# CONSTRUCTION SAFETY

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## Five Simple Ways to Improve Construction Site Safety p. 14

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## PPE



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## IN EVERY ISSUE

# Donning the Appropriate PPE this Summer is Crucial

The Spring season is pretty busy for us as many of the associations have their annual trade shows. For example, over the last couple months, I've been to Chicago, New Orleans, Boston, and Nashville. Now that we publish this magazine, I find myself purposely paying attention to all construction projects that are in my path. I usually walk from my hotel to the convention center as it helps me get my steps in for the day, which I can certainly use. In each of these cities, it's been nice to see the variety of construction projects – high rises getting higher; roads being torn apart, rebuilt, and paved; pedestrian and vehicle bridges being torn down and rebuilt, and I even spotted utility work when I was in route to one of my hotels. I pay close attention out of habit to what the workers are (or aren't wearing).

I like to see what the workers high up are tethered to and how much fall protection equipment they are using. Speaking of fall protection, check out the great article in this issue by Kevin Kelpe from Diversified Fall Protection on "How the Fall Protection Hierarchy Is Saving Lives in Construction".

And on the topic of protection… The summer temps have been hot, and I feel for the workers who are outside eight, 10+ hours a day during these dog days of Summer. Sometimes I see a shelter, tent, or something that keeps the foreman or workers a few degrees cooler and out of the direct sun. To read best practices on preventing heat stress, read the article from Nicole Randall from the ISEA on "Protecting Construction Workers from Heat Stress."

And check out these additional must-read articles in this issue on:

- Hand Protection: New improvements in ISEA/ANSI 105 glove labeling make hand protection simpler for construction safety.
- Five Simple Ways to Improve Construction Site Safety: Read the strategies to help improve health and safety in construction on any jobsite.
- The Three Safety Measures Often Overlooked on the Jobsite: With experience, testing, and education, built-in safety features are making their way into standard product development practices within the tools industry.
- Silica Standard Update: These potential changes and the current enforcement focus will hopefully better protect workers and further reduce health risks.

I have some additional trips coming up to San Diego, Austin, and back to Chicago so I will keep my eagle eye on workers hopefully using the correct PPE and processes that keep them safe and ensure they're back at home another night with their families.

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# New Improvements in ISEA/ANSI 105 Glove Labeling Make Hand Protection Simpler for Construction Safety

BY DONALD F GROCE, CONTRIBUTOR

Proposed changes in the American National Standard for Hand Protection Classification ANSI/ISEA 105-2016 are expected to be adopted in the very near future by the International Safety Equipment Association. These changes have resulted in an even better tool for providing safer hand protection for those of us who face hand injury hazards daily in the construction industry.

Those of us who work in the industry know that historically, hand protection needs do not decline during undesirable economic times. Workers must be protected every day from every hazard that could cause life-altering injuries. Many injuries could permanently redefine our ability to perform the tasks required by our livelihood. Even when the economy causes jobs to slow and the cost of construction materials to skyrocket and be in short supply, we all need the full range of hand protection from mechanical, physical, and chemical hazards. Dexterity is not considered a hazard but is a major factor in hand protection safety. Sometimes a task is even more hazardous when using poorly fitted hand protection. Workers take off their gloves to

**TABLE 1**

## Classification for Cut Resistance

| LEVEL | WEIGHT (GRAMS) NEEDED TO CUT THROUGH MATERIAL WITH 20 MM OF BLADE TRAVEL |
|---|---|
| A1 | >200 |
| A2 | >500 |
| A3 | >1000 |
| A4 | >1500 |
| A5 | >2200 |
| A6 | >3000 |
| A7 | >4000 |
| A8 | >5000 |
| A9 | >6000 |

**TABLE 2**

## Classification of Abrasion Resistance

| LEVEL (500 GRAM LOAD) | ABRASION CYCLES TO FAIL |
|---|---|
| 0 | <100 |
| 1 | >100 |
| 2 | >500 |
| 3 | >1000 |

| LEVEL (1000 GRAM LOAD) | ABRASION CYCLES TO FAIL |
|---|---|
| 4 | >3000 |
| 5 | >10000 |
| 6 | >20000 |


**TABLE 3**

## Classification for Puncture Resistance

| LEVEL | PUNCTURE FORCE (NEWTONS) |
|---|---|
| 0 | < 10 |
| 1 | > 10 |
| 2 | > 20 |
| 3 | > 60 |
| 4 | > 100 |
| 5 | > 150 |

perform a fine motor task and get injured when hands are unprotected.

**New Labeling ICON:** The new labeling icon includes a "home plate" pentagon shape with the ANSI/ISEA 105 Performance Classification Levels on each side of the icon. The Cut Resistance Performance Classification (Level A1 to A9) is along the top line. The Abrasion Resistance Performance Classification (Level 0 to 6) is on the left side of the pentagon. The Puncture Resistance Performance Classification (Level 0 to 5) is on the right side of the icon. The example above shows a Global Glove stamp that performed at ANSI/ISEA 105 Cut Level A9, Abrasion Level 3, and Puncture Level 4.

You can tell at a glance the performance level for three of the main determining qualifiers for glove selection for Construction Safety.

### Great News for The Construction Industry

New advancements in cut-resistant fiber technology have resulted in more cut-resistant gloves than any other point in history. Cut-Resistant gloves remain the fastest growing category of gloves and have been for a number of years.

**Cut Protection:** New developments in fiber engineering technolo-

gy have brought new even higher cut levels than ever seen before. Some cut levels have measured far above the more recent ANSI 105-2016 American National Standard for Hand Protection Classification which includes an expanded ANSI Cut Level Rating system. Now there are ANSI/ISEA 105 Cut Levels of A1 to A9, with the highest Cut Level A9 being any material that cuts through with a weight of > 6000 grams. We have tested new gloves that are very supple and wearable that measure almost twice the requirements to be classified as Cut Level A9, with almost 12,000 grams of cut resistance. (Table 1)

**Price Considerations:** As you may expect, you pay more for more protection. The higher cut level performance gloves are generally more expensive. Most new developments have been very costly to engineer. But, what is your hand safety and the long-term use of your hands worth? You cannot put a price tag on injury prevention. Your hands affect every area of your life and wellbeing.

