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I enjoy working remotely and was doing so long before the word COVID became an unwelcome part of the global lexicon. Because my work involves editing, writing and posting material online, it can easily be accomplished with a laptop and an internet connection. The business magazine publishing industry has no central location. I've often had co-workers who lived in other states – even in entirely different regions of the country. When it comes to communicating about issues and articles, it is not necessary for us to be in the same office building.

However, while enjoying the Safety 2022 show so ably organized in Chicago by the American Society of Safety Professionals (ASSP), I was struck by the shortcomings of remote interactions. The vendor space, for instance, was filled with booths and exhibits staffed by people who are passionate about the products they'd brought to the show. I saw this again and again. There was no rote recitation of the features or benefits of what they were displaying. The company representatives conveyed real enthusiasm about the innovative, technologically and stylistically advanced products that they'd brought to the show. Being able to see safety products up close and – in some cases – touch them – was so much better than the virtual experience we were all mired in during the first two years of the pandemic (so noted because the pandemic isn't actually over yet). Yes, safety organizations offered hybrid versions of shows, and safety professionals did their best to stay on top of important developments that they needed to know about it, but virtual trade shows were pale, digital imitations of the real thing.

Case in point: I knew about Magid's line of comprehensive line of PPE. However, watching Jamie Bonnema dip one of the company's Cool Gaiters in water and then - a minute later – getting to touch it with my fingers and feel how cool it had gotten gave me an understanding of how it could help prevent heat stress that I would not have understood in a mere description of photo. For the record, a Cool Gaiter's temperature drops 30 degrees below body temperature in 60 seconds, and yes, Jamie had a thermometer on hand to prove it!

At Safety 2022, it was also evident that many vendors are doing much more than setting up a booth and setting out products. I saw and participated in innovative displays and demonstrations, like the Red Wing Shoes brought to the show. Tito and Chris showed me first-hand how the company's digital voucher program makes it easy for large employers to make sure their workers get the exact type of safety footwear they need, based on the jobs they perform and the hazards they're exposed to. I got to tour the truck Red Wing Shoes will bring to jobsites when requested. It is stocked with all of the shoes and boots needed by a particular company. I also got the in-store treatment, with a high-tech measurement of my feet that returned some surprising news: my feet are two different sizes! Fortunately – I was assured by Adam, the footwear fit expert – this is very common, and probably doesn't call for shoes of different sizes. That's a relief.

Beyond products, just getting to chat with people IRL (in real life) was refreshing. I had a wonderful conversation with Marie of the American Red Cross about how we can bring some of the organization's rich store of knowledge about first aid, CPR and AED use to *Workplace Material Handling & Safety* readers.

So, while I love working remotely - because it saves me the time I'd spend commuting and the money I'd spend on gas - going to trade shows in person is refreshing and rewarding. I look forward to doing it more in the future.

Maureen Paraventi

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Technology and Forklift/Pedestrian Safety

By: **Brian Colburn**, *Contributor*

We live in a pretty amazing time in history. When I joined the material handling industry decades ago, the cutting edge of forklift safety technology was self-adjusting back up alarms and the very first, basic monitoring systems. Flash forward to today and there are virtual signage/floor lines, forklift safety lights of every conceivable type, artificial intelligence cameras, proximity sensors, speed zone controllers and so much more. While these things can be a real blessing, they can also be part of the problem. Too many companies today are relying on technology to save the day and protect their workers and ignoring the fundamentals. These technologies on their own are great tools, but there is no magic bullet that saves every life or injury, and they aren't enough without continued effort and vigilance on the parts of forklift operators and pedestrians.



Technology can enhance safety, but don't ignore the fundamentals, like training pedestrians on the dangers of forklifts.

That said, here is my take on where we are at the moment:

Virtual signage is a real winner. For years companies tried to get STOP, SLOW and YIELD signs and pedestrian aisles to stay in place with paint/vinyl and tape, but for most sites they were gone in short order, creating safety issues all over again. Virtual signage means that a sign or aisle looks as good after a year as they did on day one. They can also be used in situations where oil, dirt or other environmental factors make other options impossible. Most of this technology is LED so they last a long time. Lasers have also come on the scene that can make VERY long lines cost effectively and which look great. The only downside is that none of this technology works very well outside during the daytime, bar none.

Safety lights have changed our industry. I wish I had the foresight to invent the original forklift blue spotlight, whoever invented it should get an award, because I am sure they save lives and prevent injuries across the world every day. These lights are simple, they are LED, they are easy to understand, cost effective and flexible. For the most part, they are loved by employers and employees, which is pretty rare for any product! Some provide advance warning; some tell people how far back to stand and others are multi-functional. If you don't have these, you are behind the safety curve; most companies have at least blue spots

and many progressive companies have other types, such as red zones. Be sure when buying safety lights that you look for models with a lifetime warranty, which are in stock and most importantly, which are bright enough to do what needs done. Not long ago I talked with a company who bought \$25,000 worth of blue spots that couldn't produce a clearly defined blue spot over 6' away and most blue spots should be shining 15-20' in back of a forklift. To save a few dollars per unit, they ended up with hundreds of lights that don't do the job they were intended to do.

Monitoring Systems have come a long way. In the early 1990s, monitoring systems were annoying little "bump boxes" which were held on by two-sided tape. Most of the time, companies had them disconnected within the first year because they were so annoying. Flash forward to 2020. Besides the "big three" needs of most companies (access control, pre-shift checklist and impact tracking) the systems can monitor/control speed, prevent overloading, track efficiency, track training, schedule maintenance, ensure seatbelt use and even allow you to see before, during and after accidents with audio and video. Systems are no longer limited to the Fortune 500, average companies with only five or 10 forklifts are seeing the value in them. Most of the software is hosted in the cloud these days (software as a service) and is easy to use. The large U.S.-based systems out there have good hardware and software. Watch out for

start-up systems, non-U.S.-based systems, systems with only a few people or small U.S.-based parts inventories; the money you save may not be worth the risk you will take. By far the biggest problem we hear about with all systems is up front set up and on-going tech support, the companies just are not staffed at the levels they should be. That being said, we use a third-party implementation specialist for all the systems we market and that has been a game changer for us.

