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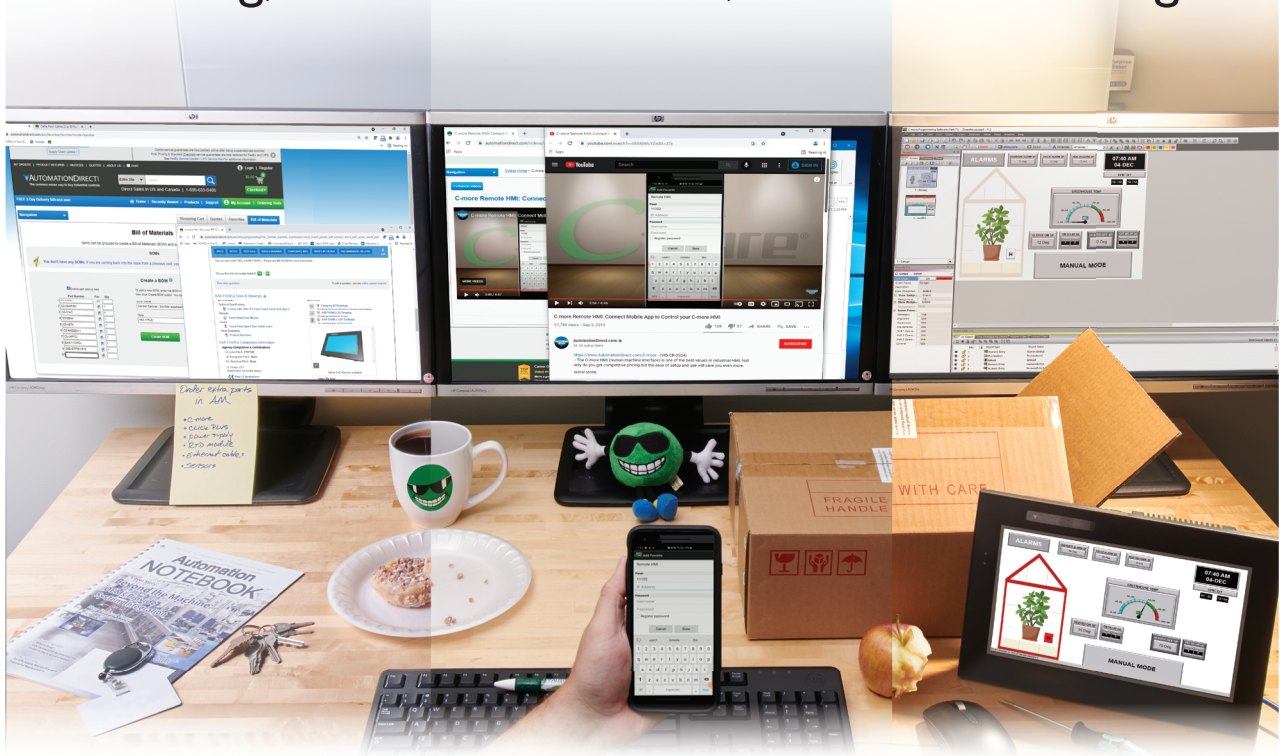
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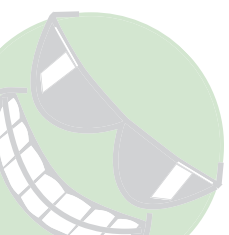
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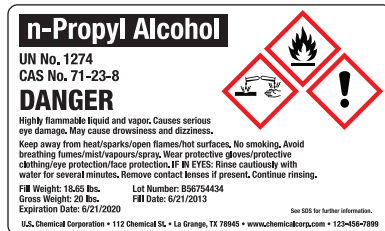
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Part of my job involves gathering articles that will appear in *Workplace Material Handling & Safety* (WMHS) magazine. It's an interesting and sometimes challenging process, because I'm asking busy subject matter experts to take time out of their workday and write a thought leadership piece for us. The goal: to deliver high-quality, specialized and timely information to our readers, in order to help them do their jobs better, make their operations more efficient and safeguard their employees from injury or illness. But what's in it for the companies or individuals who are on the receiving end of my queries?

It's a valid question. By contributing educational articles to WMHS, companies gain exposure among the various industries and decision-makers who are their potential customers. They establish themselves as credible sources of information. An article also gives a contributor the opportunity to educate would-be product users in a way that a visit to a website might not – unless you know all of the right links to click. The articles we run in WMHS are relatively short, because we are aware that our readers need information delivered quickly and concisely. The subjects the thought leadership pieces address may be evergreen or breaking news. Breaking news (i.e., a regulatory change or new rugged tablet feature) always stirs interest, but evergreen topics like ladder safety are widely read as well, because they remind us about lessons that must be conveyed to new employees and refreshed with existing ones.

With our hybrid editorial focus on both material handling and workplace safety, WMHS covers a tremendous range of topics, including: AGVs, hand protection, ASRS, heat stress, conveyors and sortation, eye protection, palletizing, balers and compactors, racks and shelving, robotics, AEDs, carts and casters, signage, protective guarding, order picking and fulfillment, eye-washes and emergency showers, lift trucks, mobile robots, bins and baskets, machine guarding, LOTO, hearing protection, safety gates, fall protection and regulatory compliance.

I really enjoy working with contributors. Some – as indicated – work for companies that manufacture or distribute the kinds of products and services widely used in the industries we serve. Others are individuals with experience or specialized knowledge they are happy to impart. Among this group: Edward Stern, who worked for OSHA for 27 years, helping to develop and explain agency regulations. He wrote “The Amazing Hazard Awareness Advisor,” which begins on p. 32.

If you are interested in contributing a feature article to WMHS – one which will appear in our print and digital editions as well as an easily “shared” stand-alone on our website – feel free to contact me. I'm open to topic ideas, because I know the experts I'm dealing with are attuned to issues and developments in their respective fields. I can also help fine tune a topic, so that it's a good fit for WMHS readers.

I learn something new from each and every article I receive from a contributor. If you've already written for us, thanks for helping us communicate important information to subscribers. If you're considering writing for us and have questions, get in touch. I'm happy to answer them.

## Maureen Paraventi

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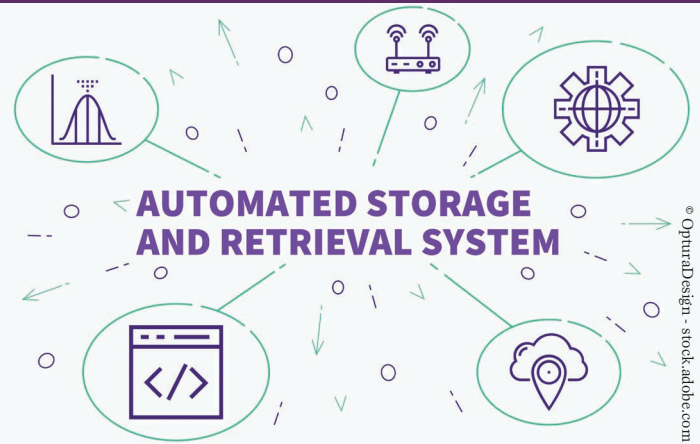
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# ASRS Terms from A to...W

Here's a handy guide to terms associated with a technology that is being adapted by more and more industries involved in the supply chain – especially those heavily impacted by the rapid increase in e-commerce.



## A

**Automated storage and retrieval systems (ASRS)** are computer-controlled systems that store and retrieve items, as needed. They generally consist of the storage and retrieval equipment, a storage rack, an input/out system and a computer system to manage the operations. ASRS are especially useful where storage density is a priority and where the loads being moved into and out of storage are high volume. The picking done by ASRS can be shelf-, bin- or robot-based.

## B

**Bins:** A heavy-duty plastic storage solution for warehouses and distribution centers. Types include stackable, vented and double-sided.

## C

**Carts:** Used to deliver items to locations within a facility, carts are available in many different types, such as a mother-daughter cart systems, quad steers, static, rotation, transfer and kitting.

**Case Picking:** When products are picked in full cases or cartons from prom pallet locations and other storage media.

**Cube:** This is the amount of space taken up by an item in an ASRS, measured in cubic feet. Cube utilization refers to the percentage of total available space in the distribution center or warehouse that is actually being used. One hundred percent cube utilization means that every bit of space in the facility is filled with product.

## E

**Ergonomics:** In ASRS, ergonomics refers to establishing certain operations at a work height that prevents employees from having to bend, stoop, stretch or twist to reach items. The ergonomic “golden zone” for avoiding musculoskeletal injuries (MSDs) is considered to be the area between the shoulders and waist.

