



Thinking Through Protection

In 2014, Westex held a live flash fire demonstration at Texas A&M's state-of-the-art testing facility. This year's lineup included NFPA 2112 experts, burn unit specialists and some of the most realistic flash fire tests ever performed. SmartBrief, the leading online publisher of targeted business news, had the opportunity to hear firsthand accounts of real-life flash fire incidents. The takeaway was eye-opening — insights were uncovered that demonstrate the importance of events like this when it comes to educating the industry on the significance of FR safety. Read the following article that resulted from our conversations with safety professionals just like you.

Westex urged attendees of its April 30 and May 1 conference to give serious consideration to how they think about fire-resistant clothing. By providing a variety of speakers, including subject matter experts in burns and flash fire testing, as well as a burn survivor, the goal was to have attendees walk away understanding that mere compliance isn't enough to protect employees. The day culminated with live, full-scale outdoor hydrocarbon flash fires, and a demonstration of how different flammable and fire-resistant materials fare when involved in a flash fire.

"What many safety managers and companies don't understand is how low the compliance bar is

set for NFPA 2112," said Scott Margolin, technical director at Westex. "These standards are intended to be inclusive, not exclusive, and to test for a very minimum level of performance. Unfortunately, many safety professionals don't understand what's really in the standard, and thus what it really means, and doesn't mean. 2112 is a starting point to evaluate FR fabrics, NOT an endpoint. Don't even consider a product that doesn't pass...but please don't consider accepting anything simply because it does pass, either. There's a ton of relevant and valuable information you need beyond 'pass.' The marketing for some products is skewed, and though many

safety professionals think they are making good decisions when purchasing fire-resistant clothing, they may not be,” Margolin said.

Some companies market their FRCs as being able to withstand a flash fire for four seconds. “The problem is,” said Margolin, a former firefighter, “flash fires don’t last that long. Flash fires, by definition, are directional, rapidly moving flame fronts lasting typically three seconds or less. So while it can be a good thing to see how FRCs perform in a fuel-fed fire at four seconds, safety managers need to know how the FRCs perform at one, two, and three seconds as well, and a lot of companies don’t provide that data because it’s not as favorable to their products,” Margolin said.

Body burn predictions become perilously high at four-second fire exposures for virtually all common FR fabrics used in secondary PPE, and especially the lighter weight versions. Additionally, many experts feel any exposure level greater than three seconds is almost irrelevant, because secondary PPE doesn’t include face, head or hand protection or SCBA or other respiratory protection, and as a result catastrophic or fatal injury would be predicted.

Mark Ackerman, a former professor at the University of Alberta and an expert in flash fire and protective gear research, said the main thing safety managers should do when considering FRC purchases is to be skeptical when they hear sales pitches misusing test results. The tests FRCs must pass are designed to be inclusive rather than exclusive, and often aren’t reflective of real-life scenarios.

“How do you relate a piece of material held over a flame (ASTM D-6413) to a manikin in a flash fire (ASTM F-1930)?” he asked. “You can’t. The test results should come from an independent lab, and people should be aware that differences of less than

4% to 5% body burn are not meaningful; they are within the standard deviation of the test itself.”

Even among manikin tests, results can vary widely based on differences in sensors, what the manikin surface is made of and how much of it is exposed based on the fit of the tested garment.

The key benefit to the full-scale, outdoor demonstrations was two-fold; it clearly showed flash fires are rapidly moving flame fronts, resulting in a brief duration of less than three seconds (usually around two seconds), and showed how easily non-FR garments ignite, as well as the protective differences among compliant FR garments. Flammable garments, including 100% cotton, ignited easily and burned fiercely long after the flash was over, while FR garments did not ignite.

In order to be NFPA 2112-compliant, an FR fabric must record greater than 50% second- and third-degree burn in the manikin test. “Unfortunately, many people read a sales claim that says “pass” or see a tag that says “NFPA 2112-compliant” without truly understanding what that means, or thinking through the implications,” Margolin said. “There is a large protective performance difference among “compliant” garments, even when new.”

“You can wear clothes that are worse than wearing nothing because if you’re wearing non-FR clothing, you are wearing fuel,” he said.

Margolin said he understands that it’s quick and easy for safety managers to allow any FRCs that passed the compliance test and move on. But he urges them to ask one key question: “Passed with what? You can pass an exam with a 100% A+ or a 60% D-, and I don’t want to drive on a bridge built by an engineer who barely passed engineering,” he said. “Don’t just comply. Standards are a minimum and there is a vast disparity between compliant fabrics.”



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