Here is the problem. We get calls every week from customers who feel technology will save the day. If they just have this product or that product, it will ensure their forklift operator and pedestrian safety. Realize this, until we remove all pedestrians from the workplace and have robots driving every forklift, there is no replacement for these things:

- **Train your pedestrians on the dangers of forklifts,** we do it all the time. Give me an hour with your pedestrians and they will NEVER look at a forklift the same way again and they will gain a newfound respect for them.
- **Certify your operators,** not just blah, blah, blah bookwork and driving them around in a circle with an empty pallet, but real-life training that reflects your workplace and your specifics and shows what can happen if they don't do the job correctly.
- **Monitor what is going on.** When we do accident analysis for companies, many times we see unsafe activities go on for years before an accident occurs. Look at what your forklift operators and pedestrians are doing and correct unsafe applications, areas and behaviors now, before the accident. Most forklift accidents are easily prevented; things like failure to look before backing up, ensuring bystanders are at a safe distance, driving with blocked vision and failure to focus on the task being conducted are some of the most common things we see.
- **Enforce the rules.** Rules which are not enforced are called suggestions. Nobody wants to be the "safety cop" or the bad guy but that's part of the job. Operators must follow your rules, you're the employer, you call the shots. People who repeatedly can't follow safety rules should be fired, better to let them be someone else's problem than to allow them to be severely injured or killed on your watch.

Brian Colburn is with Forklift Training Systems, a nationwide provider of Powered Industrial Truck and MEWP train the trainer classes, as well as cutting edge forklift and pedestrian safety products (www.forklifttrainingsystems.com).

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Image courtesy of Crown Equipment.

Creating an Ergonomically Friendly Order Picking Experience

By: **Alex Fuerst**, Contributor

While order picking is an essential part of the supply chain, it is one of the warehouse's most physically demanding and resource-intensive tasks. It is not uncommon for many order pickers to walk 10 miles in a single shift, bending, lifting and stretching to place products on pallets or in storage bins.

The rise of e-commerce has intensified the situation. Companies that predominately focused on case picking are moving to more piece picking to fill individual orders, increasing the frequency and changing the process of their order picking application.

The strenuous nature of the task not only affects the well-being of the workers but also challenges productivity and efficiency levels. The demanding working environment can also influence employee retention and hiring efforts in an especially tight hiring market.

One way to create a more ergonomically friendly order picking process may be to review the equipment assigned to the task, with the goal of enhancing operator comfort and productivity.

IDENTIFYING ERGONOMICALLY FRIENDLY FEATURES

Outside of personal breaks and maintenance stops, order pickers spend the majority of their day on and around the lift truck. How they interact with the equipment directly affects comfort and stamina throughout the shift, which can ultimately influence overall productivity and safety. Fatigued operators can be less focused or may consider taking shortcuts that put them at risk.

When selecting a lift truck to assist with low-level order picking, pay special attention to the ergonomic features it may offer. Following are a few potential features.

- **Electronic power steering** that can improve lift truck control and maneuverability while reducing operator fatigue by alleviating strain and enhancing comfort.
- **Cushioned or suspended floorboards** that absorb shock and vibrations when the lift truck travels over cracked or uneven floors and dock plates. This helps reduce stress on knees and joints and enhances operator stability.
- **Control handles** that offer a textured, comfortable grip and allow operators to maintain an ergonomically correct stance while operating the lift truck.
- **Forks** that raise and lower to enable operators to adjust the pallet to an optimal height to reduce bending and stretching, helping eliminate back and shoulder strain. Longer forks also mean operators can build two or three pallets simultaneously to reduce steps.
- **Spacious operator compartments**, combined with a low step height, accommodate operators of various sizes while providing ample room for task movement and comfortable entry and exit.

ENHANCING ORDER PICKING WITH AUTOMATION

In existing warehouses, low-level order picking can be difficult to fully automate because of the diversity of the picklist and established infrastructure. Some applications may benefit from an operator assist feature that enables the operator to remotely advance the lift truck while it uses various sensors to safely travel down the aisle, avoiding obstacles that may block its path. This control is accomplished through the use of a wearable, wireless device that communicates with the lift truck while still providing the

operator with the dexterity required to pick individual products.

Introducing this type of operator assistance technology to low-level order picking can deliver three primary benefits:

1. Enables a more streamlined low-level order picking process while in the aisle.
2. Eliminates wasted steps, reducing picking time and operator fatigue.
3. Utilizes rider mode to advance the lift truck to the next aisle or to transport the completed pallets to the order fulfillment station.

A remotely controlled lift truck enables operators to work from behind the lift truck, advancing the vehicle without stepping on and off the operator platform and moving back and forth across the aisle in an efficient Z-shaped picking pattern. Operators remotely position the lift truck relative to the next items to be picked, maintaining a smooth workflow pattern and yielding ergonomic and productivity improvements.

Low-level order picking can be very labor-intensive. Enhancing the process should focus on improving the operator experience, which will ultimately help to boost productivity and safety and promote the well-being of employees.

A CASE IN POINT

Lodge Manufacturing is an internationally known manufacturer of cast iron cookware, founded more than 120 years ago in South Pittsburg, Tennessee. It is recognized not only as one of America's oldest continuously operating cookware companies but also as an industry innovator, being the first to introduce pre-seasoned cookware to the market. Today, the company's products are shipped worldwide and sold through big box stores, hardware stores, specialty retail outlets and through online e-commerce.

For many years, the original Lodge foundry and a 40,000-square-foot warehouse and distribution center kept pace with demand, but in the mid-1990's business began to increase dramatically. A foundry expansion was soon followed by the construction of a second foundry and a new 212,000 square foot distribution center designed to handle larger orders associated with the company's traditional channels as well as smaller individual orders generated via e-commerce.