## F

**Fixed Aisle:** In fixed-aisle ASRS, a stacker crane moves vertically and horizontally through narrow aisles to retrieve products on pallet racks. Stacker cranes may be suspended from the ceiling or supported on a track and guided by rails or channels.

**Floor Robots:** These autonomous mobile robots retrieve inventory from portable storage shelving and transport it to an operator.

## G

**Goods to Person:** This method of order fulfillment involves transporting items via ASRS directly to an operator, instead of having the operator walk to retrieve the goods. It saves time that would have been spent walking and searching for goods.

## H

**Horizontal Carousels:** Each of these consists of a set of wire bins with adjustable shelves that rotate around an oval track to deliver products to an operator. The carousel rotates bins using the shortest path, based on information inputted by the operator. The use of horizontal carousels can result in faster pick rates, improved throughput and a better use of floor space.

## I

**Intralogistics:** The management of information and material goods within a distribution center or manufacturing facility through automation, integration and optimization.

**Inventory Management Software:** This works with the ASRS to functions, such as inventory tracking and the management of orders, sales and deliveries.



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## M

**Mini Load ASRS:** This type of system is typically used for the storage and management for picking and order fulfillment of small parts. Benefits include less use of floor space.

**Mobile Shelving:** As its name suggests, mobile shelving can be easily moved because it is mounted on wheeled traction systems. When not in use, mobile shelves save space because they can be packed closely together until they're needed.

**Modular Drawer Cabinet:** This is a space-saving storage solution that is ideal that is generally better suited to small parts and products than traditional shelving and pallets of bins. Cabinets come in various heights and widths and drawers can be partitioned in order to optimize space utilization. Benefits include an accelerated workflow.

## P

**Pick to Light:** Operators are guided to product locations by lighting technology, using a bar code or some other identifier. Pick to light reduces the operator's walk time and avoids the need to read paper pick lists.

**Paternoster:** Another term for vertical carousel.

## R

**Robotic Shuttles:** Boxy, upright robots retrieve stored items at high speeds while moving from level to level. Independent shuttle robots can move up to 700 lines per hour of totes, cases or trays weighing from 35 to 65 pounds.

## S

**Slotting:** Inventory data is slotted into an ASRS, analyzed and used to reorganize a facility or make adjustments (like moving high-volume SKU products closer to lifts in an ASRS aisle) that maximize efficiency and space utilization and reduce inventory handling.

**Stacker Cranes:** These cranes store and retrieve loads with the help of guide rails or channels that send them to the correct location, as directed by a Warehouse Management System (WMS).

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## V

**Vertical Carousel:** This consists of carriers attached to a chain drive that are sent in a vertical loop around a track, similar to the motion of a Ferris Wheel. A vertical carousel is designed to carry items that are similar in size and weight and can deliver them to an ergonomically positioned work counter.

**Vertical Lift Module (VLM):** This is an enclosed dynamic storage system that uses a centrally located extractor to automatically locate and retrieve trays from its two columns and deliver them to the operator at an ergonomically optimized height. VLMs have an impressive pick accuracy and require less labor.

**Vertical Buffer Module:** This tote handling system features an enclosed shelving system with a center aisle mast that picks up totes and delivers them to a picking station or some other location via a connected conveyor.



Pallets being moved in a warehouse.

## W

**Warehouse Management System (WMS):** Software that supports a range of warehouse and distribution center operations, including staffing, inventory acceptance, storage, picking, packing and shipping. **WMHS**

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# The SHOCKING Truth About ESD Bins

By: **Maureen Paraventi**

You're the manager of a warehouse, distribution center, factory or other type of industrial facility and you need to purchase bins. There are so many materials from which to choose, including plastic, steel, wire mesh and fiberglass. You need to consider cost, of course, along with what material is best for the size and shape of the items that will be stored in it. Weight may also be a factor. What should also be on your decision-making radar: whether or not the bins you're buying will hold electronic devices or components.

Static electricity can make itself known when you walk across a carpet and touch a metal doorknob, or when you take off the hat you've been wearing and your hair rises up unexpectedly and appears to stand on end. In the first case, the electrons your feet collect from the carpet transfer from you to the doorknob and give you a shock. In the second, electrons from your hair have moved onto your hat, leaving your hair with an electron imbalance. All of the hairs on your head have the same charge, which makes them try to create distance from one another.



Static electricity can create an electron imbalance which causes individual hairs to try and separate from each other.

The examples above are of temporary inconveniences with no long-lasting consequences. Static electricity may be unpleasant when we encounter it, but it can't seriously harm people. The same cannot be said for semiconductor devices, despite an effort to include electrostatic discharge (ESD) protection circuitry in integrated circuit designs. When it comes to the storage, assembly and shipping of electronic devices and components, a static electricity event can permanently damage circuitry; attract contaminants

<sup>1</sup> [www.aecouncil.com/Papers/aec1.pdf](http://www.aecouncil.com/Papers/aec1.pdf)



in clean environments; cause a metal meltdown or oxide failure; make products stick together and even ignite flammable mixtures that may be nearby. The device may no longer function, or function partially. Damage to electronics and microelectronics caused by ESD can be costly, especially when you factor in the labor, repair, shipping, overhead and loss of labor time. Electrical energy can be transferred from a person to a semiconductor device during normal handling or assembly operations. How much energy? One study found that a human body can generate static charge levels as high as 15,000 volts by simply walking across a carpeted floor and 5,000 volts by walking across a linoleum floor.<sup>1</sup>

What – and who – causes ESD? Both people and objects generate it. As noted in the hair-raising example above, a discharge of static electricity occurs when there is an imbalance – in an object – between negative and positive charges. Because of the imbalance, the charges seek a way to be discharged. A common ESD event called tribocharging occurs when two materials are brought into contact with each other and then separated.

## REDUCING THE LIKELIHOOD OF ESD DAMAGE

Using bins made of made of electrostatic dissipative materials will help prevent ESD damage to electronics when they're being stored and transferred and can help shield them when they're in uncontrolled environments. A number of manufacturers offer these types of bins, many of which are made of carbon-filled or carbon-based polypropylene – one of the most commonly produced plastics in the world. ESD-safe bins are available in many forms:

**Stacking and hanging bins** with features like an open hopper front to provide easy access when bins are stacked, wheels (in some models) and dividers that help keep the contents organized. Some stackable storage bins can do double duty as hanging bins, and can nest inside each other to save space when not in use.

**Non-stacking (shelf bins)** maximize space usage and are more economical than stacking bins because they don't have to be sturdy enough to bear the weight of other bins. They come in many size and shape options and some are tiltable, to make it easier to access the contents.

### NEED MORE INFORMATION ABOUT ESD PREVENTION?

A great deal of information can be found on the website of the ESD Association<sup>2</sup>, a professional voluntary organization dedicated to advancing the understanding of ESD avoidance and the understanding of electrical overstress (EOS), which is the exposure of a component or PCB board to a current or voltage beyond its maximum ratings. The Association offers facility certification programs to ANSI/ESD S20 and works to set global standards for static control. On its website, you can find a Buyer's Guide that allows you to search by product type, company or geographic location for ESD control products or services. Additionally, it offers a number of educational courses, including an Operator Training course that gives enrollees information about how to implement an ESD Control program helps the understand their role in protecting the electrostatic discharge-sensitive items for which they are responsible. **WMHS**

<sup>2</sup> <https://www.esda.org/>

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## Caster Selection: Not as Simple as You Think

By: **Dave Lippert**, Contributor

Casters seem pretty simple. If the total load is known, simply divide by four (or the number of casters to be used) and select one with sufficient rated capacity, right? Well, maybe not.

Let's start with capacity. Frequently, one may see a loaded cart with one wheel not touching the floor. This can be the result of uneven floors or a cart that is out of alignment. Also, particularly common outdoors is uneven pavement, including concrete or asphalt. As loaded carts roll across these pavements, the load on each caster can shift considerably. This happens even though it may not be visible. That load can greatly exceed the rated capacity.

Then there is shock loading. This happens when a load is dropped onto a cart but is more likely to occur when a rolling cart encounters an object on the floor (such as stray hardware) and the wheel tries to go up and over the obstacle. This encounter can easily create a load up to three times the static load on the caster, which means it can skyrocket past the rated load capacity.

Incidentally, when a wheel encounters an obstacle on the floor, it can roll up and over, push the obstacle to the side, or "catch" on the object. In this last situation, the wheel suddenly stops turning and begins skidding or dragging. For treaded wheels, such as polyurethane, this can quickly lead to a flat spot. This can become the cause of that very annoying "thump, thump, thump" we hear (and feel) with every wheel rotation.



