on keeping extra compressors online as a quick fix.

Once additional storage was installed and system controls were optimized, they were able to shut down the extra compressors with confidence. The system could now handle the loss of a unit or a sudden surge in demand without dropping below critical pressure levels, as standby compressors could start and respond in time.

Although many factors can contribute to part-load energy waste in a compressed air system, the following strategies can help reduce it:

- Right-size compressors for the application to avoid inefficiencies caused by oversizing.
- Evaluate system storage capacity to ensure it meets CAC (Compressed Air Challenge) and CAGI (Compressed Air and Gas Institute) guidelines. Adding pressure flow controllers can help stabilize the system and prevent operating at unnecessarily high demand-side pressures.

- Incorporate variable frequency drive (VFD) compressors as part of your strategy. In multiple compressor systems, a properly sized VFD unit can function effectively as a trim compressor—but correct sizing is critical to avoid control gaps.
- Work with a qualified compressed air system specialist to assess and data log your system, then partner with them to develop a targeted plan for reducing energy waste.

Jan Hoetzel, Grand Rapids, MI:

Beyond leaks, one of the most overlooked sources of waste in compressed air systems is ineffective control. Most plants focus on the traditional four dimensions—supply, demand, storage, and distribution—but overlook what can be considered the 5th dimension: control strategy. Relying on basic sequencing often results in compressors running inefficiently, with excessive unloaded time, pressure instability, and machines working against each other.

To truly drive efficiency, plants must take automation to new levels. An installed master controller goes far beyond simple sequencing. These often use adaptive learning logic and integrated monitoring to continuously evaluate system demand, compressor performance, and pressure conditions. Instead of reacting, controllers can proactively determine the optimal combination of

compressors and operating points—ensuring each machine runs in its most efficient range while minimizing energy waste.

Equally important, integrated monitoring provides full system transparency. Operators gain real-time insight into performance, energy consumption, and trends, enabling proactive decision-making instead of reactive troubleshooting. By elevating automation to a higher level, end users gain what they truly need: a compressed air system that operates efficiently, reliably, and intelligently.

Tom Taranto, Baldwinsville, NY:

The most overlooked waste is not compressed air consumption. The most overlooked waste is lack of a “systems approach” to ensure you have an efficient control strategy, appropriate pneumatic energy storage, good system design, and machines that operate in a way that optimizes compressed air generation efficiency. Conversely, focusing on generation efficiency without optimizing demand side use of the compressed air produced, simply wastes compressed air efficiently.

We recommend using the “Systems Approach” addressing these areas:

- Demand side; supply the needs of productive compressed air use at the optimum flow rate, pressure, air quality, and reliability.
- Supply side; supply the needs of productive air demands with optimized generation efficiency.

Beyond fixing leaks, the largest, most overlooked source of compressed air waste is poor system design and control. Adequate demand side optimization, appropriate storage, and pressure zoning can translate reduced system flow and lower pressure into real kWh savings.

Compressed air system requirements vary greatly. Follow system assessment standards and best practices to validate any proposed changes, and maintain appropriate safety margins for operating parameters to ensure trouble free operation.

Paul Maguire, Natick, MA:

Besides leaks, one of the most overlooked sources of compressed air waste is artificial demand from running at higher-than-necessary system pressure.

Plants often “solve” downstream pressure complaints by cranking up compressor setpoints, instead of fixing root causes like undersized piping, clogged filters, or poor controls. Every 2 psi increase in pressure can drive roughly a 1% increase in energy consumption, so those extra 10–15 psi you don’t really need are quietly burning money 24/7. Waste stems from a direct impact on power as well as higher air consumption from this artificial demand.

A common example: a facility running at 110 psi because one packaging line at the far end occasionally drops below 80 psi. Instead of boosting the whole system, a better solution is to fix pressure drops locally—upgrade the piping, clean or replace restrictive filters, or install a point-of-use booster for that one line. Pair that with a system-wide pressure reduction (say, dropping to 95 psi) and proper compressor sequencing controls. The result? You cut energy costs immediately while also reducing wear on compressors, dryers, and end-use equipment.

From a financial standpoint, plants often see 5–15% energy savings just from right-sizing pressure—no major capital required. On the reliability side, lower pressure means less stress on seals, valves, and actuators, fewer nuisance failures, and more stable operation across the plant. In other words, you’re not just saving kilowatts, you’re buying back uptime and extending equipment life, which is where the real ROI shows up.

Juan Londono, Winnipeg, Canada:

I would also say “Artificial Demand” is mostly missed by plant operators. Besides leaks, it is one of the most overlooked sources of compressed air system waste in industrial plants because it doesn’t show up as a visible loss like a leak does. It’s

often hidden within “normal” consumption, and many compressed air systems’ managers/caretakers do not understand the concept and do not quantify the losses.

This type of waste is often embedded in daily operations and goes unnoticed. Research has shown that only about 50% of compressed air is typically used productively, with the rest lost to leaks, inappropriate uses, and artificial demand.

What makes this especially costly is that plants run their systems at higher than needed pressure, which increases energy consumption, worsens leaks, and creates the false impression that more compressor capacity is needed. In practice, this means that even after fixing leaks, significant savings are still locked within how compressed air is used rather than how it is generated or supplied.

Gopalakrishnan Bhaskaran, Morgantown, WV:

There are many manufacturing companies that use compressed air blowing to move or separate products. For example, in the manufacture of metal lids that go on glass beverage containers such as pasta sauce, the lids are formed and moved along chutes using compressed air.

The machines that use this technology are not producing products constantly and they often remain idle for a significant portion of the time. However, the compressed air is often flowing constantly to the nozzles, trying to move a lid that is not there.

Such wasteful use of compressed air does not get the same attention that leaks do. The use of effective sensors, controls, and timers would stop such wasteful use of compressed air, to ensure that the compressed air nozzles do not operate when there is no production on the machine.

Ron Marshall, Winnipeg, Canada:

Besides leaks, one of the most overlooked sources of compressed air waste is the lack of understanding of the people operating the system. The problem often isn’t the compressors, it’s “between the ears” of the operator.

A person complains once, someone turns the pressure up “just to be safe,” and suddenly the entire system is using far more energy than necessary. Another compressor gets left running because “that’s how we’ve always done it.”

Compressed air systems are full of invisible traps for the untrained. Higher pressure feels like a solution, but it often creates artificial demand and drives up energy costs. Most operators mean well, but without proper training, efficient systems slowly become expensive noise-making machines. Sometimes the best energy-saving upgrade isn’t new equipment, it’s upgrading the knowledge between the operator’s ears.

Do you want help in finding out what to do to reduce your system’s operating costs? Compressed Air Challenge’s Fundamentals and Advanced training can help you formulate a plan. More information is on the Compressed Air Challenge website. **PS**



YOUR COMPRESSED AIR SYSTEM IS COSTING MORE THAN YOU THINK

Compressed air is often one of the most expensive utilities in a manufacturing facility, yet many systems operate far below their potential.

The Compressed Air Challenge® provides nationally recognized, product-neutral training designed to help facilities:

- Reduce energy costs
- Identify and eliminate waste
- Extend equipment life
- Improve system reliability
- Increase productivity
- Improve air quality

CAC's Level 1, Fundamentals of Compressed Air Systems and Level 2, Advanced Management of Compressed Air Systems training programs have helped participants identify opportunities to reduce energy consumption by 15% to 25% through more effective compressed air system management and optimization.

Learn more or register for
upcoming training programs at
www.compressedairchallenge.org



TRAINING • EDUCATION • EFFICIENCY
COMPRESSED AIR
CHALLENGE

THE EDUCATION FOUNDATION
of the Compressed Air & Gas Institute

Case study: Berentzen boosts bottling line efficiency with digital traceability and AI-driven production planning

A connected production ecosystem provides greater visibility into downtime, quality issues, changeovers, and material losses.

by Anna Townshend

At the Minden, Germany bottling facility for Berentzen Group, a lack of transparency into the production line was making managing multiple packaging variants, smaller batch sizes, and increasingly complex production requirements even more challenging.

“The key trigger was missing line transparency in bottling, which led to productivity losses,” says Thomas Faust, head of operations at Berentzen. “If OEE drivers such as downtime, micro-stops, speed losses, and scrap are not captured cleanly and in a timely manner, problems are recognized too late and countermeasures take effect with delay.”

Berentzen Group operates across three core business segments: spirits, non-alcoholic beverages, and equipment for freshly pressed juice. Its operations include spirits bottling in Minden, Germany; non-alcoholic beverage production in Haselünne, Germany; and a central warehouse in Stadthagen connected to the Minden plant by rail. Through its Fresh Juice Systems equipment line (in Citrocasea in Linz, Austria), it also serves food service operators such as hotels and restaurants.

At the Minden plant, output was decreasing and unit costs were increasing, and the lack of visibility into production was affecting planning and traceability. To address these challenges, Berentzen undertook a broad digitalization initiative named Project “Mehrblick,” or “more insight.”

The problem: Limited production visibility and paper-based workflows

Before the project, Berentzen faced multiple operational challenges tied to disconnected data and manual processes. “Gaps in quality control were a major pain point prior to digitalization,” Faust says. “In spirits bottling, critical quality characteristics such as fill level, closure torque, tightness, label position, and batch coding were not always documented seamlessly and system supported.” The cost of poor quality will continue to increase when complaints turn to recalls, which can include penalties and reputational damage, on top of revenue losses.

The manufacturer also faced higher scrap and rework levels and blocked batches. “Without digital batch and process



Shutterstock #2154336213

traceability, deviations often required precautionary blocking of larger quantities because affected units could not be clearly identified,” Faust says.

At the same time, production and quality data often arrived too late to prevent extended losses. As a result, issues such as rising scrap, drift in filling valves or capping heads, labeling errors, or temperature-related deviations could continue for extended periods before corrective action was taken.

Manual documentation processes created additional inefficiencies. “Quality checks performed on paper or in Excel tied up personnel, caused transcription errors, and complicated audits,” Faust says. The worst complication from this was when problems did occur, the evidence chain for investigation was weak.

The company also struggled to optimize production across multiple packaging variants and smaller batch sizes. “Without data-based transparency, changeover times, start-up losses, and SKU-specific performance were difficult to optimize,” he says. Ultimately, it needed better data to zero in cost transparency per SKU.

The solution: Building a connected production data ecosystem

For the digitalization effort, Berentzen worked with Process & Data Automation, a Krones subsidiary and certified member of the Control System Integrators Association (CSIA). The system integrator and packaging and bottling machine OEM Krones provided a unified architecture combining production data,

analytics, and planning tools built around the SAP Business Technology Platform (SAP BTP).

According to Sabine Stengel, product manager for SAP solutions at Krones, the architecture was designed to integrate with existing enterprise resource planning (ERP) systems, while minimizing ERP customization. “Most customers already run SAP ERP (ECC or S/4HANA),” Stengel says. “Basing extensions on SAP BTP allows us to keep ERP clean, fit-to-standard, while delivering innovation and integration on a scalable platform.”

The system also supports modular deployment. “BTP supports event-driven and API-first patterns,” she says. “We aim for configurable building blocks rather than heavy custom code.”

At the production level, the Krones Ecosystem connects machines and line systems into a centralized data environment. “The Krones Ecosystem creates an integrated data network that connects a customer’s machines and entire production lines with Krones,” Stengel says.

The cross-over architecture makes production data accessible across the organization. “By combining information technology (IT) and operational technology (OT), the Krones Ecosystem forms the basis for making machine and line data readable and usable,” she says.

A Krones portal gives customers access to their data dashboards. “The data is pre-processed at machine level by a

hardware and software package installed in the machine,” Stengel says. “From there, the data is securely transferred to the cloud.”

Krones also uses edge devices to make better use of the cloud. “We use edge devices on machine level, where we collect and pre-aggregate some of the machine data for more efficient cloud resource utilization,” she says.

Digital traceability and analytics turn production data into operational decisions

A central part of the project involved expanding production visibility through Krones Analytics, which aggregates and contextualizes the machine and line data. According to Stengel, the analytics platform calculates KPIs according to EN-415-11 and Weihenstephan standards. These KPIs include availability, performance, quality, technical availability, overall equipment efficiency, MTBF, MTTR, reject reasons, and actual versus nominal line speeds.

Beyond KPI tracking, the system categorizes downtime events and identifies bottlenecks. “Analytics aggregates, classifies, and categorizes the downtime events, turning fragmented raw machine data into actionable information,” Stengel says. The platform also identifies the machine responsible for line stoppages, including its fault message to help operators prioritize bottlenecks and coordinate maintenance response actions.