With capacity now available to support the significant increase in demand, Lodge needed the right mix of lift trucks and processes that would enable them to effectively handle incoming inventory from two foundries while efficiently processing orders both large and small.

Lodge Manufacturing consulted with Crown Equipment and its local dealer, The Bailey Company, on both the warehouse design and the new fleet of lift trucks, with each element designed to support specific tasks. The Crown MPC Series order picker was an important part of the order picking solution. The multi-purpose lift truck provides an ergonomically friendly order picking solution that enables operators to adjust the pallet to an optimal height at the forks. The ability to remotely raise and lower the forks reduces steps, while the adjustable height reduces bending and stretching when handling the heavy cast iron cookware, helping reduce back and shoulder strain.

The ability to remotely raise and lower the forks, combined with a spacious operator compartment that offers ample room and a low step height for easy entry and exit, provides a more comfortable and ergonomically friendly experience for workers. Overall, the company saw productivity increase dramatically, more than doubling order picking capacity.



Alex Fuerst is Marketing Product Manager at Crown Equipment. To learn more about Crown Equipment's forklifts, as well as automation and fleet management technologies, visit www.crown.com.

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Vacuum Grippers Allow Maximum Capacity Usage When Palletizing With Cobots

Contributor: **Piab**

Cobots are the first choice for palletizing processes at SME's and logistic entities based on their reasonable investment requirements, collaborative capabilities and their ability to handle boxes of up to 16kg and soon 20kg. Equipped with lightweight vacuum grippers with low building heights companies can make full use of their cobots' capacity.

With the ever-increasing labor shortage and the drive to re-localize supply chains, cobots play an increasing role in palletizing products. This is particularly the case in production facilities of small and medium-sized enterprises and logistic service providers, who are further pushed by e-commerce requirements for getting products out ever faster.

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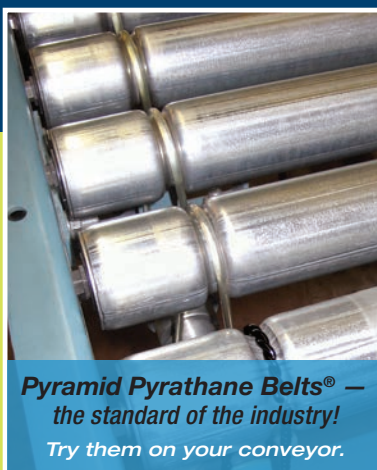
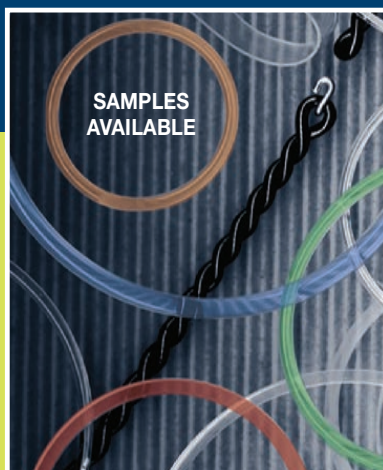
Fast and reliable cycle times when palletizing or de-palletizing boxes or containers requires a reliable end-of-arm tool

that can operate without any disturbances with no risk for damaging or leaving a mark on the object.

Vacuum technology offers just that and, hence, plays an important role as vacuum grippers offer an affordable, robust substitute for the human hand. With an integrated vacuum generation device and equipped with either a foam layer or suction cups they can securely and reliably palletize boxed or unpacked items of many different sizes, shapes and surfaces. In most cases it does not even require a change of the gripping device, when different cartons or products are handled.

A huge advantage is the compact design of vacuum grippers with low building heights. Using high quality 3D-printing technology for the production of their body, they are extremely lightweight (and similar to an ant) are able to lift a multiple of kilograms of their own weight. This makes them ideal for cobot applications, in which the cobot

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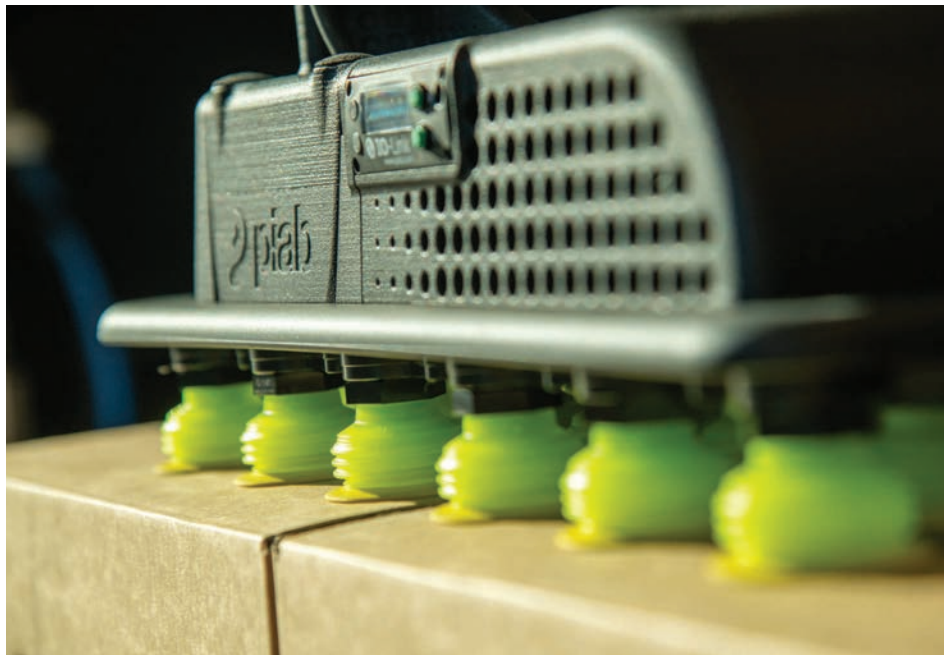
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dimensions and carrying capacity are usually the limiting factors. Reducing the amount of space and payload of the gripper is accordingly essential.

