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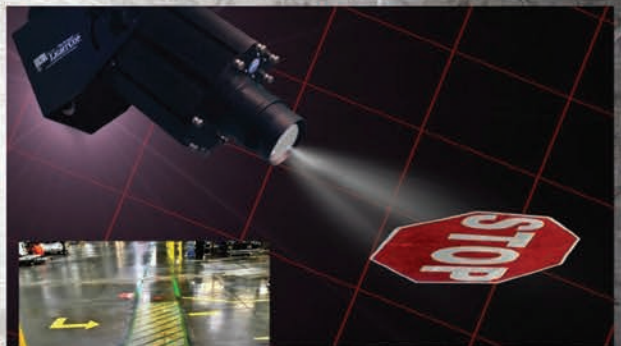
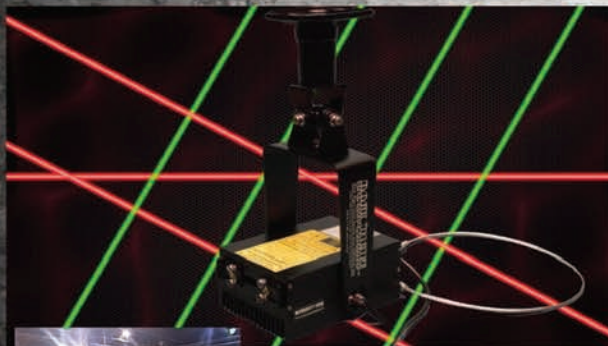
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The balancing act we do here at *Workplace Material Handling & Safety* magazine is very much on display in our April 2022 issue. We are fortunate to be able to call upon a variety of subject matter experts to write about the editorial topics that are important to our readers. On the material handling side of the equation, from the Material Handling Institute's (MHI) Protective Guarding Manufacturers Association (ProGMA) comes a helpful piece about how making a facility truly safe requires a total concept change, not just the installation of some guardrails. While that may seem like a daunting task, the article's authors break it down into manageable, easy-to-follow steps.

ProGMA also co-authors a piece, along with RMI (Rack Manufacturers Institute), that offers an intriguing suggestion for where to find extra space in warehouses and distribution centers. Using the space over your dock doors may seem counter-intuitive, but with the right kind of racking and configurations, it will provide a much-needed storage area for empty pallets, packing materials and long-term storage items.

OnLogic lists six ways to make computers and other devices vibration resistant. Cimcorp's Derek Rickard discusses how automation can help companies deal with customer demands for faster fulfillment, even in the face of labor shortages. Chris Webre, president of Safety Systems & Controls, Inc., has penned an article that addresses both material handling and safety, by educating readers about how speed limiters for forklift trucks can reduce the likelihood of incidents in high traffic areas of facilities.

This issue also includes our annual Plant Safety section. In it, Pete Saldana of iGPS outlines ways for supply chain operators to reduce the risk of workplace injuries – or worse – while also preventing costly damage to products and equipment. Graphic Products aims lower: at floors, with an article on floor marking requirements and colors (per OSHA) and how to use floor markings as an organizational tool. If you thought you had nothing new to learn about flashlights, read contributor Jane Marsh's take on innovations in portable lighting that can help workers see better and be safer. Likewise, an article on safety netting by Rack Safety Products provides new insight into features of this seemingly simple product and gives tips on things to consider when selecting safety netting, like high tensile strength and ravel resistance.

Also on the safety side of the issue: an article about how certain kinds of personal protective equipment (PPE) can actually pose a health risk, by increasing the chances of its user suffering from heat-related illness. With hotter weather up ahead, it's a good time to review work practices intended to prevent heat stroke and other problems, and to consider the use of PPE that's designed to help workers stay cool as the temperatures rise.

Hearing expert Garry Gordon of E.A.R. Inc. and his colleague, Dr. Robert Traynor, lend their expertise and knowledge to an in-depth article about how custom-molded hearing protection devices – augmented by fit checking – can provide comfortable and cost-efficient hearing protection that reduces noise while still facilitating communication.

We also cover the location requirements for emergency shower and eyewash stations and remind facility managers about the ten second rule. These vital pieces of equipment must be readily accessible to workers who encounter hazardous chemicals, or they won't be of use to the people who desperately need them.

As always, we strive to bring you high-quality information. Your comments, questions and suggestions are welcome; feel free to email me at maureenp@rdgmedia.com.

'til next time,

Maureen Paraventi
Chief Editor, WMHS



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P.O. Box 80915
Rochester, MI 48308
586-227-9344
design@rdgmedia.net
www.WorkplacePub.com

President/Group Publisher

Randy Green

Editor-in-Chief

Maureen Paraventi

Managing Editor

Elisabeth Cuneo

Associate Publisher/

National Sales Manager

Jacob Swindell

Account Executive

Lydia Stewart

Accounting Manager

Kristin Green

Systems Administrator/List Rental

Angi Hiesterman

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Jody Kirchoff

Publication Coordinator

Lacey Scanlan

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Better Batteries

By: **Christian Dow**, Contributor

The workhorse of your material handling equipment, batteries are quickly evolving into cleaner, better, longer-lasting models.

In the material handling world, batteries power a good portion of equipment—from most varieties of forklift trucks to AMR and AGV products. Computer carts for inventory management also depend on them. With such a central role to play, it's important to understand what type of battery is best for your operations, how to maintain it and what the pros and cons are of the options.

Let's start with those options. There are two common types of batteries used in material handling equipment: the standard lead acid and the newer lithium ion. The former has been around for hundreds of years and serves as the legacy battery. The latter came on the scene for material handling purposes just recently. "The technology for lithium ion was created in the 1980s, but it began with small electronic devices, like watches," explained Maxim Khabor, Marketing Director at OneCharge. "It then moved

to phones and computers, and eventually, lithium was ready for bigger formats."

Think golf carts, forklifts and autos, where lithium now is growing in popularity. Still, while the option has been readily available for about eight years now, the material handling industry lagged in adoption rates. "Some businesses are a bit reluctant to do things different, however small the change, which is why the adoption of lithium power is not as fast as it could be," said Khabor.

Robin Schneider, Director of Marketing at Green Cubes Technology, said that at the moment, lithium-ion batteries make up about 15 % of the market. "We expect it to grow and replace most lead acid batteries over the next 10 years," she said. "However, here are also new regulations, such as CARB, that will push general electrification and the elimination of fossil fuels. Diesel and propane are still very common, especially in outdoor equipment, but batteries and fuel cells will replace those, so it's possible that both lead acid and li-ion batteries will grow in market share."

As lithium options grow in availability, you'll need to assess what best fits your particular operations. Weighing the pros and cons of each battery type will help you proceed.

CONSIDERING COSTS

The granddaddy of batteries, the lead acid battery remains a popular choice in material handling. One big reason? Price. "The upfront cost to buy lead acid is still much cheaper than lithium," said Kevin Ledversis, Sales Director at Newcastle Systems, maker of powered carts and workstations. "But over a lifetime, lithium will come out on top."

Still, convincing end users of that fact remains the biggest battle for battery providers. "In the warehousing space, where most companies operate on a scale much, much smaller than an Amazon, they are less likely to invest in new technology," said Ledversis. "In these cases, they may always look for the low cost of entry versus the ROI."

For those that do want to look at ROI as the bigger factor, the numbers heavily skew lithium over lead acid. Khabor's numbers look like this: Over a five-year period, where an operation runs 14 lift trucks on three daily shifts, lithium batteries will cost 35 % less than lead acid.

The reasons behind the lower overall lifetime cost add up through several contributing factors. Maintenance is one



The future will likely see everything from forklifts to robots, sweepers/scrubbers, carts and the like powered by lithium. Image courtesy of OneCharge.

of them, as is the time lead acid batteries must spend out of the equipment, they power in order to charge. “Lithium-ion is maintenance free once it’s set up, has a much longer life cycle and can be fast charged,” said Schneider. “This makes it generally more cost effective over a few years’ time frame.”

Lead acid batteries also require real estate in your facility in the form of a separate charging room. “There’s a cost associated with that in the form of the ventilation required,” said Khabur. “There’s also about 30 % extra electricity needed to charge a lead acid battery. The dollars add up.”

There’s also a safety factor to consider. “There are fewer injuries involved with lithium batteries,” explained Khabur, “compared to lead, which must be swapped out.”

You’ll want to consider the sloppiness of lead batteries, too. Acid spills on floors and trucks develop into corrosion, one more hazard associated with lead acid batteries.

LOOKING FORWARD

With the labor shortage in full swing—with no signs of slowing down—robots have more than proved their worth and ROI. “Robots are growing astronomically and all of them run on lithium batteries,” said Ledversis. “They are also smart enough to know where their home is and to return there for charging.”

These factors combined with many others point to a brighter future for lithium over lead acid. “Anything you power to move will be using lithium going forward,” said Ledversis. “Equipment will only become smarter and easier to use, and lithium batteries fit those applications.”

There are a few varieties of lithium-ion batteries to consider, if that’s the direction you are headed. Lithium iron phosphate (LFP) and nickel, manganese and cobalt (NMC) are examples—the former tends to feature a longer life cycle and higher power delivery, whereas NMC is more common in consumer products. MultiVoltage, a proprietary technology from Green Cubes, products are another variety and can be charged in less than an hour.

