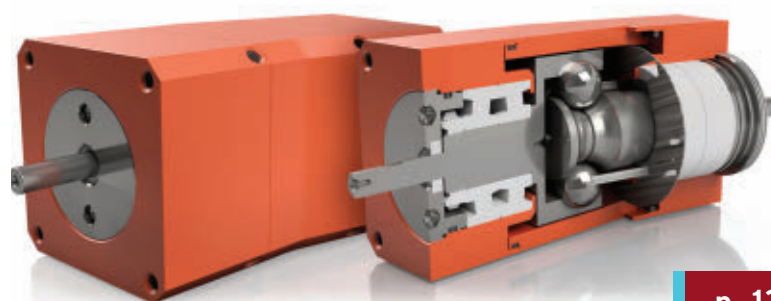


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▶ FOOD FOR THOUGHT: VERTICAL FARMING

Amid a booming world population, technology is helping find more efficient and earth-friendly ways to grow crops.

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High-Mix Feeding and Assembly

Engineered Vision's Flex-Bot offers an alternative to single part bowl feeders with its flexibility and orientation capability through robotic placement and is a cross-industry solution for manufacturers of all sizes.

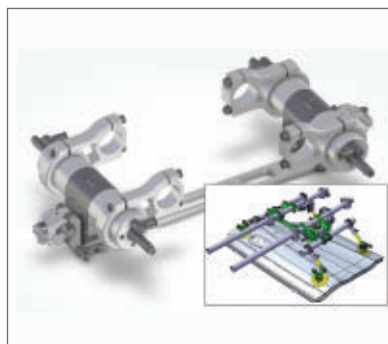
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Real-Time Warehouse Tracking System

Zebra MotionWorks Warehouse from Zebra Technologies provides immediate ROI by allowing you to see where critical assets are, automate transactions, streamline workflows, reduce labor, and improve accuracy.

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Flexible Pressroom Tooling

Reducing the number of operations in a press line by producing more parts via a single stamping, Bilsing Automation's swivel unit can be adjusted to the exact degree to grip and handle parts for each application.

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Portable Temperature Detection

TF-350 from Thingsfactory is a fully portable facial temperature sensor that detects, analyzes, and classifies the facial temperature of humans in crowded, queued or individual situations with an accuracy of 5 hundredths of a degree.

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PRODUCT SPOTLIGHTS



CENTRIC International's Status Pro-Line laser interferometer measures and compensates CNC and CMM machines to minimize downtime and reduce overall costs.

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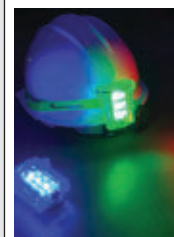
Suited for die and mold machining, Methods Machine Tools' OKK VB53a Vertical Machining Center features a range of features that minimize vibration and maximize accuracy.

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Omron Automation's CP2E Series all-in-one controller provides advanced control that enables IIoT connectivity for compact machines.

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Attachable directly to helmets or hard hats, Koehler Brightstar's palm sized Freakin' Beacon is a lightweight, rugged, personal safety beacon that is built for easy operation even with a gloved hand.

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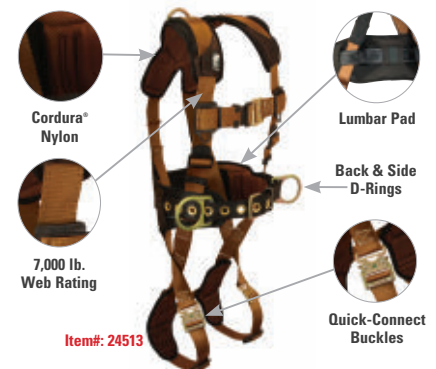
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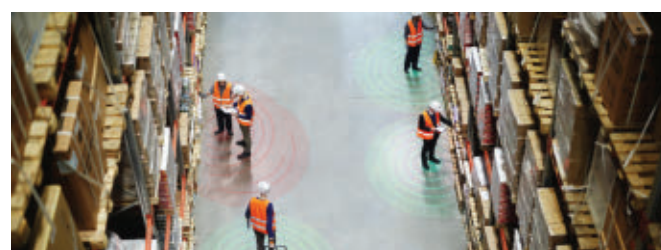


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To help workers maintain a proper distance from each other, the **ProGlove Connect Proximity app** provides an additional layer of feedback on an Android device alone or when paired with a Pro-Glove MARK barcode scanner which rests on the employee's hand. When fitted with the **MARK wearable scanner** and paired Android device, workers coming within close proximity of each other are alerted. The alerts come to the workers via a full array of options on the wearable scanner including audio sound, optic LED light, and haptic vibration signals.

ProGlove Inc.

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Screening Mobile App for COVID-19

CrowdBlink Protect, a screening and compliance application, offers a new way for construction, manufacturing, and supply-chain organizations to screen individuals for COVID-19 symptoms, fitness for work, and risk factors prior to allowing access to a workplace or location. It offers an assessment questionnaire for COVID-19 symptoms, records an employee's temperature, and then scans an employee's ID to associate the results with the individual worker and returns a PASS or FAIL result.

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The **EDGE Family of Flow Electronics** interfaces with positive displacement or turbine flow meters to provide better access, understanding, and control of processes. When installed on a flow meter, the EDGE Electronics can force the sensor to output a frequency or analog signal output for greater flexibility when interfacing with readout equipment or control rooms. A Bluetooth mobile app supports signal processing, allowing users to monitor and program flow meters from a smartphone to allow for remote correction of non-linear flow meters to keep a linear analog output.

AW-Lake Company



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Wireless IoT Bolt Connects Remote Assets

Anybus Wireless Bolt IoT enables reliable cellular-based internet connectivity for assets in the field, using LTE-based networks NB-IoT and CAT-M1. The bolt includes all elements needed to get stationary or mobile assets online over a cellular connection. Packaged in the unique Bolt format for on-asset M50 hole mounting, it features an IP66/IP67 housing with UL NEMA 4X certificate for outdoor mounting, an integrated cellular antenna with a modem, a microcontroller, and firewall.

HMS Industrial Networks



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Tough, 5G-Compatible Notebook



The **B360 notebook** delivers lightning-fast response through 10th Generation Intel Core processor and Intel UHD graphics and is engineered for 5G. This fully rugged laptop is light, portable, and meets the rugged

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Getac Technology Corp.

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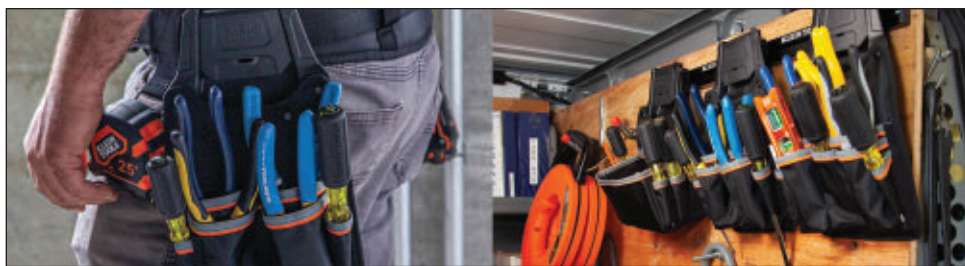
All-in-One Solution for Mobile Workers

The smartphone **Smart-Ex 02** and **Ex-Handy 10**, which have been specially developed for tough industrial use in hazardous areas of ATEX zones 1/21 and Division 1 as well as zones 2/22 and Division 2, now offer a range of charging solutions, carrying solutions, smart peripherals, and various accessories to create a future-proof solution for usage in harsh environments. The accessories include a versatile mounting plate that can be mounted anywhere the worker needs it for hands-free operation, the Battery Pack Charger Ex-BP S02, the Smart-Ex Watch 01, the Cube 800 infrared and HD video camera, and much more.

ecom instruments GmbH



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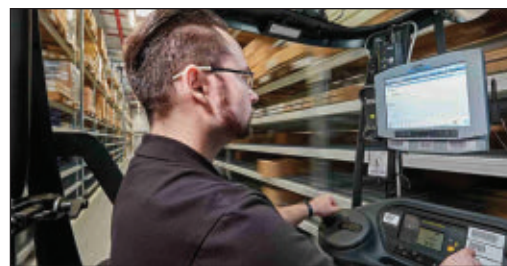


Customizable Tool Belt

A build-your-own tool belt system offers trade professionals an option that has quick-access and storage while being customizable to their needs. The **Tradesman Pro Click-Lock Modular System** features multiple pouches and holding options all designed to allow you to carry and transport both tools and parts in a system you can easily customize. The system has four tool pouch options to accommodate the tools needed for different tasks, such as trimming or piping. You can load the pouches with tools for those tasks, take only those pouches you need for the day, and then store them on the Wall Rack until the next use, to save time and keep everything organized. The pouches are durable and built to be able to quickly move from the wall rack to the belt while still attaching securely.

Klein Tools

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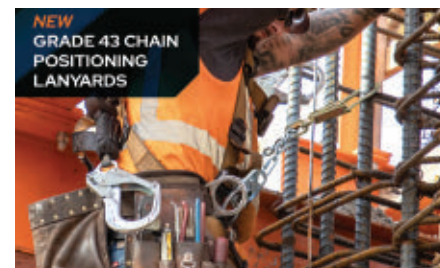
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ABB Robotics

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Jonard Tools

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Layoffs, Social Distancing May Drive Machine Shops to Automate Finishing Operations

Secondary finishing operations are able to be automated by mounting abrasive tools into the CNC machine toolholder without taking the part offline.

By Jeff Elliot, Brush Research Manufacturing

Whether driven by the reduction of in-shop personnel due to layoffs or to maintain social distancing guidelines into the future, many machine shops will likely be re-evaluating ways to eliminate labor-intensive manual operations if they can be automated instead.

At the top of this list are secondary finishing operations that are conducted offline to remove excess material on parts fabrication. Today, much of this work is still performed by hand using oscillating tools, grinders, files, abrasive hand pads, and wire brushes.

Fortunately, secondary operations such as honing and polishing can be accomplished using a variety of abrasive tools mounted in the CNC machine toolholder and carousel without taking the part offline. The better news is that in addition to reducing in-shop labor requirements, completing surface finishing simultaneously in the same operation as machining also speeds production of high-volume parts.



Brush Research Manufacturing

"When the economy begins to recover in the coming months, machine shops are going to be driven to continue to find a way to increase efficiency and one way is through automating offline processes," says Tim Urano, Quality Manager at Wolfram Manufacturing, a company that machines metal parts with complex geometries on 4 and 5-axis machines. "So, any time we can incorporate secondary operations right into the machining process, we save time, money, and also reduce our in-house labor requirements."

According to Urano, Wolfram Manufacturing produces a variety of complex parts with through-holes and so has automated the cross-hole deburring process. Removal of burrs and sharp edges in cross-drilled holes and other difficult-to-access areas such as undercuts, grooves, slots, or internal holes is critical. Failing to remove burrs can cause blockages or create turbulence in the flow of fluids, lubricants, and gases through critical passages.

To do this, the machine shop incorporates Flex-Hones in a variety of sizes in its tool carousels. The Flex-Hone, from Los Angeles-based Brush Research Manufacturing (BRM), is characterized by the small, abrasive globules that are perma-

nently mounted to flexible filaments, the product is a flexible, low-cost tool used for sophisticated surfacing, deburring, and edge-blending. The hones are available in a variety of abrasive types, sizes, and grit selections.

Urano says the hones have been installed for eight years and are used daily, usually several times an hour, on some of the shop's highest volume parts.

"On a given part, we might deploy two to three different size hones, depending on the number of cross port intersections and different hole sizes," explains Urano. "It is very easy to put a Flex-Hone in a toolholder, give it a simple toolpath cycle, and let it run."

"Automating cross-hole deburring eliminates a lot of offline work," adds Urano. "The parts we make are complex and have a lot of intersecting holes, so relying on a person to repeat that process every single time to the quality level required will always introduce some potential inconsistency there. However, if you just let the CNC machine do its work, it will achieve more consistent results."

The same tool can also be used to create a high surface finish on the internal bores of a valve assembly actuator that the shop manufactures. As part of a multi-step process, Wolfram Manufacturing uses a coarse grit Flex-Hone to smooth out any irregularities left during drilling and finishes the bore with a fine-grit hone.

In addition to honing, there are a variety of other finishing operations that can be automated using abrasive nylon brushes in a disc, wheel, cup, and end brush designs.

