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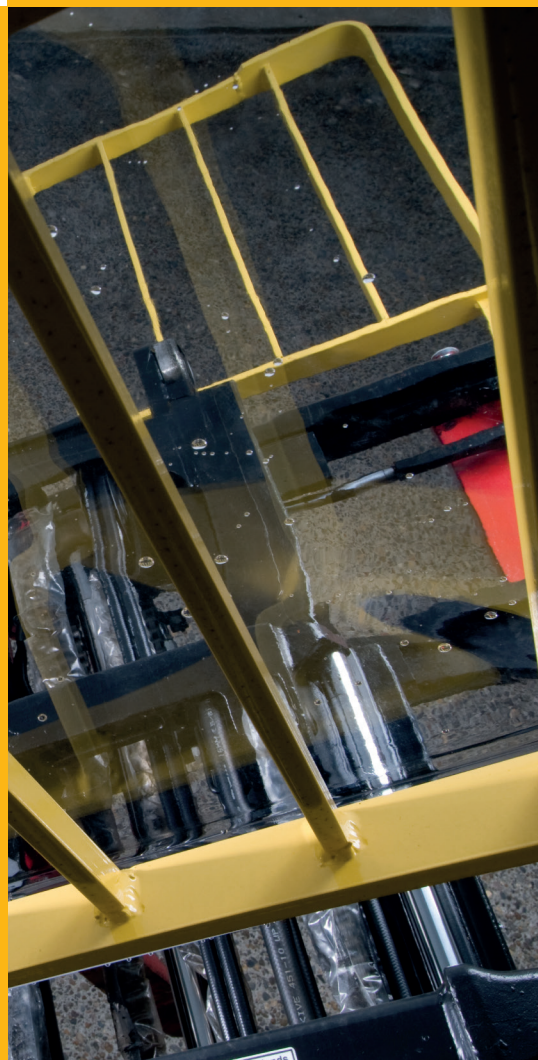


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After a period of relatively little regulatory and enforcement activity, OSHA, under the Biden administration, is signaling its intention to take on some fairly large issues. Heat-related hazards and COVID-19 are on the agency's radar, resulting in plans to tackle the former with stepped-up enforcement efforts and the latter with an emergency temporary standard (ETS) that applies to companies with 100+ employees.

Extreme heat is increasing due to climate change, and many outdoor and indoor workers are among those exposed to its effects. Although heat illness is largely preventable, it continues to claim victims in the U.S. workforce. According to the U.S. Bureau of Labor Statistics, 43 workers in this country died from environmental heat exposure in 2019 – a number higher than in all but one year from 2012 to 2018. Some 2,410 people suffered serious injuries and illnesses.<sup>1</sup>

OSHA is implementing an enforcement initiative directed at indoor and outdoor worksites in general industry, construction, agriculture and maritime. The initiative will prioritize investigations of heat-related complaints and send more inspectors to worksites on days when the heat index rises above 80 degrees Fahrenheit. The agency also will develop a national emphasis program (NEP) on heat inspections and start working on what some OEHS professionals believe is long overdue: a workplace heat standard.

The COVID-19 ETS – which requires employees of larger companies to be fully vaccinated or submit to weekly testing – provides little guidance about how employers should implement or enforce their vaccination policy, although OSHA officials did say that it would not apply to fully remote workers and that it would align with the healthcare ETS which was previously issued. The plan, as announced by the White House, is aimed at moving the needle on the significant segment of the population (around 80 million people) that remains unvaccinated against COVID-19.

Heat hazards are not new but are becoming more severe. Infectious disease is also not new, but the one currently filling hospital ICUs is extraordinarily and historically virulent. Hopefully, government interventions to combat the two important issues will be carried out in a way that keeps workers safe —with minimal requirements and red tape.

However effective or ineffective OSHA's efforts prove to be, the two dangers must be addressed, for the sake of both the companies who are trying to maintain their productivity and keep their doors open, and the workers who need to stay safe and healthy.

'til next time,

**Maureen Paraventi**  
Chief Editor, WMHS  
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1 <https://www.bls.gov/opub/ted/2021/43-work-related-deaths-due-to-environmental-heat-exposure-in-2019.htm>



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## Lithium-Ion Batteries: An Easy Cell

By: **Ioanna Gavrielatou**, Contributor

The exponential growth of ecommerce has driven demand in the materials handling and logistics sector to unprecedented levels. In the U.S. alone, ecommerce is expected to account for 26 % of all sales by 2025, with online revenues jumping \$330 billion between 2020 and 2025. Online consumers expect products to be delivered in a timely manner, so the pressure is on to keep higher inventory levels and operate with increased speed and efficiency to address demand.

Additionally, compared to traditional warehouse operations, ecommerce uses roughly three times the labor with around four times the turnover rates. Given the high demand, efficiency is critical and warehouse operators need to make the most of every tool at their disposal to service a demanding and rapidly growing market without decimating their budget. One of these tools is lithium-ion batteries.

Lithium-ion batteries have evolved from the high capital expenditure of the past. Increase in demand for lithium in the e-motive market has greatly improved their commercial viability for manufacturers and buyers alike. Moreover,

the relevant market is expected to continue growing at an annual rate of 15.7 % until 2027. And as the global market expands, upfront costs go down.

### IMPROVING PRODUCTIVITY

With greater demand-driven availability and lower upfront costs, lithium-ion batteries can contribute to improving productivity. Which, in turn, can benefit the industrial vehicle sector, as warehouse efficiency can be bolstered by the high energy density and quick recharge times of modern lithium-ion batteries. Most alternatives require backups because of lengthy recharge periods, but advanced lithium-ion batteries do not, thereby reducing costs and storage space. In addition, lithium-ion solutions do not need to be placed in ventilated charging areas to remove gases released during recharge, as do lead-acid batteries. Therefore, switching to lithium-ion frees up valuable space and eliminates additional costs, while lithium technology also reduces idle times and accommodates more work shifts.

