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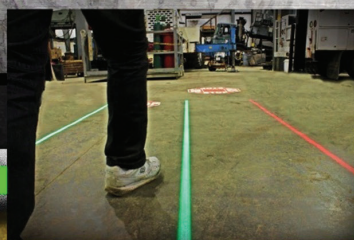
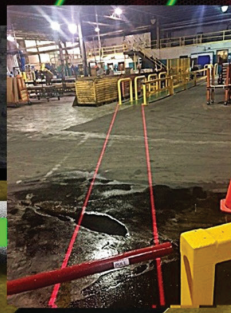
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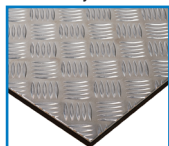
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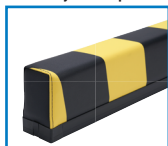
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## Material Handling/Logistics

### ERGONOMICS & SAFETY

- 8 Elements of Ergonomics Programs**  
A look at how these programs prevent further losses in productivity, quality and profit.

### BATTERIES

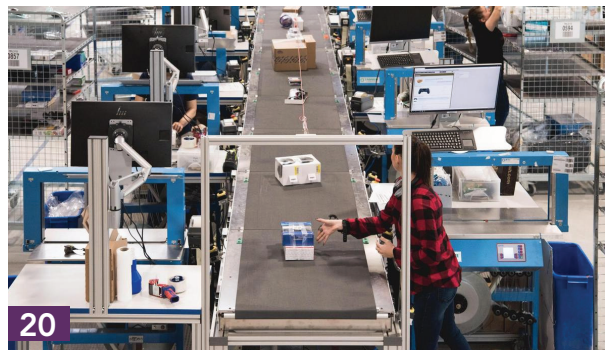
- 12 Accurate Measurement is Key to Eliminating Battery Hazards**  
A glimpse into this key power source and the toxic hydrides produced during the production and recycling of batteries.

### LIFT TRUCKS: SAFETY

- 16 Review Operational Guidelines with Your Crew This Forklift Safety Day**  
Forklifts are a necessary part of material handling, but they can also create numerous hazards to the workplace if not operated properly.

### LABELS & TAGS

- 20 Optimizing the Last 100 Feet**  
One of the best areas of a distribution center to target for both improved efficiencies and sustainability is the final 100 feet of fulfillment operations.



20



16



38

## Environmental Health & Safety

### NATIONAL SAFETY MONTH

- 24 National Safety Month: An Opportunity to Focus on Safety**  
Workplace injuries and illnesses cost the U.S. an estimated \$250 billion each year. Read all about National Safety Month and how it helps prevent workplace injury.

### LOCKOUT/ TAGOUT

- 26 OSHA's LOTO Standard: Due for an Update**  
In the U.S., employers are responsible for having a LOTO program, which means they must create one if one doesn't currently exist.

### FLASHLIGHTS

- 30 Trends for Flashlight Safety in the Workplace**  
Sufficient lighting is essential to keep workplaces safe and productive. Read up on the trends surrounding industrial flashlights.

### SENSORS/ WEARABLE TECH

- 32 Wearables in the Modern Workplace**  
Using wearable technology to connect workers is imperative to advancing safety, productivity and the well-being of everyone on the job.

### HAND PROTECTION

- 38 Safety Gloves with Touchscreen Capabilities**  
A look at how to use touch screens safely and effectively with compatible safety gloves.

### TRAINING

- 44 Safety Training Techniques and Benefits for Your Facility**  
What are some of the best safety training techniques, and what benefits can they offer your facility?





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From time to time, it's useful for me to remind myself of the specific characteristics of our readers. *Workplace Material Handling & Safety* magazine (WMHS) has a unique – and dual – editorial focus. There are a number of publications that address occupational safety and health issues, and others aimed at the material handling issue. We cover both. Every year, when we put together our editorial calendar and decide on what kinds of articles we'll be needing for each month's issue, we strive to strike a balance between safety and material handling. To provide articles of interest to all of our readers in their many industries, in other words.

Every wonder who your fellow WMHS readers are? They are in manufacturing; construction; warehousing and distribution centers; transportation; food processing and industrial machinery. Their titles and areas of responsibility range from CEO, CFO and President, to safety and industrial hygienist, plant manager and engineer. Why should any of them bother reading WMHS magazine (along with our eNewsletters, eBlasts and eBooks)? Many industries are going through profound, far-reaching changes – a process that seems to be accelerating, rather than stabilizing. For instance, technology that can improve speed and efficiency has been adopted with such rapidity that it leaves many people feeling as if they are constantly behind, in understanding it and its implications for their workplaces. Automation and robotics have transformed the way many industries operate, but they require managers and other decision-makers to regularly monitor trends and new developments. Even more basic things, like the racks and shelving, protective guarding, lift trucks, bins and casters found in warehouses are regularly redesigned and improved by manufacturers and innovators. In addition to efficiency and affordability, sustainability and environmental impact have emerged as driving forces behind much of the innovation.

Our understanding of workplace safety has deepened and gotten more complex. So have the equipment, supplies and procedures used to reduce the risk of workplace incidents and work-related illnesses. Devices that can protect workers' heads, hearing, feet and bodies from objects, noise, struck-by incidents, falls and heat stress – to name just a few hazards – continue to evolve. If an industrial or construction worker – for example – from 50 years ago time-traveled to the present, he or she would be astounded by the sophistication and market segmentation of modern personal protective equipment (PPE). New materials, designs and manufacturing techniques have resulted in safety gloves that resist toxic chemicals or sharp blades; lightweight, waterproof work boots that protect insteps and toes; hearing protection that facilitates communication and gear that makes employees in hazardous situations highly visible. Safety managers must be aware of all the options that are best for the workers they supervise, which is not an easy task. Neither is keeping track of and remaining compliant with the government regulations that apply to their workforces and workplaces.

At WMHS, we make it our business to be a source of information on all of these topics. Our goal: to help you stay up to date on the trends and topics, the products and services you need to know about, in order to make your operations run smoothly and keep your employees safe. Your suggestions and comments about the magazine or any of its digital offerings are always welcome. Feel free to email me at [maureenp@rdgmedia.net](mailto:maureenp@rdgmedia.net).

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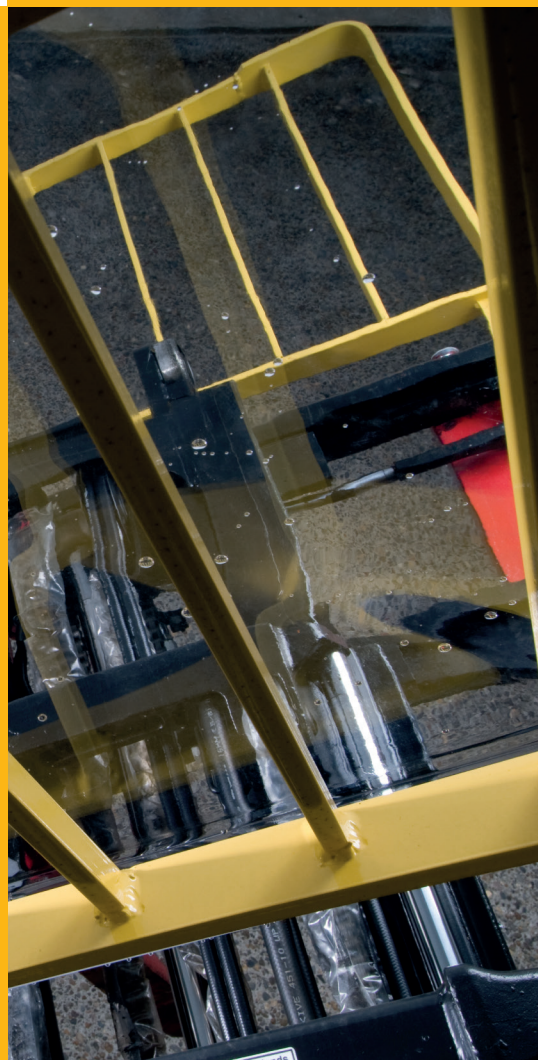


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## Elements of Ergonomics Programs

*Adapted from Workplace Safety and Health Topics, the National Institute for Occupational Safety and Health (NIOSH)<sup>1</sup>.*

Why should employers design an effective ergonomics program to prevent work-related musculoskeletal disorders (WMSDs)? They are costly and can significantly reduce worker productivity and morale. Workers suffering from MSDs have difficulty meeting the demands of their jobs. An estimated 31 % of nonfatal occupational injuries and illnesses are related to MSDs. The median days away from work for a WMSD is 12 days, compared to eight days off for other work-related injuries. Ergonomics programs enable employers to detect WMSD problems and develop solutions. This approach prevents further losses in productivity, quality and profit by lowering rates of absenteeism, lost time injury and worker compensation premiums.