ULINE

**WE ARE THE SHIPPING
SUPPLY SPECIALISTS**

ORDER BY 6 PM FOR SAME DAY SHIPPING **1-800-295-5510** **uline.com**

The ability to contextualize machine data across lines and facilities has improved operational decision-making. “Machine and line data can be contextualized, allowing comparisons across lines, varieties, or even entire plants,” Stengel says.

The analytics platform quickly uncovered small but recurring production losses, such as delays caused by material infeed or finished goods removal, or machine maintenance or repair needs. “Frequent but short stoppages, one by one, doesn’t impact the line performance significantly,” Stengel says. But in total, the cumulative effect over time does impact line performance.

“Decisions are no longer based on gut feeling but are data-driven,” Faust says. The company can now identify how individual SKUs, materials, and disturbances affect production losses. “Cause-and-effect relationships are transparent: which SKU causes which losses, which disturbance costs how many minutes, and which material leads to higher scrap,” Faust says.

The first step in the project was the introduction of the Paperless Production App in 2023. “The Paperless Production App has streamlined and digitalized all production relevant workflows – from order management to batch tracing and quality control processes,” Stengel says. Quality data can now be captured directly from connected sensors or entered by operators. All quality information is linked to the associated production order to support traceability and compliance. The system also guides users through completing and fully documenting quality checks and control standards.

“Digital traceability is ensured by tracking all materials consumed in a production order together with their batch information,” Stengel says. “A scanner-based material

validation process confirms that the correct components are used at the right time.”

Faust says digital audit trails and automated quality records for batch-level traceability have reduced risk overall and shortened response times when production deviations occur.

AI-based sequencing improves production planning

Berentzen is also serving as the pilot customer for Krones’ AI Order Sequencing application, which is designed to optimize production order planning. “We are now in the process of implementing AI Order Sequencing at Berentzen, where the company is acting as our pilot customer,” Stengel says. The project will optimize production order sequencing with the aid of AI. “The goal is to minimize changeover and cleaning times, improve line utilization, and ultimately increase overall efficiency,” she adds.

According to Krones, the AI-based planning system does not rely on trained machine learning models. “The knowledge-based AI does not need to be trained as it is working with predefined criteria that can be combined and used as restriction or optimization parameters to determine the best possible production sequence,” Stengel says. So far, the pilot test has shown that improved planning quality increased performance by about 15%.

Faust says the additional production transparency has made scheduling more realistic. “When real line speeds and real changeover times per format are available, detailed planning becomes more realistic,” he says. “This reduces rush orders, overtime, and replanning.”

10 lessons learned: What manufacturers can apply from Berentzen’s digitalization project

- 1. Start with visibility, not AI.** Berentzen’s first challenge was limited insight into line production losses. Capturing reliable data on downtime, micro-stops, scrap, and speed losses created the foundation for later analytics and AI initiatives.
- 2. Digitalize quality records early.** Replacing paper-based quality checks improved traceability, reduced transcription errors, simplified audits, and accelerated investigations when production deviations occurred.
- 3. Connect production and business data.** Integrating shop-floor information with planning and ERP systems helped production, quality, and supply chain teams work from the same data set.
- 4. Focus on hidden losses.** Analytics revealed numerous short-duration stoppages that individually appeared insignificant but collectively reduced line performance. Small losses often represent large improvement opportunities.
- 5. Build traceability into material handling.** Scanner-based material validation and batch-level tracking reduced risk, improved compliance, and helped isolate issues without blocking larger quantities of product.
- 6. Use data to improve scheduling accuracy.** Accurate line speeds, changeover durations, and SKU-specific performance data enabled more realistic production plans and reduced replanning, rush orders, and overtime.
- 7. Keep ERP customization to a minimum.** Using a platform approach allowed new capabilities to be added without extensive ERP modifications, reducing complexity and supporting future scalability.
- 8. Prioritize operator adoption.** Short, task-based training sessions and support at the workstation helped employees adapt to new workflows faster than classroom-style training alone.
- 9. Show employees what’s in it for them.** Reduced paperwork, easier access to work instructions, and fewer manual transactions helped build acceptance by demonstrating practical day-to-day benefits.
- 10. Treat digitalization as a continuous improvement program.** Berentzen plans to expand the solution while refining the system based on user feedback, reinforcing that digital transformation is an ongoing operational journey rather than a one-time deployment.

Driving workforce adoption and measurable performance gains

Berentzen also focused heavily on operator adoption during the rollout process. “On the shop floor, acceptance increased noticeably once employees experienced that the digital solutions provide real relief in daily work,” Faust says.

The digital tools reduced dependency on printed work instructions and manual information transfers. “Current work instructions are available at any time,” he says. “Errors caused by outdated printouts were reduced.”

Planners at Berentzen adapted quickly because the system improved scheduling and coordination visibility from the start, Faust says. However, operators initially required more support as they adjusted to new devices and workflows. “What worked best were short, repeatable trainings closely aligned with real work steps,” Faust says. “It was particularly effective to provide

support directly at the workplace.” This was even more important in the initial shifts after the upgrade roll-out to build worker confidence.

Berentzen tried to communicate to workers and frame the upgrade in the ways it would improve and support their work, such as less paperwork and fewer errors. “A key principle was not to overwhelm people, but to build confidence through small steps, repetition, clear instructions, and an environment where questions are explicitly welcomed,” he says.

The project has already produced measurable operational improvements at Berentzen’s bottling lines. The company has seen “less scrap and rework through systematic limit monitoring, for example, fill level, closure torque, label position, and lot code readability,” Faust says. The system also improved visibility into production losses and material yields, which led to “higher yields through accurate

recording of spirits losses, product changeover losses, flushing volumes, leakages, and overfilling,” Faust says.

Berentzen reports line efficiency improvements of 13% to 15% with AI-based planning. Inventory levels have also been reduced, including both safety stock and stock shortages for raw and packaging materials.

The company also expects labor savings through the automation of manual transactions and documentation workflows. Faust says the digitalization of manual processes will reduce the workforce needed to do live postings of goods receipt, consumption, and auxiliary material inventory transactions.

Following the Minden deployment, Berentzen plans to extend the solution to additional facilities. “By leveraging the insights our teams gain in their daily work, we’ll further refine both the system and the user experience,” Faust says. PS

Making compressed air more efficient... and quieter!



BLOW OFF AIR NOZZLES

25 times air amplification
60% quieter than standard nozzles
Thrust ranging from 3–72 oz-force
Meet OSHA noise & dead end pressure requirements



ENCLOSURE COOLERS

78% quieter than conventional vortex coolers
Cooling Capacities from 1500–5000 BTU/hr
NEMA 12, 4, 4X and Hazardous Locations

1-513-613-3223
WWW.VORTEC.COM



Case study: Husqvarna's robotic lawnmower manufacturing plant upgrades outdated electrical system to elevate reliability

Upgrading aging medium-voltage switchgear with new air-insulated switches delivers higher switching capacity and modern arc extinguishing capability.

By Sheila Kennedy

Pursuing disruptive technologies with the shiny goal of transformational change is not a high priority for organizations with immediate needs and lean budgets. Rather, they continue to advance their operations and maintenance effectiveness with more focused solutions.

The Husqvarna Manufacturing CZ facility in Vrbno pod Pradědem, Czech Republic, is one of those. The robotic lawnmower manufacturing plant chose swift modernization over full capital replacement when aging infrastructure posed a risk to operational reliability.

An installed base of switchgear dating back to the 1960s was still operational, which is a testament to the maintenance and reliability team's strength as well as the quality standards of the original equipment manufacturer (OEM). But it was clear that upgrading the electrical system would significantly enhance power reliability and resilience and reduce costly downtime, making the organization safer and more successful at multiple levels.

To arrive at this approach, Husqvarna leveraged ABB Navigate advisory services, delivered by ABB's

Electrification Service team, for a comprehensive technical assessment and targeted modernization recommendation. Based on that recommendation, the plant's aging medium-voltage switchgear was upgraded with state-of-the-art switches.

With its electrical infrastructure modernization, Husqvarna's flagship robotic lawnmower plant is saving thousands of euros for each hour of avoided unplanned downtime. The sustainable solution also reduced the need for large capital expenditures and is helping to safeguard operations, extend equipment life, and support long-term performance.

Outdated electrical installed based posed growing risks to safety and reliability

The Vrbno pod Pradědem site produces plastic parts using injection molding technology and assembles robotic lawnmower kits, among other products. It operates 24 hours per day, seven days a week, making operational reliability and a dependable power backbone essential. Yet with an electrical installed base dating back nearly six decades, issues with obsolete equipment, declining spare parts availability, and limited servicing options put availability and uptime at risk.

"Unplanned downtime can cost our facility thousands of euros per hour, which is why a reliable and predictable power supply is crucial," says Pavel Jiroušek of Husqvarna Manufacturing, Czech Republic. "We needed a sustainable solution that focused on modernizing rather than replacing our existing installed base of switchgear. A solution that offered swift implementation and minimum disturbance to our operations."

Technical expertise and tailored solutions enabled efficient upgrade of legacy electrical systems

Husqvarna worked with ABB, a trusted partner, to determine and implement an optimal solution. ABB Navigate advisory services, delivered by ABB's Electrification Service team, included a comprehensive technical assessment and development of a recommended modernization plan.

The mutually accepted solution was to upgrade the plant's aging medium-voltage switchgear by replacing outdated load break switches with new NAL/NALF air-insulated switches, which rapidly extinguish electrical arcs and support high switching capacity. Their modular build shortens installation time, and after commissioning they can run for 15 years before requiring service.

"These units are rated to M1 mechanical and up to E3 electrical endurance classes, with a visible open insulation gap and a wide -40/+55 °C operating envelope," says Marco Tellarini, senior vice president – EMEA region, ABB Electrification Service.



SEE THE NEW FMB SOLAR CN FULLY AUTOMATIC VERTICAL BANDSAW

If you are planning to visit IMTS or FABTECH, don't miss the NEW FMB Solar CN. It delivers fast, precise miter cuts on structural steel and heavy profiles.



FMB SOLAR CN FULLY AUTOMATIC VERTICAL BANDSAW

The FMB Solar CN Vertical Tilt Bandsaw offers fully automatic operation. It features heavy-duty construction and reliability that fabricators and structural steel shops have come to know and trust. FMBs are built to last.

- Precise Cut Length Positioning
- Ballscrew with Servo-Controlled Material Indexing
- Full Control over the Cutting Rate with Linear Encoder
- Saw Head Tilts 60 Degrees to the Left and Right
- Large Touchscreen Control with High-Speed Resolution Provides Full Machine Diagnostics and Cutting Parameters
- 18" x 22" Cutting Capacity

THE NEW SOLAR CN WILL DEBUT AT IMTS AND FABTECH.

VISIT US AT
IMTS2026
BOOTH 236914

VISIT US AT
FABTECH
BOOTH A2167



Decidedly targeted upgrade fosters Husqvarna's journey toward greater reliability and sustainability

Modernizing the aging electrical infrastructure by transitioning from outdated medium-voltage switchgear to new air-insulated switchgear proved to be an efficient and cost-effective solution for Husqvarna's robotic lawnmower manufacturing facility.

Significant savings arise from protecting against costly equipment failure, plant disruption, and unplanned outages, gaining more than a dozen years of maintenance-free operation and extending equipment life. The predictable power supply enhances operational safety, resilience, and long-term reliability. Additionally, modernization supports Husqvarna's circular approach by prioritizing the sustainable reuse of existing infrastructure over full replacement.

"Too many industrial operators still view electrical modernization as a deferrable maintenance expense rather than the competitive lever it has become," observes Tellarini. "At Husqvarna's Vrbno pod Pradědem plant, swapping obsolete load break switches for modular NAL/NALF air-insulated units delivers 15 years of service-free operation."

