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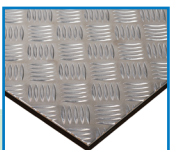
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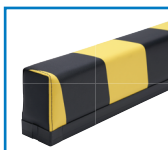
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Material Handling/Logistics

PACKAGING / PALLETIZING

- 8 Vacuum Technology-Based Palletizing Meets High-Speed Needs**
Understanding available tools and grippers is crucial to installing a solution that increases efficiency to handle current ecommerce market growth.

TUGGERS

- 10 Six Steps to Automating Tugging and Other Material Handling Operations**
Steps include identifying opportunities for automation, meeting with an AMR vendor and more.

BARCODING / LABELING

- 14 Creating Productivity in all the Nooks & Crannies**
Placing the power of a high-quality label and receipt printer in the hand of an employee goes a long way in streamlining any logistics operation.

AUTOMATED STORAGE / RETRIEVAL SYSTEMS

- 16 What AS/RS Solution Is Right for Your Operation?**
With the advancement of technology and increased affordability, there is likely an AS/RS that is right for you.

MOBILE ROBOTS

- 18 AMRs: The Scalable Solution for Semi-Automated to Full-Scale Industry 4.0 Automation**
Learn how AMRs can create value from the moment they are installed.

HAND LIFT TRUCKS

- 20 The Small But Mighty Pallet Jack**
A look at the various types of pallet jacks and their benefits.

In Every Issue

- 6 Editor's Column**
56 Ad Index

Environmental Health & Safety

LEADERS IN SAFETY

- 22 Read about participating suppliers' solutions on how they can help with your safety needs.**

LIFTS

- 46 Ergonomics in Manufacturing and Beyond**
Using devices designed for ergonomic safety prevents injuries, potentially lowers workers compensation costs and boosts productivity.

HAZCOM

- 48 SDS Availability Must Be 24/7**
A guide to understanding the HazCom responsibilities of employers.

CHEMICAL SAFETY & STORAGE

- 50 Chemical Safety and Storage**
How can managers and business owners improve chemical safety and storage protocols in their own workspaces with the goal of keeping employees safe?

HEARING & NOISE

- 52 Guidelines for a Legally Acceptable CAOHC Industrial Hearing Conservation Program**
With appropriate hearing conservation measures, workplace hearing loss is completely preventable. Learn how.





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With pandemic-related restrictions easing and vaccinations making it possible for more people to engage in more activities, there's a greater willingness to travel. Government-imposed limitations and rules are easing. The fear that was so rampant last spring has abated. Many of the work-related activities that were canceled or shunted online in 2020 are back, in hybrid and real-life versions.

Safety 2021*, for instance, will have a "dynamic format" according to the American Society of Safety Professionals (ASSP). This 60th iteration of the conference, held Sept. 13-15, will have education and activities taking place both online and on site, in Austin, Texas. The ASSP says that some programs will be different - depending on how you participate in Safety 2021 - but there'll be shared experiences "to bring all attendees together," such as live-streamed general sessions. Everyone who attends the in-person conference in Austin will be required to follow established safety and health protocols that include providing proof of vaccination or of a negative COVID-19 test within 48 hours prior to the event, wearing masks and practicing physical distancing. Aisles will be one way only, seating limited and food provided outside, to reduce the amount of time that people go maskless indoors.

Will hybrid events like Safety 2021 continue on into the future, even after the COVID-19 health crisis has abated? Now that we're aware of the possibilities - and limitations - of what can be done online, will that remain an option? Some people look forward to spending time with their fellow industry professionals from all over the globe. For others, the cost of travel and hotel rooms is prohibitive. This may particularly be true of would-be attendees who work for smaller companies or who live outside of the U.S. Keeping conventions hybrid could actually increase overall attendance.

I learned first-hand during ProMatDX that product demonstrations can be as effective online as they are in real life - in some cases, more so. I was able to view a live demonstration of a mobile robot that was conducted at the company's facility. The amount of space there made it easy for the demonstrators to put the robot through its paces. I was able to ask questions and get answers, just as I would have if I'd been talking to the company reps in person. Likewise, you can get as much out of an online educational session as if you were sitting in a chair in a convention center, watching a speaker at the front of the room. Haven't webinars been proving that for some time now?

However, there's no substitute for in-person connections. The networking opportunities that conventions offer don't resonate in the same way via a computer screen. Enjoying some shop talk with new acquaintances over cocktails (or mocktails) is a great way to unwind and learn about new developments or products that may help you improve operations at your company. It's a different experience via the internet.

What about you? Are you ready to attend conventions in person again? Are you pleased with the restrictions that will likely remain in place for some time to come, or are you over them? I'll be in Austin in September, wearing some of the many masks I've sewn over the past year. Maybe I'll see you there!

Maureen Paraventi
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*By the way, registration for Safety 2021 is now open. Go to <https://safety.assp.org/> for more information.

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Vacuum Technology-Based Palletizing Meets High-Speed Needs

By: **Andrea Bodenhagen**, Contributor

With the pandemic-driven ecommerce market growth, changed retail structures continue to drive investment in automated packaging and palletizing. Understanding available tools and grippers is crucial to install a solution that increases efficiency, copes with market needs and enables flexibility and customization. Vacuum technology based gripping solutions play a major role when it comes to cost effective and energy efficient palletizing of a broad variety of products, particularly compared to complex electro-mechanical solutions for the same task.

COVID-19 is changing the way companies and people obtain goods, with lasting effects on the whole supply chain. The sudden demand for social distancing short-term led to increasing production shifts. This sets the stage for a higher degree of automation across all process steps – including packaging and palletizing to reduce dependency on increasingly expensive human labor. Particularly retail, FMCG, pharma and cosmetics, as well as food and beverage industries saw a strong shift for various reasons.

To prevent contamination, fresh food online ordering grew up to 200 % and Amazon ramped up its grocery capacity by 160 % in the second quarter of 2020, while sales tripled, according to a study by Mordor Intelligence. Accordingly, production was not left unaffected and saw a major pressure to speed up its processes, increase efficiency of supply chains and provide more customized pallet configurations. Despite large investments in automated warehouse systems, distribution centers continue to depend on a huge workforce for picking the respective items. Interact Analytics predicts the need for 28,500 new warehouses by 2025. As this implies a 50 % increase in staffing requirements, the pressure on finding enough people or developing more fully automated solutions continues.

A LOOK AT TECHNOLOGY

Vacuum technology in semi- as well as fully automated systems offer exactly what is needed in terms of cost consciousness, handling efficiency and speed, ergonomics and flexibility. An easy start to automation is the deployment of vacuum lifters. They support employees in palletizing products ergonomically and safely, maintaining an optimum lifting pace and preventing work-related injuries affecting the bottom line. Such lifters allow easy handling and repositioning of bags and boxes, as well as swinging them over a pallet or lowering them carefully onto it.

Vacuum lifters allow a single person to handle a large volume of packages, lifting and moving them without



De-palletizing full layers with a gripper with Piab's Duraflex suction cups. Courtesy of Piab – www.piab.com

physical effort. An operator can deal with a constant stream of packages of varying dimensions and weight arriving on a conveyor to sort them onto a pallet. Stand-alone systems, as well as overhead crane systems, offer maximum flexibility depending on the facility in which they are planned to be installed.

The huge advantage of vacuum handling for the food industry is that these lifters do not have any sharp gripping parts that could tear holes into the bags, allowing foreign substances to infiltrate ingredients and potentially making them dangerous to consume.

For fully automated palletizing processes using an industrial robot, different vacuum gripping solutions are available and can perform anything from positioning the pallet itself to product placement, up to intermediate slip sheet handling. Safety in vacuum-based palletizing solutions can easily be managed by using ejector technology with valves that remain open in case of power failures, while vacuum gripping force is easily controlled by the vacuum level, ensuring that sensitive objects and packages to be palletized are not destroyed in the process.

Vacuum area grippers with technical foam can move complete layers of cans, pasta or sugar packs onto a pallet, as well as stacking furniture part bundles in the right order.

As their surface does not need to be fully covered or can be zoned and equipped with flow-control valves, they are able to palletize a broad variety of products, almost eliminating the need for expensive tool changes. Hence, they are an optimal solution if customized retail store pallets are packed with different products coming in various materials, surface structures, geometries and sizes – offering maximum flexibility.

Suction cups provide a gentle gripping solution and can handle several types of surfaces or objects, leading to less tool changes and increased flexibility. The quality and material characteristics of the suction cups are crucial. Increased productivity can be achieved by using suction cups that are durable as well as wear and oil resistant. For fast processes they should be able to handle shear forces from rapid acceleration and retardation.

INDUSTRY 4.0

Independent of the gripping solution chosen, integrating Industry 4.0-ready vacuum ejectors increases system uptime and consistent end-of-line throughput by allowing predictive maintenance. Particularly multistage vacuum ejectors are highly efficient, use less compressed air and can evacuate the system as fast as possible so that the robot can start the next motion earlier. If it is a leaking system, as when handling porous material such as cartons, the ability to maintain a satisfactory vacuum level is equally important. The most effective system is where vacuum is generated as close to the suction cups as possible. Such a system eliminates unnecessary hose volume to be evacuated and the risk of reduced performance due to restrictive piping. Choosing such a decentralized vacuum system eliminates the risk of costly over-sized central vacuum pumps to meet productivity goals. The energy consumption can be

reduced tremendously by changing to a more decentralized vacuum solution with one vacuum pump per suction cup.

If choosing an efficient multistage vacuum ejector, evacuation time can be reduced, which substantially increases the possibility to speed up cycle times. State-of-the-art multistage ejectors are up to twice as fast compared to single-stage ejectors, with the same air consumption.

Industry 4.0-ready vacuum ejectors with IO link offer field-bus-independence, allowing automated parameter setting and reading and writing parameters for various features even during operation and fast tracking of performance issues or system defaults. This has the potential to greatly improve productivity, supporting the need for speed in palletizing operations in logistic distribution centers and warehouses. **WMHS**

Andrea Bodenhagen is the Global Ownership Content Manager at Piab. In 2020 the company acquired TAWI, a leading manufacturer of smart lifting solutions with global reach. The former Piab Ergonomic Handling division is now merged under the brand TAWI securing an even broader range in ergonomic handling solutions. Piab is evolving automation through progressive gripping, lifting and moving solutions and has done so since 1951 (www.piab.com).



Multiple drum palletizing with the VacuEasylift from TAWI. Courtesy of TAWI - www.tawi.com

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Six Steps to Automating Tugging and Other Material Handling Operations

By: **Mike Harper**, Contributor

To automate the delivery of lineside supplies, a top-tier automotive manufacturer recently integrated its existing manufacturing conveyers with autonomous mobile robots (AMRs) pulling custom trailers. Not only did this autonomous tugger solution reduce how often employees had to manually lift and move heavy objects, but it eliminated the risk of forklift-related injuries that could occur while transporting engines and other materials from assembly to testing within their 40,000 ft² facility.

In one trip, a single AMR tugger can carry what it typically takes two manned forklift trips to transport, which adds up substantially over the course of a typical day. As a result, the manufacturer was able to move two team members in two shifts to higher value tasks, while maintaining just-in-time lineside supply delivery and their 95 % uptime goal.