Lithium-ion batteries are also easier to improve and maintain, as several procedures associated with lead-acid

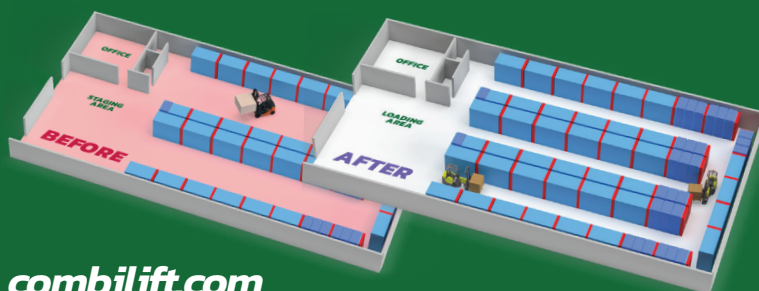
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# INDUSTRIAL BATTERIES

batteries are not required at all. This improves battery lifecycle and further reduces operating costs. Innovative Battery Monitoring Systems (BMS) track the state of

charge of battery cells, while Active Balancing modes can be employed in both the charging and discharging cycle. This allows for equal flow and receipt of energy

between lithium-ion cells, so they maintain a consistent voltage level, thus greatly increasing the system's longevity. Batteries from established and trusted manufacturers can utilize these types of applications to achieve batteries with 4,500 recharge cycles – i.e., the number of times a battery can be charged and discharged. Long-term, these improvements result in greater returns on investment, offsetting the slightly increased initial costs of lithium-ion batteries compared to lead-acid ones.

Lithium-ion batteries also assist in the more accurate monitoring of performance and efficiency. Warehouse management systems (WMS) integration enables operators to monitor the batteries and pre-empt the occurrence of any issue. Hence, warehouse managers should look for manufacturers that incorporate standard cloud access, as multi-directional



Lithium-ion batteries can be recharged quickly, which reduces downtime and accommodates more work shifts. Photo courtesy of SUNLIGHT

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communication via Wi-Fi and 5G via cloud allows engineers to remotely access batteries to shut down a damaged module or increase charge to reduce unnecessary downtime associated with faulty or low power machinery.

The boom in demand for ecommerce has placed increased pressure on global supply chains and the logistics sector, but it is also having a positive effect on the equipment used to fulfil increased demand – driving down the cost of improved lithium-ion batteries. This in turn is helping accelerate product innovation in ways which greatly improve both functionality and long-term performance. A company's overall productivity can be significantly boosted by the correct battery choice; and by assessing operational demands at the point of purchase, it's possible to achieve improved performance, as well as power storage abilities. **WMHS**

*Ioanna Gavrielatou is Marketing Director at SUNLIGHT, a technology company that produces integrated and innovative energy storage solutions in its plants in Greece, Italy and U.S. For the past 12 years SUNLIGHT has been heavily investing in lithium-focused R&D to develop innovative applications, including the high-performing Li.ON Force range of batteries (www.systems-sunlight.com).*

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## Safely Deploy Mobile Robots with Standards, Proven Guidelines and Teamwork

By: **Ed Mullen**, Contributor

Transporting materials across facilities can be difficult, time-consuming and dangerous, potentially resulting in overexertion for workers and contact with objects and equipment. In 2018, for example, forklifts alone caused 85 work-related deaths and 7,940 non-fatal injuries involving an average of 12 days away from work, according to the National Safety Council.

Not only does automation present opportunities for increased productivity and faster ROI, but it can also make work conditions safer. Implementing autonomous mobile robots (AMRs) in particular, which navigate using sensors, software algorithms and artificial intelligence capabilities, can help improve safety in part by eliminating accidents caused by blocked views from materials in front of the forklift.

When Visteon Electronics first implemented its fleet of four AMRs, employees wondered if the AMRs would be able to transport materials throughout the plant without running into workers or even other robots. It didn't take long for the employees to see that as the robots maneuvered through the manufacturing facility in 24-hour operations, five days a week, they avoided obstacles and

could actually recompute their path on the fly. In fact, extensive built-in safety mechanisms allow the robots to navigate collaboratively around human co-workers and other obstacles by slowing down, changing direction or stopping completely to avoid collision.

Employees quickly appreciated that the robots freed them from heavy, monotonous and low-value material-moving tasks, and as the days went on, they became increasingly confident in the AMRs' safety features.

With safety a top priority, management had to be on-board as well. The AMRs' safety features were carefully researched and scrutinized before any decisions were made, as was the manufacturer's and integrator's suggestions for how to work together to ensure a safe mobile robot installation that complies with evolving standards to ensure safe conditions for workers interacting with these robots.

### SAFETY STANDARDS STILL IN FLUX BUT EXPANDING FOR MOBILE ROBOTS

Safety standard requirements vary by region or country. The three main AMR safety standards for functional



Extensive built-in safety mechanisms allow the robots to navigate collaboratively around human co-workers and other obstacles by slowing down, changing direction or stopping completely to avoid collision. Photo courtesy of Mobile Industrial Robots

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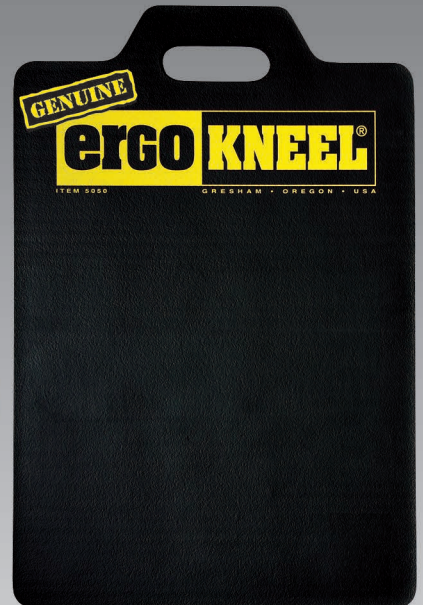