### FIRST, A FEW DEFINITIONS:

- **Musculoskeletal disorders** (MSDs) are disorders of the muscles, nerves, tendons, ligaments, joints, cartilage or spinal discs that are caused by sudden or sustained physical exertion and are *not* the

<sup>1</sup> <https://www.cdc.gov/niosh/topics/ergonomics/ergoprimer/>

result of any instantaneous non-exertion event (e.g., slips, trips or falls). The pain ranges in severity from mild/occasional to intense/chronic.

- **Work-related musculoskeletal disorders** (WMSDs) are MSDs that can be attributed to the work environment and the performance of work; are made worse or longer lasting by work conditions that require employees to lift, push, pull or carry many or irregularly shaped objects; maintain awkward/unnatural postures; withstand cold temperatures; withstand vibrations from machinery and tools; and increase the intensity, frequency and duration of activities.
- An **ergonomics program** is a systematic process for identifying, analyzing and controlling workplace risk factors, often for reducing musculoskeletal disorders

### DEVELOP A PROACTIVE APPROACH

To design an ergonomic intervention for WMSDs you must understand work processes, job tasks, equipment and workplace layouts. Your first objective is to determine whether machines or people are best suited to complete a particular job task. Ideally, workers should not experience



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Records of complaints and injuries are often enough to reveal the scope of a WMSD problem. © Laiotz - stock.adobe.com

undue stress or strain when using tools, job methods, workstation layouts and materials. Develop a proactive engineering approach that eliminates the risk factors for WMSDs in that job. Proactive action can help management and workers anticipate and prevent WMSD problems. *Ergonomic Guidelines for Manual Material Handling*<sup>1</sup> outlines a proactive action plan in four steps: 1) look for clues, 2) prioritize jobs or improvements, 3) make improvements and 4) maintain involvement (2007).

Imagine an appliance manufacturer designed a new assembly line that prevents WMSDs without limiting production. Management evaluated musculoskeletal injury patterns, risk factors and possible engineering solutions. Assembly line workers, engineers and management recognized job risk factors and cooperatively planned a new assembly line. Workers now use pneumatic tools to open clamps and lift heavy appliances to reduce awkward postures and static (constant) exertion forces. Workers also use height-adjustable turn tables, work tables and shelving units to reduce risks associated with overhead work, reaching, bending and maintaining awkward postures. Once management establishes baseline injury rates, follow up on symptom surveys to determine injury trends and outcomes. Then, periodically fine-tune the production line as workers become more skilled in their jobs.

## NIOSH' GUIDE TO PREVENTING WMSDS

NIOSH has a step-by-step guide to evaluate and address musculoskeletal concerns in your workplace. There are seven simple steps:

**Step 1: Identify risk factors.** Incidents of possible WMSDs are either isolated to a particular job/task or widespread, affecting multiple departments. Records of complaints and injuries are often enough to reveal the scope of a WMSD problem. OSHA logs and company medical records are readily available to most employers. These records can be used to calculate incidence rates (i.e. new cases) and prevalence rates (i.e. new and old cases) of MSD problems, which come in handy for step 3.



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**Step 2: Involve and train management and workers.** Ergonomics training would be beneficial for all workers exposed to conditions that contribute to MSDs. Employees know their own jobs better than anyone else does. Workers must be given the opportunity to discuss problems as they see them. Management and workers need to understand ergonomics if they are to correctly identify and solve workplace MSD problems. Ergonomics training enables managers, supervisors and employees to identify the risk factors for WMSDs, recognize the signs and symptoms of WMSDs and develop strategies that reduce and prevent WMSDs.

**Step 3: Collect health and medical evidence.** Determine the scope and characteristics of the problem by collecting health and medical evidence of WMSDs. It is essential to follow up on workers whose jobs cause undue physical fatigue, stress or discomfort. If employees report their symptoms early and openly, you can take corrective measures to delay the development of MSDs. In a scenario where workers in a certain department report more MSD problems than workers in other departments, it is best to immediately study possible MSD risk factors in that department.

**Step 4: Implement your ergonomic program.** There are five approaches to control WMSD risk factors. Elimination is the most effective way to reduce MSD risk

factors in the workplace. The Hierarchy of Controls also includes substitution, engineering controls, administrative controls and personal protective equipment. In ergonomics, engineering controls (isolating the hazard), substitution (replacing the hazard) and/or elimination (removing the hazard) can be highly effective. Personal protective equipment (PPE) and administrative controls are not as likely to reduce or eliminate WMSDs.

Workers should not experience undue stress or strain when using tools, job methods, workstation layouts and materials.



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**Step 5: Evaluate your ergonomic program.** You can use a variety of techniques to measure the effectiveness and benefits of your ergonomic program. Compare the following data before and after the intervention: job analyses, checklists, symptom surveys, OSHA form 300 logs, employee absentee rates, turnover rates, workers' compensation costs, productivity indicators, quality of products and services and savings. Remember that workers will not experience the benefits of your ergonomic program immediately. It can take months for old MSD symptoms to disappear, and you will need to modify your intervention if new MSD symptoms appear.

**Step 6: Promote worker recovery through health care management and return-to-work.** Develop a return-to-work program in which modified jobs, restricted duties or temporary job transfers are provided to accommodate employees with WMSDs; educate and train employees to recognize and report signs and symptoms of WMSDs and encourage employees who report symptoms of WMSDs to speak to the qualified health care provider.

**Step 7: Maintain management commitment and employee involvement.** Research shows that management commitment is crucial to the success of musculoskeletal health awareness training and WMSD interventions. Management is responsible for encouraging worker input

<sup>2</sup> <https://www.cdc.gov/niosh/hhe/default.html>

on real or suspected job hazards, ways to control these hazards and how best to implement interventions.

NIOSH recommends ergonomics programs be used to supplement existing occupational health and safety management systems. Organizations that have identified possible WMSDs can contact NIOSH for a free, customized Health Hazard Evaluation (HHE).<sup>2</sup> **WMHS**

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## Accurate Measurement is Key to Eliminating Battery Hazards

By: **Dr. Blaise Champagne**, Contributor

The manufacturing of chips and other high-tech electronics has helped drive the electric vehicle (EV) revolution. Common gas hazards monitored in electronic production processes include toxic hydrides, such as arsine ( $\text{AsH}_3$ ) and stibine ( $\text{SbH}_3$ ). Batteries provide the energy storage to power EVs, making them a key technology underlying the revolution.

Although the use of batteries is considered more environmentally friendly than fossil fuels, in terms of a carbon footprint, their use also gives rise to familiar environmental hazards such as hydride gas emissions—amongst others. In what is perceived to be a “green” revolution, let us explore this key power source and the toxic hydrides produced during the production and recycling of batteries.

Both  $\text{AsH}_3$  and  $\text{SbH}_3$  become toxic at quite low levels.<sup>1</sup>  $\text{AsH}_3$  has a TWA exposure value of 0.05ppm and an IDLH of 3ppm<sup>1</sup> and  $\text{SbH}_3$  a TWA of 0.1ppm and an IDLH of 5ppm.<sup>1</sup> Both substances target organs such as the blood, kidney and liver. Additionally, arsine is linked to certain cancers. This article discusses the measurement challenges that arise as the TLV values for these compounds are in the sub-ppm concentration range.

These gases arise during processes used to produce and recycle important non-ferrous metals used in batteries, such as zinc and copper. Normally, a key part of the refining and purification processes is the addition of the ore or dirty recovered metal to sulfuric acid ( $\text{H}_2\text{SO}_4$ ) solutions. The ores or refined metals have trace amounts of arsenic (As) and antimony (Sb) contaminant in various chemical forms. The addition of sulfuric acid can cause a reaction to produce ( $\text{AsH}_3$ ) and/or ( $\text{SbH}_3$ ).

<sup>1</sup> See the NIOSH Pocket Guide to Chemical Hazards available online at the CDC website and in printed format.

### MEASUREMENT AND MONITORING

Measuring these substances is quite challenging under the best of conditions. The toxic hydrides must be monitored at quite low values due to their toxicity at sub-ppm levels. When batteries are being produced and processed for recycling, these hazards are present in a demanding environment that is potentially very corrosive and dirty—and might have elevated temperatures plus high humidity.

There are highly effective technologies for measuring low-level hydrides that have been in use for some time in semiconductor manufacturing. The technology most often utilized for this is colorimetric tape analyzers. These colorimetric tape analyzers are able to measure hydrides down to low-ppb concentrations and have proven themselves to be quite dependable for these types of measurements over the years. However, implicit in semiconductor manufacturing are carefully controlled ambient conditions. Most semiconductor hydride measurements are recorded in environmentally controlled “clean rooms” with little or no dust, moisture or excess temperature.

### OVERCOMING CHALLENGES IN BATTERY PRODUCTION

The key challenge to overcome for battery production and recycling is deploying precision colorimetric analyzers designed for clean dirt-free environments, in less pristine sampling conditions associated with metal refining and recycling. To make these measurements without destroying the analyzer, the use of sample conditioning systems is required. The sample must be conditioned to ambient conditions of temperature, pressure, particulate concentrations and humidity so the analyzer is not destroyed.



