

# NED<sup>TM</sup>

## New Equipment Digest<sup>®</sup>

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### SPECIAL SECTION SAFETY



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# BREATHING EASIER

*How Cummins Filtration transitioned its high-performance engine filter media to supply the critical PPE needed to help combat the COVID-19 crisis.*

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### On-Demand Access

The REFLEKT ONE operating system for enterprise AR from RE'FLEKT reduces errors and increases uptime with smart, step-by-step instructions and remote guidance projected directly onto equipment.

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### Redefining Charging

VOLTERIO is a fully automatic electric vehicle charger that combines all of the advantages of conductive, cable-based charging systems with the advantages of inductive systems—without the disadvantages of either.

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### Get Started Programming

ABB's Wizard Easy Programming enables users to quickly and easily create robot application programs covering a wide range of tasks without the need for specialized training or programming knowledge.

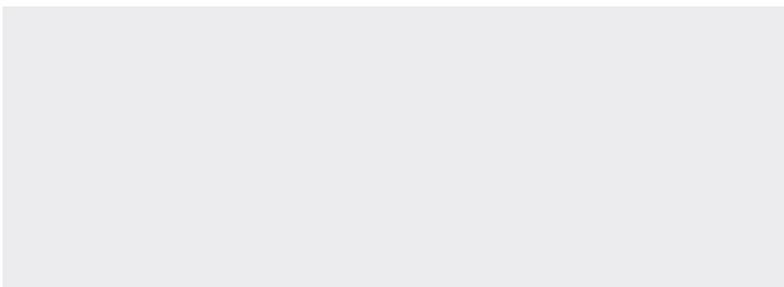
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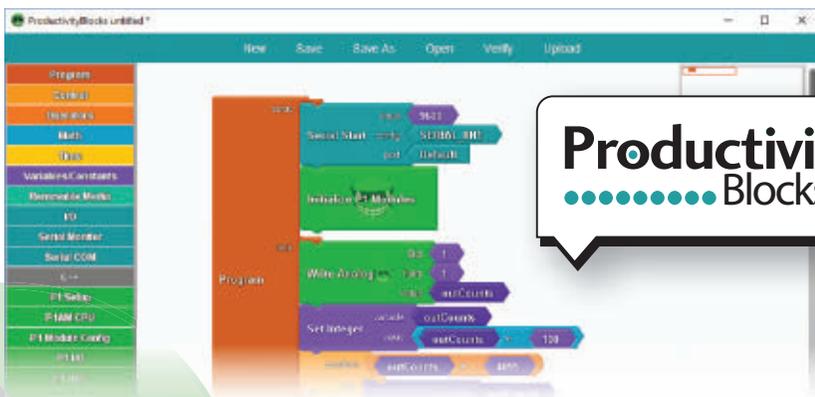
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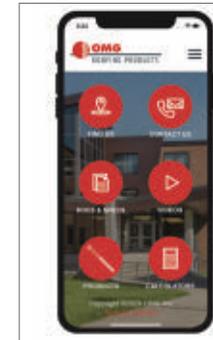
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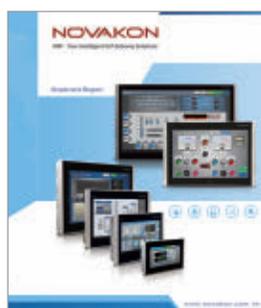


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# The Revolution in Ethernet Connectors?

*The ix Industrial interface opens new opportunities.*

By Horst Messerer, Product Manager, Helukabel

Hardly any other connector is as widely used as the RJ45 (also known as the western plug). It has been around since the 1970s, and in the decades that followed, technologically superior variations were developed for use in industrial applications. It's hard to imagine the industrial world today without them, not just for their convincing price to performance ratio, but because they are almost synonymous with Ethernet connections. However, this could change as the ix Industrial interface has recently emerged as a promising alternative with a significantly smaller design and more robust construction (Fig. 1). It is opening new opportunities in device manufacturing and offers benefits to end-users.

RJ connectors were introduced in the 1970s by Bell Laboratories in the USA and standardized a few years later by the FCC (Federal Communications Commission). One of the best-known versions is the RJ45 connector—used for telecommunications and data transmission in offices for decades—that connects PCs to wall outlets with patch cables ranging from Category 5 to Category 7. Over the years, more technologically advanced, industry approved RJ45 connectors have been developed. These are compatible with larger cables and wires, can be assembled without crimping tools, and are shielded to meet industry EMC requirements. A popular example is the RJ45 connector used in Siemens DRIVE-CLiQ systems, which has two integrated power contacts that allow data and power transmission over a single cable; up to eight data cables (four pairs) and two power cables can be connected to it.



Figure 1. The new industrial Category 6A: ix Industrial connectors from HIROSE with Ethernet cables from HELUKABEL. Photo courtesy of Helukabel.

plays, small programmable controllers, cameras, and sensors, are then defined by the size of the RJ45 connector. It's easy to understand why a smaller Ethernet connector would be desirable.

## ROBUST AND 70% LESS SPACE REQUIRED

A modern alternative that could replace the RJ45 industrial version has recently emerged: the ix Industrial interface with 10 contacts, Cat 6A classification, and data transmission rates of up to 10 Gbit. It is compliant with IEC/PAS 61076-3-124 and due to multiple advantages could potentially supersede the standard industrial RJ45 in its implementation as a robust, miniaturized Ethernet interface.

Some advantages of the ix Industrial interface include a more compact mating surface and high mechanical robustness. Designed with industrial settings in mind, it has two sturdy locking mechanisms with metal hooks to ensure resistance to vibrations and contact durability. It is suitable for ambient temperatures from -40 to +85°C (-40 to 185°F) and shielding provides EMC robustness. The space-saving aspect of the ix female connector is impressive: it only requires 30% of the space of an RJ45 female connector (Fig. 2), allowing circuit board size to decrease even further, which is key to device miniaturization. At the same time, efficiency and sustainability also improve, as smaller housings require fewer raw materials. A smaller fan with lower power consumption is also more likely to suffice, given less air is needed to circulate in the housing. Therefore, the ix Industrial interface makes sense from an economic and ecological point of view. Furthermore, it could be a far more reliable alternative to USB connectors on inspection cameras.

## ASSEMBLY SOLUTIONS WITH THE NEW ETHERNET INTERFACE

New connector technology often requires cable manufacturers to adapt existing products or develop new cable technologies. Given its early stage, cable manufacturers are optimistic about the opportunities offered by this new Industrial Ethernet interface and their ability to provide plug-and-play assembly solutions with ix Industrial connectors to device manufacturers. The industry focus is currently automation technology, video and camera technology, visualization in mechanical engineering (e.g. detection, quality assurance, etc.), and companies that manufacture measurement systems, all who require patch cables to transmit power and data. Additionally, cables with “mixed” connections, i.e. ix coding at one end and RJ45 coding at the other, need to be offered as the market adopts this new technology.

The ix connectors are currently available with A-coding for standard Ethernet (4 or 8 pins, plus two power cables rated at 3A for 50 or 60V DC), or B-coding for application-specific installation; both versions are straight. Two 90-deg.-angle plug versions, as well as a field-wireable plug with C-coding for standard Ethernet, will be launched in 2020. The significant space-savings compared to their RJ45 counterparts open additional miniaturization opportunities to device manufacturers, especially since horizontal, vertical, or upright versions of the corresponding housing are also available. Durability, compactness, high data transmission rates, and a double locking mechanism clearly speak for the new ix Industrial interface. Now the wait begins to see how the market responds. **NED**

For more, visit <https://newequipment.com/21128097>

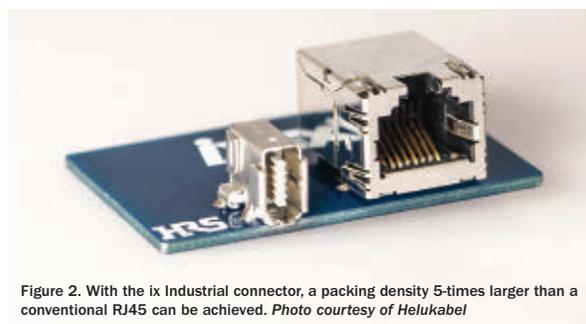


Figure 2. With the ix Industrial connector, a packing density 5-times larger than a conventional RJ45 can be achieved. Photo courtesy of Helukabel

## THE RJ45 IS A BARRIER TO MINIATURIZATION

While the features listed above are adequate for the RJ45, it does pose significant drawbacks. First, the connector is not robust enough for many applications; industrial versions only have one locking hook, which unlike the plastic office version, is made of metal and thus provides at least some durability. A far more serious drawback, however, is the size of the plugs and sockets.

As miniaturization advances, devices get smaller and smaller, as do the circuit boards upon which the sockets are mounted. As a result, the connector's dimensions of 7 to 11 mm become comparatively large and the product designer must ensure enough space is allocated. The limits of miniaturization, especially for compact mobile devices, dis-

# Measuring It All: Position Sensors Get an Upgrade

Calnetix Technologies has received a patent for its novel eddy-current position sensor.

By Laura Davis

**E**ddy-current position sensors, which measure shaft displacement in rotating machinery, have been around for many years as they offer manufacturers high-linearity, high-speed measurements, and high resolution. Most eddy-current sensors on the market only measure the distance between the sensor and the shaft—leaving room for other shaft displacements to go unnoticed. Alexei Filatov, Principal Research Engineer for Calnetix Technologies invented a novel eddy-current position sensor that measures multiple displacements with a single sensor. New Equipment Digest spoke with Alexei and Larry Hawkins, Co-Founder and Director of Technology for Magnetic Bearings at Calnetix Technologies to find out how this sensor works and how it will benefit manufacturers.

**NED:** What is the Eddy-Current Position Sensor and what does it do?

**AF/LH:** The Eddy-Current Position Sensor technology allows non-contact detection of an object's position in the space. They are often used to measure the static and dynamic shaft displacement in rotating machinery. At least some part of the object (shaft) must be electrically conductive and is typically referred to as the "sensor target." In generic terms, the operational principle of the sensor always includes exposing the sensor target to high-frequency electromagnetic fields. These fields induce eddy currents in the target, which produce their own electromagnetic field, altering the original field. The amount of the field alteration depends on the distance between the target and the source of the original field and is used for the object position detection. In most designs, changes in the inductance of the electrical coil generating the original field are used as a measure of the distance between the object and the coil.

**NED:** Calnetix just received a patent for this technology. Can you explain what the new technology is and why it was developed?

**AF/LH:** Calnetix has developed a novel eddy-current position sensor with unique properties, which include:

- "Slide-by" position measurements—the sensor can detect not only a normal distance between the sensor and an object as other eddy-current position sensors do but also displacements of an object when it moves tangentially to the sensor ("slides-by").
- No coaxial cables required as in other eddy-current sensors—it uses twisted pairs, which are much easier to work with and bring through machine interfaces.