Automating tugging and other material handling workflows can be a daunting task. To alleviate the concerns and any potential risks, consider these six steps:

1. IDENTIFY OPPORTUNITIES FOR AUTOMATION

Not all tasks benefit from automation, but a closer look at your operation might identify more than expected. Look for tasks that are:

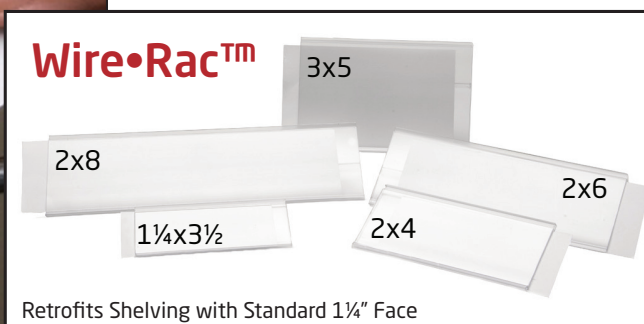
- **Repetitive:** Is your task the same every time? Automating these tasks enable workers to stay focused on high-value tasks.
- **Predictable:** Does the task adhere to the same process each time, like moving materials from point A to point B or just-in-time delivery of raw materials from storage to lineside?
- **Unsafe or taxing on people:** Could automation eliminate moving heavy loads by hand or push carts, or reduce/eliminate other safety risks and hazards?
- **Cause product or materials damage:** Would automation, with sensors and other safety features, reduce or eliminate the risk of damage?
- **Inefficient:** Does the task really require a human worker?

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2. MEET WITH AN AMR VENDOR

There is no one-size-fits-all robot or automation deployment. To ensure the best automation solution, work with a vendor who looks at your unique needs, and identifies the best opportunities for automation and the robot best suited for each task.

A proven and trusted vendor will:

- Adopt a consultative approach to the sale to help you create and support an end-to-end solution that meets your specific needs and concerns.
- Look at all of your processes and advise you on the most impactful (including labor, costs and ROI) tasks for automation.
- Create an intentional automation plan with a step-by-step plan for automating your facility, beginning with the workflows that are easiest and/or most impactful. Once people are accustomed to working with automation, more complex workflows can be implemented.
- Arm you with a solid business case to justify the expense, taking into account improved safety, resource re-allocation and operational efficiencies.

3. DEVELOP A PROOF OF CONCEPT

Work with the vendor to develop a proof of concept (PoC) that helps you understand how and where the solution meets your requirements, and specifically for the intended

application. This PoC should identify objectives for the robot and measure the results based on specific criteria.

During the PoC, issues that apply across multiple workflows, such as connectivity, integration challenges or unexpected interruptions to the larger production process can be identified and resolved, ensuring the pilot runs smoother and faster.



Following six key steps can help facilitate the process of automating tugging.

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Ask these questions to define your PoC:

- Does the robot do what they say it can? Ask the vendor to demonstrate proof of robot capabilities.
- Does the robot act in a safe and predictable way? Ask the vendor to point out the robot's safety features and provide documentation for regulatory compliance.
- Does the robot perform the intended task as expected? Ask for a demonstration of the robot in action.
- What is not working as expected and how does that affect the deployment? Work with your vendor to identify gaps and develop solutions.
- What can be done to mitigate the risk for items not working as expected? Discuss ways to improve workflows and infrastructure to eliminate risk areas.

4. EXECUTE AND EVALUATE A PILOT IN THE PRODUCTION ENVIRONMENT

When deploying a pilot project in a production environment, ensuring it's a natural extension of the PoC helps mitigate risk. During the pilot, remember to:

- Keep the pilot to a single task in a single workflow. For example, moving a pallet from end of line to a shrink wrap machine.



In one trip, a single AMR tugger can carry what it typically takes two manned forklift trips to transport.

- Choose an AMR workflow that limits the exposure of the automated task to a single geographic area, a small group of employees and a clearly defined outcome. For example, moving materials from the inbound dock to storage.
- Fully train operators interacting with the robots to program and collaborate with them safely. Your vendor should provide training for all operators.
- Clearly communicate to all employees where the robots will be operating and how to interact with them should they encounter one.

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- Evaluate and measure the pilot, adapting and re-defining it as you go.

5. MOVE FROM PILOT TO DEPLOYMENT

Once a pilot has proven out the business value of automation, move from pilot to deployment by:

- Deploying one task inside a single workflow in a production environment and measuring its effectiveness.
- Making the necessary tweaks to optimize the process until all efficiency gains possible have been achieved.
- Measuring progress to evaluate the degree of efficiency gained based on the stated goals.
- Calculating and understanding how the deployment affects the profitability of your operation.

6. EXPAND THE AMR DEPLOYMENT TO OTHER WORKFLOWS AND FACILITIES

Next, work with the vendor to identify other opportunities to deploy an analogous or similar workflow, and expand to additional workflows and facilities. Now that the value of automation has been quantified, and the risks have been identified and mitigated through the first deployment, it should be easier and smoother to automate additional ones.

Collaborating with a vendor familiar with both your operation and AMR solutions can greatly mitigate the concerns of automating your facility. By establishing a process for moving from evaluation to full-scale deployment, your operation can quickly realize the productivity, efficiency and safety benefits AMRs offer when automating tugging or other material handling tasks. **WMHS**

As VP of Sales and Marketing at AutoGuide Mobile Robots, Mike Harper is tasked with helping manufacturers and warehouse managers successfully move materials through their facilities. For more information on AutoGuide, visit www.agmobilerobots.com.

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Creating Productivity in all the Nooks & Crannies... A Story of Products That Move Where You Need to Be

By: **Jessica Bernardo**, Contributor

Last year we saw a precedent-setting 44% expansion of e-commerce in the United States. This rate far surpasses the 15.1% year-over-year increase in 2019, according to U.S. Department of Commerce data.

The year 2020 put immense pressure on supply chain logistics, particularly on warehouse and distribution center operations. Extreme flexibility was necessary for accurate and efficient fulfillment and faster delivery times to address the dramatic uptick in orders. Better warehouse management boasts productivity while driving overall improvement and profitability.

Where can companies invest to alleviate pressure within logistics operations? First and foremost is improving the quality of work life for warehouse personnel. There are many incentive programs to help reduce employee turnover. Equipping staff with the proper equipment is one vitally important element within this equation that organizations often overlook.

in the hand of an employee, or rather on their hip, goes a long way in streamlining any logistics operation.

Another pressure for successful businesses is that more online orders equal more returns. Quickly and correctly classifying returned items via labeling ensures proper product management. Moreover, labeling technology identifying reusable products enables next-level product management and loss prevention.

Quality barcode labels facilitate shipping, which is important in quickly and effectively managing product returns. Customers expect supply chain logistics to perform optimally. Anything less may even bruise the organization's brand image.

PRINTING MUST-HAVES

So, what are the characteristics of an ideal product for low- to mid-volume receipt and label printing for logistics personnel? For starters, the printer must be mobile and wearable. It should also integrate within existing infrastructures via system languages. This occurs through language emulation support.

Wearable printers should additionally include ruggedized components to endure the bumps and bruises logistics environments commonly dish out. Extensive battery life is another must-have as warehouse, distribution center and supply chain personnel are far too busy to interrupt their day to charge or swap out a battery.

There are also instances where mounting mobile printers on forklifts provide ultimate accessibility for warehouse workers. Such printers require elite speed for labeling multiple pallets and packages while on the move. Having a printer that is easy to navigate with a clear, concise status window and one that is easily accessible to change out labels or swap batteries is vital.

Extensive training is usually not a luxury for today's logistics settings. Interruptions or downtime because of equipment failure may be the deciding factor between a profitable and unprofitable month.



Placing the power of a high-quality label and receipt printer in the hand of an employee, or rather on their hip, goes a long way in streamlining any logistics operation. *Courtesy of Toshiba America Business Solutions.*

Personnel needs to be agile while performing key responsibilities within any area of the warehouse. Tasks requiring speed don't necessarily happen in the same location time after time. Stationary label and receipt printers requiring the back-and-forth of personnel is completely inefficient. Placing the power of a high-quality label and receipt printer



Courtesy of Toshiba America Business Solutions

Mobile label and receipt printers are the products capable of meeting these needs. Logistics managers should demand reliable, intuitive and long-lasting printers. Anything less should be unacceptable.

As you look for the right labeling technology for you, consider these elements:

- Reliability
- Ruggedness
- Lightweight
- Print speeds
- Battery life
- Ease of use
- Flexibility

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Jessica Bernardo is the Senior Product Marketing Manager, Label Print Solutions, Toshiba America Business Solutions (<http://business.toshiba.com>). Toshiba provides an extensive and award-winning line of direct thermal mobile printers producing two- to four-inch labels. The three-inch mobile printer is a particularly rugged workhorse with many of the features mentioned in the article.

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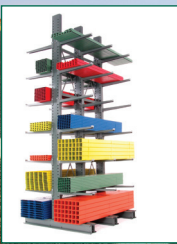
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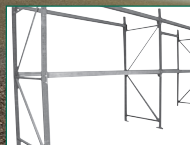
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What AS/RS Solution Is Right for Your Operation?

By: **Tony Morgott** and
RC Paschke, *Contributors*

Since the inception of automated storage and retrieval systems (AS/RS), companies have wondered how they can benefit their operation. Because these systems promise improved utilization of available space and a reduction to the workforce required to manage the inventory, they are very appealing. Pre-COVID-19 forecasts predicted record growth in the global automated material handling market over the next five years.

Now, growth has accelerated even more, and companies are experiencing even greater challenges in hiring and retaining a skilled workforce. These market pressures, combined with higher employment costs and the never-ending focus on increased efficiency and accuracy, are escalating the adoption of AS/RS solutions. With the advancement of technology and increased affordability, there is likely an AS/RS that is right for you.

Look for a partner who will look at the situation holistically. Often, an AS/RS may be only one component of an overall solution. The Raymond Corporation and its network of Solutions and Support Centers recently announced its Intralogistics Solutions initiative. Simply put, this means working together on a portfolio of integrated solutions that focuses on optimizing space and connecting products and data to help the customer identify the best direction for automation.

WHICH AS/RS SOLUTION IS RIGHT FOR ME?

Initially, AS/RS solutions offered only two types of systems: mini-load systems and unit-load systems. However, many companies have requirements that fall in between these two types of systems. Also, early systems were costly and typically required high-bay additions to have any hope in justifying the investment in AS/RS solutions. Fortunately, through advancements in technology and ingenuity, there are more offerings to fit varied needs and improved ROI. Among the latest offerings to expand viable AS/RS applications are the mid-load AS/RS and pallet shuttle systems.

Mini-load systems are generally utilized for handling totes and/or cases. Typical applications include automated case picking, goods-to-person picking, pick-face



Pallet shuttle systems can reduce floor space requirements and allow operations to store up to 100% more pallets in the same place when compared with conventional racking applications. Image courtesy of Raymond.

replenishment and as a material storage buffer. Mini-load systems typically:

- Handle containers from 6 in to 26 in wide with capacities of 100 lbs or 200 lbs per container.
- Operate at high speeds running on a floor-mounted rail system and require precision racking systems.
- Work within heights typically ranging from 25 ft to 65 ft, making them a good option for dense storage of slow-to-medium movers.

Unit-load systems are utilized for handling traditional pallets. Unit-load systems are well-suited for high-speed storage in both ambient and cold-storage applications. Typically, unit-load systems:

- Have capacities typically ranging from 2,000 lbs to 4,000 lbs, perfect for manufacturing and distribution operations in the food and beverage industries.
- Utilize cranes run on floor-mounted rail systems and can operate at high speeds, often requiring semi-precision racking systems.
- Typically fall within the 40-ft to 80-ft range; however, some systems can extend upward of 150 ft with both single- and double-deep applications for improved density.
- Are typically long and narrow to maximize ROI.