As the material handling world focuses on more sustainable options, lithium will offer the features most companies are looking for. A reduced carbon footprint, fewer fumes and acid spills and the elimination of battery charging all make lithium a greener option than its predecessor. The future will likely see everything from forklifts to robots, sweepers/scrubbers, carts and the like powered by lithium. It may take several more years to reach that breaking point, but battery makers are confident the day is coming.

“When you add up performance, safety, sustainability and costs, lithium comes out ahead,” said Khabur.



In the material handling world, batteries power a good portion of equipment—from most varieties of forklift trucks to AMR and AGV products. Image courtesy of OneCharge.

“For the material handling industry, that’s what it’s all about.” **WMHS**

Christian Dow is the EVP of Membership and Industry Leadership for MHI. He is working with the Battery Manufacturers within MHI’s Membership to put together a Battery-focused Industry Group. He can be reached at cdow@mhi.org (www.mhi.org).

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Six Tips for a Vibration Resistant PC

Contributed by: **OnLogic**

Computers mounted on forklifts, metal stamping facilities, in-vehicle computers, data-logging on bridges. What's the connection? Shock and vibration. If you are in an environment where your computer is going to be knocked around, vibrated, shocked or just shaken every which way, you'll need to make sure your PC is vibration resistant. Let's take a look at six tips to make a vibration resistant PC.

1 VIBRATION RESISTANT PC PLATTER DRIVES: MAKE YOUR HARD DRIVES SOLID STATE

First and foremost, the easiest thing to do is replace all hard drives in the computer with Solid State Drives (SSD). While you can get shock pads to mitigate vibration effects, platter hard drives are very sensitive to shock – swift blows can cause damage to the platter, and vibration – constant shaking will throw the read and write heads out of alignment – which just means they should be gone. SSDs have



If you are hearing a rattle from your PC, take a good look at your environment and make sure you have the right PC with the right protection.

no moving parts and are perfect to take the shake. However, cables that connect SSDs are another matter.

2 PC CABLES: THE WEAK LINK

Connections are the greatest points of failure for cables inside your PC. Either a steady shake or a swift blow can easily knock a cable loose. The first priority? Remove any and all superfluous or extra-long cables. If it is not in use, get rid of it. If it is a multi-function cable and you don't

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use all the functions, replace it. Eliminating all dangly bits prevents that much more movement within the system.

If you aren't using zip-ties, it's time to start. Use them to connect various free-floating cables together and minimize movement. But beware, bundling cables is a fine art in itself. You want it taut, but not too taut, so the slightest motion doesn't pull a connection out; snug, but not too snug, so no sharp edges or heat sources damage the cables; and well secured, but not too secured, so the zip-ties don't hurt the wires. In the end remember: The fewer moving parts, the better.

3 PC FANS: PRONE TO FAILURE

Speaking of fewer moving parts, go fanless. This is right up there with removing platter drives as a quick and easy way to remove a point of failure. In a vibration-prone environment, a fan is often one of the first parts to fail. Whether it is a good shock that just breaks the fan or a constant vibration that slowly warps it, when the fan goes,

your system is soon to follow. Going fanless requires a motherboard designed to stay cool with heatpipes, heat sink, thermal paste and other passive cooling methods, so take that into account when selecting a board and system.

4 PC MOTHERBOARDS: THE MOTHER OF ALL PROBLEMS

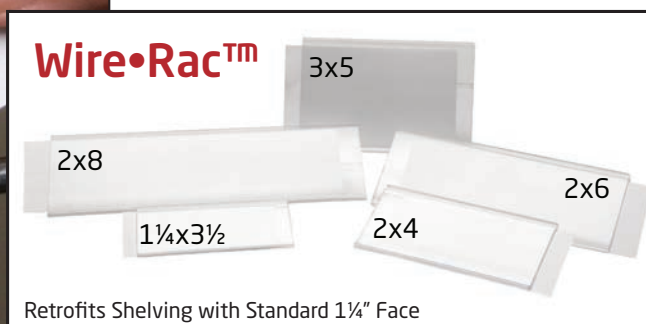
Put aside I/O & processing power for a moment and focus on a motherboard's capacity to resist vibration. First, look at the size of the motherboard, and more specifically the distance between the points that connect it to the case. The more space there is between connection points, the more wobble. Like a piece of sheet metal held between your hands and shaken, the motherboard will flex and shake. Smaller form factors like Mini-ITX have close screws, reducing the wobble. Fanless boards will also tend to have a heat pipe, which rests on the board, and a pad under the board. This creates an additional anchor point and is another good argument for going fanless.

SCREWS

Screws: While it's not necessarily its own topic, it's worth bringing you the choice of screws when dealing with vibrations. Normal screws can, over the course of time, shake loose. Anyone who has an office chair can attest to the subtle but inevitable need to tighten things up every once in a while. However, re-tightening is not always an option, especially in remote deployments. System screws need to stay in, so thread-locking screws are a quick and easy solution

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RUGGED COMPUTERS

Keep an eye out for certain motherboards designed from the ground up to resist vibration. These feature stiffer boards, fewer components that might shake themselves loose or break (like Electrolytic Capacitors), strategically placed rubber bumpers, and power supplies that can take a pounding. However, the best motherboard in the world – with the best drives and cabling – still needs to go in a good case – the chassis.

5 PC CHASSIS: MAKE IT HARDSHELL FOR VIBRATION RESISTANCE

Selecting a good chassis is the second to last big hurdle to creating a vibration resistant PC. Start with a look at the case design. When it comes to dealing with vibration, as stated above, the stiffer the better. If it is not stiff enough, the case and the motherboard can begin vibrating at different frequencies, which can be disastrous. This usually excludes plastic cases, so when looking at the metal case, how it is designed will tell you a lot. Folded metal is superior to multiple pieces screwed together. The more parts there are to the case, the more chances there are for it to have room to move. Finally, look at the placements of the mounting brackets, and if the chassis you are looking at doesn't mount, just walk away.

6 MOUNT YOUR PC: PICK A GOOD SPOT TO MINIMIZE VIBRATIONS

Imagine a PC sitting on top of a washing machine in motion. The PC will dance all over the place! If you place your hand on it, it will move less violently. This is what mounting does. By attaching the PC to a larger object, even if that object is in motion, it reduces the vibration and shock. Even so, you just need to pick the right spot with the least vibration. With specially designed mounts, like Vibration Isolation Mounting Kits, that vibration can be further mitigated. As mentioned above, keep an eye on where the mounts are.

VIBRATION RESISTANT PC TAKEAWAY

Vibration is a serious issue, and an unprepared PC can be torn apart by even the smallest of vibrations over time. If you are hearing a rattle from your PC, watch out and take a good look at your environment. Then, make sure you have the right PC with the right protection. You may not be able to say that your PC is “vibration-proof.” But there is a lot you can do to mitigate the risks of vibration. **WMHS**

This article first appeared on the OnLogic website at: www.onlogic.com/company/io-hub/6-tips-vibration-resistant-pc/

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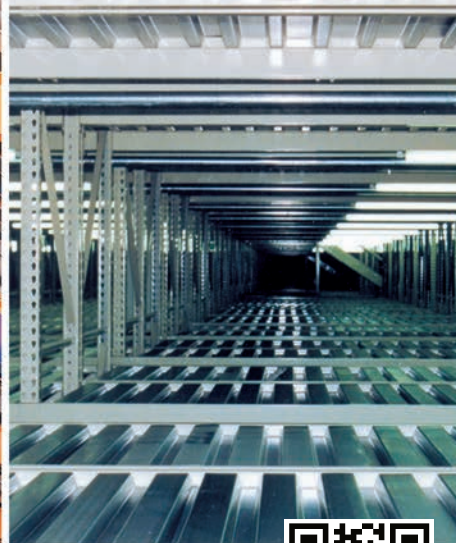
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Forklift Speed Limiter Increases Safety AND Productivity

By: **Chris Webre**, Contributor

Some of today's manufacturing plants and distribution centers are massive in size. To move product inside these facilities, today's fork trucks, reach trucks (truck), etc. are built with the speed and power to move product efficiently. Without speed restrictions, however, these vehicles can move at high speeds, which increases the potential for accidents. For that reason, it is common for companies to limit top travel speeds even at the expense to productivity. That is where many of us are today.

Instead of unlimited, or one slower top travel speed, today's technology allows outputs of multiple speeds on the same truck. Safety Systems & Controls, Inc. (SSC) was one of the first to use this technology and developed the Pace-One G2 Speed Limiter. The idea is not to have one set safe speed, but to have multiple top speeds that activate automatically. These top speeds would be appropriate to the areas being travelled and controlled without operator input. How does it work? The truck receives its location and/or activity information and outputs up to six different

top travel speeds. Essentially ending up with slower speeds in sensitive areas where there is congestion, sharp turns or pedestrians, and faster travel speeds where there is little congestion and no pedestrian foot traffic. This multi-speed approach maximizes productivity with minimal negative effect to overall fork truck safety. In fact, users can expect a 5-10 % increase in truck productivity when compared to a set single slower top speed.