GRIPPERS THAT ALLOW MULTIPLE PICKS IN ONE CYCLE EXTEND THE COBOTS LIFETIME

Increasing sustainability and energy efficiency is mandatory, as is maximizing equipment lifetime at times of exploding prices. Therefore it is important to optimize processes in a respective way. As speed matters in palletizing operations, any solution requires to keep it up to the possible maximum. Fortunately, speed does not necessarily mean faster moves as it can also be achieved by moving more items at once. Therefore, solutions enabling picking up several cartons and moving them at once, combined with adding little weight to the cobot arm with the gripper as such, strongly reduce the wear on the robot leading to a longer cobot lifetime.



Piab's Cobot Palletizing Tool (CPT) gripping two cartons in one cycle to reduce the wear and tear of the cobot while maintaining the process' speed

HASSLE-FREE VACUUM HANDLING IN DUSTY ENVIRONMENTS

As carton handling and respectively their handling are usually quite dusty operations, the choice of vacuum ejector



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technology also plays an important role in the system design. High quality solution providers know that getting a vacuum based materials handling system to operate reliably in dusty industrial environments can be challenging. However, where other vacuum ejectors might clog up and fail, first class multistage vacuum ejectors will keep going, saving time and money. Energy efficient and high performance multistage ejectors are designed to easily overcome any dust clogging issues.

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The efficiency of an ejector is determined by the vacuum flow and the vacuum level performance relative to the air consumption. State-of-the-art multistage vacuum ejectors such as the COAX® ejectors will reach the required vacuum levels up to twice as fast as single-stage ejectors, with the same energy consumption. The faster air evacuation time and better vacuum flow of the multistage ejectors result in a much improved suction capacity.

PLUG & PLAY & INDUSTRY 4.0

Plug & play cobot models require plug & play gripper technology to enable the easy installation and operation of a plug & play solution. This translates into an easy mounting of the gripper to the cobot and connection to the compressed air system as well as communication between the cobot and the gripper. Depending on the cobot type the gripper should be delivered with a respective software, e.g. UR caps or Fanuc CF files, which facilitate simplified installation, programming and usage. This is an important feature for SME's who usually do not have specific personnel for robot programming inhouse.

Industry 4.0 functionality enables predictive maintenance an important feature to reduce and plan downtimes. Through an IO-Link the vacuum gripper is able to communicate with the cobot and other systems at the production site. Providing smart functions such as vacuum control, leakage warning, system voltage and temperature etc. the whole system can be easily monitored and in cases of malfunctioning fast and easily corrected, which further contributes to a long system lifetime.

For any company starting to automate their palletizing process with a cobot the easiest way to find the right vacuum gripper is to look for a standard solution already developed as a cobot palletizing tool by gripper manufacturers that can be customized to their needs if necessary. The vacuum gripper should have an integrated high quality vacuum multistage ejector with a high vacuum flow, a supporting program if one of the cobot types is used that provide such an environment and an IO-Link for communication purposes between devices. The gripping surface needs to match the requirements to be lifted and a respective foam or suction cups selected. Finally, the gripper should be designed to enable multiple picks in one cycle and be low in building height and weight.

ABOUT PIAB

Piab provides gripping skills to robots, intelligent flow to materials, and lifting power to humans. The company serves many sectors with its products, including the food & beverage, automotive, packaging, logistics & warehousing, e-commerce, electronics, chemicals, and pharmaceutical industries, and general manufacturing. Piab's vision is an automated world where no resources are wasted, and no humans are injured (www.piab.com).

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Contributed by The Protective Guarding Manufacturers Association of the Material Handling Institute

In industrial areas where pedestrians encounter vehicle traffic, enter hazard areas or work on elevated platforms, protective guarding safety gates serve a critical role in a facility's overall safety plan. By installing the necessary gates, facility operators help pedestrians and vehicle operators understand potential hazards, allowing them to make the right choices to protect their safety and the safety of their coworkers.

WHY SHOULD I INSTALL A SAFETY GATE?

The decision to install an industrial protective guarding safety gate should be carefully considered. The best advice, however, is that it's certainly better to overprotect rather than under protect. Your facility should incorporate safety gates to:

- Indicate an entrance into a work area
- Indicate an entrance to a vehicle-traffic area
- Indicate an entrance to or exit from a transitional platform (elevators, ladders, ramps)

- Protect an area where there is a potential fall hazard (such as a loading dock, scissor lift, pallet drop area, pick module)
- Provide access to machines or equipment surrounded by protective barriers
- Limit access to overhead storage and/or stop stored items from falling
- Improve situational awareness before entering a hazard area

WHAT ARE MY OPTIONS FOR SAFETY GATES?

The types of protective guarding safety gates fall into three main categories: Those made from metal, those made from polymer or plastic and those using a mix of the two.

- Metal protective guarding safety gates offer extremely high durability, and can be fabricated in a variety of metals, including galvanized or stainless steel for sanitary or hazardous applications. Gates can be also

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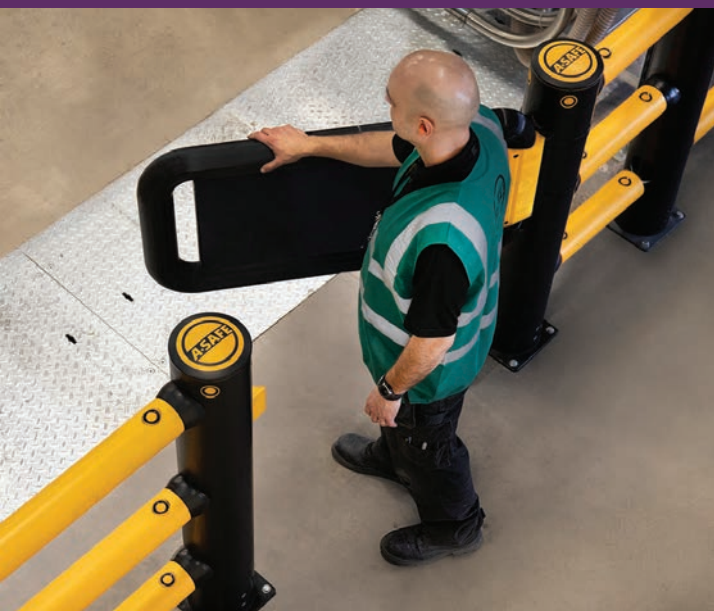
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The new Universal Swing Gate from A-SAFE is a polymer safety gate that adjusts to the size of the opening, includes space for signage and can be installed to swing in or swing out. Image courtesy of ProGMA.

be powder-coated with any color, often “hazard yellow” or to match the color of a rack system.