The primary motivation for this technology development was the need for a better performing, more highly reliable and lower-cost alternative to the other types of non-contact position sensors available today.



**NED:** Is this sensor a part of a larger product offered from Calnetix or is it a standalone product?

**AF/LH:** The primary application of the new position sensor is a part of Calnetix Magnetic Bearing Systems, but it can also be used as a standalone product. Calnetix Magnetic Bearing Systems provide non-contact suspension of high-speed rotors in rotating machinery, including gas compressors and expanders, motors, generators, flywheel energy storage systems, etc. The sensor provides the feedback control input for the position control loop of the magnetic bearing, allowing it to control the position of a rotating shaft with a magnetic field.

**NED:** How is this technology different from similar position sensors already on the market? What specific advantages does it provide to users?

**AF/LH:** The sensor delivers a combination of the following advantageous properties not found collectively in prior technologies:

- The sensor target consists of solid steel such that the primary shaft surface can be the target with no added sleeves or laminations. In contrast, other common non-contact electromagnetic position sensors, known as "reluctance" or "inductive", have the target composed of electrically isolated steel laminations. Such laminated targets are much more difficult to make, and the sensor accuracy can be affected by the target machining—smearing and shorting between the laminations during machining leads to significant sensor errors.

• Position sensing along two radial and one axial axes in rotational systems can be implemented in a single assembly with a minimal number of external wires, as often needed in Magnetic Bearing Systems.

- Excellent linearity over wide displacement range.
- High operating temperature potential (>225 °C).
- Much lower operating frequency than in other eddy-current sensors (200kHz instead of >500kHz, typically MHz) results in much simpler electronics.

• Higher operating frequency than in reluctance sensors (200kHz instead of tens of kHz) results in higher bandwidth and better rejection of electromagnetic interference with other system components switching at tens of kHz (such as switching amplifiers and motor drives).

- Fewer components inside the sensor (no laminations, no wire-wound coils, no lamination-to winding isolation, no magnet wire to lead wire splices).
- Well suited for high-volume production.

**NED:** What was the biggest challenge in developing the new position sensor?

**AF/LH:** Achieving the necessary combination of a large gain, high linearity and large measurement range in the "slide-by" mode was the biggest challenge. This has not been achieved in any other eddy-current position sensor. **NED**

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# Breathing Easier

*Cummins Filtration applies its high-performance engine filter media to N95 respirators.*

By Stephen Petit

At the beginning of this year, Siddhi Salvi and the Cummins Filtration product team spent virtually all of their time working on new ways to refine the company's Fleetguard fuel, lube, and air filtration media for diesel engines. Their main challenges were coaxing ever-better filter efficiency, capacity, and flow restriction to capture contaminants and extend the lives of commercial trucks and off-highway equipment.

Then came COVID-19.

"We had been researching various applications beyond the engine filtration industry where our media could be utilized," said Salvi, the product manager for media at Cummins Filtra-

tion in Nashville. The filtration capabilities of NanoNet media technology, the same multilayered polymeric synthetic media used in the company's most advanced engine filters, suggest that the material would also be effective for N95 respirators, the most common type of face mask for healthcare workers.

When NanoNet was tested using industry-standard methods, it exceeded the performance requirements implied by the N95 designation, which includes not only the mask material but other aspects like fit. Companies that incorporate the media would need to seek approval from the National Institute for Occupational Safety and Health (NIOSH) to list their products for sale with NIOSH's N95 designation.

For Salvi and the product team, the question was always whether there would be sufficient demand and urgency to move ahead with the research and development necessary to supply NanoNet for use in N95 masks.

#### **THE PANDEMIC PROVIDED AN ANSWER.**

The need for N95 respirators has been overwhelming. In March, the U.S. Department of Health and Human Services estimated that healthcare workers alone will require 3.5 billion N95 masks during the outbreak. The agency has ordered 600 million N95 masks from five companies to distribute to hospitals and replenish the national stockpile.



The U.S. estimates that healthcare workers alone will need 3.5 billion N95 masks during the coronavirus outbreak.

Photo Credit: 3M

**W**hen NanoNet was tested using industry-standard methods, it exceeded the performance requirements implied by the N95 designation, which includes not only the mask material but other aspects like fit.

“We looked at the situation and knew we could help,” said Salvi. “We have a high-performance media, global production capacity, great partners, and a lot of creative energy to channel into supporting this global effort to help manufacturers supply more masks. We wanted to get to work.”

**POPULAR PPE**

Cummins Filtration is one of several heavy-duty equipment manufacturers that have mobilized resources to support the production of personal protective equipment (PPE) and other supplies to help fight against the coronavirus.

N95 respirators are the PPE most often used to control exposure to COVID-19 and other infectious diseases transmitted through the air. The N95 designation means the masks can block at least 95% of particles from entering the wearer’s nose and mouth. They’re designed to filter out a wide range of different contaminants down to 0.3 micron in size or smaller, including airborne viruses spread from person to person when someone coughs, sneezes, or talks.

The company has provided samples of NanoNet to mask manufacturers across the globe for testing, and it’s also supporting a unique collaboration with researchers at the University of Minnesota.

The group is developing a respirator with protection similar to N95-level effectiveness that can be mass produced using materials that aren’t likely to be affected by supply chain shortages. It includes students and faculty from the university’s Institute for Engineering in Medicine; Medical School; College of Design; College of Science and Engineering; and Center for Filtration Research Consortium (CFR).

Using NanoNet media donated by Cummins, the team has designed two respirator-mask prototypes—one modified anesthesia mask and one single-use mask.

In an ideal world, wearers in healthcare would get an N95 and change it between every patient. But in practice, the project team found, masks and other PPE may be rationed or reused multiple times. The University of Minnesota’s designs are meant to be effective, durable, comfortable, simple to produce, and provide relief when stocks of N95 masks run low.

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# HOW LOW CAN YOU GO?

## Filtering Small Particles is a Balancing Act

**LIKE THE DROPLETS** containing COVID-19, the size of contaminants in fuel, oil, and air moving through a diesel engine is measured in microns.

A micron is a unit of length equal to 1 millionth of a meter or 39 millionths of an inch. For context, a human hair is 50 to 70 microns in diameter. Dust, sediment, and other types of hard particles that can wear down engine components are typically in the 5 to 15-micron range or less.

Filter designers want to stop these tiny contaminants but they have to balance three things: the filter's efficiency, or the size of the particles it can capture; its capacity to hold contaminants during the filter's service life; and the flow restriction that naturally increases as the filter collects more unwanted contaminants.

The challenge is to remove small particles at the highest efficiency. But it's not possible to simultaneously improve efficiency, capacity, and flow restriction using traditional media.

In response, Cummins Filtration created a new type of synthetic media that allows filter performance to progress past many of the tradeoffs that traditional media present. The company introduced NanoNet for Fleetguard fuel filters in 2012 and developed a variant for lube filter applications beginning with the LF14000NN used in Cummins heavy-duty engines.

NanoNet media is comprised of five layers of thin, tightly woven polymer fiber in a mesh material no thicker than a dime. In a heavy-duty filter application, it can capture particles as small as 4 microns 99.9% of the time. That means of 100,000 particles flowing into the filter, only 100 would make it through the media. NanoNet is capable of capturing particles as small as 0.2 micron.

Tougher emissions standards have led to engines that require extremely clean fuel, air, and lubricants. Synthetic, multilayered filtration media like NanoNet is a big step forward in terms of being able to remove the smallest contaminants while retaining very high efficiency and capacity. The result is better performance, less risk of unplanned downtime, and the service life you expect from your engine.

### MATERIAL ADVANTAGES

Within 12 hours after receiving the NanoNet material, the team at the University of Minnesota tested it and determined it would provide wearers of the prototypes with N95-level protection.

"The first thing we recognized from our experts in the Center for Filtration Research, who work directly with Cummins, is that not all filtration materials are created equal," said Jakub Tolar, campus health officer and medical school dean at the University of Minnesota.

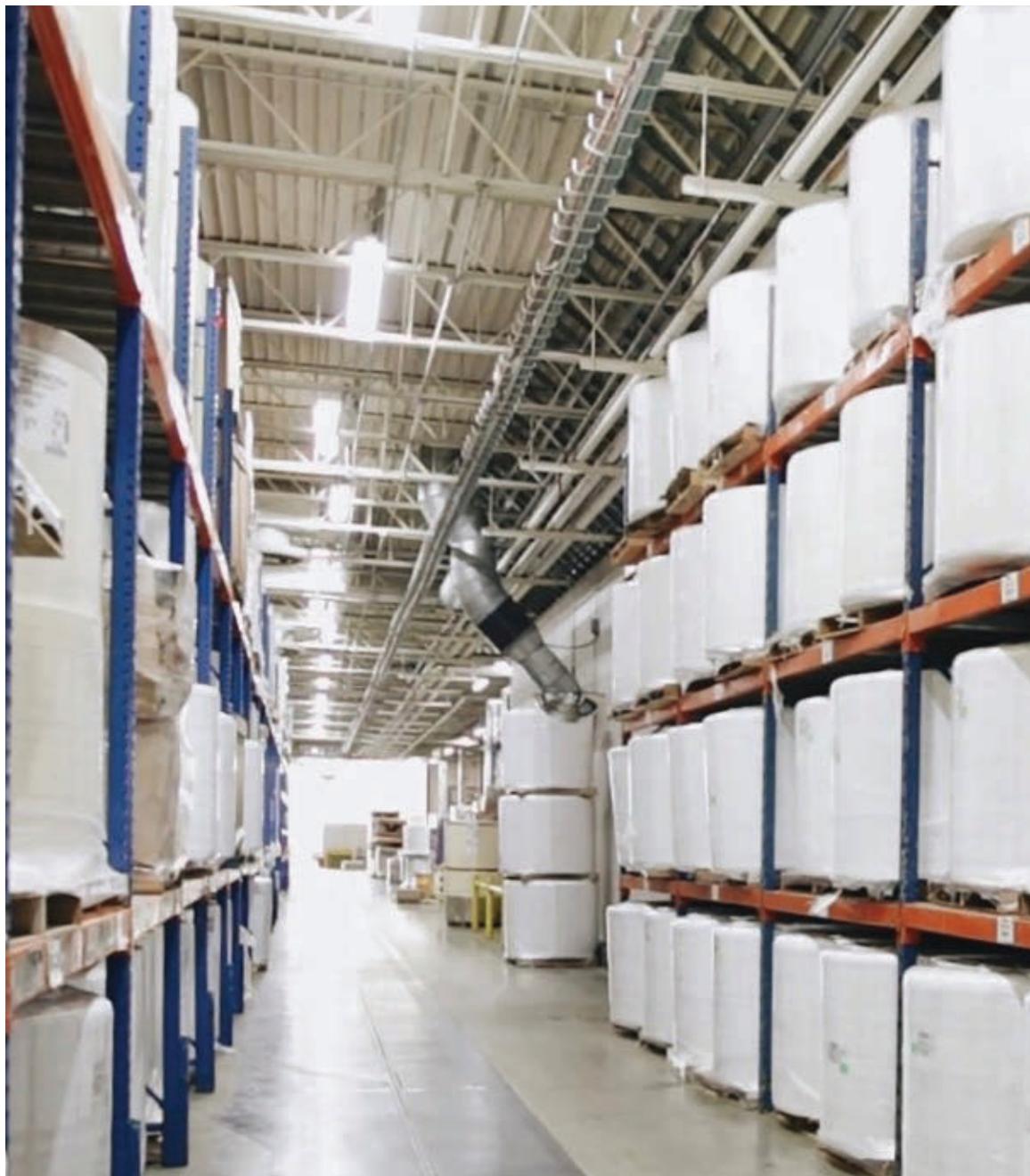
NanoNet is a fully polymeric material made of sub-micron-sized fibers bonded together in various layers. The synthetic fibers don't shift and come apart under dynamic conditions, which preserves their ability to capture particles as small as 0.2 micron.