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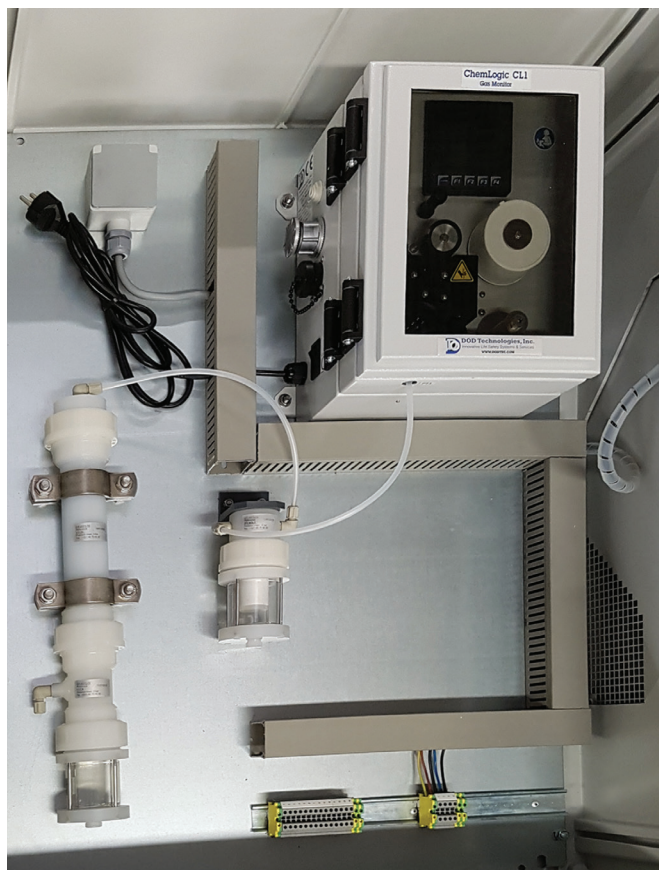
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Shown here is a colorimetric analyzer in combination with a sample system for gas sampling in a harsh industrial environment. Image courtesy DOD Technologies, Inc.

A typical sample system that reduces dust and excess humidity, and provides sample cooling, is shown in the photo below. Although these systems can be quite complex, the underlying goal is straightforward. You need to draw a non-ambient gaseous sample and convert it to an ambient one in a reproducible way, so it can be measured by precision analyzers designed for clean, ambient atmosphere environments. This combination of ambient colorimetric analyzers and sample systems is being effectively utilized at battery manufacturing and recycling facilities; several high-profile players in this field have successfully implemented these types of solutions to address hydride hazards.

Based on current market trends, the requirement to monitor hydride emissions from battery production and processing will increase rapidly. For example, there are over 1,000lbs of batteries in a typical EV.<sup>2</sup> Driven by EVs and other consumer electronics, the global market size for rechargeable batteries is expected to grow from \$44.49 billion in 2021 and is projected to reach \$193.13 billion by 2028. That translates into a compounded annual growth rate of 23.3 % during the forecast period from 2021-2028.<sup>3</sup>

The number of facilities that produce and recycle batteries will have to rapidly grow to keep up with the demands for manufacturing and recycling of rechargeable batteries.

<sup>2</sup> Tesla Model 3, Wikipedia.org.

<sup>3</sup> Fortune Business Insights February 21, 2022



## INDUSTRIAL BATTERIES

CATL, LG and Panasonic, estimated to control about 70 % of the EV battery market, are currently planning capacity and plant expansions.<sup>4</sup>

In summary, hydride emissions from battery production and recycling are increasing in the workplace, driven by strong demand for the batteries used in EVs and other applications. The same colorimetric tape technologies that have been effectively utilized in the semiconductor industry, primarily in clean rooms, are effective at measuring these toxic hydrides. The technical challenge is that the conditions associated with battery production are often quite dirty and might have elevated temperatures and moisture associated with them. These issues are addressed with sample conditioning systems bringing the sample to ambient conditions that will not harm the analyzer and allow accurate hydride measurements to be made—even under harsh sampling conditions. **WMHS**

*Dr. Blaise Champagne has 30+ years of experience in gas detection and related fields. He is the Business Development and European/Southern Territory Manager at DOD Technologies, Inc., a gas detection manufacturer specializing in low-level, colorimetric-based gas-detection technologies (<https://dodtec.com>).*

<sup>4</sup> Spectrume.ieee.org, The Top 10 EV Battery Makers, August 25, 2021.

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# Review Operational Guidelines with Your Crew This Forklift Safety Day

By: **Joe Calhoun**, Contributor

Often called “the workhorse of material handling,” forklifts are one of the most widely used types of equipment in warehouses and facilities across the country, because they can do so much. They bring countless benefits to the modern workplace, efficiently lifting and transporting inventory day in and day out.

Forklifts are a necessary part of material handling, but they can also create numerous hazards to the workplace if not operated properly. Studies show that roughly 70 % of all forklift-related accidents could have been avoided with proper training.

Maintaining a safe workplace is crucial, and the Propane Education & Research Council (PERC) wants to ensure that forklift operators have the information they need to keep themselves and their co-workers safe. Employee incidents are preventable by taking the right precautions and regularly reviewing and practicing proper forklift safety

procedures. The best way to keep crews safe and informed is by conducting ongoing safety meetings to review best practices, regulations and basic safety guidelines.

Here are a few important forklift safety tips to share with crews this June—and throughout the year.

Critical forklift safety reminders:

- Complete a routine check of equipment before operating and notify management of any damage or repairs needed to forklifts.
- Wear personal protective equipment as provided by the employer including hard hats, protective footwear and high visibility clothing.
- Always wear a seatbelt while operating a forklift. It's important for operators to buckle up while operating a sit-down forklift, as overturned forklifts are a leading cause of forklift-related accidents. Wearing a seatbelt can save operators



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from being crushed by a machine's overhead guard or roll cage in the event of an accident.

- Keep loads within the forklift's weight capacity. Employees can greatly increase the risk of tipping a forklift over by exceeding its weight capacity. Double check forklift load capacities in the equipment's operating manual. Load capacities may also be listed on the machine itself.
- Operate at a safe speed, use the horn when vision is obstructed, and use caution on grades or ramps. Operators should use the horn to alert pedestrians or other forklift operators nearby to avoid an unnecessary collision. Take corners and turns slowly to minimize the risk of tipping.
- Set the parking brake, lower the forks and set any controls to neutral when finished operating. Safely parked machines reduce the risk of unintended movement when left unattended. If a forklift is parked on an incline, employees can further secure the machine with wheel blocks.

Different forklift fuels require different safety procedures. It's important for crews to be aware of fuel-specific safety measures to help them get the most out of their equipment and prevent potential injuries. With 90 % of Class 4 and 5 forklifts across the United States being powered by propane, it's important to share proper propane safety practices.

Best practices for handling propane cylinders:

- Wear protective gloves.
- Keep open heat, flames and ignition sources away from cylinders while refueling equipment.



Keeping loads within the forklift's weight capacity reduces the risk of the forklift tipping over. Image courtesy of PERC.

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- Handle cylinders carefully, making sure not to drop, throw or drag them.
- Use proper lifting techniques when transporting cylinders.

Safety measures before and after operating propane-powered equipment:

- Inspect cylinders before operation. Check cylinders for rusting, dents, gouges and leaks. Cylinders that show signs of wear or leaks shouldn't be used and may need to be replaced, even before the cylinder's requalification date.
- Secure the cylinder's pressure relief valve. Operators should check that the pressure relieve valve is clean, unrestricted, set to the 12 o'clock position, and directed upward at a 45-degree angle when the cylinder is mounted horizontally.
- Close the service valves on cylinders when not in use. This helps prevent potential injury around internal combustion engines and unintended fuel loss.
- Store propane cylinders in a secure rack or cage. The cylinders should be stored horizontally with the pressure relief valves in the uppermost position, and operators should use proper lifting techniques when removing cylinders from storage and placing onto a forklift.
  - A propane cylinder storage rack should be located a safe distance from heat or ignition sources,

away from stairwells and high traffic areas, and protected from exposure to the elements.

Establishing ongoing safety briefings is a great way to keep employees informed throughout the year, share valuable seasonal safety reminders, and address their questions or concerns. The only thing more important than keeping employees productive is keeping them safe. And choosing propane as your fuel can help you do just that because you get the additional support of your local propane supplier. That means you can focus on the business while your supplier helps ensure the safety of your forklift operators.

Propane suppliers have hours of safety training and can teach your crew safe handling practices and how to properly connect a cylinder to a forklift. With the supplier's help, your crew will be safety pros in no time. **WMHS**



*Joe Calhoun is director of off-road business development for the Propane Education & Research Council. He can be reached at [joseph.calhoun@propane.com](mailto:joseph.calhoun@propane.com).*

To learn more safety tips and how crews can benefit from using propane, visit [Propane.com/Material-Handling](http://Propane.com/Material-Handling).

