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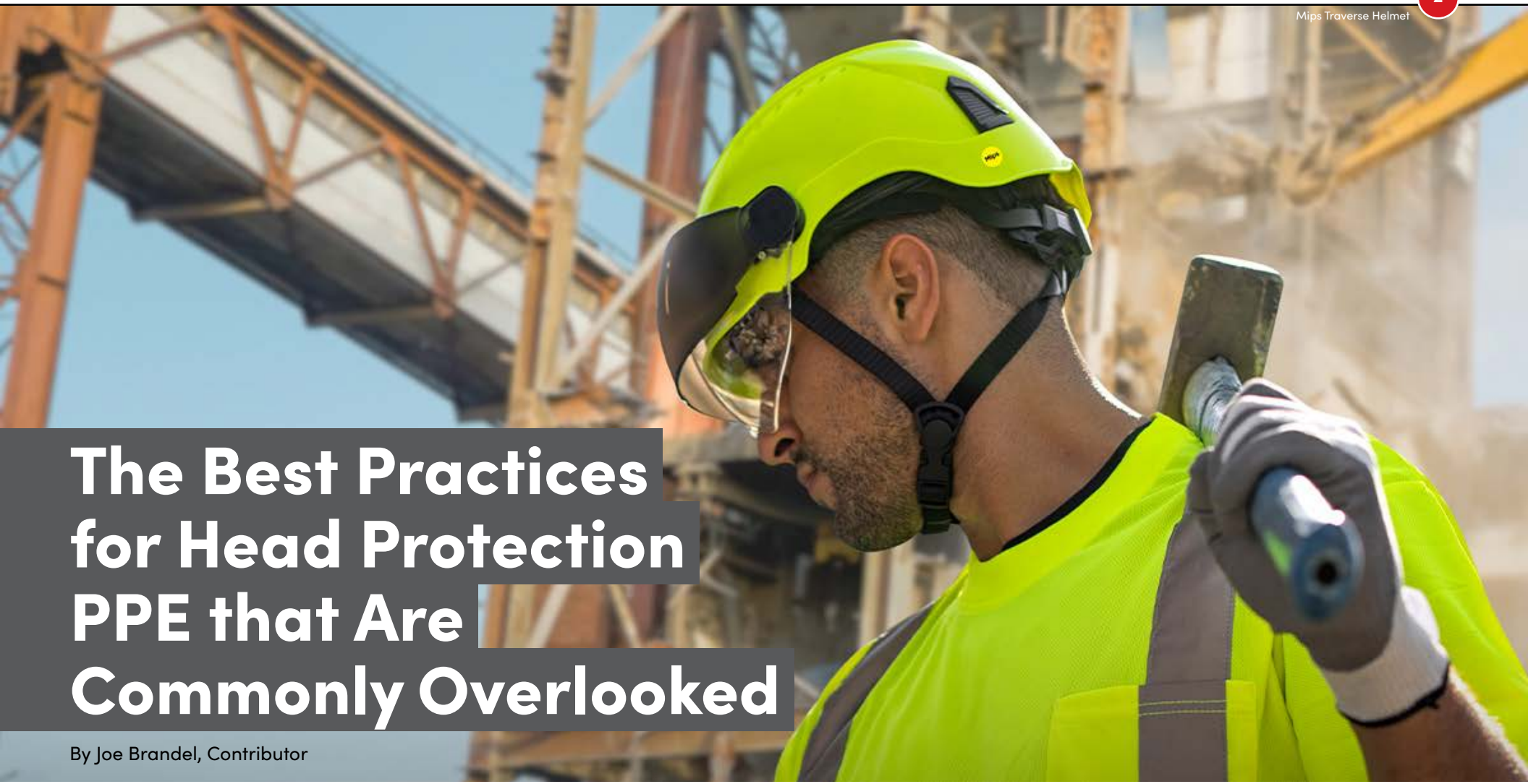
Head Protection



The Best Practices for Head Protection PPE that Are Commonly Overlooked

By Joe Brandel, Contributor

For workers, construction is one of the most dangerous professions out there. The industry is ranked fourth on the Occupational Safety and Health Administration (OSHA) list of most dangerous jobs.[1]

According to OSHA, the four leading hazards, or "Fatal Four," that construction workers face on job sites include falls, being struck by an object, electrocution, and being caught in between two or more objects.[2] Depending on how these highlighted hazards occur, the dangers that workers are exposed to run the risk of causing traumatic brain injuries (TBIs), which can have life-altering and even fatal repercussions.