Green Machine – built by Hamilton Caster – is an 8' wide, 20' long trailer that can support 30 tons of industrial recycling machinery. *Image courtesy of Hamilton Caster.*



A swivel caster on aluminum wheel with 1/2" sealed precision ball bearing *Image courtesy of Hamilton Caster.*

### SIX TAKEAWAYS TO HELP YOU SELECT THE RIGHT CASTER

The lesson from all of this is that selecting the proper caster is not a simple process. Getting casters that will serve well and for a long time requires some planning. **Lesson number one** is to overstate the capacity. In the industry, we suggest assuming three casters will carry the load of four.

When carts will roll across uneven surfaces and the load capacity is critical, the use of spring-loaded casters can help to spread the load evenly. Think of an automobile on an uneven surface, and how the four wheels stay in contact with the pavement even as the surface changes. The suspension serves to keep all the wheels on the pavement, and to spread the load across all the wheels. Spring-loaded casters help in a similar way.

**Lesson number two** is planning the casters' overall height. In some cases, this is not important. But in many cases, it is crucial. For example, are there low doorways that must be cleared? Determine the tallest item(s) to be carried and add the height of the cart or dolly. If the required capacity results in casters that will make the load too high, consider multi-wheeled casters. Typically, these have two wheels (most standard casters have one wheel), and the load capacity can exceed that of taller single-wheeled casters.

Another reason to opt for multi-wheeled casters is to keep the center of gravity of a load lower – and safer. Taller loads can be unsteady, posing a safety hazard. (Imagine what happens when a tall load on wheels encounters debris or hardware on the floor.) One way to lower the center of gravity is to keep the dolly or cart height to a minimum.



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**Lesson number three** is protecting the factory floor. Steel and metal wheels carry heavy industrial loads, and also roll relatively easily. Yet they can do damage to concrete floors, resulting in expensive repairs or premature replacement. Wheels with polyurethane treads can have high load ratings and also protect the floor. Have a maximum load pressure limit on your floor? Caster manufacturers can determine which treaded wheels can spread the load sufficiently to protect the floor. "Contact pressure" curves can be determined in a lab, resulting in data to help select appropriate floor-preserving wheels.

**Lesson number four** is floor surfaces. Many industrial environments have multiple floor types encountered during load transport, including smooth, level indoor concrete floors, outdoor pavement of either concrete or asphalt, and even gravel. Selecting the optimum wheel type is key to success. Besides load capacity, know that softer tread wheels such as pneumatics or solid rubber can traverse



A spring loaded shock absorbing caster. Image courtesy of Hamilton Caster.

even gravel, while the more traditional industrial wheels are normally too narrow and too small for that. Consult the manufacturer for good advice.

**Lesson number five:** environment. Is there an oven (excessive heat) in play? Outdoor applications include sunlight (can accelerate the demise of some polyurethanes), rain, sand, and dirt. Chemicals in plants, even cleaning solutions, must be considered when selecting casters and wheels. As before, consult the manufacturer to assist.

**Lesson number six** is power requirement. Even when heavy loads will be moved by a tugger or other powered device, wheel type plays a significant role in the power required to begin and sustain movement. How much horsepower and torque should the tow vehicle have? Optimum wheel selection can make the difference between success and failure (for the tow vehicle) or enable the purchase of a less expensive tugger.

Still think caster selection is simple? There are two ways to assure success. One is to become a caster expert. The other is to consult with a capable industrial distributor or caster manufacturer. We think the second choice makes the most sense! **WMHS**

*Dave Lippert has worked in the industry since 1982 and has served as President of Hamilton Caster since 1995. Hamilton Caster is a family-owned and managed manufacturing company located in Hamilton, OH. In business since 1907, the company designs and makes industrial wheels and casters for industry, and produces industrial carts and trailers ([www.hamiltoncaster.com](http://www.hamiltoncaster.com)).*

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## Achieving Conveyor Automation Starts with Product Orientation

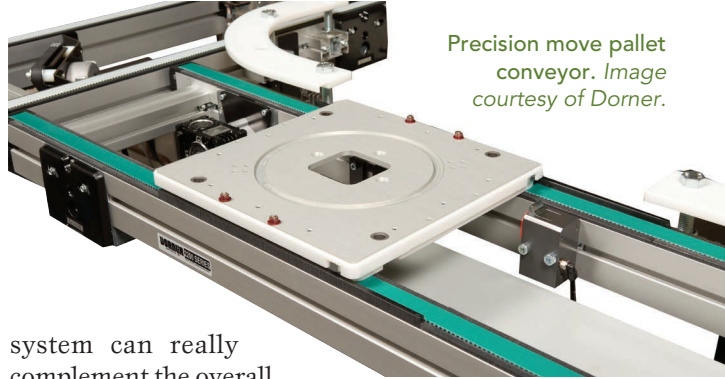
As more companies look to automate their processing lines, product orientation becomes more critical – here's why...

By: **Mike Hosch**, Contributor

New waves of technologies are transforming not only the way products are produced and packaged, but manufacturing facilities as a whole. Flexibility and connectivity are the names of the game when it comes to equipment, and that's certainly the case for conveyors.

Conveyors today have become integral components in all phases of the automation, assembly and industrial markets. And while some of the dominant global brands have been the early adopters to embracing the full potential of conveyors, more companies of all sizes are taking a closer look at how they too can better integrate conveyor systems to ultimately improve the entire line.

An effective conveyor system not only moves product from one point to another, but also orientates that product to be in the correct position for the next step in the manufacturing or packaging process. A well-engineered conveyor



Precision move pallet conveyor. Image courtesy of Dörner.

system can really complement the overall efficiency of a line when its able to successfully orientate and sort products. Here are some different types of conveyors to consider in your next project that excel in orientating products.

### PALLET SYSTEM CONVEYORS

The manufacturing environment inside facilities is much different than what it was a generation ago. Automation is

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# CONVEYORS



ARB conveyor with package orientation. Image courtesy of Dorner.

now a prime driver behind the way products are being produced. Many applications include both manual processes and robotic interaction, and as such, conveyors today need to be engineered to meet these challenges. That's why pallet system conveyors have become a popular choice.

Pallet system conveyors are ideal for many automation-focused applications that require exact movements and positioning of parts, as they can be setup or programmed to start and stop at specific intervals to sync up with robotic interaction or other processes. Pallet system conveyors typically come on three different platforms to convey the pallet, either a dual belt configuration powered by a

common drive on a flexible plastic chain belt design or a linear motor. The pallets can stop, raise up off the belts and rotate the pallet 90° or 180° to reposition product as necessary. Companies using a pallet system conveyor are also doing so for the accuracy. They need their product at an exact location, and the conveyor's lift and location station deliver repeatability of 0.002”.

## FLEXIBLE CHAIN CONVEYORS

Some application designs dictate product to be moved in and around equipment and machinery. To accommodate this need, conveyors need to be flexible and make tight turns – which is ideal for flexible chain conveyors.

Automation applications within the processing and packaging, industrial, medical, life sciences and health industries, typically operate in an environment that has tight spaces or elevation changes; these are ideal settings for flexible chain conveyors.

## PRECISION TIMING BELT CONVEYORS

Many industrial automation, product assembly, manufacturing and packaging applications require product to be in an exact spot on the conveyor at the right time. The right choice here is precision timing belt conveyors.

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repeatability of  $\pm .040''$ , all at a rate of 100 indexes per minute. This level of precision is critical, especially for robotic applications.

## SELECTING THE RIGHT CONVEYOR SYSTEM

As you can see, there are many conveyors engineered for automation-type applications, but the trick is to select the right one for your needs. Conveyors today are built to your specifications to improve efficiency and output of your production line. There's no reason to settle for a conveyor that's being shoe-horned into your application, especially when a system can be engineered to seamlessly integrate into a larger process.

But to do that requires an understanding of what the goals and expectations are for your conveyors – in other words, what do you need your conveyors to do? Knowing this upfront will set you up for success with a conveyor system that's designed to perform – and perform well.

Whether you're an OEM or integrator, a small family-owned shop or a multinational business, everyone has the same concerns regarding their new conveyor system. A good place to start is by considering these questions:

- How do you see the conveyor system integrating with what you're trying to build?

- What is the height, weight and shape of the product(s) being moved?
- What's the targeted rate of production?
- How much space is available for the conveyors?
- Is space likely to be tight, requiring conveyors to make sharp turns or go up inclines?
- Is the machine/production line manual or automated?
- Is the anticipated flow of production linear or oval?

Knowing this information upfront helps define the scope of the project and allows the conveyor supplier to streamline the quotation process by gaining a more complete picture of the application.