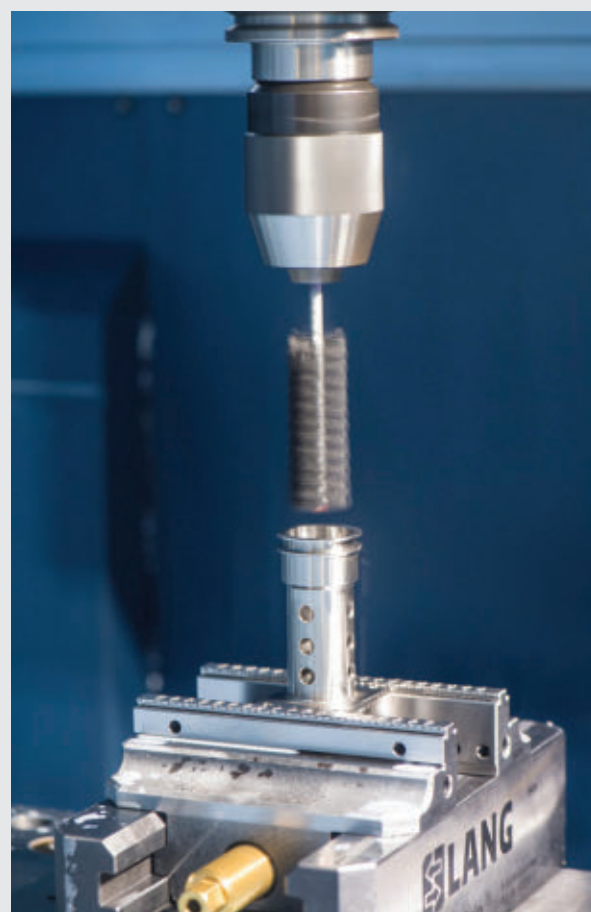
When an application calls for surface finishing, cleaning, polishing, deburring, edge blending, or removal of paint, rust, or other contamination, these types of tools are the ideal solutions. In some cases, these multi-purpose tools can even eliminate machining operations traditionally performed by chamfer tools and face mills.

For JR Precision & Welding, a machine shop in Houston, Texas, the issue of removing large burrs from machined holes in an extremely hard 4140 steel alloy part used as a muzzle brake for firearms was proving a challenge. To remove these burrs, the company decided to automate the process using a 3" diameter abrasive nylon wheel brush with silicon carbide filaments from Brush Research.

Muzzle brakes are devices connected to the barrel of a rifle or pistol to help control recoil and the rising of the barrel that normally occurs after firing. The parts use slots, vents, holes, and baffles to redirect a portion of propellant gases to counter recoil and unwanted muzzle rise. Where and how these holes are placed has a tremendous effect on recoil and muzzle movement.

When machining these holes, however, large burrs were forming at the oval-shaped gas ports. The cylinder was made of 4140 steel, which is a 1% chromium-molybdenum steel alloy that is generally hardened and tempered to a tensile strength of 850 to 1,000 Mpa.

According to says James Mawazeb, Director of operations and lead engineer at JR Precision & Welding, the abrasive nylon fit well into the shop's 5-axis machine magazine holder and existing toolholders.



Brush Research Manufacturing

"In addition to removing the large burrs, the wheel brush also provided a soft edge break to the ports so they were not razor-sharp without affecting the surface finish," says Mawazeb.

Even miniaturized brushes as small as 0.014" in abrasive nylon, carbon steel, stainless steel, and diamond abrasive filaments can be used with adaptors on CNC equipment. These tools are ideal for deburring internal and external threads. Internal threads often have micro burrs at hole entrances and exits, on thread crests, and on most slot edges. External threads on bolts, screws and spindles have similar issues, particularly at the start of the thread.

Regardless of the type of finishing operation or abrasive tool used, automating secondary processes is one-way machine shops can reduce unnecessary in-shop labor to replace lost personnel and to maintain social distancing into the future. **NED**

JEFF ELLIOTT is a Torrance, Calif.-based technical writer. He has researched and written about industrial technologies and issues for the past 15 years.

For more, visit newequipment.com/21130401

Viega MegaPressG Pressing System Fills Market Niche

“Until this year, there was no pressing system approved for carbon steel gas and fuel oil pipe larger than 2 in.”

By Kristen White

Pressing pipe has been gaining in popularity, largely due to its substantial advantages in installed cost, ease, speed, and safety over traditional methods of joining pipe. As the technology is adopted more widely, manufacturers continue to introduce press fittings for a variety of pipe materials, including copper, carbon steel, stainless steel, and PEX.

The number of approved applications also has increased to include water, compressed air, fuel oil, gas, and various chemicals. However, until this year, there was no pressing system approved for carbon steel gas and fuel oil pipe larger than 2 in.

Earlier this year, Viega LLC, the company which brought pressing technology to North America in 1999, solved that problem with three larger sizes of MegaPressG, the first press fitting system for carbon steel pipe approved for use in gas and fuel oil applications in larger pipes.

It's an expansion of the MegaPressG system, which previously had been available only in sizes up to a 2-in. pipe. The new additions include fittings for 2 1/2, 3, and 4-in. pipe.

Constructed of carbon steel with a corrosion-resistant zinc-nickel coating and first-of-its-kind graphite separator ring in larger sizes, MegaPressG is suitable for use with ASTM Schedule 5 to Schedule 40 carbon steel pipe.

The design of the large-diameter fittings took four years, with additional testing of the graphite separator ring needed in order to pass the stringent standards for use in natural gas applications.

Though it might not have seemed so to impatient contractors, Viega moved with all deliberate speed, says Will Dutcher, Product Manager, Metals IPS, Viega.

“Viega is very methodical when it comes to the introduction of new products. We want to release products that we've tested to be sure they perform in every environment. And doing so can take time,” he says.

And adding MegaPressG fittings up to 4 in. proved to be more complex than simply enlarging the fittings and other components. There were a number of engineering and material challenges, Dutcher says.

For example, the amount of force needed to press a 4-in. fitting is significantly higher than that for a 2-in. fitting. In order to achieve this pressing force, Viega recommends using the RIDGID Press Booster or equivalent alternatives.

Smaller MegaPressG fittings have 304 stainless steel separator rings, which would not work on the larger sizes. Viega scientists tested a number of possible materials before choosing a graphite separator ring. The ring can withstand temperatures up to 1,000°F, an important safety feature that can prevent leaks during a fire.

Viega also redesigned the component housing in the larger fittings for a more secure connection. The HNBR sealing element also was re-engineered for effective coverage in the larger sizes.

Prototypes were tested in the field and scrutinized by focus groups, Dutcher says: “When we are testing a fitting, it's getting installed in a real-world scenario and it needs to perform in 10°F and up in Vermont in the winter.”

Ultimately, the new fittings exceeded the requirements for Canadian Standards Association CSA LC 4 certifications.



Viega LLC

“The tests for us are baseline, but not where we stop,” Dutcher says. “Viega likes to go beyond that just for the confidence in our fittings and to be able to tell customers that if we say a product is rated to 200 psi, we've actually tested it to 1,000 psi.”

The fittings came just in time for Schreiner Mechanical of Frankenmuth, Mich., which put them to work piping a soybean-roasting plant in Gilford, Mich.

In order to feed the 12-million BTU burners that roast the soybeans, Schreiner created a manifold with 4-in. gas lines. They work their way down to 2-in. lines throughout the plant. Thanks to the new Viega fittings, the contractor didn't have to thread the gas pipes.

“If we'd had to thread this, it would have changed the whole philosophy on how to do things,” owner Steve Schreiner says. “It would have made things 10 times more difficult, being 40 ft in the air, so we would have had to change the installation, plus it would have tripled or quadrupled the labor intensity. We're talking about lift rentals and all things that come into play, plus the costs incurred for that if we'd done it a different way than pressing. Threaded pipe would have been absurd.”

Of course, even 4-in. pipe doesn't meet all specifications, so will Viega develop fittings up to 6 in.?

“It is something we're looking into,” Dutcher says. “It's inevitable that when you come out with one size you hear from your customers, well, when are you going to come out with the next size?”

However, just like with MegaPressG, designing for 6-in. pipe poses its own set of challenges. For example, it would be pushing the current limits of press tools and ring sizes, as well as battery power. Dutcher hints that Viega is considering alternative possibilities.

“If we continue to push into those new frontiers of sizes, we have to keep an open mind that it doesn't have to be the traditional press for which we're known, but an innovative solution that improves the lives of the installer and end-user,” he says.

In the meantime, Viega is designing its own line of MegaPressG valves, which could launch as early as next year.

“We want customers to have a full Viega system solution so they have one manufacturer they're working with,” Dutcher said. **NED**

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Food for Thought: Vertical Farming

Amid a booming world population, technology is helping find more efficient and earth-friendly ways to grow crops.

By Thomas Renner

Living Greens Farm is not your grandfather's farm. There are no acres to harvest, tractors to fuel and repair, or wagons to haul. The Minnesota business produces an assortment of fresh greens from an indoor farm with environmentally-friendly measures such as less water, less shipping, and fewer herbicides. And less land. A lot less.

Living Greens Farm is one business joining in the world-wide emergence of vertical farming. In about 4,000 square yards—the equivalent of one acre—the business extracts the same quantity of food produced on about 100 acres of conventional agriculture.

With the world population rapidly expanding and the land required for farming rapidly diminishing, vertical farming is expected to grow significantly over the next few years. Busi-

ness Wire reported vertical farming values in the United States are expected to reach \$3 billion by 2024, growing at a compound annual growth rate of 24% through 2024.

"We whole-heartedly believe indoor/vertical farming is the path forward for agriculture," said Nate Klingler, Vice President of Business Development for Living Greens Farm. "Demand for food is growing, and demand for safe, delicious, and healthy food is growing at an even faster rate."

Another factor is playing into the growth of vertical farming: automation. The growth of the industry coincides perfectly with the advent of sophisticated machinery that allows many farming tasks to be completed with automation. In 2018, an Ohio business broke ground to become the nation's first fully-automated vertical farm.

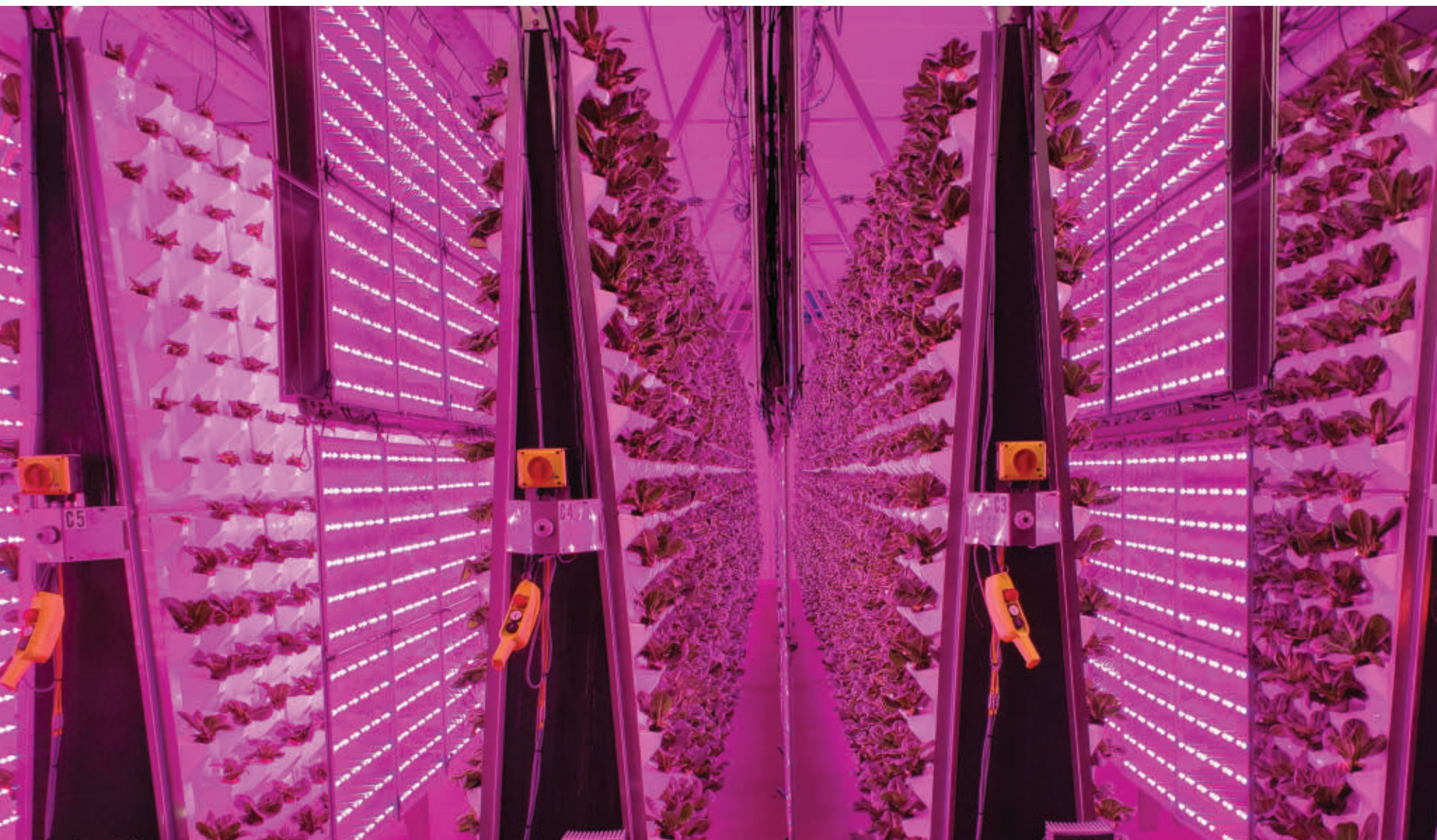
"The majority of vertical farming systems have some kind

of automation built into them so they can operate 24/7," said Charles Jaskolka of igus, whose company's products are included in a traverse system at Living Greens Farms. "Plants need constant attention and these facilities provide consistent environmental conditions that optimize growing conditions."