As a material for respirators, NanoNet has two other important advantages.

It incorporates Dupont technology that helps enhance the breathability of the material while maintaining a high filtration efficiency of particulates.



A cutaway of a Fleetguard LF14000NN lube filter shows two levels of filtration: StrataPore media on top removes larger particles during engine start-up, while the NanoNet media below captures smaller particles to prevent long-term engine wear. Photo Credit: Cummins



The same media that keeps engines clean can help meet the demand for masks. Produced in sheets, NanoNet media is now available to N95 mask manufacturers worldwide. Photo Credit: Cummins

# Powered air purifying respirators (PAPRs) are an important piece of equipment for front-line healthcare workers responding to the COVID-19 pandemic.

Durability is another factor. NanoNet is designed to be tightly pleated, placed in a filter housing, and then work over thousands of miles of use to prevent tiny pieces of metal, dirt, and other contaminants from circulating through a heavy-duty engine. The material is resilient and retains its filtration qualities after it's been processed and formed into shape by the mask manufacturer, Salvi said.

The next steps for the University of Minnesota team are to define ways to produce the masks quickly and cost effectively, and then to manufacture a limited run for Minneapolis-based healthcare systems.

Ultimately, the project will publish open-source instructions that other healthcare systems and groups can use to make their own masks.

## PAPR PRODUCTION

Cummins Filtration is also manufacturing high-efficiency particulate filters for use in 3M's Powered Air Purifying Respirators.

Powered air purifying respirators (PAPRs) are an important piece of equipment for front-line healthcare workers responding to the COVID-19 pandemic. PAPRs use a battery-powered blower that sends filtered air into a hood or head top that covers the wearer's head or face; and can provide increased levels of respiratory protection, especially for critical healthcare situations such as aerosol-generating procedures.

PAPRs may also be more comfortable to wear for those who need respiratory protection for long periods of time.

Cummins Filtration is using its existing manpower and equipment at its Neillsville, Wisconsin, facility to pleat the media, assemble it into cartridge housings, and do final testing before shipping the filters to Valley, Nebraska, where 3M's PAPRs are manufactured.

The partnership has the potential to more than double the current production of filters for 3M's PAPRs. The additional filters are needed as 3M has ramped up production of PAPRs to meet a surge in demand for personal protective equipment due to the COVID-19 outbreak.

## SATISFYING WORK

With the need for N95 respirators and other types of PPE continuing to grow, Salvi is proud of the company's role among manufacturers and the University of Minnesota team to find innovative ways to relieve the burden.

"Our team has a long history of success with high-performance filter media for trucking and other heavy-equipment applications," she said. "It's especially gratifying to use our resources and expertise to help protect people, too." **NED**

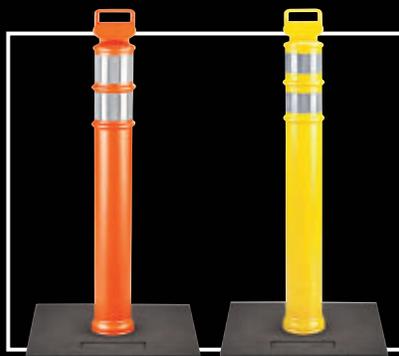
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# Safety Equipment



## CONTACT-FREE BODY TEMPERATURE MEASUREMENT

For safeguarding points of entry at industrial, commercial, and public facilities around the country, DuThermX provides automated temperature scanning and security solution that is a contact-free and continuous flow system. It alleviates the need for manual screening and any bottlenecks created by stopping people that often requires two or more personnel at any building entry point. It can be added to existing surveillance and monitoring systems or installed separately.

Easily, quickly, and unobtrusively, DuThermX detects body temperatures within  $\pm 0.54^{\circ}\text{F}$  for 16 to 40 people simultaneously, depending on the configuration of a facility's entry point. With a response time of 30 milliseconds, the hard-wired set-up delivers a constant, secure, and reliable data feed. When a person passes through an entry point with an elevated temperature, an alarm alerts designated personnel. The multi-notification alarm system includes audible, visual, email, SMS text, onscreen, and network video capture.

**Dubak Electrical Group**

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## CONTACT TRACING IoT SOLUTION

Proximity Trace provides proximity distancing alerts and contact tracing through a wearable device for workers across many industries, including construction, heavy industrial, energy, and manufacturing. It offers added protection for essential workers during the COVID-19 pandemic and helps companies get employees back to work safely while addressing recommended social distancing practices.

The devices are affixed to a hard hat or worn on the body with a lanyard and emit a progressively louder alarm, alerting workers when they are too close to each other. This enables them to focus on their work, rather than worrying about their proximity to another worker or potential exposure to the virus. If there is a confirmed case of COVID-19, an employer can conduct contact tracing using historical data captured passively by the worker's device to identify who may have been exposed.

With more reliable information, companies can decide who needs to be in mandatory or precautionary quarantine per the Centers for Disease Control (CDC) guidelines and whether the site can continue to operate safely without the need to shut down the entire operation.

**Triax Technologies, Inc.**

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## MONITOR GAS LEAKS FROM A SAFE DISTANCE

Facilities and plant engineers will find the next-generation TG5000 Gas Monitor offers them a safe, reliable, and effective solution to detect oxygen, combustible, and toxic gases in a wide range of light industrial applications, including wastewater treatment, industrial plants, and commercial buildings.

The modular single or dual sensor mechanical design offers application flexibility and helps to reduce wiring costs. Simple to install, use, and maintain, the OLED multilingual display and bright LED indicators show the instrument status (power, fault, or alarm), the gas readings, and its Bluetooth connection. A touch button interface provides tool-free, rapid access to all instrument settings and functions.

The monitor features XCell TruCal Sensors that detect potential failures or maintenance needs without applying calibration gas. The sensors also compensate for sensor drift due to environmental changes and notifies users if the gas sensor becomes blocked.

The TG5000 is available with a helpful Bluetooth interface that connects with MSA's X/S Connect App for Apple iOS or Android platforms. Workers can wirelessly access the gas monitor up to 75 ft away using the smartphone or tablet of their choice.

**MSA Safety**

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## LIGHTWEIGHT LEATHER GLOVES

Leather Performance Gloves provide all-day comfort without sacrificing productivity. The gloves leverage the lightweight design of the current Milwaukee Performance Gloves with an added leather palm for durability.

The palms of the Leather Performance Gloves are made from soft, top-grain goatskin leather for increased durability and the back features a breathable, lightweight design. The gloves feature a moisture wicking terry cloth sweat wipe on the thumb to increase comfort and SMARTWIPE technology on the knuckle for touch screen compatibility without having to remove the gloves. For easy on and off, the gloves are complete with a webbing pull loop and a hook and loop closure for a secure fit.



### Milwaukee Tool

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## COUGH AND SNEEZE SHIELDS

GermBlock shields limit the spread of airborne droplets resulting from coughing, sneezing, or speaking from reaching a nearby person, helping to mitigate possible COVID-19 infection. Constructed of heavy-duty clear polycarbonate and stainless-steel framing with full penetration welds, the shields are offered in tabletop, floor-standing, and extended-leg versions in popular sizes.

To ensure shield stability, all shields include footplates with gussets, designed to affix to countertops or floors with front and side mounting options. In addition, the shields are offered in standard and clean-room models in the same types and sizes. Further, custom shields are also available, which include a broad array of sizes, mounting, and material options, as well as casters.

GermBlock shields can be cleaned with surface and sterile wipes, ethanol, hydrogen peroxide, isopropyl alcohol, and dish-washing soap solutions, all of which are cleaning agents specifically recommended by the CDC in the fight against the coronavirus.

### Rockford Systems, LLC

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## PPE GARMENT KITS AND CANISTERS

UltraLite Series Arc Flash PPE Task Wear is designed to combine complete safety with comfort.

The 11 cal/cm<sup>2</sup> UltraLite garments include a balaclava-hooded long-sleeve t-shirt and simple high-waisted 12 cal/cm<sup>2</sup> pants, made to fit comfortably over daily-wear clothing. The garment kits include gloves, a hardhat, and a clear face shield to ensure that workers are completely safe and prepared for the job.

The PPE storage canisters provide the ultimate protection for arc flash suits with hoods or face shields, thanks to their oversized 14-in. diameter. These extra-large, ultra-durable hard-sided arc flash storage canisters are designed to withstand the harshest environments and safely store technicians' most delicate and valuable PPE items. The canisters also feature a stackable design for easy, orderly storage in shops and equipment rooms. Their snap seal-tight lids ensure secure, reliable closure, and durable rope handles include a comfort grip for easy transport.

### Cementex

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## SAFETY SCANNER FITS INTO TIGHT SPACES

The ultra-compact safety laser scanner, nanoScan3, combines smart safety functions with excellent measurement data quality for accurate and reliable localization.

With an overall height of just over three inches, this space-saving sensor can be used wherever machines and vehicles require maximum performance but have minimal mounting space. This enables manufacturers to use small AGVs or mobile robots equipped with SICK's leading-edge safety technology.

Based on successful microScan3 technology, the 2D safety sensor, nanoScan3, uses patented safe-HDDM scan technology. This enables the nanoScan3 to hold up well even in harsh or challenging ambient conditions. It is impervious to interferences like dust, contamination, and ambient light.

With its small size, the nanoScan3 opens up potential applications where space is extremely critical, such as in mobile intralogistics, collaborative robots (cobots), or mobile assistance and service robotics on autonomous transport platforms and carts. What's more, the nanoScan3 is setting a new standard in this market segment with its price-performance ratio.