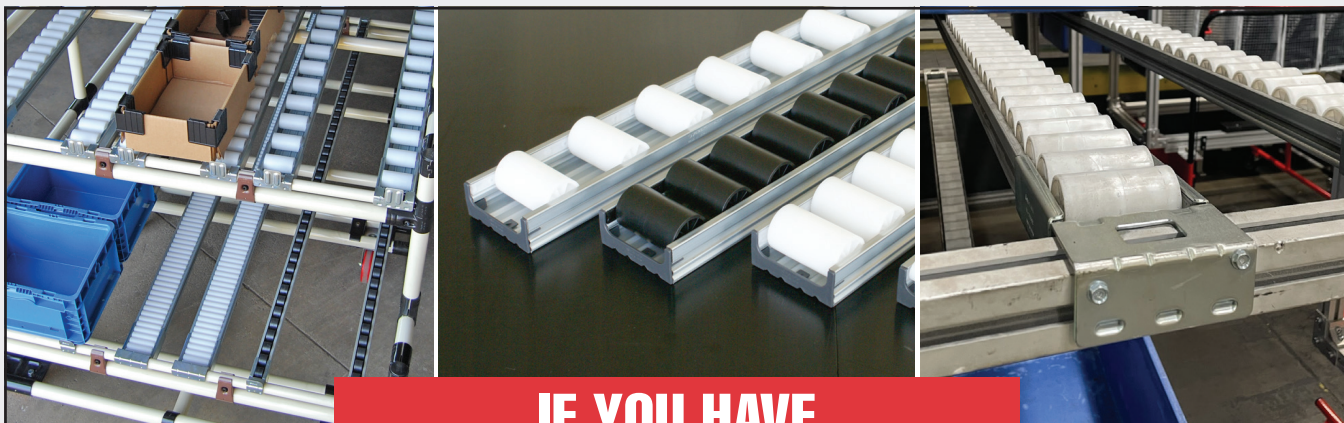
The comprehensive technical assessment behind the project also secured a foundation for future digital investment across the installed base. "When downtime costs thousands of euros

per hour, that blend of near-term reliability and long-term digital headroom is what makes targeted upgrades pay back so quickly," Tellarini explains.

ABB's 140 years of expertise in electrical systems facilitates safer, smarter, and more sustainable futures for its customers

Though not specifically quantified by the Husqvarna plant, ABB's internal analysis of customer successes shows that projects relating to ABB Navigate advisory services typically result in a 25% reduction in downtime by mitigating risks of failure, 50% reduction in safety incidents, and 30% reduction in energy consumption by integrating sustainable technologies and energy-efficient practices. **PS**

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. She can be reached at sheila@addcomm.com or www.linkedin.com/in/kennedysheila.



**IF YOU HAVE
GRAVITY FLOW PROBLEMS...**

...CREFORM CONVEYORS PERFECT THE ART OF WORKFLOW.

Whether it's with a Creform structure or a structure of your own, Creform gravity roller conveyors provide smooth, quiet and reliable operations. With over 16 varieties and types of roller conveyors, Creform has the answer to your problems. They provide low-rolling resistance, stability and extra support for handling totes and even unpackaged goods. They feature a wide selection of roller sizes, spacing and styles that are modular by design for flexibility and recyclability. *That's perfecting the art of workflow.*

CREFORM® MATERIAL
HANDLING
SYSTEMS

www.creform.com • 800-839-8823



From the editors of

MH & L

September 2026

Material
Handling
& Logistics®

THE COST OF MANAGING A WAREHOUSE

*Strategic options for running an
efficient distribution operation*

- 30 The Effect of
Unexpected Downtime
on Forklift Cost
- 32 Beyond Outsourcing:
Why Best-Shore Is
Reshaping the Future
of Industrial Operations
- 36 Resilient by Design:
Why Modern Supply
Chains Can't Rely on
Efficiency Alone
- 38 When Throughput
Meets Grid Constraints
- 40 Majority of Supply
Chain Leaders
Unclear on AI
Investment Returns



The Effect of Unexpected Downtime on Forklift Cost

Total cost of ownership includes not just purchase price but also fuel, maintenance, downtime, and operator costs, which can significantly impact overall expenses.

By Dan Zinn

When considering a forklift purchase decision, it is often tempting to focus on the up-front cost of the equipment itself, which disregards many factors that can ultimately affect a user's total cost of ownership over the forklift's life. An informed buyer knows there are several factors that can affect the total cost of ownership (TCO), including the forklift's power system, fuel or electricity, replacement parts, and service requirements. Even more importantly, that buyer also considers the total life of the forklift and the cost of the individual to operate it shift after shift.

Forklift buyers that focus solely on acquisition cost are making purchase decisions based on less than 8% of the TCO. Even the costs of power, parts and service account for single-digit percentages of the total cost. Buyers that make decisions based on any of these costs or even their sum total may identify small savings opportunities, but once the lift trucks are operational, slower throughput, unplanned downtime and maintaining backup capacity can quickly erase these savings.

The cost of unplanned downtime, regardless of the cause, can quickly increase TCO due to one significant factor. Research shows that the cost of the operator accounts for at

least 83% of the TCO over the life of the lift truck. Think of it this way—a gas-powered vehicle sitting at idle is getting zero miles per gallon while the fuel continues to be depleted. Similarly, a forklift that isn't moving product while the operator is still being paid is effectively getting zero miles per gallon. Worse yet, the lost work still needs to be completed, often leading to extended shifts, overtime or short-term equipment rental until the forklift is up and running again.

A more useful TCO question is what it costs to complete the work reliably, shift after shift and year after year. A lift truck isn't the lowest-cost solution if it can't maintain the required pace, isn't available when needed, or requires the facility to purchase and maintain additional equipment to support spikes in demand.

Define the Work and Desired Business Outputs

Acquisition cost, financing, monthly payments and hourly service rates are valid inputs, but they don't consider whether the fleet supports the operation effectively. A more complete analysis also considers capability, throughput, uptime and availability.

Warehouse operations purchase forklifts to move material, maintain production and get revenue-producing product out the door. TCO should therefore connect equipment cost to measurable business outputs through metrics such as cost per pallet moved, cost per order shipped and picks or putaways per hour.

It should also account for the factors that interrupt that output: production-cycle time, equipment availability during peak periods, unplanned downtime and rental expense. Labor requirements, product and facility damage and the fleet size needed to complete the work also matter.

The objective is to support a consistent and uninterrupted flow of product through the facility. Therefore, operational considerations are critical, perhaps even more critical than quoted costs, when making a purchase decision.

Validate Assumptions through Operators, Trials and Fleet Data

A credible TCO process combines commercial terms with application trials, service history and operational feedback. Because labor associated with operating a forklift represents a much larger lifetime investment than the equipment itself, improvements in lift truck performance can influence operator confidence, comfort and willingness to work at the required height, which may affect productivity, throughput and operator retention.

Structured demonstrations or trials give operators a meaningful role in the evaluation. Their feedback can show how well the equipment supports the work under real operating conditions. Over the life of the forklift, operator behavior can also influence throughput, equipment life, damage and maintenance expense.

Required training and operator assist technology should be considered in the same context. Operator assist systems can reinforce training even when supervisors aren't able to provide

feedback, helping to reduce avoidable damage and related downtime.

Capturing operational data is also important. Analysis of this data can show when and where lift trucks are active, what that activity produces, and how downtime can affect availability and operating expense. Data can also expose mismatches between equipment and work.

These measurements may challenge assumptions about fleet size, equipment type and deployment, and help determine what equipment is needed and how each forklift should be deployed.

Translate Accumulated Knowledge into Fleet Decisions

The knowledge gained through operational data analysis should guide equipment selection and deployment. Underspecified equipment can reduce productivity and may require additional equipment to complete the required work. Overspecified equipment can increase acquisition cost without providing operational value.

Deployment matters, too. A newer, higher-performing unit may provide more value in a high-throughput application, while an older but serviceable lift truck can be moved to lower-utilization work. Redeploying equipment according to utilization and capability can improve productivity and reduce repair demands.

Thinking Beyond the Forklift

The lowest labor rate does not always produce the lowest maintenance cost. A provider charging \$200 an hour may deliver better value if service is needed twice a month, while a provider charging \$100 an hour may cost more through weekly visits or longer repairs.

A better comparison considers service frequency, downtime and whether repairs occur during peak operations. Repeat repairs, parts consumption and mean time between failures can show whether maintenance is addressing

the underlying cause. Routine service can usually be scheduled around production demands; unplanned work during a busy shift carries a greater operational cost.

Durability and serviceability also matter before purchase. Consider whether technicians can reach frequently serviced components, whether routine replacements are straightforward, and whether the truck has been designed and tested for the intended duty cycle. When a component fails sooner than expected, conduct a root-cause analysis. Failure may be due to the application environment, but it may also result from using low-cost, inferior parts.

Energy cost extends beyond batteries and electricity. Power options should be evaluated based on the charging space and infrastructure they require, battery-handling labor, the time operators spend away from material movement, battery life, available power and flexibility as volumes or operating hours change.

The utilization of rental forklifts can also be a useful indicator. Seasonal rentals may support a deliberate capacity plan, but regular rentals outside peak periods may point to persistent equipment availability problems that could be avoided.

Think Long-Term

Most equipment alternatives can appear attractive at the point of purchase. While it may be tempting to make a purchase decision based on today's information, a TCO analysis should consider the characteristics of the fleet in five or even 10 years. Is the equipment still delivering the required performance? Are the right lift trucks available when needed? Is the fleet operating at an appropriate cost for the business? The answers to these questions can help differentiate between calculating the price of a lift truck and understanding the total cost of getting the work done. **MH&L**

Dan Zinn is managing director—corporate sales with forklift manufacturer Crown Equipment Corp.



Beyond Outsourcing: Why Best-Shore Is Reshaping the Future of Industrial Operations

Best-shore strategy evaluates the nature of the work and places it in the location that delivers the greatest overall business value.

By Erik Mendez

For more than three decades, outsourcing followed a simple logic, moving work to lower-cost locations to reduce expenses and gain efficiency.

That model delivered real benefits, but the business environment has changed. Organizations now face pressure to innovate faster, strengthen resilience, protect worker safety, and meet increasingly complex regulations. As a result, many leaders, including me, are asking a basic question: is cost still the primary factor in deciding where work gets done?

Increasingly, the answer is no.

Instead of focusing solely on offshore outsourcing, organizations are adopting what many industry leaders describe as a best-shore strategy, an approach that evaluates the nature of the work and places it in the location that delivers the greatest overall business value.

The best-shore model recognizes that cost matters, but so do collaboration,

speed, resilience, compliance, talent availability, and operational continuity. Rather than choosing between offshore, nearshore, or onshore delivery, organizations are learning to combine all three in ways that support their broader business objectives.

Why Traditional Outsourcing Is No Longer Enough

The original outsourcing model emerged during an era when labor arbitrage created substantial financial advantages. Companies could often reduce costs significantly by moving work to offshore locations while maintaining acceptable service levels.

Today, the equation is more complex.

Business leaders are operating in an environment defined by disruption. Supply chain disruption, cybersecurity threats, geopolitical uncertainty, workforce shortages, regulatory change, and rising customer expectations have

created new challenges that traditional outsourcing models were not designed to address.

Many organizations have also discovered that the lowest-cost location is not always the lowest-cost solution.

Communication delays, time zone differences, management overhead, quality issues, rework, travel expenses, and slower decision-making can erode anticipated savings. In highly collaborative environments, the inability to work in real time can become a significant obstacle to productivity and innovation.

This is especially true in industries where safety, compliance, operations, and business performance are tightly interconnected.

A manufacturing plant cannot afford prolonged downtime because a critical engineering issue must wait until another region wakes up. A logistics operation cannot delay responding to a cybersecurity incident

REINFORCE TRAINING AND SAFE OPERATION



Object detection technologies, like those used in Crown's ProximityAssist System, limit travel speed to further enable the operator to take appropriate action.



Scan here to
learn more
about Crown's
ProximityAssist
System

CROWN
crown.com

due to communication barriers. An environmental compliance issue may require immediate collaboration among multiple teams across different disciplines.

The Rise of the Best-Shore Strategy

The best-shore concept starts with a different premise.

Instead of asking, “Where can this work be performed most cheaply?” organizations ask, “Where can this work be performed most effectively?”

This distinction may seem subtle, but it fundamentally changes how leaders think about global operations.

Different types of work have different requirements. Some activities require scale and cost efficiency. Others require real-time collaboration, local regulatory knowledge, or close interaction with business stakeholders.

The best-shore model recognizes these differences and aligns work accordingly.

Under this approach, organizations typically leverage a combination of offshore, nearshore, and onshore resources, assigning responsibilities based on business requirements rather than geography alone.

The result is a more balanced operating model that optimizes not only cost, but also performance, resilience, and speed.

Understanding the Three Components of Best-Shore

While every organization will design its own version of a best-shore strategy, most models incorporate three complementary delivery layers.

Offshore: Scale and Cost Efficiency

Offshore delivery remains an essential component of global operations.

Countries with large technical talent pools offer organizations access to skilled professionals at competitive costs. Offshore teams often provide the scale necessary to support large transformation programs, application development initiatives, engineering

projects, testing activities, data management, and managed services.

In recent years, Southeast Asia has emerged as an increasingly attractive destination for offshore delivery. Countries such as Vietnam have gained recognition for their growing engineering talent, strong technical education systems, and expanding expertise in cloud computing, artificial intelligence, cybersecurity, and enterprise software development.