In the United States alone, the construction industry has the highest number of fatal and non-fatal workplace-related TBIs out of any other industry. In the construction industry from 2003 to 2010, a total of 2,210 employee fatalities were due to TBIs. These represented 24% of all workplace-related TBI fatalities in all industries.[3]

1 https://www.invictuslawpc.com/most-dangerous-jobs-osha/
2 https://ehsdailyadvisor.blr.com/2019/05/oshas-fatal-four-leading-causes-of-fatalities-in-the-workplace/
3 https://blogs.cdc.gov/niosh-science-blog/2022/11/10/construction-helmets/#:~:text=Work%2Drelated%20Traumatic%20Brain%20Injury%20in%20Construction,100%2C000%20full%20time%20equivalent%20workers)

In light of the threats that exist for workers in the construction industry, there are several steps that employees can take to help safeguard themselves from risk of injury and even death while on the job. One crucial step is using proper head protection PPE, such as helmets and hardhats.

MANY WORKERS AREN'T PROPERLY PROTECTED

Despite this, according to a recent survey from PPE provider J.J. Keller Safegear, a huge portion of construction workers are not wearing proper head protection on the job. In a field so well-known for the omnipresent dangers that exist for workers, why are workers not taking adequate measures to reduce their risk for TBIs? According to the survey, the vast majority of workers who refrain from wearing head protection simply do not want to wear it (72% of respondents) while half do not think that it is mandatory (50%).[4]

The construction industry has an education problem, as underscored by this survey's results. The very real threat of TBIs while working on the job is not being clearly articulated by industry leaders, construction company owners, and project managers – and neither are the straightforward measures that workers can take to minimize on-the-job risks.

INCREASING PPE USAGE

One approach to increasing helmet usage is to better educate those in the industry on the risks of rotational motion and TBIs.

The majority of traditional helmets are developed and tested to withstand only the force of linear impacts, which address focal injuries such as fractures and contusions. However, many accidents on real-life construction jobsites do not occur linearly, but at an angle. For instance, when a person falls and their head strikes the ground, the impact typically occurs at an angle. These accidents can expose the brain and head to rotational motion. For the brain, exposure to rotational motion can cause movement of brain cells relative to each other, which leads to shearing, and can result in damage to the brain's axons, the cable transmitters of neurons.

As a result, without design or technology that addresses rotational motion, helmet wearers are in greater potential danger of diffuse injuries like diffuse axonal injury and subdural hematoma. Depending on the severity of the impact sustained, TBIs can lead to time away from work, life-long afflictions, and even fatalities.

A greater industry focus on the risks that head trauma and rotational motion present, as well as the steps workers can take to address them, are crucial to increasing helmet usage.

Another important step the industry can take to increase worker helmet usage is selecting helmets that fit comfortably. A comfortable helmet that fits firmly against the head has been proven to make workers more prone to wearing their helmets.

CHOOSING THE RIGHT PPE

Over the decades, neuroscience has rapidly advanced to better understand the causes and consequences of brain injuries. However, in the past century, very little has changed in present-day helmet and hard hat design.

When selecting helmets, construction workers should take into consideration whether their helmets are designed to address rotational motion. Mips' safety system, for instance, is designed to help reduce the rotational motion of certain impacts that may otherwise be transferred to your head, bringing helmets into the 21st century.

From a regulatory standpoint, construction industry standards for helmets lag drastically. While there have been promising developments for some standards in both the sports and moto industries to address the impact and consequences of rotational motion, today's construction helmet standards do not take into account rotational motion. As the industry pushes for crucial regulatory standards that put worker safety at the forefront, we at Mips are committed to continue innovating solutions in line with our mission of leading the world to safer helmets.