### SICK Inc.

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**AR Platform for Enterprises**

*offers vertical-specific solutions*



REFLEKT ONE operating system for enterprise augmented reality (AR) lets companies benefit from vertical-specific solutions that solve industry problems with AR. The operating system is a platform, a device, and a tracking agnostic system that integrates with software such as Siemens PLM Teamcenter and Cortona Rapid Manual.

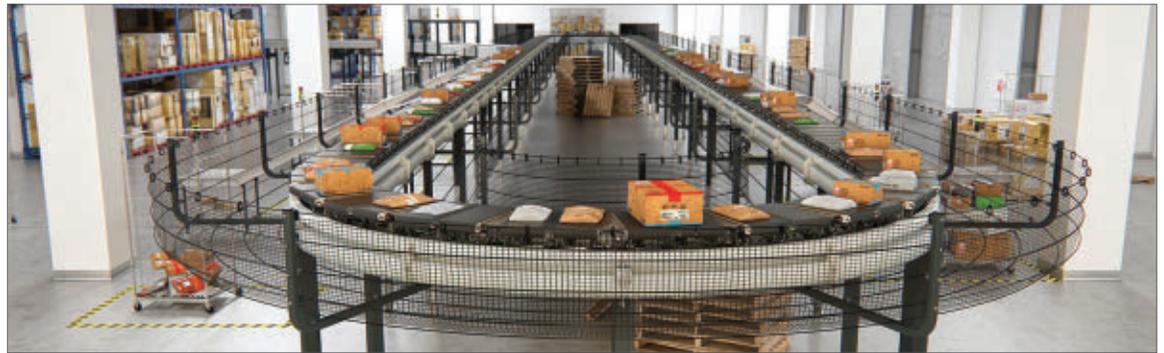
Create step-by-step instructions and visualize product components as well as diagnostic data without coding skills. By reusing 2D and 3D content, rich media, and video, users can turn paper-based manuals into interactive guides—for Android, iOS, Windows, and Microsoft HoloLens.

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**Smart, High-Capacity Sortation System**

*features a low height to fit where headroom is tight*

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**Electro-Chemical Devices (ECD)**

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**Material Transfer & Storage, Inc.**

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**Dynamometers for Electric Motor Testing**

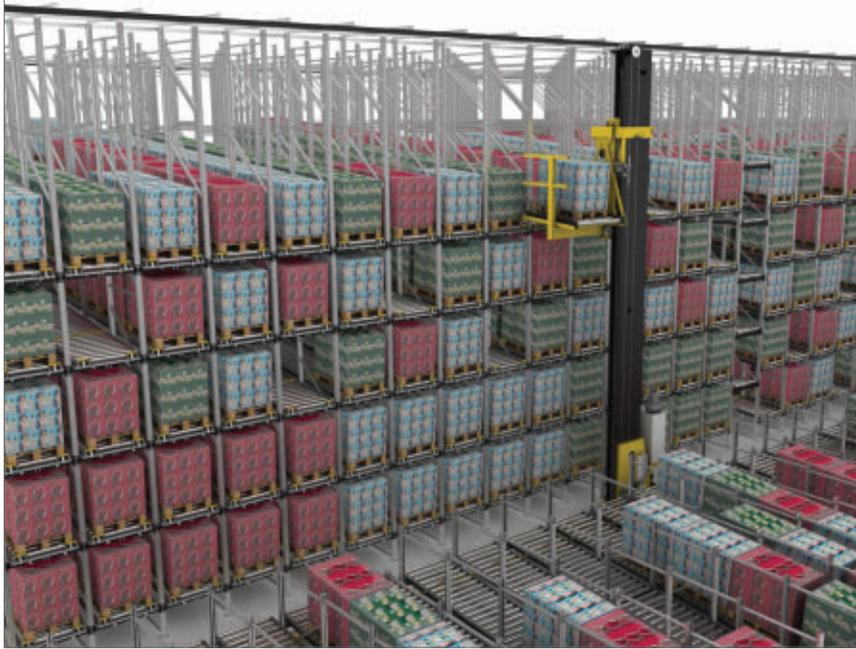
*can test the widest possible range of motor sizes*



Testing and verifying the efficiency of electric motors, SAKOR dynamometer systems can be used to test from two to eight pole motors ranging from 10 W to more than 3 MW. The line of motor testing dynamometers offers high-accuracy testing for designers and manufacturers of electric motors of any size.

**SAKOR Technologies**

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*can be used in low-temperature applications*

A versatile pallet conveyor system, the Modular Pallet Conveyor Platform (MPP), is distinguished by its highly flexible modular design. The MPP consists of chain or roller conveyors, as well as additional modules such as transfers and turntables. Depending on the conveyor design and the chosen modules, pallets weighing up to 1,200 kg can be transported at a top speed of 0.5 m/s. The elements in the system are guaranteed to function perfectly within a temperature range of -28 to +40°C, meaning that the MPP can also be used in low-temperature applications. Pallet inspection stations can also be installed along the conveyor upon request. These enable the dimensions, weight, intactness, or suitability of the pallets on the conveyor to be checked.

**Interroll Corporation**

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*offer ranges up to 20,000 psi/1600 bar*

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**Ashcroft Inc.**

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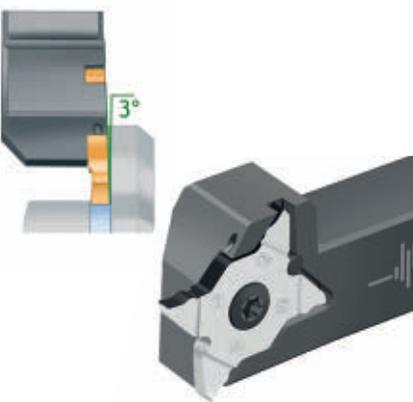
### Heavy Duty Roll Pusher

*moves round objects safely, easily, and efficiently*

The RollMover HD features a smart lithium battery and a rugged, high-visibility, steel ergonomic design. Powerful, versatile, and highly maneuverable, it moves heavy rollable loads safely and easily. The battery features in-depth, onboard analytics that offer data on battery state, performance, and maintenance cycle for improved use.

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### Grooving Toolholder System

*has a cutting depth of up to 0.197 in.*  
A system designed for grooving along a shoulder, the G3051-P groove turning holder and the MX22-2L/R indexable inserts, features an insert installation position inclined by 3-deg. in the insert pocket. The G3051-P grooving system can be used on CNC lathes and multi-spindle machines, as well as automatic lathes.

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### RGBA/RGBW Luminaire

*has a lifespan of over 100,000 hours*  
AEON LED RGBA/RGBW Luminaire delivers simple and easy-to-use full-spectrum color floodlighting solutions that provide advanced functionality, versatility, and operational efficacy. It is adaptable to wired or wireless lighting controls and can be paired with the HyLink Wireless Control for custom needs.

**AEON LED**

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### Work Platform & Multi Person Work Platform

**Convert your forklift into a work platform!**  
Base and 4 inch curbs are formed from one piece heavy gauge sheet for extra strength. Back panel is 1/2-#13 expanded metal mesh. Deck is slip resistant, Hinged gate with safety lock built in. Fork channels are 25 inch on centers (on single) and 29 inch Multi-Person. Full length fork tube openings 7" x 2.75". Safety pins behind each fork. Heavy duty retaining chains welded to back of platform to secure around fork carriage. Safety harness ring at center of back panel (harness not included).

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## Personal Utility Case

can be submersed in water up to 3 ft for 30 minutes



The Pelican RUCK is a Personal Utility Case (PUC) that provides a strategic storage solution built to protect essential accessories on any adventure. RUCK cases are watertight and built with a co-molded rubberized liner and an exo-skeleton cushioned EVA lining that protects the most important valuables from drops, shock, dust, dirt, and water. Convenient storage and organizational solutions, including a removable lid and divider trays with nylon loops, provide various storage configurations for personal gear like phones and wallets or outdoor gear such as first aid kits and multitools. Pelican RUCK cases are available in three sizes and four color schemes to accommodate a wide variety of gear and lifestyles.

**Pelican Products, Inc.**

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## Full-Cycle Automation Analytics Platform

manages virtual workers with full visibility



ConsoleX is an advanced web-based management and monitoring dashboard that lets its users configure, schedule, and manage virtual workforces comprised of Kryon robots from any location, all in real-time. Based on the NGINX server platform, ConsoleX boasts a new dashboard providing a condensed and

informative operational view. It allows users to spot changes very quickly in expected robot execution, identify bottlenecks, easily identify their sources, and perform corrective actions. Customizable advanced analytics provide immediate, actionable insights that highlight areas that require attention.

**Kryon Systems**

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## Adhesive System for Packaging Efficiency

can fully integrate with packaging machine HMI's



Packagers looking to trim costs and streamline operations can benefit from the efficiency, reliability, and low-cost operation of the Micron+ adhesive systems. Key benefits include an innovative tank construction that ensures uniform melt temperatures with no hotspots, char or waste, a horizontal piston pump design that provides consistent, direct adhesive feed, and high-efficiency design that uses 60% less energy and 50% less compressed air than comparable systems.

**Meler USA Corporation**

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## Multi-Purpose Safety Station

provides quick rinsing of eyes, face, and body



The Safety Station is a multi-purpose drench shower, eye/face wash, and safety supply storage cabinet all in one. It is ideal for laboratories where persons may be exposed to potentially hazardous chemicals. Sanitary white polypro construction means there is no wood or metal to rot or rust. The Safety Station is fitted with a pull rod activated shower and a push handle eye/face wash for quick rinsing of eyes, face, and body. Towels and first aid supplies can be stored in the cabinet below.

**HEMCO Corporation**

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## Multitasking Machining Center

features the world's shortest tool spindle

Nakamura-Tome JX-250 High Performance Multitasking Turning Center offers the largest machining area envelope in its class for high precision milling and turning of complex parts, along with a unique twin lower turret configuration allowing ultimate flexibility of complex component manufacturing.

**Methods Machine Tools, Inc.**

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## Energy-Efficient Electric Motor

supports four standard voltage supplies

An energy-efficient electric motor, the three-phase NORD UNIVERSAL motor is available in 20 models and provides a power range of 0.16 to 60 HP. Options for the motor include quick connectors, single or double protection canopies, space heater, spring-applied brake, and forced ventilation.

**NORD Drivesystems**

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## Cold Temperature Tapes

can be used in temperatures as low as -10 °F

Macbond Arctic Tapes boast superior adhesive performance for an extremely wide range of temperatures—from -65 to 150°F. The tapes bond well to many grades of foam and foam rubber substrates and feature great performance on low-surface energy materials. With built-in moisture resistance, the tapes are designed to achieve and maintain a high bond in cold, damp conditions.