Setting up a truck with a speed limiter is step one. When researching top speed limiter systems, consider the following:

1. Does it have multiple top speed settings?
2. Does it restrict hydraulics?
3. Can you program ramp-up acceleration and ramp-down (electric) deceleration rates?
4. Can you assign zone priorities?
5. Does it have a safety "limp" speed in case of a malfunction?

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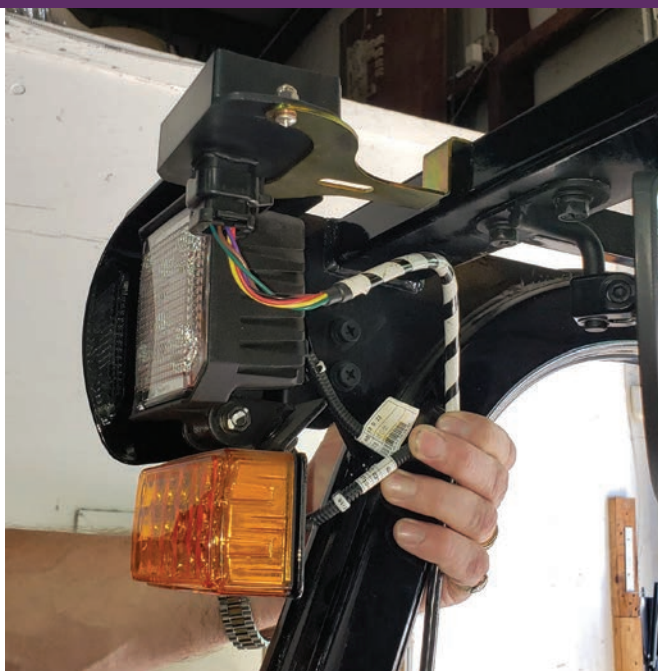
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An IR/RF Receiver mounted on a forklift receives information from IR and RF Transmitters and sends it to the Pace-One Speed Control, where it is interpreted and outputs a Top Travel Speed. Image courtesy of Safety Systems & Controls, Inc.

6. Does it work on internal combustion and electric trucks (what voltage range)?
7. Does it work on CAN APPS (accelerator pedal position sensor) trucks?

8. Does it have easy-to-use software?
9. Is installation Plug & Play?
10. What kind of inputs/outputs signals are available?
11. Is there an activation delay between speeds – is it programmable?
12. Does the kit work with single, dual and crossing APPS, as well as trucks with idle switches?
13. Does it comply with UL and SAE standards?
14. What temperature operating range does it have?

The above are just some of the questions to consider when researching speed limiters.

Step two is instructing the truck when to limit travel speeds. At SSC we accomplish this with IR and/or RF transmitters. IR is great when setting up permanent speeds in specific location. The RF (Nomad and PedGuard) are designed to set up permanent and/or temporary work or pedestrian safe zones. Nomad has an ON/OFF switch which is great to give maintenance employees to create temporary “work” zones when working in fork truck travel areas. PedGuard is similar to Nomad but is a wearable that slows all traffic around the wearer and vibrates alerting the wearer of nearby traffic. SSC uses IR and RF technologies to detect zones but there are other options available.

These third-party detection systems can be found with an online search for Perimeter Protection Systems, Collision



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Avoidance, Zone Speed Control, Pedestrian Alert and Protection, Proximity Detection and so on. Some offer visual artificial intelligence, radar and/or RF Detection Tags. Some of these systems can differentiate between people, vehicles and objects and output various responses. Some offer a visual monitor to see what's in front of the camera and others telematic options. The end user needs to research all options to find the solutions best for them. Whatever solution chosen, incorporating one of these systems with a multi-top speed limiter transforms a passive warning system into an active speed control.

A LOOK AT FORK TRUCK ACCIDENTS

OSHA lists "speeding" as the second most common cause of fork truck accidents; the other top five include 1. Poorly trained driver, 3. Operating with an elevated load, 4. Improper turning and 5. Insufficient warning & markings. Using a top travel speed limiter with multiple speed settings can increase safety in these other areas as well. For instance:

- When combined with an access control system, "new" operators can be assigned a slower top travel speed until operational competence is achieved.
- With a mast height sensor, travel speeds can be reduced when the mast is raised.
- Travel speeds can be restricted at corners where trucks turn.

Other functions, or ways a speed control system can be utilized, include:

- Trucks can be forced to stop at specified crossings or other locations.
- Direction of travel (forward or reverse) can also be a speed selection criterion
- Engine out of range operating conditions can result in lower travel speeds
- Force compliance to a truck maintenance schedule
- An impact event can be set to reduce travel speeds rather than shutting down the truck.

Safety will always be our collective top priority, but we can be smart about it. With today's technologies, one slower "fits-all" speed thinking does not have to be the only solution. Review your operations and if you find there are areas where slower and/or faster speeds would be beneficial, a multi-speed system might be the ticket – in a good way. **WMHS**

Chris Webre is President of Safety Systems & Controls, Inc. (SSC). Founded in 1994, SSC designs products that help prevent operator abuse on Airline GSE and Refuse (on and off-road) equipment. The company produces a line of products for the fork truck market that protects people, property and equipment and is a market leader in the design and production of top travel speed limiters. Most SSC products are "plug & play" and all SSC products are produced in the U.S.

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ORDER PICKING & FULFILLMENT

PICKING PERFECTION:

Three Ways Automated Order Picking Makes For Fresher Produce

By: **Derek Rickard**, Contributor

In the immortal words of legendary chef Julia Child, "Freshness is essential. That makes all the difference." It comes as no surprise that freshness is top of mind for most order fulfillment and warehouse managers serving the grocery market.

The grocery world has changed drastically in just the past five years. Customer demands for faster fulfillment continue to climb, as well as the number of SKUs needed in each warehouse to meet consumer expectations for variety. Yet widespread labor shortages are making it a challenge to deliver high quality produce at a competitive

price. And on top of it all, the popularity of grocery delivery and pick-up services is booming. Now, many grocers are feeling the pressure.

Fortunately, some large-scale grocers and food suppliers have found an ideal way to keep up with the competition - automated order picking systems, which can be installed in nearly any facility setup.

So, what are the benefits of automation and why should grocers implement these solutions sooner rather than later?



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Here are three ways that automated order picking can enable the perfect pick on produce every time:

1. MAKING PRODUCT HANDLING FASTER AND MORE EFFICIENT

Keeping produce fresh requires quick and decisive product movement across the grocery supply chain – including in warehouses and distribution centers that must supply greater varieties of fresh food to stores within increasingly short time frames. Some must house upwards of 6,000 different SKUs, all of which need to be sorted, picked and shipped within a small time window.

This can be difficult for facilities with a manual setup, where order speed and accuracy are completely dependent on how fast employees can pick and prepare everything by hand. It's far too easy to fall behind, even in the best of times. By the time orders get out the door and onto store shelves, that produce is no longer fresh for customers.

Instead, automation can ensure that everything from apples to zucchini is perfectly ripe for purchase. Automated systems can move produce through the facility far faster and more accurately than humanly possible. In short, fresh products enter the system and fresh products come out. Grocers and distributors can get ahead of short lead times, accelerating fulfillment and quickly delivering the highest quality products to store shelves.

The most efficient of these solutions combine order picking and product handling within a single system, allowing for buffer storage and picking in one fluid operation. They can provide reliable fulfillment for a wide range of produce on a massive scale. In fact, some grocers that employ automated picking solutions service over 1,600 storefronts – relying on the speed of automation to bring fresh food to millions of consumers and their families.

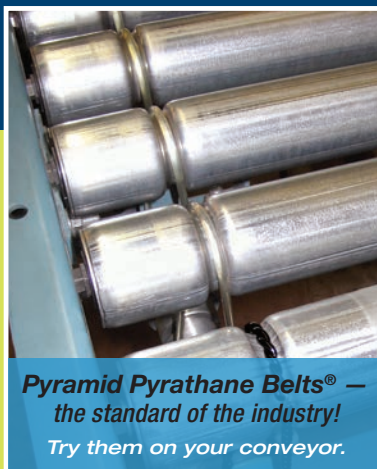
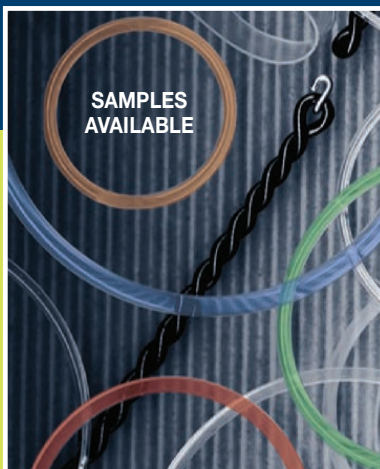
2. PREPARING FOR SEASONAL PEAKS AND UNEXPECTED SPIKES

Any business in the consumer retail market knows how seasonal peaks put pressure on order fulfillment operations. The grocery industry is no exception. During busy holiday months, many traditional warehouses struggle to handpick the influx of orders and find themselves running out of sufficient space for the increased volume of goods.