Joe Brandel is the Business Development Manager for the North America Industrial Safety Market, Mips (mipsprotection.com).

4 https://www.jjkellersafety.com/news-articles/survey-finds-reasons-employees-dont-wear-ppe

BOLT™ Safety Helmet with IMPACT ARMOR™ Liner

Milwaukee Tool has developed the BOLT™ Safety Helmet with IMPACT ARMOR™ Liner to provide advanced slip, trip and fall protection on the jobsite.

The need for protection against traumatic brain injuries (TBIs) is as great as ever in the electrical trades. According to the Bureau of Labor Statistics, traumatic brain injuries (TBIs) from slips, trips & falls are some of the most common on the jobsite, accounting for just over one-third of all fatalities. These injuries can cause oblique impacts, a combination of both linear and rotational forces.

Dedicated to innovation and safety, Milwaukee® has developed the BOLT™ Safety Helmet with IMPACT ARMOR™ Liner to provide improved protection against TBIs caused by oblique impacts.

While developing the IMPACT ARMOR™ Liner, Milwaukee designed a test to simulate TBIs caused by oblique impacts from a slip, trip, and fall injury. The test assessed impacts at 16 different locations around the full helmet circumference. Each impact occurred at a 45-degree angle and had a speed of 6.5 meters per second. The test showed that the BOLT™ Safety Helmet with IMPACT ARMOR™ Liner provides the best oblique impact protection†, even in comparison to competitive advanced safety helmets.

The helmet's IMPACT ARMOR™ liner utilizes RHEON™ technology; energy-absorbing polymers that are initially soft but harden upon impact, providing added protection on the jobsite.

The BOLT™ Safety Helmet with IMPACT ARMOR™ Liner is part of the Milwaukee BOLT™ system. The BOLT™ system allows you to secure accessories simultaneously so you can quickly swap out accessories, providing you protection and efficiency on the jobsite. Designed to protect the sides and top of a user's head, each BOLT™ safety helmet complies with ANSI/ISEA Z89.1-14 Type 2 by the American National Standards Institute (ANSI).

The BOLT™ Safety Helmet with IMPACT ARMOR™ Liner also features a comfortable padded suspension with an adjustable swinging ratchet for better comfort. An adjustable chin strap provides additional security and ensures the helmet remains secure in case of a slip, trip, or fall.

The BOLT™ IMPACT ARMOR™ Liner is also available separately, allowing users to retrofit the liner into any Milwaukee safety helmet increasing protection and performance.

Specifications:

- Meets Energy Absorption Capacity clauses: 4.2.1.2 (Front), 4.2.1.3 (Side), & 4.2.1.4 (Rear) and Retention clauses 4.2.3 (Strength) & 4.2.4 (Effectiveness) of EN12492:2012
- ANSI/ISEA Z89.1-2014
- Class E
- Type 2
- Made in the USA
- Limited Lifetime Warranty

Milwaukee Tool's new BOLT™ Safety Helmets with IMPACT ARMOR™ Liner demonstrate their focus on creating innovative solutions that won't slow users down, helping them STAY SAFE. STAY PRODUCTIVE™.

†Based on impacts at a 45 degree angle at a speed of 6.5 m/s averaged across 16 testing locations around the full helmet circumference.