- Polymer or plastic protective guarding safety gates offer high durability and color stability. Polymer gates, in particular, are very low maintenance and return to their original shape if they take an accidental impact.

Polymers and plastics are permanently colored “hazard yellow” and lightweight for ease of use.

- Hybrid protective guarding safety gates offer a few of the benefits of each.

WHAT ARE THE MOST IMPORTANT SAFETY GATE FEATURES?

The best protective guarding safety gates are designed with the facility operation in mind, while also aiming to satisfy the expectations of the end-user. Key features of industrial safety gates include:

- **Durability** – A safety gate could be used hundreds of times each day, so its overall durability is critical. Fixings and hinges, for example, should be highly reliable despite excessive use. In addition, if the safety gate is used in an application with a lift truck or AGV, it must be able to withstand an accidental strike.
- **Self-closing and/or non-obstructing** – In applications with pedestrians and traffic, a safety gate should self-close after a pedestrian passes through it, which prevents the gate from blocking vehicle or pedestrian traffic if left in the “open” position. If the gate doesn’t self-close, since some gates need stay-open functionality, then the gate needs to offer zero-route obstruction by telescoping inside the main barrier. In applications around elevated pallet drop areas or in rack supported pick modules, a dual-gate safety system can provide fall protection for

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PROTECTIVE GUARDING



The Roly safety gate from Mezzanine Safeti-Gates is a dual-gate safety system constructed in powder-coated steel, and provides fall protection for employees working around elevated pallet drop areas. Image courtesy of ProGMA.

workers by ensuring that the ledge gate side is closed when the aisle side gate is open, and vice versa, which protects workers from exposed ledges.

- **Opening direction** – To keep a gate from opening into traffic or into a picking aisle, the opening direction needs to be adjustable. In applications with pedestrians and vehicle traffic, gates should open away from traffic to slow pedestrians as they are *entering* vehicle traffic.

Conversely, pedestrians leaving vehicle traffic areas will have an easier time *exiting* through the gate, which opens in the direction they are traveling. Safety gates on elevated pallet drop areas or pick modules should open without obstructing the aisle flow while allowing access to palletized material.

- **Signage mounting** – As protective guarding safety gates often lead to hazardous areas in the workplace, they have a secondary function: To display signage indicating the hazard. The space should be large enough to be easily seen and placed at an appropriate height.
- **Intentional complexity** – Safety gates should not easily allow entry into a hazardous area. Instead, safety gates require some intentional steps that slow a pedestrian, essentially forcing the user to make a spot check for hazards before proceeding. This intentional complexity can include releasing of latches to open the gate. Additionally, the placement of the gate should be carefully considered (such as not putting it directly in front of a pedestrian door or at the end of a long walkway) to prevent tunnel vision while walking.
- **Ease of installation** – While safety gates provide a critical function in industrial work areas, they shouldn't be difficult to install. Complex installations are often delayed, which puts safety at risk until the gate goes up. The best safety gates can be installed in a few hours (or less).

WHAT ARE THE CURRENT REGULATIONS FOR PROTECTIVE BARRIER SAFETY GATES?

The Occupational Safety and Health Administration (OSHA) has a Working-Working Surfaces Rule, 1910 Subpart D, which requires fall and falling object prone toon requirements, which include regulations for guardrails, safety gates, safety netting and other fall protection criteria. OSHA's regulation mandates fall protection at the height of four (4) feet.

There are a number of American National Standards Institute (ANSI) Standards that cover protective guarding and fall protection. These include MH32.1-2018 - Stairs, Ladders and Open Edge Guards for Use with Material Handling Structures; MH29.1-2020 Safety Requirements-Industrial Scissor Lift; and MH28.3-Design, Testing and Utilization of Industrial Steel Work Platforms.

TAKING THE RIGHT STEPS TOWARD IMPROVED SAFETY

Understanding what you need from and what you can expect in a protective barrier safety gate will help you find the best gate for your facility. Whether it is the maintenance-free benefits of polymer gates or the durability of metal gates, safety should be your number-one goal!

For more information about safety gates and protective guarding equipment, visit the Protective Guarding Manufacturers Association at www.mhi.org/progma.

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FAQs About Rugged Computers

By: **Maureen Paraventi**

Computers are essential to almost every workplace, but not all computers are built to withstand the conditions found in every workplace. Rugged laptops, tablets and even cell phones are becoming more and more popular for certain environments and applications. While the word “rugged” is very descriptive, it’s also a bit general. What, exactly makes a device rugged? Are rugged devices costly? Are there standards and/or certifications that can help buyers decide on the model or features that are best for them. Here are answers to some of the questions asked frequently about rugged computers and other devices.

WHAT MAKES A RUGGED DEVICE RUGGED?

Rugged computers are engineered to survive and function in harsh conditions. They are waterproof and dustproof and can withstand shocks, strong vibrations, corrosion, temperature and humidity extremes, electromagnetic interference and excessive levels of noise and pressure. Being dropped, dented or otherwise damaged will not affect their operational ability.

WHERE ARE RUGGED DEVICES FOUND?

The military is a major user of rugged devices, and issued a standard in 1962 that establishes guidance and testing intended to replicate the effects of various environments on equipment – including rugged computers - used in military operations. (More on that below.) Rugged devices are also in widespread use in manufacturing, construction, the oil and gas industry, transportation, agriculture, retail, healthcare and outdoor recreation.