AUTOMATED STORAGE / RETRIEVAL SYSTEMS

However, there are some specialty units used for the storage of large and heavy items, such as car bodies, steel coils and dies.

The mid-load AS/RS is a new genre of AS/RS that has emerged to address the applications for which the mini-load and unit-load systems are not suitable. ISD pioneered a mid-load system called UltraStore®, which incorporates many unique features the mini-load and unit-load systems lack. One unique feature is that the ISD mid-load crane rides directly on the floor instead of a rail. This not only reduces cost but also allows the option of a manual or automated backup crane to support mission-critical operations. This makes the system particularly well-suited for work in progress (WIP), kitting and sequencing applications in manufacturing and assembly operations, including automotive. Many companies find the mid-load system is the best solution as it spans the best of both worlds. Mid-load systems:

- Excel with loads from 300 to 1,500 lbs.
- Support a diverse range of applications; loads include trays, pallets and containers within a 15- to 60-in-wide by 30- to 96-in-long range.
- Typically operate at heights below 40 ft and at moderate speeds; however, throughput is often high due to a smaller system footprint.

Pallet shuttle systems incorporate automated shuttle carts and specialty racking for deep-lane storage. Pallet shuttle systems can reduce floor space requirements and allow operations to store up to 100 % more pallets in the same place when compared with conventional racking applications. Systems such as Radioshuttle® semi-automatically execute orders to load or unload pallets into a lane. Pallet shuttle systems have:

- Lanes that are fed pallets by lift trucks, such as reach trucks or counterbalanced forklifts.



AS/RS promise improved utilization of available space and a reduction to the workforce required to manage inventory. Image courtesy of Raymond.

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- Dense storage capabilities, making them popular in cold-storage environments where storage space is at a premium.
- Additional applications, including high-volume SKUs, staged shipments and buffer storage of raw materials, WIP or outbound from manufacturing processes.

Knowing the difference between AS/RS options is important, but, as mentioned earlier, partnering with a trusted systems company that works with other professionals to help adopt and execute an integrated intralogistics solutions plan will help lay the groundwork for a successful implementation. **WMHS**

Tony Morgott is Vice President of Sales at Integrated Systems Design (ISD; www.isddd.com); and RC Paschke, Vice President of Sales and Marketing at Andersen Material Handling (www.andersenmaterialhandling.com), a Raymond Solutions and Support Center. They work together on intralogistics solutions with clients. Solutions focus on developing creative design, integration and implementation of automated systems, warehouse equipment and best practices to achieve the highest gains in productivity and the quickest return on investment.

AMRs: The Scalable Solution for Semi-Automated to Full-Scale Industry 4.0 Automation

By: **Ed Mullen**, *Contributor*

Autonomous mobile robots (AMRs) are increasingly used as the most effective solution when wanting to optimize internal logistics, reduce cost and increase productivity while addressing labor shortages. Despite the turmoil created by the COVID-19 pandemic for most businesses, mobile robots have been singled out by Interact Analysis as one of the most promising emerging technologies, offering an important tool in the race amongst manufacturers to adopt to flexible, digitized and safe working practices.

AMRs require no additional infrastructure. Instead, they use built-in sensors, cameras and intelligent software to navigate efficiently and safely around workers and equipment. The robots' missions can be easily programmed, updated and optimized as new workflows are added or production requirements change. AMRs allow manufacturers to focus workers on high-value activities that directly drive revenue, rather than taking them away from their workstations for low-value tasks such as pushing carts. As with most new technology and robotics, the strategies for implementing AMRs into facilities vary significantly between companies, but AMRs can create value from the moment they are installed, whether in simple, semi-automated or fully automated applications.

CREATE VALUE WITH COMPLEX OR BASIC AMR SOLUTIONS

The most advanced AMRs have the capabilities to be part of highly complex and fully automated solutions. These flexible robots can be customized with different top modules such as racks, conveyors or collaborative robot arms, while the software can be integrated into existing systems such as enterprise resource planning (ERP), manufacturing execution systems (MES) and warehouse management systems (WMS) to ensure that material is always where it needs to be—automatically, efficiently and consistently, while also generating valuable data to see how efficient the material transportation is. Integrated AMRs also ensure that material is delivered just-in-time to each stage in the process, so equipment and operators are kept consistently productive. Complex, customized and fully automated solutions like these give an extremely high payback while maximizing the throughput of logistics operations.



In 2016, Honeywell decided to add AMRs to its line of robotics to automate the transportation of raw materials and assemblies, which until then was manually pushed around on carts by employees in the nearly 1 million square feet facility.

For some companies, however, it makes sense to start these automation projects at a smaller scale. One of the main benefits of AMRs are the flexibility, adaptability and scalability of the mobile robots, allowing companies to have a phased approach where they begin projects by focusing on a simple implementation and then customize the solution once they get familiar with the robots. Mobile robots can easily be deployed and redeployed, potentially with different top modules, and a simple rack structure can be placed on top of a robot with just a few bolts as a start. The communication with the robot in simple implementations is mostly handled via the robot interface on a tablet, where the employees can summon a robot with a push of a button. This approach does not use the robots' full potential and there may still be manual pick up and drop off, for example, so the processes are not fully automated. On the other hand, it is a low-risk and fast deployment process that can add significant value as the employees grow familiar with the robots and get a sense of how to implement the AMRs into the facility (and workflows) in the best possible way.

THE FLEXIBILITY OF AMRS SUPPORTS CONTINUOUS OPTIMIZATIONS OF INTERNAL LOGISTICS

Take Honeywell Safety & Productivity Solutions in Poole, UK, as an example. Honeywell produces gas-detection equipment that is used in off-shore oil and mining, as well as consumer-grade detection for homes. The company's manufacturing processes are highly automated, and in 2016 Honeywell decided to add AMRs to its line of robotics to automate the transportation of raw materials and

assemblies, which until then was manually pushed around on carts by employees in the nearly 1 million ft² facility.

Honeywell utilized the scalability and flexibility of the robots to their advantage. When the company implemented the robots in 2016, it initiated the project with a phased approach. It then introduced the robots into a semi-automated workflow with a simple box on top. The robots were manually loaded in the warehouse, and the employees sent the robot to a workstation via a tablet. The robots were not integrated into any external systems and were controlled by the simple robot interface.

Today, Honeywell has upgraded the application and developed a conveyor system for a fully automated process, where the employees have minimal interaction with the robots. The robots now have conveyors mounted on top and can automatically go to the warehouse, collect raw material from a conveyor that connects to the robots' conveyor and then deliver the material to different assembly lines. Honeywell has integrated RFID scanning technology into the robots, so they can check the content of the boxes and take it to the correct manufacturing line.

INCREASED INTEGRATION INCREASES PRECISION AND PRODUCTIVITY

When Honeywell first started using the AMRs, the company had four delivery stations. Now it has 15 throughout the production plant. When the company first integrated the AMRs, it redeployed six full-time employees for higher-value tasks. With the fully automated solution, the company saves even more manhours, as the robots are automatically summoned, loaded and unloaded. There are additional benefits as well. For example, the automated workflow has eliminated the risk of errors in goods



AMRs require no additional infrastructure. Instead, they use built-in sensors, cameras and intelligent software to navigate efficiently and safely around workers and equipment.

delivered from the warehouse, as the RFID scanner ensures that the robots always take products to the correct line.

As Honeywell demonstrates, AMRs deployed on a small or large scale can help optimize internal logistics, reduce cost and increase productivity while addressing lingering labor shortages. These flexible, digitized and safe working practices AMRs offer can benefit nearly every sector as they continue to recover from the pandemic shutdown and remain competitive in today's uncertain business environment. **WMHS**

Ed Mullen is Vice President of Sales, Americas, at Mobile Industrial Robots ApS (www.therobotreport.com/tag/mobile-industrial-robots). At MiR, he is responsible for establishing and managing the company's distribution channels and marketing activities in the Americas. Mullen is a seasoned business development executive with more than 25 years' experience in industrial automation sales management and engineering roles.



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The Small But Mighty Pallet Jack

It's no secret that automation is transforming operations in warehouses, distribution centers, factories and other facilities where large quantities of good are moved from one location to another. Amid all of the complex new systems being rapidly rolled out and adopted, though, is a relatively simple piece of equipment that many companies find indispensable: the pallet jack.

Despite its humble status as the most basic form of a forklift, the pallet jack has somehow been able to accumulate many names – or nicknames, if you will. It is also known as a hand forklift, pallet pump, pallet truck, pump truck, scooter, dog or jigger. Exactly how the hand forklift came to have so many monikers is a mystery, at least to Google. What is known is that a crude pallet jack that allowed a user to elevate a skid manually was invented in 1887.¹ It evolved into a labor-saving device glowingly described in a 1918 issue of Popular Science magazine as having “ingenious features,” – one “that helps women tackle men’s jobs” in factories, because it could be unloaded by simply pressing a lever.² These days, a hand-pumped hydraulic jack does the work.

Why bother with pallet jack for lifting, lowering and moving pallets when there are more sophisticated versions of forklifts available?

- They are a cost-effective and reliable option for small businesses whose material handling needs consist mainly of moving heavy pallets a short distance.
- Pallet jacks are smaller than conventional forklifts, so they take up less storage space. This is an important consideration in warehouses, where space is vital.
- They can be used to lift pallets and boxes to heights that people can't reach.

- Like conventional forklifts, they move heavy loads that could cause ergonomic injuries if moved by workers.
- Certain models come with accessories, like printers (for printing the weights of loads) and scales that enable loads to be weighed while they are on the hand forklift.
- They are easy to use, requiring minimal training.
- They move items efficiently, from semi-trucks, through warehouses, up or down dock ramps or wherever else you need them to go.
- Some models can lift loads weighing up to 11,000 lbs.
- Pallet jacks are ideal for moving pallets inside a trailer, where space is tight.

THE PARTS OF A TYPICAL PALLET JACK

- The direction in which the pallet jack goes is controlled by a **handle** that can be rotated to the left or right.
- The pallet jack's two **forks** are raised or lowered using a **control lever** on the handle. Squeezing the lever releases hydraulic fluid and lowers the forks. Pushing the lever forward raises them – just enough to clear the floor and enable the pallet jack to be moved.
- Pallet jacks generally have nylon or polyurethane **steer wheels**. Polyurethane wheels are preferable in environments shared by customers, such as retail establishments, because they are quiet and won't scratch or mark floors. Nylon wheels are extremely durable. They are a good choice in facilities with harsh environments and wet or rough-textured floors.
- **Load wheels** are under the tips of the forks. Because they must fit into the openings under a pallet, these are smaller than steer wheels. Load wheels are available in polyurethane, nylon

¹ <https://packagingrevolution.net/pallet-or-forklift/>

² <https://tinyurl.com/5uc92jz5>

and steel. The weight of the loads that will be moved, in addition to the conditions to which the pallet jack will be exposed, should factor into the decision about which wheel material to use.

PALLET JACK VARIATIONS

Electric or powered pallet jacks are – as their name suggests – motorized, which allows them to move very heavy pallets or stacks of pallets. Electric pallet jacks have large, lead-acid batteries which must be charged regularly, a process that can take anywhere from four to 16 hours. They are steered by a throttle on the handle. Some models have a platform for the user to stand on and systems for stopping the vehicle quickly.

Rough terrain or all terrain pallet jacks have heavy-duty frames and pneumatic tires, so that they can roll easily over uneven surfaces and withstand harsh conditions. They are used extensively at construction sites, lumber yards and other outdoor operations.