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BOLT™ SAFETY HELMET w/ IMPACT ARMOR™ LINER

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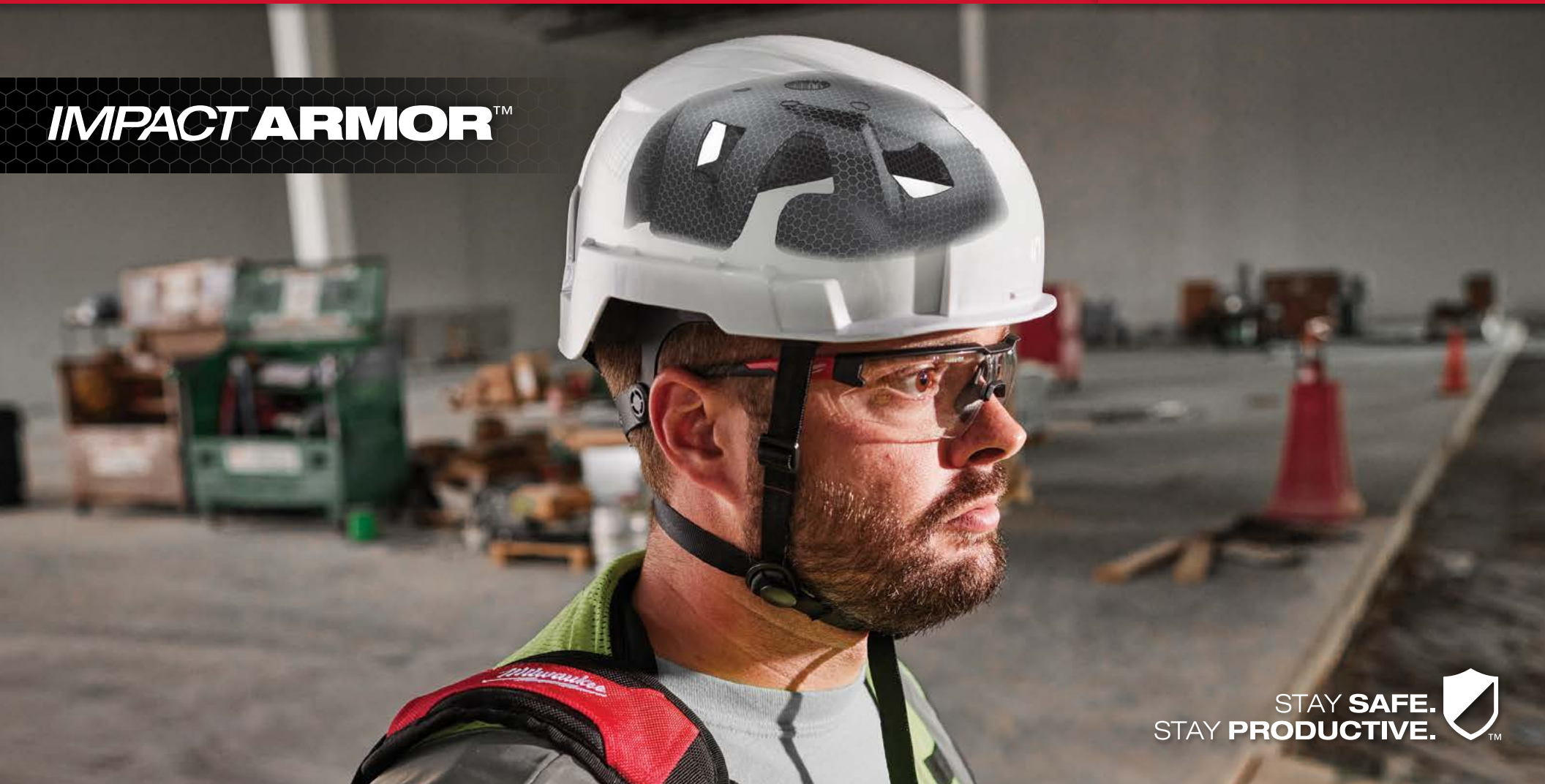