**Mactac Industrial Tapes**

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## Highly Flexible Ethernet Cables

offer predictable and reliable service life

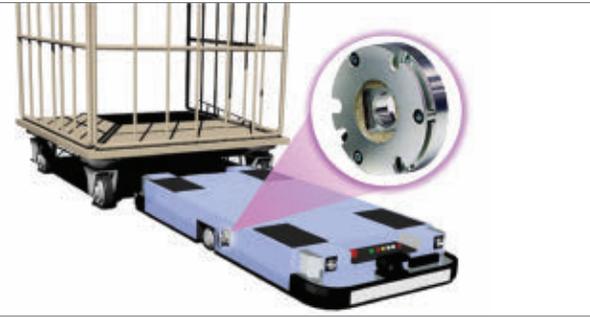


CFBUS.045 and CFBUS.049 Ethernet cables for use in energy chains are indispensable for the implementation of Industry 4.0 in automation. The cables have UL certification for North American markets and received the certificate for CC-Link IE protocols for the Asiatic region. The CC-Link IE controller network has been designed for the rapid exchange of large amounts of data in a factory or production plant, whereas the CC-Link IE field network has been optimized for the connection of a wide range of devices and their connection to other existing networks such as the standard CC-Link. These increasing requirements for industrial Ethernet communication nodes call for a secure

and long-lasting connection between the components to meet the continuously growing amounts of data being transferred. The CAT5e and CAT6 chainflex Ethernet cables ensure secure and reliable communication.

igus

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## Brakes for Automated Guided Vehicles

minimize battery recharging operations

BXR-LE brakes provide perfectly controlled braking using less power for the demands put on AGVs. The BXR-LE brake is a power-off engaged brake that will hold the AGV in place when not in use. When the AGV must navigate the production floor, the brake is energized, which disengages the rotor disc and allows free rotation of the AGV drive wheels.

Miki Pulley US

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## Digital Hydrometer and Tester

connects via USB or Bluetooth for data management

The SBS-2510 hydrometer is ergonomically designed and lightweight, allowing one-handed operation. A joystick offers intuitive operation with a guided workflow. A built-in motor and automatic sampling pump draw electrolyte into the hydrometer for quick readings between the range of 0.000 to 3.000.

Storage Battery Systems, Inc.

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## Volumetric Feeder with Wetting Cone

has a feed rate of 0.36 to 3.56 ft<sup>3</sup>/hr



The VMF-90F volumetric feeder, a totally self-contained, automated dry chemical addition system, offers useful options to optimize automatic monitored dosing processes in the water and wastewater industries. The standard VMF-90F unit features carbon steel construction with

corrosion-resistant zinc oxide primed, dry powder epoxy coating. A gravity-fed, 3.6 ft<sup>3</sup> hopper is built-in and has a maintenance access hatch and an integrated load cell attachment point.

Scaleton Industries, Ltd.

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## Low Profile, Bi-Directional AGV

supports mixed model production



Model CA-B50100-BST NSI AGV with kitting cart presents a product kit for a specific assignment or multiple kits for small batch production and manufacturing efficiency. The unit is bi-directional and provides great flexibility for movement along its guideway as it can travel in both directions and, when necessary, rotate in place. The dual drive wheels also give this AGV higher load capacity and the ability to travel laterally. It can travel at speeds up to 50 m/min. and has an estimated towing capacity of 2,222 lb.

Creform Corporation

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## Tri-Mer Packed Tower Scrubbers

Ideal for the efficient removal of inorganic gases, odors, & fumes

- Guaranteed effective, regardless of loading for H<sub>2</sub>S, SO<sub>2</sub>, CH<sub>3</sub>SH, Cl<sub>2</sub>
- Simultaneously handles particulate



## Crossflow Scrubbers

Guarantees your operating permit level for HCl, HNO<sub>3</sub>, HF, H<sub>2</sub>SO<sub>4</sub>, Cl<sub>2</sub>, and NH<sub>3</sub>

- Maintains stack emissions to specific ppm levels for all input concentrations
- System configurations for every requirement



## Process Tanks

Factory tested for 72 hours & certified leak-free

- 1" solid polypropylene, copolymer, PVDF, steel and stainless steel



Details from Greg Worthington:

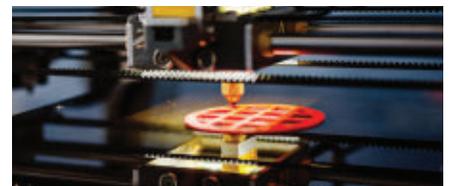
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## FROM THE COVER

### Fully Automatic Vehicle Charging

does not require precise parking



Together with the world's leading automotive OEMs, VOLTERIO is developing a revolutionary automatic connection device for electric vehicles.

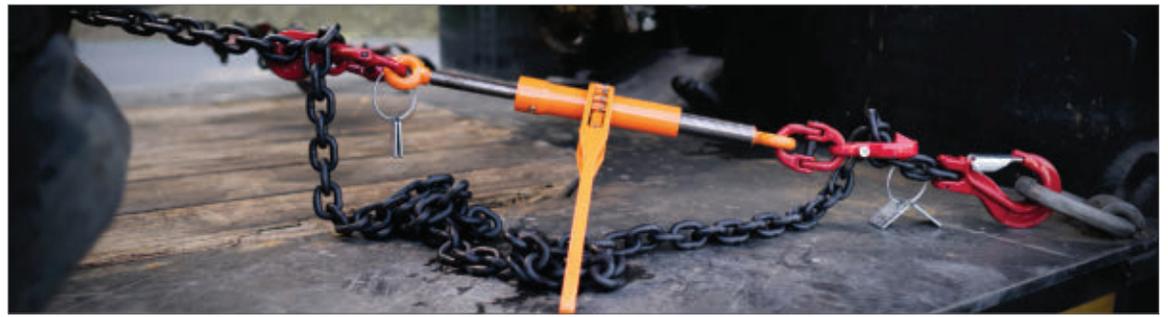
VOLTERIO is a smart and fully automatic high-power charging solution. The system does not require precise parking and can be easily integrated/retrofitted to almost every electric vehicle architecture because of the small packaging size as well as the low complexity of the onboard unit.

Charging through a physical connection to the vehicle's underbody enables the simplest possible robotic for an automatic connection. Due to the self-centering, high-power 360-deg.-connector, the angular orientation of the parked electric vehicle does not matter. Unlike inductive charging that requires the vehicle to be positioned very precisely, the charging robot can handle large parking misalignments.

The VOLTERIO ground unit automatically communicates with the electric vehicle's onboard unit via a secure WLAN connection when approaching. When charging is requested, the ground unit automatically connects to the vehicle unit in the car's underbody guided by an ultrasound-based micro-navigation system and the charging process starts automatically or can be scheduled by intelligent charging management.

**VOLTERIO GmbH**

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### Load Binder Makes Retensioning a Breeze

retensions chains without detaching

Just 3/4 the length of a standard load binder, the DoRa Ratcheting Load Binder fits into tighter spaces but expands to enable users to reach twice as far as any other. The compact size and the extra length of the DoRa saves users time and trouble as they don't have to detach and reattach chains when retensioning cargo. The design allows the ratchet housing to be shorter by enabling one threaded spindle to retract by screwing inside the other. When extended, the longer spindle length gives users twice the tensioning distance of other load binders, allowing users to start out with a tighter chain and to perform multiple retensioning without the need to disengage the binder's clevis hooks.

**Doleco USA**

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### Electric Coil AC/DC Contactors

compensate for changes in voltage fluctuations



The Ex9C F-type IEC contactors provide increased protection and stable performance on any AC or DC system. Featuring an electronic coil, the Ex9C F-Type Contactor compensates for changes in voltage fluctuations

which eliminate noisy, contact-damaging chatter conditions. With a more efficient design, this contactor offers valuable integral surge protection and less energy is required to operate the coil, which translates to lower operational costs.

**NOARK Electric Co., Ltd.**

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### Explosion-Proof Continuous Processor

performs 24/7 in unattended operation



Set within a steel frame design, the explosion-proof SC Processor features a hazardous location motor that meets National Electrical Code standards for processing Class I, Division II hazardous materials. Ideal for solvent removal and recovery, degassing VOCs, and reacting raw chemicals and ingredients that are impractical to transport over the road, the SCP automatically transforms liquids, slurries, and wet cake into dry powders or high viscosity liquids/pastes in a single step.

Set within a steel frame design, the explosion-proof SC Processor features a hazardous location motor that meets National Electrical Code standards for processing Class I, Division II hazardous materials. Ideal for solvent removal and recovery, degassing VOCs, and reacting raw chemicals and ingredients that are impractical to transport over the road, the SCP automatically transforms liquids, slurries, and wet cake into dry powders or high viscosity liquids/pastes in a single step.

**Readco Kurimoto, LLC**

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### Safety Automation Platform

monitors up to 20 safe motion functions



The drive-integrated SafeMotion machine safety platform can be integrated into almost any new or existing machine automation architecture, giving machine builders and end-users more options in machine

safety functionality. Adding safety capabilities in the drive can alleviate additional hardware and components. SafeMotion can be used to monitor up to 20 safe and certified motion functions, such as Safe Torque Off, Safe Brake Control, Safe Direction, and Safe Stop. It provides the maximum level of safety (Cat 4, PL e, SIL 3) for all functions.

**Bosch Rexroth**

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### Hybrid Tare Compensation Feeder

automatically manages flow variations

The DIW-PE-GZD hygienic, hybrid loss-in-weight tare compensation feeder is for precise, reproducible powder feeding in sanitary production environments. The feeder features aseptic drives, flexible sleeves, a filtration unit, and twin screws to ensure smooth, consistent feeding without risk of deposits or trapping ingredients.

**Gericke USA, Inc.**

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### Spring Force Tester

has a 1,000N testing capacity



Rotary Table Springs Force Tester is set up to test multiple springs in a single setup without the need for additional operator input as required when springs are tested one by one. Multiple springs can be loaded and

tested in the system which then provides a pass/fail report on each spring. Detailed information on each spring is also available including free length, spring rate, and critical load and distance points. Different rotary table options are available to accommodate a customized number of springs in a single setup.

**The L. S. Starrett Company**

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## Connected, Thermal Camera for Detecting Methane

allows for seamless integration into gas monitoring systems



The FLIR GF77a Gas Find IR camera is a fixed-mount, uncooled, autonomous leak detection camera that visualizes methane and other industrial gases. The connected camera provides upstream and midstream gas processors, producers, and operators with the ability to monitor continuously for invisible, potentially dangerous methane leaks at natural gas power plants, renewable energy production facilities, industrial plants, and other locations along a natural gas supply chain. The camera is engineered to detect industrial gases such as methane, sulfur dioxide, and nitrous oxide to improve inspections and reduce the chance of false readings. Featuring a FLIR-patented High Sensitivity Mode (HSM), the technology enables better detection capabilities by accentuating movement to make gas plumes more visible to the user.

**FLIR Systems Inc.**

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## Condensate Evaporator Pans

eliminate the need for electro-mechanical controls

Evapoway PTC Condensate Evaporative Pans are constructed to evaporate, defrost, and condensate water where no drain line is available. Ideal for applications including commercial refrigeration, industrial units, elevators, and HVAC units, the pans feature no electro-mechanical components to reduce potential field failures, and are suitable for low flashpoint refrigerants.