## Types of Cut-Resistant Gloves

**Aramids:** Many cut-resistant gloves are made from Aramid (aromatic polyamide) fibers that may have brand names DuPont™ Kevlar®, Bulwark® Nomex®, Teijin Aramid BV Twaron®, or Global Glove Aralene®. Aramid fibers were some of the first developed fibers with many other safety applications including body armor, hard hats, and gloves. Aramid fibers are also flame resistant. They can be made in different gauges, usually 7, 10, 13, 15, and even 18 gauge and can be strengthened by special treatment with ceramics or by twisting with stainless steel, glass fiber, etc.

**UHMWPE/HPPE:** High Performance Polyethylene (HPPE) fibers or UHMWPE Ultra High Molecular Weight Polyethylene are specially engineered by extruding polyethylene into fibers and twisting the fibers under high temperature and pressure. The resulting gloves are very abrasion and cut resistant. These fibers are not flame resistant. Like Aramid fibers, they can made in different gauges, usually 7, 10, 13, 15, 18, and even 21 gauge and can also be strengthened by special treatment with ceramics or by twisting with stainless steel, glass fiber, etc. Some of the brand names include DSM® Dyneema® or Global Glove Tuffalene®.

**Dexterity:** All glove manufacturers are continually improving their product offerings and searching for better protection for the industries and workers they are serving. To make a cut-resistant glove normally requires more material thickness to gain a higher cut level. However, recent developments and advancements have resulted in even thinner gauge cut-resistant yarns that are extremely cut resistant and even higher than ever before. The goal has always been to provide more comfort, dexterity, and bare-hand sensitivity for workers. The desired result is they will always wear their gloves to complete even tasks that require maximum motor dexterity and fine touch sensitivity. So, in construction jobs, it will be easier to convince workers to keep their gloves on and minimize the risks of hand injury.

**New advancements in cut-resistant fiber technology have resulted in more cut-resistant gloves than any other point in history.**

**Abrasion Resistance:** Abrasion resistance performance for the ANSI/ISEA 105 standard is measured using a Taber® rotary platform abrader. The exact same type of abrasion testing equipment is used throughout the textile industry to measure how long carpet and flooring will wear as a quality assurance measure.

A weighted load of either 500 grams or 1000 grams is applied to the special pumice H-18 abrasive wheels which turn the designated number of cycles on the surface of the glove material. The end-point of the test is when the sample has a hole all the way through the coating and the liner. (Table 2)

**Impact Protection:** Impact protection is needed in many different construction jobs as well as occupations such as mining, automotive mechanic work, or assembly. Many impact injuries to the dorsal or top of the hand can be reduced with the addition of impact pads to the gloves. Common materials for impact protection include TPR, TPU, and Silicone, though new material pads are and will continue to be developed to maximize protection, comfort, and dexterity. Many manufacturers will use impact test data from either ANSI/ISEA 138 or EN 13574 standard test methods to categorize impact protection. The impact protection ratings for ANSI/ISEA 138 are assigned based upon the amount or percent of impact force absorbed by the impact material. The greater the percentage absorbed, the less impact on the hand. Now that the standard is published with the ratings, manufacturers will search for the best impact materials that absorb the most impact force.

**Puncture Resistance Classification:** Puncture Resistance for the ANSI/ISEA 105 Performance Classification is based on EN 388:2003 for a nail-like probe. There are five performance levels based on the force (Newtons) to puncture. The results are determined from an average of 12 punctures. (Table 3)

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**Chemical Resistance:** Chemical Resistant Gloves have not seen many breakthrough products introduced in recent years. The main new gloves that offer protection from mixtures of chemicals include PVA/Nitrile gloves and TPE disposable gloves.

**Multi-Hazard Environment:** The future safety marketplace will always see an increase in multi-hazard gloves that protect from more than just one hazard. The reality is that there is never just one hazard. Combining the strengths of protection from mechanical, physical, and chemical risks will fit many of the new jobs of the future.

The new ANSI/ISEA 105 labeling icon from the upcoming edition of the ANSI/ISEA 105 American National Standard for Hand Protection Classification will provide an easy-to-use tool for assessing the proper glove for the hazard at hand. With a little knowledge of what the levels mean, employers in the construction industry can use the icon as an excellent tool in making decisions that will keep hands safer and also utilize better stewardship of financial resources. The new home plate design icon will help you hit a "homerun in hand protection." Protecting workers hands are what we are all about!

The ANSI/ISEA 105 American National Standard for Hand Protection Classification labeling icon design is not required by law, unlike CE Requirements in Europe. We do, however, feel that the practice of ANSI/ISEA labeling is very popular and that the new icon labeling design will catch on. Some companies have already started redesigning their labels to conform to the new labeling requirements. CS

*Donald F. Groce of Global Glove and Safety Manufacturing (www.global-glove.com) is an Analytical Chemist and longtime expert in protection of workers from exposure to hazardous chemicals and issues related to hand protection. He has published more than 50 articles related to exposure to hazardous chemicals, cut hazards, proposition 65 compliance, occupational allergies, and technical standards.*

