

PPE

3 Ways High-Tech PPE Is Outsmarting Workplace Hazards

Kellie Escoto | Nov 02, 2022

The world is full of smart devices that can keep you safer. Your watch beeps if your heart rate is too high or low, your phone calls emergency services for you after a car accident and your doorbell alerts you if someone is lurking on your porch. Manufacturers are using these innovations in safety gear to help you work smarter and safer, too.

Personal protective equipment (PPE) such as *gloves, eyewear*, hard hats and ear protection is designed to protect manufacturing employees from workplace hazards that range from loud machinery and heavy equipment to sharp tools and extreme temperatures. But the gear only works if workers wear it.

Otherwise, both employee and employer are at risk of injuries and the fallout that can come with them, including lawsuits and fines. In a **2022 report published by J.J. Keller**, over 90 percent of employers say they often struggle to get workers to wear PPE, and 72 percent of the time it's because they simply don't want to do so.

Your Smart Safety Gear Checklist

If you're considering introducing smart personal protective equipment (PPE) into your workplace, you're not alone. *EHS Today* reports that over half of all environmental health and safety decision-makers surveyed by Verdantix planned to increase their PPE budget in 2021, and the market for smart PPE in particular is **expected to grow by more than 13%** in the next decade.

Here's what to consider so your transition to tech-forward gear is smooth:

- **Are you well connected?** *Fortune Business Insights* notes that, while smart PPE is a growing market, it could be restrained by network availability. Assess whether your employees have access to a strong wireless or mobile network if needed for connected safety gear.
- **Is it in your budget?** When considering a smart PPE purchase, it's important to factor in not only the initial purchase, but the cost of maintenance and replacement over time. Be sure to build a budget that accounts for the potential higher price of electronic components.
- **Does it require training?** Some smart PPE is grab-and-go. After all, a high-vis vest works the same whether or not it has built-in LEDs. However, equipment that requires internet access or connects to a phone or other device might take more training, especially for less tech-savvy workers.

Now, manufacturers are combining PPE's built-in safety features with electronic components inspired by smart technology to modernize gear and improve outcomes. These products have the double benefit of enhancing safety and being more appealing to workers, who often prefer the look and the technological perks of smart gear.

Here's how smart PPE is changing the game in workplace safety—and why Fortune Business Insights predicts it will become a \$9 billion industry by **2028**.

Data-Driven Fit Information

Tech-minded PPE manufacturers are connecting their safety gear to computers, smartphones and other devices that gather data on whether it ***fits properly***, works effectively and is in good condition. For example, 3M's connected ear protection can be plugged into a fit-measurement system for science-backed decision-making on finding the most effective product.

"Once you lose your hearing, you can't get it back," says Bill Veeninga, a senior account executive at 3M. "With the 3M E-A-Rfit™, we can actually measure how well earplugs work for each employee."

To test the ***noise protection***, an employee tries on 3M earmuffs or earplugs, which are then connected to the ***E-A-Rfit validation system***. The system measures how much noise is reduced by the hearing protector to determine which product and size is best for every individual—and, in some cases, each ear.

Glove-maker Ansell has partnered with ProGlove to create protective handwear that uses sensors to gather real-time data, such as fit and condition.

"Wearing an improper glove for work applications can expose workers to unsafe conditions, which can

lead to injury and prevents workers from effectively performing their job throughout the day,” Neil Salmon, president of industrial business at Ansell, says in a **statement**.

He adds that the Ansell and ProGlove PPE will offer “real-time data collection capabilities for precise and immediate information enabling compliance to safety recommendations.”

Built-In Smart Tech


Most smart PPE is defined by built-in electronic components that improve its ability to protect the user or enhance existing safety features.

Effectively integrating the protective garb into the Industrial Internet of Things (IIoT), the addition of sensors enables tracking of vital statistics such as blood pressure, heart rate and breathing.

It can even filter out harmful environmental conditions and alert employees and employers when PPE is not functioning correctly.

Take hearing protection as an example. According to the **National Institute for Occupational Safety and Health**, 22 million workers are exposed to hazardous noise levels each year, which can lead to premature hearing loss.

But smart earmuffs and plugs, such as 3M’s **PELTOR™ series**, have built-in microphones that **detect harmful noise levels** and instantly emit an opposite sound wave to cancel it out. They can also amplify safe sound, such as speech, so workers don’t need to take off their hearing protection to have a conversation.



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Neil Salmon
Ansell

Welding helmets guard workers from blinding light that can cause permanent vision damage. However, like hearing protection, it only works when it’s on. **3M’s Speedglas™ auto-dimming lenses** make it easier for welders to keep their helmets on by lightening when damaging light isn’t present, then **activating a filter within the lens** that quickly darkens when it senses ultraviolet and infrared light from a welding arc.

Intelligent Textiles

You might think of smart PPE as being tied to electronics, but some of the most innovative technology isn’t connected at all. Pioneers in smart PPE have been engineering groundbreaking materials for years—think **heat-resistant Kevlar** or **Ansell’s INTERCEPT™ cut-resistant** gloves.

Ergodyne set out to find a solution for workers who use high-vibration equipment after seeing the long-term medical damage it can cause. **Hand-arm vibration syndrome** can result in numbness, reduced dexterity, pain, and loss of feeling in hands and fingers. Its **anti-vibration** technology, built into the palms of gloves, absorbs the impact of tools such as drills and grinders without compromising dexterity.

Uvex by Honeywell is improving protective attire, too, with ***built-in lights for work vests and jackets***. The rechargeable battery-operated LED lights provide optimal visibility in all settings, eliminating hazards that can result from low lighting or inclement weather.

How are you implementing smart PPE to keep workers safe at your business? Share your tips in the comments below.

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