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Rugged computers are waterproof and dustproof and can withstand shocks, strong vibrations, corrosion, temperature and humidity extremes, electromagnetic interference and excessive levels of noise and pressure.

HOW ARE DEVICES MADE RUGGED?

In addition to tough exterior housing, rugged computers have elements and design features that enable them to perform well in challenging environments. That may include liquid cooling and heat sinks, less cabling and electronic components manufactured to endure very high and very low temperatures.

DO I REALLY NEED A RUGGED COMPUTER?

If you work indoors, in a clean, climate-controlled office, the answer is no. However, if your work-related tasks require you to use a computer in transit, out of doors, in hazardous environments, near forklifts or heavy machinery or in the vicinity of welding activities, a rugged computer may be a wise choice for you to make- especially if you

RUGGED OPTIONS

Laptops – Although mobile, rugged laptops have thicker, stronger and heavier housing than conventional laptops. They can be used reliably outdoors and in wet and dusty conditions and will not be affected by shock, vibration or being dropped.

Tablets – These have a solid-state drive, no moving parts and typically, no fan, which makes them more dust- and water-resistant than rugged laptops. They are engineered to work in extreme temperatures and to avoid breakage due to vibrations, shocks and being dropped.

Smart phones – Because they are difficult to design and manufacture, there are few rugged smart phones on the market. The ones that are available are protected from dust, water, vibration and shock with a completely sealed housing.

store valuable data on the device. The increase in remote work means that IT pros may not be readily available if you need emergency data retrieval.

ARE RUGGED DEVICES WORTH THE PRICE?

Rugged units do cost more than conventional units. However, it is important to consider the relatively longer lifespan of such devices and the impact on productivity if a non-rugged device becomes damaged and stops working. These factors may explain the results of a 2007 study that found the total cost of ownership for rugged notebooks was 36 % lower than for non-rugged versions.¹

ARE THERE CERTIFICATIONS OR STANDARDS FOR RUGGED DEVICES?

If you want to be sure you are getting an authentically rugged device, make sure it has two certifications:

1. Military Standard (MIL-STD-810) (mentioned above).
Devices that have earned this rating have been tested to make sure they meet the military's standards for equipment that can function in challenging environments.
2. An IP-rating that verifies water- and dust-proofing

It may also have ATEX certification, a European Union designation used to regulate equipment intended for use in potentially explosive atmospheres in the EU.



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Eye Protection for Infection Control

Adapted from CDC information



The COVID-19 pandemic has shone a bright, sustained and uncomfortable spotlight on the subject of infectious disease, but its spread has been a danger to humanity for as long as humanity has existed. While the respiratory system is often perceived as the most likely transmission route, the mucous membranes of the eye can provide access into the body for viruses and bacteria that can cause conjunctivitis and systemic infections like hepatitis B and C, herpes viruses and rhinoviruses. The introduction of infectious agents can be direct - by way of blood splashes, respiratory droplets generated during coughing - or indirectly, from touching eyes with contaminated fingers or other objects.

The Centers for Disease Control and Prevention (CDC) recommends eye protection for a variety of potential exposure settings where workers may be at risk of acquiring infectious diseases via ocular exposure. Eye protection provides a barrier to infectious materials entering the eye and is often used in conjunction with other personal protective equipment (PPE) such as gloves, gowns, masks or respirators. One thing to note: regular prescription eyeglasses and contact lenses are *not* considered eye protection.

As with all forms of personal protective equipment, eye protection should be appropriate for a given task and potential hazards and compliant with relevant regulations. It must be comfortable, adjustable to ensure a secure fit and it must allow for sufficient peripheral vision. When infections have occurred, a review of the resulting exposure incidents could be helpful in identifying protective eyewear that would be better suited for that work environment.

FROM GOGGLES TO CONTACT LENSES

Goggles can provide effective protection from splashes, sprays and respiratory droplets, *if* they fit snugly – especially from the corners of the eye across the brow - and are indirectly vented. Splashes and sprays may be able to penetrate directly vented goggles. While older models tended to fog up and affect the wearer's ability to see, newer styles reduce fogging by having better indirect airflow. Although

Airborne splashes and droplets containing viruses and bacteria can be transmitted via the mucous membranes of the eye.

goggles shield the eyes, they do not protect other parts of the face from exposure to hazardous droplets.

Face shields can protect the entire face - including the eyes - from infectious disease-causing materials. In order to do that, they must have both crown and chin protection and wrap around the face to the point of the ear, which reduces the likelihood that a splash could go around the edge of the shield and reach the eyes. Per ANSI/ISEA Z87.1-2020, American National Standard for Occupational and Educational Personal Eye And Face Protection Devices, face shields should be used in addition to goggles, not as a substitute for goggles in occupational environments in which there is a risk of chemical exposure.

Safety glasses should not be used for infection control purposes, although they are appropriate for impact protection.

Full facepiece elastomeric respirators and powered air-purifying respirators (PAPRs) are intended for respiratory protection, but they also provide optimal eye protection.

ABOUT PRESCRIPTION EYEWEAR

Although there are prescription safety glasses with side shields, they do not prevent splashes or droplets from reaching the eye like goggles do. Wearing safety goggles over prescription eyewear is a better option. There are also special prescription inserts for goggles.

Both full facepiece elastomeric negative pressure (i.e., non-powered) respirators and tight-fitting powered air purifying respirators (PAPRs) require prescription inserts to avoid compromising the seal around the face. PAPRs designed with loose-fitting facepieces or with hoods that completely cover the head and neck may be more accommodating to prescription lens wearers.

Contact lenses, by themselves, offer no infection control protection. However, contact lenses may be worn with any of the recommended eye protection devices, including full-face respirators. Contact lens users should rigorously adhere to hand washing guidelines when inserting, adjusting or removing contact lenses.

PUTTING IT ALL TOGETHER

Eye protection must work with other forms of PPE – or, with other types of eye protection, if they are to be worn together. For instance: safety goggles may not fit properly when used with certain half-face respirators, and similarly, face shields may not fit properly over some respirators. Once PPE requirements have been established for a specific infection control situation, the selected PPE should be pre-tested to assure suitable fit and protection when used as an ensemble. Elastomeric, full facepiece respirators and powered air-purifying respirators (PAPRs) have the advantage of incidentally providing optimal eye protection.