The key difference today is that offshore is no longer viewed as the entire strategy. Instead, it represents one component of a broader global operating model.

Nearshore: Speed and Collaboration

As businesses become more agile, collaboration has become a critical success factor.

Nearshore delivery helps organizations bridge the gap between cost efficiency and operational responsiveness by locating teams in similar time zones and cultural environments.

For companies operating in North America, Latin America has become an increasingly important nearshore destination. Teams can collaborate during the same business day, participate in real-time meetings, respond quickly to changing priorities, and engage more directly with business stakeholders.

The value of nearshore delivery extends beyond convenience.

Real-time collaboration can accelerate project execution, improve communication, reduce misunderstandings, and support faster problem resolution. In industries where operational continuity and rapid decision-making are critical, these advantages can have a measurable impact on business performance.

Nearshore teams are often particularly effective in agile development environments, operational support functions, engineering collaboration, and customer-facing initiatives that require frequent interaction.

Onshore: Governance and Business Alignment

Certain activities benefit from being located close to the business itself.

Executive engagement, regulatory compliance, stakeholder management, strategic planning, safety oversight, and customer relationships often require local presence and a deep understanding of business context.

Onshore resources provide this connection.

They serve as the bridge between business objectives and operational execution, ensuring that global delivery teams remain aligned with organizational priorities.

For highly regulated industries, onshore capabilities can also help organizations navigate legal, environmental, labor, and compliance requirements more effectively.

Rather than competing with offshore or nearshore delivery, onshore resources enhance the effectiveness of the overall model by providing leadership, governance, and accountability.

Why Best-Shore Matters for Operational Resilience

One of the most compelling drivers behind the best-shore movement is resilience.

Recent years have demonstrated how vulnerable organizations can become when they depend too heavily on a single geography, supplier, or operating model.

Business continuity planning has traditionally focused on facilities, equipment, and supply chains. Increasingly, organizations are applying similar thinking to workforce and service delivery strategies.

A diversified best-shore model helps reduce concentration risk.

By distributing capabilities across multiple regions, organizations gain greater flexibility to respond to disruptions. If one location experiences challenges, other locations may be able to absorb workloads and maintain operations.

This capability is particularly valuable in sectors where downtime can have significant operational, financial, or safety consequences.

Manufacturing, energy, utilities, transportation, healthcare, and industrial organizations all depend on reliable support functions that enable safe and efficient operations.

The ability to maintain continuity across multiple geographies has become a strategic advantage rather than simply an operational consideration.

The Human Factor

Another reason organizations are embracing best-shore strategies is the growing importance of talent.

Many industries face persistent skill shortages in critical areas such as cybersecurity, artificial intelligence, cloud computing, engineering, data analytics, and digital transformation.

Finding the right talent has become more challenging than finding the lowest-cost talent.

A best-shore strategy enables organizations to access specialized skills wherever they exist while maintaining the appropriate balance of governance and collaboration.

This approach also supports workforce flexibility. Organizations can build teams that combine global expertise with local business knowledge, creating a more dynamic and adaptable workforce.

As competition for talent continues to intensify, the ability to tap into multiple labor markets may become one of the most important advantages of the best-shore model.

Moving Beyond Geography

Perhaps the most important aspect of the best-shore strategy is that it shifts the conversation away from geography and toward outcomes.

The debate is no longer offshore versus nearshore versus onshore.

The real question is how organizations can combine these capabilities to achieve their business objectives more effectively.

A successful best-shore strategy does not begin with location decisions. It begins with understanding the work itself.

Which activities require close stakeholder interaction? Which require scale? Which involve regulatory oversight? Which demand specialized expertise? Which can be standardized and delivered remotely?

Answering these questions allows leaders to design operating models that align resources with business needs.

In a world where resilience, agility and innovation increasingly define competitive advantage, the best location for work is not necessarily the least expensive one. It is the location that creates the greatest value for the business, for the safety and productivity of its people, and for its long-term resilience. **MH&L**

Erik Mendez is executive director for Mexico for FPT Software.

LIFTPOINT

by Mohawk Lifts

Forktruck Service Lifts

18,000, 22,000 and 30,000 lb. Capacity
Material Handling Service Lifts



Watch the LiftPoint
Showcase Video

*The Only Lifts Built to
Service Forklifts, Pallet
Jacks, Reach Trucks,
Order Pickers & More*



Resilient by Design: Why Modern Supply Chains Can't Rely on Efficiency Alone

Future supply chain success depends on integrating resilience into design and operations, ensuring networks remain optimized amid change.

By George Ninikas

Traditional supply chain optimization models were developed during a period when operating conditions were relatively stable. Demand patterns were easier to forecast; supplier networks were more predictable, and global trade operated with fewer disruptions.

In that environment, optimization delivered impressive results. Companies designed transportation networks that minimized empty miles, consolidated shipments and balanced warehouse workloads. But today's operating environment is far less predictable.

Industry research shows that supply chain disruptions have become both more frequent and more costly. In fact, many organizations report that disruptions now occur twice as often as they did just a few years ago, and companies can lose 5-10% of annual revenue as a result of supply chain interruptions.

When disruptions occur, companies often respond by making rapid operational adjustments, rerouting deliveries, expediting transportation, or reallocating inventory across distribution centers. While these actions may resolve short-term challenges, they often erode the efficiency gains that were originally modeled during strategic planning.

Over time, the savings projected during network design will gradually disappear during day-to-day operations.

The Strategic-Operational Gap

One of the most common challenges organizations face today is the disconnect between strategic supply chain design and operational execution.

At the strategic level, companies make long-term decisions about distribution center locations, supplier networks and transportation structures. These decisions are often supported by advanced modeling tools that identify the most cost-effective network configuration.

However, such optimal distribution networks may look efficient on paper based on stable demand assumptions. But if customer order patterns shift, driver and labor availability tightens, or delivery windows change, planners often compensate manually—adding routes, changing schedules and reallocating capacity. The network continues to function, but

the original savings model defined during strategic planning quietly erodes over time.

Bridging this gap requires a broader perspective, what many supply chain leaders now describe as taking a “helicopter view” of the supply chain. Because the real challenge is not optimizing individual functions, but managing the interaction between strategic design, tactical planning and daily execution.

The Value of a Helicopter View

A helicopter view means understanding the supply chain as a connected ecosystem rather than a collection of isolated decisions. Network design, transportation planning, inventory management and real-time execution are all interconnected. Decisions made in one area can significantly influence performance in another.

For example, modifying delivery zones might improve route efficiency but increase complexity within distribution centers. Similarly, diversifying suppliers to reduce risk may alter transportation flows or change inventory positioning across the network.

Organizations that evaluate these decisions independently risk optimizing individual components while overlooking the broader system. By contrast, a holistic perspective allows companies to connect long-term strategy with operational reality and ensure supply chain decisions remain adaptable over time. This is where a resilient supply chain begins, with intelligent design supported by technology that can model uncertainty, validate real-world feasibility and continuously adapt as conditions evolve.

Designing Supply Chains for a Volatile World

Adaptability has emerged as a mission-critical requirement for every organization in the industry. Global supply chains are increasingly described as operating in a “permanent state of disruption,” with trade tensions, climate events and regulatory shifts continuously reshaping logistics networks.

In response, many organizations are redesigning supply chains with flexibility built in adopting diversified

sourcing strategies, re-evaluating distribution networks, and investing in technology that enables faster decision-making.

Resilient supply chains are enabled by technology that spans the full lifecycle of operations. At the strategic level, scenario modeling and territory design tools allow organizations to test whether their network can withstand demand variability or structural changes. At the tactical and operational levels, advanced routing solutions validate load feasibility, driver constraints and time-window requirements, while still enabling rapid re-planning when disruptions occur.

Equally significant is real-time visibility. Driver applications, proof-of-delivery systems and control tower dashboards provide immediate insight into execution performance, allowing organizations to respond proactively rather than reactively when conditions deviate from plan.

Importantly, resilience does not necessarily mean sacrificing efficiency. The most advanced supply chains are learning how to balance both.

A New Supply Chain Imperative

If the past several decades emphasized efficiency above all else, the coming decade will likely prioritize adaptability and resilience.

The frequency and scale of supply chain disruptions suggest that volatility will remain a defining feature of global commerce. Organizations that succeed in this environment will be those capable of aligning long-term network design with daily operational decision-making.

Resilience also depends on continuous improvement. AI is increasingly enabling organizations to move beyond reactive analysis toward predictive intervention—identifying where network assumptions repeatedly fail, surfacing structural inefficiencies, and recommending adjustments before performance deteriorates. By analyzing historical execution alongside planned scenarios, AI can stress-test networks, uncover planning blind spots and simulate future conditions, allowing organizations to proactively refine both strategy and operations.

The result is a synchronized decision ecosystem where strategic design, tactical planning and operational execution continuously inform and reinforce one another. In this model, resilience is not a reactive capability, but a built-in advantage.

The critical question for supply chain leaders is no longer whether their network is optimized. It is whether it remains optimized when conditions change. **MH&L**

George Ninikas is the senior vice president of sales and accounts, supply chain planning, Americas for ORTEC, a provider of advanced analytics and optimization solutions.

jesco
— Since 1932 — ®

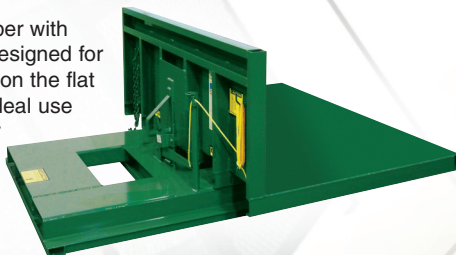


All-welded dump hoppers handle bulk materials or scrap easily. Over 60 different units to handle all your material or scrap with ease. Standard safety equipment on all units.



Visit www.JescoOnline.com

Flat Deck Open-Sided Hopper with Extended Fork Pockets is designed for long materials to be placed on the flat deck for ease of stacking. Ideal use for this unit is for plasma or laser skeletons.



Towable rotator box designed for the collection and storage of bulk materials, the wishbone style tongue allows for towing at up to 4 mph. Rolls on 8" x 2½" casters.



Four different sizes are available to handle all your bulk material. Fork openings are 3" x 8". Dumped with a rotating forklift attachment.



This side pivot hopper will allow the bucket to pivot between the casters to empty the contents. 4000 lbs capacity. Standard safety equipment on all units.

Call 800.609.8290



Jesco Industries, Inc. PO Box 388 Litchfield, MI 49252-0388 Phone: 517.542.2903

When Throughput Meets Grid Constraints

Operators must rethink their energy strategy in light of record import volume.

By Jim Bunsey

The supply chain industry is experiencing a multi-level disruption this summer as record-breaking container import volumes converge with extreme seasonal temperatures, creating operational and energy challenges across ports, terminals and warehouse networks.

What began as a rush to front-load inventory ahead of anticipated August tariff changes has evolved into a system-wide stress test — one that is exposing vulnerabilities in both material handling operations and energy infrastructure.

Shippers are accelerating inbound freight to get ahead of potential tariff increases, driving import volumes to levels that are straining every link of the supply chain. While ports are under pressure to process unprecedented cargo throughput, the impact extends well beyond the dock. Warehouses and intermodal facilities are absorbing higher inventory levels months ahead of traditional peak season, increasing not only equipment utilization and facility congestion, but energy demand simultaneously.

With U.S. imports expected to reach record levels before tariffs take effect, logistics hubs can no longer rely on grid-dependent approaches to power their operations. Aging grid infrastructure and seasonal peak loads are creating growing risks of capacity constraints, demand charges and operational disruptions. Operators must rethink their energy strategy and consider on-site power generation for resilient, on-demand connection while supporting continuous material handling day-to-day operations.

While many facilities are looking toward electrification, they often find themselves bottlenecked by rising infrastructure costs and multi-year interconnection delays. For operators seeking to diversify energy sources without sacrificing uptime, propane has emerged as a proven, data-driven solution to help operators navigate these market shocks and grid constraints.

The financial stakes are also higher than many realize; recent research from the Propane Education and Research Council reports the median cost of a long-lasting power outage for a commercial organization is approximately \$8,750. This figure, which accounts for lost revenue, equipment damage, and repair costs only represents a baseline, with total costs scaling rapidly depending on the facility's specific role in the supply chain.

The Ripple Effects of Energy Constraints

Historically, warehouse electrical systems were designed around predictable load profiles with moderate peak demand.

Today's distribution centers operate differently; high-density battery charging, warehouse automation, cold storage, robotics and more sophisticated technologies have substantially increased connected electrical loads.