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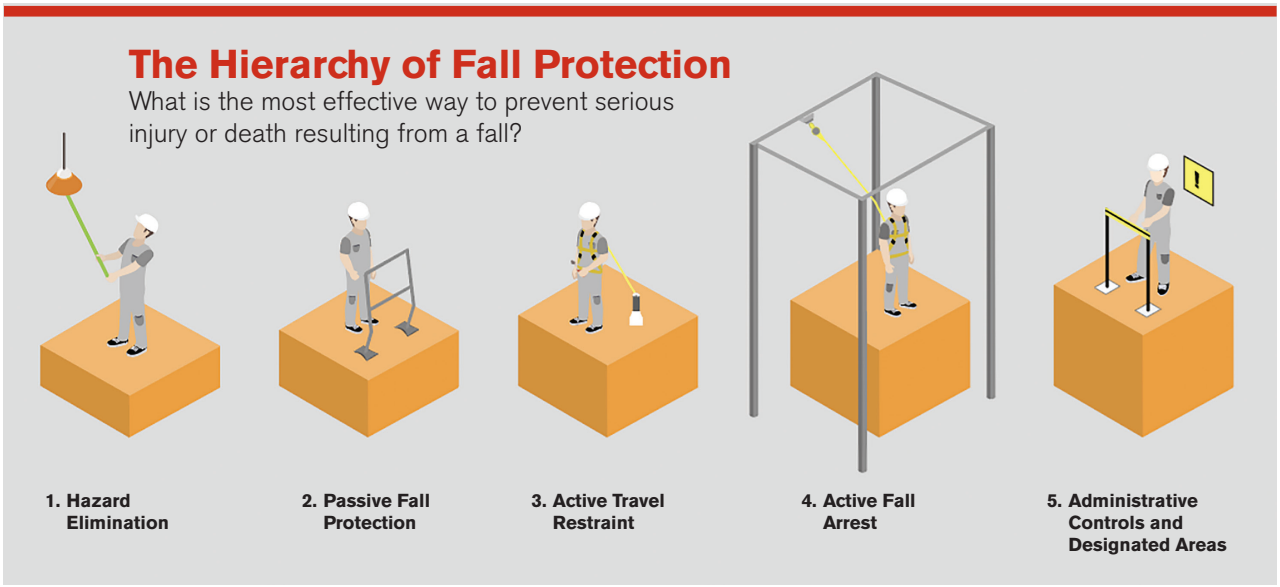
# How the Fall Protection Hierarchy Is Saving Lives in Construction

BY KEVIN KELPE, CONTRIBUTOR

Falls are the leading cause of fatality in construction, and according to the Bureau of Labor Statistics, construction has more fatal falls than any other industry. In 2020, one in five workplace deaths occurred in the construction industry, and 1/3 of those deaths were due to a fall to a lower level.

OSHA has made it one of its top priorities to fight back against these troubling statistics, and their National Safety Stand-Down to Prevent Falls in Construction is an example of this. During this annual campaign, OSHA and its partners attempt to raise awareness amongst workers and employers about fall hazards and best practices.

Besides raising awareness, OSHA also has strong regulations to combat workplace falls. Fortunately for those working in the industry, OSHA understands that construction is complex, and a one-size-fits-all regulatory approach doesn't work. OSHA's fall protection standard,




1926 Subpart M, reflects that.

Protecting your employees from a fall is a regulatory obligation, but when that obligation begins depends on the work they are performing. For example:

"29 CFR 1926.501(b)(1): Each employee on a walking/working surface with an unprotected side or edge which is six feet or more above a lower level must be protected from falling."

The above applies to most workers and situations you'll find on an average construction site, but not everything.

"29 CFR 1926.760(a)(1): Each employee engaged in a steel erection activity who is on a walking/working surface with an unprotected side or edge more than 15 feet must be protected from fall hazards."

The height limit went from six feet to 15 feet as the work changed. That is why, as with any regulation, you must read the fall protection standard diligently to identify what applies to you.

It is the employer's responsibility to identify and then eliminate or mitigate fall hazards in the workplace. If you have identified fall hazards in your workplace, the best method to address them is to apply the fall protection hierarchy.

### What is the fall protection hierarchy?

The fall protection hierarchy is a ranked system of fall protection solutions that range from the most effective to the least. Once you have identified a fall hazard, you apply the controls from the most effective to the least until you have eliminated the hazard or reduced the risk to a reasonable level. Let's explore this easy-to-apply and effective step-by-step method to eliminate fall hazards.

### Hazard Elimination

The most effective way to prevent someone from falling is to eliminate the fall hazard. When doing a hazard assessment, ask, does this hazardous situation need to be there? Can we change the process in some way to remove the hazard altogether?

### Passive Fall Protection

Creating a physical barrier between the workers and the fall hazard is the second most effective way to prevent falls. Things like a guardrail around a roof edge or a cover over a skylight are permanent, require no training or maintenance, and provide 24/7 protection.

### Active Travel Restraint

Active travel restraints are the third most effective method and use personal protective equipment to restrict a worker's range of movement. Think of it like a leash preventing the worker from being able to reach the fall hazard.

### Active Fall Arrest

Near the bottom of the list, active fall arrest systems are one of the least effective methods to protect workers from a fall. Think of it like a seatbelt; to do its job, you must be in an accident. It is always safer to prevent an accident than to attempt to limit the damage once it has occurred.

### Administrative Controls

Finally, administrative controls are the least effective way to prevent a fall. These rules attempt to change workers' behavior but are ineffective because they are easily ignored or misunderstood.

When it comes to preventing serious injury and death from falls, you have three options. You can change the work, change the workplace, or

change the worker. But employers should not only be concerned with their people falling but also consider what they might be dropping.

### The Impact of Dropped Objects in Construction

According to the Bureau of Labor Statistics, dropped objects killed 255 workers in the United States in 2016. Things like radios, hard hats, wrenches, pliers, and construction debris are commonly dropped accidentally and pose a significant hazard to workers below.

A single falling object can seriously injure or kill a construction worker, and it doesn't have to weigh much to cause severe damage. In 2015 a New Jersey man delivering drywall to a construction site was fatally killed when he was struck in the head by a 1 lb tape measure that fell from the 50th floor. Unfortunately, tragedies like this are far too common in construction, which is why employers and workers must take preventative action to stop dropped objects.

### What can you do to stop dropped objects?

Many still don't understand the danger that dropped objects pose to worker safety within construction. Therefore, one of the most significant first steps to prevent dropped objects is educating your workers on the risks. After that, securing tools and equipment, storing materials away from edges, and installing safety nets can make a huge impact.