HOW THEY DO IT

Each vertical farm develops its own science and mechanical equipment for producing crops. Living Greens Farm uses a patented Air Grown vertical system that dramatically reduces the need for land, energy, water, and space.

Plant roots remain in the air 99.9% of the time, the company reports, and thrive when spritzed with nutrient-rich mist. No soil is needed. "That opens up a lot of possibili-



The "Air Grown" vertical system at Living Greens Farm reduces the need for land, energy, water, and space. In about 4,000 square yards, it produces the same quantity of food produced on 100 acres of conventional agriculture. Living Greens Farm

“With the world population rapidly expanding and the land required for farming rapidly diminishing, vertical farming is expected to grow significantly over the next few years.”

ties, including the fact that frozen ground during winter is no longer an obstacle,” the company says on its website.

The result is healthy crops that thrive under the perfect balance of light, air, humidity, and nutrition. Its products are among the safest and healthiest offered to consumers. Its products require 95% less water and shipping, and 99% less land. Residents in the Midwest can purchase products at Whole Foods, Walmart, and many other grocery stores.

The most critical component to Living Greens’ method is a patented traveling carriage system. The system allows the plants to receive a consistent supply of nutrient-rich water. Living Greens received a patent in 2016 for its irrigation system. The system developed over more than a decade of research and development.

“Living Greens Farm was a science and engineering operation for many years while we worked to make our proprietary aeroponic grow systems commercially viable,” Klingler said. “There were many challenges along the way. Many different versions of the systems were developed, tried, scrapped, or refined. That went on for years.”

TRAVELING CARRIAGE IRRIGATION

The traverse system used by Living Greens includes a 16-ft energy chain manufactured by igus, the Germany-based manufacturer of motion plastics. The company runs its North American operations out of Providence, R.I.

The H4-32 energy chain from igus is frequently used in applications that require high speeds and/or accelerations, quiet operation, and long travels. It is also used in applications where high fill weights are needed, such as the case with Living Greens.

A water line is set into the energy chain, and the system runs 24 hours a day and 7 days a week throughout the year. Living Greens has 74 traverse systems in place at its Minnesota location, and 12 more at a sister farm. Klingler said the company is also working to license its technology to people interested in starting their own farms in Europe, Asia, and Africa. Each energy chain dispenses 130,000 gallons of water each day, about 5,417 gallons per hour.

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“It’s important that our plants have a consistent supply of water, and this carriage system is the delivery method for supplying that water,” Klingler said.

PROTECTING THE WATER LINE

Jaskolka said the energy chain acts as a guide to keep the water line in place so that it does not wander or get caught in the structure. “The benefit of an automated system is that it allows for better coverage when watering the plants,” Jaskolka said. “It also doesn’t over saturate the plants because they get a dousing of water briefly and the water has a chance to soak in before they get their next drink.”

Klingler said developing the traverse system was one of the challenges in the company’s development. “We were working in a very small space,” he said. “The carriage needs to travel a relatively lengthy distance with a heavy water line. The main feature that we liked about the igus energy chain was that we

could incorporate water hose protection. Water is very important to our operation so protecting that source during delivery was essential.”

Energy chains from igus are used in a wide range of applications. The dry-running chains require little maintenance and resist dirt and debris. Engineered composite plastic materials from igus are designed with base materials, fibrous reinforcements, and solid lubricants that eliminate the need for external lubrication.

WATER TREATMENT

Klingler said the water comes from the city of Faribault. The water is completely distilled and then treated to provide what the plants need to thrive in a “spa-like” environment.

“We use inorganic salts to enrich our water. Using inorganic salts allows our growers the ability to choose the individual components the plants need to survive and thrive,”

Klingler said. “Inorganic salts also enable the plants to be able to obtain the nutrients they need in the specific ionic form they prefer. Organic nutrients tend to be in a more basic form and the plant then has to expend energy to convert the organic nutrients into the form they need.”

Living Greens grows mostly leafy greens such as Romaine, Butter Lettuce, mixed greens, and basil. It also has a nutrient and light recipe that maximizes flavor.

“Our products are grown indoors in exceptionally sanitary conditions away from all dangers that can cause food-borne illness,” the company says. “No birds, canal water, insects, animals or the like are allowed in. The result? Beautiful, safe, and delicious salads.”

RAPIDLY GROWING INDUSTRY

Living Greens Farm is not the only vertical farming business in the United States. There are plenty more, and the



One of the critical components at Living Greens Farm is a traverse system with a 16-ft energy chain, manufactured by igus, that provides plants with a consistent supply of nutrient-rich water.

igus

“A business in Germany has partnered with Kroger, a leading U.S. grocery store, to offer vertical farming units that can be installed in-store and inside restaurants.



A water line set into the energy chain feeds the plants and feeds the plants, delivering about 5,417 gallons of water per hour. Living Greens Farm has 86 traverse systems in operation to help grow its products. *igus*

industry is growing in other nations, too. Japan has more than 150 vertical farming businesses with artificial lights. A business in Germany has partnered with Kroger, a leading U.S. grocery store, to offer vertical farming units that can be installed in-store and inside restaurants. In Singapore, where 90% of its food is imported from over 30 countries, the nation's first vertical farm opened last year.

Besides demand, vertical farming is expanding because it can reach consumers quickly. By 2050, according to the U.S. Department of Agriculture, 66% of the population is expecting to be living in urban areas. “Producing fresh greens and vegetables close to these growing urban populations could help meet growing global food demands in an environmentally responsible and sustainable way by reducing distribution chains to offer lower emissions, providing higher-nutrient produce, and drastically reducing water usage and runoff,” the USDA wrote.

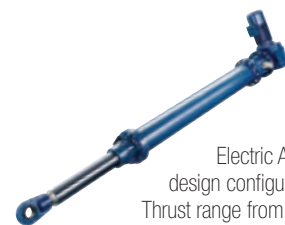
With its technology in place, Living Greens Farm is ahead of many others in an embryonic global business that is rapidly evolving. Living Greens Farm might not be your grandfather's farm, but the food tastes just as good, less manual labor is required, and crops are not ruined by weather whims. The time is right for a new way to generate food in an environmentally friendly way.

“With dwindling amounts of land that can be used for farming, as well as the decreasing amount of clean water available for farming it just makes sense,” Klingler said. “Living Greens Farm plans to play a big part in this path forward and is excited to see what the future holds.” **NED**

The True Pioneer of Electric Actuators

RACO International, LP

RACO Electric Actuators provide a reliable solution for all of your linear and rotary motion needs. A variety of design configurations provide a multitude of thrust and speed ratings. RACO Electric Actuators are designed to be robust with virtually no maintenance while also being economical to operate and friendly to the environment.



RACO MA-Series

The modular design of RACO ACME and Ballscrew Electric Actuators allow for a variety of design configurations while offering a Linear Thrust range from 70lbs to 225,000lbs, Linear Rod Speeds from 0.2"/sec to 30"/sec and Linear Travel (stroke) up to 20 ft.

RACO LM-Series

The RACO LM-Series is designed for high speeds and long travel (stroke) with capabilities that are frequently found in today's automation processes. The LM can be used as a single axis system or can be combined to form a multiple axis system.



RACO Rotary-Series

The Rotary Actuator is designed to automate the operation of valves, gates, dampers, louvers and other positioning applications requiring partial or multi-turn rotational movement.



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Motors & Drives

CABINET-FREE DRIVE SYSTEM

More and more finished goods now have to be modified or created in several different variations on the manufacturing line to accommodate consumer preferences. This requires much greater flexibility for factory operations and equipment when changing the product or format on a production line, for example, in a packaging facility.

The cabinet-free electric drive system, IndraDrive Mi, helps manufacturers meet those challenges with more flexibility and modularity. IndraDrive Mi eliminates drive electronics from the cabinet and lets machine designers mount a more compact controls enclosure directly to the machine—freeing up valuable plant floor space and reducing energy consumption for cabinet coolings—while all the motion modules are programmed in a single software environment.

Bosch Rexroth

www.nedinfo.com/76477-25



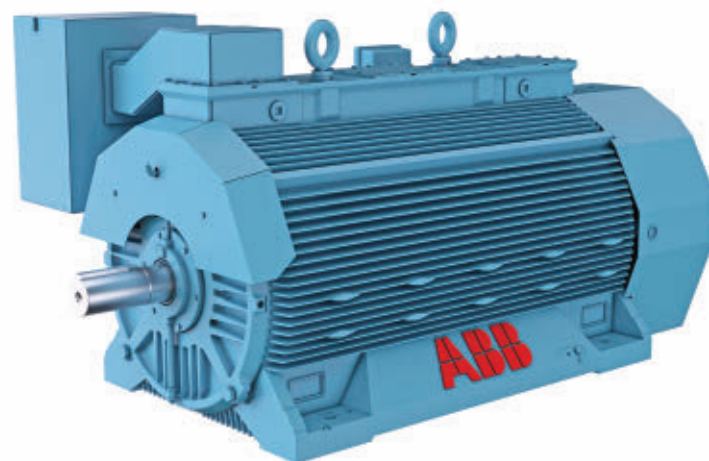
SERVO SERIES MAXIMIZES MACHINE PERFORMANCE

MELSERVO-J5 Series of AC servo motors, amplifiers, and motion control units brings performance, reliability, flexibility, and efficiency to a wide range of industries, including manufacturing, packaging, printing, converting, material handling, and more.

New to the MELSERVO-J5 Series is the quick-tuning function that allows users to quickly and reliably tune their servo mechanism in approximately 0.3 seconds. The servo amplifier sets the speed loop gain and suppresses machine resonance through the servo on command. No tuning experience is required because gain values are automatically generated, reducing machine setup time and effort. Additional functions and features include an advanced vibration suppression function, multi-axes servo amplifiers, expanded predictive maintenance capabilities powered by Mitsubishi Electric's Maisart AI technology, and multi-network capability including compatibility with CC-Link IE TSN and EtherCAT. In addition, MELSERVO-J5 was designed with long-term migration paths in mind, making retrofits and upgrades, both now and in the future, easier and more cost-effective for users.

Mitsubishi Electric Automation, Inc.

www.nedinfo.com/76477-26



MOTORS OFFER POWER-DENSE DESIGN

Above NEMA (ANEMA) NXR 7100 motors offer more HP per pound than conventional TEFC (totally enclosed fan cooled) motors but with a smaller frame size in some power ratings. This helps save space, up to 8 in. in overall length in some cases, which enables more compact installations for industrial applications. The NXR 7100 is Class I Div 2 capable, making it ideal for hazardous area locations.

The NXR motors offer improved cooling, a critical factor to extend the life of the motor. An internal cooling loop circulates air inside the motor, moving heat from the rotor to the frame, where an external fan blows air over the frame to remove the heat.

As the main terminal box and auxiliary box can be mounted in several positions, installation and maintenance are easy. This also means fewer spares are needed, which saves money. The rigid frame increases stability so that the motor can meet NEMA vibration requirements.

NXR 7100 motors extend the power range of the existing NXR 5000 and NXR 5800 up to 1750 Hp while offering the same great features. These motors are available with up to an IP56 rating, for protection against contaminants and dust ingress.

ABB

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SAVE SPACE WITH LINEAR STEPPER MOTOR



Nippon's smallest linear stepper motor, the PFL20 Linearstep is a highly efficient, high thrust, tin-can linear actuator with a 20 mm diameter and a bipolar winding.

PFL20 is RoHS-compliant, has a 30/60 mm effective stroke, and can reach 6 N of force at 200 pps. With 24 steps per revolution, the lead screw has a 1.2-mm thread pitch and also reaches 5V rated voltage, resistance of 33 Ohms/phase and inductance of 12mH/phase.

The simple structure of Linearstep motors—just a threaded rotor hub and lead screw—helps to save space and reduce costs, due to fewer components needed compared to systems that convert rotary motion to linear. Linearstep motors are also easy to control and can be ordered with unipolar or bipolar windings and a variety of usable voltages. In addition to the 20 mm motor size, this motor is also available in 25 mm (captive or non-captive option) and 35 mm diameter sizes.

Nippon Pulse America Inc.

www.nedinfo.com/76477-28

DIRECT, ON-LINE DRIVES

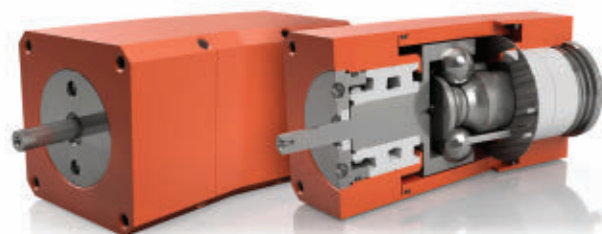
The Gold Tuba series of AC servo drives are highly resilient and designed to deliver the highest density of power and intelligence—it delivers up to 25 kW of continuous power in a compact package.