The unprecedented import surge we are seeing now exacerbates operational strain, extending beyond port congestion:

Power constraints and fleet availability

Peak-demand charges and charging bottlenecks are eating into margins during critical high-volume periods. Extended operating schedules are also pushing battery electric lift truck fleets to utilization limits. High-volume charging cycles combined with elevated HVAC demand during extreme heat can increase electrical loads and can trigger significant peak-demand charges. Without sufficient charging capacity or on-site power, equipment availability can become a potential bottleneck for throughput.

The cost disparity is stark: while diesel yard tractors often average an operating cost of \$8.14 per hour, comparable propane units operate at just \$6.17 per hour—a 25% savings in fuel spend alone. Furthermore, propane removes the “capital penalty” of electrification; propane-fueled forklifts are typically 30% less expensive to purchase than electric models, and they eliminate the capital expense of installing and permitting battery-charging infrastructure.

Warehouse throughput and labor efficiency

Facilities are processing peak-season inventory volumes months earlier than normal, increasing pallet movements, dock door utilization and storage density. Congested layouts and elevated handling activity reduce productivity while placing additional physical demands on warehouse personnel working in high-temperature environments. The result is a significant safety risk and high operating costs with overtime and early seasonal staffing.

The specific impact of these outages varies significantly by operation type. For manufacturing facilities, labor costs (33%) and lost revenue (29%) are the most cited financial stressors. Conversely, retail distribution centers face a different set of pressures, where lost revenue (48%) and materials loss/spoilage (29%) create the most immediate threat to profitability.

Capacity planning and network agility

With import volumes projected to decline following the current surge sharply, operators face the challenge of balancing short-term capacity requirements against long-term asset utilization. Decisions involving labor expansions and material handling equipment deployment must account for the potential “bullwhip” effect, where temporary demand declines and leaves facilities with underutilized assets.

Propane’s Value Proposition

Recognizing these risks, the industry is already shifting its approach: 52% of commercial organizations have increased their backup power strategy over the last two years, driven largely by the need to protect critical loads (50%) and growing concerns over grid instability (39%). Operators are moving away from monolithic grid reliance toward hybrid systems that provide the resilience necessary to maintain productivity.

Fleet operators often think of the choice between diesel and electric, overlooking propane as a viable bridge from diesel to electric, especially if full electrification is the end goal. For many operators and businesses, a complete transition to electric isn’t feasible overnight due to charging limitations, capital investment cycles and more.

Propane offers the opportunity to reduce emissions and modernize fleet operations immediately while providing the flexibility to transition to electrification over time.

Propane-powered material handling equipment provides an independent energy source that is not constrained by grid capacity or charging infrastructure. Because propane cylinders can be exchanged in minutes, fleets can remain productive without the hand-off downtime associated with battery-electric equipment.

This operational edge is quantified by real-world performance. The West

Basin Container Terminal (WBCT) at the Port of Los Angeles, the first U.S. port terminal to power its entire yard tractor fleet with propane, saves an estimated \$1 million per year. By leveraging domestic propane, WBCT matched diesel performance while avoiding the grid integration challenges inherent in electric fleet transitions. In

2024, WBCT paid an average of \$1.66 per gallon for propane, which is less than half the price of diesel at \$3.44 per gallon. **MH&L**

Jim Bunsey is the senior manager of material handling business development at the Propane Education & Research Council (PERC).



**FAMILY OWNED
AMERICAN MADE • TRUSTED PARTNER**

Pallet Rack Systems

**Push Back • Selective • Drive-In • Seismic Base Isolation
Flow • Pick Modules • Cantilever**



Proud members of:
MHEDA, RMI & MHI



**American Steel • Superior Fit & Finish
Project Management • Online Sales Tools
Rack Configurators**

RIDG-U-RAK®
Famous for integrity since 1942
Ridgurak.com PROUDLY Made in the USA

Majority of Supply Chain Leaders Unclear on AI Investment Returns

Companies that rightsize their change management will achieve twice the ROI on AI initiatives.

By MH&L staff

More than half (55%) of chief supply chain officers (CSCOs) are unclear on the return on investment (ROI) of their AI investments, even as 67% of supply chain digital investments are now allocated to AI, according to a survey from analyst firm Gartner.

To achieve clear and positive returns from their AI investments, CSCOs must deploy a “rightsized” change management strategy that explicitly links change execution to AI strategy, supply chain strategy and broader enterprise priorities, so that change resources are directed toward outcomes and not individual activities.

“Organizations are getting better at executing change for individual initiatives,” says Lorraine Gavin, senior principal analyst in Gartner’s supply chain practice. “The bigger challenge

today is deciding where to invest limited change management resources so that they support the business outcomes that matter most. AI is making that decision more important than ever.”

Rapid AI evolution is causing use cases to proliferate faster than organizations can develop effective change management approaches to support them. Gartner research distinguishes between change methodologies and change strategy.

While change methodologies provide the steps and activities used to execute change for individual initiatives, a change strategy establishes how finite change management resources should be allocated across AI initiatives to achieve broader supply chain and enterprise objectives.

CSCOs should establish an AI change strategy that aligns change investments with business outcomes and protects AI investments from fragmented adoption.

Rightsized Change Management to Double ROI

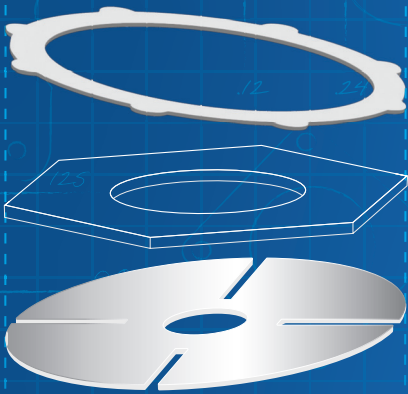
As AI initiatives continue to multiply, CSCOs must move beyond fixed, one-size-fits-all approaches and deliberately align change investments to the outcomes they are trying to achieve. Gartner predicts that by 2030, organizations that rightsize their change management efforts in this way will achieve twice the ROI on AI initiatives compared with those that continue to rely on legacy methodologies. According to Gartner research, CSCOs seeking to improve their organizations’ AI outcomes should:

- **Establish a Formal AI Change Strategy:** Institutionalize AI change management as a distinct strategic discipline that supports the organization’s AI technology strategy and creates a foundation for intentional, outcome-driven execution.
- **Prioritize and Allocate Change Resources Strategically:** Treat change management capacity as a scarce resource and concentrate investment on high-value AI initiatives with the greatest potential to drive supply chain outcomes and ROI.
- **Adopt a Composable Approach to Change Execution:** Define different change approaches based on the scale, speed and organizational context of each initiative, rather than relying on a single standardized methodology.
- **Build AI Change Leadership Capabilities:** Develop leaders with business acumen, workforce development expertise and risk management capabilities so they can effectively guide AI-enabled transformation. **MH&L**

ALL WE NEED ARE
YOUR SPECS

WE'LL DO OUR PART.

STAMPINGS, WASHERS, SPACERS & SHIMS
MADE TO ORDER SINCE 1919





SUBMIT YOUR PART SPECS &
GET A FAST QUOTE
SCAN OR EMAIL: SALES@BOKERS.COM

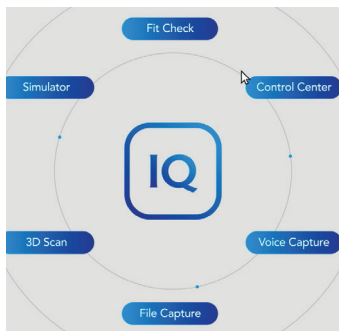


STAMPING & WASHER SPECIALISTS SINCE 1919

(800)-WASHERS | bokers.com







AI Platform Streamlines Workcell Design

Designed to unify fragmented automation project data, **Robotiq's IQ** is an AI-enabled platform that converts customer requirements, site scans, and legacy files into validated robotic workcell designs. Captured 3D scans become digital twins, matched against cycle times using standardized engineering rules to validate performance before deployment. Available now for robotic palletizing, with more applications planned.

Robotiq

More online: newequipment.com/55390582

FROM THE COVER



High-Output, Long-Lasting Flashlights

The **LEO 10000 FLEX** and **LEO 12000 FLEX** are high-output rechargeable flashlights built from anodized aircraft-grade aluminum. Both models feature 5 lighting modes—Turbo, High, Medium, Low, and Strobe—along with Flex-Power technology. The LEO 10000 FLEX produces up to 10,000 lm with up to 8 h of rechargeable battery life and includes a 3x zoom. The LEO 12000 FLEX produces up to 12,000 lm with up to 6 h of rechargeable battery life and includes a 2x zoom.

NEBO

More online: newequipment.com/55373616

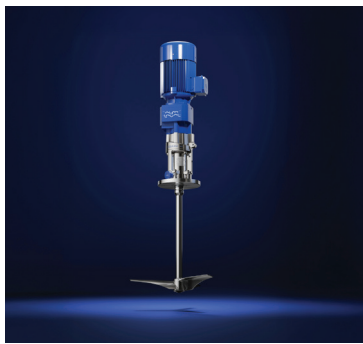
AMR Forklift Skips Fixed Markers

Designed to eliminate floor markers and reflectors, the **Flexley Stack F712** is an autonomous forklift using Visual SLAM for markerless navigation with ± 0.4 in (± 10 mm) accuracy. It handles loads up to 4,409 lb (2,000 kg) to 27.9 ft (8.5 m) heights at up to 3.8 mph (1.7 m/s). VDA5050-compatible integration with AMR Studio cuts commissioning time by up to 20%.

ABB



More online: newequipment.com/55389648



Agitator Line Simplifies Maintenance

Designed for hygienic processing across food, dairy, beverage, and pharma applications, the **EnSaLine agitator platform** pairs energy-saving EnSaFoil impellers with a flushable design and Clariot VX sensors for predictive maintenance. All seals and bearings sit in one replaceable cartridge, letting one technician complete maintenance in under 30 min without entering the tank. Available in S and B configurations.

Alfa Laval

More online: newequipment.com/55371249

Borescope Probe Reaches Micro Gaps

The **VOYAGER M40 Industrial Video Borescope** provides probe diameters spanning 0.037 to 0.236 in (0.95 to 6 mm) for inspecting micro motors, capillary tubes, and compact aerospace components. A tool-free aluminum alloy connector swaps probes quickly, while a 5 in (12.7 cm) HD touchscreen with 4x zoom and 0° to 270° rotation reveals cracks, weld defects, and wear without disassembly.

Fiberscope



More online: newequipment.com/55393004



Bin-Picking Cell Self-Configures On-Site

Built to eliminate custom engineering for bin picking, **VuePod** is a self-contained, self-configuring cell that plans picking strategy, reorientation, and path planning independently. Running Vue software on 4D Vision, it ships pre-tested, reducing setup to power/network connection, self-calibration, and part-placement teaching. The launch model handles small-to-medium ferrous parts via a magnetic gripper, with wider part support planned.

Apera AI

More online: newequipment.com/55389922



Digital Sensor Eases Commissioning

Featuring a digital Modbus interface and M12 quick-connect cabling, the **Rosemount 350A High Performance pH/ORP Sensor** simplifies commissioning in harsh, high-temperature and high-pressure process conditions. Onboard calibration and diagnostic storage help maintenance teams troubleshoot faster, while titanium body options and selectable reference electrolytes support demanding process chemistries and improve sensor life.

Emerson Electric Co.

More online: newequipment.com/55396346

Crimper Redesign Eases Operator Strain

Built on a 12-ton platform, the **EK1240SLX Crimper** delivers 24,000 lb (106.8 kN) of force for connectors up to 750 kcmil (380 mm²), weighing 10% less and lasting 35% longer than its predecessor. A redesigned C-head improves balance, while Automatic Retraction Stop and Intelli-CRIMP force monitoring speed cycles and flag out-of-spec crimps with visual and audible alerts.

Greenlee



More online: newequipment.com/55390967



DC Meter Tracks High-Power Charging

Designed for high-power battery storage, DC distribution, and EV charging systems, the **DCM2 DC energy meter** measures voltage and current up to 1,500V DC and 1,500 A DC, supporting loads up to 2.25 MW with 0.0001 kWh resolution and ≤200 ms refresh. Modbus RTU/TCP interfaces and alarms for overtemperature, overcurrent, and overvoltage support real-time monitoring and safe operation.