Product orientation and sortation are essential factors to consider in your conveyor system. That's because automation relies heavily on products being positioned correctly at a specific time and location. Making this happen can be a daunting task, but you don't have to do it alone. The first step is to evaluate your application and determine the expectations for your conveyor system. There are a number of resources available to assist you in this. The right conveyor system is out there, it's just waiting to be designed. **WMHS**

*Mike Hosch is the Vice President, Industrial Products for Dorner ([www.dornerconveyors.com](http://www.dornerconveyors.com)). He can be reached at [Mike.hosch@dorner.com](mailto:Mike.hosch@dorner.com).*

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## Propane Forklift Q&A

*Matt McDonald, Director of Off-Road Business Development for the Propane Education & Research Council, answers questions about propane forklifts.*

### Q HOW DO EMISSIONS BETWEEN PROPANE, ELECTRIC, GASOLINE AND DIESEL-POWERED FORKLIFTS COMPARE?

*McDonald:* Sustainability is a hot topic in the industry, forcing businesses to take a closer look at their operational emissions profile. For material handling professionals, this means selecting equipment with reduced carbon emissions. Propane offers a clean alternative energy solution compared with electric and diesel forklifts.

The Propane Education & Research Council (PERC) contracted the Gas Technology Institute (GTI) and the Nexight Group to study and analyze the comparative emissions of propane in key markets, including forklifts. The reports studied full-fuel-cycle energy consumption, greenhouse gas emissions, hydrocarbons, and criteria pollutant emissions like nitrogen oxide (NOx) and sulfur oxide (SOx).



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According to this study, propane reduces SOx emissions by up to 76 % compared with electric when you consider the total site-to-source emissions required for bringing electric



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forklifts to market. Site-to-source emissions include those produced in the manufacturing and transportation of batteries for electric forklifts. Not to mention, the electricity needed for recharging batteries is mostly generated by coal-fired plants that release even more harmful emissions into the air and toxins into the water supply.

The same study revealed that propane forklifts reduce NOx emissions by 94 % and hydrocarbons by 94 % compared with diesel-powered equipment.

## Q ARE PROPANE FORKLIFTS SAFE TO USE INDOORS?

*McDonald:* According to data from PERC, 68 % of forklift fleets work both indoors and outdoors, making this an important question. And the answer is yes, propane forklifts can be operated safely indoors.

Propane and electric-powered forklifts dominate the indoor space, but propane offers a significant reduction in overall emissions. Well-maintained propane forklift engines exceed nationwide indoor air quality standards, while gasoline and diesel models produce higher amounts of carbon monoxide. There is no nationwide ban on the indoor use of propane forklifts. As long as the engines have been properly serviced and they're in a ventilated environment, propane forklifts are perfectly suited to operate indoors.



## Q BESIDES THE EMISSIONS DIFFERENCE, DO PROPANE FORKLIFTS OFFER OTHER ADVANTAGES?

*McDonald:* Propane offers notable performance benefits, helping crews to increase productivity day in and day out. For example, propane-powered forklifts provide 100 % power throughout operation and maintain more consistent travel speeds and acceleration throughout a shift compared to battery-powered forklifts, according to data from PERC.

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# COMFORT IS THE KEY TO COMPLIANCE

Did you know that 70% of workers who suffer hand injuries are not wearing gloves at the time of their accident. Simply put, gloves can never protect those who don't wear them, which is why we spend so much time ensuring that comfort is built into all our gloves.

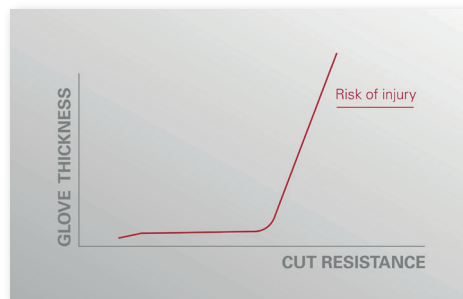
With the additions to the ANSI/ISEA 105 standard, which grade gloves from A1 to A9, the race to the top began, even though gloves achieving an ANSI A9 grade are purchased by less than 1% of the market. The best intentions can be dangerous and the number of injuries confirms that.

Over the last 10 years workplace injuries have fallen by 25%, BUT hand injuries have almost doubled in that time because the focus has been on using gloves that receive high test scores, i.e. that meet the EN, ISO and ANSI standards, which we call the 'Cut Protection Paradox'.

## THE CUT PROTECTION PARADOX

**This is a phenomenon whereby choosing the most cut-resistant gloves leads to more cut injuries when the opposite should be true.**

Why does this happen? Because in these gloves comfort is compromised, leading people to take their gloves off to do certain activities, which is when accidents happen. Remember that 70% of people were not wearing gloves at the time of their injury! So how can you resolve this phenomenon?



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And propane provides the quick refueling necessary to keep materials moving, regardless of fleet size. One cylinder typically covers an eight-hour shift and swapping out an empty cylinder for a full one takes only a few moments.

Propane's refueling process eliminates downtime spent recharging or the need for strict battery management by crews, like with electric equipment. Plus, companies operating with propane can work with their local propane supplier to ensure their cylinder cages are always full by setting up a tailored refueling schedule.

## **Q** PROPONENTS OF ELECTRIC FORKLIFTS ARGUE THAT THEY ARE QUIETER AND INVOLVE LESS MAINTENANCE. CAN YOU ADDRESS THAT?

*McDonald:* Forklifts traditionally do not get the level of preventative maintenance they require or deserve. One of the main areas that gets ignored is the exhaust system, resulting in a higher noise level from the exhaust. That being said, a properly maintained propane forklift engine complies with all workplace noise level requirements. And electric motors, while quiet, are not silent like many people think.

Additionally, to say an electric forklift is low, or no, maintenance is a common misconception. In fact, electric lifts require specific maintenance items because of forklift batteries, which are a significant maintenance item in general. It's also important to consider the wear and tear electric batteries can have on a lift.

## **Q** DO PROPANE FORKLIFTS POSE A RISK OF EMPLOYEES INHALING HARMFUL GASES?

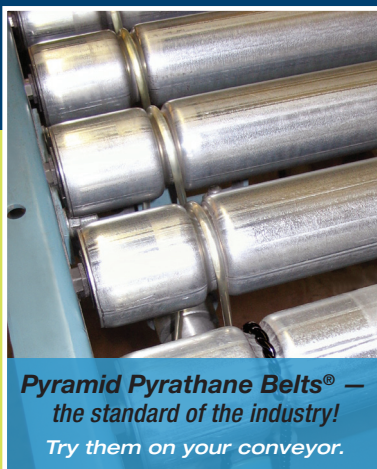
*McDonald:* Propane's low-emissions profile means propane forklifts are not only better for the environment, but they also protect employees from harmful emissions—unlike gasoline and diesel, which produce higher amounts of carbon monoxide.

## **Q** HOW DO THE TWO COMPARE IN TERMS OF COST – BOTH INITIAL AND OPERATIONAL?

*McDonald:* Between propane's lower capital cost and impressive cylinder lifespan, businesses can see significant savings throughout ownership compared with electric and diesel-powered equipment.

Most notably, the capital cost of a propane forklift is approximately 30 % lower than the purchase price of an electric forklift. Electric forklifts also incur additional

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utility costs to keep them charged, and their battery life and power output diminishes over time, which can lead to future costs.

Propane forklifts, on the other hand, can be refilled at any time without impacting the lifespan of the cylinder. And the life expectancy of a propane cylinder is three times longer than an electric forklift battery and oftentimes extends beyond the typical lifespan of a forklift.

Additionally, businesses making the move to electric oftentimes forget about the costly installation requirements that come with electric equipment—like battery charging stations, which must be located in a designated area of the facility. It's important to note that charging stations may cause issues in some facilities and require costly service upgrades to accommodate the new power requirements.

With propane forklifts, however, infrastructure requirements are minimal. Refueling infrastructure requires only storage space for the propane cylinders, freeing up valuable warehouse square footage that would otherwise be occupied by battery stations.

## Q ARE THERE PARTICULAR APPLICATIONS OR ENVIRONMENTS FOR WHICH PROPANE FORKLIFTS ARE IDEALLY SUITED? NOT SUITED AT ALL?

*McDonald:* Because propane is a highly versatile energy source, it's well suited for a wide variety of applications and environments. Propane forklifts are commonly used in and around warehouses, on loading docks, around ports, in food and beverage operations, etc.

Beyond its indoor-outdoor versatility, propane forklifts also offer weight class versatility—meaning crews don't have to juggle multiple energy sources to complete different jobs. Electric forklifts can't bring the power needed for larger jobs and diesel isn't suited for small jobs, but propane provides power for every size job and works for every weight class and application to match the job at hand. **WMHS**

For more information, visit the Propane Research & Information Council's website (<https://propane.com>).