**BriskHeat**

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## Super-Duty Refractory Mortar

protects internal linings of furnaces and boilers



Ultra Demon Mortar is an enhanced, wet, air-setting refractory mortar that exhibits the thermodynamic stability required for the protection of industrial boilers, furnaces, and incinerators that operate at temperatures as high as 3,000°F. Engineered for superior strength and extended workability, Ultra Demon Mortar is a reliable, economical solution for laying up intermediate, high-duty, and super-duty fireclay bricks. Creamier in texture when compared to other mortars, Ultra Demon Mortar is exceptionally pliable, making it easier to install by trowelling or dipping.

**Plibrico Company, LLC**

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## Waterproof Power Connector

combines high vibration and high heat resistance



A low-profile, waterproof, wire-to-wire connector, the ZE064W Series, was developed for demanding automotive, agricultural, and construction vehicles. Rated to IP67 / IP69K, the 2.2 mm pitch

ZE064W is resistant to temperatures up to 125°C. A double-layer spring, three-point contact design ensures highly reliable connectivity in high vibration and shock conditions. A contact retainer prevents incomplete mating and offers a pull force strength of 50N. Mating keys prevent mismatching when using multiple connectors and produces stable contact resistance for up to 3,000 cycles, satisfying engine compartment heat resistance requirements.

**Hirose Electric Co., Ltd.**

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## Compact, Industrial Ethernet Switches

offer up to 18 ports



The EDS-2000 series of unmanaged Ethernet switches feature up to 16 Ethernet ports and two Gigabit combo ports to meet increasing needs for additional nodes and bandwidth. Slim enough to fit into crowded control cabinets and machines, these plug-and-play switches allow for easier deployment and upgrading of existing devices without configuration hassles. The switches are inexpensive solutions for implementing industrial control and data acquisition over a LAN and require virtually no IT skills. Long distance fiber uplinks of over 100 m are made possible by the two Gigabit combo ports.

**Moxa**

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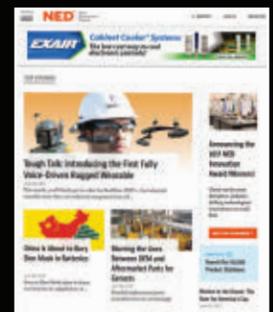
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## Modular Automated Work Cell

is fully wired with all safety features in place



FLEXBASE standardized modular automation cells are designed to easily integrate with robotics, vision, lasers, and other technologies to replace repetitive manual operations and reduce time to market at a reasonable cost. Flexible and scalable, the FLEXBASE systems can be configured as a stand-alone, automated workstation with manual loading and unloading or linked together via conveyors to quickly create

a completely automated assembly line. Featuring Allen Bradley Compact GuardLogix controls and 24 VDC power supply, FLEXBASE is a compact automation solution that is fully wired with all safety features in place. The electrical enclosure has space for adding a variety of components such as motion controllers and drives, robot controllers, PCs, We wi or other larger devices.

**Tooling Technology Group**

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## Microdrive Provides 10 Years of Operation

can be programmed without main power applied



The GA500 Industrial Microdrive meets RoHS2, providing a sustainable and environmentally friendly drive. Providing a wide range of flexibility, the drive is rated up to 40 HP and can be applied to 240 VAC single-phase, 240 VAC three-phase, or 480 VAC three-phase incoming power. The GA500 can be programmed without main power applied, which means users can set up the drive so it is ready to run before main power is available. A highly visual LED status ring provides drive status at a glance. Yaskawa's mobile app, DriveWizard Mobile, provides the ability to program and/or monitor the GA500 through mobile devices like a smartphone or tablet.

**Yaskawa America, Inc.**

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## Waste Drainage Joint System

allows for installation in tighter spaces



Fusel Fast-Lock Polypropylene is a mechanical joint system for waste drainage systems that significantly cuts down on installation time and costs. The system includes fittings in sizes 1-1/2 to 4-in. in flame retardant (FR) Fusel polypropylene that connects with both FR and non-flame retardant pipes. Another feature of the Fast-Lock system is the small dimension of the outer collar, which not only allows for installation in tighter spaces but also makes system layout easier for contractors and piping designers. The only tools needed for pipe installation is an off-the-shelf cordless drill or hand tool.

**GF Piping Systems**

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## Buffing Wheels Eliminate Buffing Compound

provide a cleaner, and safer way of buffing



Norton FAB (Fixed Abrasive Buff) buffing wheels feature a patent-pending design that incorporates abrasive grains into the buffing wheel and consistently results in single-digit Ra values ranging from 1 to 5 Ra. The wheels are tear-resistant, waterproof, and durable, providing a significantly longer life than traditional cotton buffs. Due to significantly decreasing the need for buffing compounds, Norton FAB wheels offer a more efficient, cleaner, and safer way of buffing.

**Norton | Saint-Gobain Abrasives**

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## High-Resolution EtherNet/IP Encoder

provides network fault tolerance



Offering rugged and reliable performance combined high resolution and repeatability, the AI25 EtherNet/IP absolute encoder features a stainless-steel housing, wide input voltage and temperature ranges, industry-leading 400G shock and 30G vibration ratings, and high shaft speeds. The single-turn and multi-turn models are available with up to 22-bit single-turn and 12-bit multi-turn resolution and high accuracy within a full suite of shafted and hub shaft variants. Optional shaft seals and IP67 ratings are available for increased protection.

**Dynapar**

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## Self-Contained Cleaning System

meets FDA and NSF disinfecting certifications

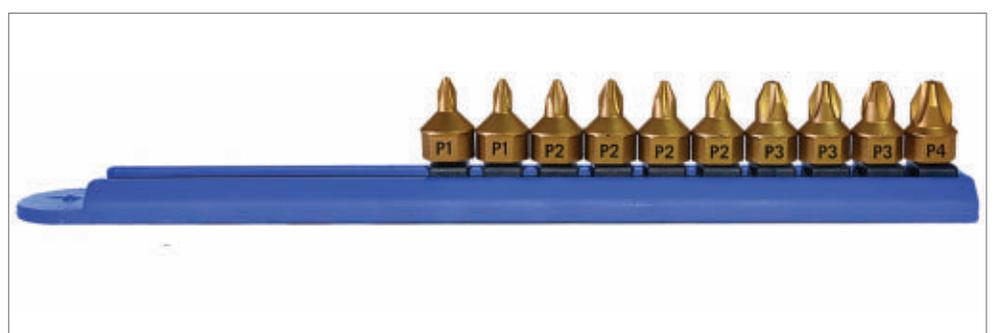


The Companion Cart Mobile Cleaning, Sanitizing, and Disinfecting System is designed to clean, sanitize, and disinfect items in locations without having to bring them to a water source. Rather than bringing the items to a water source to clean, users can now bring the cleaning station with a fully usable sink to their contaminated items or work areas. The Companion Cart comes in

two styles. The first cart features include a direct connection to a water supply with a 50-ft hose and an extendable drain board for extra counterspace. The second cart is fully self-contained with a battery powered water pump and a 15-gallon fresh-water tank.

**The Vollrath Company, LLC**

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## Titanium, Dual Drive Bit Set

features a precision tip profile for positive and precise fastener engagement

The IOPC Phillips Titanium Coated, Low Profile, Dual Drive Bit Set features a range of sizes, allowing users to fasten or unfasten a variety of common Phillips screws. The bits are made from S2 Tool Steel and one of the only sets on the market that feature a titanium coating for added strength and wear resistance. The low-profile dual drive design allows for use with a ratchet or 11 MM wrench.

**Mayhew Steel Products, Inc.**

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## FROM THE COVER

### Robotic Programming Software

supports advanced robot functions



Wizard Easy Programming is a graphical programming method that enables users to quickly create robot application programs for ABB's single-arm YuMi collaborative robot, without the need for specialized training.

This easy programming software is built on the concept of Blockly, an open-source visual coding method that presents programming language or code as interlocking blocks. By using this simplified approach, Wizard allows users to program and use the Single-Arm YuMi robot without prior knowledge of any robot programming language. A user can simply drag and drop these functions on the Flex-Pendant, see the results immediately and adjust the robot's actions within seconds.

The software features essential robot functions such as "move," "pick," and "vacuum," covering a wide range of tasks that are usually executed by the robot. There are also functions for error handling, allowing novice programmers to take care of errors such as collisions. By simplifying the typically complex programming associated with handling errors, Wizard easy programming can help any robot user develop highly effective robot programs.

**ABB**

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### Auto-Darkening Welding Helmet

guarantees total eye protection during welding



T-LINK System is the new technology granting total eye protection for the welding operator. The T-LINK system is based on the continuous communication between the welding torch and the auto-darkening mask, which is handled with Bluetooth technology. When the trigger is pulled, a Bluetooth signal is sent to the LCD screen filter, which responds by getting dark a moment before the arc is activated. The "STANDBY TIME" is a feature that allows the system to adapt perfectly to the different MIG / MAG and TIG welding modes, 2 and 4 stroke and in general, to all the parameters set on the generator. Thanks to this feature, once the torch button is pressed, the filter becomes obscured and remains obscured for the set standby time, regardless of the current passage.

**Trafimet Group**

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### Marking Stations for Robotic Workcells

feature a plug-and-play design



Mite-E-Mark is a compact, ready-made marking station that specializes in marking station IDs, date codes, or QC marks on products for robotic work cells. Providing a lower-cost solution to dot-peen and laser marking systems, the units are rugged, provide rapid cycle times, and produce deep, highly-legible marks.

The marking stations feature a plug-and-play design with a selection of dry or lubricated air, all required valves, marker mounts, and a part rest.

**Columbia Marking Tools, Inc.**

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### Power Supplies Maximize Uptime

require less space and generate less heat



Pro2 Power Supplies include six units ranging from 120 to 960 W and an energy conversion efficiency up to 96%. They incorporate an interface allowing them to be tailored to any application requirement and offer monitoring functions that provide continuous power supply data information and signal errors

for application monitoring. They also have easy fieldbus connection with snap-on type communication modules with WAGO's TopBoost and PowerBoost capabilities.

**WAGO**

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### Rooftop Attachment Anchor

offers up to 2,214 lbf. of load strength

PowerGrip Universal 7 is a rooftop attachment anchor for mounting solar racking systems and other products to virtually any commercial roof. The units reduce or eliminate the need for ballast in solar racking systems, so there's less weight, material handling, and labor on the roof.

**OMG Roofing Products**

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### Rust Breaking Penetrant

lubricates while breaking through existing rust



Bust That Rust, a synthetic penetrating oil engineered to break through rust, provides the ultimate in rust-breaking capabilities. Its foaming action allows the penetrant to soak deep into and beyond the areas to which it is applied. Solvent free, it will not evaporate, and it lubricates while breaking through existing rust. Bust That Rust will also help prevent new rust from forming. Bust That Rust is perfect for use on nuts/bolts, padlocks, shafts, flanges, hinges, and all other rusted metal parts.