Carlo Gavazzi

More online: newequipment.com/55391827



Green Cleaner Skips Harsh Chemicals

Providing professional-strength cleaning without compromise, the **EvoGreen All-Purpose Cleaner & Degreaser** cuts through grease, grime, and everyday soils on virtually any washable surface. Free of harsh chemicals, phosphates, PFAS, and VOCs beyond fragrance, the biodegradable formula can be used full strength or diluted, requiring less product per use while reducing packaging and refill frequency over time.

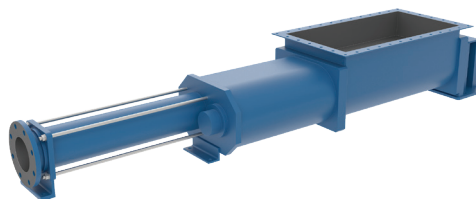
Hospeco Brands Group

More online: newequipment.com/55398774

Hopper Pump Handles Dry Solids

Handling highly viscous, abrasive, and solids-laden materials, the **ALLWEILER AE-RG Hopper Pump Series** transfers substances with up to 45% dry solids using intermeshing augers that prevent bridging and clogging at the inlet hopper. Capacities reach 148 GPM (560 L/min) with pressure ratings up to 348 psi (24 bar), supporting dry sludge, biogas, and wastewater applications.

CIRCOR International, Inc.



More online: newequipment.com/55396849



Digital Data Meets Density Monitoring

Providing a scalable path from mechanical switching to continuous digital monitoring, the **87x9 platform** targets SF₆ and alternative insulation gas mixtures in gas-insulated equipment. A sealed reference chamber enables mechanical temperature compensation, while hybrid variants add continuous density measurement for leak detection, trend analysis, and documentation. Switching accuracy reaches ±1.45 psi (10 kPa) at 68°F (20°C), with spans up to 36.3 psi (250 kPa).

Trafag, Inc.

More online: newequipment.com/55396328



On-Demand Pouch Machine for Med Lines

Handling pouch sizes from 2 x 2 in (51 x 51 mm) up to 6 x 10 in (152 x 254 mm), the **Securus VS 610** vertical pouch making machine produces sealed pouches on demand from rollstock materials, including Tyvek, poly films, and foils. Tool-less changeovers take

under a minute, and built-in validation outputs confirm package integrity for medical device and healthcare packaging applications.

AZCO Corp.

More online: newequipment.com/55378320

FROM THE COVER



Integrated AI Forklift Platform

Integrating operator support, safety, systems, automation controls, and warehouse software connectivity into forklifts, the **NobleOne AI forklift platform** turns forklifts into connected systems, improving operator consistency and productivity with real-time insights, skills-development tools, advanced driver assistance systems (ADAS), automation controls, and performance monitoring. The open platform allows for integration directly at the point of use.

Noblelift North America

More online: newequipment.com/55370951

PCD Inserts Boost Turning Accuracy

Featuring lasered chip-breaking geometries and a fully ground circumference in G tolerance, **WL25 PCD indexable inserts** deliver stable, low-vibration profiling and copy turning for aluminum, plastics, and titanium for the W1011 and W1211 copy turning systems. Four insert geometries support finishing to fine finishing and interrupted cuts, with feed rates from 0.001 to 0.015 in/rev (0.03 to 0.38 mm/rev) and depth of cut to 0.118 in (3.0 mm).

Walter USA, LLC

More online: newequipment.com/55392225



Lithium Forklift Adds AI Safety

Featuring a 96V/920 Ah LiFePO₄ battery, the **FE4P220N Heavy-Duty Lithium Forklift** delivers 22,000 lb (9,980 kg) capacity with full charges in as little as 2 to 2.5 h, enabling multishift operation without swaps. A Curtis CAN bus system manages dual AC motors and hydraulics, while AI-powered cameras detect pedestrians and automatically stop the truck when someone enters its safety zone.

Noblelift North America

More online: newequipment.com/55391845

Worn, Slippery or Damaged Stairs? Renovate with **STAIRMASTER®** Anti-Slip Stair Treads



**#1 in stair
safety for
over
100 years!**

LOW COST RENOVATION

EXCELLENT ANTI-SLIP PROTECTION

**WITHSTANDS HEAVY TRAFFIC • FOR INDOOR OR OUTDOOR USE
QUICK AND EASY INSTALLATION ON ANY EXISTING STAIR**

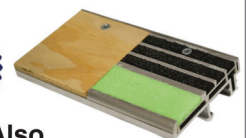
Specify Wooster

"Make Every Step a Safe One"

800-321-4936

Sales@wooster-products.com

www.woosterproducts.com



Also
available in
NITEGLOW®



PoE++ Switch Delivers 100W Per Port

Handling high-wattage PoE++ demands in solar-powered deployments, the **LMP-1204G-SFP-bt-24-T** is a 12-port Gigabit managed Ethernet switch with a V6.2 firmware update enabling up to 100 W per port at 24V DC input within a 180 W total PoE budget. The DIN-rail or shelf-mountable switch includes four IEEE 802.3bt ports, four IEEE 802.3af/ at ports, and 4 dual-rate SFP slots, operating from -40° to 167°F (-40° to 75°C).

Antaira Technologies, LLC

More online: newequipment.com/55378302

Portable Compressor Runs 9 Hours Straight

Handling underground utilities, sand-blasting, and general construction, the **MOBILAIR M76** portable compressor delivers flows up to 270 cfm across two variable pressure ranges—100 to 150 psig and 145 to 200 psig—adjustable in 1 psi increments via the Sigma Control Smart controller. A 4-cylinder Kubota Tier 4 Final diesel engine pairs with a 34-gal (129 L) fuel tank for up to 9 hours of continuous operation per fill.

Kaeser Compressors, Inc.

More online: newequipment.com/55378331



PC-PRO:
Advanced technology for high-end applications



Propel Software for Hydrostatic Transmissions

Designed for off-highway machinery with hydrostatic drives, **PC-PRO** is a single-path propel software solution delivering precise speed and torque control. All-range ECO mode reduces engine speed and fuel consumption while maintaining vehicle speed. Smart calibration routines compensate for

product variances, enabling consistent fleet performance and eliminating assembly line adjustments to reduce commissioning time.

Danfoss

More online: newequipment.com/55377254

Low Maintenance Plant Solutions



"Workhorse" Collector

- For dusts, particulate
- Low water and utility use
- No "wear" parts



Gas Scrubbers

- For fumes, gases, odors, particulate

High-strength Tanks

- Every shape, capacity
- 4 engineered plastics
- Exceptional stress resistance



There is only **one...**

Tri-Mer
CORPORATION

(989) 723-7838

Salesdpt@tri-mer.com

MADE IN THE USA



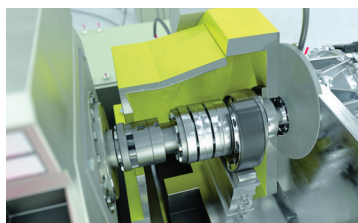
Platform Lets Teams Preview Automation

Designed to align teams before capital commitment, **RealitySync** is an immersive collaboration platform placing people, project data, and physical automation systems into one shared environment. Running on Apple Vision Pro and guided by automation experts, it lets engineering, operations, finance, and leadership walk through production lines together, spotting issues and building shared understanding before deployment.

Eclipse Automation, Inc.

More online: newequipment.com/55388995

FROM THE COVER



Lightweight Coupling Spins Up to 32,000 RPM

Engineered for e-mobility and high-speed automotive test stands, the **ROBA-DS Type 9120** aluminum disk pack coupling reduces mass and mass moment of inertia to 40 to 60% of its steel counterpart, with outside diameter reduced by up to 0.39 in (10 mm). Rated to 32,000 rpm with G 2.5 balance quality, it pairs with the ROBA guidestop, linear-stop, and ROBA-stop M safety brakes, plus the ROBA brake-checker module for sensorless condition monitoring and predictive maintenance.

Mayr Corporation

More online: newequipment.com/55378238

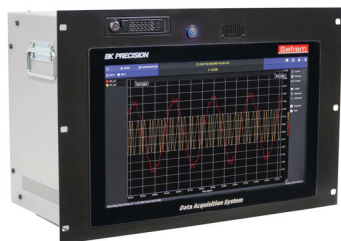


Resin Powder for 3D Printing and Sintering

Durast Powder converts high-performance resins, including LCP, PPS, PBT, and POM, into fine powders for use in 3D printing and powder sintering. Particle sizes range from 1 to 100 μm for LCP and 20 to 100 μm for PBT and POM. Powders are available in spherical or fibrous forms.

Daicel HPP USA, Inc.

More online: newequipment.com/55375955



Rackmount DAQ Scales to 80 Analog Channels

Providing up to 80 analog channels and 16 digital inputs across 10 plug-and-play module slots, the **DAS1800-R** is a 19 in rack-mountable data acquisition system built for ATE environments. Sampling rates reach 1 MSa/s per channel on up to 40 channels, with signal measurement up to $\pm 1,500\text{V DC}$ or 1,000 Vrms. A front-accessible, lockable 1 TB SSD supports data sanitization

protocols for aerospace and defense applications.

B&K Precision Corporation

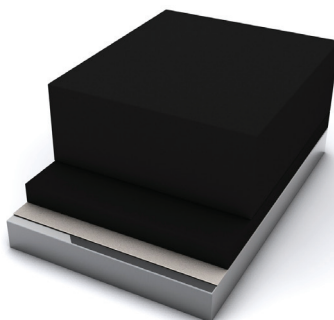
More online: newequipment.com/55378219

Roll Cover Cuts Wear, Boosts Grip

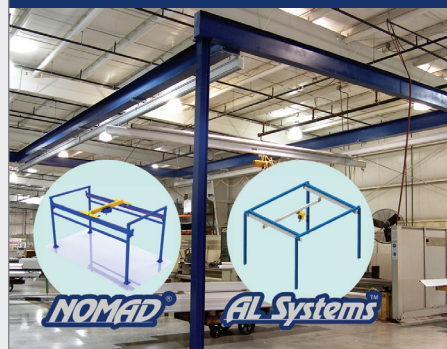
Designed for the wet end of paper and board machines, **MegaDrive** is a rubber wire drive-roll cover engineered to improve traction and reduce wear in the forming section. Its flexible compound resists hardening and surface cracking under high loads, variable speeds, and fluctuating temperatures, delivering up to 30% lower abrasion than standard covers while cutting maintenance effort and downtime risk.

Voith US, Inc.

More online: newequipment.com/55391599



YOUR WORKSTATION CRANE SOLUTION SOURCE



WIDE RANGE CAPACITIES FROM 25 LBS TO 20 TONS

Looking for a workstation crane for light loads? Heavy loads? Or something in the middle?

AL Systems™ Aluminum Rail Workstation Cranes are surface treated, anodized, and ideal for clean rooms, or any application up to 2,200 lbs.

For heavier loads, ask about **NOMAD®** Freestanding Cranes— easily assembled, disassembled and reassembled, with capabilities up to 20 tons and 50 foot widths. For wider widths up to 60 feet, ask about **NOMAD XW**.



Call: (330) 220-8600
info@emhcranes.com
www.emhcranes.com



Ask About Custom System Capability
Proudly Made in the USA

E·M·H®
Engineered Material Handling



Rotary Vane Vacuum Pumps Ease Maintenance

Engineered for lab and industrial vacuum systems, the **ShieldDrive i Series Rotary Vane Vacuum Pumps** use magnetic coupling to eliminate oil migration and ensure leak-free operation. A Quick-Change Oil Mist Filter and detachable oil reservoir speed servicing, while Eco Mode variable-frequency operation, anti-suck-back protection, and corrosion-resistant construction improve efficiency. Available in SD4i, SD8i, SD12i, and SD16i configurations.

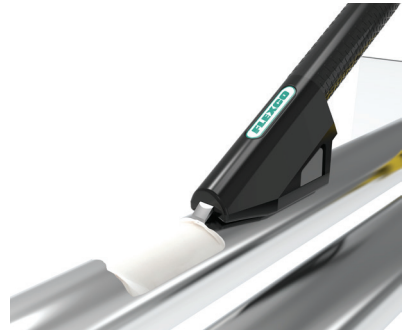
NAVAC

More online: newequipment.com/55390952

Scraper Tool Clears Roller Buildup

Designed for roller conveyor maintenance, the **Roller Conveyor Scraper Tool (RCST)** removes sticker and adhesive buildup that slows or stops rollers, disrupting throughput. Its contoured blade fits 1.9 in (48 mm) diameter rollers, flexing up to 2 in (51 mm) nominal, clearing more buildup per pass than flat scrapers. Replaceable blades extend tool life and reduce downtime.