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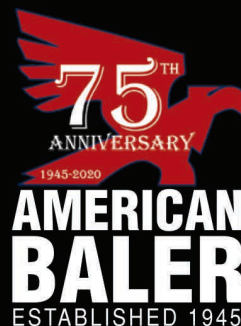
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## Increasing Manufacturing Productivity in an Increasingly Demanding World

By: **Keith Simon**, Contributor

In today's fast-paced environment, ecommerce surrounds nearly every aspect of our purchases, putting the world—and our groceries—a finger-click away. While a consumer's dream, the rapid rise of ecommerce—in addition to thriving plastics, automotive and tech manufacturing sectors—creates new challenges for warehouse and manufacturing facilities, leading them to look for new ways to drive operational efficiency in order to meet growing demand on labor and resources.

To meet demands in the past, manufacturers often turned to investment in operational capacity. This, however, led to additional operation costs and new labor requirements. With the rise of ecommerce not slowing down, continuously expanding operational capacity is not always a viable solution. Rather, today's challenges must be met with forward-thinking strategies that leverage technology, as well as lean and new ways of thinking about efficiency and optimization. Re-imagining workflows with innovative processes and the right tools will help operators realize the full potential of existing resources, thus limiting

investment, while also improving efficiency and safety. And, it all starts with the right material flow design and material handling equipment.

### ALIGN MATERIAL FLOW WITH MATERIAL HANDLING EQUIPMENT

For many operations, the default material handling tool is the forklift. But, a warehouse is only as efficient as the material flow design and the tools specified to carry out material movements.

According to an analysis by CBInsights which measured overall equipment effectiveness (OEE), on average, manufacturing and warehouses operate at only 60 % of designed capacity. But, that doesn't have to be the case. Forklifts are a great solution for what they were made to do—loading and unloading trucks, as well as vertical goods storage. When used for horizontal movement, however, forklifts create undue challenges and risks to the operator, the product and the entire operation.

In fact, OSHA reports nearly 35,000 worker injuries caused by forklifts every year. These avoidable injuries increase workplace costs and decrease efficiencies. Additionally, forklifts require frequent maintenance intervals, as well as high repair and fuel costs. This results in increased downtime and operator expenses, year-over-year.

The key to optimizing costs, productivity and safety in the ecommerce environment is matching the right tool to each task. As already mentioned, forklifts are ideal for vertical movement but produce efficiency challenges for horizontal movement. Tow tractors and tug systems, on the other hand, are designed specifically for horizontal material movement, transporting more material in fewer trips and reducing material delivery time by up to 50 %. These systems are also designed with operational safety in mind.

In addition to unobstructed views, for example, tow tractors and tug systems often increase visibility with features such as flashing emergency lights, reflectors and light bars; as well as include warning sounds and a cut-off power switch in case of emergencies. And, the proof is in the numbers. Since 2002, there have only been eight total OSHA-reported tow tractor incidents, compared to the over 500,000 reported injuries by forklifts in that same timeframe.



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## OPTIMIZE OPERATIONS

Operations that don't evolve to more forward-thinking material flow will struggle to keep up with ever-increasing resource and labor demands. Deloitte estimates that 2 million manufacturing jobs will remain unfilled by 2025. Investing in new material handling systems will help re-allocate workers and optimize workflow, offsetting the need to increase staff size or facility footprint.

With limited hauling abilities and heavy OSHA regulations, forklifts require additional, highly paid and skilled workers to haul materials to key areas of the facility without slowing productivity. When used in horizontal material handling, instead of focusing simply on vertical movement or loading and unloading, additional trips become needed to move material—leading to increased transportation bottlenecks and operational inefficiencies. By incorporating tow tractors and tug systems into a current forklift fleet, operations can better scale up to meet ecommerce demand by reducing these bottlenecks—while achieving new labor efficiencies and increasing overall productivity.

## INCREASE ROI

By replacing forklifts where performance is sacrificed with more efficient tow tractors and tug systems, operations get a cost-effective option up-front that also

immediately begins to capture efficiencies and long-term cost savings. For example, for every forklift that is replaced with a tow tractor, operations can see an average of \$22,200 in total cost of ownership savings over five years. This savings is supplemented through increased workplace safety and more strategic labor allocation. Workflow efficiencies and increased productivity also have the potential to generate revenue growth as a direct result of tow tractor and tug system adoption.

By converting forklifts to tow tractors and tug systems in horizontal material flow areas, companies can save millions of dollars in operational expenses—all while creating an operational eco-system that stands up to the ever-increasing demands of today's ecommerce world.

## WMHS



*Keith Simon serves as the Vice President and General Manager of Polaris Commercial and Government North America. With an extensive background in manufacturing and engineering, Simon oversees the strategy and operations of Polaris' broad portfolio of commercial, industrial and utility vehicle solutions. (www.polaris.com)*

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## Maintain Injury-Free Jobsites Through Digital Compliance Processes

By: **Travis Parigi**, Contributor

Many employers with field service teams have traditionally relied on the honor system for much of their safety and regulatory compliance. This can be a recipe for disaster that puts undue pressure on field technicians to take safety risks.

For example, a worker sent to run wiring at a client's remote jobsite discovers that a power winch needed to pull cable bundles is damaged and unsafe. The individual knows they should stop and obtain a replacement or repair the winch before continuing, losing half a day to drive to their workshop and return to the site. Will they attempt to repair or continue to use the damaged tool to avoid the delay? Is the worker adequately trained and certified to recognize the danger, or to perform the repair? Did other technicians know that the winch was damaged or due for service, but fail to schedule its repair or replacement?

This hypothetical scenario underscores common challenges. In fact, equipment failure and machinery issues are among the most frequently cited OSHA violations. In addition to fines, these accidents can lead to serious financial losses related to an injury or death, as well as damage to the company's reputation and employee morale.

### USING ENTERPRISE ASSET MANAGEMENT TECHNOLOGY

A better approach is to enforce safety and regulatory compliance systematically using enterprise asset management technology (EAM). With the right systems in place, an organization can increase visibility into the condition of its equipment and machines, ensure workers are qualified for the jobs they are assigned to do, and maximize asset performance through predictive and proactive maintenance.

Today's EAM platforms tackle compliance on multiple fronts. For an organization integrating one of these technology sets with its legacy systems, the first step toward greater efficiency typically is to modernize its job safety data and analyses through digitization.

Digital information is almost instantly retrievable and allows automation of many processes that can be tedious and prone to human error when performed manually. Once equipment records and ongoing reporting are converted to this more versatile format, safety managers and field service teams can quickly search and group that information to clarify worksite safety conditions.



A better approach is to enforce safety and regulatory compliance systematically using enterprise asset management technology (EAM). Image courtesy of LiquidFrameworks.

Returning to our earlier example, the field technician's quandary might have been avoided if the worker had learned before setting out for the client's worksite that the winch was damaged on a previous job or simply due (or overdue) for replacement. Drawing from previous reporting, manufacturer's recommendations and specifications, and other key details stored in an EAM's digital database, technicians can identify which machines and equipment are most reliable, which are failing or at risk of failing, and even where a specific tool, machine or vehicle is stored.

### PREDICTIVE MAINTENANCE

Over time, a platform can provide additional analytical insight by identifying trends and patterns that can inform predictive equipment maintenance and replacement. The previous life cycle of wear parts, for example, can tell planners when a motor brushes, contactor or other components are likely to need replacement. Notification functions can alert a purchasing officer in sufficient time to order replacement parts, so they are on hand when it comes time to service the machine. Digital inventory tracking also assists technicians in locating and pulling those parts, avoiding redundant purchases of components already in inventory.

Employers can use a similar approach to digitally track employee certifications. Just as a platform reveals a machine's service history, software can keep managers updated on each worker's training history and current certifications to perform various types of jobs. By tying certification tracking to assignment schedules and dispatching systems, supervisors and dispatchers can avoid sending out a journeyman to perform a job that will exceed their skillset or certifications and should instead be performed by a specialist or a master electrician.

An EAM platform can incorporate and coordinate training histories with relevant contextual data, such as insurance requirements and upcoming dates when an individual must complete refresher courses or renew their certification. In practice, scheduling software can suggest a roster of

available workers qualified to perform a needed task. A platform can also alert a dispatcher when a service team lacks certification for a task within an assigned job.

Finally, a digital foundation positions a field service provider to institute systematic predictive and preventive maintenance. Leading EAM systems not only coordinate, but automate, many key administrative functions to maximize efficiency. In addition to scheduling inspections and service dates for thousands of pieces of equipment, a platform can automatically generate work orders and alerts in accordance with usage meters, or when triggered by events that would require a status check or repair.