Finally, installing guardrails and toe boards is another effective way to prevent dropped objects. Construction sites can get messy, with tools and materials left in piles on the ground. You can significantly reduce the potential to accidentally kick those items over the edge if you have a barrier like a toe board there to stop it.

When it comes to workplace falls and dropped objects, gravity can have severe consequences if not managed correctly. Therefore, a business must be proactive if they want to provide a safe workplace for their employees, maintain regulatory compliance, and avoid costly and reputation-ruining accidents. CS

*Kevin Kelpe is a workshop facilitator and instructor from Diversified Fall Protection. He is a credentialed continuing ed provider for AIA and IIBEC and has issued hundreds of learning units to architects, engineers, and safety professionals. His live courses and webinars focus on fall protection codes, standards, and solutions to protect window cleaners, maintenance professionals, and other workers at-height. Learn why conducting a fall hazard assessment of your facility with the fall protection professionals can help you at www.fallprotect.com/solutions-by-market-segments/construction.*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# FIVE SIMPLE WAYS TO IMPROVE CONSTRUCTION SITE SAFETY

BY JAMES STROHECKER, CONTRIBUTOR

Time is money on a construction worksite.

You face constant pressure to meet deadlines and stay within budget. Sometimes, this causes worker safety to fall to the wayside.

These strategies can help improve health and safety in construction on any jobsite:

### 1. Set Safety Expectations

As a project/safety manager, it's important to "walk the talk" when it comes to workplace safety and health. "The example you set, and the way you talk to workers about safety, has a huge impact on the company's safety and health program, safety culture, and ability to reduce injury and illness," according to OSHA. When workers are able to recognize the value management has for their well-being, it helps build trust.

Research shows that workers are more likely to value and internalize safety messages when they are occasionally delivered by higher level management, rather than passed down in the chain of command.

Make it clear that it's everyone's responsibility on the jobsite to follow rules, procedures, and best practices to prevent incidents. Incorporate safety language into policies and procedures so it becomes ingrained as a natural part of a worker's daily routine.

Start each workday with an informal "Toolbox Safety Talk." This makes safety managers' jobs easier and improves a worker's understanding of safety expectations. The informal safety talks reduce inconsistencies and chances of error. Toolbox Talks are one of the most effective means of reinforcing safety to workers. The Toolbox Talks spark discussion on general safety and help share information about the need for safer tools, equipment, materials, and processes.

### 2. Promote a Non-threatening Environment

Always encourage employees to speak up when they see something going wrong; this can significantly help to avoid incidents, injuries, and fatalities.

To increase participation, make sure workers feel comfortable asking questions and raising safety concerns (and suggestions) without fear of retaliation or bullying. This will make it easier and quicker

to address and prevent issues.

OSHA has found that managers often avoid giving feedback to avoid confrontations. If improvements to a worker's performance can be made, approach them in a constructive, positive way. Make sure to stay clear of judgmental statements and criticisms and focus on the behavior itself – not the person and their values or personality.

The authors of Crucial Conversations conducted a survey of 1,500 workers in 22 organizations and found 93% of employees say their workgroup is currently at risk from a safety issue that is not being discussed. In addition, almost half knew of an injury that occurred because someone didn't speak up. Trust and quality of relationships heavily influence the safety and overall productivity of workers.

### 3. Plan Ahead

A thoughtful planning process can help the workday start more efficiently and safely.

- Ensure all prework activities, such as approvals, are completed before work begins.
- Implement zoning to block off areas where certain tasks will take place. Install nets and catch platforms.
- Stage and stock each work area with the necessary tools, PPE, and equipment before the workday begins. This will make it easier and safer for workers to access what they need.
- Make sure to supply the right tools for the right tasks, and double check that workers understand how to properly operate the equipment they'll be using.
- Eliminate hazardous distractions and obstructions by reinforcing consistent housekeeping practices on the jobsite.
- And apply any other signage and protective safety measures.


**Make it clear that it's everyone's responsibility on the jobsite to follow rules, procedures, and best practices to prevent incidents.**

### 4. Take Advantage of Technologies

Provide new opportunities to address safety challenges and experience immediate cost savings. Technology can be worth the investment to help bridge time and distance constraints, improving efficiency and safety in the long term.

The growth of digitization in construction now makes it possible to make real-time decisions remotely. Unmanned aerial vehicles (UAVs), known as drones, are already in use in the industry and provide a convenient way to conduct site inspections, observations, and safety audits. Managers can use smartphones, tablets, and project management software to share project data instantaneously from remote worksites and to workers and other onsite supervisors using a cell phone or tablet. Allowing everyone to have immediate access to the same information eliminates costs of equipment that must be updated and maintained, and it keeps everyone consistently on the same page.

A recent report by Dodge Data & Analytics found that 82% of contractors who use wearable technology see instant site-safety improvements. Wearable devices like smart watches, glasses, and clothing allow managers to have better visibility of the worksite and workers. These devices can alert managers to activities and improve response time when injuries occur.

Example: Safety Managers and designated site personnel, and medics can be alerted and respond immediately when an employee slips, trips, or falls.

These devices also keep track of locations of workers and procedures on the job site. Other trigger alarms can streamline evacuation procedures in the event of an emergency.

### 5. Use Easily Implemented Safety Solutions

Here are ways to help workers identify hazards to create and maintain a safe jobsite:

1. Train all employees about the hazards they may face.
2. Conduct a complete walk-through of the site to identify hazards before breaking ground. Make note of these, so you can mitigate them using engineer controls, safe work practices, PPE, signage, or regular maintenance.
3. Create a site safety plan that accounts for all potential hazards as well as provides a means to respond to any accident.
4. Identify all hazardous materials and labeling them according to HazCom 2012.
5. Inspect the worksite on a daily basis to identify new hazards and malfunctioning equipment. Immediately report and fix any issues found.
6. Ensure employees have the

necessary PPE to perform work safely. This includes hard hats, eye protection, gloves, work boots, hearing protection, respiratory protection, fall protection, and more.