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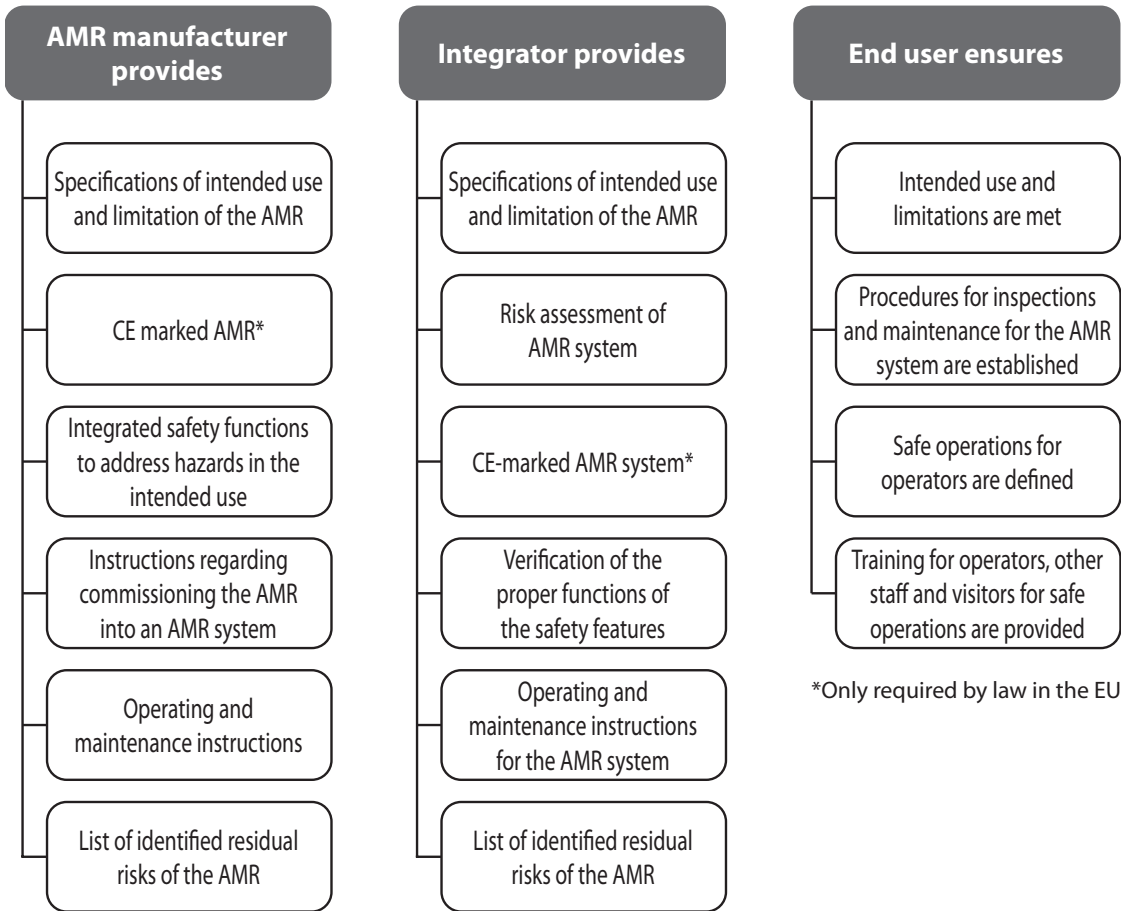


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## Roles and responsibilities to ensure a safe AMR system workspace



safety of the robot are currently the ANSI/ITSDF B56.5-2019 from the American National Standards Institute / Industrial Truck Standards Development Foundation, which addresses automated guided industrial vehicles; the EN 1525:1997 (EU), and the ISO 3691-2020: “Driverless industrial trucks and their systems,” which was released in February 2020.

The EN 1525:1997 also applies to an automated guided industrial vehicle as well as its systems and to the commissioning and preparation of the environment in which the robot will be used. The ISO 3691-4:2020 addresses safety concerns for internal logistics and the hazards related to recompute paths on-the-fly, which are key aspects of AMRs. The new standard provides detailed requirements for deploying mobile robots, as well as environment and work-cell design.

Other standards in progress that will likely have an impact on manufacturers, users and integrators of mobile robots include the prUL 3100, and the ANSI/prRIA 15:08 (expected to be published at the end of 2020). As addressed in a Robotics Industries Association (RIA) webinar in July, this latest standard covers ground-based industrial mobile robots in a semi-structured environment with trained personnel and no public interactions

(i.e. retail warehouse space with only employees vs. retail floor). These must be fully autonomous and capable of moving and planning its own path along a free space, which distinguishes the AMRs covered under this standard from traditional automated guided vehicles (AGVs).

### PROVEN EUROPEAN GUIDELINES SET THE STAGE FOR GLOBAL SAFETY

In addition to the safety standards previously addressed, consider following the guidelines established by European MD, which has proven to be a solid framework that can be applied to all factories, with amendments to address local requirements. Discuss the following steps (more detail in chart) with your AMRs manufacturer and system integrator:

- The AMR manufacturer must provide a vehicle designed to be deployed in a safe AMR system, which includes the environment, charging station, top modules, and other peripherals, along with providing adequate information for integration and operation. This means the manufacturer is responsible for specifying intended use and limitations of the AMR, which is typically to transport materials in industrial environments without a human driver. In Europe, the manufacturer must CE-mark the AMR according to

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intended use through compliance to safety standards for AGVs, which is what most standards are based on today. They must also comply with complementary standards to address all risks and provide integrated safety functions to address expected hazards.