In short, today's EAM solutions remove the guesswork from safety and regulatory compliance. By continually tracking employee qualifications, a good platform enables managers to avoid placing building engineers and other service team members in positions for which they lack the proper training or certification needed to complete their tasks safely. By the same token, systems that track the upkeep and predict the performance of machinery and equipment help to minimize breakdowns, the risk of injuries and downtime due to unplanned repairs. Compliance becomes not a burden, but a means to achieving greater efficiency and worksite safety. **WMHS**

*Travis Parigi is founder and CEO of LiquidFrameworks (www.liquidframeworks.com), whose FieldFX is said to be the most complete mobile field operations management solution for companies in the oil and gas, industrial and environmental services industries. FieldFX is user-friendly and increases the long-term success rate with field technicians.*



Technology solutions help workers keep up with equipment maintenance on and off site. Image courtesy of LiquidFrameworks.

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## The Amazing Hazard Awareness Advisor

By: **Edward Stern**, *Contributor*

The Amazing Hazard Awareness Advisor ([webapps.dol.gov/elaws/oshahaz.htm](http://webapps.dol.gov/elaws/oshahaz.htm)) is a very bold title. I would not say it if it were not true. The official name, OSHA Hazard Awareness Advisor, does not reveal its power.

Imagine if I could arrange for a panel of occupational safety and health (OSH) professionals, doctors board-certified in OSH medicine and lawyers specializing in OSHA regulations to meet with you for a short time. They would ask you questions about your work environment; then ask expert follow-up questions (as needed); and give you a detailed written report of what they think are your workplace safety and health issues.

Based on YOUR answers to the questions, the panel's report would tell you which OSHA standards apply to your work and give you brief guidance on the issues. The report might be from 5 pages to 35 pages. It all depends on what happens at your work site. The price remains the same--FREE. And you ask: How can that be?

Well, I doubt you could get such free expert advice from a panel of live OSH experts. BUT, if the decision-logic of the expert panel to identify safety and health hazards (and applicable standards) and their knowledge were captured into expert interactive, diagnostic software, you could get their advice. OSHA did that with the Hazard Awareness Advisor "expert system." It holds the panel's problem-identification talent.

### FLEXIBILITY AND COVERAGE

This expert Advisor is focused on general industry. It can still help those in construction and agriculture because they often have general industry issues, e.g., warehouses.

Consider simple workplaces. A dress shop or law office might need guidance on railings for stairs and fire exits. Next, move up to restaurants. They have sharp tools, slippery surfaces, fire suppression and fire exits, and strong cleaning chemicals.

Now, move up to a small manufacturing site, with issues of ventilation, fire protection, eye and face protection, pinch points on machinery, hazard communication for dangerous chemicals and the paint spray-booth. (A dear uncle was upset that I worked for OSHA, but he still let me walk through his plant.)



OSHA focused particularly on small businesses, because we thought they were most likely to need the help. But we got a surprise. Consultants on occupational safety and health for major companies told me they alerted their clients to the OSHA Expert Advisors.

I asked a senior consultant, with a PhD in Industrial Hygiene, why they alerted their clients to these tools. (I had spoken with OSH professionals at Dow, Alcoa, IBM, John Deere, and the like, and I thought they were extremely knowledgeable.) He told me, "You were speaking to experts at corporate headquarters, but these companies do not have those experts at each of their sites. So, they also need help."

The Hazard Awareness Advisor can evaluate sites in general industry from a dress shop to a huge manufacturing site plant. For example, for bigger industry it asks:

"There are areas in your workplace where: (Select all that apply and press continue.)

- ☐ People have to shout to be heard over background noise
- ☐ Workers may have to stand in water because of a wet process or washdown
- ☐ Workers are in physical contact with chemical solutions, solvents or vapors
- ☐ Flying or airborne debris, dust, chips or other particles are generated
- ☐ Workers are exposed to mists, fumes, gases, smokes, sprays or fogs
- ☐ Visitors comment about strange odors" ...  
(this is a subset of the questions)

The last question recognizes that people become accustomed to odors in their environments (olfactory fatigue), but visitors notice strange odors.

In another section, if you had checked that painting is done at the site, the system asks this follow-up:



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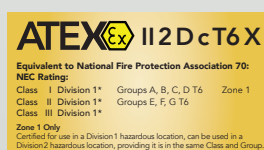
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Which of the following types of painting do you perform? (Select all that apply and press continue.)

- ☐ Roller or brush
- ☐ Conventional spray finishing
- ☐ Electrostatic spray painting
- ☐ Powder coating
- ☐ Dip tank
- ☐ Spray painting with aerosol cans
- ☐ None of the above

I checked “Dip tank” to see the follow-up, which is:

Is there a danger of splashing when working with or near open surface tanks or dip tanks?

- Yes
- No
- I don’t know

Now let us look at materials handling equipment.

“Which types of mechanical materials handling equipment do you use at your facility? (Select all that apply and press continue.)

- ☐ Fork-lift or other powered industrial trucks
- ☐ Overhead or gantry cranes
- ☐ Slings used for materials handling
- ☐ None of the above”

Checking fork-lift or other prompts this follow-up:

“Do you have a formal, periodic evaluation of the on-the-job performance of your powered industrial truck operators?

- Yes
- No

## FOLLOW-UP QUESTIONS AND YOUR INPUTS

Please keep in mind that you only see follow-up questions triggered by your answers about your workplace. Some readers who use this Advisor will not see the questions in this article. Instead, they will see other questions appropriate to the workplaces that they describe to the system.

You may wonder what, if anything, will OSHA do with the users’ input into the Advisor. The answer is NOTHING, because OSHA does not see responses to the questions. The Hazard Awareness Advisor is maintained by the Office of the Assistant Secretary for Policy, which does not collect users’ input into the Advisors. The whole point is to help employers make their workplaces healthier and safer.

## WHAT’S IN THE ADVISOR’S REPORT?

The first section of the Report contains “Highlights.” Most are on one line. Here are some based on my answers.

## HIGHLIGHTS

- Evaluate the exposure to chemicals in your workplace.
- Your site needs a hazard communication program.
- Keep aisles and loading areas clear of unneeded materials.
- Listen when visitors say they smell strange odors.
- Possible noise hazard. Have sound level tested.
- Your workers may be exposed to blood-borne disease...

## DETAILS

This section has detailed responses to users’ input. I said we had powered industrial trucks. So, the Advisor produced a brief overview of the related hazards and identified applicable OSHA standards. Here is part of it:

## MATERIALS HANDLING AND STORAGE

Your answers indicate that mechanical materials handling equipment is present in the workplace. This equipment can cause injury to workers by trapping them between the equipment and materials or structures and by colliding with stacked materials causing overturn of heavy objects onto workers. Equipment can also block exit in the event of fire. ...

1910.176 Handling materials, general: Provides requirements for use of mechanical handling equipment, and for materials storage.

## TO SUM UP

The OSHA Hazard Awareness Advisor ([webapps.dol.gov/elaws/oshahaz.htm](http://webapps.dol.gov/elaws/oshahaz.htm)) can help businesses doing many kinds of work and using many different materials. It will spot the most likely safety and health issues in your workplace. Maybe you are good, maybe you have more work to do. Why not find out before Federal or State OSHA shows up? Lastly, OSHA did not do this all by itself. Our contractor, Alex Botkin, designed it with many good ideas from OSHA, business, labor and the State Plans. **WMHS**

*Edward Stern spent 27 years at OSHA, developing and explaining OSHA regulations. He also served on an EPA Federal Advisory Committee on Compliance Assistance.*



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## Safety Considerations for Extension Ladders

By: **Maureen Paraventi**

Extension ladders - also known as portable ladders - can be found in many types of worksites. They usually have two sections that operate in brackets or guides allowing for adjustable lengths. Because of the heights they can convey workers to, and the fact that they are not self-supporting, extension ladders pose special fall risks for those who use them. The following are recommendations for preventing fall injuries during extension ladder use.

**Choose the right ladder and pay attention to load limits.** Extension ladders are available in wood, fiberglass and aluminum. The application for which the ladder will be used should be a factor in determining which type of ladder material to choose. For example, a fiberglass ladder will be safer for electrical work than one composed of metal or wood - both of which conduct electricity. As for load limits, make sure that the tools or equipment being carried are included in calculations of how much weight a ladder can safely handle. (And of course, only one worker at a time should be allowed on a ladder.)