But what happens when those peaks hit amid wide sweeping labor shortages? Or when external disruptions cause sudden and unpredictable changes in demand? Many grocery and food distributors faced these questions during 2020 and 2021, when their facilities lacked the staff to meet heightened demand and keep shelves stocked.

Equipped with automation technology, warehouses can keep produce orders flowing out the door all year round. Food suppliers can get ahead of seasonal peaks with fast

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and efficient picking systems that run around the clock with minimal human involvement and cut down lead times for orders of all sizes. And by using a high-density automated storage and retrieval system, facilities can improve space utilization. These systems require just 50 % of the space needed in a manual setup.

3. ENABLING GREATER CONTROL OVER PRODUCT FLOW

Fresh produce distributors must adhere to a variety of food safety regulations, including strict sell-by-dates. Orders that are sent late or delayed can result in wastage, which eats into the bottom line, leads customer dissatisfaction and contributes to the major food waste problem.

Automated systems allow for greater control over the flow of produce, from warehouse to storefront. Advanced Warehouse Control System (WCS) software executes all system movements to optimize flow in real time, and all historical data stored is stored for increased visibility and traceability. This makes it far easier to track inventory across potentially thousands of different products, as well as meet traceability requirements for the food industry.

Overall, the result is smooth operations across the supply chain, where quick and decisive action is possible if problems arise.

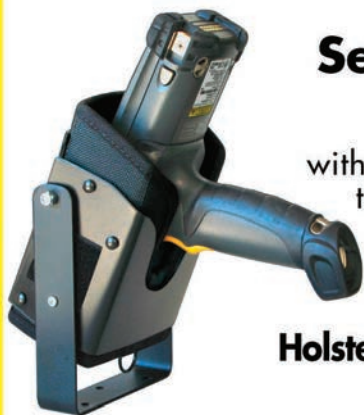
PICK THE PERFECT FIT

When exploring automating, grocers and fresh food distributors should look for a solution provider and integrator that is well-versed in the fresh food industry. A partner with proven experience brings the know-how to optimize product flow within any given warehouse, applying best practices to create a solution that meets each business' unique needs.

The benefits of order picking systems for consistent fresh produce are clear. Grocers keen on preserving customer satisfaction should pay close attention to how automation can help supplement their business. The right system and the right integrator can set them up for success in the long term, even in the face of challenges like labor shortages and rising customer demands. No matter what lies ahead, automation can ensure that the freshest possible produce is what grocers, and in turn, their customers, are picking every time. **WMHS**

Derek Rickard serves as Director of Sales at Cimcorp, where he leads the sales team in developing robotic order fulfillment solutions designed to meet each customer's warehousing needs. With 20+ years of supply chain experience, Rickard has worked on many of the first fully automated robotic picking systems in North America, with some of the largest exceeding 1 million cases per week (www.cimcorp.com).

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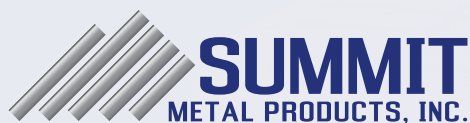
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Put Over-the-Dock Space to Use

A cost-effective way to making use of empty space, over-the-dock storage is at your fingertips.

Contributors: RMI (Rack Manufacturers Institute) and ProGMA (Protective Guarding Manufacturers Association) of MHI

If things are beginning to get a bit tight in your warehouse or production facility, you might be overlooking one of the easiest places to gain a little space: over your dock doors. Yes, it's a hub of activity, bustling with incoming and outgoing shipments, but it is free, available space to solve your growing pains. To get it right, however, you'll need some tried and true guidance from racking experts.

"Over-the-dock storage can be a good fit for almost any distribution center," said Jeff Howard, Vice President of Sales and Marketing at Advance Storage Products. "Space is at a premium in most facilities, and this allows you to maximize your otherwise unusable space."

Exactly how much space you can gain with over-the-dock storage varies from building to building and operation to operation. But in general, said Jonathan Hirst, Vice President and General Manager at North American Storage Equipment. "Buildings are getting taller every year, but the dock doors remain at about 10-feet tall," he explained. "So, if you have a 40- or 50-ft tall building and a 10-ft tall door, that's a lot of space you can put to good use."

What you store in over-the-dock racking will vary, as well, but a good application is to place your various packing and shipping materials in these spaces. Think empty pallets,

packing materials and other supplies that are both useful near the dock, but generally not products that need to move in and out of the DC or exist in different types or racking than what you might use over the dock door.

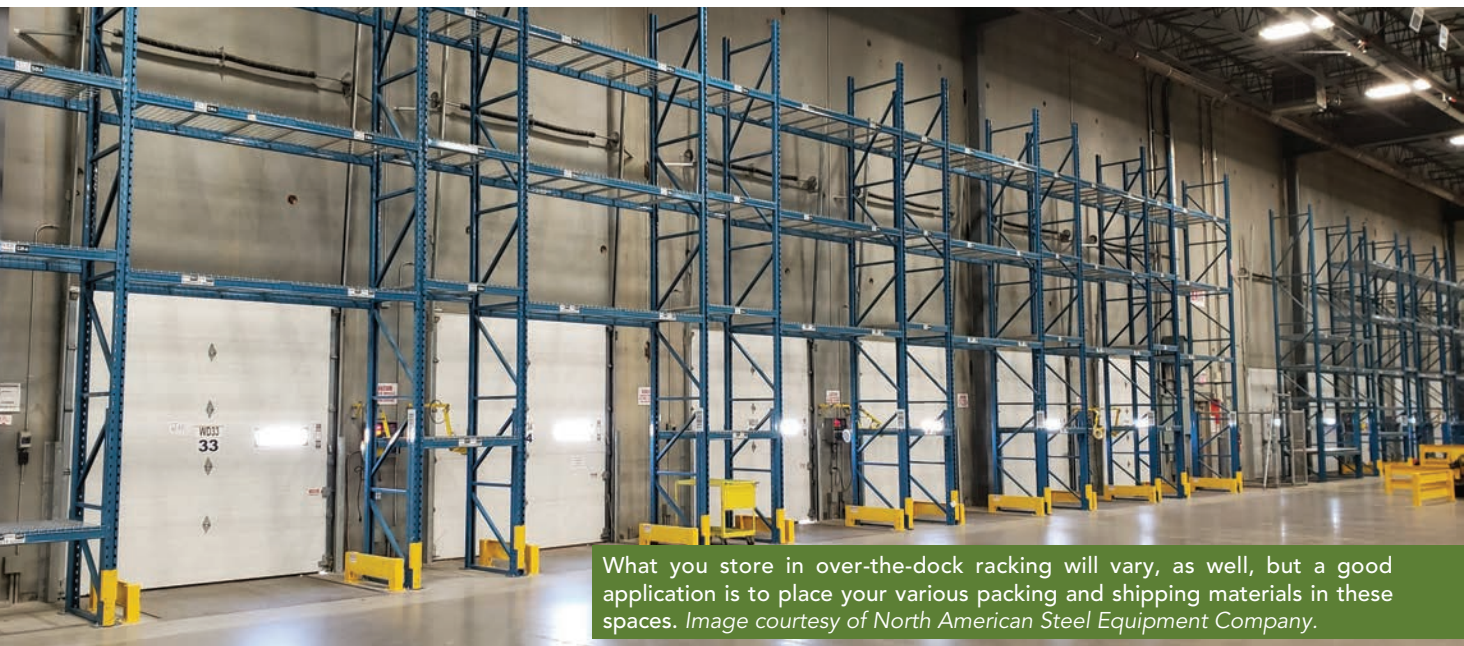
"We often see a lot of cardboard boxes stored here, or wrapping and packing materials," said Ray Niemeyer, Vice President of Sales and Marketing at Space Guard Products. "Other options might be long-term storage items you don't need to reach quickly."

Howard, who has many customers in the cold storage arena, says that over-the-dock racking can be ideal for products that don't need specialized storage.

"If you've got a big cube of cooler or freezer space, that's expensive space," he said. "You don't want to use that for anything other than product requiring that climate enhancement. That's where the dock area can be great for a bunch of empty pallets and similar items."

OVER-THE-DOCK RACKING IN PRACTICE

That's the long and short of what you might want to store on this new, gained space. But how do you configure it and what type of racking should you install over your docks? There are several ways to go about it.



What you store in over-the-dock racking will vary, as well, but a good application is to place your various packing and shipping materials in these spaces. Image courtesy of North American Steel Equipment Company.

One of the easiest types of racking to install over your docks is conventional racking, using standard pallet uprights placed between the dock doors. The bays are then decked above the doors. “The most common configuration here will be selective rack, single deep,” said Hirst. “You’ll want to set it up at least 24 to 36 inches off the wall to allow room for the overhead door to pass and away from chains, rollers and the like.”

Another option is to install a suspended pallet rack. Starting at the ceiling, the rack hangs down and attaches to the wall above the doors. While a creative solution, it’s usually one reserved for greenfield facilities rather than a more difficult—or sometimes impossible—retrofit. Most brown-field buildings won’t have a roof designed to handle that kind of load.