7. Create an injury and illness prevention program. Programs should include first aid training, supplies needed to treat common workplace injuries, and a means to contact local emergency services.
8. Identify hazards and communicate safe work practices using vivid labels and signs.
9. Comply with OSHA and ANSI standards and reinforce safety anywhere on the work site.
10. Create clear and effective communication at all times. Operations can easily communicate with workers in different areas on a jobsite through safety signs and labels.

OSHA's Safety and Health Regulations for Construction: OSHA 29 CFR 1926 serves as a baseline for safety requirements. Safety management in construction must reinforce these regulations and go beyond by continuously leading by example and making safety a priority before work begins. By setting clear expectations for safety from the beginning, managers can set the tone to ensure each worker understands their personal responsibility for safety. This will help everyone work together toward the common goal of preventing injuries.

Utilize OSHA's website for a variety of topics from emergency planning, tool and equipment safety, ladder safety, personal protective equipment, and more to help create or obtain a presentation. Always make sure the content is relevant to your specific work site and feature engaging elements like visuals and anecdotes that workers can connect with.

Implementing each of these strategies will help to reduce downtime and injuries, and can help improve morale, productivity, and revenue through more efficient time-to-completion. CS

*James Strohecker is the Director of Marketing Innovation at Graphic Products + DuraLabel (https://www.graphicproducts.com). Graphic Products is a leader in delivering innovative design software, industrial sign and label printers, all-purpose floor marking, multi-language signs and labels, and colored pipe markers for any facility's compliance and safety requirements. Learn how to create safety signs that meet OSHA requirements with the Best Practice Guide to OSHA Safety Signs. This helpful guide breaks down all the requirements, from text size to color and graphics.*

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Manufacturers are now incorporating innovative safety features into their tools – especially those performing heavy-duty applications – in order to protect against vibration, loss of user control, and dust. *Image courtesy of DEWALT*

# The Three Safety Measures Often Overlooked on the Jobsite

BY RICHARD CACCHIOTTI, CONTRIBUTOR

Construction safety comes in many forms – from PPE requirements to proper equipment and protocol training, to the planning and guidance of a qualified safety manager. But did you know that the design and ergonomics of the power tools professionals use on the jobsite every day also fall into this category? Manufacturers are now incorporating innovative technology driven safety features into their tools – especially those performing heavy-duty applications – in order to protect against vibration, loss of user control, and dust. Each are incredibly important and can be contained by choosing tools that are optimized for user safety, without sacrificing performance.

## Reducing Vibration

After years of research and conversations with workers on the job, power tool manufacturers recognized the need for solutions that mitigate vibration. Tasks like demolition, and concrete and masonry work, require tools that generate heavy vibration from the impact

against hard surfaces. Today you'll find that most tool makers now incorporate vibration reduction systems in equipment like rotary and demolition hammers, which are some of the biggest contributors to hand/arm vibration exposure.

Mechanisms are now built into tools to help reduce vibration felt at the handles with the purpose of having the tool absorb the shock, rather than the user. Using the rotary and demolition hammer as the example, you will now typically see a small rubber accordion covering the handles, an internal counterbalance weight, or a free-floating mechanism/motor. Both the counterbalance and free-floating mechanism are internal to the tool and seamless in the design.

## Increasing User Control

Keeping the user in control of their tool not only keeps workers on task but helps to provide protection particularly in drilling and cutting applications where jams may occur. To reduce the likelihood of bind-ups, manufacturers are now building clutch reducing technology into heavy-duty drills. This system detects the motion of the tool and shuts it down in bind-up situations, helping to minimize sudden torque reaction compared to standard clutches. In addition, some tools like grinders now feature a brake that stops the wheel when a pinch is detected. And finally, integrated solutions like lanyards allow users to tether tools to rigid structures when working at height to secure the tool in case it is dropped.

## Containing Dust

DEWALT has been on jobsites providing dust management solutions to its users for years. Manufacturers are making it a priority to not only focus on dust extraction equipment, but the application as a whole, including the tool, accessory, and extractor to create a seamless, easy-to-follow system.

**Keeping the user in control of their tool not only keeps workers on task but helps to provide protection particularly in drilling and cutting applications where jams may occur.** *Image courtesy of DEWALT*

**Today you'll find that most tool makers now incorporate vibration reduction systems in equipment like rotary and demolition hammers, which are some of the biggest contributors to hand/arm vibration exposure.**

Users should be implementing grinding, cutting, and drilling shrouds as well as extractors and extraction accessories that capture dust in-application. Capturing dust before it is emitted into the air has three benefits: it reduces the amount of airborne silica particles that users can potentially inhale, increases user visibility for safe, uninterrupted work, and cuts down on tool maintenance costs from prolonged wear and exposure to particles.

To provide an example, the 1-1/8-in. Rotary Hammers cover a large drilling range but are really designed around anchors needing 8-in. embedment. This covers 1-in. diameter holes ideal for mechanical anchors that are typically used in shoring and beam anchorage. It is important to have a solution for onboard extraction for this application. Additionally, a 1-in. Rotary Hammer is now offered with on-board extraction to work with stop bits for users doing work with post-tension cable and Mini-Undercut+ Anchors. This is an important improvement for two major reasons; standard dust collection heads across the industry don't typically work with stop bits and striking post-tension cable is dangerous to the craftworker.

With experience, testing, and education, built-in safety features are making their way into standard product development practices within the tools industry. CS

*Richard Cacchiotti is the Director of Product Development, Commercial Products, DEWALT (www.dewalt.com).*

# Protecting Construction Workers from Heat Stress

BY NICOLE RANDALL, CONTRIBUTOR

Our world is getting hotter. Last July was the warmest month ever recorded on Earth, according to the National Oceanic and Atmospheric Administration (NOAA). Scientists are studying the causes. And well-intended people can argue over whether humans are to blame.

