Safety

DuPont Upgrades Fire Safety PPE with a 'Better Mousetrap'

James Langford | Jun 27, 2024

The goal of building the proverbial better mousetrap has stoked the imaginations of inventors ever since the philosopher Ralph Waldo Emerson observed that doing so would prompt the world to beat a path to the builder's door.

Today, the expression is used to describe innovations from highway upgrades to high-tech tools as well as the historical advances (including a literal mousetrap) featured in a ***Smithsonian exhibit*** on U.S. patent history.

It's also an apt description of what DuPont Personal Protection has done for secondary flame-resistant (SFR) garments with the introduction of the Tyvek® 400 SFR, says Daniel Bowen, the company's Northeast regional sales manager.

Commonly worn by workers performing maintenance on oil and gas refineries and petrochemical plants during shutdowns, disposable secondary-flame resistant garments are designed to protect more expensive primary flame-resistant garments from particles, oils and greases that might render them unusable.

Secondary items shouldn't be worn without primary flame-resistant garments— such as DuPont's Nomex®—that are designed to protect wearers from flames and thermal burns, underneath, the company notes.

Workplace Fire Injuries

Providing appropriate flame-resistant clothing for workers is a priority for U.S. employers since burn injuries pose a persistent risk. Labor Department statistics show ***107 workers*** died in fires and explosions in 2022, the most recent year for which statistics were available, down 7 percent from 2018.

The National Safety Council, which publishes workplace injuries every two years, reported ***3,190 injuries*** from fires and explosions in 2021 and 2022.

While the ***U.S. Occupational Safety and Health Administration*** sets overall requirements for flame-resistant clothing, more specific ***guidelines*** for secondary flame-resistant garments are covered by the American National Standards Institute.

The key qualification is that SFR garments don't contribute to burn injuries or hinder the protection offered by primary flame-resistant gear, Bowen says. When testing them, their capacity to self-extinguish once a worker escapes a fire is more relevant than resistance to charring.

Photo courtesy of DuPont

Click here to shop Dupont's SFR gear on MSC.

"If workers wear something that doesn't self-extinguish, they run the risk of increasing a burn injury beyond what it would have been if they were wearing just their primary flame-resistant garments," Bowen explains.

What separates the Tyvek® 400 SFR from its predecessor, which is made from a light blue wood pulp material widely used for secondary flame-resistant garments, is its durability, Bowen says.

The pulp material, a longtime industry standard for secondary flame resistance, is not only easily damaged by water but also prone to rips and tears. These attributes can be an Achilles' heel, he adds.

"Think about a refinery going through a turnaround: The vast majority of the plumbing and the refinery equipment is outdoors," Bowen says. "If it's a rainy day or even a damp day or you're dealing with water in any way, shape or form, that material doesn't hold up well. Also, due to the physical demands of turnarounds, when you're dealing with tools, sharp objects and pipes, it's really easy to tear it."

That meant that wearers often had to replace their secondary flame-resistant gear several times a day.

Hazard Types and SFR Options

Users who tested the Tyvek® 400 SFR garments during field trials in 2023 were delighted that they no longer needed to make changes as frequently and could complete their jobs more efficiently. DuPont began selling the new product earlier this year, quickly moving from limited to full production.

“Refineries and petrochemical plants, when they do turnarounds, use staggering amounts of secondary flame-resistant products, so the market was already there,” Bowen says. “In essence, our product is a substitution for the products that previously existed.”

Safety managers choosing secondary flame-resistant coveralls should weigh not only the possibility of flash fires but also a worker’s potential exposure to hazardous and nonhazardous particles, liquids or chemicals, DuPont points out.

While the company recommends that employers whose workers deal with hazardous liquids and chemicals consider its Tychem® 2000 SFR line, it says the Tyvek® 400 SFR line offers superior protection from particulates.

Tests on it showed 95 percent particle filtration efficiency, DuPont says, compared with 30 percent for flame-resistant wood pulp and polyester spunlace fabric.

And despite its substantially higher performance in terms of durability, particle holdout and wetness resistance, Tyvek® 400 SFR “doesn’t carry a premium price tag,” Bowen explains.

Its cost is close to that of DuPont’s ProShield® 6 SFR, an earlier entry in the secondary flame-resistance market made from a wood pulp and polyester blend, “because we want people to adopt it,” he says.

How would more durable secondary flame-resistant garments benefit your business? Tell us in the comments below.