Flexco



More online: newequipment.com/55392254



Sealing System Frees Cabinet Space

Providing a lightweight, remote sealing head separate from its control module and touch-screen, the **PW4214 heat-sealing system** frees up workspace in confined, controlled environments that need reliable, flexible package sealing. Film capacity reaches 13 in (33 cm), with configurable security, 21 CFR Part 11 data-logging support, and a quick-detachable stainless-steel cover with a safety interlock for easy maintenance.

PackworldUSA

More online: newequipment.com/55393178

MADE IN THE USA

ENM
Counting Instruments



Self Powered LCD Counter/Timer L3/L4 Series

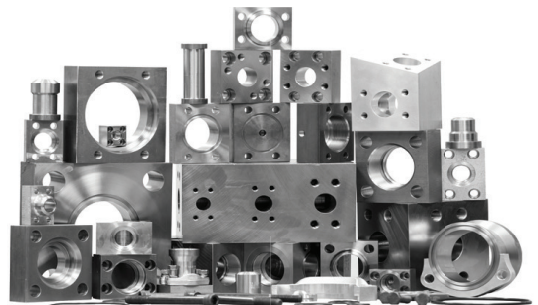


www.enmco.com

TOLL FREE: **888-372-0465**

customerservice@enmco.com

Don't Compromise! Use MAIN



Choose the company that is:

- **Dependable** – 60+ years of service to the industry.
- **Informed** – Active on the SAE, NFPA, and ISO tech committees.
- **Quick** – Thousands of SAE J518/ISO 6162, ISO 6164, & JIS flanges stocked. Specials in less than a week.

Call **MAIN** – your source for hydraulic flanges and components. Get the flanges you want NOW!

MAIN Manufacturing Products, Inc.

Grand Blanc, MI 48439
800.521.7918 810.953.1380
info@MainMfg.com

A North American
Manufacturer



**Single Drive Powers
Two Synchronous
Conveyor Movements**

Combining a 1 in (32 mm) BX4 brushless motor with dual GPT metal planetary gearheads at each motor end, the **DualGear** drive system delivers two synchronous movements from one unit

for conveyor belt and autonomous logistics applications. Available in 2 in (42 mm) and 3 in (68 mm) motor lengths with up to 3 gearhead stages, it uses sine/cosine Hall sensors for precise positioning and features all-welded construction for long-term durability.

FAULHABER MICROMO, LLC

More online: [newequipment.com/55378237](https://www.newequipment.com/55378237)

Sees Inside Every Nut Shell

Designed for in-shell nut processing, the **Multiscan MXV-Bulk** X-ray inspection system analyzes internal density to catch hidden defects, insufficient kernel fill, and dense foreign material like stones and metal that optical sorting can't detect. Nuts pass through on a stabilizing belt, and out-of-tolerance product is automatically ejected via air valves, supporting higher grades with less manual inspection.

WECO



More online: [newequipment.com/55396657](https://www.newequipment.com/55396657)



**Single-Use Bioreactor
Advances Cell Therapy Mfg.**

Designed for cell expansion from process development through early clinical production, the **Gibco CTS DynaXS Single Use Bioreactor** is a stirred-tank, single-use system supporting cGMP-ready manufacturing across a broad operating range and multiple cell types. Integrated within Thermo Fisher's CTS portfolio, it connects cell isolation, activation, expansion, and downstream processing workflows with unified technical support and regulatory documentation for oncology, autoimmune, and other cell therapy applications.

Thermo Fisher Scientific

More online: [newequipment.com/55378227](https://www.newequipment.com/55378227)

LABEL
HOLDER

GRIPPERS

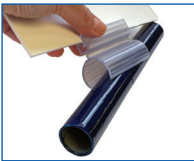
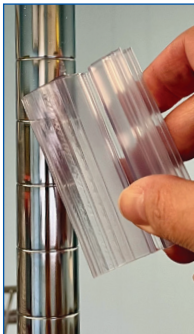
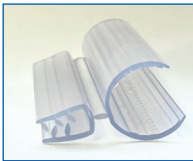


AIGNER LABEL HOLDER



FOR WIRE SHELVING

EZ•Post™ Gripper

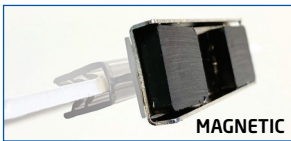


- ✓ Mount Gripper Horizontally or Vertically
- ✓ View Signage at Any Angle
- ✓ Total Flexibility



FOR PALLETS & RACKING

Slip•N•Stik™ Aisle Sign Holder

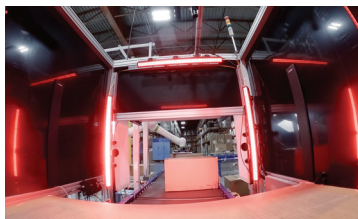


**HIGH CAPACITY GRIP HOLDS
SIGNAGE UP TO 1/8" THICK**

EASY TO USE | VERSATILE SOLUTIONS

www.aignerlabelholder.com

FROM THE COVER



AI Platform Unifies Warehouse and Floor Data

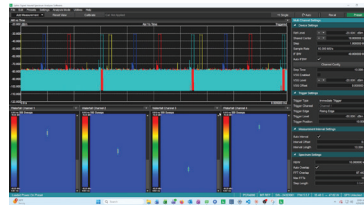
Peak Automation Intelligence is an AI-powered platform delivering real-time visibility across material movement, dock workflows, and production flow without adding labor or slowing operations. The platform is built on machine vision, smart optics, mobile computing, and unified analytics, and delivers an automated end-to-end view of every pallet, package, material movement, and dock workflow. At the center of the platform is Peak Analytics, which consolidates data from docks, forklifts, pallets, and conveyors into a unified dashboard.

Peak Technologies, Inc.

More online: newequipment.com/55377928

Spike Software Gains 4-Channel I/Q Analysis

Available at no additional cost via **Spike software** version 4.0.13, multichannel phase-coherent I/Q analysis delivers synchronized time and spectrum analysis across up to four channels, with up to 40 MHz of bandwidth per unified plot. Compatible with the PCR4200 multichannel receiver, the update supports amplitude, phase offset, and phase delay calibration across the full signal chain, with time-synchronized markers enabling precise channel-to-channel delta measurements across multiple plot types.



Signal Hound

More online: newequipment.com/55378229

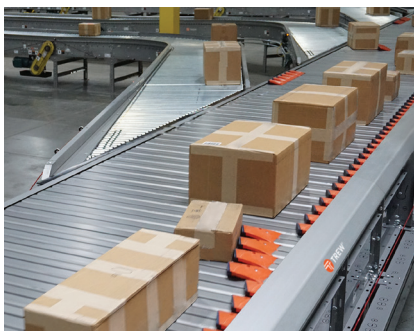


Tool-Free Cam Screws Speed Up Workpiece Changes

With a 360-degree adjustable clamping lever requiring no torque wrench or Allen key, **cam screws with clamping lever** secure workpieces in seconds for assembly, laser, and milling applications with frequent changeovers. Available with a brass hexagon clamping nut or clamping washer, thread sizes range from M6 to M16 with clamping forces between 1.2 and 2.8 kN.

norelem, Inc.

More online: newequipment.com/55377817



Sorter Gets Smoother, More Accurate Divert Control

TrewTouch is a handling approach for the **TrewSort sliding shoe sorter** that improves sorting accuracy and control through smooth, controlled acceleration during diverts, reducing product impact and mis-diverts across cartons, polybags, parcels, and bags. Supports speeds up to 750 ft/min (229 m/min) and sorter lengths up to 800 ft (244 m).

Trew, LLC

More online: newequipment.com/21285259



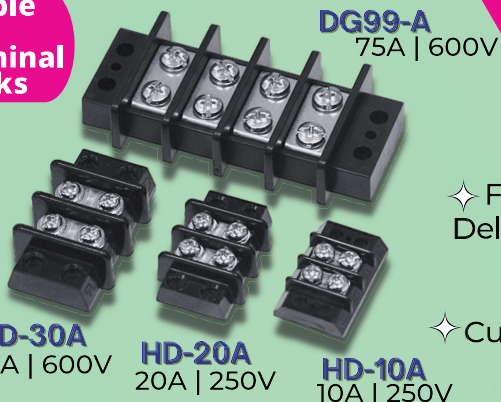
Wi-Fi 6 APs Extend Site Range

Built for demanding industrial environments, the **AIROLINX-6-MAX-DR-T** and **AIROLINX-6-DR-T** are Wi-Fi 6 access point/routers delivering reliable 802.11ax connectivity for surveillance, SCADA, and vehicle-to-infrastructure links. Both cover up to 0.4 mi (0.64 km) with included external antennas and support dish, sector, horn, and panel antennas, with the MAX model adding dual-radio operation for extended deployments.

Antaira Technologies, LLC

More online: newequipment.com/55389005

Double Row Terminal Blocks



DG99-A
75A | 600V

HD-30A
40A | 600V

HD-20A
20A | 250V

HD-10A
10A | 250V

Fast Delivery

Customizable

BLOCK MASTER BLOCKS
World-Class Terminal Blocks

Sales@BlockMaster.com
P: 800-595-8881
BlockMaster.com



BENKO PRODUCTS

ENGINEERED TO BE MORE

Benko Products, Inc. has been manufacturing a complete line of industrial ovens for over 30 years. Ovens offered include: batch, drum & tote warming, cabinet, walk-in, truck-in, powder coating, conveyor, preheat, curing, drying and more. Electric, steam, natural gas. Room temp to 500 degrees F.

Sahara Hot Box



Benko Products

(440) 934-2180

email: info@benkoproducts.com

www.benkoproducts.com

OVENS AND FURNACES BY BENKO PRODUCTS, INC.

Benko Products designs and manufactures a robust line of Ovens and Furnaces for a variety of applications. Standard and custom models available. Burn Off, Batch, Curing, Drying, Conveyor and Drum Ovens. Furnaces up to 2300F.

Furnaces

Burn-off Ovens

Industrial Ovens



BENKO PRODUCTS
ENGINEERED TO BE MORE

Benko Products

(440) 934-2180

email: info@benkoproducts.com

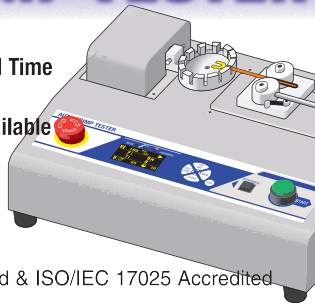
www.benkoproducts.com

AUTOMATIC WIRE CRIMP TESTER

- Destructive/Non-Destructive
- Program Force, Speed and Hold Time
- Save up to 26 Custom Setups
- Quick Change Attachments Available

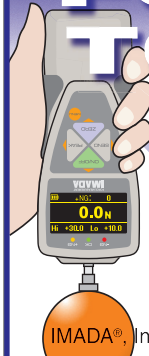
800-373-9989

www.imada.com



IMADA®, Inc. ISO9001 Registered & ISO/IEC 17025 Accredited

FORCE & TORQUE



- Mechanical & digital force gauges
- Manual & motorized test stands
- Torque screwdrivers & wrenches
- Torque calibrators & testers
- Data acquisition

800-373-9989

www.imada.com



IMADA®, Inc. ISO9001 Registered & ISO/IEC 17025 Accredited

Auto Durometer

Highly visible OLED displays and simple one button operation enable quick, consistent hardness testing.

- Highly visible OLED displays
- For Shore Scales A, B, C, D, DO, E, O, OO, and Asker C
- Peak, timer hold, and real time modes
- Auto average a series of readings.
- ISO 17025 calibration certificate traceable to NIST
- Digital & analog durometers available



800-373-9989 imada.com

MAIN MFG - your source for hydraulic flanges and components



MAIN's Quick Reference Guide contains many standard generic drawings that helps define your special flange/adaptor needs.

Your conversations are quicker and clearer with MAIN Manufacturing's Quick Reference Guide and that "special" may be stocked at MAIN.

Many specials are part of MAIN's 7000+ inventory. If not, MAIN has the expertise, raw material, and quick turn-around time to help you get the right hydraulic flange/adaptor quickly.

Go to: Mainmanufacturing.com/quick

STRUCTURAL ADHESIVES for Metal Bonding

- ✓ High strength bonding
- ✓ Convenient cure schedules
- ✓ Similar & dissimilar substrates



ADHESIVES | SEALANTS | COATINGS

(201) 343-8983 • main@masterbond.com • www.masterbond.com

INTRINSICALLY SAFE ULTRASONIC SENSORS

Non-Contact Distance Measurement for Oil, Gas, Mining and other Hazardous Locations/Explosive Atmospheres

Measure from 1 in. to 18 ft.

