



Personal Protective Equipment

## Reliable Secondary FR Gear for Chemical Protection

Matt Morgan | May 22, 2025

Employees working with flammable chemicals need protection against flash fires, plus the double threat of skin contact with harmful substances. This unique challenge requires a unique solution.

Secondary flame-resistant (SFR) garments are worn on the outside of primary flame-resistant (FR) garments to keep the primary garment—and the wearer—free from contaminants. During a flash fire or other thermal event, SFR garments are specially formulated to burn up quickly and not contribute to a burn injury.

“There are a lot of applications where multiple hazards are present for workers. Of course, fire trumps everything,” says Dan Bowen, **DuPont’s** technical specialist for North America. “Acids and bases are extremely common in manufacturing environments. Flammable alcohols and solvents—such as isopropanol, methanol, methyl ethyl ketone and acetone—are widely used in industry.”

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Dan Bowen  
DuPont

To provide the most effective protection for workers, employers should furnish SFR garments specifically rated to resist the classes of chemicals they might encounter at their facility.

“What’s nice about the DuPont portfolio is that we’ve got an extremely wide range of secondary FR garments,” Bowen says.

A versatile option, the **ProShield® 6 SFR** has been around for many years. Made of a wood pulp and polyester blend, “it’s kind of like a paper towel,” Bowen says. It is useful for providing a barrier against nonhazardous particles and aerosols, though it is prone to rips and tears and doesn’t hold up well in wet environments.

***Read more: DuPont Upgrades Fire Safety PPE with a 'Better Mousetrap'***

Introduced in 2024, the **Tyvek® 400 SFR** adds durability and protection against hazardous or combustible particles along with secondary flame resistance. Field trials showed it reduced the number of garment changes, which boosted efficiency on the job.

## **Intro to Chemical-Resistant and Flame-Resistant Garments**

Workers needing chemical protection in addition to secondary flame resistance have long relied on **Tychem® 2000 SFR** garments. The line of coveralls, aprons (bibs) and jackets provides at least 30 minutes of protection against more than 40 chemical challenges, including inorganic acids and bases and industrial cleaning chemicals and particles, plus light splash protection.

"Tychem® 2000 SFR was a great first foray into the world of secondary flame resistance that had chemical resistance as well," Bowen says. "The reason it's been so successful is that there are lots of places where high and low pH materials [bases and acids] have the potential for a flash fire."

The garment "became an immediate hit" among workers, Bowen says, in part because it does triple duty: It provides a secondary flame-resistance solution, a decent chemical barrier against acids and bases, and protection from the weather, which is a differentiator from the papery ProShield® 6 SFR and other treated wood-pulp garments.

"Think about refineries—most of the work that's done there is outdoors," Bowen explains. "Tychem® 2000 SFR serves as a rainwear-type solution. A lot of workers like the jacket-bib combination, because if they're not in an environment where they need that protection, they might be able to take the jacket off and stay a little bit cooler."

*WATCH: The DuPont SafeSPEC™ online selector tool can help you more efficiently identify the proper PPE for various needs.*

## **Flame Resistance with Broader Chemical Protection**

As popular as Tychem® 2000 SFR has been among manufacturing workers, the garment has limits, Bowen says. Many applications call for secondary flame resistance with a rating beyond acids and bases.

"When it comes to flammable atmospheres in some manufacturing environments, alcohols and solvents are also very common," he says. "That's where Tychem® 6000 SFR really shines. It expands the range of chemical classes and subclasses that the fabric is going to hold out."

The Tychem® 6000 SFR offers the same secondary flame resistance and flash fire protection as the Tychem® 2000 SFR but with at least 30 minutes of protection against more than 250 chemical challenges. Applications include oil and gas and industrial chemical processing.

"What's unique about the Tychem® 2000 SFR and the Tychem® 6000 SFR is that they both have Tyvek® SFR as their substrate," Bowen says. "Then there is a chemical-resistant coating on the top."

Bowen says he expects the Tychem® 6000 SFR portfolio to expand beyond coveralls to include a range of garment styles.

*Read more: [How to Exceed Flame-Resistant Clothing Requirements While Staying Comfortable](#)*

## Choosing Secondary FR Garments You Can Trust

Not all SFR garments are created equal, although it can be difficult for manufacturing employers to know that. Unfortunately, the information gap can have dangerous consequences when a substandard garment fails to protect a worker from a hazard.

"The challenge we have in the safety industry is that there is no real governing body that keeps personal protective equipment [PPE] manufacturers honest," Bowen says. "You can print whatever you want in a brochure."

For example, most manufacturers don't do permeation testing, Bowen explains. "They do penetration testing, which is not meaningful for hazardous chemicals," he says. "They'll claim that they meet **NFPA 2113**, which isn't a pass-fail standard. They'll claim that they test to **NFPA 701**, a standard for wall covering, draperies and carpeting, which has nothing to do with PPE."

### ***VIDEO: DuPont Personal Protection Promise***

So, do your homework, Bowen tells safety professionals. "Make sure that you understand exactly what you're getting, how it's tested, how it's rated and that it's going to do the job it needs to do in your specific manufacturing environment," he says.

Also, find a manufacturer you can trust. "DuPont steps up our game," Bowen says. "We do permeation testing for the chemical resistance on these garments in the portfolio. And we've got **burn videos** that show the performance of them on an **ASTM F1930** fully instrumented mannequin test."

He adds, "We're providing garments that people should be confident will perform the way they need to perform in the unlikely event of a thermal exposure. And of course, they've got the broad-range chemical protection that we substantiate with our permeation database."

***What chemical hazards can the Tychem® 2000 SFR or the Tychem® 6000 SFR help you protect against? Let us know in the comments.***