The Gold Tuba series operate from an AC power source in current, velocity, position and advanced position modes, in conjunction with a permanent-magnet synchronous brushless motor, DC brush motor, linear motor or voice coil. They are designed for use with any type of sinusoidal and trapezoidal commutation. It can operate as a stand-alone device or as part of a multi-axis system in a distributed configuration on a real-time network.

The drives are easily set up and tuned using Elmo Application Studio software tools which enables users to quickly and simply configure the servo drive for optimal use with their motor.

Elmo Motion Control

www.nedinfo.com/76477-29



INNOVATIVE TRACTION DRIVE

High-efficiency traction drives, the MAR-17-1-2.1 and MAR-23-1-2.1 are 1-way traction drives with only six moving parts and use an engineered traction fluid with a coefficient of friction of just 0.1 to 0.12.

These traction drives typically last three times longer than conventional gearboxes and with no metal to metal contact, they generate up to 72% less heat after 24 hours of continuous operation. Additionally, they create up to 38% lower dB at 3,000 rpm (less than a home refrigerator) than conventional gearboxes. Even though there is no metal to metal contact there is no slippage or lost motion between the input and output shafts.

The MAR17-1-2.1 Traction Drive is designed for speeds to 3,600 rpm with 10 to 20 in/lb. of torque, and the MAR-23-1-2.1 Traction Drive is rated for 3,600 rpm with 20 to 30 in/lb. of torque.

Operating at temperatures that are lower than a motor's, with low vibration, and no torque losses from 10 to 3,000 rpm, these traction drives permit a motor to operate at peak efficiency. Applications include pumps, blowers, fans, turbo and super chargers, conveyers, HVAC systems, medical applications, and other power transmission and motion applications.

Rolling Motion Industries

www.nedinfo.com/76477-30

FLAT MOTORS GAIN INTEGRATED SPEED CONTROLLER

The BXT motor family, consisting of brushless DC-servomotors with especially short design, was expanded in all sizes with a diameter-compliant, integrated Speed Controller. Using synergy effects with the encoder variants, the Speed Controller is fully integrated into the motor housing.

Based on the FAULHABER SC technology, the motors can be put into operation quickly, easily, and comfortably with the Motion Manager. The Speed Controller is connected to the application with a six-pole flat cable and suitable connectors are available as an option.

Even with full integration, the Speed Controller guarantees the use of nearly the entire power and speed range of the corresponding base motors. A well-designed cooling concept minimizes thermal losses here.

The combination of the BXT H motors with the integrated Speed Controller is the ideal solution if speeds need to be controlled precisely in the smallest of spaces and high torques are also required.

FAULHABER Group

www.nedinfo.com/76477-31



FROM THE COVER

Flex Feeding and Assembly Robot

easily integrates into manufacturing lines

The **Flex-Bot** provides a solution to a previously unsolved manufacturing dilemma of high mix part feeding. This limitation has stifled manufacturers' ability to automate leaving manual labor in charge of dull and monotonous part feeding for anything less than ultra-high volume. The Flex-Bot offers an alternative to ultra-high volume single part bowl feeders with multiple part flexibility and additional orientation capability through robotic placement. With a standard hardware and software platform, there has been a greater than 40% reduction in engineering hours required to develop a custom application and those savings are being passed on to the customer. It offers the ability to quickly adapt to an immense range of parts through Vibratory and Smart Auto-Tuning Technology, as well as a point-and-click user interface.

Using the power of Epson and the innovation of Engineered Vision, the Flex-Bot is a cross-industry solution for manufacturers of all sizes. Handling simple to complex parts sized 5 to 40 mm, the Flex-Bot can support a wide variety of materials across the plastic, rubber, and metal industries.

Quick Parts Changeover allows for the Flex-Bot to easily integrate into manufacturing lines that produce multiple products of different shapes and sizes. The Flex-Bot uses unique directional vibration through multi-axis vibration technology for optimization in part control and singulation including part flipping.

The Flex-Bot comes with an Equipment Base, SCARA Robot, Machine Vision System, Flex Feeder, Hopper, Robot EOAT, Safety System, HMI, Programming, and Installation. Additionally, Engineered Vision provides upgrade options to integrate an Indexing Table or Conveyor for part placement and/or assembly.

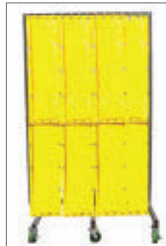
Engineered Vision



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Radiation Shielding Wool Blankets

offer protection up to 500°F



Lead Wool Blankets provide shielding from harmful radiation in various areas where gases or uranium rods are cooling and creating high dose rates. The blankets can be hung on piping or on a nuclear-shield frame. Specialty handles and buckles are available for moving panels and magnets and clips can be designed to accommodate lead blankets permanently around areas of the plant. All lead blankets are constructed by encapsulating the QQ-C-40 lead with 18 oz coated vinyl within a CNC quilted backside to prevent the lead wool from shifting. All covers are standard with RF heat sealing on the outside perimeter, as well as heavy-duty number 5 grommets for hanging the blankets.

Steel Guard Safety Corp

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Signal Generator Drives Lower Cost

provides 196 built-in arbitrary waveforms



with numeric keypad, these instruments offer plenty of features including linear/logarithmic sweep, burst mode, and variable DC offset. Generate custom arbitrary waveforms using the included application software, or select from the 196 built-in arbitrary waveforms.

B&K Precision Corporation

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Precision Linear Stage

has position repeatability up to 0.1 microns

A high-precision linear translation stage family for High Vacuum (HV) and Ultra-High Vacuum (UHV) applications, the **L-509 vacuum stage series**, is offered for



3 different vacuum levels: 10⁻⁶, 10⁻⁷, and 10⁻⁹ hPa. Linear motion ranges of 26, 52, and 102 mm are available. The precision-ground ball screw and high-resolution motors allow sub-micrometer resolution with excellent position repeatability up to 0.1 microns. The vacuum linear stage series was designed from the ground up for vacuum compatibility, with each component qualified to work under the specified conditions. Everything, from the base materials, nuts and bolts, encoders, cables, and limit switches were selected for optimal performance.

PI (Physik Instrumente) USA

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High-Strength Tubing

features less stretch and higher-break strength

Green-Line high-performance jacketed tubing enables users to expand the working range of pumping systems. The tubing is constructed with enhanced polyamide material for improved toughness and less water absorption. The material's high tensile strength leads to less stretch and higher break strength, for a longer useful life



in deeper wells. The material also delivers reduced humidity absorption for longer service life, improved strength, and less weight gain over time. Green-Line is Underwriters Laboratory rated, meeting UL94 HB flame retardant specifications. All dimensions of QED tube, hose, and fittings are carefully designed and controlled to ensure high flow capacity, easy assembly, high pullout strength, and leak-tight connections.

Q.E.D. Environmental Systems

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Portable Hand-Washing Stations

eliminate recontamination

Rugged and purpose-built, portable and vehicle-mounted hand-washing stations allow water and hand sanitizer to be dispensed virtually anywhere. The **black or translucent white water-dispensing tanks** come in 6.5 and 10-gallon sizes and are made of durable, virgin polypropylene with an additive that makes them resistant to UV rays. An integrated removable soap dispenser serves as the cap to the filling port, and a separate cap is also available. Spring-toggle water spigots are easy to operate, and because they automatically stop water flow when no longer depressed, they eliminate recontamination because there is no need to touch them again once hands are clean.

National Fleet Products

MORE ONLINE: nedinfo.com/76477-37

Next-Generation Material Handler

can be fitted with a variety of hitches

With a 20,000 lb. capacity, the **CartMover XR** features a number of enhancements that increase productivity and ensure worker safety wherever heavy loads on wheels need to be moved. Features include an enhanced ergonomic design that increases worker safety, a 4-in. lift range that allows for moving carts over a greater range of surfaces and transitions, and a long-life Lithium Iron Phosphate, easy-to-change modular battery with on-board analytics.

Appleton Mfg.

MORE ONLINE: nedinfo.com/76477-38



Mid-Range Vacuum Conveyor

conveys from 3 to 33 liters per cycle



Perfect for vacuum conveying of food and chemicals that do not require the use of acid-resistant stainless steel, **piFLOW fc** is a premium heavy-duty vacuum conveyor. piFLOW fc offers a fully contained unit that enables toxic and allergenic powders to be transported without the risk of operators and the surrounding work environment being exposed to hazardous materials. Automatic filter cleaning and overall hygienic design make piFLOW fc easy to clean and requires minimal maintenance.

Piab USA, Inc.

MORE ONLINE: nedinfo.com/76477-39

Inline Barcode Verifier

provides immediate feedback of printing issues

Providing contract-compliant assurance in adherence with the ISO, the **DataMan 475 Inline Barcode Verifier (475V)** high-speed system delivers reliable code



verification and quality reporting for 1D, 2D, and direct part mark (DPM) codes. The DataMan 475V is packed with precision optics, powerful light-

ing, robust grading algorithms, and a high-resolution camera to capture and grade even the most difficult codes. When code quality drops, users can get immediate feedback to quickly identify printing and process control issues, as well as diagnostic tools needed to correct them.

Cognex Corporation

MORE ONLINE: nedinfo.com/76477-41

Adjustable Display Mount

withstands vibration, forces, and heavy loads



The **AV-D32 Height Adjusting Arm (W-Series)** allows the height of a monitor or display to be precisely adjusted according to end-user preferences, enabling intuitive positioning without the need for additional locking mechanisms to hold it in place. It offers increased reach for applications that require extended length and travel, as well as positional stability. Available with two tilt torque options, constant tilt torque or counterbalanced tilt torque, the W Series arm offers design flexibility to suit the unique needs of a variety of display positioning applications.

Southco, Inc.

MORE ONLINE: nedinfo.com/76477-40

Portable Oscilloscopes

can be remotely controlled via a mobile device

Micsig ST01000E PLUS series of two and four-channel



battery-powered portable oscilloscopes offer bandwidths of up to 150MHz. Each oscilloscope includes 70Mpts memory, 1GSa/s sampling (single channel), 130,000wfms refresh rate, and a 7.5Ah Li-battery for extend-

ed field use. These portable instruments are a development of Micsig's range of tablet oscilloscopes and combine an 8-in. touch screen (touch, drag, and swipe) with 'button & knob' operation. An external USB mouse can also be connected for additional control choices, with an internal software pop-up keyboard provided for data entry.

Saelig Company, Inc.

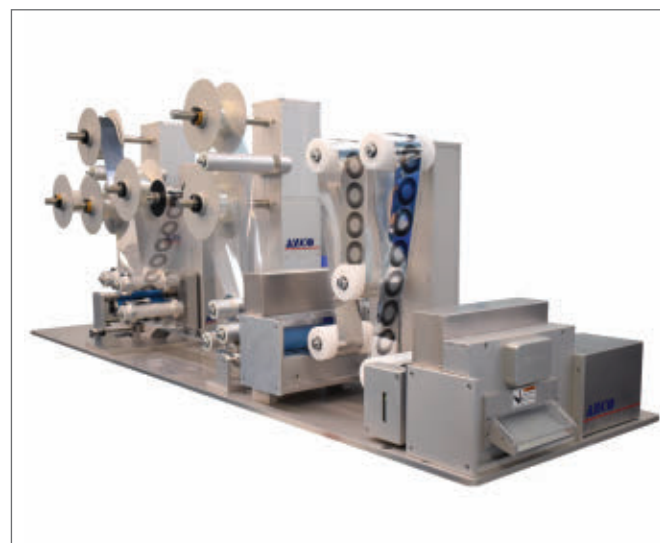
MORE ONLINE: nedinfo.com/76477-42

All-in-One Laminator System

unwinds, laminates, and cuts

The **Laminator and Cut-to-Length** system is able to unwind four different materials from rolls, laminate them together, and then cut the finished product to a specified length. A roll feeder pulls the materials off the unwinds and laminates them together. The product then travels through a dancer accumulator and is advanced by precision ground urethane drive rollers where an internal guide directs it into the knife assembly. A registration eye sees a mark that signals where to cut the product. An operator control panel is provided which includes an HMI color touch screen for easy setup and operation of the unit.

AZCO Corp.