For some facilities, another option is a single leg offset design. “One issue with using space above the doors is that there’s often a lot going on here,” said Howard. “You might have sprinklers, electrical boxes or electronics that control the doors themselves here. So, if you use a single leg on the floor that goes up and then widens out, to your storage space you’ll solve that issue.”

Still, the potential for instability in this design exists, so securing it to the wall is critical. “You must make sure the racking can handle the loads without pulling away from the wall,” said Howard. “Check with your building designer to know what structural items can take it.”

IMPORTANT CONSIDERATIONS

Having a building and/or safety engineer involved, along with your racking experts, will be essential to safe and efficient design of your over-the-dock storage areas. No matter which option you’re using, there are important safety measures to take around the dock doors.

“You’re going to have a lot of forklift traffic here, so you must protect the racking well,” said Hirst.

Niemeyer agrees. “Think about guarding on the back side, because if it’s not there, what could get damaged?” he asked. “You’ve got the vertical door, the door track, the panels, the motor or all of the above at stake.”

Additionally, you’ll need to ensure that whatever you are storing above the docks doesn’t fall and end up in the dock area. “You need a fence, a net or backstop beams for safety, depending on what you’ll be storing,” said Hirst.

To understand how to use rack guarding—anything attached to the uprights, backs or sides of pallet racks—it can be useful to reference the standard developed by

Niemeyer’s working group, the Protective Guarding Manufacturer’s Association. Recognized as ANSI Standard MH31.1, the guide defines safe loads, impact deflection and the like to ensure containment and safety around racking, essential over the dock.

One more consideration that is easy to overlook, said Niemeyer, is regular scheduled maintenance in the dock area. “Know the schedule so that you can communicate to the warehouse team in advance, and they can make sure the over—dock-storage racks are clear,” he said. “If you don’t, you might be at risk for extra bills from your service contractor.”

With some collaborative approaches, you can put lost space to work over your dock doors safely, as well as cost effectively. **WMHS**

For more information about the Rack Manufacturers Institute (RMI) and Protective Guarding Manufacturers Association (ProGMA) of MHI, visit www.mhi.org/rmi and www.mhi.org/progma.



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Emergency Showers & Eyewashes: Location Matters

By: **Maureen Paraventi**

No matter how carefully thought out the engineering controls and work practices in your facility are, if there are hazardous substances present, there is also the possibility of accidental exposure to them. The first few moments after a worker has come into contact with a harmful chemical are crucial. Failure to get fast and effective first aid can lead to life-altering health effects, like vision loss, tissue damage and permanent disability. An immediate and thorough drenching of the affected area using emergency showers, eyewashes or a combination of the two can help lessen the severity of injuries. Most managers of facilities where hazmat is present are aware of the need for this essential equipment, and have some on hand, but are those units located in the right places?

The first step in answering that question is to perform a risk assessment aimed at identifying work areas where chemical splashes involving toxic or corrosive chemicals could occur, or where workers could be exposed to dangerous airborne substances or liquids that are extremely cold. Gathering information from team members will increase the accuracy of your hazardous chemical inventory. This is also an opportunity to examine the condition of containers and reevaluate work practices, because those are often contributors to chemical incidents.

The density of the workforce in those areas is another factor to consider, because if employees are working in close proximity to another, a chemical splash could affect more than one person. If that is a possibility, a single eyewash and emergency shower

– even if they are located nearby – may not be sufficient.

TEN SECONDS

ANSI/ISEA Z358.1-2014: American National Standard for Emergency Eyewash and Shower Equipment specifies that emergency eye wash and shower stations must be within ten seconds of a chemical hazard. This is generally considered to be a distance of 55 feet. Keep in mind, though, that the person or persons traversing those 55 feet are likely to be in pain, disoriented and possibly having difficulty seeing where they are going. In order for them to be able to access emergency equipment quickly and easily:

- It must be highly visible.
- The path to get to it must be free of obstacles and easy to navigate (not up or down a flight of stairs, for instance). Because things get moved around in work zones, do regular inspections of the path from the work zone to the emergency equipment and of the equipment area itself, to make sure that there are no new impediments to movement in those places.
- The area leading to the safety equipment must be well lit and marked with signage.

Another factor to take into account: don't position the safety equipment too close to a chemical hazard, or it could become contaminated.

TELL THE TEAM

Human nature being what it is, it's easy to stop seeing elements in your everyday environment that you don't normally use – like emergency

equipment. When an emergency does occur and emotions are running high, there may be a delay in accessing knowledge that wasn't needed until that moment, such as the location of showers and eyewashes. During safety meetings, it's a good idea to remind workers how to get to – and use – vital equipment, so that these details are fresh in their minds. Establishing a buddy-buddy system in which employees guide injured and/or vision-impaired co-workers to drench facilities is another part of the groundwork that could be laid during these meetings.

BEYOND LOCATION

The type of drench stations needed in a facility depends upon the particular hazards found in an industry or environment. There are a variety of types and combinations. Emergency showers may be ceiling, floor or wall mounted or platform operated. Eyewash stations may be plumbed or portable. There may be instances where a reluctant employee is reluctant to remove his or her clothing in the workplace, not realizing that their garments could be contaminated with chemicals that will burn them. Enclosed emergency showers give people privacy and help avoid compounding physical trauma with emotional trauma.

Quickly and effectively flushing toxic chemicals out of the eyes and away from the body is only possible if emergency showers and eyewashes are sufficient in number throughout a facility and are located in the areas where they are likely to be needed.

WMHS

Focus on Portable Safety Equipment

“Purchasing safety equipment, while meeting crucial standards such as ANSI Z358.1-2014, can be a daunting task. As a designer and manufacturer of safety showers, eye washes and decontamination equipment, Hughes Safety Showers can guide you through the recommendations to ensure you have the correct equipment, in the right location on site to achieve compliance and protect the safety of your workforce.”

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Portable, self-contained emergency safety showers and eyewash stations are among the equipment types covered by the American National Standards Institute's (ANSI) Emergency Eyewash and Shower Equipment Standard, ANSI Z358.1-2014. Many temporary or remote worksites experience a lack of a constant water supply, or the location of the hazard may move as a project progresses. In these circumstances portable, self-contained safety equipment is essential to ensure speedy and effective first aid where permanent plumbed-in solutions are unsuitable. Lack of access to a clean potable water supply or a power supply that can ensure the water remains at the required tempered level may present challenges, but not a basis for exemptions. Meeting the requirements of the standard with appropriate portable equipment can make a significant difference in the medical outcome if a worker's eyes, face or skin have come into contact with hazardous chemicals. Severe injuries, permanent

disability and even fatalities may be avoided, if portable emergency safety showers and face/eyewash stations are readily available and functioning at the performance level specified in the standard.

WHERE IS PORTABLE EMERGENCY SAFETY EQUIPMENT NEEDED?

The construction, oil and gas and utilities industries are among those who have portions of their workforces spend time at temporary or out-of-the-way locations. In these circumstances, just as in conventional facilities, keeping workers safe depends both upon implementing measures to prevent incidents and on being ready to respond if an incident does happen.

WHAT TO LOOK FOR IN PORTABLE EQUIPMENT

The eyewash and emergency shower industry has developed technologically advanced equipment designed to provide first aid despite challenging conditions. Major manufacturers

offer portable shower and eyewash units that can be easily maneuvered on site to provide proximity response within 10 seconds reach of a hazard and can drench water at the required flow rates for at least 15 minutes to provide a thorough decontamination. Features include:

- Portable safety showers with pneumatic tires to aid mobility, larger models may feature a towing hitch to enable equipment to be towed by a vehicle
- Retrofittable insulated jackets to offer protection from solar radiation, or heated jackets to prevent water freezing during colder months
- Self-contained eyewash models designed with carrying handles to make moving and relocating easy to areas where a continuous supply of water is unavailable

OTHER CONSIDERATIONS

According to the ANSI standard, flushing equipment must be located in areas that are accessible within 10 seconds (roughly 55 feet) reach of a hazard. However, when highly corrosive chemicals are present, locating the flushing equipment closer to the hazard is recommended. Additionally, the equipment must be easy to identify with a highly visible safety sign, that it is not blocked by obstructions and that it is in a well-lit area. All personnel must be trained in how to use the product and know its location. **WMHS**

» For more information, read the ANSI blog post about emergency eyewash stations and showers: <https://tinyurl.com/499vk35t>



Custom Molded Hearing Protection in Hearing Conservation Programs

By: Garry Gordon, MS and Robert M. Traynor, Ed.D., MBA, F-NAP

In the workplace, when noise levels and exposures exceed OSHA guidelines, employers are required to provide adequate hearing protection as part of a comprehensive hearing conservation program. Several providers now offer custom fit hearing protection devices (HPDs). These options present questions and concerns from safety managers, hearing conservation providers, workers and corporate executives responsible for those managing hearing impairment as a byproduct of device production. These concerns are amplified when deciding among hearing protection styles, especially when considering custom molded products. This article will discuss the advantages and limitations of custom molded hearing protection devices (CMHPDs).