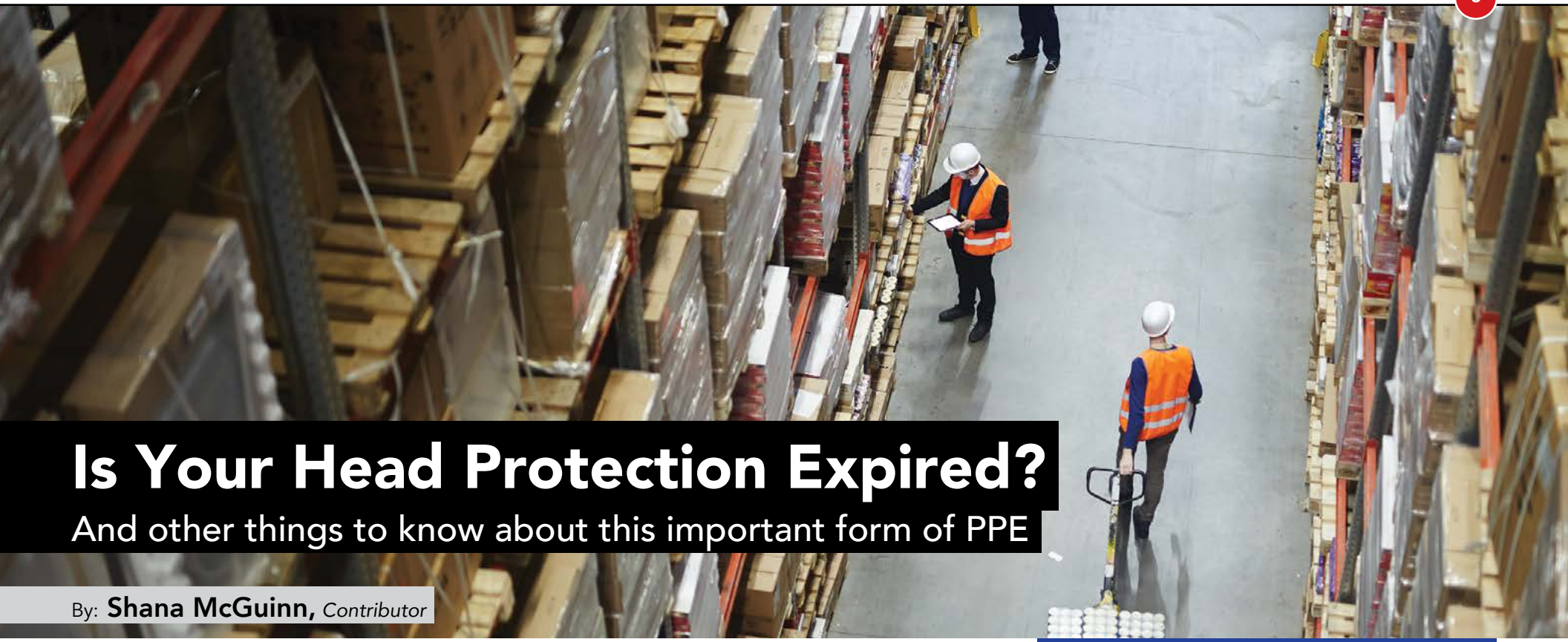

Is Your Head Protection Expired?

And other things to know about this important form of PPE

By: **Shana McGuinn,** *Contributor*

Tools falling from high above, power lines, objects being swung by a crane or dropped by a forklift — any of these can cause severe head trauma when they come into contact with a worker. Concussions, skull fractures, electrical shock, lacerations, burns and traumatic brain injuries are possible consequences. The affects of these injuries can be short- or long-term and, in severe cases, fatal.

According to the U.S. Bureau of Labor Statistics[1] (BLS), workers in the U.S. suffered 155,830 head injuries from 2021-2022 that involved days away from work, restricted activity or a job transfer. Of those, 32,380 were intracranial injuries, including cerebral hemorrhages and concussions.

Traditional hard hats have long been the standard when it comes to workplace head protection. This iconic headgear, generally made of high-density polyurethane, has provided a measure of safety over the decades for workers in a variety of industries, from construction to manufacturing, transportation to utilities. They still do, in plenty of environments.

Safety helmets have emerged as an additional head protection choice. Design innovations and the development and adaption of new materials make them a good fit for some workers. Shells made of fiberglass, composites and thermoplastic result in safety helmets that are relatively lightweight and comfortable to wear over long periods of time, while offering a high degree of impact resistance. If a wearer experiences a slip, trip or fall, a chin strap holds the safety helmet in position, thus reducing the likelihood of a head injury.