But the actual fact of rising temperatures means we have to be both humble and serious about the need to protect ourselves from heat's effects. Staying cool on the job is especially important for construction workers, who are literally on the front lines of rising heat.

## It's Time to Act

Will this summer meet or exceed 2021's temps? Time will tell. The long-term trend is clear, though. "As average global temperatures continue to rise, the threats of both extreme heat events and chronic heat are projected to increase," observed the American Planning Association (APA).

And the impact will be especially felt in urban areas, where buildings, roads, and other paved surfaces contribute to "urban heat islands." The APA even published a special report on the urban heat challenge for planners: Planning for Urban Heat Resilience.

According to the report, "Increases in both chronic and acute heat risks are compounding dangers for cities in historically hotter regions and posing new threats for cities in historically more temperate and colder climates."

APA added, "Cities in historically colder regions are often less prepared for heat, as they have lower adoption rates of indoor cooling and less experience managing extreme heat events. In areas with higher humidity, even small temperature increases can increase the danger to human health."

## The Dangers of Heat Stress

Those health risks are not to be taken lightly. When it comes to heat stress, the consequences of making a wrong call can be deadly.

The Centers for Disease Control and Prevention (CDC) reported that, on average each year in the U.S., heat is responsible for 67,512 emergency department visits, 9,235 hospitalizations, and 702 deaths.

## Prevention Measures in Place

The Occupational Health & Safety Administration (OSHA) is taking workplace heat stress seriously. The agency announced the beginning of regulatory action last October when it issued an Advanced Notice of Proposed Rule Making for Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings in the Federal Register. This April, OSHA launched its National Emphasis Program to protect millions of workers from heat illness and injuries. (Here's a PDF fact sheet about the NEP.)

OSHA says it plans to proactively initiate inspections in indoor and outdoor work settings of 70+ high-risk industries when the National Weather Service has issued a heat warning or advisory for an area. And OSHA inspectors and compliance assistance specialists will engage in proactive outreach and provide technical assistance on days when the heat index is 80 degrees Fahrenheit or higher.

The need for rest is integral to a workplace heat stress prevention program. There are three essentials of such a program:

- Heat awareness training.
- Making water, rest, and shade available.
- Providing personal protective equipment (PPE) that cools the body and mitigates the effects of heat.

The International Safety Equipment Association (ISEA) provided OSHA with the following insights about using water, rest, and shade to prevent workplace heat stress:

- The water needs to be located near the work being done and should be cold (or at least cooler than ambient air).
- Rest should suit the type of working being done. The more strenuous the work, the more breaks should be taken.
- While work in outdoor settings sometimes means exposure to direct sunlight is unavoidable, providing a shade structure to block direct sunlight can reduce temperatures by 15 degrees Fahrenheit (F). Rest breaks in vehicles are not advised unless there is always adequate space for all employees.

## The Role PPE Plays

High-quality cooling PPE is a vital investment for every construction workplace today and should be a top priority. Workers need to use it every day when the heat index hits 80 degrees (F), even when they're doing indoor work.

- When worn correctly and when use instructions are followed, cooling PPE can reduce the surface of the skin temperature and aid in maintaining core body temperature.
- Cooling PPE should be worn on areas of the body where there are large blood vessels located near the surface of the skin (neck, arms, and core).
- Studies indicate cooling PPE coverage on the body is directly correlated to its effectiveness. (A vest covering the core, for example, is more effective at cooling the body than a towel or bandana on the neck.)

ISEA actually organized an internal Heat Stress Product Group, which will be fully functional this summer, to help support member companies that provide cooling PPE. ISEA is also looking at possibly developing a heat stress solutions standard, which would spell out performance metrics for heat stress PPE.

And this summer, ISEA and its members are giving out heat stress PPE for free. An online PPE giveaway is running through the summer, with winners chosen each week. Be sure to sign up for a chance to win a cooling towel, vented apparel, a phase-change vest, cooling headwear, a large worksite cooler, and more. Enter at safetyequipment.org/heatstress.

Rising temperatures pose an imminent threat to all workers that are exposed to the elements and keeping these men and women safe deserves our attention. Because of the hotter world we're headed into, outdoor workplaces of all types have to build smarter ways of staying cool on the job. As we sweat our way through another summer, ISEA and its members plan on doing their part to keep workers on construction sites from burning out. CS

*Nicole Randall is the Director of Marketing and External Affairs for ISEA. Headquartered in Arlington, Virginia, the International Safety Equipment Association (ISEA) is the trade association in the U.S. for personal protective equipment and technologies. Its member companies are world leaders in the design, manufacture, testing, and distribution of protective clothing and equipment used in factories, construction sites, hospitals and clinics, farms, schools, laboratories, emergency response, and in the home. Since 1933, ISEA has set the standard for the personal protective equipment industry, supporting member companies united in the goal of protecting the health and safety of people worldwide.*

# Silica Standard Update:

## What You Need to Know

BY ROBERT T. LAHEY, CONTRIBUTOR

On March 25, 2016, the Occupational Safety and Health Administration (OSHA) released the final rules for Occupational Exposure to Respirable Crystalline Silica, 29 CFR 1910.1053 (General Industry & Maritime) and 29 CFR 1926.1153 (Construction Industry). Since the release and subsequent implementation date in construction of September 23, 2017, there have been three key aspects of note that may impact the rule going forward.

The first stems from the petitions to review the rule made by both labor and industry in 2016. The U.S. Court of Appeals for the District of Columbia Circuit decision on December 22, 2017, upheld only one of labor's petitions regarding the absence of medical removal protection (MRP) within the medical surveillance requirements of the standard, rejecting all others from labor and industry. This was remanded back to OSHA for further consideration. An advanced notice of proposed rulemaking (ANPR) was issued in March of 2022, indicating that OSHA is about to begin looking into the feasibility of implementing MRP for silica (https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202110&RIN=1218-AD31).