BENEFITS OF CMHPDS

There are numerous advantages to CMHPDs:

- When properly fit with high-grade silicone material, there is a high acceptance by users as they can be worn comfortably for extended periods of time.
- CMHPDs provide dependable attenuation.
- Independent and military laboratories have reported fewer recordable standard threshold shifts using CMHPDs.
- When properly made with high-grade silicone materials, CMHPDs can be used for at least three years, and under some conditions even longer.
- CMHPD options are numerous and may be designed to provide full occlusion of the ear with estimated NRR's of 30-32 dB across the frequency spectrum or with filters for situational awareness (NRR's 7-21 dB).
- CMHPDs offer improvement for communication systems, including noise reduction features that enable better hearing in noise while attenuating loud sounds.

While these products are cost efficient and beneficial, there are some variables that must be evaluated seriously before their adoption.

VARIABLES OF USING CMHPDS IN HEARING CONSERVATION PROGRAMS

Successful fittings of CMHPDs that ensure maximum comfort and attenuation characteristics are conducted by individuals specially trained in the best practice methods of taking ear impressions. Ear canal shapes and sizes are as unique as fingerprints; no two are exactly alike. Ear impressions must be taken safely with no artifacts impeding the fabrication of the CMHPD. Some companies choose CMHPD providers that offer an onsite ear impression



service with a traveling professionally trained staff that has verification of liability insurance. Others prefer to use members of their staff, such as nursing, or safety employees properly trained to obtain these ear impressions. Either of these options allow for significantly less worker “down time,” as they simply go to a central position within the plant for the impressions. There are also “do-it-yourself” kits. While a less expensive option, these may be dangerous and result in ill-fitting CMHPDs, injury to the ear, reduction of comfort and a reduction of the NRR ratings.

Once the impressions are obtained, the next concern is making sure the CMHPD will be used by the worker. The most popular choices use high-grade silicone that do not shrink over time and are water repellant (hydrophobic) and in many cases float on water. These products offer two options:

- The use of a two-part silicone that, when properly mixed can be cured in the ear as the impression sets up. Once removed from the ear it can be inspected for fit and fabricated on site.
- An alternative is to simply deliver the impressions to the laboratory in the form of a digital file. The data in the file is then used to fabricate the CMHPD. An additional benefit: if the worker



loses their set of CMHPDs, a new set can be manufactured immediately without the need for new ear impressions.

On the horizon is technology that will scan the ear, ear canal and tympanic membrane (eardrum) by 3D scanning computerized techniques, thus eliminating the need for ear impressions. This will supply all the information required to fabricate CMHPDs.

Another concern is the acceptance of CMHPDs. Most companies offer the CMHPDs to employees who do not like or cannot use the generic or disposable earplugs or earmuffs. Workers who are exposed to the most noise and need HPDs all day find that CMHPDs are very comfortable and provide the most efficient attenuation available.

NRR V. PERSONAL ATTENUATION (PAR)

The critical measurement of HPDs is the amount of protection the worker obtains from one. A common perception is that if the NRR is 33 dB then the worker is obtaining a 33 dB attenuation from the HPD. The NRR is an earplug attenuation measurement that is taken in a laboratory under controlled conditions. The PAR is the actual amount of attenuation in dB provided by the HPD within

an “in situ” or in-use situation. Thus, the NRR laboratory measures and the PAR individual user measures do not correlate well.

To complicate the direct use of the NRR further, Berger, Voix & Harper (2008) found that many individuals using disposable and reusable HPDs were significantly under attenuated relative to the noise levels present due to insertion variations, thus non-compliant according to OSHA standards.



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Compliance

Videos

To ensure compliance for HPD use in high noise areas, the data of Berger et al (2008) was used by the Council for Accreditation in Occupational Hearing Conservation (CAOHC) to derive a formula to allow for the use of the NRR



Image courtesy of E.A.R. Inc.

in predicting the PAR measurement. This formula for estimating the PAR, or "Derating", is the label's $NRR - 7dB/2$. For example, if the NRR was 31 dB on the label, the predicted PAR for that device would be 12 dB. In this example, if the noise level was 95 dB, $95\text{ dB} - 12\text{ dB} = 83\text{ dB}$ the facility would be OSHA compliant at 83dB.

We now have audiometers that can measure PAR as part of a baseline or annual hearing test. The most common technique is a program that is incorporated into most computerized audiometers. Essentially, the hearing is tested without the HPDs, then HPDs are inserted, and another hearing test is conducted. These programs then conduct calculations on both the threshold measurement and the assessment with the HPDs to obtain the PAR. This method offers an "in situ" PAR rating which allows

direct reduction of the PAR from the noise levels to arrive at the amount of actual hearing protection for the worker.

In actual fit checking of workers using HPDs, a Salt Lake City (2012) study found in PAR testing of 40 subjects, variability for reusable/disposable HPDs ranged from 5 dB PAR to 39 dB PAR, while testing CMHPDs devices achieved a consistent PAR of rating 35.8 dB. Conducting a PAR test allows for accurate assessment of the amount of protection offered by various HPDs and the ability to predict how much protection is derived from a particular HPD on a specific individual.

EVALUATING COST

Cost is an issue in the use of CMHPDs. While more expensive than generic plugs, CMHPDs are often more cost efficient, as they may be used for three or more years by a worker that uses hearing protection all day, every day. Depending on the type of CMHPDs selected, costs can range from \$7 - \$10 for room temperature-cured molds fabricated on site by professionally trained company staff or, when hiring an outside professionally trained provider, approximately \$65 - \$95 per set. As with many other product purchases, the volume of the CMHPDs required by the company to outfit its workers affects the discount price offered by these outside professionally trained providers. Pricing for digitally recorded laboratory molds begin near

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The variables in hearing protection are not simply the size of the ear canal but a combination of size and geometry, which varies significantly in the noise exposed employee population. Often when using the CMHPDs companies have found that their ongoing cost for disposable hearing devices is dramatically reduced, and employee acceptance of hearing protection is much higher than with the disposable products. For example, if an employee uses two pairs of disposable plugs per day at \$0.18 per set or \$0.36 cents per day at roughly 260 workdays in a year, this results in an expenditure of \$93.60 each year per employee for disposable hearing devices. The average price of a set of CMHPDs for a worker is \$75 and they have a duration of three years. Thus, for 100 workers using two sets per day, the price of disposables for a three-year period would be \$28,080 while the cost of CMHPDs for the same period would be \$7,500. Further, the workers would be protected more comfortably with better attenuation, reducing the possibility of standard threshold shifts. Ultimately, the use of CMHPDs becomes a smart business decision.

For those safety managers and occupational hearing conservationists concerned with the efficiency of HPDs within their hearing conservation program, the use of CMHPDs

augmented by fit checking is an effective method of providing the most comfortable, accurate noise reduction and cost-efficient hearing protection. **WMHS**

Robert M. Traynor, Ed.D., MBA, FNAP is an Adjunct Professor of Audiology at the University of Arkansas for Medical Sciences and Salus University and a Fellow of the National Academies of Practice. He also consults and does forensic audiology (<https://roberttraynor.com>).

Garry Gordon, MS, is the CEO/Owner and Audiologist/Instructor at E.A.R Inc. Gordon has served well over 4,000 major medical, audiological and industrial accounts and trained a network of 500+ recreational and industrial providers who market high-quality hearing protection (<https://earinc.com>).

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PPE and Heat Stress:

When Protection Poses a Danger

By: **Maureen Paraventi**

There's no question that personal protective equipment (PPE), along with engineering controls and safe work practices, is vital to helping workers avoid injuries – or worse. Nonetheless, under certain circumstances, PPE can actually increase the chances of someone suffering harm while on the job, by making those who wear it more likely to suffer from heat-related illnesses. Although manufacturers continue to develop new, lighter weight materials for protective clothing, preventing worker from coming into contact with chemical, radiological, physical, electrical, mechanical and other workplace hazards can still require garments like coveralls, vests and full body suits that are substantial. Those, in addition to head protection, respirators, face shields, boots and gloves, can all be contributors to heat stress. Heavy clothing designed to shield the wearer from chemical, electrical or physical hazards may:

- Inhibit the body's normal processes for ridding itself of heat, as through sweating
- Make the body retain heat and moisture
- Result in greater exertion on the part of workers who are performing physical tasks. Carrying the extra weight of PPE makes muscles work harder and increases the body's heat production.

Exposure to hot environments and extreme heat can result in illnesses, including heat stroke, heat exhaustion, heat syncope, fainting or passing out, heat cramps, and heat rashes or death.

Certain industries and work environments harbor heat stress hazards year-round. In other industries, workers who predominantly toil out-of-doors will face increasingly hotter temperatures during the summer months that are ahead of us. High humidity poses an even greater physiological burden on the body. What are the steps employers and safety managers can take to reduce the risk of heat-related illness among PPE-wearing employees?

The National Institute for Occupational Safety and Health (NIOSH) recommends that when developing work/rest cycles, managers take into account the type and length of time of the PPE being worn; the individual worker's work rate, fitness level, hydration level and acclimatization; and the environmental conditions, including the heat and humidity, radiant heat from sun if outdoors, and wind speed if outdoors.