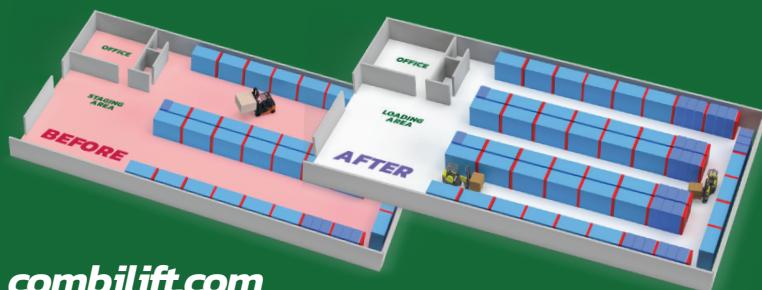
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# Optimizing the Last 100 Feet

By: **Christian Dow**, Contributor

Image courtesy of PSI Engineering.

Using advanced tools, your fulfillment operations can be both efficient and sustainable.

All distribution centers are working toward more efficient—and more sustainable—operations, for many reasons. With the historic labor shortage continuing, DCs need to operate with fewer employees wherever possible. Automation that might have seemed out of budgetary reach is now justifiable, so DC managers are deploying it more often than in years past. On the sustainability front, companies have both corporate mandates to reduce their corporate impact, and demand from their customer base to do right by the planet.

One of the best areas of a distribution center to target for both improved efficiencies and sustainability is the final

100 feet of fulfillment operations. This is the area where scanning, labeling, application and manifesting takes place, and when you add SLAM solutions to your operations, you up your efficiency while also reducing your environmental impact. It's a double win for overall operating goals.

These opportunities present themselves in a variety of ways. They might reduce dunnage, for instance, which keeps packaging materials out of the waste stream. Or the equipment can improve shipping accuracy, which prevents returns, both costly to the bottom line and to the environment. With the right equipment, there are a wide variety of options within that final 100 feet to make a difference.

## PRINTING GAINS

One of the areas of opportunity within the final 100 feet of fulfillment is printing. Rick Fox, president of FOX IV Technologies, said that his company has developed a product that automatically prints and applies shipping labels and the packing slip on one label. “It combines a process that most people do in two steps,” he said.

This serves two purposes. For one, it eliminates a step of the process, cutting down on the labor required and the equipment. It also ensures that the shipping label and packing slip match, which can drastically reduce mis-shippments and returns. This pays off by cutting down on transportation costs and the use of fossil fuels. “If you look at a standard fulfillment line, you put the packing slip in, close the box and then add the shipping label,” said Fox. “Sometimes that results in a mismatch.”

Another feature of the equipment is that utilizes a smaller footprint for the packing list

Another product that can deliver sustainability and efficiency in the final 100 feet is ultrasonic banding in ecommerce operations. *Image courtesy of Felins.*

than the traditional 8 1/2" x 11" sheet and repurposes about 60 % of the label liner, thus making an impact on the amount of paper required while reducing waste. "We use what was the label liner to make the packing slip," Fox explained, "so we're taking something you usually throw out and repurposing it."

The company has been making labeling equipment for years, said Fox, and when it saw the opportunity for improvement, it took it. While the solution is ideal for DCs with a high level of automation in place, it might not be a perfect fit for more manual operations, he admits. "If you're only doing 10 to 40 boxes an hour, it won't justify the investment," Fox said. "But if you're high volume, this is a great solution."

Customers of the product tell Fox they like the fact that they're taking paper out of the fulfillment stream, as well as finding a solution that cuts down on the need for labor. "It's sustainable and delivers savings," he said.

## BANDING OPTIONS

Another product that can deliver sustainability and efficiency in the final 100 feet is ultrasonic banding in ecommerce operations. Packaging comes in many forms and flavors here, and Felins has developed a more sustainable process for outgoing packaging. "With ecommerce

fulfillment, you're often going to have orders that involve multiple, unique sized products," said Gina Barrieau, banding sales manager for ecommerce at Felins. "Our bands hold the products together for easy conveyance and to protect them during shipment."

This ups the efficiency and sustainability in a few different ways. Rather than sending three different products in three different packages with multiple shipping labels, for instance, you can consolidate them together and print the license plate labels directly onto the band. Then the orders are integrated with right-sized packaging, eliminating wasted materials.

Banding can also make a substantial dent in the amount of packaging materials required. "Our goal is to reduce packaging waste, and the bands secure products to either a corrugated insert or to each other, which keeps them from clashing or moving inside the box without the need for additional void fill," Barrieau said.

Similar to Fox's printing and labeling equipment, the banding process works best in high-volume operations. "Banding unitizes the orders so that they keep their shape as they move down conveyors and through the entire scanning and packaging process," Barrieau explained. "Without



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FOX IV Technologies has developed a product that automatically prints and applies shipping labels and the packing slip on one label. Image courtesy of Fox IV Technologies.

a band, those products might shift as they travel and cause machine jams and downtime.”

Barrieau points out that the banding process contributes to faster, more efficient operations and more satisfied customers. “This is extremely important today,” she said. “We know that consumers are willing to change their shopping habits in order to improve the environment, and this helps deliver on that.”

## RIGHT-SIZED BOXES

As with Felins and FOX IV Technologies, PSI Engineering is also focusing on reduced waste and increased efficiencies for its fulfillment customers. Stephen Pickfield, CEO at the company, said that “customers want to work with companies that provide good corporate responsibility and sustainability.”

Those same customers also want their packages to show up on time and personalized “like a present,”

said Pickfield. To that end, PSI has developed a document inserter that is print-on-demand, delivering personalized messages to the order. The company also has a solution that provides right-sized packaging, eliminating waste. Combined, the products deliver exactly what consumers are after.

“When you provide right-sized boxes, it eliminates damage, reduces shipping costs and reduces the amount of carbon footprint,” he explained. “As products go through the last 100 feet, the machine folds the box into the correct size for what is being shipped. It adds a lid, glues it shut and sends it out. There’s no packaging added to the box.”

If the box requires an insert before being sealed up, PSI’s friction feeders add in the pre-printed materials, gift cards or discount cards. “It matches up to the order profile,” said Pickfield. “When it’s all integrated together, customers have a line of friction feeders along the conveyor system along with the right-sizing equipment, and they have a complete solution.”

Going forward, the ecommerce world will only become more demanding of efficiency and sustainability. SLAM equipment delivers exactly that, making the final 100 feet an area of improvement and opportunity. **WMHS**

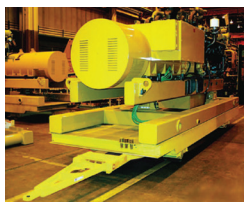
MHI’s SLAM Industry Group provides education and thought leadership for “the last 100 feet” of warehouse and distribution operations. The group is made up of the companies that make the solutions and technologies that go into ecommerce fulfillment processes. You can learn more at [www.mhi.org/slam](http://www.mhi.org/slam)

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## National Safety Month: An Opportunity to Focus on Safety

By: **Maureen Paraventi**

June is designated by the National Safety Council (NSC) as National Safety Month, a time to focus efforts on improving the safety of work environments by spreading awareness of hazards and preventing occupational injuries and illness. National Safety Month has been observed since 1996. The NSC itself dates back to 1913, when it was established (as the National Council for Industrial Safety) at the Second Safety Congress. That was during an era when an estimated 20,000 industrial workers died from work-related causes annually, and two years after the infamous Triangle Shirtwaist Factory fire that claimed the life of 146 workers. The name was changed to National Safety Council in 1914, to reflect a broader scope.

Workplace injuries and illnesses cost the U.S. an estimated \$250 billion each year. Approximately 2.8 million nonfatal workplace incidents and injuries occur in the private sector of the U.S. each year, with overexertion; slips, trips and falls, and contact with objects and equipment accounting for 84 % of them. In 2019, 5,333 U.S. workers died on the job. The most dangerous injuries are agriculture, forestry, fishing and hunting, followed by the transportation and warehousing industries and the construction industry. According to the Bureau of Labor Statistics (BLS), 64,640 of the 421,400 employees who were involved in workplace accidents in 2019 missed at least one day of work due to the injury or illness they sustained during their shift. Some 28 %, or 32,470, of those who missed work, sustained a sprain or strain, while 14.5 %, or 16,790, had soreness or pain, and 13.3 %, or 15,380, had a cut, laceration or puncture. More than 5,000 workers died on the job that year – about 15 workplace deaths per day across the nation.

### FROM MSDS TO SLIPS, TRIPS AND FALLS

Each year, National Safety Month includes four specific safety related topics – one for each week in the month. This year's topics are:

**Week 1: Musculoskeletal Disorders (MSDs)** - Injuries or disorders of the muscles, nerves, tendons, joints, cartilage and spinal discs may be caused by work or exacerbated by it. MSDs cases are more severe than the average nonfatal injury or illness and result in high costs to employers related to absenteeism, lost productivity, and increased health care, disability and worker's compensation costs.