MORE ONLINE: nedinfo.com/76477-43

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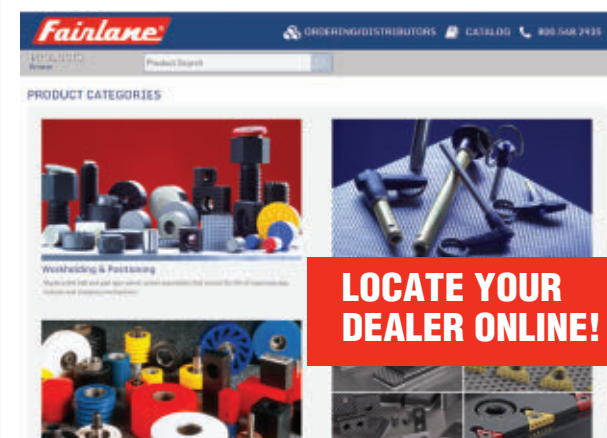
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Interferometer Provides Fast Measurement

calibrates a machine within a few hours



A laser interferometer is the instrument of choice for measuring and compensating CNC machines and CMM machines in order to minimize downtimes and make them more cost-efficient. With the **Status Pro-Line laser interferometer**, regular checks and compensations can be performed quickly and easily to inspire maximum confidence among your customers. With the wireless components and user-friendly software, downtime is greatly reduced. Before complex treatments are carried out on critical machine components, a complete functional check can be performed in less than an hour, and the entire machine can be calibrated within a few hours.

CENTRIC International

MORE ONLINE: nedinfo.com/76477-44



Moisture-Barrier Paper and Linerboard

Protects moisture-sensitive components

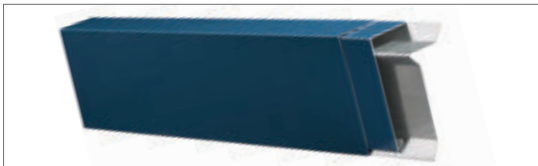
EcoShield Recyclable Barrier Paper and Linerboard are coated with a water-based barrier coating that resists moisture, grease, and oil. When tested according to ASTM E-96, EcoShield Recyclable Barrier Paper shows a Water Vapor Transmission Rate (WVTR) comparable to polycoated paper and far superior to waxed paper. The paper and linerboard are fully recyclable/repulpable into other types of paper products such as boxes, cardboard, and other corrugated materials.

Cortec Corporation

MORE ONLINE: nedinfo.com/76477-45

Roofing Fascia for Single-Ply Applications

features self-locating slotted holes



ES-1 tested for performance, **TerminEdge LT** is a three-piece snap-on, fascia system that is fast and easy-to-install. The system includes a formed 24-gauge galvanized steel retainer with self-locating, pre-punched slotted holes to help reduce installation time. In addition, the system includes a decorative snap-on fascia cover and matching 4-in. wide concealed splice plates. TerminEdge LT products are supplied in convenient 10-ft lengths and available with face heights in any size from 3.75 to 12 in. to accommodate most nailer heights.

OMG Roofing Products

MORE ONLINE: nedinfo.com/76477-46

Big Bag Discharge Station

suits any powder handling process



The **BBU Big Bag Unloader** enables food, chemical, pharmaceutical, and other powder processors to safely discharge materials from bulk bags into hoppers, feeders, reactors, sending vessels, conveyors, and other stages in the process. Developed to promote consistent product flow and reduce material waste in a safe work environment, the unloader features a proprietary, twin-ring, dust-tight docking station that creates a sealed, dust-free connection linking the bag bottom to the process. With a single worker managing the operation, the bulk material transfer system virtually eliminates ambient combustible dust along with its inherent safety risks.

Gericke USA, Inc.

MORE ONLINE: nedinfo.com/76477-47

Low-Loss Cable Assembly

is ideal for space-limited applications

The **RF047-A cable assembly**, using 1.85 mm male and female connectors, operates to 67 GHz with a maximum VSWR of 1.4:1 or better. The connectors are solder clamp designs with fully captivated center contacts. The body components are passivated stainless steel with gold plated brass solder ferrule and beryllium copper contact. Other connector options offered include male and female 2.92 mm series, as well as male and female SMPM series.

Samtec, Inc.

MORE ONLINE: nedinfo.com/76477-48

Compact Carton Former

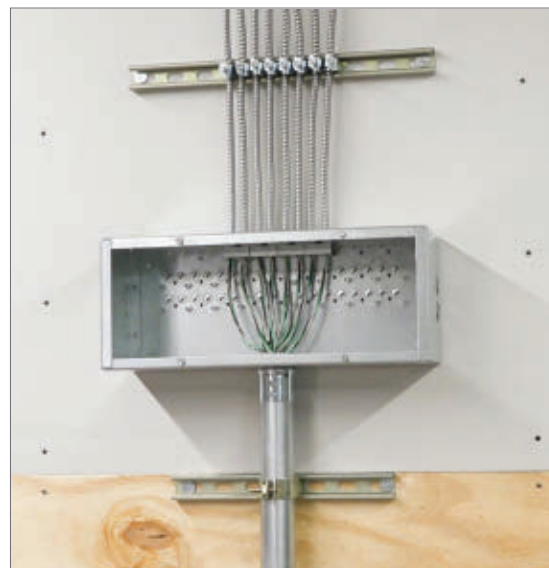
allows tool-less changeovers



Kliklok ACE (Advanced Carton Erector) carton former was developed with a particular focus on ergonomic design, sustainability, and increased efficiency. The integrated Flex Feeder ensures a reliable and safe carton control throughout the entire process. The Kliklok ACE range runs at up to 80 cycles per minute with single, double or triple head and is suited for a number of food applications, such as bakery, snacks, cereal bars, frozen/prepared food, tea and coffee, as well as non-food products.

Syntegon Technology GmbH

MORE ONLINE: nedinfo.com/76477-49



Cable Transition Box

reduces installation time

The **Dugout box** is designed for pulling wires through from MC cable to conduit and offers the quickest and easiest way to transition from flexible armored cable to conduit before entering a circuit panel. The model SC082006STRC Dugout box features built-in STAB-IT cable clamps, RACO's unique design which is field-proven 3x faster than traditional MC connectors. The 21 included STAB-IT clamps to hold up to 42 MC cables.

RACO International, L.P.

MORE ONLINE: nedinfo.com/76477-50

Explosion-Proof Area Light

can be used in any weather condition



Air-Light EX Explosion-Proof DC Powered LED Area Light uses the Air-Light ready-to-use orange case design with the lights deploying rapidly without the use of tools and folds to fit within the integral case. The light comes with two light heads, which can move independently in any direction, and provide 2,500 lumens per light. Each light is powered by a 12 VDC rechargeable lithium-ion battery pack, with a run time of 3.5+ hours when illuminating both lights on high (5,000 lumens) and 14+ hours on low (1,250 total lumens).

Air Systems International, Inc.

MORE ONLINE: nedinfo.com/76477-51

Sanitation Workstation

helps combat the spread of COVID-19



A simple mobile station has been designed to hold cleaning supplies, hand sanitizer, and postings about proper health practices and company procedures. It can hold supplies such as gloves, wipes, cleaning/sanitizing solutions, towels, hand sanitizers, and masks. The structure features a small table surface with a shelf located close to the base that can hold additional bulk supplies and a refuse receptacle. The wheels provide easy movement of the structure from point to point or for housekeeping.

Creform Corporation

MORE ONLINE: nedinfo.com/76477-52

Pressure Sensing Flowmeters

can be configured to show air pressure or airflow



Pressure Sensing Digital Flowmeters provide a way for plant personnel to monitor pressure throughout a compressed air system along with flow. A pressure sensor is mounted between the two flow sensing probes and the display can be configured to show air pressure or airflow. A transistor output can also be configured to provide a low-pressure alarm to protect your processes and/or equipment. They are available in standard units that display airflow values on a bright LED screen, with an optional data logger to capture and manipulate the data.

EXAIR Corporation.

MORE ONLINE: nedinfo.com/76477-53

Manual Tube Bender

provides consistent bends with a variety of materials

The **T30860 Manual Tube Bender** provides a stable and durable platform for tube bending that is quick to set up and easy to use. Manual tube benders can be used with minimal training to provide accurate and consistent bends with a variety of tubing materials including steel, copper, and aluminum.

The T30860 is capable of bending round tubing from 1/2 to 2-in. in diameter or square metal tubing from 1 to 2-in. in diameter while also making bends up to 180-deg.

Grizzly Industrial, Inc.

MORE ONLINE: nedinfo.com/76477-54

Press Tool for Every Size

can press pipe in under 12 seconds



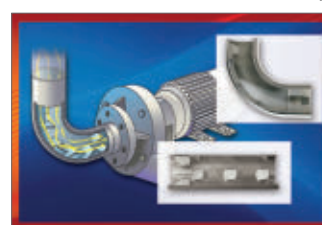
No two jobs are created equal, but the **RIDGID RP 342-XL Press Tool** is built for them all: Its lightweight design packs major power and boasts the widest range of applications of any press tool. Users can press 1/2 to 4-in. copper, stainless steel, and carbon steel pipe, and 1/2 to 2-in. PEX pipe in under 12 seconds and all with one tool. The lightweight tool features QuickSwitch technology to quickly switch from Standard to Extended 32kN applications to press 2 1/2 to 4-in. carbon steel.

RIDGID

MORE ONLINE: nedinfo.com/76477-55

Flow Conditioners Enhance Pump Life

create a uniform, non-swirling, symmetrical flow



Vortab Flow Conditioners deliver a uniform, swirl-free flow profile to the pump inlet in as little as six pipe diameters to correct flow disturbances and to mimic adequate pipe

straight run. The Flow Conditioner's anti-swirl and inclined vortex generating profile correction tabs generate vortices that accelerate natural pipe effects to create a uniform, non-swirling, symmetrical flow profile in a much shorter section of pipe.

The Vortab Company

MORE ONLINE: nedinfo.com/76477-56

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FROM THE COVER

Real-Time Warehouse Tracking System

gives complete asset visibility across operation



Zebra MotionWorks Warehouse is a near real-time warehouse asset tracking system optimized for handling large volumes of assets at the rapid pace required by today's warehouse operations. It provides immediate ROI by allowing you to see exactly where critical assets are—whether they're stationary or in motion—automate transactions, streamline workflows, reduce labor, and improve accuracy.

Using directed worker instructions, the solution allows organizations to handle increased volumes efficiently while maintaining current staffing levels. This eliminates steps in workflows, letting you increase the number of goods and assets processed, reduces the time your workers spend looking for missing assets, and provides real-time alerts to prevent errors.

Automation of processes and real-time alerts ensure goods make it to the right place at the right time, without errors. Zebra MotionWorks Warehouse creates a digitized manifest of product as it's loaded into trailers, providing an auditable chain of custody and eliminating mis-shipments.

Tracking finished goods from manufacturing to shipping is often a complex and manual process. With Zebra MotionWorks Warehouse, finished goods are tagged and electronically scanned into the system of record, and the delivery instructions can be automatically sent to workers, eliminating steps in the workflow. This reduces the time needed to collate goods assigned to an order and provides an auditable record of events and electronic manifest to confirm all goods are sent to the right place.

Zebra Technologies

MORE ONLINE: nedinfo.com/76477-57

Hybrid Conveyors

are able to fit into the most precise spaces



Hybrid specialty conveyors are designed and built specifically to meet the most demanding conveyance objectives that can't be met with traditional conveyor systems. The challenges that come with limited spaces; high speeds; heavy loads; heavy impact; abrasive; and/or hot and cold products are overcome with the unique design of each Hybrid conveyor system. Unlimited angles and geometries allow the creation of precise inclines, declines, and lateral turns to fit into the most precise spaces or match perfectly with other equipment.

Dynamic Conveyor Corporation.

MORE ONLINE: nedinfo.com/76477-61



Corrugated Crates Save on Shipping Costs

diminish vibration-related damages

J-Crates are customized corrugated crating solutions that offer a host of benefits including reduced shipping costs, maximization of warehousing space, and increased sustainability. The J-Crate concept is simple: rather than the typical all-wood crate typically used to transport large items, this solution comprises a wooden base surrounded by sturdy yet pliable corrugated material. The corrugated containers have been proven to keep even the most fragile items secure during transport, as the structure can withstand 4,000 lb. of pressure.

PACT, LLC

MORE ONLINE: nedinfo.com/76477-58



8-Channel Input Module

features built-in counter and timer functions

Ideally suited for bridge-based sensors and strain measurements, the **IBIV-8 module** for Daxus DXS-100 and SmartCorder DDX-100 data acquisition systems offers internal bridge completion, shunt calibration, and support for the most common bridge resistance values. It also offers unparalleled flexibility allowing users to perform a variety of measurements in a single module.

AstroNova, Inc.

MORE ONLINE: nedinfo.com/76477-59



Direct Electron Detector

improves strain analysis

The world's first commercially available direct electron detector designed for Electron Backscatter Diffraction (EBSD), the **Clarity system** provides zero noise and zero distortion collection of EBSD patterns by directly measuring the incident electrons onto the detector. This approach removes the traditional phosphor and optics from the collection path, resulting in sharper EBSD patterns with higher sensitivity. Powered by this technology, Clarity is optimized for applications where traditional EBSD analytical conditions are not viable for quality results.

EDAX, Inc.