PALLET JACK SAFETY

While they may not present the obvious hazards that larger, more complex pieces of machinery may have, pallet jacks are nonetheless capable of causing injuries to users. In

³ <https://www.youtube.com/watch?v=ITm3Tsz8Nc4>

an incident³ in Washington state, a worker's ankle was crushed when he was struck by a pallet jack operated by a co-worker.

Following some basic guidelines will go a long way ensuring that both pallet jack users and others in their vicinity are safe:

- Load the heaviest items first.
- Make sure the forks are centered evenly under the load, for good balance.
- Make sure that the forks are completely under the load.
- Avoid overloading the pallet jack; pay attention to the maximum rated lifting capacity.
- Be especially careful when moving loads up and down ramps. If the user releases his or her grip, the pallet truck can reverse and strike something – or someone.
- Wearing steel-toed footwear will help protect against foot injuries. **WMHS**

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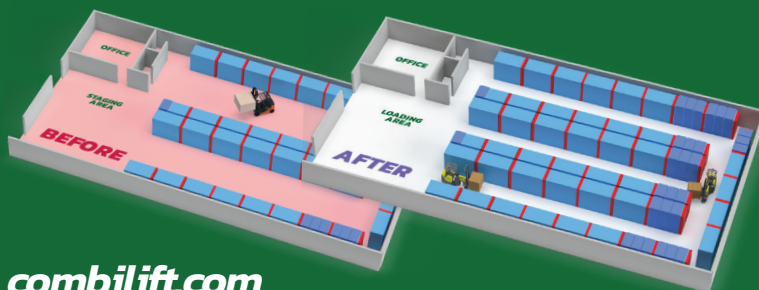
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Selecting the right chemical resistant glove for the job is obviously complicated. In this *IHW* exclusive interview with Gilbert LeVerne, Jr., Director, Marketing at SHOWA International, we discussed a wide range of issues that can help protect workers from chemical burns, including the company's *Chemical Resistant Glove Directory*.

Employees where chemicals are manufactured are obviously at risk for hand injuries due to chemical exposure. Other industries are also high-risk for such hazards (i.e., mining, painting, construction, welding, etc.). How can workers unintentionally expose themselves to harmful solutions?

Mishaps, misunderstandings and lack of training: Proper training and certifications are paramount to a safe work environment, especially where harmful chemicals are in use.

What is "chemical permeation," and how can it be combatted in industries where chemical exposure is a risk?

Permeation is a process by which a chemical can pass through a protective film without going through pinholes, pores or other visible openings. Individual molecules of the chemical enter the film and "squirm" through by passing between the molecules of the glove compound or film. This is combatted by wearing the proper hand protection within the regulated time of exposure to chemicals.

How does permeation differ from the term "penetration," when used to describe a chemical process?

Permeation is described as something moving through a substance by diffusion or going through the pores of it by being spread onto it. Penetration of something is when a certain chemical can find its way into

the pores and imperfections of a certain material.

There seem to be many complications that workers might suffer from chemical burns. What are some of these complications?

Serious chemical burns can cause long-term complications:

- Many people have pain and scarring.
- Burns in the eye can lead to blindness.
- Swallowing harmful chemicals can lead to problems in your gastrointestinal tract, potentially leading to permanent disability.
- Some acid burns can cause the loss of fingers or toes.
- Burns can cause emotional issues including anxiety, depression and insomnia.

Long-term effects for employees and employers differ and are reviewed by incident. Employers lose tens of thousands of dollars in work compensation for injuries at work, loss of valuable employees due to permanent injuries, OSHA violations, etc.

What are the three "service pillars" of SHOWA's ChemRest Platform?

Educate, Evaluate, Equip

What type of education does SHOWA provide for employees on chemical resistance and permeation?

SHOWA has 70 years of experience with chemical hand protection. Our sales professionals, our technical team and our online services all are available to our customers at any time. We make complex chemical applications much easier for our customers to understand and prevent against.

How is this education or training delivered?

We do in-person training, video conferencing and videos.

Has the company conducted any after-education

assessments to see if their training/education programs help to mitigate a company's injury statistics?

Yes, we utilize our Sentinel evaluation program to measure all of our recommendations, training, injury prevention, cost savings, etc.

What is SHOWA's process for determining a company's best choice(s) for chem-resistant gloves?

Application Type/Chemical Name/CAS #/Time of Exposure are the main areas that we cover before recommending the proper glove.

Can you briefly explain SHOWA's global labeling system and its various benefits?

We utilize the EN-374 TYPE A, B, C labeling system*. This labeling system is throughout our online assets, catalogs, inner packaging, dispensers, marketing materials, training materials, etc.

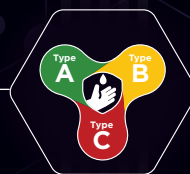
Selecting the right chemical resistant glove for the job is obviously complicated. What is the Chemical Resistant Glove Directory (ChemRest.com) and how does it help users navigate the myriad issues they might face in choosing the right hand protection?

Our mission is to educate, evaluate and equip. We do this most effectively in-person, but that is not always an option. We developed chemrest.com to bridge the gap in an easy to use interface with our chemical glove portfolio of products. Go to chemrest.com; register as a user; and walk through the clear steps to finding the chemical, the exposure time and the product to protect.

SHOWA professionals are experts at using chemrest.com and can also be of great benefit to aiding the user in navigating the site.

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Established in 1987, Omega Industrial Safety is a leading supplier of safety products designed to improve workplace safety, reduce employee injuries, and increase overall productivity. We have a nationwide dealer network to help support our customers. Our products are proven in the field in commercial, industrial, institutional, and municipal facilities worldwide.

Omega Industrial Safety puts the interests of people and their working environment at the forefront. Our products help prevent accidents and damage caused by moving forklifts, sweepers, and other vehicles. We offer a wide range of barriers and guards as well as safety railing systems.

Barrier systems such as guardrails, bollards, and other protectors are designed to safeguard people, machinery, equipment, building walls, shelving, racks, doors, inventory, and other assets that require on-site protection.

Railing systems include handrails and dock rails, stairs, crossovers, and safety gates that help ensure safety and efficiency throughout the facility.

Omega's safety products are manufactured from the highest-quality materials for strength and durability. They can withstand heavy usage and busy working conditions. Expert design ensures compliance with job site codes and regulations, including OSHA standards.

In addition to a wide range of standard products in stock and ready to ship, Omega offers custom design and manufacturing to meet

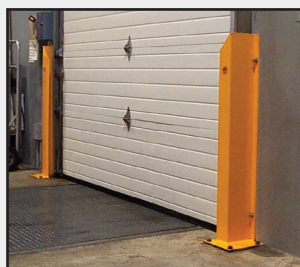
specific needs or requirements of a building. This could be as straightforward as extending the length of a guardrail or as detailed as access platforms and railings in confined spaces.

Guardrails



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When managers and employees can find and understand the regulations they need quickly, they can be more confident that they are applying them correctly, without missing any key details.

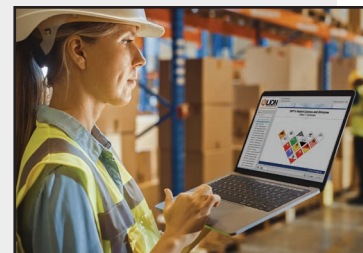
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Anti-Slip Tape and Floor Marking Manufacturer and Supplier

About Us

We are Heskins LLC, based in East Butler, Pennsylvania. We are America's largest manufacturer of non-slip tape and floor marking materials, fully certified to ISO9001:2015.

Heskins LLC, based in East Butler, Pennsylvania, are a manufacturer of non-slip tape and floor marking materials, fully certified to ISO9001:2015.

Heskins produce and supply a wide range of anti-slip tape and floor marking materials in various widths, lengths, shapes, grades and colors, abrasive and non-abrasive, available for immediate dispatch to the whole of North America and beyond! Heskins manufacturing their own anti-slip materials allows them to offer many unique safety options not available anywhere else.

Heskins produce many self-adhesive anti-slip, line marking, glow in the dark and reflective tapes suitable for applications ranging from flooring to vehicle marking. If your floor is not ideal for adhesive application, then they have other options too!

Heskins knowledge is vast and constantly evolving, striving to stay at the forefront of technology for the safety products manufactured and distributed, allowing Heskins to provide the best quality



materials and ensure that they are as cost-effective as possible. This gives commercial end-users the lowest prices and resellers the best margins for maximum profitability. If you need any questions answering, please do not hesitate to enquire, as Heskins want to show you how expansive their knowledge is. Helping you get maximum efficiency is the primary goal! With Heskins reputation for being as competitive as possible, they recommend you give them a call.

Heskins have complete confidence in their products. So much so, they offer free samples for virtually everything they stock so you can see the quality of their tapes firsthand.

and sizes tailored to your specific requirement with a range of custom cutting and printing machines. Heskins will face challenges beyond these, too; they encourage you to contact them to discuss your problem.

To guarantee a great experience when you become a Heskins reseller, not only will they support you with printed marketing material or designs to print your own, but they can offer custom packaging that features your brand. To support your marketing efforts further, a massive library of high-resolution photos to download are available to you for use in digital or print. Dropshipping is an option should you be short on space too, and Heskins would be happy to discuss any other needs you may have.

Please contact Heskins for any slip prevention needs you have. You can call them toll-free, speak to a sales agent on live chat, or get in touch via the contact us form and they will get back to you as soon as possible. Get your next anti-slip solution from Heskins LLC!

Have a custom anti-slip problem or marking tape requirement? With a history of providing solutions for people who have issues in this regard, Heskins are up to the challenge! Heskins can provide safety tape in many colors, shapes,



Heskins LLC

500 Grant Ave, Suite 200B
East Butler, PA 16029
877-900-8359
www.heskins.us



HESKINS

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Industry Leading Experts in
Anti-Slip Tape



www.heskins.us

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Wwww.heskins.us **E** mail@heskins.us **T** 877-900-8359



Driving Jobsite Safety and Productivity

About Us

Milwaukee Tool is a global leader in delivering innovative solutions to the professional construction trades that increase productivity and safety. Milwaukee® is known for their world-leading cordless systems, safety solutions, battery-powered outdoor power equipment, jobsite lighting and clean-up, time-saving accessories, and innovative hand tool and storage products. Milwaukee® has dedicated resources to work alongside their users and partners to understand the demands of a constantly changing jobsite and how they can best deliver solutions for a safer, more productive jobsite.

Milwaukee Tool is always looking for ways to help trade professionals get their work done faster and more efficiently, while keeping them safe. A prime example of this is the company's leadership in cordless technology and their mission to eliminate cords on the jobsite. The company continues to tackle the top safety issues in the industry. This includes (but is not limited to):

Dust Management

Milwaukee® is committed to providing safe and versatile silica dust management solutions that help address the OSHA regulation on respirable crystalline silica dust (29 CFR 1926.1153). The company's dust management solutions are focused on enhancing productivity.

Emissions

Gas equipment present on today's jobsite results in workers becoming twice as likely to develop respiratory diseases due to exposure and inhalation of gas fumes and emissions. Milwaukee provides users with cordless solutions that eliminate exposures associated with gas equipment. These solutions deliver upon the performance, run-time and durability demanded by



users without the hazards associated with emissions, noise vibrations and frustrations of gas maintenance.

Vibration & Noise

Hand-arm vibration syndrome (HAVS) and noise-induced hearing loss continue to affect workers across various jobsites due to repeated exposure. However, cordless solutions decrease noise or vibration to limit the exposure to the user when the tool is in application.