Standard Ultrasonic Sensors and Intrinsically Safe Models

Contact Us

www.migatron.com

info@migatron.com

+1-815-338-5800



IECEX

ANEX

Ex

Migatron is ISO9001 CERTIFIED

PRODUCT GUIDE

Your complete source of products, equipment, and services shown in this issue.
Need information from this issue in a hurry? Inquire online at www.nedinfo.com

3D PRINTING

3D Printing Materials	
Powders	45
Modeling & Software	
3D Scanners	6

ADHESIVES & FASTENING

Adhesives/Sealants/Lubricants	
Adhesives	49
Lubricants	5
Assembly/Fastening	
Clamps	48
Shims	40
Spacers	40
Tape	23
Washers	40

AUTOMATION

Automation Systems	
Assembly Systems	43, 48
Automation Cells	41
Automation Controls	9
Material Handling	41, 48
Software	43

Robots

Mobile	41
Vision Systems	9

Sensors

Alarms	IFC
Sensors	42, 49
Ultrasonic Sensors	49

CONTROLS & INSTRUMENTATION

Analyzers	42, 48
Calibration Equipment	49
Cameras & Vision Systems	8, 41, 48
Counters	46
Data Acquisition	45, 49
Gauges	49
Inspection Equipment	6, 14, 41, 47
Borescope	41
Thermal Imaging	14
Laboratory Equipment	8, 46, 47, 49
Analytical Instrumentation	49
Metrology & Test Equipment	8
Other Laboratory Equipment	46, 47
Measurement Equipment	8, 13, 42, 48, 49
Electrical	48
Flow/Pressure/Level	42
Force	49
Optical & Acoustic	8
Position/Speed/Accuracy	49
Temperature & Humidity	13
Meters	42
Monitors	13, 42
Quality Control	6
Switches	42
Test Equipment	48, 49
Thermometers	13
Timers	46

ELECTRICAL & ELECTRONICS

Electrical	
Battery Chargers	6
Cable Management	15
Electrical/Power Distribution	48
Energy Management	38-39, 42
Fasteners & Contacts	48
Meters	42
Reels	15
Switches	26-28
Wiring	48
Electronics	
Speakers	IFC
Switches	26-28, 44

FACILITY/OPERATIONS

Facility Maintenance	
Air Handling & Cleaning	44
Cleaning & Maintenance	42, 46
Construction Equipment	16, 44
Dock Equipment	48
Mezzanines	BC
Sanitary Supplies	42
HVAC	
Dust Collection	44
Furnaces	49
Lighting	
Flashlights	41

HYDRAULICS & PNEUMATICS

Compressors	44
Fittings	46, 49
Flanges	46, 49
Fluids	5
Nozzles	25
Pumps	12, 42, 46

MACHINE TOOLS & METALWORKING

Machine Tools & Equipment	
CNC	8, 9
3-Axis	8
5-Axis	8
Milling	8
Turning	8
Cutting Tools	43
Drills	15
Grinding Equipment	8, 9
Metal Cutting	6, 8, 9, 27
Toolholders & Workholders	9
Metalworking	
Forming Equipment	16
Welding Equipment	16

MATERIAL HANDLING & PACKAGING

Barcode & Labeling	
Camera & Vision Systems	48
Marking & Printing	16
Conveyors	
Conveyor Components	46
Flow	28
Gravity	28
Pneumatic	16
Roller	46
Lift Trucks	
Forklifts	30-31, 33, 41, 43
Riders	33
Scissor Lifts	IBC
Lifting/Positioning Equipment	
Cranes	45, IBC
Dumpers	37
Hoppers	37
Inverters & Upenders	IBC
Lift Tables	IBC, 35
Monorails	6
Service Lifts	35, BC
Packaging	
Bagging	43
Case Sealers	46
Filling	23
Labeling	23
Shipping	23
Wrapping	23
Sorters	
Sliding Shoe	48
Storage	
Automated Storage/Retrieval Systems (AS/RS)	6
Bins & Baskets	41
Picking Equipment	41
Rack Protection	39
Racks	39
Shelving	39
Storage Labeling & Organization	47
MATERIALS & CHEMICALS	
Fluids	
Oils	5
Other Materials & Chemicals	
Biodegradable Materials	42
MOTION CONTROL	
Couplings	45
Drive Components	45
Motors	47
Gear Motors	47
Power Transmission	45
PROCESS EQUIPMENT	
Agitators	41
Air Compressors	18-21, 25, 44
Air Nozzles & Guns	25
Alarms	IFC
Cooling Equipment	25
Food & Beverage	6, 47
Heating Equipment	49
Hose & Tubing	15
Mixing Equipment	41
Pipes & Fittings	13
Pressure & Temp Indicators	13
Process Equipment	6, 41
Process Tanks	44
Pumps	12, 46
Spraying Equipment	7

SAFETY

Electrical	
Wiring Devices	49
Environmental Management	
Air Filtration	44
Hazardous Material Storage	6
Pollution Control	44
Fall Protection	
Tread & Walkway Products	43
Fire Protection	
Detectors & Alarms	IFC
Hose & Accessories	15
Machine & Tool	
Alarms	IFC
Presence Sensing	33
Warning Devices	IFC, 33
Security	
Alarms	IFC
Signs & Warning Devices	
Speakers	IFC

SOFTWARE & COMPUTERS

Computer Peripherals & Accessories	
Access Points	48
Software	
Accounting & Financial	13
Artificial Intelligence	22-25, 40, 41
CAD & CAM	9
Enterprise Resource Planning (ERP)	13
Equipment Management	14, 16
Industrial & Engineering	44
Industrial Controls	44
Inventory Management	13
Maintenance	14, 16
Manufacturing Execution System (MES)	9, 13, 16
Quality Assurance/Testing/Compliance	9, 22-25
Simulation	44
Supply Chain Management (SCM)	13, 36-37

TOOLS

Cutting Tools	
Saws	27
Hand Tools	
Crimpers	42, 49
Screwdrivers	49
Wrenches	49
Power Tools	
Crimpers	42

AD INDEX

Advance Lifts, Incorporated	C4	Crown Equipment Corporation	33	Migatron Corp.	49
Aigner Label Holder Corp.	47	EMH Incorporated	45	Mohawk Lifts (LiftPoint USA)	35
Air Technical Industries	C3	ENM Company	46	Pat Mooney Saws	27
Arnold Machinery*	18A-18B	Floyd Bell Inc.	C2	Ridg-U-Rak	39
Benko Products Inc.	49	IMADA	49	Spraying Systems	7
Boker's Inc.	40	Jesco Industries Inc.	37	Transducers USA	48
Compressed Air Challenge	21	Lubriplate Lubricants Company	5	Tri-Mer Corporation	44
COXREELS	15	MAIN Manufacturing Products	46, 49	Uline	23
Creform Corporation	28	Master Bond Inc.	49	Vortec (ITW Air Management)	25
				Wooster Products Inc.	43

Every effort is made to ensure the accuracy of this index. However, the publisher cannot be held responsible for errors or omissions.
*Indicates ad is a regional ad.

SOLUTIONS FOR YOUR LIFTING AND HANDLING CHALLENGES

www.airtechnical.com

Engineered, heavy-duty material handling equipment designed to lift, position, rotate, and move heavy loads safely and efficiently. Purpose-built for demanding industrial environments.

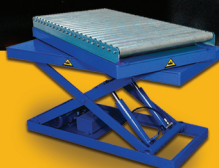
Why Customers Choose ATI

- 60+ years of industrial material handling expertise
- Engineered-to-order solutions, not catalog compromises
- Built for safety, reliability, and long-term lifecycle value
- Designed and manufactured in the United States



ZERO-LOW LIFT TABLE

Capacities from 500 to 50,000 pounds,
Deck sizes
up to 72" x 192"
Lift from ground level
up to 96" high



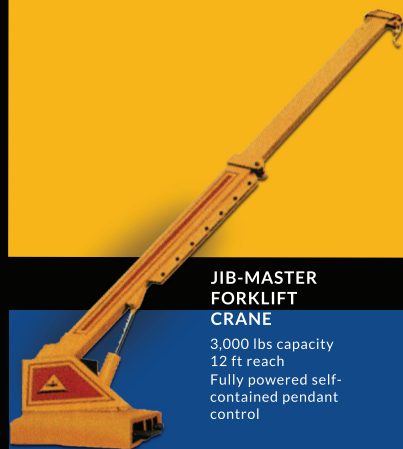
LIFT TABLES

Hydraulic & Mechanical
operation available
250 to 50,000 pounds



REVERSIBLE BOOM CRANE (RBC)

Reach above, over, and beyond!
Available powered telescopic
boom, powered mast rotation,
and cable winch
1,000 to 20,000 lbs capacity
14 ft height, 7 ft reach



JIB-MASTER FORKLIFT CRANE

3,000 lbs capacity
12 ft reach
Fully powered self-
contained pendant
control

HUSKY-MASTER FLOOR CRANE

Up to 6,000 lbs 12 ft height
Power lift, power boom,
winch options available



ZERO-LOW DOCK LIFT

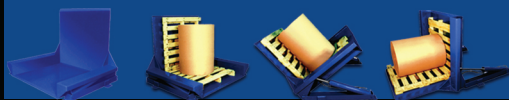
Instant loading dock!



ZERO - LOW UPENDER

Up to 6,000 pounds
Smooth 90° upending

Ground level
loading & un-loading.



PORTABLE JIB CRANE

500 to 2000 pounds
Up to 12 ft span
No installation required!



UPENDER INVERTER

Clamps and holds
securely from 250
to 50,000 pounds
capacity, smoothly and
effortlessly rolls over 180°



SHOP ONLINE



**AIR TECHNICAL
INDUSTRIES**
MANUFACTURING - INNOVATIVE
LIFTING SOLUTIONS
SINCE 1964



www.airtechnical.com

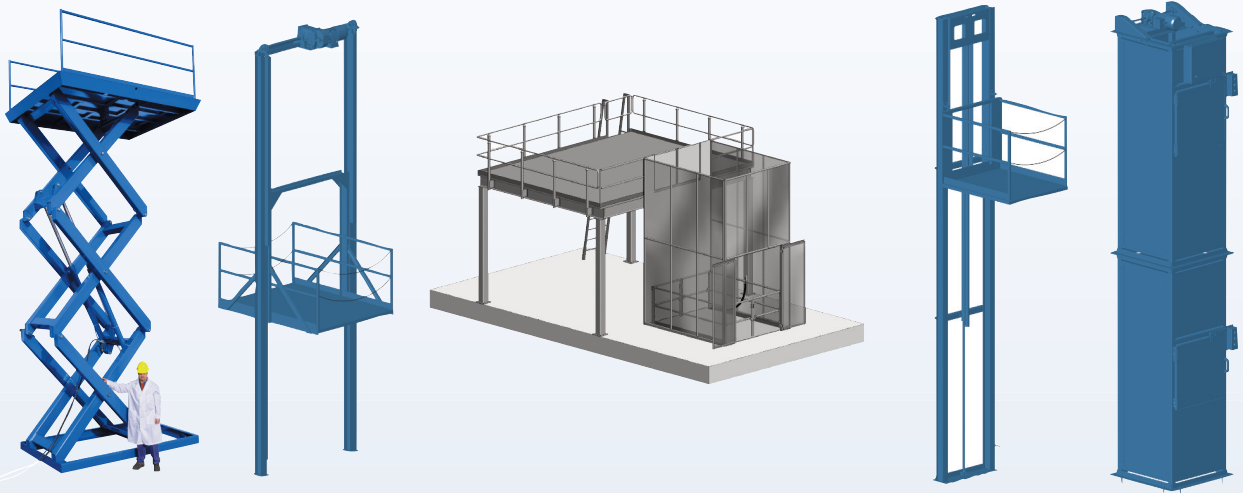
7501 Clover Ave, Mentor, OH 44060

call toll-free: 888-857-6263



ADVANCE LIFTS®

MEZZANINE ACCESS LIFTS



- ▶ Rider Scissors Lifts compliant with MH29.1:2014 as cited by the 2015 International Building Code
- ▶ Non-Rider Scissors Lifts compliant with MH29.1:2014 as cited by the 2015 International Building Code
- ▶ VRC's (vertical reciprocating conveyors) compliant with ASME B20.1 & The Application Guidelines for Vertical Reciprocating Conveyors
- ▶ Package Lifts which are free-standing, smaller & faster VRC's

**WE OFFER A FULL ARRAY OF CHOICES
FOR EFFICIENTLY SERVICING MEZZANINES**



ISO 9001:2015
Certified



WHITE PAPER, TWO (2) VIDEOS

AVAILABLE AT advancemezzaninelifts.com



1-800-843-3625