- When the robot is ready to deploy, the AMR system integrator becomes responsible for the safe workplace. If the end user is installing the AMR themselves, they are the responsible party. The integrator must provide an installation where all hazards are addressed or identified while providing adequate information for operation. Because AMRs can be programmed to move throughout a building, factory, or warehouse, the integrator must anticipate potential safety hazards and program the robot and top module to act appropriately in compliance with safety standards.



Visteon Electronics' fleet of four AMRs free employees from heavy, monotonous and low-value material-moving tasks. *Photo courtesy of Mobile Industrial Robots*

If the robot is deployed outside of those limitations, the integrator (or end user) must incorporate additional protections to ensure that safety standards are met for

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the full robot application. Consequently, the integrator must specify the intended use and limits of the AMR system and make a risk assessment of the AMR system in light of the AMR manufacturer's specifications, intended use and limitations.

- Once the AMR system is deployed, the end user is then responsible for setting up and following procedures for operation and maintenance. The end user must ensure that the intended use and limitations are met and set up procedures for inspections and maintenance for the AMR system, including warning and markings.

Ensuring a safe workforce around autonomous mobile robots isn't an easy process but it can be facilitated by following the chart shown, or by contacting the AMR vendor being considered to help effectively and safely navigate the process. With the increasing number of AMRs installed worldwide, new AMRs on the market, and new customers with limited experience with this technology, every relevant member of the implementation team must work together to ensure a safe workplace. It's too important to try to do alone. **WMHS**

*Ed Mullen is the VP of Sales, Americas at Mobile Industrial Robots. ([www.mobile-industrial-robots.com](http://www.mobile-industrial-robots.com))*

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## Four Principles to Ensure Protective Guarding is Used Correctly

By: **Aaron Conway**, Contributor

Look around the facility you are working in; it's likely filled with equipment found in many material handling operations: storage systems, racking, conveyors, fork-trucks, AGVs and more. Within all of the machinery is also some kind of protective guarding or barrier. Is the protective guarding being used correctly? If not, the guarding or barrier can become a hazard itself, go unused, and not provide the intended protection. Risk for employee injury is just as great as having no equipment at all.

This issue of safety equipment becoming a hazard becomes a greater issue when it comes to ROI. Initial costs of protective guarding can be high, depending on the complexity of the facility and the number of areas that need to be secured. However, the cost of not having the safety equipment in place is much greater; costs can add up: fines from OSHA, the potential for the facility to be shut down for a period of time, costs for legal teams and damage control on the corporate reputation. These potential costs outweigh any cost for safety equipment.

By ensuring the protective barriers in your facility are being used correctly, you will not only be protecting the most important asset of your company, employees, but also your ROI. Here are four principles to guide you to ensure protective guarding, like safety gate systems, will be used correctly.

### ENSURE THE FIT & QUALITY

First and foremost, it is important that you choose the right safety equipment for the application. Ensuring you have the right design for your specific application will help to increase the ROI of your investment.

Make sure you review the proper OSHA regulations and your application. For example, OSHA's Walking Working Surfaces Rule mandates that all elevated work platforms of 48 inches and higher be protected. In the instance of pallet drop areas on elevated platforms, dual-gate systems are the best way to ensure compliance, and there are many models to choose from.



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A custom-engineered Roly safety gate that is power-operated, double wide and double deep. Image courtesy of Mezzanine Safeti-Gates, Inc.

The fit of the safety equipment will also depend upon a number of factors, including the application, location within the facility, climate and usable space in the area. Your application or space within the area may call for a custom-engineered design or use of specific material.

Repetitive motions can increase an employee's risk for injury; they can also contribute to fatigue, another factor for injury. Equipment should be installed to reduce the effort and strain on these employees and to make the process as ergonomic as possible. Safety equipment that requires no effort by the worker, such as a loading dock gate that automatically closes when the

Another point to keep in mind is the quality of the equipment. What may appear to be the most budget-friendly design may end up being the most expensive if the equipment is not used properly or is easily damaged by daily use. Look for something well-constructed and ask about any preventative maintenance needed to keep the equipment operating properly.

## OPERATE ERGONOMICALLY

In most material handling environments, employees are working long hours and often moving material from the pallet drop area to conveyors or racks in other parts of the facility. Workers are often required to lift heavy items, move heavy loads, reach above or below to grab or place items, and more. These movements are often repeated throughout the day.

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# PROTECTIVE GUARDING



A Rack Supported High Pallet Pivot model. Image courtesy of Mezzanine Safeti-Gates, Inc.

truck drives away, rather than rely on the worker to slide a barrier back into place, can help ease the risk for injury.

## AUTOMATE & COMMUNICATE

The way materials are moved through facilities has changed at the same rapid pace as the machinery used throughout

the building. Processes are more automated, and some of the picking is now being done by robots.

However, the rise in use of robots will not replace real employees any time soon. Facilities rely on people to work throughout the building on various applications, some on ground level and some on elevated levels. That means safety equipment like protective guarding continues to be a necessity in material handling environments.

Technology, like power operation, can not only help with ergonomics, but also allows the protective guarding to communicate with other plant equipment and software. For example, controls and sensors integrated with power operation on safety gates can send an AGV a signal when the ledge gate is up, telling it to load material to the pallet drop area. After the pallets are loaded, the sensors from the AGV send a signal to the safety gate to use the motor to close the ledge-side gate so employees can work with the material.

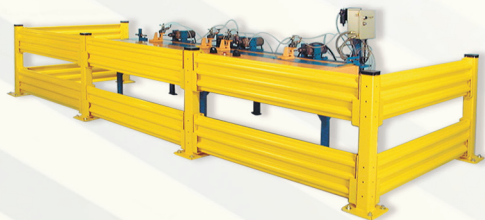
When you add power and technology to protective guarding, it is also important to utilize built-in safety features like photo eyes to detect the presence of a person or object and prevent the gate from opening or closing. An adjustable clutch that engages if the gate makes contact with another object can also be included.