PPE designed to shield the wearer from hazards may inhibit the body's normal processes for ridding itself of heat, as through sweating. © Kings Access - stock.adobe.com

Brenda Jacklitsch, MS, a health scientist with NIOSH's Education and Information Division, says that acclimatization should be based, in part, on the employee's experience level. New workers should spend only about an hour and a half in the heat during their first 8-hour shift. Their exposure time should be increased gradually, by no more than a 20 % increase per day. Experienced workers on an 8-hour shift can spend up to four hours in the heat on the first hot day, five hours on the second and about six and a half hours on the third day. Jacklitsch says that most healthy workers who are adequately hydrated and get sufficient rest breaks should be able to tolerate eight hours in the heat by the fourth day.¹

Wearing PPE designed specifically to keep workers cool on the job can help prevent heat stress. This kind of gear includes water- or air-cooled garments and cooling vests.

¹ <https://blogs.cdc.gov/niosh-science-blog/2014/07/14/acclimatization/>

During rest breaks, heavy, non-cooling PPE should be removed and the worker should receive hydration. Cooling accessories like cold packs; and cool, wet towels should be applied, in order to reduce the body's core temperature. If possible, rest breaks should be taken in an air-conditioned room or shaded area. According to NIOSH, "Core body temperature decreases relatively slowly, and simply stopping hard work will not result in an immediate decrease. Therefore, increasing the rate of heat removal from the body would reduce the risk for heat-related illness. Using wearable personal cooling systems could reduce the time required to lower core body temperature."² *Note:* cooling systems should be relatively new and in good condition in order to effectively transfer heat from the body to the environment.

WATCH FOR THE SIGNS OF HEAT STRESS

Workers who are exposed to hot and humid conditions should be monitored for symptoms of heat stress and physiological strain. They include:

- Thirst (although NIOSH notes that thirst is not a reliable indicator of hydration status)
- Headache
- Urine that is dark yellow and has a strong odor
- Flushed skin
- Heavy sweating

² https://www.cdc.gov/niosh/topics/heatstress/heat_burden.html

- Fatigue (heat exhaustion)
- An increase in body temperature
- Dizziness or loss of orientation
- Decreased cognitive function (decreased situational awareness, poor judgement)
- Loss of balance, leading to an increased risk of slips, trips and falls
- Temporary circulatory failure while standing upright, with symptoms of light-headedness or dizziness

NIOSH has a poster aimed at preventing heat-related illness available for download at: <https://tinyurl.com/4enn5e5d>. It is aimed at workers, and covers the basics in four steps:

1. Take time to acclimatize. Work shorter shifts until your body has had time to adjust to the heat.
2. Stay well hydrated. Drink often – *before* you get thirsty.
3. Watch for signs of heat-related illnesses. Designate a buddy and ask how they feel periodically.
4. Take time to rest and cool down. Sit somewhere cool, rest and rehydrate frequently.

Heat stress is a concern in many work industries where employees are exposed to high levels of heat and humidity. Extra care must be taken with workers who must wear heavy PPE while performing their duties. **WMHS**



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OSHA Floor Marking Can Mitigate Hazards

Contributed by: **Graphic Products**

Modern workplaces, however safe they may be, are fraught with hazards. Forklifts, energized equipment, loading docks, busy warehouses and other hazards can make it difficult for employees to work and move safely throughout a facility.

To that end, floor marking for a factory is an essential component of a safe workplace. The lines, stripes and dots lining facility floors throughout the United States can create order, keep employees away from dangerous areas and mitigate hazards wherever possible.

Here's a look at what OSHA has to say about floor marking, and how it can improve efficiency and increase safety in your facility.

OSHA FLOOR MARKING REQUIREMENTS

At its core, floor marking consists of lines and symbols, most commonly painted or taped on a floor, that help people move around a facility and avoid hazards.

OSHA addresses floor marking specifically in its standard on materials handling and storage (29 CFR 1910.176). There it states, "permanent aisles and passageways shall be appropriately marked," though it offers few details or requirements.



To clear things up, OSHA has offered interpretations expanding on these requirements. Interpretations state that:

- Floor marking lines must be at least 2 in. wide to ensure maximum visibility, though the agency recommends lines to be 2 in. to 6 in. wide.
- Aisles should be at least 4 ft. wide, or at least 3 ft. wider than the largest piece of equipment used in the aisle.
- OSHA allows facilities with unusual surfaces (including dirt floors) to use flags, traffic cones, barrels and other similar methods as long as employees are trained on the system used.



OSHA considers yellow lines the most convenient and inexpensive way to mark aisles and passageways.

OSHA FLOOR MARKING COLOR REQUIREMENTS

OSHA offers no requirements for specific floor marking colors; however, a 1972 OSHA interpretation states that lines meant to define aisles may be any color, provided they clearly lay out the aisle.

That said, the agency's standard for safety color codes (29 CFR 1910.144) offers some guidance for establishing a color-coded floor marking system. It specifies that red and yellow must be used for marking physical hazards.

- Red identifies fire-related hazards (including fire protection equipment and containers of flammable liquids), as well as emergency switches, bars and buttons on hazardous machines.
- Yellow signals caution and marks physical hazards (including striking against, stumbling, falling, tripping and "caught in between").
 - *Note:* This does not mean standard floor marking can't or shouldn't be yellow; OSHA said, in a 1977 interpretation, that "yellow lines are usually recognized as the most convenient and inexpensive way to mark aisles and passageways."

Beyond these requirements, employers are free to use whichever colors they see fit for floor marking, provided they use the same colors consistently throughout a facility.

MITIGATING HAZARDS WITH OSHA FLOOR MARKING

Now that you know the floor marking basics, how can it protect employees from hazards? Here's a quick rundown. Floor markings:

- **Separate workers from machines and moving equipment:** Use floor marking to designate paths that protect pedestrians from forklifts, electrical panels, heavy machinery and other hazards.
- **Warn of hazardous areas:** Keep employees safe on loading docks around dangerous equipment and around areas with exposed edges.



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- **Provide instruction:** Let employees know where to stand (or where to avoid) when operating heavy machinery and other equipment.
- **Improve forklift safety:** Forklifts are fraught with hazards. Floor marking can establish pedestrian-only paths, keep employees away from imbalanced or unsafe loads and establish traffic controls for drivers.
- **Keep employees safe in low-light conditions:** Phosphorescent floor marking can help employees find exits and equipment in emergencies and other low-light situations.

IMPROVING ORGANIZATION WITH OSHA FLOOR MARKING

Floor marking isn't just a great tool for mitigating hazards and improving safety; it can also improve organization and efficiency. Here's how:

- **Establish traffic routes:** Establish aisles for pedestrians and vehicles and direct the flow of

traffic; doing so can help employees get where they're going in a safe, efficient manner.

- **Use floor marking in your 5S system:** The 5S system aims to improve efficiency, increase organization and reduce waste—all of which can be facilitated through floor marking.
- **Designate storage areas:** Floor marking can cordon off areas meant for inventory, PPE, hazardous equipment, forklifts and other items. **WMHS**

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Improving Worker Safety: How to Keep Your Plant or Facility Accident Free

By: **Rick Pedley**, Contributor

Without a plan for worker safety, your business will suffer from accidents and equipment failures. Avoid these problems by thinking about safety from the start.

Worker safety and productivity go hand-in-hand. Workplace safety and health are key motivating factors for employee productivity and engagement. When leadership promotes a healthy work culture, they take steps to eliminate preventable accidents and injuries. As leadership, it's your job to make sure that everyone has what they need to stay safe, from the rules on your worksite to the equipment you provide.

Luckily, it's easy to break down the essentials of workplace safety: a good safety culture is made when people at the top follow the rules and provide good equipment and training. This allows good safety practices to be modeled for the workers and keep everyone happy and healthy. Here are six ways to prevent workplace accidents and keep your workers safe.



Being approachable and leaving the door open for feedback will help pave the way for safety improvements. Image courtesy of PK Safety.

FOLLOW THE STANDARDS

As an employer, you're responsible for complying with federal and state safety measures for your industry. Stay on top of OSHA and other relevant regulations, especially the General Duty Clause, Section 5(a)(1) of the OSHA Act: employees should have a workplace that's reasonably free of hazards that can hurt or kill them. This protection can include everything from administrative controls to providing PPE, depending on your industry, so do your

reading ahead of time. In the event of ambiguity, err on the side of providing a safer workplace.

START (AND CONTINUE) SAFETY TRAINING

Safety-focused training should be mandatory for new workers, especially anyone who will be using and maintaining any complex equipment. This doesn't just mean new hires only because machines and technology can evolve, and everyone, including long-term employees, should go through the same exercises on the same equipment. This can be done over a few days each year to keep everyone updated. A test at the end of the training can help confirm that learning and retention took place. It might seem like a lot of time set aside for something very basic, but it's less time than an accident would set your work back.

KEEP EQUIPMENT IN GOOD WORKING ORDER

Your PPE, heavy machinery and other equipment should be in good repair. Pay attention to how your gear performs, especially as it gets closer to the end of its service life, and make the appropriate repairs or replacements as needed. Do your proactive and preventative maintenance as well by keeping machines well-lubricated and performing inspections or tests for any safety equipment that someone will take or wear on the job.