Medical removal protections have been included in other OSHA health standards, such as for occupational exposures to benzene, cadmium, cotton dust, formaldehyde, lead, methylene chloride, methylenedianiline, and vinyl chloride. In these health standards, biological monitoring of the blood and/or urine or pulmonary function testing of employees is required when airborne exposures exceed the action level for the standard. If measured results exceed a trigger level, the employee must be removed from exposure and monitored until it is determined that they can return to work or be permanently removed from further exposure to that chemical. While the worker is recovering, they may work at an unexposed job or be compensated at their normal pay while additional medical testing is performed to determine when or if they may return to work. If the employee files a worker compensation claim, their pay during the removal protection period is reduced by any award from that claim. In essence, they must maintain the earnings, seniority, and other employment rights and benefits as though the employee had not been removed from the job or otherwise medically limited for the specified period during recovering. That specified time varies depending on the regulation (e.g., from six months to up to 18 months). In addition, there are specific record-keeping requirements for medical removal under 29 CFR 1904.9, and record retention requirements for the medical evaluations under 29 CFR 1910.1020 (29 CFR 1926.33) of duration of employment plus 30 years.

For respirable crystalline silica, the health effects that the medical surveillance requirements address are silicosis, chronic obstructive pulmonary disease (COPD), lung cancer, tuberculosis (TB), and kidney disease. The medical tests that are required include pulmonary function testing (PFT), chest X-ray (read by a B Reader) and TB skin testing. Standard urinalysis is performed as part of the required physical and may show signs of kidney disease. Of these diseases caused by exposure to respirable crystalline silica, TB is

treatable with drug therapy for six to twelve months and would not require removal from work. However, it would be recordable under 29 CFR 1904.11. If the PFT indicates restriction (silicosis) or obstruction (COPD) of the lungs, the severity may require MRP similar to those found in the Cotton Dust standard, 29 CFR 1910.1043. If silicosis or lung cancer is discovered by X-ray, MRP may also be required. And lastly, urinalysis indicating kidney disease may require MRP, as well. Depending on severity, these may require permanent removal from silica exposure for silicosis, COPD, lung cancer, and kidney disease diagnoses.

The next key potential change in the construction standard is the update to Table 1. The respirable crystalline silica standard for construction is unique in that it affords contractors the ability to utilize a table in lieu of performing exposure assessments (i.e., air sampling) for common tasks that are performed which may result in exposures exceeding the Action Level (AL) of 25 µg/m3. When the standard was developed, 18 common construction tasks were listed along with available engineering controls to be used. If the use of those controls were not sufficient to reduce exposures below the Permissible Exposure Limit (PEL) of 50 µg/m3, the use of respirators to achieve that protection are listed in the third column of the table, depending on how long the task is performed (<4 hours or ≥4 Hours), and whether the task is performed indoors/in an enclosed area or outdoors. Some common tasks with potential exposures exceeding the AL in construction such as mortar mixing, and finish sanding of drywall joint compound were excluded. In addition, since the rule was promulgated, new advances in engineering controls not listed in the table have been developed. For those reasons, a Request for Information (RFI) was issued by OSHA on August 15, 2019. The comment period ended on October 15, 2019 and an ANPR will likely be issued this summer (https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202110&RIN=1218-AD18).

The last aspect is enforcement. On February 4, 2020, OSHA issued a compliance directive, CPL 03-00-023 - National Emphasis Program – Respirable Crystalline Silica (https://www.osha.gov/sites/default/files/enforcement/directives/CPL_03-00-023.pdf). Due to the pandemic, the enforcement was delayed. However, in fiscal year 2021, the most frequently cited serious violations in Subpart Z, Toxic and Hazardous Substances, were all for respirable crystalline silica (https://www.osha.gov/sites/default/files/MFC_Construction_FY21.pdf). Area offices are to target enforcement in construction based on North American Industry Classification System (NAICS) codes, randomly assigning numbers to contractors to determine who is visited and when. As this is OSHA's fourth priority for inspection, following imminent danger, fatalities and catastrophes and employee complaints/referrals, they will be including silica on their list of high hazard inspections comprising an estimated 2% of their inspections in each Federal Region.

In their 2018 to 2022 Strategic Plan, the U.S. Department of Labor is targeting high risk industries. They estimate that roughly 1,100,000 construction workers are exposed above the AL and roughly 850,000 are exposed above the PEL each year. They also recognize that the PEL should not be considered a "safe level." This is evident by other federal agencies, such as the U.S. Department of Energy, requiring contractors to control respirable crystalline silica exposures to 25 µg/m3. These potential changes and the current enforcement focus will hopefully better protect workers and further reduce their health risks. CS

*Robert T. Lahey is the President & CEO of Chicagoland Construction Safety Council (www.buildsafe.org).*

# What are Your OSHA Compliance Obligations in the Construction Industry?

BY MARK MORAN, CONTRIBUTOR

As an employer in the Construction Industry your OSHA obligations fall into three general categories:

1. A general duty to maintain a workplace free from recognized hazards that are likely to cause death or serious physical harm to your employees. That is part of the OSH Act known as the "General Duty Clause". Its wording is rather ambiguous and indefinite. It is not used very often as the basis for the citation and it is not supposed to be;
2. Observe all applicable Occupational Safety and Health Standards (OSHA Standards) in the Construction Industry (1926) promulgated by the Secretary of Labor. There are thousands of OSHA Standards. Most OSHA citations to date have alleged violations of OSHA Standards. Understanding and observing them is, therefore the most important of the three employer responsibilities listed here; and
3. Virtually every employer is obligated to keep records of their employee's recordable injuries and illnesses, report work- related employee fatalities and multiple hospitalizations to OSHA, and display an OSHA supplied poster that provides general information on the OSH Act.

## What are the OSHA Construction Standards?

Shortly after the OSH Act went into effect in 1971, the Secretary of Labor, under the authority delegated by Congress, adopted thousands of Occupational Safety and Health Standards. In subsequent years, additional standards have been added and some of those standards have since been revised.