MORE ONLINE: nedinfo.com/76477-60

Heavy-Duty Angle Heads

provide spindle speeds up to 18,000 rpm



A line of **standard and custom angle heads** are available in all popular sizes and styles to accommodate today's machine tools and CNC machining center builders. Designed for heavy milling, deep drilling, and tapping operations, this line of angle

heads features twin or double twin sets of matched angular contact bearings plus a rear radial support bearing, ensuring maximum stability in use. All the gears on these angle heads have inclined teeth made from high-resistance gear steel and have been specially hardened, ground, and lapped in sets to provide the smoothest transmission output possible.

Heimatec Inc.

MORE ONLINE: nedinfo.com/76477-62

HEPA and Carbon In-Line Filter Paks

features easy access for filter change-outs

CleanAir HEPA and Carbon Filter Paks are designed to be mounted inline in the exhaust ducting from a fume hood or contaminant source up to 1,500 cfm. The filter pak includes a galvanized steel housing with a



hinged and gasketed access door for filter change-out as well as molded composite resin inlet and outlet plenums with duct connection collars. Both filters include a 30% pleated prefilter and can be paired together for applications that require particulate and fume removal.

HEMCO Corporation

MORE ONLINE: nedinfo.com/76477-63



Entry Line Touch Displays

can be used indoor or outdoor

easyTOUCH Display (eTD) Entry Line, a high-quality line of PCAP based touch displays, covers the popular size range of 3.5, 4.3, 5, and 7 in. The touch-displays support multi-touch functions and seamless touch inputs with either gloves or water. All displays have an RGB interface, higher brightness, and a PCAP touch with ILITEK's 2511 IC that offers both I2C and USB interface. Customers can use the DATA MODUL tuning tool easyANALYZER to adjust the pre-programmed touch settings for all display sizes of the eTD-Entry Line.

DATA MODUL Inc

MORE ONLINE: nedinfo.com/76477-64

High Precision Linear Guide Stages

can handle loads to 110.2 lb.

Five single-axis positioning stages have been added to the **AQ150 Series** of linear stages. Available in travel



lengths of 600, 700, 800, 900, and 1,000 mm, these stages are available with either a two-phase stepper motor or with a three-phase brushless motor

with a quadrature incremental optical encoder. Stepper Motor driven models feature a resolution of 2.1 microns. For closed-loop operation, high precision, higher travel speeds, and greater throughput, the stepper motors are replaced with three-phase brushless servo motors and quadrature encoders.

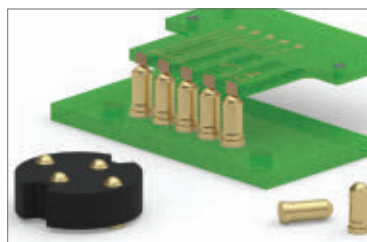
Optimal Engineering Systems, Inc.

MORE ONLINE: nedinfo.com/76477-65

Spring-Loaded Contacts

improve connection through a rotational motion

The unique **Omniball spring-loaded contact** features



a rolling ball interface, enabling mating components to engage in lateral, rotational, and angular alignments while providing

optimal electrical, mechanical, and structural reliability. The Omniball contact is a spring-loaded pin in which the traditional plunger has been replaced by a gold-plated ball. It simplifies and improves the connections between components that are mated in a sliding or rotational motion rather than in an axial or vertical orientation.

Mill-Max Manufacturing Corp.

MORE ONLINE: nedinfo.com/76477-66

Shoulder Milling Cutter

decreases the need for finishing operations

Xtra-tec XT M5130 Shoulder

Milling Cutter handles a wide array of machining operations including face milling, shoulder milling, ramping, pocket milling, and circular interpolation operations. The mill is best suited to machining steel, stainless steel, cast iron, non-ferrous material, and materials with difficult cutting properties. This wide range of uses results in lower tooling and administrative costs, as does the fact that its 90-deg. approach angle dramatically decreases the need for finishing operations.



Walter USA, LLC

MORE ONLINE: nedinfo.com/76477-68

Conduit Fitting Eliminates Downtime

handles fine and coarse pitch conduits



Flexicon conduit, specifically designed for industrial and OEM sectors, provides an inherent mechanical barrier for cabling and systems where failure can be costly. The conduit fitting, Flexicon Ultra, is a one-piece conduit fitting solution featuring integrated sealing technology and is engineered to provide unrivaled performance with both fine and coarse pitch conduits. With six all-round teeth to secure the conduit, it offers superior strength of connection and dynamic performance in one package.

AFC Cable Systems

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High-Precision VMC

offers a load capacity of 2,646 lb.

Suited for die and mold machining, the high-speed **OKK VB53a Vertical Machining Center (VMC)** features a range of features that minimize vibration and maximize accuracy, resulting in superior surface finishes for high-end die and mold applications and precision parts. A rigid machine base, wide size linear roller guide, and fine pitch high-resolution ball screw increase machining precision. Enhancing positioning accuracy, a 0.05-micron resolution linear scale is offered. Soft Scale Cube technology features thermal sensors that monitor and compensate for any displacement in real-time.

Methods Machine Tools Inc.

MORE ONLINE: nedinfo.com/76477-69

Industrial Control Transformer

provides a high degree of voltage regulation



ICT transformers provide safe control voltage for the operation of a wide variety of electromagnetic devices. These dry-type, step-down transformers provide a high degree of voltage regulation during inrush, the brief overload period when a circuit becomes energized. Encapsulated TB series and CE series ICT models feature a compact design that runs cooler and cleaner, to provide application flexibility. Integral

terminals and molded terminations offer robust support. The TB series models are UL/cUL Listed and CE series models also carry the CE mark for global applications.

Acme Electric

MORE ONLINE: nedinfo.com/76477-70

Peristaltic, Ethernet Pumps

enable more data sharing and diagnostics

The range of **530, 630, and 730 peristaltic pumps** are now available with EtherNet/IP control, providing users with access to fast, accurate performance data and seamless connectivity to modern PLC control systems and the IoT. The protocol offers all the benefits of modern digital networks, such as enhanced process control, lower running costs, and minimized downtime. Operators can set local limits on pump operation as a simple, cost-effective solution for safeguarding process integrity by independently monitoring performance.

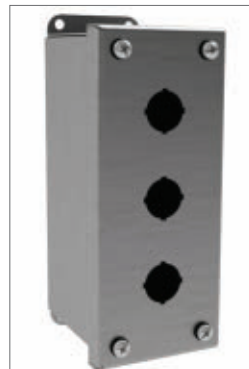


Watson-Marlow Fluid Technology Group

MORE ONLINE: nedinfo.com/76477-71

Pushbutton Enclosures

accepts standard pushbuttons and switches



Stainless-steel versions of the **PBGX series** pushbutton enclosures are designed to hold industry-standard 22.5 mm push buttons. The stainless-steel models add a new level of protection for operator interfaces. Standard 4-way 22.5 mm pushbutton holes accept all standard brands of miniature pushbuttons, switches, and pilot lights. To maintain superior sealing closed-cell, oil-resistant neoprene gaskets and captivated cover screws that thread into sealed wells are provided.

Wiegmann

MORE ONLINE: nedinfo.com/76477-72

Dual Hydraulic Reel

eliminates space concerns for hose lines



Dual hydraulic reels, designed for use with hydraulic tools and accessories, are offered in two configurations; the MPD and the TDMP series. As with most spring rewind reels, the **dual hydraulic reels** feature single-sided access for both the spring and the swivel. The supply and return lines come in the same side of the reel into an external fluid path via a removable, dual-port hydraulic swivel. This same inlet and swivel side of the reel also houses an easy-to-service spring cartridge motor.

Coxreels Inc

MORE ONLINE: nedinfo.com/76477-73

Compact, Zebra-Based Labeler

features a resolution range of 203 to 600 dpi



A user-friendly, compact labeler, **model 5411**, is perfect for low-to-medium volume automated labeling applications. Color-coded print engine touchpoints and toolless printhead and platen replacement combined with the 4.3-in. color touch display makes set up, operation, and maintenance fast and simple. Additionally, the swing-away cylinder assemblies,

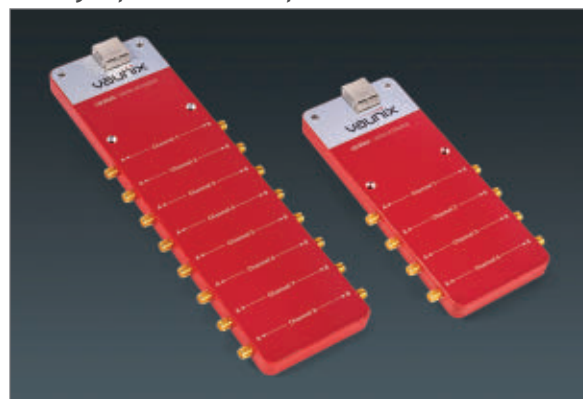
screened media paths, and one-to-one ribbon to label roll ratio means that downtime is reduced and user experience is improved. Because the 5411 uses Zebra technology, it is Zebra Link-OS enabled. This means that 5411 users have access to innovative Link-OS software tools such as print from PDF.

Fox IV Technologies, Inc.

MORE ONLINE: nedinfo.com/76477-74

Multi-Port Step Attenuators

suit high-speed MIMO test platforms



Two multiport **Lab Brick Digital Attenuators**—the 4-port LDA-802Q and the 8-port LDA 802-8—each operate from 200 MHz to 8 GHz for a variety of L, S, and C-band applications that require the need for single-shot or repeating attenuation ramps. These solid-state, rugged 50 Ohm step attenuators are bi-directional and offer a high dynamic range of 120

Vaunix Technology Corporation

MORE ONLINE: nedinfo.com/76477-75



Burnishing Tools Eliminate Secondary Operations

produce sizing in .0001-in. increments

Elliott Tool Technology **burnishing tools** produce a 4 to 8 Ra surface finish in one pass, eliminating secondary machining operations and their requisite set-up time and costs. Fast cycle times mean that burnishing projects are measured in seconds, not minutes. Speed is coupled with accuracy, as ID burnishing tools produce accurate sizing in .0001-in. increments. Roller burnishing results in a 25% size improvement in steel and up to a 50% size improvement in high ductility materials.

Monaghan Tooling Group

MORE ONLINE: nedinfo.com/76477-76



Handheld Analyzer for Fast Detection

offers clear on-screen grade ID and comparison

The **Vanta Element-S handheld X-ray fluorescence (XRF)** analyzer delivers fast light element detection at an affordable price, joining a family of cost-effective, entry-level Vanta Element XRF instruments. The S model is equipped with a silicon drift detector (SDD) to analyze light elements like Mg, Al, Si, S, and P in alloys. The analyzer offers clear on-screen grade ID and comparison for the light elements Mg, Al, and Si in seconds. Optional wireless connectivity helps future-proof your analyzer for Industry 4.0. Connect to the Olympus Scientific Cloud for wireless data sharing.

Olympus

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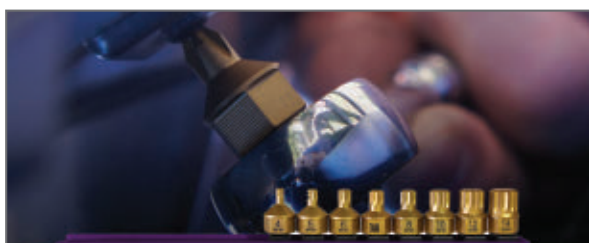
Processors Ensure Fast Mixing

automatically feed, mix, and react materials

Continuous Processors feature a proprietary design that ensures the fast-reacting materials used to process rigid polymeric foams are mixed, gelled, and fully reacted entirely within the sealed reactor barrel before they begin to cure. Allowing foam formation and curing to occur entirely downstream, the processors eliminate the risk of premature curing inside the barrel. Developed for producing foams and other materials that cure instantaneously, the Continuous Processors strategically introduce isocyanates, blowing agents, and other reactants at key points in the process to efficiently produce a uniform, homogeneous dispersion of materials within a tight residence time.

Readco Kurimoto, LLC

MORE ONLINE: nedinfo.com/76477-78



Low-Profile, Square-Bit Set

is great for use in tight spaces

The **8PC Triple Square, Low Profile, Titanium Coated, Dual Drive Bit Set** can be driven by a ratchet, socket spinner, box or open-end wrench. With the titanium coating, the bits offer maximum wear resistance and rust prevention along with great durability and strength against heat. The set includes 4, 5, 6, 7, 8, 10, 12, and 14 mm bits made in the USA from S2 Tool Steel and includes a convenient storage rail that keeps all bits organized and easily accessible.

Mayhew Steel Products, Inc.

MORE ONLINE: nedinfo.com/76477-79

Commercial Duty Transfer Switch

features easy access for contact inspection



RTSCD commercial duty transfer switch provides emergency power needed to keep critical operations online. Available in 100, 200, 260, and 400A rated models, the switch features a user-friendly operator interface panel with an intuitive keypad that features text and icons and comes standard with a historical event log. Featuring rapid and reliable arc quenching, the front connected RTSCD offers manual transfer with rapid arc interruption, as well as a permanently affixed handle and double throw mechanically held contactor.