REMOVAL AND CLEANING

Eye protection should be removed by handling only the portion of this equipment that secures the device to the head (i.e., plastic temples, elasticized band, ties), as this is considered relatively “clean.” The front and sides of the

device (i.e., goggles, face shield) should not be touched, as these are the surfaces most likely to become contaminated by sprays, splashes or droplets. Non-disposable eye protection should be placed in a designated receptacle for subsequent cleaning and disinfection. The sequence of PPE removal should follow a defined regimen that should be developed by infection control staff and take into consideration the need to remove other PPE (see donning and removing PPE).

Each worker should be assigned his/her own eye protection to ensure appropriate fit and to minimize the potential of exposing the next wearer. A labeled container for used (potentially contaminated) eye protection should be available in the HCW change-out/locker room. Eye protection deposited here can be collected, disinfected, washed and then reused.

Manufacturer guidelines for cleaning and disinfecting eye protection should be followed. Gloves should be worn during this process.

For more information about eye safety and PPE, visit <https://www.cdc.gov/niosh>.

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Fall Protection in the Automated Warehouse

By: **Aaron Conway**, Contributor

Warehouses, distribution centers and material handling facilities are increasingly becoming a workplace for automated machines. Many factors attribute to this rise; demand for goods is very strong, and speed of delivery is of utmost importance to all end users. At the same time, there is a labor crunch with a shortage of labor in the industry. Another advantage to automation is that a robotic or mechanical workforce can often be controlled from WMS systems, which can capture data to ensure the application stays on schedule.

Even with the robotic workforce, there will always be a need for employees, as they are crucial to each and every business. Often, when a warehouse or distribution center utilizes robots or AGVs, the machines work on lower levels and employees work on the elevated platforms within pick modules or around elevated pallet drop areas.



A worker is protected from the open ledge in a pallet rack system by a Rack Supported Roly Safety Gate. When the lift truck finishes loading the material into the pallet drop area, the ledge gate will close, providing a barrier so the worker can safely access the material.

OSHA's Walking-Working Surface Regulation 1910 Subpart D requires protective guarding to be in place around any opening on platforms elevated four feet or higher on which an employee is working. The barrier must be in place when the opening is not in use for handling materials.

Keeping safety and regulations in mind, some applications feature workers and robots or AGVs working successfully within the same environment. Highlighted are a few examples of how safety gates for fall protection are helping to not only protect employees, but also work with the automated systems in facilities today.

THE PROS OF USING SAFETY GATES

In one distribution center, a Roly safety gate was installed to protect employees working around elevated pallet flow lanes were equipped with power operation and sensors to communicate with the facility's Automated Guided Vehicles (AGV). The safety gate system communicated to the AGV that the rear side gate at the end of the lane was closed while the ledge-side gate was open, allowing the vehicle to load the pallets into the lane while a barrier was in place preventing the employee on the platform from entering the area while it was being replenished. When the pallets are unloaded, the AGV can communicate with the gate system to automatically close the ledge-side gate, allowing the employee to access the lane while maintaining a safe environment around the ledge area. After six months of using this safety gate system, the facility was determined that the pace of productivity had quickened while keeping employees safe.

In another customer's material handling facility, employees and automated vehicles work together on the same level, often in close proximity of each other and an elevated overhead door. The facility manager wanted to ensure that not only would employees not be exposed to an unprotected ledge when the door was open, but also be safe from vehicle traffic. The solution was a Roly safety gate with power operation, photo eyes and sensors posted on the gate that communicated with the vehicle and overhead door. When the overhead door opens, it sends a signal sensor on the safety gate to close the ledge side gate near the door, providing a barrier for employees working in the area. When the worker is detected on the platform by the photo eyes, the gate sends a signal to the AGV in the area telling it to stop moving. When the worker is finished on the platform, they can move away, and remotely control the safety gate to open rear-side gate and let the AGV know it can begin moving again.



A power operated Roly Safety Gate provides fall protection in an elevated doorway. Sensors on the safety gate communicate with AGVs and overhead doors to ensure employees working in the area are safe when the door is open.

Software integration with safety gates can help track product and processes in operations. For example, a software system could track the materials that a AGV moves to each

pallet drop area. By using power operation, the safety gate power station can communicate with the facility's system to record how often the safety gates are operated. The integration can track the cycles of the safety gate to determine the material that has been delivered by the AGV and automatically send it a signal indicating which area needs to be replenished.

Perhaps you have a safety gate system that is manually operated; manual operation continues to be a very safe choice for gate operation, but if you would like to add power operation or other sensors to your existing safety systems, speak with your manufacturing representative, as retrofitting these tools is often a very easy option.

Automation can help make your material handling facility or warehouse much more efficient, and streamline applications. Don't forget about keeping the employees working with and around the automated vehicles safe while they are on the job.

Aaron Conway is President of Mezzanine Safeti-Gates, Inc., a provider of pallet drop safety gates for over 40 years (www.MezzGate.com).

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Meeting OSHA Requirements with Safety Signage

By: Jane Marsh, Contributor

An organized society depends in part on the state of its infrastructure. Some workplaces are simply vital, whether maintaining roads and bridges or stowing and picking orders in warehouses.

It falls to employers to provide as safe a workplace as possible, whether or not workers face physical risks at work, like heavy equipment or speeding motorists. The U.S. Bureau of Labor Statistics recorded 4,764 deadly workplace injuries in 2020, plus an additional 2.7 million nonfatal workplace injuries.

One injury or death is too many. Here are the essentials that engineers, worksite supervisors and warehouse managers should know about regarding OSHA requirements for safety signage.

1. LEARN WHICH STANDARDS APPLY

There are two primary sets of written guidelines for safety tags and signs:

- **OSHA:** CFR 1910.145
- **ANSI:** Z535

The OSHA rules are based on original ANSI standards, which have been revised several times to better reflect the needs of modern industry.