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## TRAIN & MAINTAIN

While safety systems should be intuitive, they are often not used properly when the orders and picking activity increase. Demonstrating how to operate all protective guarding to each employee helps to ensure workers will properly use each piece of safety equipment they encounter. Discussing safe practices while working on an elevated platform - knowing how and when to operate the safety gates on elevated pallet drop areas, for example, can ensure they can move about the ledge safely.

Humans are not the only ones working in a distribution center or warehouse - automated vehicles and robots are increasingly deployed in these facilities. It's important to discuss the roles of the machines, including how and when they work. This can help prevent accidents, and keep employees safe on the job.

Lastly, ensure the safety equipment is maintained properly, and at any sign of showing wear contact the manufacturer or team within your facility to make necessary repair. If the equipment operates at a high capacity, make sure to check hinges and other connections on a regular basis. Equipment can only operate properly if it is in good condition. **WMHS**

*Aaron Conway is the President of Mezzanine Safeti-Gates, Inc., which can be found online at [www.mezzgate.com](http://www.mezzgate.com).*



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## Leaders in MATERIAL HANDLING

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### Gamber-Johnson

#### About Us

Gamber-Johnson is a leading supplier of rugged mounting systems that safely secure mobile communication systems, computers and other electronic equipment in fleet vehicles, public safety vehicles, forklifts and other mobility applications. Their products are used by law enforcement, public safety, military, and warehouse fleets around the globe and are known for being rugged, reliable and responsive.

Gamber-Johnson has always strived to be at the forefront of technologies; Founded in 1954 as a wooden furniture manufacturer that housed radios to a globally recognized rugged mount manufacturer for critical job-related technologies. The idea of “supporting technology to help save the world” has fueled innovation and company direction since the beginning. This evolution from producing furniture in 1954 to becoming a 21st-century world leader in mounting equipment for electronics was a natural progression, fostered by company culture and continuous improvement. As a result, the company currently exports to more than 40 countries, with installations in thousands of fleets worldwide.



Today, Gamber-Johnson is still proudly made in Stevens Point, Wisconsin, and manufactures **rugged, reliable, and responsive**, complete mounting solutions and systems for laptop, tablet, and handheld computers, radios, light, and audio products, cameras, printers, keyboards, and other devices. Partnering with major technology manufacturers such as Dell, Getac, Panasonic, Samsung, and Zebra, Gamber-Johnson is a trusted name in the industry. With more than



20 patents and counting, the company has received numerous awards and accolades as an industry leader.

These include:

- The President’s “E” and “E” Star Award: Recognize outstanding contributions and growth to U.S. exports.
- Wisconsin Governor’s Export Achievement Award: Honors the company’s work in furthering Wisconsin’s global economy.
- The Cygnus Innovation Award: Acknowledging that the company is at the cutting edge of emerging technologies.
- Gamber-Johnson has been nominated as Wisconsin Manufacturer of the Year eight times, winning a special award for Outstanding Customer Relations in 2019.
- J.P. Leggett Innovator Award from Leggett & Platt
- “Workplace of Distinction” by Corporate Report Wisconsin.

Gamber-Johnson’s dedication to producing products that are rugged, reliable, and responsive is unparalleled. The Gamber-Johnson name has become synonymous with high quality products

that can withstand even the most extreme situations. Our products are designed and tested for long term durability and performance. Combined with a strong focus on customer service, the Gamber-Johnson brand is also uniquely responsive, offering custom-designed solutions, lightning-fast production and shipping and working directly with technology partners to ensure the optimum fit and function every time.

From the company’s local origins to its modern-day global impact, Gamber-Johnson has continued pursuing its mission — supporting our heroes and saving the world through a laser-like focus on innovation. This is accomplished by understanding individual needs and making recommendations based on them for improved technology/docking/mounting solutions.



#### Gamber-Johnson

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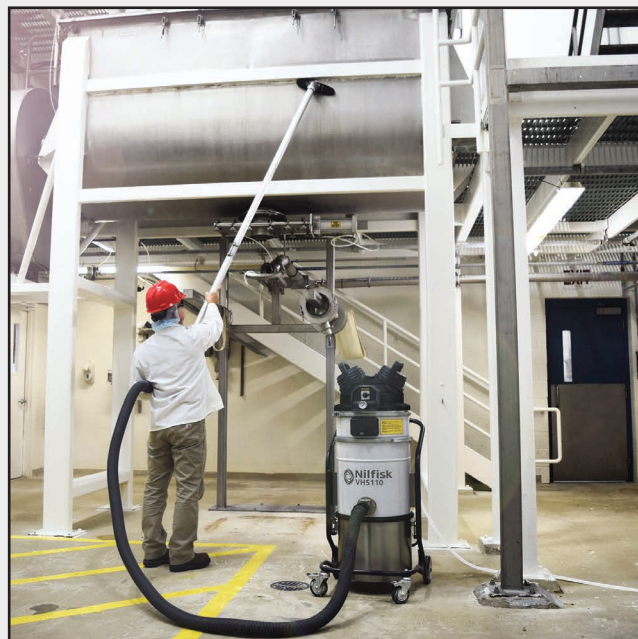
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Nilfisk offers an extensive range of premium cleaning products, including floorcare equipment, vacuum cleaners and high pressure washers worldwide to help customers navigate these changing demands, needs and standards.

Nilfisk was founded on a vision of producing and selling products of the highest quality worldwide and for more than a hundred years, Nilfisk has adapted to the changing needs of markets and customers



with innovative products and solutions. With a global sales force and proven sales channels, we have established strong and valuable customer relations and partnerships across the world and we strive to be at the forefront of technological advancement to drive future customer needs.