Ergonomics

To combat musculoskeletal disorders (MSDs), Milwaukee solutions ensure ergonomics is a key aspect of the product design process. Even when technology is not utilized, ergonomics is still one of the key aspects of product design, from comfort in the handle of a drill to

innovating how drain cleaning professionals transport heavy equipment.

Safety Technology

Milwaukee uses electromyography, or EMG, to measure muscle effort during a tool's use. With the ability to measure up to 108 unique muscle groups throughout the body, the use of EMG technology allows the company to produce tools that reduce peak muscle efforts and fatigue helps workers age and retire with greater strength and health.

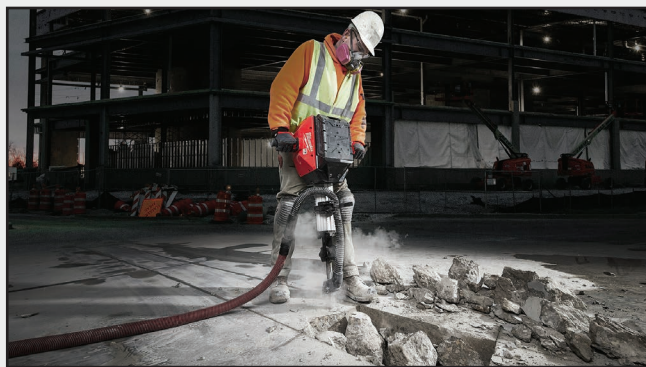
Personal Protective Equipment

PPE is critical on jobsites, but a lack of innovative offerings has led many users to modify their jobsite protection to maximize productivity at the expense of safety. Milwaukee has disrupted this space with solutions designed for the challenges workers face every day and offers features that have been demanded for years such as s hard hats with the versatility to support critical accessories, anti-fog and anti-scratch safety glasses, safety vests with increased functionality, and much more.



Milwaukee Tool

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Brookfield, WI 53005-2550
1-800-SAWDUST
www.milwaukeetool.com





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ELIMINATING EMISSIONS



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REDUCING VIBRATION & NOISE



IMPROVING ERGONOMICS



MILWAUKEE® is a world leader in jobsite solutions and has a long tradition since 1924 of improving safety of users through product innovation. We are unwavering in our commitment to deliver Relentless Safety Solutions, Built For Productivity. MILWAUKEE® has dedicated resources to work alongside our users and partners to understand the demands of a constantly changing jobsite and how we can best deliver solutions for a safe, more productive jobsite.

**LEARN
MORE**



or visit <https://qr.mke.tl/2vtn2>



About Us

Since 1977, Gorbels has been providing overhead material handling equipment solutions that are A Class Above in quality, reliability, performance and safety. Whether you're moving materials or protecting workers at heights, the owners of overhead safety have your back. Gorbels cranes, ergonomic lifting solutions and fall protection devices can be found in virtually every industrial environment, elevating safety, productivity and profitability.

From 50 lbs. to 40 tons, Gorbels Cranes Keep you Moving

Elevate your applications with our rugged Work Station Cranes

Available in free standing and ceiling mounted configurations, Gorbels® Work Station Cranes are proven to improve productivity, increase quality, and provide a safer work environment. Our aluminum and steel systems feature an enclosed track that is high in strength and low in weight. With standard spans to 30 ft. and lift capacities to 4,000 lbs., they ensure a higher level of productivity.

Heavy-duty I-Beam Jibs, always ready for duty

From free standing to floor-supported to wall

bracket configurations, Gorbels I-Beam Jibs are synonymous with quality, safety and performance. Designed to lift and move materials in semicircles or full circles, they're a cost-effective way to ensure maximum productivity in environments with limited space.

Cleveland Tramrail®

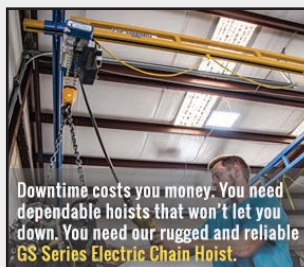
Cleveland Tramrail® Patented Track Cranes are the gold standard of overhead cranes. We've built a reputation based on quality products, top-notch service, engineering expertise, and application knowledge. This combination allows us to provide flexible integrated solutions that will



give your productivity a lift. Cleveland Tramrail's unique Tarca Track, with its special raised tread and high-carbon track, is superior to I-beams in strength, durability, and consistency. Our rails permit the use of underhung carriers operating on a single straight, curved, or inclined track or operating on two or more straight track runways.

GS Series Electric Chain Hoists

Available in a wide variety of models and configurations, our rugged line of GS hoists is ideal for just about every



Ergonomic Solutions for an Easier Lift

application—from high-production environments to periodic lifting and positioning. Their compact design makes them a good fit for all types of spaces, including those with low headroom, and they're easy to install, maneuver and relocate.

Intelligent Lifting Devices take your lifting to the next level

Combining the agility and responsiveness of a human operator with the power

of a machine, Intelligent Lifting Devices (ILDs) are revolutionizing the material-handling landscape. Gorbels's G-Force® and Easy Arm® ILDs are leading the transformation with systems that can make repetitive-motion injuries obsolete, eliminate product damage, and facilitate record-breaking levels of productivity.

Protect Your People with Gorbels®'s Fall Protection Solutions

Anchor your Fall Protection Program with Tether Track™

Gorbels Tether Track Rigid Rail Fall Arrest Systems provides workers with a high degree of mobility and freedom, while preventing falls to lower levels. Standard systems are designed to

accommodate multiple workers, each weighing up to 310 pounds with tools. Gorbels Tether Track Rigid Rail Fall Arrest Systems provide a reliable and cost-effective solution for reducing the risk of injury in elevated work environments. Available in various configurations.



GORBEL®
A CLASS ABOVE

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PROTECT

PEOPLE • PROFITS • PRODUCTIVITY



**TETHER
TRACK™**
FALL PROTECTION
SYSTEMS BY GORBEL®

Defend What Matters Most

Finding a balance between safety and productivity doesn't have to be a losing battle. Gorbel's Tether Track Fall Protection solutions were designed to protect the things that matter most to you – your people – without sacrificing productivity or profits. We take the guesswork out of fall protection by helping you select a system designed specifically for your needs.

On the front line of falls, we're your best defense.

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PROTECTION TOOLKIT TODAY!**

» www.gorbel.com/right-track

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GORBEL®
A C L A S S A B O V E

DENIOS, Your Partner in Safety and Environmental Protection

About Us

Quality, Performance, and Compliance – products designed, manufactured and shipped direct from our plant

Expertise and Responsiveness - a team of Technical Sales and engineering Staff available for expert consultation

Customized Solutions - standard and custom engineered solutions for any application

A Complete Program of Chemical Storage and Containment Solution



As a manufacturer and supplier of groundbreaking environmental technology, nature and environmental protection are not just words, but values we live by at DENIOS. For over 30 years we have been developing products that nature and people can rely on for the safe handling of hazardous materials and for safety in the workplace. We want to protect nature, so that it will be preserved for tomorrow. This is our mission. This is our passion. You can count on it.

GLOBAL REACH

The DENIOS Group has over 30 offices across North America, Europe, and Asia.

MADE IN THE USA BACKED BY GERMAN ENGINEERING

International collaboration for best in class product innovation.

DENIOS ENGINEERING PROVIDES YOU

A complete understanding of hazardous chemicals and chemical processes. Our Technical Sales and Engineering Staff know

specific chemicals and the risks they pose to facilities, personnel, and the environment. They will work with you every step of the way in designing a safe storage solution for your individual applications. Expertise in helping you meet applicable laws and regulations. DENIOS not only knows the regulations, we work directly with leading insurers, risk managers, and government authorities in developing new equipment or setting performance standards for existing designs and construction. We will work with you in meeting Federal standards as well as those of your local authorities, helping

make sure your DENIOS products are in complete compliance. When we put a DENIOS label on your product it's to let you know we stand behind what we design and manufacture, and that we're here for you well after the sale is completed.

ON-SITE CONSULTATION

Our experts will also be happy to meet you personally on site for consultations and needs analyses. We will identify your individual requirements, and profile together the appropriate products to meet your unique needs.

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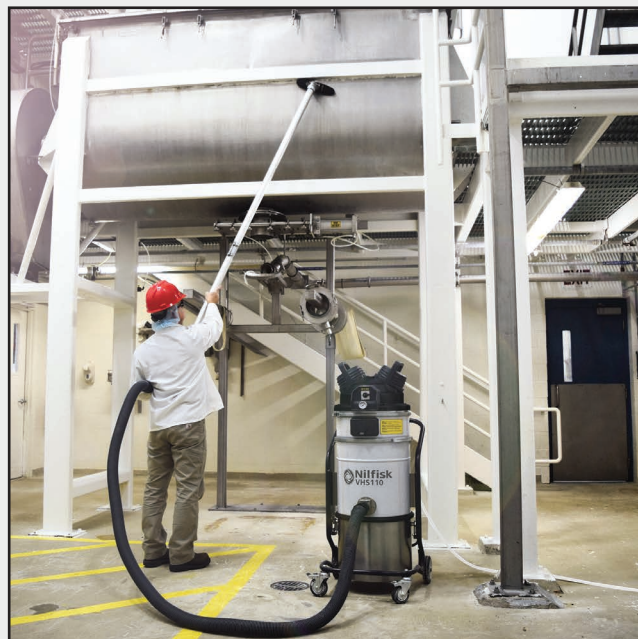
About Us

A leading global provider of professional cleaning products and services. We enable sustainable cleaning worldwide to improve quality of life

Recently, the COVID-19 pandemic fundamentally altered many aspects of our lives, making us more focused on cleanliness and hygiene than ever before. Cleanliness is now business-critical for all industries, and the process of cleaning is moving from backstage to center stage and may require many companies to completely rethink how they approach the concept of cleaning.

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

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



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

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.



Nilfisk
9435 Winnetka Ave N,
Brooklyn Park, MN 55445
800-989-2235
www.nilfisk.us

CLEAN IS CHANGING

Let's make your facility cleaner and safer together.



Cleanliness is now business-critical for all industries, and the process of cleaning is moving from backstage to frontstage.

Let's not just adapt to the new reality –
Let's make things better together



Nilfisk, Inc.
www.nilfisk.us
800-989-2235
askNilfisk@nilfisk.com



About Us

Working together for a safer, stronger future

For more than 100 years, the American Society of Safety Professionals has been at the forefront of helping occupational safety and health professionals protect people and property. The nonprofit society is based in the Chicago suburb of Park Ridge. Its global membership of 36,000 professionals covers all industries, developing safety and health management plans that prevent injuries, illnesses and deaths. ASSP advances its members and the safety profession through education, advocacy, standards and a professional community.



American Society of Safety Professionals

520 N. Northwest Highway,
Park Ridge, IL 60068
+1 847-699-2929
customerservice@assp.org
www.assp.org



Creating Safer Workplaces

For more than 100 years, ASSP has served as a global advocate for the occupational safety and health (OSH) profession by providing advocacy, education and standards development, and by promoting the expertise, leadership and commitment of its members. With more than 36,000 members worldwide, we create safer work environments by preventing workplace fatalities, injuries and illnesses.