Typical MSDs are:

- Sprains, strains and tears
- Back pain

- Carpal tunnel syndrome
- Hernia

**Week 2: Workplace Impairment** - Substance abuse on the job can pose a serious risk, but impairment can take on other forms as well. Mental distress, stress and fatigue can also affect an employee's ability to perform work tasks safely. Employers are encouraged to identify and address *all* forms of impairment that potentially effect on workplace safety.

**Week 3: Injury Prevention** - In 2020 alone, more than four million workplace injuries required medical attention in the U.S. A comprehensive approach to injury prevention requires an analysis of the work environment and tasks to identify potential hazards, changes to reduce the risks and effectively and regularly communicating safety policies to employees.

**Week 4: Slips, Trips and Falls** – Falls are the second-leading cause of unintentional injury-related death in general and are the top cause of fatalities in the construction industry. This National Safety Month topic is an opportunity to reduce the risk of slips, trips and falls and falls from height, through changes in work practices and, when appropriate, the use of fall prevention equipment.

Safety, of course, should be a priority all year round and in all situations – not just the workplace. During National Safety Month, it's a good idea to enhance safety in a variety of ways – beyond the topics of this year's observance. This may include first aid, CPR and AED training; making sure your home or workplace's first aid kit has any supplies that might be needed in the event of an emergency; avoiding distracted driving – and making sure family members and/or employees do the same; and taking a self-defense course. You should also have your home tested for radon; make sure you have a functioning fire extinguisher on hand; ensure that hazardous materials like cleaning solutions or pest control products are out of reach of small children and pets; and take measures to prevent heat stroke during hot weather and frostbite and hypothermia in the colder months. **WMHS**

*The NSC has a wealth of resources, for both National Safety Month and year-round safety. Visit the organization's website at: [www.nsc.org/work-safety/get-involved/national-safety-month](http://www.nsc.org/work-safety/get-involved/national-safety-month)*



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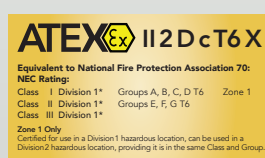
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# OSHA's LOTO Standard: Due for an Update

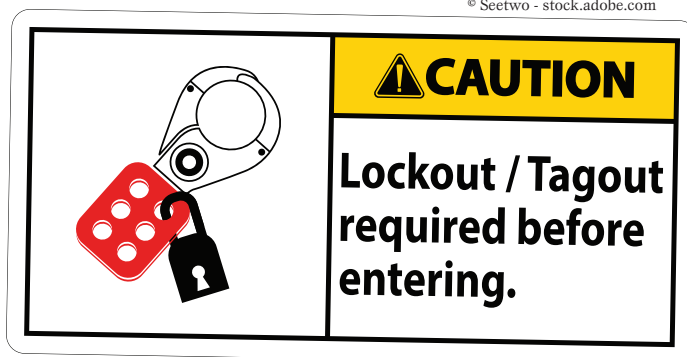
By: **Maureen Paraventi**

A variance granted to a U.S. steel production company set the stage for what many in the occupational safety community hope will be a long-overdue revision of OSHA's lockout/tagout (LOTO) standard. CFR-29 910.147, which is aimed at preventing equipment from releasing hazardous energy while someone is using it, hasn't been changed in more than three decades. In contrast, ANSI/ASSP Z244.1, ANSI B11.0, ANSI B11.19 and UL 6420 have all been released or updated within the past three *years*. These standards provide a framework to help improve LOTO and alternative measures while meeting OSHA requirements.

In a Safety 2021 session last year, Christopher Brogli, VP of Global Safety Business Development for Ross Controls, discussed both current federal regulations and the variance that may have gotten the ball rolling toward a revision of CFR-29 910.147. He began by noting that the regulation deals with all types of hazardous energy, including electrical, mechanical, hydraulic, pneumatic, chemical and thermal.

## EMPLOYER RESPONSIBILITIES

In the U.S., employers are responsible for having a LOTO program, which means they must create one if one doesn't currently exist; establish procedures for it; determine what hardware is necessary to do the energy isolation; train employees on it on a yearly basis; and conduct periodic inspections of the program.



"As part of the program, employers must identify when lockout and tagout is necessary on a piece of equipment," said Brogli. "They have to identify the energy sources on that piece of equipment and what the isolation device is. Once they've identified that isolation device, they need to determine how it can be locked out and tagged out and they have to define a procedure for that."

He added that in addition to a lockout procedure, there must be one for re-energizing the machine once lockout's been done. They must also provide LOTO devices. In addition to employees, training must include contractors who will use the equipment. The periodic inspections of the program should encompass the premises, procedures and hardware. If new equipment was introduced into the worksite, or existing equipment was modified, the procedures and lockout devices may need to be modified. Additionally, employees might require additional training, to address the changes.

## LOCKOUT/TAGOUT DEVICES MUST:

- Control and/or dissipate hazardous energy
- Be easily accessible (outside of hazardous area and at a convenient height)
- Easily identifiable
- Capable of being locked only in the off position
- Suitable to the application environment

## HOW A VARIANCE LED TO AN RFI

OSHA issued a request for information (RFI) a few years ago intended to generate information from stakeholders about LOTO procedures. "Basically, what this RFI was looking at was, 'is there a way of doing lockout using something called energy isolation devices, or maybe more of an automated lockout process?'" said Brogli. The RFI asked people in industry about their perception: "Is there a better way to do lockout that's less burdensome for the employers themselves and just as effective?"

Brogli noted that the RFI was inspired by a permanent variance OSHA granted in 2016 to Nucor Steel Connecticut Incorporated, from complying with the provisions of





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OSHA standards that regulate LOTO. Most of the 87 comments OSHA received in response to the RFI "were very encouraging," according to Brogli, although there were a few negative comments from mechanical installer and electrical installers. Most respondents felt that some sort of automated lockout process would be beneficial.

Nucor incorporated a *trapped key system*. In this system, whenever the machine is turned to the off position, the trapped key sends a signal to an energy isolation device that deenergizes the system. That key remains trapped until the pressure in the system reaches a zero-energy state. Once it does, the employee can then remove that key, and put into a group lock box.

"It was a very systematic approach and it used energy isolation devices," said Brogli.

Nucor had to provide a substantial amount of documentation to OSHA in order to obtain the variance – documentation which allowed the agency to evaluate:

- Whether the device provided an equivalent level of employee personal control over machine re-energization
- The ability to account for exposed employees

- Verification of isolation to that required by the OSHA standard

OSHA reached three conclusions from its review of Nucor's application for a variance:

1. The alternate device allowed energy control measures to remain under the personal control of the exposed employee through control of the trapped key, using a group lockbox
2. Employees were able to verify de-energization
3. Authorized employees were easily identified before an equipment re-start

An automated LOTO process has been in use in Europe a number of years, said Brogli, "But in the U.S., because the standard really has not been updated since the late 1970s, our standard is seen as very old and outdated." **WMHS**

*ROSS Controls designs and manufactures pneumatic valves and control systems and is recognized as a leader in fluid power safety solutions and poppet valve technology (www.rosscontrols.com).*

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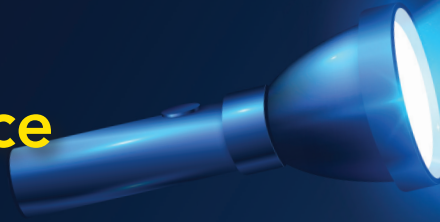
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# Trends for Flashlight Safety in the Workplace

By: **Jane Marsh**, Contributor



Industrial workplaces today are safer than ever before. Workplace injuries have steadily decreased in recent decades as companies have taken safety more seriously and technology has provided new opportunities. Advancements in personal protective equipment (PPE) are a substantial part of this trend.

One piece of PPE that often goes overlooked or underappreciated is the flashlight. While not every facility needs these tools, they're an indispensable part of workplace safety in those that do.

## THE NEED FOR FLASHLIGHT SAFETY

Sufficient lighting is essential to keep workplaces safe and productive. Poor visibility can make it harder to spot hazards, leading to dangerous situations that would otherwise be easy to avoid. Similarly, employees may misread labels without enough light, leading them to mishandle hazardous items or misunderstand safety protocol.

Studies also show that even artificial light can significantly improve health outcomes like depression, agitation and sleep issues. When workers don't suffer from these conditions, they can pay more attention to physical safety.

While flashlights are relatively straightforward tools, they still feature many opportunities for innovation. Here are a few growing trends for flashlight safety in the workplace.

## LED LIGHTING

Traditionally, flashlights use incandescent bulbs. However, light-emitting diodes (LEDs) are far more efficient. In an LED light, 80 to 90 % of the power goes directly to the bulb, whereas conventional lightbulbs typically waste 80 % of their electricity. LEDs are also often brighter, providing more visibility with less power.

LEDs have already overtaken incandescent bulbs in consumer segments, but many workplaces are only recently switching over. Since flashlights don't immediately come to mind as essential PPE, it's easy to overlook upgrading them. As companies put more emphasis on new PPE, though, this trend is shifting.