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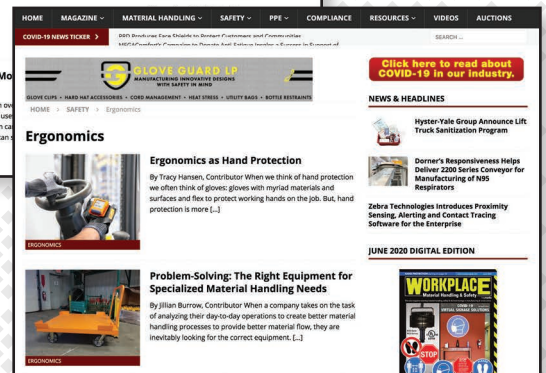
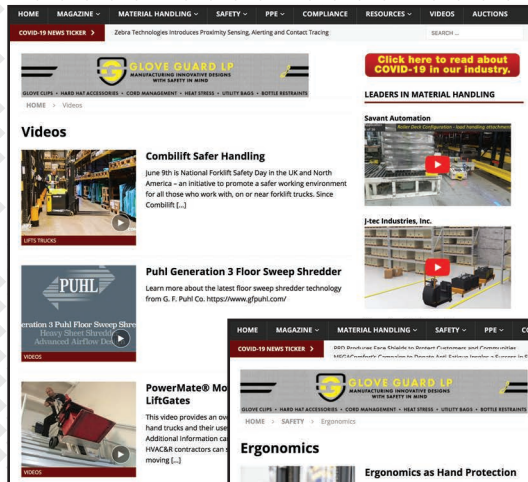
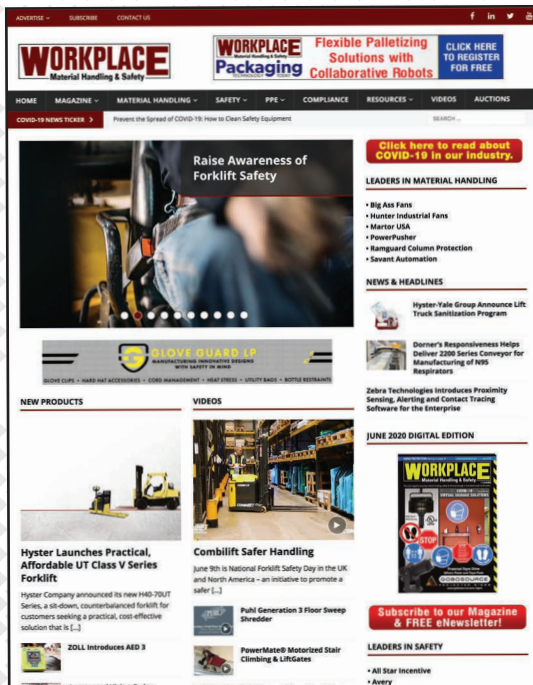


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# The Comfort & Care of Work Boots

By: **Maureen Paraventi**

Work boots – especially for industries such as construction – are substantial items, designed and built to protect your phalanges and metatarsals, your muscles, tendons, ligaments and oh yes, that painful-when-injured Achilles tendon - all of the marvelous parts that make up the all-important appendage that allows you to walk, run, jump and just...*stand*.

While safety footwear manufacturers strive to make their products as comfortable as possible, the weight and solidity of work boots can leave feet (along with ankles and even knees) feeling sore and strained at the end of a shift. There *are* some things you can do to increase the comfort level when wearing this type of this indispensable safety gear.

### START WITH FIT

Wear the same socks you wear on the job, preferably ones made of polyester or a wool or wool blend. Polyester cushions the foot well and ushers moisture away from your foot. Wool and wool blend socks are naturally antimicrobial, so they decrease moisture and odor. Cotton socks – which are very popular due to their affordability – quickly lose their cushioning property. Worse, they absorb moisture, so that

your feet are kept damp during your shift. Uncomfortable *and* unhealthy.

When you're boot shopping, try on both at the same time. Walk in them. Hop up and down in them. Do your toes have sufficient room? Do they have too much room, so that they're moving forward? Is your heel rising up out of the boot? Are any components on the inside of your boot irritating your foot? (Even stitching can be irritating.) When you flex your feet, do the boots bend too much? That's an indication of insufficient support in the arch area.

Once you've decided upon a pair of work boots, wear them for a week outside of work, during normal activities, in order to break them in. Using an oil-based conditioner will also help get your boots ready for on-the-job use.

### WORK BOOT SELECTION GUIDE

Safety footwear must fit the job as well as the person who'll be wearing it. In addition to a hazard analysis, a review of work-related activities will help narrow down the choices. The wearer must be comfortable, but must also be able to efficiently perform work-related tasks. Here are the features that should be taken into account when choosing a work boot:

**Construction** should be sturdy and slip resistant. If you want boots to have a long life, choose welted or stitchdown ones that can be re-soled when needed. In addition to the traditional steel toes – which may make feet feel cold during outdoor work in the winter – there are also protective toes made of alternative materials.

When **water resistance** is needed, look for boots with waterproof membranes or leather outer layers and a taller height. Keep in mind that waterproof boots will be heavier (because of the extra height) and will take longer to dry after a shift. If water resistance is not needed, shorter boots will provide more comfort. (You



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can also take steps to waterproof your boots; they're discussed below).

**Insulation** in a work boot is important for workers who spend a lot of times outdoors in cold temperatures, but in warm weather, it can make feet feel hot and sweaty.