Supporting the Careers of Safety Professionals

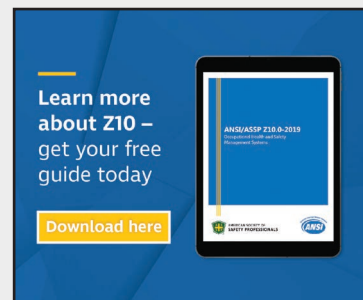
Our commitment to safety is what inspired us to create the ASSP Foundation, the charitable arm of ASSP that was chartered in 1990. The Foundation promotes occupational safety and health as a career choice and works to build a sustainable talent pipeline to make all industries safer worldwide. Its programs and services are solely supported by charitable donations from the ASSP community and corporations motivated to support the profession. The ASSP Foundation has invested more than \$5 million into the occupational safety

and health community to develop opportunities for career guidance, education and leadership development. The charitable effort is designed to attract new individuals to the profession as well as enhance the knowledge and skills of current safety students and professionals. Visit www.assp.org/foundation to find out how you can support the future of the OSH profession.

Safety Education You Can Trust

Sharing knowledge is at the heart of what we do. We deliver enriching learning opportunities in a range of formats from webinars, online courses and micro-learning to conferences, symposiums, certificate programs and certification exam preparation courses. ASSP is approved as an accredited provider by the International Association for Continued Education and Training (IACET) and is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET standard. We offer a robust education

calendar, full of online and in-person learning opportunities throughout the year. View our Education Calendar



Safety Standards Development

We engage in a collaborative, consensus-based process that brings together diverse viewpoints to develop and publish standards on many issues with the American National Standards Institute and the International Organization for Standardization. ASSP is secretariat of the Z10 Committee, which writes the current Z10 occupational health and safety management system standard and two implementation guides. We are also administrator of the technical advisory group (TAG) to ANSI for the ISO TC-283 Committee, the global group responsible for the ISO 45001 OHSMS standard. These roles reflect our position as a global champion of these systems and our advocacy for the importance of effective safety management overall.

Workplace safety is constantly evolving. So are we. Learn more at www.assp.org



PLAN FOR THE UNEXPECTED – KEEP WORKERS HEALTHY AND SAFE



Organizations that implement safety management systems go beyond compliance to identify and eliminate safety and health risks.

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- Understand the importance of worker health
- Earn CEUs as you learn from industry experts
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AMERICAN SOCIETY OF
SAFETY PROFESSIONALS

HafcoVac Air-Powered Industrial Vacuums

About Us

HafcoVac is a product line of Hafco Foundry. Hafco Foundry is located in Midland Park, New Jersey. Founded in 1969, Hafco Foundry manufactures and distributes a variety of vacuum cleaner units and accessories that are perfectly adapted to the heavy duty requirements of industrial and machining cleanup.

HafcoVac Air-Powered Industrial Vacuums are designed to be high-performance solution for use within environments where electricity is not available, too dangerous or prohibited for use. Our vacuums are multi-functional, maneuverable, easy-to-use and can be accessorized to meet the needs of any type of industrial cleaning necessary. HafcoVacs safely collect both wet and dry materials and are constructed with no moving parts that can create friction, arcs or sparks. They are also ATEX and NRTL certified for use in the cleanup of hazardous combustible dusts. Many industries have to comply with safety regulations involving combustible materials and the versatile HafcoVac is both a price and service leader for intrinsically safe, certified, air-powered industrial vacuum cleaners.

HafcoVacs are perfect for use in heavy-duty industrial cleaning for the purpose of recovery of wet and/or dry materials. Using the existing compressed air in your facility, our simple Venturi system can provide up to 5x the power generated by motor driven



systems. Since the Venturi has no moving parts it also maximizes operation and minimizes maintenance and all of our Vacuums carry our industry-leading Lifetime Warranty.

Highly portable, Air-Powered HafcoVacs can be used in a multitude of industrial work area spaces. For confined areas that require the removal of combustible and possibly hazardous dusts, our 30-gallon drum may be more effective and for larger spaces and amounts of material to be collected or recovered we offer a 55-gallon capacity drum. HafcoVac Air-Powered industrial vacuums always work wherever electricity is unavailable and within ATEX and NRTL guidelines.

HafcoVacs are engineered and manufactured for maximum efficiency. Using a minimum of air consumption they generate powerful suction 5x more powerful than a equivalent electric motor driven vacuum. HafcoVacs are an industry leading solution for reaching and keeping housekeeping standards within industrial locations. They are also very effective

for atmospheres producing dangerous fumes in their processes and facilities that have machines prone to issues related to the production of dust as a by product.

When coupled with our popular Overhead Cleaning Kit accessory, Air-Powered Hafcovacs prevent blow-down and distribution of harmful fumes and materials. Available in 4 different lengths the kit makes cleaning pipes, beams and overhead areas quickly, efficiently, and safely.



Certified, safe, strong, portable, easy-to-use, built to last, and backed by our Lifetime Warranty it is particularly suitable to use within a range of industries while also complying with the directives of ATEX and NRTL.

HAFCO Vacuums are ATEX certified and designed for use in Class I: Division 1, Groups A, B, C and D T6, Zone 1, and Class II: Division 1, Groups E, F, G, T6, and Class III: Division 1 Hazardous Locations as defined in the National Electric Code (NFPA 70). They can be used in a Division 2 hazardous location, providing it is in the same Class and Group.



HafcoVac

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Certified
Anti-Static
Hose

Static
Conductive
Air Hose

Essential
Overhead
Tool Kit

Grounded
Stainless Steel
Container

Stainless Steel Dolly

Floor Tool and Wand

SAME DAY SHIPPING

BENEFITS OF STAINLESS STEEL

CORROSION RESISTANCE
Resists corrosion to water, acids, alkaline solutions, and chlorine environments.

FIRE AND HEAT RESISTANCE
Retains strength at high temperatures.

EASY TO CLEAN
Easy to clean, perfect for strict hygiene areas including food.

IMPACT RESISTANT
A natural property of Stainless Steel is its inherent toughness.

LONG TERM VALUE
Summed up by its natural characteristics HafcoVac Stainless Explosion-Proof Vacuums are often a less expensive option when total cost is considered.

SUSTAINABLE
Stainless, being corrosion resistant, durable, and containing high-recycled content and recapture rates is one of the most sustainable material choices available.

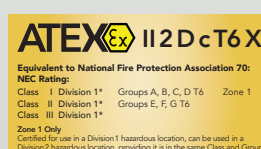
HAFCOVAC HEPA



HEPA FILTRATION
included with all units

**THE ESSENTIAL OVERHEAD
TOOL KIT**

**HAFCO VACUUMS HAVE THE MOST
POWERFUL VENTURI SYSTEMS
WITH LIFETIME WARRANTIES**



Safety Rail Company

About Us

Safety Rail Company makes OSHA-compliant fall protection safety railings and guard rail systems that are durable and innovative, but still affordable. With years of industry experience, our fall protection products are engineered first and foremost to save lives!



Safety Rail Company

4244 Shoreline Drive

Spring Park, MN 55384

888-434-2720

sales@safetyrailcompany.com

www.safetyrailcompany.com



Safety Rail Company, Spring Park, Minnesota is the premier manufacturer of fall protection railing systems for industrial/ commercial applications. We manufacture Mobile and Permanent Safety Rail, Skylight and Roof Hatch Guards, Safety Gates, Warning Line Systems, Ladders and more.

We offer high quality 100 % made in the USA fall protection solutions coupled with exceptional service and support. The core of Safety Rail Company's solution is found in products that engineer away the fall hazard. Products that are effective at preventing falls for everyone, not just trained personnel. Products that give piece of mind such as the SRC360 Mobile Safety Rail System. The SRC360 railing system is a free-standing, OSHA compliant,

passive fall-protection system designed to be used at or around leading-edge fall hazard areas to prevent workers from being exposed to fall hazards. In OSHA's hierarchy of controls, engineered solutions are the most favored course of preventative action over implementing some sort of administrative or personal protective equipment (PPE) protocol for controlling worker exposures in the workplace. Passive barrier systems such as the SRC360 Mobile Railing System, are designed to isolate the hazard, before the worker is exposed to it. The SRC360 railing system utilizes weighted cast iron base plates and railings to act as a physical barrier around workplace safety hazards. Once installed, workers have complete freedom of movement behind the barrier which not only increases productivity,

but it eliminates any concern for workers circumventing PPE or administrative controls. When installed permanently, the SRC360 Mobile railing system is always in place, always protecting everyone that enters the hazard zone. To find out more information, call the Safety Rail Company at (888) 434-2720 or visit our website at www.safetyrailcompany.com.



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TURN-KEY SAFETY RAIL SOLUTIONS

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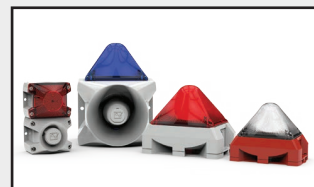
Why Pfannenberg is a leader in the Audible and Visual Signal Space

About Us

Pfannenberg, Inc. is a global manufacturer of Thermal Management, Liquid Cooling Solutions and Signaling Technologies.

For over 50 years Pfannenberg has developed technically superior signaling devices. Pfannenberg's core purpose is "Protecting people, machines, and the environment". As signaling safety experts we've always felt that safety begins with understanding the situation. You need to know the space being covered, standards or codes to be met, the type of event (Alarm - Imminent Danger, Warning - Impending Danger, Indicate - Process Notification)

and the detailed performance characteristics of visual and audible signaling devices needed to ensure the safety of personnel within the space. This Pfannenberg innovation is "3D-Coverage". With this, Pfannenberg is the first company to offer a reliable statement about spatial product performance. Both customers and system specifiers will greatly benefit from Pfannenberg's 3D-Coverage, which creates transparency for signaling product performance, resulting in more efficient solutions and planning security right from the beginning. Now, with both technically advanced products and an all-inclusive approach for establishing performance criteria, planners can easily



comp are signaling devices to ensure truly capable performance. With worldwide reach, Pfannenberg is well positioned to offer consultation, rapid product delivery, and after sale services to ensure the success of your next safety requirement. From ordinary to complex, our extensive legacy of successful signaling deployments has given us the experience to address your every need. Please contact us to find out how we can help you plan your next signaling project.



Pfannenberg, Inc.
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www.pfannenbergusa.com

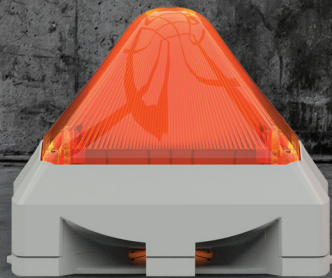


SAFETY BEGINS

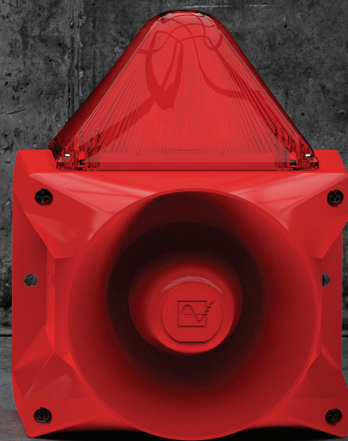
WITH UNDERSTANDING THE SITUATION



INDICATION



WARNING



ALARM

AUDIBLE ALARMS • VISUAL ALARMS • COMBINED SIGNALING • SIGNAL TOWERS / STACK LIGHTS

www.pfannenbergusa.com/signaling-technologies/



About Us

Glove Guard LP is committed to providing quality products that meet the basic needs of keeping up with required personal protective equipment.



Glove Guard LP
P.O. Box 946
Highlands, Tx 77562
888.660.6133
safety@gloveguard.com
www.gloveguard.com



Safety is important. In fact, it is a science. Yet, the main elements of safety are quite simple: preparedness and awareness. Glove Guard LP is committed to providing quality products that meet the basic need of keeping up with required personal protective equipment so that workers are prepared. Products like the Glove Guard® and Utility Guard® glove clips have a proven record of keeping gloves with the worker and, as a result, glove loss and hand injuries have been reduced because gloves are readily available.