Whichever type or model is chosen, the Occupational Safety and Health Administration (OSHA) recommends checking:

- The date of manufacture, which generally can be found inside the shell
- The manufacturer's guidelines
- The labels and certification marks

The head protection should fit the wearer comfortably and securely and not be loose or too tight. © *pressmaster - stock.adobe.com*

The manufacturer's guidelines will specify the recommended lifespan of the model, and the date of manufacture will tell you whether or not the head protection has expired. Using a too-old hard hat or safety helmet will not provide the desired level of protection. The labels and certification marks will verify that the head protection meets the required safety standards.

The head protection should fit the wearer comfortably and securely and not be loose or too tight. The wearer should gently shake their head. If that action indicates that

1 www.bls.gov/iif/nonfatal-injuries-and-illnesses-tables.htm

components are loose or damaged, the head protection should be inspected by a qualified person before it is used.

WHAT TO LOOK FOR IN AN INSPECTION

Before each use, inspect the head protection carefully:

- Look for — and feel for — cracks or dents in the outer shell.
- Tug lightly at the headband and chin strap, to verify that they are securely attached to the shell.
- Examine goggles, face shields, earmuffs or any other accessories or attachments for signs of wear and tear. These, too, should be securely attached to the head protection.
- If the head protection's interior padding is worn or compressed, contact the manufacturer for a replacement. Cushioning that is in poor condition will not provide the comfort and impact absorption it is intended to provide.

CLEANING AND STORAGE

It is also important to take proper care of the head protection, to ensure that it will maintain its structural integrity and its ability to protect the wearer:

- After each use, clean the exterior of the hard hat or safety helmet with mild soap or water, to remove harmful chemicals or debris. Allow it to air-dry in a cool place.
- Store the head protection in a place where it will not be exposed to extreme temperatures, direct sunlight or corrosive substances.

OTHER IMPORTANT CONSIDERATIONS

Maintaining a record of head protection and other forms of PPE will help ensure that the equipment being used is viable. The date of purchase should be recorded and inspection details such as dates, findings and actions taken should be documented.

Visible damage is not always the only indicator that the structural integrity of the head protection has been compromised. If the equipment has been on the receiving end of a strong force or impact, it should be discarded. Per OSHA, "Head protection is designed for single-use impact protection and may not retain its full effectiveness after an incident."[2]

For detailed guidelines on the care, use and storage of head protection, always consult the manufacturer's guidelines.

RELEVANT STANDARDS

OSHA standard 29 CFR 1910.135 – Head Protection[2] outlines the requirements for head protection in general industry workplaces. It covers criteria for choosing appropriate head protection and the responsibilities of employers and rights of employees in ensuring compliance.

ANSI/ISEA Z89.1 – Industrial Head Protection[3] specifies performance and testing requirements for industrial head protection, including safety helmets and hard hats. ***WMHS***

Shana McGuinn is a freelance writer who contributes articles about occupational safety, environmental issues, health and wellness.

2 www.osha.gov/sites/default/files/publications/safety_helmet_shib.pdf
3 http://tinyurl.com/ANSI-ISEA-Z891

The Evolution of Head Protection: From Hard Hats to Safety Helmets

By Ryan Barnes, Contributor

Hard hats have been the safety norm for more than 100 years. Invented by Edward W. Bullard in 1919, they were intended primarily to protect workers from falling objects. Although the hard hat served its purpose, it's become antiquated as we now transition to a high-tech safety helmet.

After all, construction sites come with a long list of potential hazards. Whether dropped objects, falls, or material and chemical hazards, there's a potential risk around every corner. The risk and injury most industrial tradespeople face today require protection from more than just a falling object, which is where a hard hat meets its limit.