KEEP THINGS NEAT AND ORGANIZED

Going the extra mile to ensure that things are tidy is vital to preventing accidents. It might not seem worth it to stop your workflow in order to put something away, but organizing and cleaning can significantly reduce the risk of accidents. Keep walkways clear of obstructions, spilled liquids and other tripping hazards. Resolving these problems as soon as they happen removes the hazard entirely, so everyone can continue working as usual. No amount of preparation and keeping things in order is a waste of time: if you don't have the time to do things right the first time, you won't have the time to do it over again.

SCHEDULE AND PERFORM ROUTINE CHECKS

Risk assessments and other routine checks are crucial for finding anything that could cause harm. Look for anything that could become a hazard—fall risks, ergonomic hazards, exposure to harmful temperatures or atmospheres, poor lighting, unlabeled systems or pipes and anything else that can affect employee health and safety. You should also think about how serious those risks are and how likely it is that each worker will experience that hazard while doing their job. These risk assessments will be more effective



When performing machinery or building checks, make sure that employees are using PPE at all times. Image courtesy of PK Safety.

with an outside inspector that's less likely to overlook something that you see all the time.

When performing machinery or building checks, you'll need to make sure of the following:

- Employees are using PPE at all times
- Proactive maintenance is performed on machinery once Lockout/Tagout procedures have taken place
- Walkways and stairways don't have any debris
- The emergency exits are unlocked and easily accessible
- Cords are put away
- All surfaces are clean and dry
- Chipped concrete or other holes are covered or smoothed out

DEVELOP A ROBUST CULTURE OF SAFETY

If you're expecting your employees to be safe on the job, as their employer or department head, you should demonstrate a commitment to safety as well.

You can't force people to be safe unless you make it easy, safe and positive for them to do so on their own. Don't tolerate shortcuts or slip-ups—the one time you look away instead of putting your welding helmet back on, don't wear cut-resistant gloves when doing a quick cut with a sharp blade, or anything else could be the moment when an accident happens. Invest in new systems for communication and accountability to ensure that everyone can play a role in the maintenance of your safety culture. Stay approachable and leave the door open for feedback and potential improvements. **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 online at www.pksafety.com/contact-us/.

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Visual devices tell us what we need to know, exactly when we need to know it. They often also tell us what to do, and help keep us safe and informed,

Imagine a visual workplace environment where the benches, tools, fixtures, and even the floor are intentionally designed to direct, change, or even prohibit behavior. An environment that helps workers and visitors do the right thing, every time, and safely.

The challenge is information deficit—missing visual cues. The solution is to identify missing information and transform the workplace.

The visual workplace builds information directly into the process of work and becomes a powerful way to ensure adherence to both technical standards (specs) and procedural standards (SOPs).

This sample facility floor plan demonstrates real-world floor marking and color-coding applications:

1. Purple Tape - Finished Goods



2. White Tape - 5S

Cart Storage

3. Blue Tape - Part Organization

4. Printable Tape - Traffic Marking

5. White Tape - Work Area

6. Green Tape - Part Organization

7. Black Tape - Part Organization

8. Yellow Tape - Pallet Storage

9. T's & Corners

10. Red/White Stripe - Keep Clear Area

11. Stop Sign for Traffic

12. Black/Yellow Stripe - Hazardous Area

13. Yellow Tape - Traffic Flow

14. Black/White Stripe - Keep Clear Area

15. Black/Yellow Stripe - Electrical Area

16. Green Tape - Safety Area

17. Footprint Cutouts

18. Glow-in-the-Dark Floor Marking

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Nilfisk was founded on a vision of producing and selling products of the highest quality worldwide and for more than a hundred years, 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.

Today, Nilfisk offers an extensive range of premium cleaning products and a trusted aftermarket offering to the professional market. Our main product lines are floorcare equipment, vacuum cleaners and high pressure washers and a wide range of domestic vacuum cleaners and high pressure washers to consumers worldwide.



By choosing Nilfisk, you can expect top-tier cleaning performance across our extensive product portfolio, complemented by services that increase productivity, reduce total cost of ownership, and generate lasting value in any field. And as global company, we also prioritize the sustainability of our products, because we want you to accomplish more with equipment that consumes less. No matter which opportunities we pursue, we remain driven by a passion for innovation, knowledge, sustainability, and transformative technologies. As a trusted partner when it comes to both equipment and services – anywhere in the world – we make it our business to help you maximize the performance of yours.

For more information, please contact us at www.nilfisk.us.



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Haws Corporation

Haws® holds itself to the highest standard when it comes to a safety culture with recognition by OSHA and SHARP (Safety & Health Achievement Recognition Program) status. Our safety culture is engrained in all we do, by providing ANSI Z358.1 compliance resources and education, the products we develop and recommend, to the service and maintenance we provide.



Haws® Services is a warranty and service provider for all brands of emergency shower and eye/face wash products to ensure your emergency equipment is ANSI compliant and functioning properly. From startup and commissioning to annual inspections and preventative maintenance, *Haws Services*’

experts specialize in emergency response equipment.

In a safety industry survey¹ conducted by *Haws*, professionals who make product recommendations and/or buying decisions were asked what they considered the most crucial factors when selecting an eyewash and/or eyewash/ shower combination unit. Not surprisingly, the top answers were ANSI compliance and victim comfort. Victim comfort is an important consideration to creating a complete safety response environment. By putting yourself in a victim’s shoes, you are most likely to purchase equipment that not only meets the ANSI standard but provides the most critical care during an emergency.

Based on testing by *Haws Services* it was found while all sites believed they were complying, 75 % of equipment tested was actually non-compliant for both minor and significant violations.²

When selecting, placing, and maintaining your emergency equipment, remember these five key things:

1. **Proper Product Specification:** When it comes to emergency response equipment, there is no shortage of available products. With many choices, it’s important to critically assess specific risks to

determine the most suitable product.

2. **Assure Proper Visibility:** High visibility of safety equipment can be achieved with clear signage, proper lighting and the use of the “safety green” color. This color is used industrially to designate both the concept of safety and the physical locations of first aid and emergency response equipment.

3. **Provide Tepid Water:** Excessive temperatures in equipment can exacerbate the very injuries the safety equipment is designed to reduce. By selecting a suitable mixing valve and defining a tepid water range that is more comfortable to the user, you are encouraging the full flush period.

4. **Perform Continuous Maintenance and Testing:** One implied responsibility of specifying and installing emergency equipment is assuring a maintenance process is designed to keep safety equipment functioning optimally. Testing should replicate a real-life scenario and the proper coordination of testing alleviates any concerns related to functionality allowing your safety team an instant reference for

monitoring all safety equipment performance.

5. **Create a Robust Safety Culture:** In 2016, OSHA increased its penalties by 80 % and continues to increase annually based on the Consumer Price Index yearly percentage increase³. Studies have shown workplace injuries are reduced in settings in which health and safety inspections have direct consequences for violations. The hope is emergency eyewashes and showers will never be used, and it is this mindset that exposes facilities to risks and potential severe fines for non-compliance. The key to overcoming this is developing a strong safety culture and understanding the risks of noncompliance.

Knowledgeable personnel should be responsible for the execution of a cohesive safety program necessary to meet minimum requirements and to cultivate a culture of safety for all. Haws Services offers various safety service offerings to help standardize and maintain safety equipment. A subject matter expert can be a helpful resource to alleviate workload and guarantee functionality.

Visit us online at www.hawsco.com

1 2014 Independent research survey, Haws Corporation

2 Based on results from Haws Site Survey Program

3 OSHA fines to increase significantly. (2015, November 5) Retrieved from <http://www.safetyandhealthmagazine.com/articles/13258-osh-fines-to-increase-significantly>



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APPLICATION: Halo Wall and Pedestal-Mounted Retrofit



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AX16



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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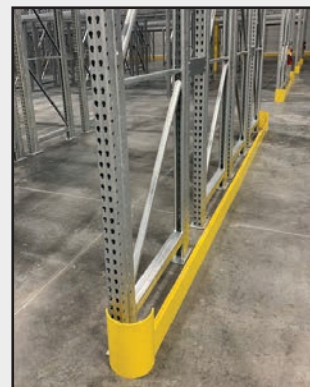
Why Ideal Shield is the leader in Facility Maintenance & Protection Products

About Us

Officially established in 1997, Ideal Shield is a minority-owned, family-run company headquartered in Detroit, Michigan.

Since 1997, Ideal Shield has been covering bollards, guardrail, and handrail with plastic to limit maintenance needs within plants and warehouses all over North America. The company has also been covering the needs of customers since then with the mentality that “the customer is king”. This has led to working directly with customers to design new products that cover their every need.

“We’ve Got You Covered” is more than just a tagline. It’s the way Ideal Shield has been operating its business since its beginning when Frank Venegas saw the growth potential for two of his most popular inventions, the plastic-sleeved steel pipe guardrail system, and the Bumper Post Sleeve or Bollard Cover, which went from a “crazy idea” to architecturally specified all over the country.



Ideal Shield
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Now, officially celebrating 25 years in business, Ideal Shield continues to be an industry leader. Featuring five manufacturing plants across the country including a 75,000 sq. ft. facility in Detroit, Michigan, Ideal Shield has a talented workforce that produces and

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