



Safety

Smart PPE Alerts Workers to an Overlooked Hazard: Themselves

James Langford | Aug 24, 2023

Many manufacturing workers don't even realize that they're using an awkward stance to perform tasks or contorting and straining their hands to operate certain tools. Until the pain kicks in.

And that can occur hours, weeks or even months later, sometimes increasing to debilitating levels that require time off from work, physical therapy and even surgery to correct, costing U.S. industry some \$16 billion a year.

Relief is in sight, however, thanks to advances in digital technology that are overhauling how **American manufacturing facilities work**. Not only are they enabling real-time monitoring and maintenance of expensive equipment, they're also being integrated into personal protective equipment that can track worker movements and flag high-strain activities before they cause serious health problems.

The **Inteliforz™ Motion Series**, which safety supplier Ansell introduced in 2022, is one example, gathering data on hand and wrist movements from wearable sensors and funneling it into software that shows musculoskeletal stress to workers and provides comprehensive reports to managers trying to keep workplaces safe and avoid costly injuries.



Ansell Inteliforz developed a sensor pod embedded in a wrist strap that can be worn on top of—or underneath—a glove. Its data is translated into intuitive electronic dashboards. | Photo courtesy of Ansell

The double-pronged approach acknowledges that using connectivity to improve safety requires more than gathering data and dumping it into a mind-boggling spreadsheet.

“If you don’t help people interpret it, it’s just data,” says Beemal Vasani, director of Ansell’s Inteliforz. “It’s not going to keep people safe because they won’t know what to do with it.”

Gathering data as well as showing what it means in easy-to-read formats is one of the ways that **Ansell** acts as a partner for its clients, demonstrating ways that improvements in technology and PPE can support core operating goals of productivity and workforce retention.

Keeping Scarce Workers Safe

Hiring and keeping qualified workers is increasingly important to manufacturers and machine shops grappling with a labor shortage that may reach 2.1 million workers by 2030 as senior employees retire and fewer people enter the industry to replace them.

Those who do lack the skills and experience that departing workers spent their careers developing,

which can leave them more susceptible to on-the-job accidents and injuries, particularly in the months just after their hiring.

Statistics show that 1 out of 3 new employees are hurt within their first three months, Vasani explains.

"The more you are able to help people be efficient and safe with their motions and movements, the fewer challenges you are going to face in those first few months," he adds. "Retention is a big concern for everyone in the manufacturing industry, and the more you can do to keep workers happy and productive, the longer they're going to stay with you."

In many ways, smart PPE is the workplace version of so-called wearable technology used in smartphones and watches that track fitness data in the athletics and leisure markets.

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Many companies are using it to monitor vital statistics such as blood pressure, heart rates and breathing, especially in environments where workers risk exposure to hazardous chemicals or dangerously high temperatures.

Employing smart devices to prevent repetitive motion injuries tackles a more widespread—and often, less obvious—source of harm to workers.

Musculoskeletal disorders are the ***most common cause*** of disability, involuntary retirement and limitations to gainful employment, according to the National Safety Council, which established the MSD Solutions Lab in an attempt to curb them.

In 2020 alone, private-sector firms reported more than ***247,000 musculoskeletal disorder injuries or illnesses*** that kept employees away from work, the organization says.

Ergonomic Regulation

While the U.S. Occupational Safety and Health Administration, the country's top workplace safety regulator, spent much of the 1990s developing a rule governing ergonomics—the adaptation of tasks and equipment to workers in order to ***avoid musculoskeletal disorders***—the policy was scrapped in the early 2000s.

The agency has since regulated ergonomic safety through its general duty clause, the section of the 1970 Occupational Safety and Health Act that requires employers to provide a hazard-free work environment.

"An ergonomic process uses the principles of a safety and health program to address musculoskeletal disorder hazards," ***OSHA says***. "Such a process should be viewed as an ongoing function that is incorporated into the daily operations, rather than as an individual project."

Developing systems to monitor poor posture and protect workers' spines was among the early forays by safety suppliers into using smart technology to help achieve that goal.

Building equipment that could provide similar analysis for hands and wrists, which are highly flexible and have wide ranges of motion, was an even more complex task—and one where Ansell, which specializes in gloves and PPE for workers' hands—was ***ideally positioned***.

Using wearable technologies, Ansell Inteliforz developed a sensor pod embedded in a wrist strap that can be worn on top of—or underneath—a glove. Its data is gathered through a software platform created by developers at Ansell and translated into intuitive electronic dashboards.

Real-Time Strain Analysis

Workers using Inteliforz™ can see the information on kiosks where they pick up their sensor pods or on an app they can download onto their phones.

Both displays use the strain index, a scale that rates the risk of developing musculoskeletal disorders from movements, to evaluate the safety of a task. The index considers movements with scores of three or lower to be safe and those with seven or higher to be hazardous.

“Rather than having occupational therapists sit there and count off, say, 30 repetitions of one motion in five minutes and 400 repetitions of another motion in the past hour, we can give customers a daily overview of what movements people are making and classify them in terms of riskiness, allowing occupational therapists to focus on other, more important wellness treatments,” Vasani explains.

While identifying an ergonomically hazardous task alerts workers and managers alike that changes are needed to prevent injuries, providing the information directly to workers serves the additional purpose of alleviating concerns about how the data that’s collected might be used, Vasani adds.

“They get the ability to see their movements every single day, and we give them data and insights that they can think about the next day or over the next week on how to change the movement that they’re doing to be safer,” he adds.

How could smart PPE make your workplace safer? Tell us in the comments below.

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