Such guidelines typically see revisions every five years. Employers already using signs compliant under previous iterations may voluntarily update them to reflect the changes, but this is not required.

These guidelines demystify whether signs must be used in a particular environment, their physical layout and size, and the kinds of colors and phrases that effectively communicate about hazards clearly and succinctly.

2. UNDERSTAND THE ELEMENTS OF COMPLIANT SIGNAGE

Several essential elements go into an effective and compliant safety tag or sign.

Header (Signal Word)

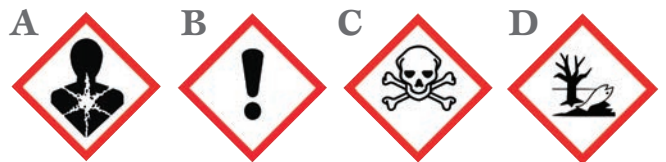
This is located at the top of the sign. Examples include “warning,” “danger,” “caution” or “notice.”

Depending on the severity of the hazard, the background color could be red, orange or yellow. A blue background denotes the chance for property or bodily damage.

Safety Alert Symbol (Pictogram)

Compliant signs feature a single image depicting the present hazard. Some of the most common ones include:

- A** General health hazards (pinching, crushing, etc.)
- B** Explosion or ignition danger (contents stored under pressure, inflammatory materials, etc.)
- C** Skin, eye or respiration danger (particulate inhalation, burns, etc.)
- D** Hazards representing a danger to the environment or nearby wildlife



Message Panel

If the signal word is there to capture the attention of passersby, then the message panel’s intention is to elucidate why that level of awareness or preparation is required. Here are some examples:

- **Confined space:** Enter by permit only.
- **Keep away:** High-pressure pipes may cause injury or death.
- **Construction area:** Hard hat and ear protection are required beyond this point.

The safety manager’s task is to craft an appropriately descriptive message that leaves nothing open to interpretation. Specific and detailed language is encouraged, but not at the expense of being impactful and succinct.



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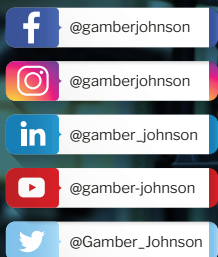
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Optional color-coding may accompany these message panel phrases. A blue outline around the pictogram indicates required personal protective equipment (PPE), and a black or red outline with a slash through it illustrates a prohibited item or behavior.

3. USE THE RIGHT SIGN IN THE RIGHT PLACE

There are three primary classifications for the risk severity described by safety signage. It's important to match the sign to the type of hazard. OSHA and ANSI recognize these primary risk classifications:

- **Danger:** These red signs indicate a hazard nearby that will almost certainly result in death if proper procedures are not followed.
- **Warning:** Warning signs are usually orange and call attention to a hazard that could result in injury or death, but with a lower likelihood of occurring than the "danger" sign.
- **Caution:** These yellow signs indicate the chance for minor to moderate injuries if people don't take the required safety actions. One example could be the presence of compromised air quality — a more common workplace factor than most realize.

There are several other colors and types of signs that may be relevant. They indicate to workers and visitors how to

appraise their surroundings, travel about safely, find tools quickly in an emergency or get more information about a situation:

- **Notices:** These deliver notifications about an area, a piece of equipment or rules to follow.
- **General safety signs:** These may reference housekeeping, sanitation and general practices.
- **Fire safety:** These show the locations of emergency equipment and exits.
- **Admittance:** These indicate who is permitted to enter an area, who is not and under which circumstances.
- **Non-hazard indicators:** These may show directions to a location or provide other general building information to help control traffic or access.

Safety managers and other decision-makers must work closely with employees to find and accurately label workplace hazards. Sometimes it takes the keen eyes of a frontline worker to identify dangers the C-suite might overlook.

The resulting signage should be placed at average eye level and in a noticeable spot before accidents happen. It should alert workers as they approach a controlled or hazardous area and give them time to react and prepare accordingly.

SAFETY BEGINS WITH EFFECTIVE COMMUNICATION

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These essential roles aren't always 100 % safe, but they don't have to be overly risky. Understanding and deploying the right signage is required to keep crews safe. Effective communication is key in any workplace, and sometimes a well-chosen icon or warning phrase can say a thousand words.

Jane Marsh covers topics in green technology and manufacturing. She also works as the Editor-in-Chief of Environment.co.

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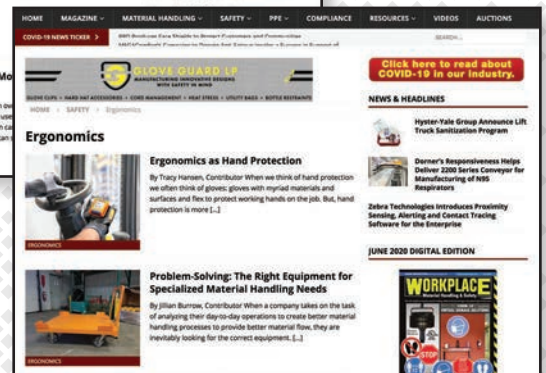
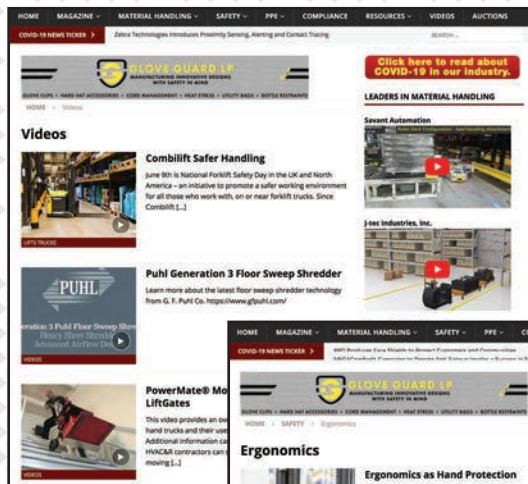
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