



Championing Safety

A University Sets Student Safety Above All

A Case Study: Safety a Major Factor in Lab Operations

For a U.S.-based research laboratory at a major university, the pursuit of scientific discovery brings students into close contact with potentially hazardous situations. Laboratory researchers often utilize risky chemical agents to further their studies, and the question of safety is a major factor in lab operations.

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The university's lab supervisor focuses on organic synthesis and catalysis, and prides himself on not only encouraging cutting-edge research but fostering the safest possible environment for his researchers. In looking to promote discovery through hands-on involvement, he was, and is, a proponent of a comprehensive laboratory safety protocol. "In our labs," he shares, "we strive to be farsighted in our approach to safety, because it is only when our technicians are protected that our work truly can begin."

"We did everything right..."



The day started like any other — a postdoctoral experiment called for trimethyl aluminum, an extremely flammable chemical that immediately ignites upon

exposure to air. Experiments using this pyrophoric agent must be closely monitored, and those handling the substance must follow additional safety protocols. As such, the postdoctoral researcher setting up the reaction donned a laboratory coat comprised of Westex® ShieldCXP™ — a flame resistant (FR) fabric with inadvertent chemical splash-resistant properties — as personal protective equipment (PPE) to coincide with the use of this pyrophoric agent. In experiments like this, where dangerous chemicals like trimethyl aluminum are used, the supervisor stresses the critical importance of being thorough.

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The trimethyl aluminum was inadvertently exposed with the air, oxidizing in a split second and igniting both the researcher's and the spotter's gloved hands. As the pyrophoric chemical burned hot and fast, it moved to the primary researcher's laboratory coat. Had it not been for the laboratory coat made with Westex® ShieldCXP™, both the primary researcher and the spotter could have faced serious repercussions.



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However, as soon as the fire spread to the primary researcher's coat, the garment self-extinguished, protecting her non-FR clothes underneath the coat and insulating her against potential second- and third-degree body burns in the process.

The science behind FR

At its best, FR fabrics work to mitigate flash fire situations through a combination of self-extinguishing and thermal protection properties.

1. FR fabric works to protect the skin during thermal exposure through its insulation properties, thereby reducing potential skin damage.
2. FR fabrics are engineered to self-extinguish once a thermal source is removed, so garments do not continue to burn post-exposure. It is the post-exposure burns that often lead to the most destructive body burns.

When these elements work together, PPE made with reputable FR fabric can substantially reduce burn injuries, especially injuries comprised of life-threatening second- and third-degree burns. Recent inventions have enhanced the comfort and mobility of protective garments long thought of as stiff and uncomfortable. Promoting this 'want to wear' experience has helped increase the proper usage of FR PPE and, in turn, continues to help lower the potential for life-altering accidents.

Yet, until Westex® ShieldCXP™, FR fabric only had the capability of meeting arc flash or flash fire hazard standards, and did not venture into the realm of inadvertent chemical splashes. Westex® ShieldCXP™ combines Milliken's innovative textile expertise, state-of-the-art FR protection and patented SofTouch™ softening technology with 100% DuPont™ Nomex® IIIA fibers to provide superior comfort, chemical splash resistance and flame resistance all in one fabric.

- Milliken SofTouch™ addresses the physical characteristics of flame resistant DuPont® Nomex® IIIA, which, because of its rigid polymeric structure, can display itchy and stiff characteristics. This process mechanically alters the woven fabric to achieve a softer garment. While the chemical composition of the polymers remain the same, the yarn architecture becomes more open, flexible and permeable — providing the user with a cooler, more breathable wear experience.
- Westex® ShieldCXP™ technology creates a repellent textile surface that resists penetration of many solvents, acids, bases and other common laboratory chemicals, while allowing air to pass through the textile.

Combining these technologies into one fabric ensure that lab and safety managers do not have to prioritize certain garments characteristics over others. In fact, those outfitted in laboratory coats made with Westex® ShieldCXP™ can rest assured in a performance-driven garment that achieves maximum protection over the lifespan of the coat.

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Meeting researchers where they are

“I get chills just thinking what would have happened had she not been wearing one of your coats,” reflects the lab supervisor, as he continues with the story. While both the primary researcher and the spotter sustained second- and third-degree burns on their hands, neither had burns beyond that portion of their bodies. Indeed, the primary researcher was the only one to have flames spread beyond her hands, and her clothing underneath the coat was completely unharmed. Both parties’ injuries are healing well, and the long-term prognosis is very good.

The incident, however, has reinforced the case for investing in more laboratory coats utilizing Westex® ShieldCXP™. The lab currently has six coats to be used in pyrophoric experiments like this; usually, though, the lab utilizes standard, non-flame resistant coats, which are less expensive because of budget constraints of university life. Today, the entire chemistry department supports the shift to coats made with Westex® ShieldCXP™, after witnessing the impact they had in helping to mitigate what could have been a major incident.

It is clear the university did their due diligence in finding the best solution for those in pyrophoric chemical situations, and now, on the heels of this real-life brush, the university is taking steps to increase the level of protection among all its researchers.

Blending the best of both worlds — proven protection and performance-enhancing comfort — lab coats made with Westex® ShieldCXP™ will in time become the standard for this university, showcasing long-term investment in the safety of its students.

“I was highly impressed with the performance of the coat,” the lab supervisor shares. “As a leading research center, it is important to balance the learning opportunities of our students with the foundational importance of keeping them safe. Laboratory coats made with Westex® ShieldCXP™ are our way forward, not only because they are proven right here in our own labs, but also because we can trust in the fabric brand behind the PPE. Our students really like these coats, and we will be working diligently to incorporate this key protection piece into all of our laboratory work.”

For more information on Westex® ShieldCXP™, including videos and a list of finite challenge chemicals tested to a modified version of AATCC 193, visit www.milliken.com/shieldCXP

These fabrics are innovative, flame and inadvertent chemical splash resistant materials intended to be used in garments that supplement personal protective equipment. The materials are engineered to self-extinguish when the source of ignition is removed and to repel small quantities of liquids following a splash from a wide variety of liquids onto the garment, thus limiting the exposure to the wearer. They may be used as a layer of, but are not intended for use as the primary protection in, firefighting garments or other products subject to repeated or extended exposure to heat or flame (unless explicitly certified in writing to meet the relevant regulations for use in such firefighting garments). This material is not intended for primary protection against large amounts of liquid chemicals, toxic or corrosive gases, and/or chemical mixtures under pressure. As each customer’s use of our product may be different, information provided, including without limitation, recommendations, test results, samples, care/labeling/processing instructions or marketing advice, is given in good faith but without warranty and without accepting any responsibility/liability. All sales are exclusively subject to our standard terms of sale posted at www.milliken.com/terms (all additional/different terms are rejected) unless explicitly agreed otherwise in signed writing.