## CONSIDER USING ARCH SUPPORT SOLES

Support insoles can help you with on-the-job comfort as well as existing foot conditions such as plantar fasciitis and tendinitis. By keeping your foot aligned correctly, they can also prevent pain in your knees and hips. The range of features and types offered by manufacturers gives you plenty of choices, including:

- Extra shock absorption, for workers whose feet may potentially be struck by objects
- Anti-fatigue technology
- Ventilation to help keep the feet cool
- Extra thickness, for heavier weight people
- A thick heel cup and thin front foot which keep feet in a comfortable position and the wearer's spine properly aligned

- Anti-microbial materials that keep feet cool and reduce odor

## TAKING CARE OF YOUR BOOTS

Regular cleaning of built-up dirt, mud, salt and waterproofing wax with a water-based agent and a nylon brush will help boots last longer and keep them from drying out. Cleaning out the inside of the boot with a shampoo will help remove odor.

To boost the water resistance of leather or suede boots, apply a water-based waterproofing agent specific to that material. A water-based product won't cause the leather to stretch and will keep the boot breathable. Repeat the applications twice more, after three-week intervals, for superior water resistance. To prevent suede boots from shrinking, stuff them with newspaper after applying the waterproofing product.

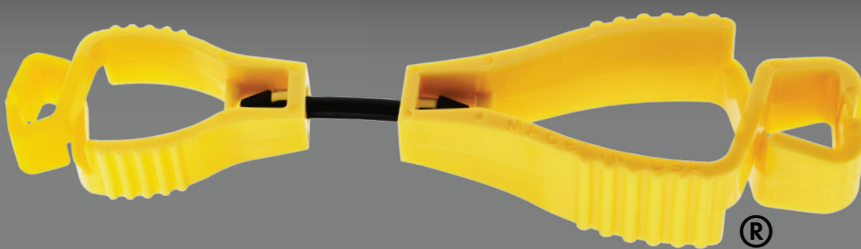
And finally, always make sure boots dry thoroughly after each shift. **WMHS**

If you have an interest in contributing an article for an upcoming issue or would like to have WMHS on your PR list, please email: [maureenp@rdgmedia.net](mailto:maureenp@rdgmedia.net).

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# Mastering the Ever-Increasing Performance and Safety Requirements in Welding

By: **Peter Deutsch**, Contributor

The performance and safety requirements in welding are becoming greater. All welders in industry and workshops notice this every day due to the ever-increasing pressure to perform. How can you deal with these rising demands on the welder with confidence? It's simple: integrate the best technology into a welding helmet to make work easier and safer and simply put it in the welder's hand (or on his head). As an example, let's take a look at two technologies that make daily work much safer while also increasing the quality of the work.

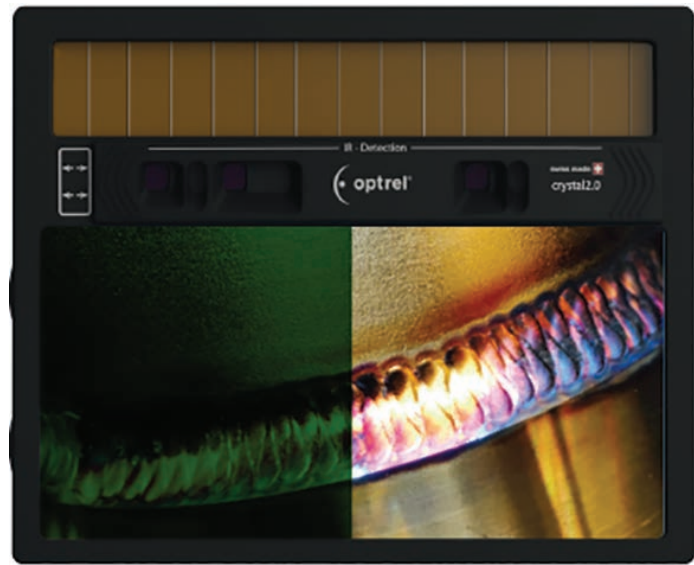
What are the challenges of welding? Since the human eye cannot look directly into the welding light, a welding filter must be used. Today, welding filters automatically darken when welding begins (ADF = auto darkening filter). This leaves both hands free to work and gives a more or less good view of the component before welding. The brighter the filter is when the welder is not welding, the better.

In addition to darkening, the ADF has another fundamentally important function, namely filtering out dangerous UV and IR radiation. This filter element in every ADF is one of the most expensive components in an ADF. Therefore, a simple filter is often used that protects well, but does not transmit all visible colors. These filters can be recognized by the fact that the welding arc and everything around it can be seen in green or orange. However, this is a significant disadvantage in welding. Welding temper colors and marks can hardly be seen, and the welding pool cannot be seen clearly.

## SOLVING COMMON CHALLENGES

In the meantime, however, there are welding helmets with ADFs on the market that solve this exact problem. Through an elaborate manufacturing process, technology is now available that enables both an open shade level of 2 and a really true color view of the welding process. An example of this is CL Technology (CLT). This technology gives the welder an unprecedented bright, clear and true-color view also when the helmet is open (Figure 1). This allows the helmet to be worn throughout the work process without having to constantly flip it up and down. This saves time and prevents work interruptions due to poor visibility, while at the same time protecting the workers' eyes from debris and other welders in the area. In the dark state during welding, the CLT now provides an unprecedented view of the arc and the component being welded. The welder can see every subtlety in the arc and the molten metal and can finally fully control the arc. Furthermore,

the welding temper colors during welding can now be seen completely, which allows ideal control of the heat input. This makes welding much easier and prevents expensive and time-consuming welding errors, such as binding errors or a heat-affect zone that is too large.



**Figure 1:** The bright, clear and true-color view through a modern cassette (example optrel crystal2.0). Photo courtesy of Optrel

## WHAT OTHER CHALLENGES DOES THE WELDER FACE?

With modern welding power sources, the welder can adapt his arc (welding current) to the component during welding. For example, with a foot pedal or a torch switch in TIG welding, the welding power can be continuously increased or decreased according to the requirements. However, this also means that the brightness of the arc increases or decreases accordingly. This is exactly where the welder with an ordinary automatic helmet has a problem. The shade level is then no longer appropriate for the amperage being used.