**Fluoramics, Inc.**

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### Ultra-Thin Hood Latch

meets requirements of limited-space applications



The HH Hood Latch features a thin profile, maintaining robust performance with a form factor of just 8 mm. The latch features an easy-to-use pop-up handle for intuitive operation.

The Hood Latch offers a dual engagement hole mounting design, allowing for convenient installation with pin allocation at either location. Additionally, the appearance of the HH Hood Latch can be customized, allowing customers to choose complementary colors that match their overall equipment design.

**Southco, Inc.**

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**Bluetooth Communication Enabler**

Part of the 4500-series of communication interfaces, the 4512 Bluetooth Communication Enabler allows users to enable Bluetooth communication and data logging on all their PR 4000 and PR 9000 units. Just mount the PR 4512 on the front of the device from PR electronics and install the PPS app on the smart device (iOS and Android). This enables live monitoring of process data, data and event logging, and easy programming of the device.

**PR Electronics**

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**5G Signaling Test Solution**



For developers of 5G devices, the CMX500 radio communication tester enables non-standalone (NSA) and standalone (SA) signaling tests in FR1 and FR2 frequency ranges. The tests performed in NSA mode feature both LTE and 5G connections. They verify LTE/5G signaling protocol behavior, OTA RF/TX measurements, end-to-end data testing with LTE & 5G bearers, as well as mmWave OTA signaling and RF measurements. It provides easy guidance via dashboards and customizable workspaces which allow quick access to the various types of 5G measurements.

**Rohde & Schwarz USA, Inc.**

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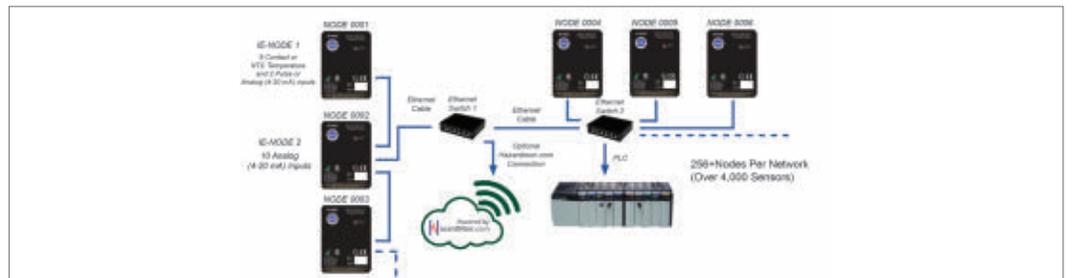


**Location Asset Trackers**

Abeeway Asset Trackers use multiple location technologies (GPS, Low-power GPS, Wi-Fi, and BLE) to allow accuracy, speed, and indoor/outdoor use. The technology sends GPS calculations to the cloud, making location tracking faster and extremely energy-efficient.

**Saelig Company, Inc.**

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**Remote Monitoring Interface**

The Industrial Ethernet Node (IE-NODE) is a remote monitoring interface designed to provide sensor data to PLC's or other automation and control systems. The IE-NODE operates by reading its sensor inputs and sending processed data when requested by another system.

**4B Components**

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**Compact Radio Control**

MINI, a compact radio control, is used to remotely control various electrical systems (operating distance: 150 m). The handheld transmitter provides a control panel that is customizable (on request) and resists intensive use. The MITO electronics provide an automatic search of the best available free frequency even while operating (bi-directional LBT Listen Before Transmit system). The identification code is unique and the transmission is clear from possible interference from any other system present in the area of use.

**Elcac**

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**Manage Pallet Rack Inspections**



Able to be accessed from anywhere, **Damotech's Platform** serves as a centralized solution to keep all documentation related to racks up to date. It facilitates the sorting and reporting of deficiencies found during a conformity inspection of the racking systems and ensures consistency in reporting across multiple facilities. The inspection software provides a visual representation of a warehouse in plan view. The intuitive interface makes it easy to zoom in on rack locations, view the status of deficiencies, and track progress toward addressing them. A list of all inspections and deficiencies are visible and can be sorted or generated in a report.

**Damotech**

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**Work Cell Operations (WCO)** makes it possible to include all manual production tasks, work cells, and stand-alone machines in the IT-supported planning, control, and monitoring of production. WCO provides all the tools to combine automated and non-automated production steps in a uniform production management system.

**Fastems, LLC**

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**Connect Data + Devices**

**Olympus Scientific Cloud** is a single-source hub to enhance Olympus connected devices with data management, fleet management, and other features that streamline and improve inspection and analysis processes.

**Olympus Corp.**

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**Warehouse Management Execution**



The **Warehouse Management and Execution System** combines Softeon's WMS with its WES. The WES provides visibility, orchestration, and optimization of order picking and related processes, which include maximizing materials handling system use, leveraging capabilities far above what is available today—even in advanced WMS.

**Softeon**

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**Flow Measurement Visualization**



**Micro Motion ProcessViz** is a standalone solution for flow meter process data visualization. Having an instant visualization of raw process data translates into direct, actionable information, helping plant operators to reduce the time needed to identify a problem in the flow process.

**Emerson**

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**Voith Digital Ventures**

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**ABB**

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**Ultra-Reliable IMU Sensor**

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**ACEINNA Inc.**

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**Wireless Monitoring System**

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**Regal Beloit Corporation**

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**Compact Power/Energy Sensor**



Ophir L40(500)A-LP2-DIF-35 is a laser power/energy sensor that can measure up to 4kW without the need for water cooling. The L40 measures CW lasers up to 500W and pulsed lasers up to 2kJ. The compact design makes it easy to place between optical components when troubleshooting a beam path. The sensor can handle large, unfocused beams of 35 mm diameter, as well as narrow, high density beams down to 1 mm @ 1kW.

**MKS Instruments, Inc.**

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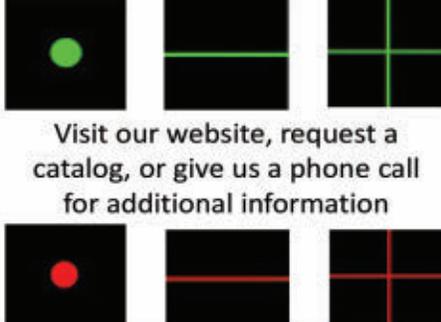
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### ADLINK Technology

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**FROM THE COVER**

**Asphalt Density Inspection Tool**  
*seamlessly integrates with GPS systems*



PavScan RDM 2.0 is an asphalt density assessment tool that provides accurate real-time measurements to ensure pavement life and quality.

It incorporates a sensor design built specifically for the extremes of the asphalt paving environment, foldable deployment arms with high-visibility for worksite safety, and has a warm-up time of under one minute when the ambient temperature is over 70°F.

PavScan RDM is ideal for uncovering problems that occur during the paving process, including poor uniformity and significant variations in density. By avoiding these problems, PavScan helps avoid such premature failures as road raveling, cracking, and deterioration along joints.

Automatically measuring the dielectric value to identify anomalies in real-time, the technology enables users to obtain critical density data for QA/QC of new pavements. PavScan does not result in any site hazards or require closing off work areas.

**Geophysical Survey Systems, Inc.**

MORE ONLINE: [nedinfo.com/76475-100](http://nedinfo.com/76475-100)

**Wire Termination Pins and Receptacles**

*can be insert molded or potted around*



A series of crimp pins and receptacles are precision-machined to exacting tolerances and gold plated for excellent conductivity and durability. The receptacles are fitted with the high reliability Mill-Max spring finger contacts. With a broad acceptance range of wire sizes (16 to 24 AWG) and mating leads (.022 to .063 in.), this group of diverse crimp termination products offers flexible solutions for a variety of applications. These crimp pins and receptacles may be used to terminate discrete wires, such as in board-to-board or intra-board connections for power or signal.

**Mill-Max Mfg. Corp.**

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**FROM THE EDITOR**

**Disrupting the  
DISRUPTION**



Manufacturing, as I see it, is an industry dependent on long-term plans and coherent, consistent strategy. This is why, from an outside perspective, the great digital transformation appears to be moving at such a painfully slow pace—the goal is always to absorb change into core processes, to build up an archive of case studies and best practices to calculate precise ROIs and plot careful implementation strategies before undergoing any significant move. In essence, it's a process of neutralizing the disruption of disruptive change.

But in the wave of uncertainty unleashed across the industry and across the world by COVID-19, this model no longer applies. Manufacturing is being disrupted, we're all being disrupted, and there are no best practices to guide us through. So instead of careful plans and strategies, most of us are just reacting, making the best possible decisions on the best possible data available.

Last month, we conducted a survey of readers across many of our books here to understand more precisely both how COVID-19 is affecting your businesses and how effective your reactions to it have been. It covers a wide range of topics—from supply chain disruption to keeping workers safe, to basic business continuity.

The results of this survey were amazing, to say the least. Through the many new best practices and effective strategies being adopted across the industry, the overwhelming impression from the responses was that of optimism, strength, and success. In total, about 53% of respondents indicated that their business is running at or above pre-COVID production levels and nearly 86% have been able to successfully navigate the changing supply channels despite nearly 50% of them dealing with closed offices or facilities.

It's a remarkable result that, I think, underscores the innovative strength of the industry all the more. Yes, manufacturing is an industry best run on careful plans, but in a pinch it can succeed in the lightning-fast changes the world needs to function.

This is also a kind of theme through this whole issue of NED. The clearest example is the Cummins Filtration story (pg 8) where a careful, long-term plan to improve diesel engine filters suddenly became a life-saving project to help supply N95 masks to workers, health care providers, and at-risk citizens in need. But it goes beyond that, too, from Dubak Electrical Group's high-speed temperature scanners to Triax Technologies' IoT-enabled proximity sensor/contact tracing device (pg 12) to the 101 other breakthrough innovations and solutions covered in these pages—a whole new world of innovation and opportunity is erupting around us despite all this confusion and uncertainty.

Combined, the survey results and these concrete examples of innovative brilliance confirm my confidence in this industry even more. The basic lesson is this: times are tough, but manufacturers are tougher. If we continue on this path, nothing will stop us.

To help, I invite you to check out the full survey results and use the insights and tactics it covers to help keep your workers safe, your production running, and your processes sound: [newequipment.com/21130510](http://newequipment.com/21130510).

**T. Travis Hessman**  
Editor-in-Chief

# 10 Forklift Safety Tips

## Crews Should Keep Top of Mind

*Prevent workplace hazards with these easy-to-implement forklift safety reminders.*

By Jeremy Wishart

**F**orklifts are often the workhorse of any productive warehouse or facility, but, as with any heavy machinery moving throughout a facility or warehouse, they also represent one of the most significant hazards in the workplace.