## HANDS-FREE LIGHTS

Another rising trend in flashlight safety is using lights that workers don't have to hold. Sufficient light is crucial for safe operation in many workplaces, but if workers can

only use one hand while providing that light, its benefits are minimal. As a result, many workplaces are turning to new light types that enable hands-free operation.

Headlights are common in industries like mining but less so in warehouse and factory settings. Lights that clip onto workers' vests or shoulders are a more popular hands-free alternative in these workplaces.

## NEW POWER SOURCES

More workplaces today are also looking for flashlights that move away from the single-use batteries of the past. Part of that is because more manufacturers are striving for sustainability, and part of it is a need for longer-lasting power sources. USB rechargeable batteries are a popular option, but some new options offer more sustainable alternatives.

Since LED flashlights don't require much electricity, they're an ideal candidate for self-powering technologies. Internal components can generate energy from movement as workers carry them throughout the day. Others may feature solar panels that can charge by windows while not in use. Options like this remove environmentally harmful batteries from the equation and reduce energy bills.

## INTEGRATION WITH OTHER PPE

As PPE advances, some companies are integrating flashlights into other pieces of equipment. Some safety vests now include built-in LEDs to light the way in front of workers. In other cases, work shoes feature 400-lumen LEDs or gloves place miniature lights at employees' fingertips.

Combining flashlights with other PPE takes hands-free operation to the next level. Companies will only have to buy one piece of equipment to serve several needs. This integration also helps keep light in line with workers' walking direction and field of view, improving visibility.

## LIGHTING IS CRUCIAL FOR WORKPLACE SAFETY

Light is easy to overlook as a safety consideration, but it makes a substantial difference. These recent flashlight trends help address that issue, making this PPE more efficient, useful and safe than ever before. Workers across industries will be able to work safely as a result. **WMHS**

*Jane Marsh is an independent writer who covers topics in green technology and manufacturing. She also works as the Editor-in-Chief of Environment.co.*



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## Wearables in the Modern Workplace

By: Cheryl Palmer, Contributor

Did you know helmets were once blamed for causing head injuries? Yet today, the thought of setting foot on a worksite without a hard hat is unheard of. Low-tech PPE, such as hard hats, steel-toed boots and high-visibility clothing may sound like obvious safety requirements in 2022, but they were once novel technologies. They were questioned and scrutinized the same way businesses question high-tech options today. There will be a time when people look back and question the sanity of those of us who worked in high-risk environments *without* worker-centric technology.

As consumers, we are already using high-tech solutions for our most challenging problems and to make our lives easier. One example is technology that monitors our health and wellbeing—from sleep technology to smart watches and apps on mobile phones. Now, consumer technology used by large groups of people is becoming specialized for use in industrial applications.

Since 2015, survey results indicate a consistent 73 % of workers are willing to use wearable technology at work if it improves safety. Eighty-one percent of CIOs believe high-tech wearable technology will become common in the workplace. Despite these numbers, only about 12 % of workers report using wearable technology on the job.

### EMERGING WEARABLE TECHNOLOGY TO CONSIDER

Artificial Intelligence (AI), machine learning and automation are buzzwords that guide our decisions on ways to benefit from technology. Numerous companies are focused on increasing worker safety or productivity through developing connected worker technologies. These technologies fall into several wearable categories.

#### Accessory Devices

High-tech watches and fitness trackers have been part of our day-to-day lives for several years. Currently, their most common use in the workplace is related to healthcare incentives that track employee behaviors and gather data used to lower insurance premiums. They're also often credited with assisting in time-management and boosting productivity. Major wearable watch companies have also been researching how to develop illness-detection capabilities.

Many viruses are communicable before a person knows they are sick, so illness-detection could increase workplace health and safety by informing employees they are ill and encouraging them to stay home—so they do not spread the illness within their workplace.

Other companies are exploring and developing uses for wearable devices that may increase worker safety, such as fall detection, posture monitoring, GPS positioning and core body-temperature monitoring. These applications are not part of existing consumer-brand smartwatches and are generally used for a very specific purpose and dataset. These capabilities will likely be developed and merged into one device in the future.



Using wearable technology to connect workers for the purpose of understanding the “what, how and why” of worker injuries is imperative to advancing safety, productivity and workers’ health and wellbeing. Photo courtesy Kenzen

#### Smart Clothing

Wearable technology won't be confined to accessory devices for much longer. Smart textiles have become a focus for several major companies and universities. PPE-type clothing, such as cut-proof sleeves, arc-proof clothing and slip-resistant surfaces, are existing wearable tech solutions. PPE clothing will become smarter—capable of monitoring employees’ heart rate, breathing and posture. Clothing



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will also be able to monitor environmental hazards, such as UV exposure, temperature and air quality. Many companies will collect this data from the clothing and connect it to an app that offers safety insights and suggestions for improving performance.

## Exoskeletons

Ironman-type suits that reduce risk to the human body are still a vision of the future. Exoskeleton development dates back to the 1960s, but products didn't come to market as viable solutions until the 21<sup>st</sup> century. The first exoskeleton prototypes were for gait training for people with stroke and spinal cord injuries.

Since 2014, several companies have designed exoskeletons to protect workers. They are designed to reduce muscle fatigue and prevent injury when lifting, bending, reaching, squatting and performing other repetitive or heavy-lifting activities. This wearable technology generally works by improving posture and redistributing weight. The capabilities of this technology and its workplace applications are still being discovered and researched.

## Glasses

The first piece of wearable technology ever created was the eye glass. Eyeglasses with futuristic capabilities are still in prototype and secondary development stages. Tech innovators are only skimming the surface of how glass technologies may be used for worksite enhancements. Current smart glasses offer a wide range of features and price tags. Simple, cheaper versions have the characteristics of a smart watch. Some act simply as a platform for viewing things. Eyeglasses can take calls, deliver notifications and allow the wearer to control music through a touch interface. Some eye technology can even take pictures and apply filters to the pictures.

Other higher-tech eyewear solutions were designed to supplement the brain's ability to memorize complex diagrams and processes. These glasses allow the user to view displays from their phone or computer while working. Some even integrate with virtual meeting platforms, allowing workers to consult supervisors or share live work experiences.

At the more complex and expensive end of smart glasses, big brand names and start-ups alike are experimenting with augmented reality (AR) solutions. They can overlay images on a real-world, real-time view. Not surprisingly, versions that currently exist are only available for specific work applications. Glass technologies that include VR or AR options are being used to reduce time and costs for training. They can also be used to experiment with various approaches and techniques to view the most favorable approach and outcome, i.e., for use in complex medical surgeries.



Increase user adoption and success rates of high-tech wearables by choosing solutions that empower and enable employees to make good choices about their health and wellness. *Photo courtesy Kenzen*

Smart glasses can even be used to assess an individual's job skills. AR smart glass solutions are now available for healthcare, manufacturing, education and national defense applications. While smart eyewear is currently cost-prohibitive for many employers, this category of smartwear is projected to double in value in as little as three years, which increased capabilities at decreased costs.

## CONSIDERATIONS BEFORE IMPLEMENTING HIGH-TECH WEARABLES

With the exception of smart eyewear, most industrial wearable options are affordable. Ready to give the majority of workers what they want when it comes to wearables? Here are considerations and next steps:

### Do it for the Right Reason: Focus on Safety

Bring high-tech wearables into your workplace for the primary purpose of increasing worker safety. Increase user adoption and success rates by choosing solutions that empower and enable employees to make good choices about their health and wellness.

### Understand Data Privacy

You can avoid being seen as a "Big Brother" by giving employees access to their data and educating them on how to use it to make informed decisions. Always use informed consent by being transparent about the data that is collected (or not collected); who can see the data; and how the data will be used.

Educate yourself about the type of data the technology collects. Know whether the device collects biometric (identifiable) or physiological (not identifiable) data and learn the difference between the two. Understanding the data that is collected and the purpose for that data can help you identify privacy risks vs. data benefits. Data knowledge



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Smart clothing will be able to monitor environmental hazards, such as UV exposure, temperature and air quality. Photo courtesy Kenzen

allows you to provide employees with transparent information and accurate training regarding the technology.

Correct data handling and storage is vital, no matter what type of data a wearable collects. Let your IT team do its due diligence on the technology you are considering. Have them research the technology vendor's security and privacy policies. Ensure the security and privacy policies adhere to local or regional regulations. Require vendors to meet security standards (SOC2, ISO27001, GDPR, etc.) before bringing their technology into your company. Be open and

transparent with your employees regarding the findings of your privacy and security investigations. Create FAQ documents that explain what data is collected, who owns it, how it is stored, and how it is used. Explain how an employee can request access to their data or have it deidentified.

## Know the Science Behind the Tech

Consider whether the technology vendor provides evidence-based research, proving their device is capable of doing what they claim it does. Conducting partnered research with reputable universities and publishing peer-reviewed articles are good signs the vendor is able to deliver exactly what it promises. Don't be afraid to ask for reasoning and research to guide your decisions, especially when it relates to worker physiology. Even if you don't fully understand physiological science, you should be capable of judging whether the company has solid, scientifically backed methods or formulas for their solutions.