We are aware that work environments and safety

standards are continually changing, and our strategy has been to listen to people as they've shared their needs for specific safety solutions. In response, we have developed, adapted, and manufactured unique products to meet those needs. As we proceed into the future, we aspire to continue to listen, innovate, and manufacture unique solutions that

Glove Guard LP

play a part in achieving safer work environments for all.

Glove Guard LP has a dedicated staff of personnel who genuinely care and are ready to assist both direct and indirect customers in all industries, yet we only sell through distribution. We manufacture products but aim to never lose sight of people.



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Ergonomics in Manufacturing & Beyond

By: **Ric Schlesinger**, Contributor

The field of ergonomics continually strives to create products that, in industrial settings, improve production line operations and increase productivity while at the same time reducing or eliminating operator strain. Ergonomics is quite simply fitting the job to the person, rather than vice versa. It brings together anatomy, physiology, engineering and other sciences to design solutions that addresses the physical aspects of a person's environment. In terms of a workplace, this may involve the layout of a workstation or the equipment needed for specific tasks. Particular attention is given to the prevention of musculoskeletal disorders (MSDs), which are injuries or disorders of the muscles, nerves, tendons, joints, cartilage and spinal discs. These can be caused by bending, climbing, crawling, reaching, twisting, overexertion or repetitive motion.

According to the U.S. Centers for Disease Control and Prevention, MSDs are work-related when¹:

1. The work environment and performance of work contribute significantly to the condition; and/or
2. The condition is made worse or persists longer due to work conditions.

Work-related MSDs are not rare; OSHA reports that they are among the most frequently reported causes of lost or restricted work time. In a typical year, MSD cases may account for a third of all worker injury and illness cases compiled by the Bureau of Labor Statistics (BLS).

PREVENTING INJURY

Fortunately, there are products that can help prevent MSDs. Lift tables are popular ergonomic devices that remove the need to bend, reach or turn past a comfortable, safe distance and angle. They are raised or lowered using a scissors mechanism. With yield capacities ranging from 1,000 lbs up to 40,000 lbs - dependent upon each specific application - lift tables can handle large, heavy loads, usually for short distances. Lift tables are widely used in many industries, including warehousing and distribution, transportation, manufacturing,

woodworking, printing, and heavy machinery and transportation. In addition to being used to handle pallets and other sizeable items and loading vehicles, lift tables can position work at a height that is ergonomically suitable for operators.

The lift table's functionality and versatility make it one of the most popular ergonomic products used throughout industry. This piece of machinery helps in many ways. Positioning the item being worked on at a comfortable level and ergonomic height not only increases productivity, making the operator's movements more efficient, it also reduces the opportunity for injury and wear and tear on workers. By elevating the work to a comfortable, safer operational height, downtime is reduced or eliminated. This enhanced feature reduces repetitive motion injuries, which in turn can lessen a company's overall workman's compensation costs.



Image courtesy of Econo Lift

The application photo that accompanies this article demonstrates the use of ergonomic technology at a medical diagnostic company. Econo Lift worked closely with the company to discover needs and provide customized solutions to enhance the production line, in a specific assembly area. In the photo, you'll see Lift and Rotate Tables, custom set to different heights dependent on the stage of production and the operator's height. As their

¹ <https://tinyurl.com/urr5rpfm>

name indicates, these units not only lift but also rotate, so that excessive reaching is not required. This improves the work accessibility to a correct ergonomic height, dramatically improving the efficiency of each operator. The ability to rotate the table further reduces any reaching or twisting while working on the product; thereby efficiency is increased.

Another interesting addition to this design is that the customer desired automating the production line. By adding a powered conveyor attachment that grabs the Lift and Rotate unit, each individual portable workstation can be propelled down the assembly line to its next station automatically. This eliminates the employees' need to manually propel the cart and removes injury due to push force. Time studies have calculated in this particular application that operator productivity increased production substantially, which in turn reduced costs and increased profits for the company.

While lift tables such as the kind used by the medical diagnostic company are in high demand, other ergonomically designed products are also being used in the automotive, pharmaceutical, food, warehousing, retail and other

industries to help safeguard workers from suffering MSDs. Dumpers and upenders can safely and quickly unload bulk bins, drums or palletizing, preventing back strain. Ergonomic tilters also eliminate back strain, by tilting containers and parts toward the operator. Ergonomic stackers allow users to maneuver, lift and stack things safely. They allow full flexibility to easily adjust to any comfortable work height. Econo Lift also manufactures innovative air bag tilts and lifts that use compressed air – not people – to provide the lifting force. No electrical power is needed to operate them.

Using devices designed for ergonomic safety not only prevents injuries, potentially lowers workers compensation costs and boosts productivity – it also makes a difference in employee morale and employee retention. **WMHS**

Ric Schlesinger, in partnership with his late father, Otto Schlesinger, founded Econo Lift Limited in 1985, after identifying a need in the market for ergonomic equipment. Econo Lift Limited is on the leading edge of industry, implementing the highest level of technology in the production process and providing solutions to requests and potential health and safety, ergonomic challenges (www.econolift.net).



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SDS Availability Must Be 24/7

By: **Maureen Paraventi**

It's not enough to have a safety data sheet (SDS) for each hazardous chemical in your workplace - one that describes the physical, health and environmental health hazards of the substance, and provides information about how it should be safely handled and stored. Employers must make sure that employees are able to access the SDSs they need, around the clock, during any shift.

That was one of the points emphasized by Phil Molé, during a presentation entitled, *Avoiding Incompatible Chemicals: HazCom Tips for COVID-19 and Beyond*, during VPPPA's 2021 Next Level Safety event in April 2021. Molé, who is Environmental Health & Safety (EHS) and Sustainability Expert at Velocity EHS, brings 25 years of EHS experience to the subject.

Most chemical manufacturers, distributors and importers understand the importance of having SDSs, which are required under OSHA's 2012 revision of the Hazard Communication Standard (HazCom) (29 CFR 1910.1200(g)). Formerly known as MSDSs or Material Safety Data Sheets, SDS have much of the same information as MSDSs, but in a 16-section format OSHA describes as more "user-friendly." Keeping SDSs available to all relevant employees can be problematic in the best of times, but Molé said the pandemic has made it even more challenging at some facilities, particularly those who were using physical, on-site SDS information stations or have workforces that are geographically separated. In response to the pandemic, some companies closed or restricted access to certain areas, or moved workstations in order to increase the distance between employees.

"We may have people who are not in the usual locations they work in," Molé said. "If we don't have ways that people can access SDSs from anywhere, then we're not meeting our obligations under the standard. Remember: there can't be any barriers to access."

Even if SDSs are in digital, rather than physical form, getting to a computer may prove difficult. "If they're in a supervisor's office and that door is locked when he or she goes on a lunch break, then we're not meeting our obligations because that barrier is keeping employees from accessing that information."

He noted that companies must be able to print hard copies of the SDSs upon request. If the SDSs are online, there



OSHA's HazCom standard requires employers to make sure that employees have access to the SDSs they need at all times.

must be a backup system in place, in case of an emergency. A cloud-based SDS system is fine – as long as employees know how to do it. Companies should not advise employees to "Google it" when looking for chemical hazard information. Molé said a 2015 OSHA interpretation letter sent in response to a query from a company made it clear that an online search was not acceptable under the regulation. "There is no guarantee – and very little chance – that they're going to find the documents for your chemicals that are in your locations," he said.

HAZCOM RESPONSIBILITIES

In addition to discussing SDSs and Right-to-Know access, Molé outlined other HazCom responsibilities of employers who are the end-users of chemicals. They include:

- Having a written, site-specific HazCom plan for their chemicals, their hazards and their methods of providing access to safety data sheets to their employees.
- Compiling a chemical inventory list.
- Implementing a management method for labels, including both shipping labels and secondary container labels.
- Training employees about the general requirements under the HazCom standard, as well as all of the specific aspects of HazCom management at the facility.

As for the last item, Molé said it's a good idea to make sure that every employee can recognize the HazCom pictograms that OSHA requires on labels for hazardous materials. The skull and crossbones pictogram, for instance, indicates acute toxicity (fatal or toxic), while an exclamation mark warns of a whole range of dangers, from skin, eye and respiratory tract irritation to an environmental effect: hazardous to the ozone layer.

To illustrate the importance of compliance with the HazCom standard, Molé told a story from when he was a graduate student and had to go to a hospital and listen to

cases of people coming in to talk about their previous work experiences and how those affected subsequent conditions and health problems.

Of the many people he met while doing that, “there was one gentleman whose story I never forgot. His job, for 35 years, was to take greasy parts and dip them in a tank that was filled with solvent. He did this by hand, and he did this repeatedly, every day for 35 years. Because there was no HazCom standard for most of the time he had this job, he did not even know the identity of the chemical he was working with, so he definitely didn’t know the right precautions, like what type of ventilation was adequate, what types of personal protective equipment he needed or how he should be storing and using this chemical on a day-to-day basis.”

The solvent contained a chemical that – in the case of long-term exposure to it - caused brain damage, including short-term memory loss.

“It became evident during this interview that while he could remember all of these details from the past, he couldn’t remember how he got to the interview that day,” said Molé. The man’s wife, who was with him, was evidently his caretaker as well. He was unable to live independently because of the chemical exposures that he’d had.



Companies must have a method for managing both shipping labels and secondary container labels

“That’s really the reason why all of these regulations and requirements exist. It’s not just a bookkeeping exercise we have to do,” said Molé. “It’s not just a matter of compliance. These things are important because employees need them to be able to get home safe at the end of every day.” **WMHS**

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Chemical Safety and Storage

By: **Jane Marsh**, Contributor

Chemicals, both caustic and benign, play essential roles in nearly every industry. Their use is unavoidable. However, while dangerous, they don't have to present a hazard for employees in the workplace.

How can managers and business owners improve chemical safety and storage protocols in their own workspaces with the goal of keeping employees safe?

PROVIDE PPE

Personal protective equipment, or PPE, is easily one of the most important parts of chemical safety in the workplace. The required PPE will vary depending on the type of chemicals in the workplace, and while the below list is not an exhaustive list, they may include:

- Eye protection
- Gloves, including chemical-resistant options
- Skin coverage
- Closed-toed shoes
- Respiratory protection
- Aprons
- Splash shields
- Earplugs



PPE is easily one of the most important parts of chemical safety in the workplace.

It is also important to provide various size options for men and women, as PPE sized and designed for men won't provide adequate protection for women due to differences in bone structure, body size and shape.¹

1 <https://rcni.com/nursing-standard/opinion/comment/ppe-one-size-fits-all-design-a-fallacy-thats-putting-female-health-staff-risk-160536>

2 <https://environment.co/green-healthcare-for-medical-manufacturing/>

3 <https://www.bu.edu/ehs/ehs-topics/chemical/safe-handling-and-storage-of-chemicals/>

4 <https://blog.epa.gov/2014/03/20/keep-pesticides-and-other-chemicals-in-their-original-containers-to-prevent-poisonings/>

5 <https://blog.aquaphoenixsci.com/the-nexus-between-mechanical-filtration-and-chemical-treatment-in-cooling-water-applications>

GO GREEN

As we collectively work toward creating more sustainable industries, the focus is beginning to shift toward chemical waste and the impact it has on the environment.