**Do the math.** Non-self-supporting ladders should extend at least 3 feet but not more than 4 feet past the edge against which they rest. They should be set at a 4:1 ratio for a proper working height/angle. According to the U.S. Office of Compliance, each section of a multi-section ladder must overlap the adjacent section by at least 3 feet for ladders up to 36 feet and 4 feet for 40 feet or longer extension



When ascending or descending a ladder, maintain three-point contact at all times.

ladders. For example, a 24-foot extension ladder will consist of two sections each 12 feet long, but the maximum extended length will be 21 feet, because the sections overlap by no less than 1½ feet when the ladder is at maximum extension.<sup>1</sup>

**Inspect the ladder before use.** Look for rungs that are loose, bent or have slippery substances on them; side rails that are cracked or split and loose fasteners. Rope or pulley systems must be free of fraying or rotting. Non-slip pads on the ladder's feet must be in good condition. Clearly mark a ladder that needs repair, to prevent injuries by giving employees a heads' up.

**Site and secure the ladder properly.** Make sure the ladder is on a firm, level base. Avoid having the ladder sway or walk by securing it near the top. Prevent slipping by staking or burying the ladder at its base. Be sure that all of the locks are engaged.

**Use the ladder safely.** Although safe ladder use would seem to be intuitive, a momentary deviation from it can have life-altering results. For instance, the need to maintain three-point contact with it at all times - with two hands and a foot or both feet and a hand - is generally well known. However, briefly losing that three-point contact while reaching for a falling object could cause the ladder user to fall and suffer serious injuries. Always face the ladder when climbing up or down it. Using a tool belt will keep hands free and enhance safety. Use an extension ladder for access, not as work platforms. It is safer to work from



Extension ladders should extend at least 3 feet past the edge against which they rest.

<sup>1</sup> <https://tinyurl.com/ct36kfxs>

scaffolding, scissor lifts or boom lifts. If the ladder will be used near a door, block the door to prevent it from being opened. Keep the area around the bottom of the ladder free of equipment, materials and tools.

**Train and retrain the workers who'll be using the ladders.** OSHA requires employers to designate a competent person to train workers on how to recognize and minimize hazards related to ladder use. The trainees must be made aware of the nature of fall hazards in the work area; correct procedures for placement and care in handling ladders; maximum intended load-carrying capacities of ladders used; and ladder inspection points. Employees must be retrained when necessary to maintain understanding and knowledge.

### Common Causes of Extension Ladder Incidents:

- Using the ladder near energized electrical lines
- Standing on the top three rungs of the ladder
- Overreaching to do the work
- Moving the ladder while a person or equipment is on it
- Exceeding the maximum load rating
- Placing the ladder base on an unstable surface or moveable objects
- Leaning to reach a work area rather than moving the ladder to a better position

- Failing to have at least a 3' overlap
- Tying two ladders together to make them longer
- Using an extension ladder horizontally, like a platform
- Carrying tools in hands while climbing the ladder

### Compliance

The following are the OSHA standards related to ladder use that the agency cites most often:

- §1926.1053 (b)(1) - Failure to extend a portable ladder at least 3 feet above the upper landing surface to which the ladder is used to gain access.
- §1926.1053 (b)(4) - Using ladders for a purpose other than for which they were designed.
- §1926.1053 (b)(16) - Failure to mark portable ladders with structural defects as such or withdraw them from service until repaired.
- §1926.1053 (b)(22) - Employee carrying an object or load that could cause him or her to lose balance and fall.
- Safety standards for portable ladders can be found in ANSI A14.1-2000 through 14.5-2000 and OSHA 29 CFR §1910.25 and §1910.26, §1926.1053. Training falls under 29 CFR §1926.1060. **WMHS**

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# The Three Keys to Hand Protection Management

By: **David Shutt**, Contributor

On any given month, one might read about a dozen incidents resulting in injuries to the hands and arms. Gloves are the most common form of personal protective equipment (PPE) utilized, yet the U.S. Bureau of Labor Statistics (BLS) still reports more than 140,000 lost-time hand injuries annually. Open any maintenance, repair and operations (MRO) manual or safety catalog and you will find a myriad of hand protection options that offer thousands of combinations of materials, lengths, over dips and degrees of overall protection.

Confused? Why is a topic that proliferates our industry still a leading cause of work-related injuries?

How would education be approached by a safety manager at a large end user that employs multiple thousands of workers – one who wants to increase his or her level of cut protection within their plant due to high number of hand injuries or lacerations? I would start with exploratory questions regarding the cut level and type of gloves they are using. Understanding and knowing the hazards within the applications will play a pivotal role in identifying what type of CE Certifications (for products used within the European Economic area) or ANSI/ISEA certifications are needed to correct the situation. In return, the employer generally does their part to reduce the hazards or completely remove them from the workplace, and then the PPE selection becomes one of the final steps to protect the worker.

PPE has evolved considerably, due to the development of best practices and innovative technologies and the increased awareness of standards that are in play to benefit the safety of the worker. Most safety professionals know, understand and devote themselves to the exercise of continuous education. It is imperative to stay competent in the changing world of safety regulations, as not having the correct protection can be just as bad as having no protection at all.

### ENFORCEMENT

Enforcement without representation is a leading statement made on most safety assessments completed within safety departments. Too frequently, accidents simply occur due to mistakes made by workers. Enforcement of safety protocols seems to be the most challenging

aspect of safety programs. Using the wrong hand protection for the application and failing to enforce the wearing of gloves during operations that call for them result in additional consequences of compliance and monetary failures on the plant's behalf. Comprehending and implementing correct hand protection that adheres to current regulations should not be approached passively. The need for enforcement can be illustrated by one statistic from the BLS: 60 % of lost time due to hand injury incidents occur when the employee is not wearing gloves. I have yet to enter a facility where the company does not provide gloves. Further, most facilities have a glove policy in place.



It is important to use the right hand protection for the application. *Image courtesy of Wonder Grip.*

There are three primary words that I have experienced which contribute most frequently to on-the-job hand injuries.

### EDUCATION

Education is both the act of teaching knowledge to others and the act of receiving knowledge from someone else. Education also refers to the knowledge received through schooling or instruction and to the institution of teaching. Education has a few other senses as a noun.

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Increased turnover within the industrial workplace, coupled with a diverse cultural environment, has created obstacles in communicating about the proper PPE to be used within a facility. Therefore, many companies form safety committees to drive compliance. Regular safety meetings plus outreach programs that involve improvements toward PPE signage and vending have dramatically increased, to ensure that the worker is receiving the proper glove for the proper application.

## DETERMINATION

This is not me speaking as the old ball coach, it is your safety committee speaking toward determining what PPE needs to be implemented. The industrial landscapes have always been dynamic and often the PPE lags in change. However, standards and regulation can help to assist in this transition and help formalize the process toward change. OSHA has two guidelines that assist in that determination, and they read as follows:

**1910.138(a)** – General requirements. Employers shall select and require employees to use appropriate hand protection when employees' hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes.

**1910.138(b)** – Selection. Employers shall base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use and the hazards and potential hazards identified.

In the end, most glove manufacturers perform safety assessments and recommendations at no charge. These detailed audits are performed on-site at customer locations and result in a written recommendation of the hand protection to use with each hazard and samples for a trial period. Take advantage of these key partnerships with distributors and glove manufactures to provide employees with the appropriate and safest hand protection options available today. **WMHS**

*David Shutt is National Sales Director for Wonder Grip USA. Wonder Grip is dedicated to continuously providing hand protection solutions for users faced with a perpetually changing environment. By placing the end user at the heart of our R&D, Wonder Grip's range of solutions evolves on a permanent basis, redefining the very notion of hand protection ([www.wondergrip.com](http://www.wondergrip.com)).*

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\*results based on ASTM D 1894 Coefficient of Friction test  
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## How to Reduce Your Workers Compensation Premiums with Safety Software

Contributed by: **Safesite**

How do you help your organization get the best price on next year's workers compensation premium?

The answer is surprisingly simple: safety software. Yes, the same tool you use to build a stronger safety program has a unique role in managing your workers compensation premium.

Safety software harnesses your existing data and lowers your workers compensation premium as soon as next quarter — and keep it lower in the years to come.

Let's say you have an Ex Mod of 1.2. You're paying 20% more on premiums than if you had an Ex Mod of 1.0, which is strictly average. Safety software provides unique insights into your safety program, so you can go out and target the biggest risk contributors and then bring down the number and cost of claims — and your Ex Mod with it. By lowering your Ex Mod, you're saving \$0.20 per \$100 of payroll premium.

How can software do all that? Let's dive into how safety software can lower your premiums and help you make a better case for safety to leadership.

### ACT QUICKLY WITH DATA ANALYSIS

All your safety activities generate huge amounts of valuable data that you use to make decisions. To make the most of the data, you dedicate hours every week to sifting through all your paperwork. With safety software, you get those hours back.