Russelectric Inc

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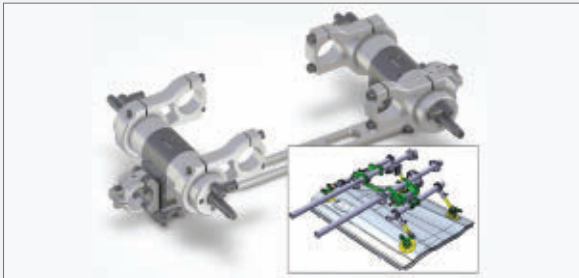
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FROM THE COVER

Adjustable Angle Tooling for Pressroom provides a holding force of 35 Nm



A **swivel unit tooling** for use in the pressroom is a flexible solution to reduce the number of operations in a press line by producing more parts via a single stamping. Whereas most products can only be used at a specific tilting angle, the swivel tooling is a universal solution that can be adjusted to the exact degree required to grip and handle parts for each application. Additionally, as compared to other offerings, the unit is 30% lighter for improved production rates and longer tool life.

The swivel unit offers a swivel angle of ± 45 -deg. (90-deg. max) and a compact design for accessibility even in difficult-to-reach, tight applications. The swivel angle is easily readable on a scale located on the top of the unit. Used as a single tooling unit, it weighs 7.94 lb., or a connecting bridge can be used to create a double swivel unit with synchronous operation and weighing 16.7 lb.

The unit offers a holding force of 35 Nm with speed that is adjustable via air exhaust restrictors. The end stops feature dampening shock absorbers to slow down and reduce the vibrations during motion. Optional features include censoring that will automatically detect the angle position and a shut-off valve that locks the tilting position angle during installation and removal to ensure operator safety.

Designed for flexibility, the swivel units work with Bilsing's lightweight carbon fiber and aluminum modular tooling as well as its entire line of vacuum cups.

Bilsing Automation

MORE ONLINE: nedinfo.com/76477-81

Manual or Automatic CNC Lathe

allows operations to be completed without any programming



The **C Series CNC teach lathes** are fitted with the Romi Manual Machining Package (RMMP) that allows simple operations to be completed without any type of programming. Using the RMMP, an operator can machine parts in manual mode using the hand-wheels, and also in automatic mode using a joystick and start cycle. The operator can also fill in the fields on the CNC screen, indicating spindle speed, feeds, cutting depth, coordinates, and angles, and start the machining with the cycle start button.

Romi Machine Tools Ltd

MORE ONLINE: nedinfo.com/76477-82

CNC Slant Bed Lathes

is suited for machining small parts

The 5-in. **CNC Slant Bed Lathe** is a turning center designed specifically for production, short runs, one-offs, and prototyping and is great for machining small parts. The lathe's small size and footprint make it an excellent option for machine shops needing a second-op machine or additional chuck. The rigid construction guarantees accuracy and repeatability. Each lathe features a Siemens 808 control which makes it easy for entry-level operators to use.

Palmgren

MORE ONLINE: nedinfo.com/76477-83

Precision Linear Stage

has position repeatability up to 0.1 microns

A high-precision linear translation stage family for High Vacuum (HV) and Ultra-High Vacuum (UHV) applications, the **L-509 vacuum stage series**, is offered for 3 different vacuum levels: 10⁻⁶, 10⁻⁷, and 10⁻⁹ hPa. Linear motion ranges of 26, 52, and 102 mm are available. The precision-ground ball screw and high-resolution motors allow sub-micrometer resolution with excellent position repeatability up to 0.1 microns. The vacuum linear stage series was designed from the ground up for vacuum compatibility, with each component qualified to work under the specified conditions. Everything, from the base materials, nuts and bolts, encoders, cables, and limit switches were selected for optimal performance.

PI (Physik Instrumente) USA

MORE ONLINE: nedinfo.com/76477-84

Clamps Offer Fast, Versatile Holding Options

work on flat, angled or round stock



Magnetic V-Pad Clamps offer welders a fast, low-profile, and versatile holding solution for their workpieces. The V-Pads' dual, pivoting, magnetic-heads can position and hold angles up to 180-deg. Each V-pad contains four powerful

magnets: two on its back, and one on each pivoting foot, giving the welder several options for holding configurations. Quick to set up and great for repetitive applications, they're easy to position and work on flat, angled or round stock.

Industrial Magnetics Inc

MORE ONLINE: nedinfo.com/76477-85

Inflatable Pipe Stoppers

prevent the production of static or sparking

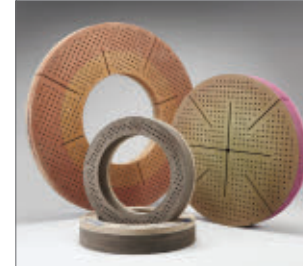
Single-Ended Inflatable Dams are available in a variety of shapes and sizes for a range of applications including sealing, blocking, pressure testing, and isolation. Pipe stopping equipment gives the user the opportunity to isolate a section of pipeline to carry out repair and maintenance work. All Inflatable Stoppers are manufactured with a strong internal latex balloon covered in a waterproof polyurethane coated nylon bag for low friction and to prevent the production of static electricity or accidental sparking.

Huntingdon Fusion Techniques HFT

MORE ONLINE: nedinfo.com/76477-86

Grinding Wheels Provide Longer Life

require less dressing and parameter changes



Norton Stellar inserted-nut **grinding wheels** for double and single disc grinding offer improved wheel life, increased parts per wheel, and lower cost per part. The grinding wheels have an over

30% longer wheel life than existing disc grinding products and require less dressing and parameter changes for increased productivity. The wheels also have an improved material removal rate of more than 15%.

Norton Abrasives

MORE ONLINE: nedinfo.com/76477-87

All-in-One IoT Controller

reduces programming time and maintenance



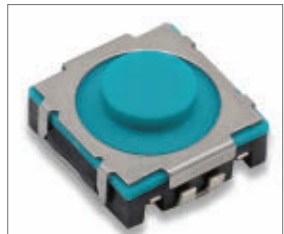
CP2E Series all-in-one controller provides advanced control that enables IIoT connectivity for compact machines. The controller improves manufacturing productivity and quality by making it easy to visualize the performance and data of connected machines through simple programming. The controller collects machine performance data and shares the necessary information with enterprise networks, while the predefined program data and function blocks allow virtually anyone to set up machines to perform complex control.

Omron Automation

MORE ONLINE: nedinfo.com/76477-88

Soft Feedback Tact Switch

has an operating temperature of -40 to 90C



The **Tact Low Sound (TLS) Series of switches** provides advanced haptic communication with ultra-soft feedback that can be customized to meet vehicle interior requirements. The compact switch with J leads gives

engineers the flexibility to reduce the size of the printed circuit board, or add functionality to the design. The IP54 sealed switch offers protection against dust, liquid, and humidity. Rated to 500K cycles, the TLS Series ensures high reliability and long-life performance.

C&K

MORE ONLINE: nedinfo.com/76477-91

Dual Mold Pallet Molding System

creates lightweight and low-cost pallets



Model PM-3S of the LUMINA Pallateer Series is a low-pressure type injection-molding machine with a two-stage injection unit. It is capable of molding two of the same or different sized pallets up to 52 X 48 in. and weighing from 16 to 50 lb. each. Hourly production rates of 48 to 72 pallets per hour are achievable with minimal labor, floor-space, and utilities requirements. The Wilmington two-stage unit processes 100% recycled plastics in either pelletized or flake form. It injects at mold fill rates up to 20 lb./sec with velocity and shot size control from Wilmington's Versafil sequential injection control system.

Wilmington Machinery

MORE ONLINE: nedinfo.com/76477-89

Preventative Maintenance Service

allows work to be scheduled in advance



Designed to assist with inspection system maintenance, **Preventative Maintenance Service** monitors and maintains inspection systems remotely during normal operation. The service helps reduce operator costs and ensure that system performance remains at an optimum level, allowing work to be scheduled in advance, rather than waiting for problems to occur. A systems specialist will check the system at regular intervals, then send a report highlighting maintenance issues, potential problems, and recommended solutions.

AMETEK Surface Vision

MORE ONLINE: nedinfo.com/76477-92

Non-Slip, Social Distancing Floor Mats

stick to most commercial floor surfaces



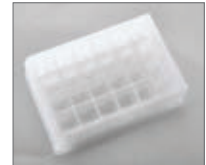
Unlike vinyl floor decals or tape, the adhesive-backed **PIG Social Distancing Floor Sign** features a non-slip surface that stays down in the heaviest foot and cart traffic and won't leave residue or damage floors upon removal. Anti-slip floor signs and markers visually reinforce the three health

New Pig Corporation

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Laboratory Filter Plate

can be used with a vacuum manifold



The **AcroPrep 24-well Cell Clarification and Sterile Filtration Plate** performs cell clarification and sterile filtration of CHO, HEK or other cultured cells in one step, in a single device, in minutes. This filter plate is ideal for laboratories that desire faster and more efficient protein purification workflows. By combining both steps, the plate eliminates the need to harvest the cells in an offline centrifugation step, saving time. The filter plate's innovative one-step workflow uses multi-layer filtration media and membranes integrated into one device. Additionally, this device can reduce plastic consumable use substantially.

Pall Laboratory

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Automotive Epoxy Resin System

The **Toray TC346 resin system** is a high-temperature epoxy system developed with input from leading automotive industry professionals. It has excellent compression strength, interlaminar shear strength, in-plane shear modulus, and improved elevated temperature tensile strength. TC346 offers a superior surface finish for aesthetic appeal and controlled flow of the resin to simplify lay-up and curing production.

Toray Advanced Composites

MORE ONLINE: nedinfo.com/76477-94

Clear Epoxy Provides Fast Repairs



Formulated to deliver a stronger-than-super glue bond, **Tank Bond Clear Epoxy** delivers a high-strength, durable repair that dries clear for a clean-looking repair that will blend smoothly with the original substrate. The multi-material adhesive provides a strong, clear bond on

metal, plastic, tile, ceramic, glass, stone, and wood for a super-versatile repair solution.

DAP Products Inc.

MORE ONLINE: nedinfo.com/76477-95



Pressure Sensitive Ceramic Tape

Ultra-Temp 390PS pressure-sensitive, ceramic tape wraps around pipes and equipment for thermal and electrical insulation to 2,300°F. The thermally efficient ceramic tape has excellent adhesion to metals, ceramic, and glass. Easy to use, the tape eliminates the time spent twisting, slipping, and unwrapping that occurs with standard tapes.

Cotronics Corporation

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Fluoramics, Inc.

MORE ONLINE: nedinfo.com/76477-97



Low Outgassing Rated Epoxy

EP42-2LV Black is a two-part epoxy with low viscosity and good flow, withstanding prolonged immersion in many acids, bases, solvents, fuels, and oils. This versatile system can be used for bonding, sealing, coating, and casting where a strong chemical resistance profile is required. It meets NASA low outgassing specifications and is serviceable over a wide temperature range from -60 to 350°F.

Master Bond Inc.

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Emerson Electric Co.

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Long-Range S-Band Radio



Eliminating the need to integrate standalone components to create a long-range wireless and intelligence, surveillance, and reconnaissance radio links working in S-band, Triad has combined high power RF subsystems

with a **Microhard pMDDL2450 core radio** that operates from 2402 to 2482 MHz. Triad model THPR1006 is an efficiently packaged, highly reliable, dual-channel MIMO, turnkey radio system that includes bi-directional amplifiers (BDAs), RF filtering, and optional real-time power measurements, link diagnostics, and innovative SoC-based monitoring and controls.

Triad RF Systems

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Charge Two Batteries at Once

The **M18 Dual Bay Simultaneous Rapid Charger**

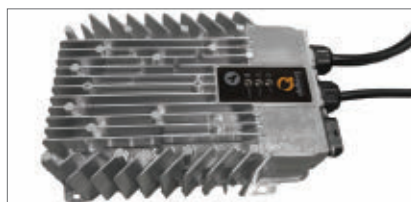


charges two packs over 3X faster when compared to Milwaukee standard sequential chargers, all while maintaining full M18 system compatibility. With the charger, users can rapidly charge

two batteries at the same time, using a single outlet and eliminating the need to take multiple chargers to the jobsite. Equipped with REDLINK Intelligence, the charger optimizes charge rates based on battery type and temperature, delivering the best combination of charge time and pack life.

Milwaukee Tool

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Electric Vehicle and Machine Charger

A sealed charger for electric vehicles and industrial machines, the **RQ350** is a 350-watt charger that meets automotive levels of product reliability, improving machine runtimes. From using an IP66-sealed die-cast enclosure that can tolerate harsh application environments to the integration of CAN bus, it offers reliability and design flexibility to OEMs integrating on-board chargers.

Delta-Q Technologies

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Molded Case Circuit Breakers

The latest additions to the popular Series M line of molded case circuit breakers, the **M1 and M2** are designed for maximum performance and reliability.

The compact case design of these breakers gives them a smaller footprint making them perfectly suited for use inside panels. Both frames sizes are available as 1 and 2 pole in a range of interrupting voltage ratings from 240 to 690 VAC and 250 to 500 VDC.

NOARK Electric Co., Ltd.

