



Next-Gen Hand Protection for Construction Professionals

OSHA Mandates and Advanced Technologies Usher in Groundbreaking PPE for the 21st Century

Occupational injuries have consistently plagued the construction industry more than any other – with a reported incidence rate more than double the overall industrial average – and account for millions of dollars in lost productivity and compensatory spending each year. Of these, none are as equally preventable and costly as hand injuries. In fact, the Bureau of Labor Statistics reported that in 2007, hand and arm injuries alone – most commonly in the form of severe cuts, abrasions and puncture wounds resulting from handling rough or sharp materials – accounted for one third of all construction-related injuries. These injuries translated to a staggering \$382 million in disability costs –roughly \$17,000 per each injured construction worker – after accounting for workers’ medical costs and lost time, jobsite downtime and site clean up.

Unfortunately, despite these alarming figures, experience shows that many of the most commonly reported hand injuries could have been prevented through the proper use of job-appropriate personal protective equipment. In an effort to remedy the problem, the U.S. Department of Labor’s Occupational Safety and Health Administration (OSHA) established new mandates in November 2007 specifying that all employers must provide adequate and job-specific personal protective equipment (PPE) for their employees at no cost and enforce its use. In May 2008, OSHA also began to cite violators and impose heavy fines, up to \$7,000 per violation, to reinforce the importance of adhering to the regulations.

However, since OSHA’s PPE mandates went into effect, nearly 60 percent of construction workers have continued to perform all work tasks barehanded. Furthermore, more than half of those who do wear gloves or have gloves provided remove them at some point during the day so they can complete certain tasks. This means that nearly 80 percent of workers in the construction/do-it-yourself (DIY) industry do not wear gloves throughout their entire work day as required by OSHA and their employers.

So why are construction workers hesitant to wear gloves or keep them on throughout an entire day’s work tasks? Most often, workers indicate that most work gloves are not comfortable enough to wear all day and don’t provide adequate dexterity making it tedious and unbearable to perform many intricate tasks. As a result, workers who wear gloves often remove their gloves to complete a certain task and subsequently find it faster and easier to continue working without them.

Choosing Hand Protection: Not All Gloves Are Created Equal

In the past, construction companies typically provided workers with lightweight cotton or leather gloves as a primary means of protecting them from cuts, punctures and abrasions. However, given this new insight into workers’ needs, we now know that in order to prevent hand protection from being counter-productive gloves need to provide high levels of comfort, dexterity and protection they need to complete their jobs, which can vary based on the many different materials, applications and tasks from site to site.

Before considering a particular hand protection product, it is vital to first evaluate the job at hand. Many construction workers – particularly general laborers, carpenters, cement finishers, HVAC workers, masonry workers and stone tile handlers – require a high level of protection from cuts, punctures and abrasion, depending on the application. Carpenters, for example, face the threat of cuts and punctures from splintered and jagged pieces of wood. Cement finishers, on the other hand, need products that will protect them from abrasions and dermatitis issues that may occur while handling concrete.

After application-specific needs are determined, it is important to carefully consider a number of factors critical to the wearer’s comfort and protection:

- **Durability and Cut Resistance**

First, it is important to consider the glove material and its ability to resist tears and abrasion. Because

most products will be used for extended periods of time, it is important to ensure that they will be able to provide the same level protection at the end of the shift as they did at the beginning. Today's advanced technologies have paved the way for new and innovative products that offer unmatched protection – some up to 300 percent more abrasion and cut resistance than traditional leather gloves – while preserving comfort, dexterity and overall worker productivity.

In addition to durability, it is also vital to select hand protection with an adequate level of cut resistance. In order to provide a benchmark for varying levels of cut resistance, the American National Standards Institute (ANSI) has established performance levels derived directly from the Cut Protection Performance Test (CPPT). The test differentiates the cut resistance of common materials by measuring the weight needed to make a standard blade slice through a protective material in a one-inch stroke. Protection levels range from Level 1 – which commonly includes everyday fabrics such as lightweight cotton and polyester/cotton blends that provide minimal cut protection – to Levels 3, 4 and 5, which include exceptionally protective fabrics.

Depending on the application, construction personnel such as HVAC workers and carpenters may need gloves with a Level 3 or Level 4 rating for high levels of cut protection. However, no matter the level of cut resistance a product provides, most glove manufacturers do not recommend using cut-resistant gloves to protect against powered devices such as saws and drills, as most gloves are tested for use with only non-powered blades and tools.

- **Grip and Dexterity**

Adequate grip and dexterity should be carefully evaluated when choosing a hand protection. In addition to preventing slipping and slicing, gloves with high levels of grip often decrease the force required to perform a task and provide the wearer with more control. Most workers — including general material handlers, electricians, carpenters, equipment operators and plumbers — require higher levels of dexterity and dry and/or wet grip. This can generally be achieved through coatings applied to the outside surface of gloves, which can increase cut protection and promote grip while protecting hands from oil and other fluids.

A natural rubber coating, for example, provides a high level of cut resistance and enhances grip. Nitrile and foam nitrile coatings can also help to protect against snag, puncture and abrasion while promoting comfort and chemical resistance and repelling oil. Fully coated nitrile gloves are available that provide excellent chemical protection. New technology includes microscopic channels in a thin nitrile layer that direct fluids away from the grip surface. This leaves a significant dry contact area that enables workers to achieve a secure grip on pipes, tools and other surfaces without exerting excessive force. Polyurethane-coated gloves resist snags and abrasion and promote a good dry and wet grip as well.

- **Fit and Comfort**

While nearly all glove materials offer some level of cut resistance and grip, it is critical that users also consider other factors, such as overall fit and comfort, to assure the highest levels of performance and protection. Hand protection products that are too large, for example, will slide around on the hands and not provide protection where it's needed, or they may slide off the hands. Conversely, gloves that are too snug will decrease dexterity and may become uncomfortable enough during the day that workers will remove them.

Many products are now available with cool, stretch liners – made of cotton or a cotton/polyester blend, LYCRA® or a LYCRA and nylon blend – that improve worker fit and are soft on the hands. Knitted products can also enhance worker comfort and gloves featuring variable stitching in high stress areas such as the knuckles can help to ensure maximum levels of dexterity, flexibility and long-term comfort. Form-fitted, ergonomically designed gloves are also available that are designed to enhance comfort and allow workers to keep their gloves on throughout the day.

Summary

While requirements for hand protection will undoubtedly vary from job site to job site, it is imperative to recognize the importance of wearing appropriate hand protection regardless the application. While recent OSHA mandates will likely help to provide a more consistent understanding of job-appropriate hand protection within the construction/ DIY industry, construction companies should do their part by

proactively consulting with industry experts for assistance in selecting hand protection products for employees working in specific applications.

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Author's note: All recommendations should be taken with caution. Further, these recommendations are based on laboratory tests and are intended as a guide for qualified professionals engaged in assuring safety in the workplace. Because Ansell has no detailed knowledge of or control over the conditions of end use, any recommendation must be advisory only, and Ansell fully disclaims any liability including any warranties (whether express or implied) or guarantees related to any statement contained herein.

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