Safety software offers easy-to-read data analytics and demonstrates safety improvements and weaknesses in real-time. With unique insights based on what's happening on the ground, you can make smarter safety decisions faster and ultimately prevent incidents.

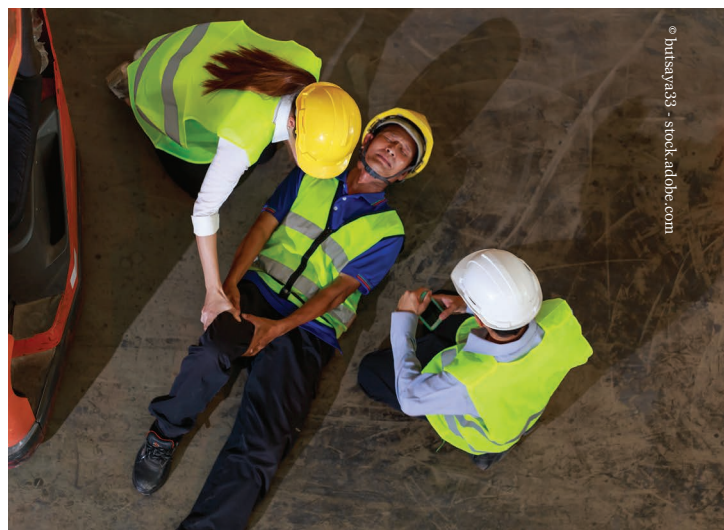
Preventing incidents lowers your workers compensation premiums — and keeps them down.

Data analysis also makes it easier for everyone dealing with workers comp to make smarter decisions by offering actionable insights for execs, brokers and underwriters. So, it has your organization's back not only when it's time to renew your policy but also when it's time to ask management for a bump to your safety program budget.

### TAP A BUTTON FOR EVIDENCE OF SAFETY ENGAGEMENT

As you know, your safety program is only powerful when workers are on board. Without worker buy-in and engagement, even the best safety programs become a list of hopes and dreams.

Safety software not only helps you achieve buy-in by simplifying safety activities, but it's also evidence of your success — timestamps and all. The more your teams engage with the software, the more evident it is to everyone — especially insurance underwriters — that your team is capable of working together and delivering long-term results.



### HOW DOES SOFTWARE DEMONSTRATE ENGAGEMENT?

It all happens in the app with no added effort from you. All those safety observations, toolbox talk attendance reports and safety audits generate the data on your behalf. And you can export the data with a few taps of a button.

Safety software also allows you to increase and communicate engagement requirements seamlessly. Let's say you require five inspections a week. If those inspections don't happen, you know in real-time by checking the dashboard. Armed with that knowledge, you can intervene ASAP.

The power of safety software is a world away from chasing managers for paperwork and reprimanding them for late delivery — and that's after a week of digging through papers wondering if it got lost in the shuffle.

## RUN MORE AGILE TARGETED SAFETY CAMPAIGNS

A quarterly examination of your reporting gives you a good indication of any patterns or problem areas. Your Ex Mod demonstrates a reflection of your risk profile compared to the industry. The analytics makes the pattern clear. But what do you do next?

Targeted safety campaigns help you mitigate future risks. With safety software, you can set up and roll out a targeted safety campaign with more agility and, of course, the benefit of data analysis. Use the campaign to:

- develop and disseminate a workplace policy
- conduct and track training
- record testing policies
- create and store paperwork

By taking proactive, targeted steps, you can eliminate incidents and provide meaningful insight into your organization's safety strategy, which directly informs your workers' compensation premiums. Talk about a competitive advantage!

## SHARE RESULTS WITH THE PEOPLE WHO MATTER

One of the best uses of safety software is simplified communication. You can share information between team members and teams and generate reports for the organization with the tap of a button. Streamlined communication

saves you time and money, allowing you to resow resources back into bettering your safety program.

## LOWER YOUR RISK AND ENJOY BETTER PREMIUMS

Why is workers compensation so expensive? There's no good answer to that question, other than to say: it doesn't have to be. With the right tools, you can help your organization pay only the premium you need to protect your workers — and not a cent more.

Safety software makes it easier to run a tighter ship, and in return, it generates compelling evidence for workers comp premiums that match your needs. **WMHS**

*This article first appeared on the Safesite website:  
<https://safesitehq.com/safety-blog/>*

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# How to Label Your Facility for Safety

By: **Kelsey Rzepecki**, Contributor

Before beginning work, it's crucial to evaluate your facility for safety hazards. Consistent and effective labeling, in accordance with OSHA and other industry regulations, is essential to prevent workplace injuries, costly downtime, workers' compensation claims and fines.

You can do this by making safety a priority before any work begins and communicating hazards and safety instructions with effective signs and labels. Start by conducting a facility safety inspection and evaluation of all operations, equipment and work areas. Here are the main areas to address for general industry compliance:

## GENERAL SAFETY

Every facility has different needs and limitations, but a safe work environment is a requirement for all workplaces. Everyone in your facility must understand the message each sign conveys. OSHA helps break down how safety

signs should be used and where they should be placed.

## IDENTIFICATION OF PIPING SYSTEMS

If your facility has a piping system, keep personnel safe and alert to hazards of a pipe's contents by marking all pipes and piping components. Clear labeling can also increase safety and efficiency during maintenance and shut-off procedures.

## ELECTRICAL EQUIPMENT AND SAFETY

General electrical safety requirements show up on OSHA's top 10 most frequently cited violations year after year. In addition to OSHA's regulations, the industry standard to follow for electrical workplace safety is NFPA 70E. Prevent injury from electrical hazards by clearly labeling all control panels and components. Display voltage ratings, arc flash warnings, electrical clearances and important safety procedures, such as lockout/tagout.

Because each workplace is different, you may need the ability to customize electrical signs and identification labels. With the variety of rules about equipment labeling, it can be difficult to keep track of exactly what is required.

## EMERGENCY PREPAREDNESS

Eliminate risk to workers in emergencies. Ensure your workplace is ready for a potential disaster with effective planning and preparation to minimize company losses. Get a breakdown of the components of emergency planning and equip your facility with key emergency signage and markings. Utilize checklists to assess your facility's needs, and understand the elements of an OSHA-required Emergency Action Plan (EAP).

## HAZARDOUS CHEMICALS

Workers need to know about and understand any chemical hazards they'll be working with. Identify all hazardous chemicals present in the workplace, and



clearly label them in accordance with OSHA's preferred labeling approach, based on the international GHS system. Understand the components of GHS Labeling and how to make a compliant chemical label.

### LEAN MANUFACTURING

Keep your day-to-day operations and workspaces organized by implementing lean manufacturing tools, such as the 5S system. Install effective visuals to give workers clear and accurate identification of locations, equipment, procedures, hazards, inventories and tools.

### FLOOR MARKING

OSHA requires the periodic inspection of all walking and working surfaces to ensure they are kept clean, safe and accessible (29 CFR 1910.22). Consistent and clear markings help improve overall efficiency and safety, especially in warehousing environments. Enhance safety and improve order with floor marking products to designate work zones, mark aisles and alert personnel to hazardous areas.

### LABEL PLACEMENT AND VISUAL SOLUTIONS

All signs and labels should always be clearly visible and legible. Proper label placement will support this and can reduce chances of miscommunication and potential injury. For effective label placement:

- Place labels and signs at eye-level for a clear view from a normal angle of approach.
- Color-code labels to make them easier to recognize from long distances.
- Install floor markings to communicate messages in hard-to-label areas.
- Improve safety awareness and navigation anywhere with thoughtful wayfinding.

Maintain safety and compliance by conducting periodic facility safety inspections to uncover new hazards and conditions, and always have a plan in place to mitigate them. Also, make sure labels remain intact, legible and accurate.

To ensure long-lasting labels, use high-quality labeling supplies that are engineered to endure a variety of harsh industrial environments. This will save you from ongoing replacement costs and help your overall bottom line. You can also instantly enhance safety anywhere with premade labels and signs that feature a variety of general safety messages for popular industry applications. **WMHS**


*Kelsey Rzepecki writes for Graphic Products, makers of the DuraLabel line of industrial label and sign printers. ([www.graphicproducts.com](http://www.graphicproducts.com))*

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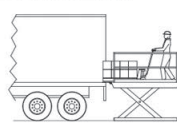
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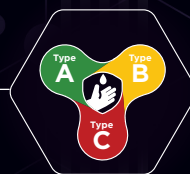
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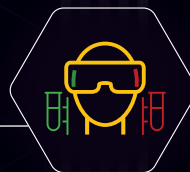
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