Today, one of the leading causes of injury and even death on the construction site is from falling, not falling objects. According to OSHA, in 2020 there were 1,008 documented fatal falls in the construction industry, making up 35% of all construction accidents. With more than half of the construction industry working on scaffolds, there is a large risk for fall accidents and corresponding traumatic brain injuries (TBIs). These injuries or deaths are preventable, and OSHA even has a "Fall Protection Campaign" to educate the industry of this danger. Now, thanks to new, innovative technologies, workers can be better protected from potentially hazardous encounters on the job site.

More specifically, new types of safety helmets can protect against side-impact head injuries, whereas traditional hard hats do not offer such protection. The side-impact head injuries relating to falls, slips, and trips are among the leading causes of non-illness-related workplace death across all industries, according to the Bureau of Labor Statistics. Most of these slip-, trip-, and fall-related head injuries happen from only six feet or less and represent one of the main reasons that many commercial general contractors are starting to mandate chin straps, along with other certifications and requirements, to ensure compliance with many high-profile job sites. When the helmet is missing a chin strap, like most general hard hats, it's unlikely the helmet will stay on during a fall, let alone the fact that such helmets don't have effective side-impact protection.

THE TYPE II SAFETY DIFFERENCE

In place of the traditional hard hat, leaders ranging from plant to construction safety officers are considering a new type of head protection – the American National Standard for Industrial Head Protection (ANSI) Type II safety helmet – with improved technologies born from action sport PPE.

The helmets are often referred to as "climbing style" because they're proven to improve the safety of construction workers and extreme sports enthusiasts alike.

While a Type II safety helmet requires a larger up-front investment compared to traditional hard hats, many organizations are making the switch because they are significantly more effective at protecting the workforce from serious injury or even death – a benefit that certainly outweighs the increased PPE cost. Other benefits of adopting Type II safety helmets include:

- Less PPE turnover as safety-helmet lifetimes typically outlast that of hard hats thanks to more thoughtful, ruggedized designs
- Overall lower risk of workplace injury due to side-impact safety and chin straps
- Fewer injuries and thus fewer workers' compensation claims
- Reduced liability insurance costs tied to reduced injury risk
- Overall risk reduction for the workplace while helping to promote a culture of safety on the job site
- Fewer injuries resulting in greater worker productivity

AVAILABLE SAFETY FEATURES

Type II helmets provide protection from the front, side, and rear, providing 360-degree head protection whether working from heights with all the required fall protection, or primarily on the ground with ladders, lifts, or scaffolding. Also, Type II helmets go beyond the single ring found in hardhats, and often feature advanced technology only found in extreme sports gear. For example, common Type II safety helmet features that make them the ideal head protection tool include:

- Impact Protection — Type II helmets include technologies that crumple instantly on impact to absorb maximum force, which protects the skull and brain from direct and angled impacts. This may reduce the risk of suffering a life-changing or life-threatening injury.
- Helmet Padding — A replaceable helmet pad system significantly reduces the sharp twisting and compression of the brain during angled or oblique impacts – the primary cause of concussions. Plus, they are usually more comfortable to wear for long periods of time.
- Identification Technology — Should an accident occur, some helmets include an integrated chip based on near-field communication (NFC) technology that stores emergency contacts and critical medical information for first responders to access. This is vital data when seconds matter and for when the helmet can't safely be removed.
- Modular Rear Brims — Helmets may come with a slight rear brim designed for rain deflection, or the traditional brim form factor to help protect against outdoor conditions.
- Four-Point Chin Strap Systems — Buckle enclosures with an adjustable nylon 4-point strap, commonly found in action sports helmets, allow for maximum adjustability and easy one-handed use with gloves.

THE NEW STANDARD

The largest commercial general contractors in the U.S. are making strides in adopting these Type II industrial safety helmets. As Type II helmets become the new standard, organizations have a new PPE tool to realize the ultimate goal of safety – to save lives and protect against serious injury within industrial trades.

At the end of the day, our heads and brains are the most important tools on the job site. Thus, we need to make the effort to protect our most precious asset, to make sure we can show up healthy and safe for the sake of the job and, more importantly, the workers' livelihoods.

Ryan Barnes is the Founder and CEO, STUDSON, Inc. (studson.com).

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