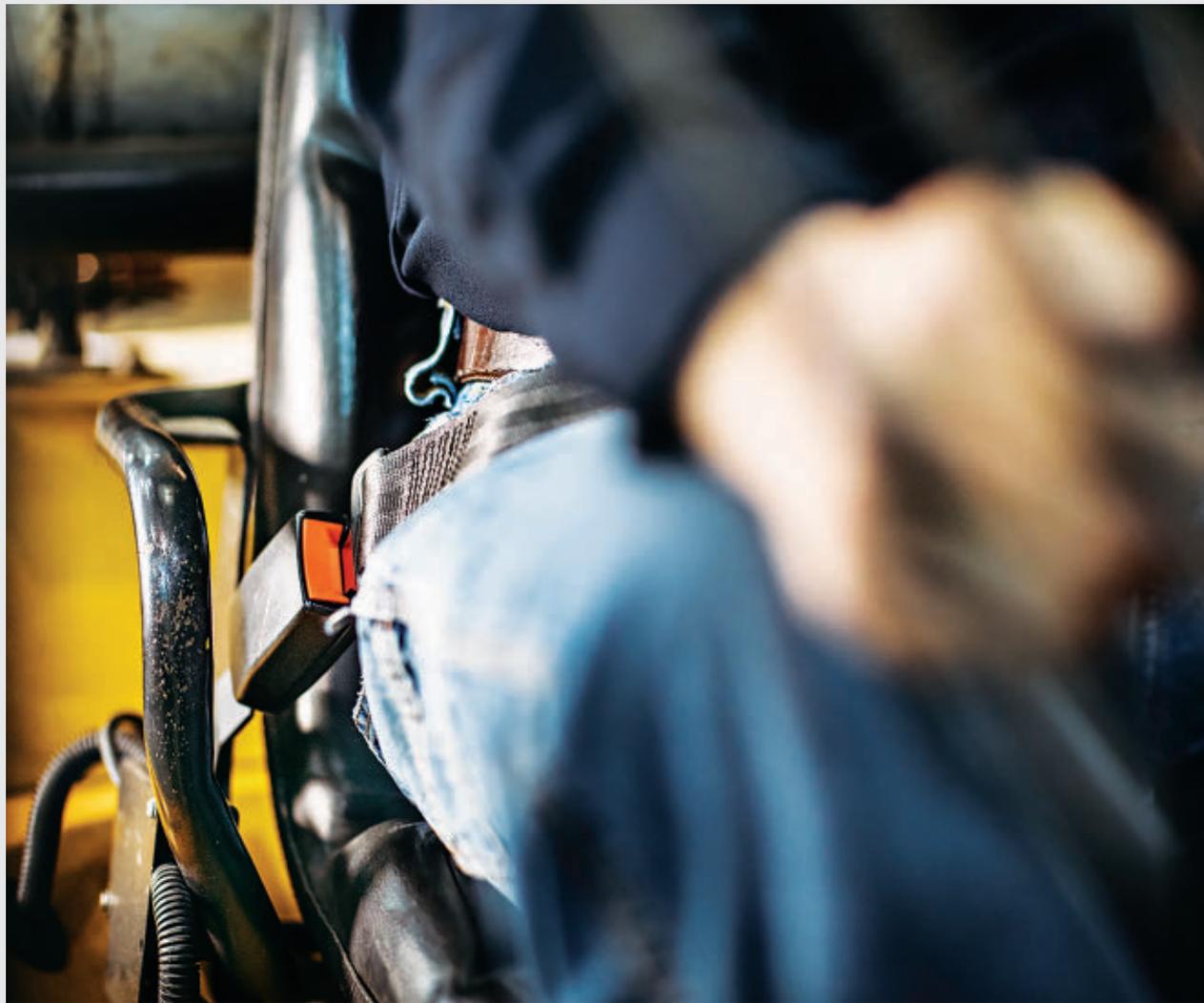
Forklift operators and other employees working around heavy equipment are at risk of hazards such as collisions, tip-overs, and struck-by conditions, for example. Today, forklifts are safer than ever, but only when crews follow proper safety procedures.

Here are 10 safety tips to help ensure employee safety and prevent hazards:

1. **Complete a routine check of equipment before operating** and notify management with damages or problems.
2. **Wear personal protective equipment** as provided by the employer. Hard hats, protective footwear, and high-visibility clothing are recommended when working around forklifts.
3. **Always wear a seatbelt while operating a forklift.** It's important for operators to buckle up while operating a sit-down forklift, as overturned forklifts are a leading cause of forklift-related accidents. Wearing a seatbelt can save operators from being crushed by a machine's overhead guard or roll cage in the event of an accident.
4. **Keep loads within the forklift's weight capacity.** By exceeding the weight capacity of a forklift, employees can greatly increase the risk of tipping the machine. These load capacities can be double-checked in the equipment's operating manual and are also listed on the machine itself.
5. **Operate at a safe speed, use the horn when vision is obstructed, and use caution on grades or ramps.** Operators should use the horn to alert pedestrians or other forklift operators nearby to avoid an unnecessary collision. Take corners and turns slowly to minimize the risk of tipping.
6. **Set the parking brake, lower the forks, and set any controls to neutral when finished operating.** Safely parked machines reduce the risk of unintended movement when left unattended. If a forklift is parked on an incline, employees can further secure the machine with wheel blocks.

For businesses operating propane forklifts, here are a few fuel-specific safety reminders to keep in mind, too:

7. **Inspect propane cylinders prior to operation.** Check cylinders for rusting, dents, gouges or worn O-rings and valves. Cylinders that show signs of wear or leaks shouldn't be used and may need to be replaced, even if within the cylinder's requalification date.



8. **Store cylinders in a secure rack or cage.** Propane cylinders can be stored horizontally with the pressure relief valves in the uppermost position, and operators should use proper lifting techniques when removing them from storage and placing onto the forklift. A facility's local propane supplier can help determine the best location for the cylinder storage rack or cage, which is generally located away from exits, stairways, entryways, and high-traffic areas.
9. **Close the service valves on cylinders when not in use** to prevent unintended fuel loss and potential injury around internal combustion engines.
10. **Ensure the pressure relief valve on the propane cylinder is secure and pointing away from the locating pin.** Check that the pressure relief valve fitting is roughly 180-deg. from the forklift's locating pin.

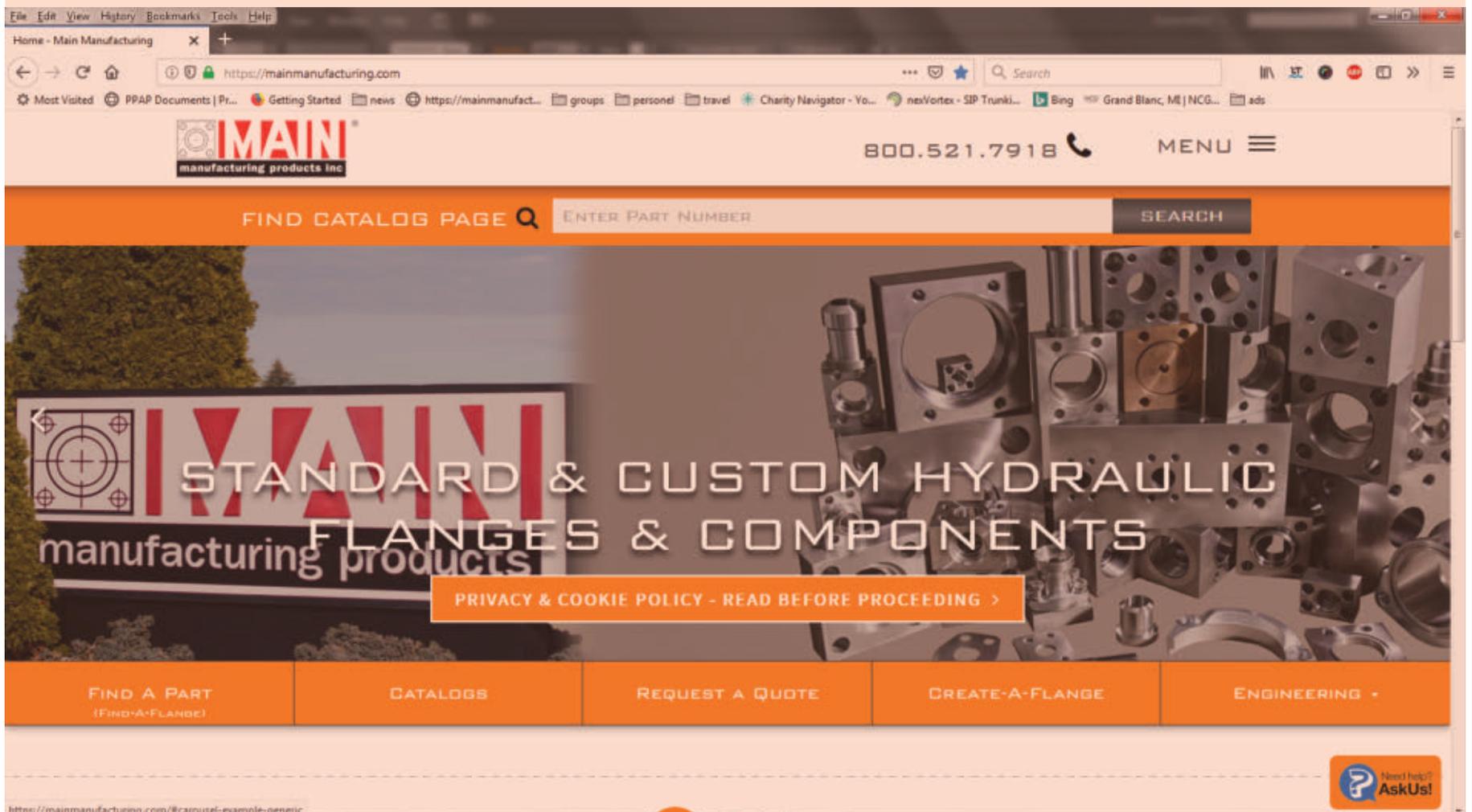
It's also important to note that the propane industry has dedicated procedures to support businesses operating

with propane-powered equipment, including assistance from local propane suppliers across the country. Propane suppliers can provide additional safety support in a variety of ways. For starters, they can help crews identify the most convenient location for cylinder cages, so they don't interfere with workflow. They can also inspect cylinders each time they're exchanged, remove damaged cylinders from service, and repair and replace worn valves and O-rings on cylinders as needed. Propane suppliers also work to ensure all employees understand how to install propane cylinders on their forklifts safely, and some propane suppliers offer additional safety training opportunities for forklift customers, too.

Regardless of forklift energy source, it's imperative for facility managers and forklift operators to regularly review and practice proper forklift safety procedures. **NED**

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