Organize a pilot project at one of your worksites to gather your own use-case information to ensure the device will meet your needs and perform as expected. Determine whether the company is willing and able to adjust their product and services to meet the specific needs of your industry and company.

## Understand the Return Before You Invest

Prepare and analyze some return on investment (ROI) scenarios. Start with simple, straightforward equations that balance the cost of the technology vs. the number of injuries you can expect to prevent. Consider the increase in productivity because of improved health and wellness, and add this number into your ROI calculation. Finally, calculate other metrics impacted by the technology and build them into your ROI. For example, you may find a technology that monitors core body temperature increases the productivity of certain safety professionals, such as your nursing or safety staff. You may also see a reduction in slips, trips, falls and machinery accidents when workers receive alerts to rest and cool down before the impacts of heat illness affect them. Thinking beyond the initial benefits of the technology and using data gathered from your pilot project can help you build out strong, more accurate ROI scenarios.

Connected technology is defining what many call the Fourth Industrial Revolution. Using wearable technology to connect workers for the purpose of understanding the "what, how and why" of worker injuries is imperative to advancing safety, productivity and the health and wellbeing of everyone on the job. **WMHS**

*Cheryl Lynn Palmer is Customer Success Manager with Kenzen. She works with companies globally that use wearable technology to predict and prevent worker injuries and fatalities caused by heat (<https://kenzen.com/superior-science>).*

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## Safety Gloves with Touchscreen Capabilities

By: **Rick Pedley**, Contributor

*Touchscreen technology isn't going anywhere and is showing up in more workplaces. Use touchscreens safely and effectively with compatible safety gloves.*

If you've ever tried to use a smartphone or tablet while gardening, on a construction site, or even in cold or rainy weather, you may have already experienced the struggle of trying to use a touchscreen while wearing gloves. Trying to tap or swipe a screen with something other than your bare fingertips can be a hassle: between the attempts to get the screen to work and the moment of defeat when you just take off the gloves, there's a lot of time lost and frustration. And when you're working on something, this lost time means lost productivity. In some workplaces, removing gloves to use a touch or swipe device can be dangerous because of the risk of contamination and accidents.

Electronic devices with touch or swipe technology are already a part of many aspects of our lives and will come into more workplaces. It's important that workplaces make this move because of how useful this technology is in so many industries. Having technology on the worksite can

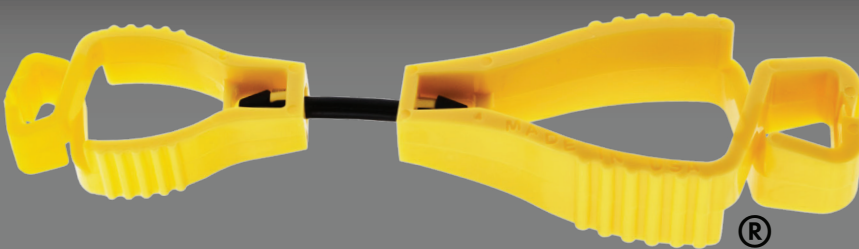


Touchscreen technology is ubiquitous in workplaces. Workers must be able to use it without having to remove their gloves, both for speed and safety. Image courtesy of PK Safety.

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make it easier to pull up data and other information, get training on the job, and report safety incidents and other important information nearly instantaneously—all hugely convenient in a world where speed is key.

Speed doesn't mean sacrificing safety, though. Keeping out contaminants and potential hazards is even more important than speed in a variety of industries. Luckily, the technology is there to make gloves from knit materials, carbon filament, leather, Kevlar, and more that are safe, insulated and compatible with your workplace technology.

## CUT-RESISTANT GLOVES

Anyone who works in the automotive industry, metal stamping, material or glass handling, recycling, fishing, sanitation, waste handling or general maintenance knows about cut hazards. Gloves like these will often be made of materials like Kevlar fiber and have nitrile-coated grips in the palm or fingers that enable touchscreen compatibility. With a material like Kevlar, you're also getting a glove that's inherently cut resistant and won't melt, ignite or conduct electricity— it's a great fiber for many industries, jobs and hazards.

## CLEANROOM/CRITICAL GLOVES

For biological hazards and jobs that require you to keep everything as clean as possible, it's especially important to wear gloves at all times. It's also critical to be able to use

your touchscreen devices to access critical information, especially if a situation is about to change and health information needs to be monitored. Nylon or nitrile are good materials for sanitary environments, and anything with antibacterial or antiviral properties is of course a must. If you're going to be working with sharps or other hazards, consider gloves that are touchscreen compatible and also offer protection from the relevant risks of your position.

## GRIPPING GLOVES

In addition to cut resistance, many manufacturing, maintenance and general duty jobs also require you to have a good grip and decent dexterity. Gloves that are comfortable and ergonomic will allow you to use your tools, including touchscreen devices, more effectively. These gloves might come with a nitrile foam coating or another coating on the fingers and palms that allows you to feel what you're doing, which is critical in jobs that require very precise handling. The right material will also make it easier to use your tools and handle small and medium parts even in wet and oily conditions (and could offer thermal protection as well).

Many industries use touchscreen technology now, and if they don't, they're likely to adopt it soon. This technology makes it easier to access the information you need to do your job well. It's just as important that workers' hands stay safe while they're working, and if you're constantly removing gloves in order to handle a touchscreen device,

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Many industries use touchscreen technology now, and if they don't, they're likely to adopt it soon. *Image courtesy of PK Safety.*

you're potentially exposing yourself to harm or contamination. Get the best of the safety world and the information world with the right pair of touchscreen compatible safety gloves from your trusted safety equipment dealer. **WMHS**

*Rick Pedley, PK Safety's President and CEO, joined the family business in 1979. PK Safety, a supplier of occupational safety and personal protective equipment and manufacturer of its own new FR line GRIT, has been operating since 1947 and takes OSHA, ANSI, PPE and CSA work safety equipment seriously. Speak with safety experts at 800-829-9580 or at [www.pksafety.com/contact-us/](http://www.pksafety.com/contact-us/).*



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# Safety Training Techniques and Benefits for Your Facility

By: **Jane Marsh**, Contributor

Plan A

Plan B

Workplace safety is an integral part of operating any business or organization. Keeping your team safe reduces the chances of accidents or fatalities in the workplace. Improving workplace safety increases employee morale and productivity while reducing costs. What are some of the best safety training techniques, and what benefits can they offer your facility?

## CREATE A SAFETY CULTURE

One of the best training techniques for improving workplace safety is to create a safety culture. Instead of only focusing on safety rules and regulations, a safety culture turns it from an abstract concept into a mindset that everyone can take on and embrace.

This safety culture should involve employees at every level, from the newest hire to the highest-paid executive. Those in leadership positions should strive to model the kind of safety-centered behavior they wish to see in the workplace.

## CONDUCT A RISK ASSESSMENT

Determining the best way to create a safety training plan starts with understanding where the risks lie. A comprehensive risk assessment can be one of the most useful tools in your arsenal. Take the time to determine where risks might exist in your facility. This list should include both work-related risks and a contingency plan for emergencies that might occur.

Natural disasters, pandemics like the COVID-19 pandemic that began in 2020 and anything else that might throw a wrench in your plans need a contingency plan to ensure that everyone in the facility understands how to react.

## START WITH PROGRAM AWARENESS TRAINING

It can be challenging to set up a comprehensive safety training plan for those who will be impacted by it. The first step should always be making everyone aware of the training program. Each person in the facility should understand what the program entails, including structure, plans, procedures and any other relevant information that could impact training or workplace safety.

This step should include a comprehensive list of steps, from the policies already in place to the requirements for reporting accidents or near-misses.

## ENSURE THAT EVERYONE IS AWARE OF THEIR ROLES

Not every employee will require the same level of safety training. Those in roles that require contact with hazardous equipment or chemicals, for example, will need more safety training than those who work in less specialized positions.

Compartmentalizing the training means that you're not wasting employees' time on training that they don't need and may never use. At the same time, ensure that there are opportunities for additional training as team members change positions or receive promotions. Safety training should be a continuous process rather than something that ends as soon as onboarding is complete.

## PROVIDE ADDITIONAL HAZARD IDENTIFICATION TRAINING

Regardless of the nature of the work in your facility, there are cases where additional hazard identification training is necessary. This training could include steps for handling a hazardous chemical spill or bloodborne pathogen training necessary to administer first aid safely. Look at your risk assessment to determine where these risks exist and use that information to determine who might need additional hazard identification training.

## BENEFITS OF WORKPLACE SAFETY TRAINING

What are the benefits of a comprehensive workplace safety training program?

- **Improved Employee Morale** — One survey from 2019 found that more than 94 % of employees would stay with a company that provided comprehensive safety training.
- **Reduced Costs** — Fewer workplace accidents mean fewer workers' compensation claims and less downtime to complete investigations.