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Subsea Valve Actuator

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monitoring, consumes up to 75% less energy, and is designed for 25 years of operation. With redundant pressure compensation, it can reliably operate in the harsh environment of subsea applications.

Bosch Rexroth

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Intelligent Linear Actuator

RTK REact EQ-L electric intelligent linear actuator for high-range force output is ideal for processes that depend on 100% running time and offers an all-in-one intelligent package for applications with opening/closing forces from 15/3,380 lbf to 30 kN/6,750 lbf. Outfitted with RTK's optimized REpos digital positioner, the actuator offers data logging functions and remote control through Profibus or CANopen. Using field device notification of diagnostic status, users can expect to conduct timely, status-based intervention to promote higher system availability and reduced maintenance costs.

CIRCOR International, Inc.

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Low/High Pressure Bellows Seals Valves

Low-pressure ASME Class 150-900 Clampseal



bellows seal valves are ideal for applications where leakage to the environment is not an option. They feature low weight and seismic profile; leak-proof integrity; in-line servicing; high cycle

bellows; high flow capacity; and no fugitive emissions. High-pressure Clampseal bellows seal valves for up to ASME Class 2500 are ideal for applications where packed valves may not reliably contain light gases or hazardous system fluids due to leakage. The valves allow for zero emissions and meet all requirements of MSS SP-117.

Conval Inc.

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Versatile

Full-Flow Valve

Full-bore, bidirectional flow-capable **Swagelok GB series ball valve** is engineered to provide high flow rates at a working pressure of 6,000 psig while simplifying installation, minimizing rework requirements, and delivering reliable shutoff performance to keep workers safe.

Swagelok Company

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Leybold USA Inc.

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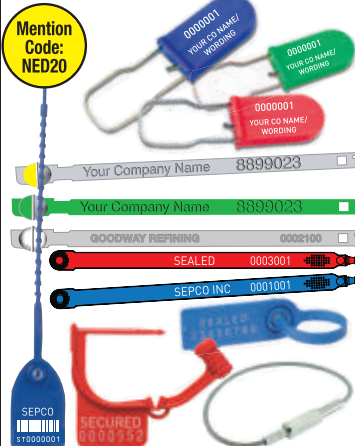
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Personal Safety Beacon
runs for up to 25 days



A palm-sized, lightweight, personal safety beacon, the Freakin' Beacon, can be programmed to a steady flash mode, random flashing mode or steady mode and be seen from over 1,000 ft away. It can signal the location of a worker in a low light situation when attached to the back of their hard hat or harness and can be used to identify teams by assigning them each a different color. Powered by just 2 AAA alkaline batteries, the Freakin' Beacon is a Class I, Division 1 light with an IP67 rating. That means it is dustproof, waterproof, and will be able to survive underwater at one meter's depth for 30 minutes. The large push-button switch is designed for easy operation with a gloved hand and the light attaches directly to a helmet or hard hat. You can choose from several back attachments including a metal clasp, plastic or spring clip, or a magnet mount. A 3M dual lock is included standard with all attachments. An accessory helmet band is also available.

Koehler Brightstar

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FROM THE COVER

Anonymous AI Temperature Detector

can be deployed in less than two minutes



TF-350, a fully portable facial temperature sensor suitable for both gatherings and individuals, is designed for real-time performance and long-term reliability. It detects, analyzes, and classifies the facial temperature of humans in crowded, queued or individual situations, without hesitation and with an accuracy of 5 hundredths of a degree. Its fast scanning and built-in artificial intelligence software reduce temperature verification efforts by 95%, saving valuable time and increasing worker safety.

The device is fitted with an ultra-sensitive thermal micro camera and a processor with a processing capacity of 32 TOPS. The visualization and warning software, HeatUp!, features powerful artificial intelligence algorithms for visual recognition and temperature measurement. Its unique, portable, and powerful design is simple to use and offers a user-friendly interface for the operator.

The TF-350 comes in an ABS carrying case with accessories and cables and can be deployed by the operator in less than two minutes. It is an indispensable component for any post-COVID restart safety plan. The TF-350 can be deployed anywhere and is best suited for high traffic situations.

For privacy reasons, the TF-350 does not store any personal data and meets the highest computer security standards for a detection device.

Thingsfactory

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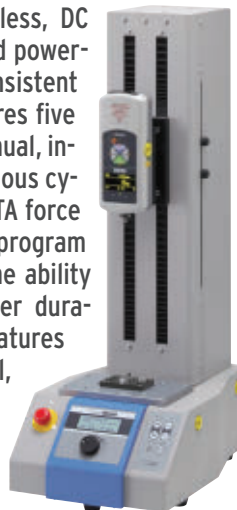
Motorized Vertical Test Stand

controls mode, speed, timer duration, and cycles

MX2 Vertical Motorized Test Stands

use maintenance-free, brushless, DC motors to provide smooth and powerful operation and ensure consistent force testing results. It features five different modes including manual, increment, single cycle, continuous cycle, and force control (with ZTA force gauges). The easy-to-use program dial and menus offer users the ability to control mode, speed, timer duration, and cycles. MX2-1100 features unique jog movement control, for precise increment testing. In jog mode, each click of the program dial moves the crosshead approx. 0.05 mm (standard speed, under no load).

Imada, Inc.



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FROM THE EDITOR

The End of Complacency

A few years ago, I had the opportunity to explore an industrial engine plant operated by one of the world's top suppliers of the things—a company known for high-quality and durable engines, custom-built for every application. With that reputation, I was expecting to see a lot of miraculous technologies and processes at work in the plant—lots of IoT wizardry tracking assets and monitoring statuses of every piece of every complex one-off assembly, or maybe some kind of flow optimization magic that allowed JIT customization to roll through at such a massive, effective scale.

I didn't exactly find any of this.

It was as if the plant were purposefully built to reinforce every single manufacturing stereotype in the heads of every high school guidance counselor. It was dimly lit, the air thick with a kind of machined metal dust I preferred not to think about, with forklifts zigzagging everywhere hauling engines from one process to the next. In one section, assembly workers were crammed together on a line reading job specs from ancient green-screen monitors and performing monotonous, simple tasks for each configuration. It hit every point of the old cliché—dark, dirty, dangerous, and dull.

At the end of the tour, I pulled the GM aside and asked him why they were running like this. Surely robots could help. Surely there's a way to cut down the forklift traffic. Surely there's a way to improve the environment. Surely there's frontline software available from this century.

But the guy just laughed it off. This is how they know how to make engines, he said. This is how they'd beaten the competition for decades and they didn't see any reason to change.

I think we all know how that story ends. It's played out at every major juncture in the evolution of manufacturing. Every new tool or technique or technology threatens the status quo—it forces companies to adapt and evolve and improve, to break out of their standard processes and use these new assets to produce better goods, faster, and more profitably than ever before. Failure to do this—and failure to do it better and faster than the competition—is exactly how great companies fall.

In this sense, maybe the great danger of change isn't the disruption itself, maybe it's complacency. Maybe its failure to see the risk of standing too long on yesterday's wins.

This point has been hitting me hard lately as I watch the industry cope with all the disruptions in the world today. This is a unique time—the combined effects of rapid technological and social change, of COVID-19 and shifting supply chains, have disrupted every company in every industry in some way. It has evened us out—we're all facing a world where the processes and requirements have changed, where the tools and assets have changed, where yesterday's wins can no longer hold us up, where yesterday's losses can no longer hold us down.

There are some who see this as a disaster, of course. But I don't know. I can't help seeing the potential for growth here. No one has the luxury of complacency in this environment, no one is able to sit this disruption cycle out. The only option is to adapt, to innovate, to change, to transform. Whether that means welding robots to turn farming on its head (pg 8) or using data to determine better routes to your customers, the optimist in me can't help but be excited for the wonders the recovery will bring.



Travis Hessman
Editor-in-Chief

Bearing Maintenance Made Easier: 3 Product Innovations You Should Know About

Some bearings are specifically designed to save time and cost in challenging applications.

By The Timken Company

Many plant technicians are familiar with routine bearing maintenance, including installation, removal, and re-greasing of critical machine bearings. These tasks can be time-consuming depending on the type of equipment, bearing location, and methods used; in all cases, speeding up the job is a priority for MRO personnel responsible for ensuring a smooth, reliable operation.

Bearing makers heard these concerns and have responded with bearings that are easier to adjust, use fewer tools or require less frequent relubrication. The goal is always the same—saving hours (even days at a time) to avoid costly disruptions throughout a facility.

Among today's popular bearing designs are some lesser-known configurations that can also relieve the burden felt by busy maintenance staff. If lost productivity is a recurring problem, consider stronger bearing solutions and innovative approaches such as these:

1. SHAFT-GUARDING TECHNOLOGY

Conventional housed bearing units (also called mounted bearings) tend to use setscrews or a similar-type locking device that can cause galling or seizing, leading to shaft repair and increased downtime for bearing removal.

Bearings with shaft-guarding technology have two setscrews that do not dig into the shaft in order to maintain grip, thus avoiding life-shortening damage due to gouging and fretting. As the setscrews are tightened, a hardened stainless steel band under the screws is compressed, locking the bearing to the shaft while eliminating any risk of damage from the screws. Other design features tend to include a groove running beneath the setscrews in the bearing inner ring bore that serves to locate the band, while the extended length of the inner ring can also provide extra stability to improve shaft support and reduce bearing misalignment.

Shaft-guarding technology can be a wise investment anywhere shaft replacement is particularly difficult and expensive. Applications tend to include fans and blowers, conveyors, presses, and other general industrial equipment.

To understand the impact such bearings can have, consider the example of a typical plant operating 50 pieces of similar equipment, each using two ball bearing housed units per shaft. Based on a 30-year equipment life cycle, two-year bearing life, and six-year shaft life (equaling 14 bearing replacements and four-shaft replacements over the life of a single piece of equipment), savings could amount to over \$4,000 annually across the plant—and more than \$120,000 over the life of all equipment—due to the reduction in the number of bearing and shaft replacements (based on standard U.S. labor rates, typical unit costs and the typical number of hours for repair and replacement of bearings and shafts). Furthermore, the plant could gain up to 525 addi-

tional hours of uptime over the life of the equipment due to faster-housed unit replacement on all shafts.

2. SPLIT-TO-SHAFT HOUSED UNITS

Often, the problems encountered with bearings are not performance-related; more likely they are related to losses in time and expense as a result of the teardown and reassembly operations required to access hard-to-reach bearings. When a housed unit is buried deep inside a machine, it can take days to disassemble the equipment, remove the shaft, service the bearing and reinstall the shaft before resuming operations. Even where housed units are easily accessible, shaft removal or lifting of the shaft and ancillary equipment is often necessary to change bearings.

Split cylindrical roller bearing housed units are the industry's answer to bearings trapped in high-service-cost locations. These units feature removable housing halves, support caps, and bearing components that make it simple to visually inspect or replace bearings in a fraction of the time compared to conventional solid block units.

By eliminating the need to remove the shaft to access the bearing, a split-housing design can reduce installation time significantly as opposed to servicing trapped SN/SD/SAF solid housings. In nearly all cases, a split configuration can mean a lower cost of ownership over the life of the bearing.

Some split-to-shaft units also employ an angled cast iron support, or pedestal, to allow mounting in locations with low clearance between the base and the center of the shaft. This design feature eliminates the need to raise the shaft to allow clearance for the pedestal yet maintains standard bearing and housing construction requirements.

For those looking for an easier way, a split bearing unit can reduce the total cost of ownership compared to housings with solid, non-split bearings. These units are favored for a wide range of applications, including equipment commonly found in cement, chemical, food processing, and pulp and paper plants, as well as for mining, power generation, and oil and gas operations.

3. SOLID LUBE

Providing proper lubrication to bearings is an essential practice in helping to ensure they will reach their targeted service life. The process can be messy and laborious, however, and in many industrial facilities, there is good reason to avoid greases wherever possible, particularly in food and beverage plants where machines operate in close contact with edible goods.

There is growing interest in target industries for Polymer Solid Lube (PSL) bearings that are a grease-free alternative to traditional bearings requiring periodic relubrication. PSL is a microporous polymer structure impregnated with oil that entirely fills the free volume in the bearing between the



Setscrew shaft damage is common—some bearings are designed to prevent the problem completely. *The Timken Company*

races, rolling elements, and cage. During bearing rotation, the polymer solid lubricant releases the appropriate amount of oil to lubricate the rolling elements and raceways.

By filling the bearing, PSL also creates an extra line of defense against debris ingress (together, the lube and bearing seals help keep contaminants out). Material and maintenance savings as a result of never having to re-grease critical bearings can be significant, and this is compelling more plant operators to investigate the advantages of PSL bearings that are also finding a place in aerospace, off-highway, and metal processing applications to name a few.

ENGINEERING EFFICIENCY

Bearings have moved our world for over a century, and while it may seem there is little room left for improvements, the reality is that innovation continues today as bearing makers are not done finding new ways to save their customers time and money. Talk to your trusted adviser about minimizing bearing maintenance with the latest solutions built specifically for industrial needs. **NEB**

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