Crafty engineers have also found a perfect solution to this problem: An ADF that also automatically adjusts to the brightness of the arc. With this technology, an automatic helmet now becomes a fully automatic helmet. The “automatic” of ordinary welding helmets refers, as already mentioned, only to the darkening of the ADF.

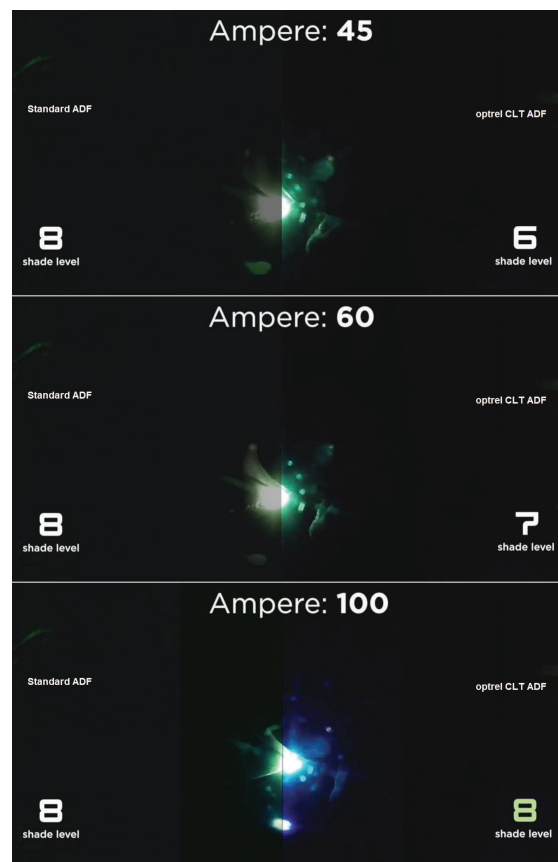
Automatic shade level adjustment, however, goes one decisive step further: the shade level of the ADF adapts fully automatically to the brightness of the arc. This means that

the welder always has the correct protection level setting and always has a perfect view of the arc, thus preventing eye fatigue and eye strain often leading to headaches while welding at the incorrect shade level. This also works when the welding power is changed during welding, e.g. when changing from main current to secondary current. Here, the darkening level automatically and continuously follows the brightness of the arc (Fig. 2). Previously, the welder only had the choice between, for example, “too bright with secondary current” or “too dark with main current.” This not only made the eyes very tired, but also preprogrammed welding errors due to the lack of visibility. With this technology, this shortcoming of ordinary welding helmets is

finally eliminated. And since every welder has an individual perception of brightness, the brightness can also be adjusted by  $\pm 2$  protection levels.

As these two examples of technical progress show, a small investment in an innovative welding helmet can make work considerably easier and safer. By avoiding errors and increasing productivity - while at the same time relieving the welder - the investment pays for itself in a very short time. **WMHS**

*Peter Deutsch is a welding engineer (IWE) and head of Product Management for Optrel, a leading global supplier of face and head protection products, breathing protection solutions and active sunglasses ([www.optrel.us](http://www.optrel.us)).*



**Figure 2:** Continuous adjustment of the darkening with the optrel ShadeTronic®. Photo courtesy of Optrel

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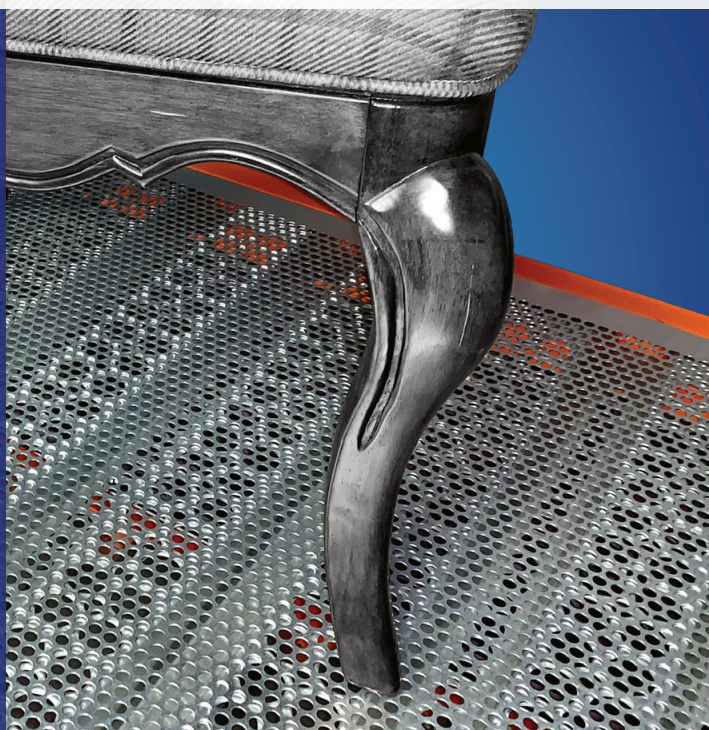
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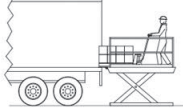
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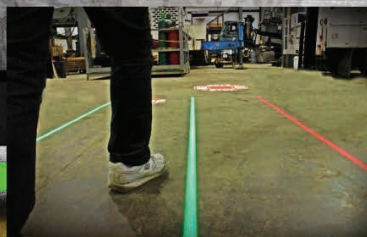
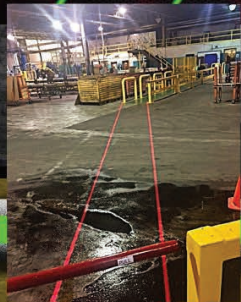
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