With public safety in mind, the medical industry is one of the biggest offenders, generating massive amounts of physical and chemical waste after every procedure. For example, a single hysterectomy in the U.S. produces more than 20 pounds of waste, most of which is single-use instruments and plastics that can't be sterilized and reused.²

Chemical waste is even more challenging. A plastic drape may sit in the landfill for hundreds of years before it breaks down into microplastics. Chemicals can leach into the surrounding ecosystems, contaminating soil and water supplies for years or decades to come.

Chemical disposal will vary depending on the type of waste but paying close attention to proper disposal procedures can help reduce a company's impact on the planet while keeping employees safe.

STORE SUPPLIES SAFELY

Short- and long-term storage for various dangerous chemicals is part of most standard operating procedures. Keeping employees safe means storing each type of chemical correctly.³

Here are some critical safety precautions to keep in mind:

- Keep all chemicals in their original containers whenever possible.⁴ When it isn't, any new containers should be clearly labeled with all necessary information.
- Limit chemical storage to the substances actively used in the facility. Keeping acid around when you have no actual application for it is a recipe for trouble.
- Follow all chemical storage guidelines as outlined in each product's Material Safety Data Sheet (MSDS).
- Any chemicals that might emit fumes should be stored in a well-ventilated area.
- Materials that are prone to biofilm buildup, such as those that contain microparticles between 0.45 and 5.0 microns in size, need to be carefully monitored, especially if they're used in a filtered system.⁵

- Flammable liquids need their own cabinet to prevent a chemical fire. Keep at least one Class-D fire extinguisher or another rated for chemical fires on hand in your storage area.
- Keep acids and bases separate if your facility requires both. If you have acids on hand, keep at least one strong base in your facility for neutralizing spills.
- Anyone who uses chemicals in the workplace needs comprehensive and continued training to optimize safety.

Each chemical you use in your facility should have a storage and disposal plan outlined before you ever open the first container. Again, this is by no means a comprehensive list. Each material in your facility will have its own requirements, and it's important to accommodate them to store each chemical safely.

LOOKING FORWARD

Chemical use and storage are common parts of nearly every industry — so common, in fact, that these tasks are easy to take for granted. Take the time to reinforce chemical storage and use training frequently to ensure it's fresh in everyone's mind. All it takes is one mistake to result in a serious injury.



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Follow all chemical storage guidelines as outlined in each product's Material Safety Data Sheet (MSDS).

When stored and used correctly, these materials are a vital part of research, engineering and manufacturing. Don't overlook their hazards. **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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Guidelines for a Legally Acceptable CAOHC Industrial Hearing Conservation Program

By: **Robert M. Traynor, Ed.D., MBA, FNAP**
and **Garry G. Gordon, MS**, Contributors

The Council for Accreditation in Occupational Hearing conservation (CAOHC) is a non-membership organization created in 1973 to collaborate with nine professional organizations that have a common interest in all aspects of occupationally related noise-induced hearing loss (NIHL). Through the mission to advance best practices in occupational hearing conservation worldwide through credentialing, education and advocacy, the organization has had a significant impact in the reduction of occupational hearing loss, which has decreased by 59 % since 2004.¹

WHO NEEDS THESE PROGRAMS?

Hearing damage is a serious occupational hazard in professions that expose workers to loud impulses or continuous noise. More than thirty million employees work in hazardous noise levels and are found nationwide in all segments of industry. Of course, most occupational hearing loss occurs gradually, over the course of years, making the impairment difficult to perceive until it is too late. However, with appropriate hearing conservation measures, workplace hearing loss is *completely preventable*. Providing noise analysis, noise control, audiometric monitoring and hearing protection makes a huge difference for workers involved in noisy occupations. Often totally overlooked, recreational noise may have a significant impact on the amount of hearing loss seen in industrial programs. Whatever the cause, NIHL is irreversible and creates multiple issues over time, such as high frequency hearing loss, ringing in the ears (tinnitus), difficulty understanding others (especially in noisy situations), as well as social withdrawal and communicative frustration that often leads to major effects on family life.

GENERAL INDUSTRIAL HEARING CONSERVATION

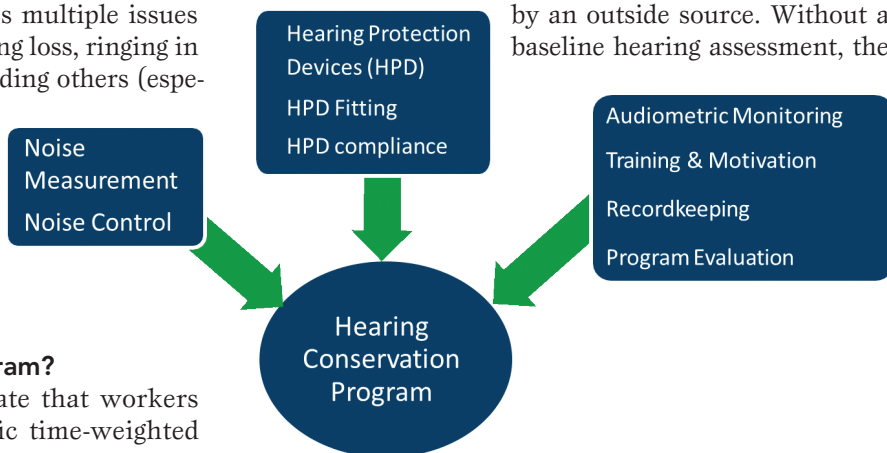
Who should be Enrolled in the Program?

OSHA and the other agencies mandate that workers exposed to noise levels over a specific time-weighted

average (TWA) throughout their shift should be enrolled in a hearing conservation program. TWA² is the combination of all the sound intensities that the worker is exposed throughout the work shift. These exposures are limited to 85 dB (A) over an 8-hour shift. Exposures at or above that level require the implementation of a hearing conservation program. When the worker reaches a Permissible Exposure Level (PEL) of 90 dB (A) they are required to use hearing protection devices. The specifics of these programs are outlined by OSHA, Mine Safety and Health Administration (MSHA) and Federal Railroad Administration (FRA) regulations. Best practices are offered by the National Institute for Occupational Safety and Health (NIOSH).

Elements of a Hearing Conservation Program

To be effective, a hearing conservation program must have the company's management team on board. Secondly, efforts must be made to enlist worker support for the program. (It's a good idea to have worker representation in the planning stage.) A third, often overlooked, element is a baseline hearing test for new worker, as well as annual assessments for workers exposed to a TWA of 85 dB (A) OSHA Presumptive Rule (OSHA, CFR 1904.5)³ states that it is presumed all injuries and illnesses result from events or exposures occurring in the work environment and the company must prove that the injury or illness is caused by an outside source. Without a baseline hearing assessment, the

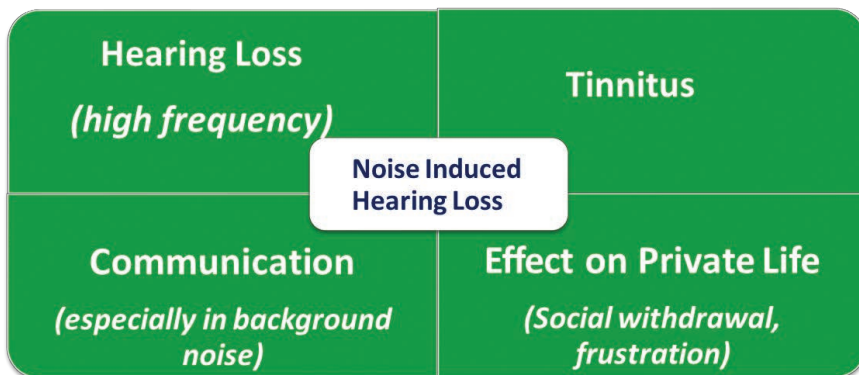


¹ U.S. Bureau of Labor Statistics

² Moriz, C. (2014). Noise Control and Measurement. In Hutchinson, T., & Shultz (Eds), *Hearing*

³ <https://tinyurl.com/57jtr2un>

company assumes *all responsibility for any hearing loss* the worker possesses at the beginning of their employment unless they can prove that the impairment existed prior to employment. Without annual assessments, the company assumes all responsibility for any hearing loss after the first baseline assessment. With no hearing conservation program, the company is liable for **any** hearing loss incurred by the worker prior to initial employment and subsequently during the life of his or her employment.



The major components of the program include the following:

1. **Noise Measurement.** The noise's locations, types and intensity must be assessed, along with sources, such as specific machines or operations.
2. **Noise Control.** Noise is controlled by altering the source, the path or the receiver. Reducing noise at the source involves engineering controls. Reducing the path of the noise involves administrative controls by rotating workers through different tasks to limit their exposure to the noise. Finally, if engineering and administrative controls are unsuccessful, then noise at the receiver must be reduced through the use of hearing protection devices (HPDs).
3. **Hearing Protection.** HPDs must be chosen to provide the correct amount of hearing protection without interfering with essential communication. HPDs must fit properly and be used correctly – so workers should receive instructions on its use.
4. **Audiometric Monitoring.** This allows for the assessment of the workers to determine if they have suffered hearing loss from their work environment.
5. **Worker Training and Motivation.** Workers must be trained about NIHL, audiometric monitoring and the use of hearing protection devices.

6. Recordkeeping. The occupational hearing conservationist, under the director of the supervisor, maintains the records of the hearing conservation program and makes them available for inspection upon request by inspectors from OSHA, MSHA and FRA.

7. Program Evaluation. The program should be regularly evaluated in each of the seven areas to determine efficiency and validity.

Hearing conservation programs do a great job of reducing NIHL. CAOHC offers Occupational Hearing Conservationist (OHC) training by Certified Course Directors in the daily operations of hearing conservation programs. These courses are available from <https://roberttraynor.com> and others. **WMHS**

Click here for an in-depth version of this article: <https://tinyurl.com/5a6ne7ex>

Robert M. Traynor, Ed.D., MBA, FNAP practiced audiology and interoperative monitoring for 46 years, has lectured on audiology topics in more than 40 countries and was a Senior International Audiology Consultant to a major hearing aid manufacturer. He is currently an Adjunct Professor of Audiology at the University of Arkansas for Medical Sciences and Salus University and is a Fellow of the National Academies of Practice. His text, *Strategic Practice Management*, 3rd Edition, co-authored with Dr. Robert Glaser, is used in most audiology training programs. Through Robert Traynor Audiology, LLC, (<https://roberttraynor.com>) he consults, does forensic audiology, and is CAOHC Course Director and Professional Supervisor in Fort Collins, Colorado.

Garry Gordon, MS. is the CEO/Owner and Audiologist/Instructor at EAR Inc in Boulder, Colorado. 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. Gordon has also written about hearing loss for publications and presentation, including *Outdoor Life*, *Field and Stream*, *Trap and Field*, *Sporting Clays*, *ENT/Audiology Japan* and the *International Symposium of Sports Medicine* held in Moscow, Russia (<https://earinc.com>).



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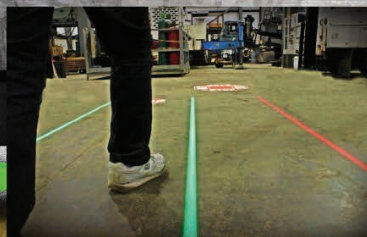
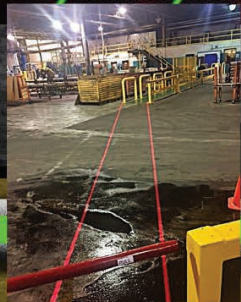
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