Have a contingency plan in place to ensure that everyone in the facility understands how to react to unexpected problems, like natural disasters. © zimmytws - stock.adobe.com

- **Lower Insurance Premiums** — Keeping employees safe in the workplace can significantly reduce insurance premiums.
- **Fewer Lost Work Days** — A workplace injury can shut down a facility for a few hours. A fatality can do the same for days while investigations take place. Safety training reduces the number of lost workdays.

## CREATING A SAFETY-CENTRIC FUTURE

Workplace safety should be at the core of every facility. Employees are the heart and soul of any organization and should be protected. Comprehensive safety training techniques will benefit any facility that implements them, starting by keeping employees safe while they work. **WMHS**

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

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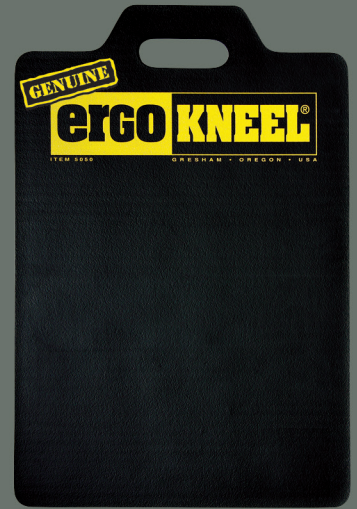
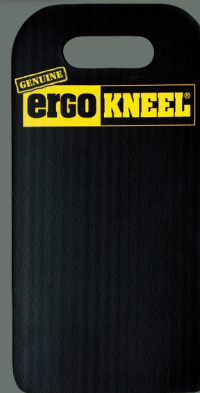
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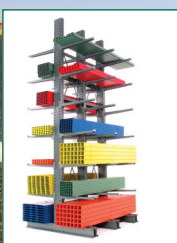
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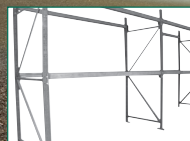
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# ADVERTISERS INDEX

|   |   |  |  |
|---|---|--|--|
|     | Advance Lifts Inc .....9<br>www.advancelifts.com          |      | LTBLtech, LLC .....2<br>www.ltbltech.com                         |
|    | American Baler Co.....11<br>www.americanbaler.com         |     | Mechanix Wear LLC.....33<br>www.mechanix.com                     |
|    | American Heart Association...37<br>www.heart.org          |     | MARTOR Safety Knives.....42<br>www.martorusa.com                 |
|     | Armor Guys .....1<br>https://armorguys.com                |     | Mid States Mfg & Eng.....22<br>www.mid-states1.com               |
|     | ASSP.....41, 55<br>www.assp.org                           |     | Nilfisk, Inc. ....31<br>www.nilfisk-advance.com                  |
|     | Automation Direct .....3<br>www.automationdirect.com      |     | OLFA U.S.A. Inc.....46-47<br>www.olfa.com                        |
|    | Avery Products Corporation...28<br>www.avery.com          |     | Omtec Corp.....13<br>www.omtec.com                               |
|    | Avetta LLC.....27<br>http://www.avetta.com                |     | OZ Lifting Products LLC.....8<br>www.ozliftingproducts.com       |
|     | Bomac Carts.....19<br>www.bomaccarts.com                  |     | Patlite Corporation.....14<br>www.patlite.com                    |
|    | CHEMTREC.....42<br>www.chemtrec.com                       |     | Proline.....49<br>www.1proline.com                               |
|    | Combilift USA.....18<br>www.combilift.com                 |     | Pyramex Safety.....39<br>www.pyramexsafety.com                   |
|    | DACS, Inc.....10<br>http://dacsinc.com                    |     | Pyramid Inc. ....50<br>www.pyramidbelts.com                      |
|    | Elk River Inc.....29<br>www.elkriver.com                  |    | Royal Products.....11<br>www.mistcollectors.com                  |
|  | Elliott Machine Works Inc....53<br>www.elliottmachine.com |   | Safe-T-Nose.....45<br>www.safetnose.com                          |
|  | Floyd Bell Inc.....17<br>www.floydbell.com                |   | Safety Rail Company.....15<br>www.safetyrailcompany.com          |
|  | Front Runner Fab Inc.....53<br>www.thecastermaster.com    |   | Safety Systems & Controls Inc. 49<br>www.loadingzonesafety.com   |
|  | Gamber Johnson LLC.....5<br>www.gamberjohnson.com         |   | Sellick Equipment Ltd.....21<br>www.sellickequipment.com         |
|   | Glove Guard LP.....38<br>www.gloveguard.com               |   | SHOWA.....43<br>www.showagroup.com                               |
|  | Gorbel Inc.....35<br>www.gorbel.com                       |   | Summit Metal Products Inc...16<br>www.summitmetalproducts.com    |
|  | Grace Industries.....45<br>www.graceindustries.com        |   | Tennsco.....53<br>www.tennsco.com                                |
|  | Graphic Products Inc.....23<br>www.graphicproducts.com    |   | The Safety Knife.....36<br>www.safetyknifeus.com                 |
|   | HafcoVac.....25<br>www.hafcovac.com                       |   | Wells Lamont Industry Group .40<br>www.wellslamontindustrial.com |
|  | Industrial Netting.....53<br>www.industrialnetting.com    |  | West Point Rack Inc.....51<br>www.westpointrack.com              |
|  | Insultab.....19<br>www.conveyorrollercovers.net           |   | Wooster Products Inc.....49<br>www.wooster-products.com          |
|  | Jesco Industries.....13<br>www.jescoonline.com            |   | Working Concepts.....51<br>www.softknees.com                     |
|  | Kanetec USA Corp.....15<br>http://www.Kanetec.com         |   | Wy'East Products Inc.....7<br>www.clearcap.com                   |
|  | Logisterra, Inc.....49<br>www.logisterra.com              |  |  |



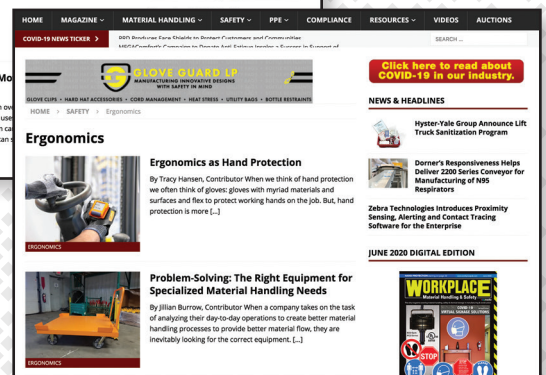
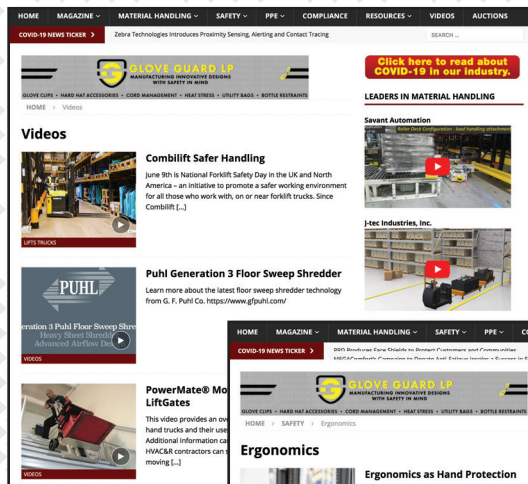
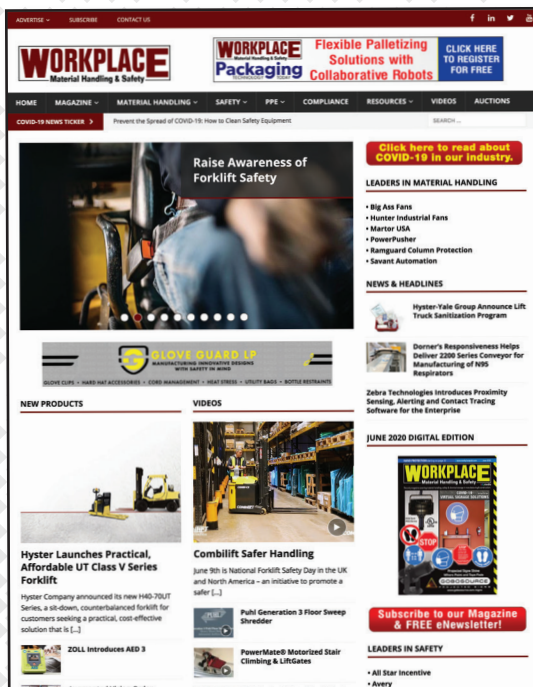
The figure consists of three separate photographs. The leftmost photograph shows a white portable generator with a yellow fuel tank and a yellow hose reel. The middle photograph shows a small, dark-colored utility vehicle with a raised dump bed. The rightmost photograph shows a yellow pump unit with multiple hoses connected to it, mounted on a trailer.

June 2022 **53**



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