The standards sometimes apply to all employers, as do fire protection standards, for example. A great many standards, however apply only to workers while engaged in specific types of work. Two examples are shown below:

**Example No. 1 – First Aid & Medical**
***First Aid and medical*** *- Medical care shall be made available by the employer for every employee covered by these regulations. Regulations prescribing specific requirements for first aid, medical attention, and emergency facilities. 29 CFR §1926.23.*

**Example No. 2 - Fall Protection**
***Fall Protection*** *-Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems. 29 CFR §1926.501*

It is the obligation of all employers and employees to familiarize themselves with the OSHA Standards that apply to them, and to observe them always. Once an OSHA Standard has been adopted, it is published in the Code of Federal Regulations (CFR).

The CFR is divided into 50 "titles" that cover all regulations, adopted by all Federal agencies. Each "title" is designated by a number beginning with "1" and ending with "50". The OSHA Standards are part of the Title 29, the section of the CFR assigned to labor regulations.

Title 29 is further subdivided into various CFR "Parts" covering specific regulatory areas. We are only concerned with three of

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the CFR Parts that apply to private employers as follows:

### Code of Federal Regulations

1. *29 CFR Part §1903 - Inspections, Citations, and Proposed Penalties*
2. *29 CFR Part §1904 - Recording and Reporting Occupational Injuries and Illnesses*
3. *29 CFR Part §1926 - Occupational Safety and Health Standards for Construction Industry*

### Complying with OSHA Requirements

The heart of OSHA compliance is becoming aware of its published standards, which address specific hazards. The standards are divided into four major categories based on the type of work being performed. The four groups of standards are:

1. *Construction (29 CFR Part §1926);*
2. *General Industry (29 CFR Part 1910$;*
3. *Maritime (29 CFR Parts §1915, §1917, §1918, and §1919); and*
4. *Agriculture (29 CFR Part §1928).*

Construction Industry (29 CFR Part §1926) - Includes standards for Fall Protection, exit routes; emergency action plans and fire prevention plans (means of egress); work platforms; ventilation; radiation; hazardous materials; personal protective equipment; sanitation; medical and first aid; fire protection; compressed gas/ air equipment; material handling and storage; machinery and machine guarding; welding, cutting and brazing; electrical wiring and electronics; commercial diving; toxic and hazardous substances.

Construction industry standards apply to any type of employment in any industry, including General Industry, shipyard employment, and agriculture, to the extent that standards for these other industries do not apply.

There is also a general duty under OSHA to maintain a safe workplace, which covers all situations for which there are no published standards. Thus, you aren't off the hook merely because you complied with all the specific written standards that apply to you. You also must be aware of safety hazards that come with new technology or unusual situations the government might not have thought of.

Complying with the Construction Industry Standards (29 CFR Part §1926) requires many different types of activities:

- Installing physical safeguards or engineering controls (for example: guardrails or fire extinguishers);
- Meeting work practice requirements through employee training, company work rules, and supervision on the job;
- Monitoring for air contaminants;
- Providing employees with personal protective equipment;
- Conducting tests and inspections of equipment;
- Recordkeeping; and
- Using safety devices and equipment

OSHA Construction standards have the same status and effect as regulations adopted under other federal laws similar to the Internal Revenue

| Part 29 CFR 1926 Remaining 26 Subparts | |
|---|---|
| Subpart C | General Safety and Health Provisions |
| Subpart D | Occupational Health and Environmental Controls |
| Subpart E | Personal Protective and Life Saving Equipment |
| Subpart F | Fire Protection and Prevention |
| Subpart G | Signs, Signals and Barricades |
| Subpart H | Materials Handling, Storage Use and Disposal |
| Subpart I | Tools - Hand and Power |
| Subpart J | Welding and cutting |
| Subpart K | Electrical |
| Subpart L | Scaffolding |
| Subpart M | Fall Protection |
| Subpart N | Cranes, Derricks, Hoists, Elevators, and Conveyors |
| Subpart O | Motor Vehicles, Mechanized Equipment, and Marine Operations |
| Subpart P | Excavations |
| Subpart Q | Concrete and Masonry Construction |
| Subpart R | Steel Erection |
| Subpart S | Underground Construction, Caissons, Cofferdams, and Compressed Air |
| Subpart T | Demolition |
| Subpart U | Blasting and the Use of Explosives |
| Subpart V | Power Transmission and Distribution |
| Subpart W | Rollover Protective Structures & Overhead Protection |
| Subpart X | Stairways and Ladders |
| Subpart Y | Commercial Diving Operations |
| Subpart Z | Toxic/ Hazardous Substances |
| Subpart AA | Confined Spaces |
| Subpart CC | Cranes & Derricks |

Service (IRS) Code, for example. You must comply with them, or you can be penalized with citations and fines.

An employer must comply with the safety and health regulations in Part 29 CFR 1926 if its employees are "engaged in construction work" (29 CFR 1926.12(b)). This is defined as "work for construction, alteration, and/or repair, including painting and decorating that no contractor or subcontractor contracting for any part of the contract work shall require any laborer or mechanic employed in the performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety, as determined under construction safety and health standards is being performed".

Part 1926 Construction standards include (Subpart A through Subpart CC), but Subparts A and B apply only to determining the scope of section 107 of the Construction Safety Act, 40 USC 333. That Act applies only to employers who are engaged in construction under contract with the US government. OSHA does not base citations upon either Subpart A or B. Consequently, no further consideration will be given to them. Employers engaged in construction should read over each of those subparts and identify those that could be applicable to their own operations, and then read the discussion of those subparts that follows. CS

*Mark Moran is currently the President of OSHA Nation.com, a software company dedicated to helping businesses comply with safety regulations. He also is the author of a book called "The OSHA Answer Book for the Construction Industry". To receive a 15% discount, call 1-855-872-6742 or go to OSHANation.com*

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