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FLAME RESISTANT INSIGHTS℠

The source for arc flash and flash fire news

PART ONE — FLASH FIRES: EXTENSIVE NEW, INDEPENDENT TESTING

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Letter from Westex

Happy New Year!

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We are excited to bring you the second edition of our Flame Resistant Insights eZine. Our goal in publishing this quarterly eZine is to continue our commitment to educating the marketplace on the important role flame resistant clothing plays in protecting workers from arc flash, flash fire and other thermal hazards.

Over the past decade, thousands of companies have implemented flame resistant clothing programs to comply with industry standards and, more importantly, protect employees that could be exposed to these hazards. While this is definitely a positive for worker safety, the rapid growth in the market has resulted in a staggering number of new flame resistant fabric and garment brands, which can make establishing a new program a daunting task. We hope the information provided in this and future editions of Flame Resistant Insights will assist end users in making this important decision.

Thank you for subscribing to Flame Resistant Insights and please feel free to contact us here at Westex if you have any questions.

Sincerely,

Michael P. Enright
Vice President of Marketing and Sales

PART ONE — FLASH FIRES:

EXTENSIVE NEW, INDEPENDENT TESTING

By Scott Margolin
International Technical Director, Westex

Situation

Spurred by the recent "how long does a flash fire last" debate and other FR marketing issues, groundbreaking research was recently conducted to reaffirm the behavior and properties of flash fires, and to also determine if the industry's benchmark flash fire standards from NFPA and CGSB were adequate safety guidelines.

The research, designed and executed by personnel from the University of Alberta's Protective Clothing and Equipment Research Facility (PCERF) at the Texas A&M Brayton Fire Field, aimed to confirm the duration, average heat flux and speed of actual outdoor flash fires.

Experiment

The experimental design featured:

- A large, open outdoor area with a centrally located pipe to release hydrocarbon vapor, the essence of flash fires
- 360 degrees of unimpeded space to allow natural vapor cloud movement in all wind conditions
- Externally operable ignition sources to create the flash
- Mounting surfaces adaptable to thermocouples and data loggers
- Good sight lines for HD cameras
- Independent university labs and personnel

More than 60 experiments were conducted in prevailing environmental conditions over several days, with major success in quantifying the energy, brief duration and rapidly moving nature of flash fires.

The center of the prop features a large diameter vertical pipe which released propane, two rings of piping 10 and 25 feet from the propane release point, and an outer ring of torches 40 feet away. The experimental design focused on three concentric rings around the fuel source pipe: an inner ring of double sensors at 10' facing both out toward an oncoming flash and in toward the fuel leak, a second ring of single sensors at 25' facing out toward an oncoming flash, and the outermost ring of torches which would initiate combustion of the hydrocarbon vapor cloud *(see photo below)*. The sensors were placed in rings to allow for changes in prevailing wind speed and direction, and remained stationary for the duration of the experiments. There were also three cube arrays, each of which has five sensors, one per cube face, on a surface 6 sq. in; the 6th side of the cube houses an adjustable stand to deploy the array. These cubes are mobile, and were placed downwind to ensure maximum exposure to each flash. HD cameras were positioned perpendicular to wind direction to best capture movement of the flame front, and were adjusted as conditions dictated.

Each sensor was placed at upper-torso height of an average adult to optimize data capture in the area most relevant to a worker caught in a flash fire. Thirty-one sensors were deployed in each flash, and more than 60 flashes were created over several days. Each sensor measured heat every tenth of a second, which was recorded by a dedicated data logger for each unit. The data was then uploaded into a computer, which plotted precise flash duration as well as peak and average heat flux.

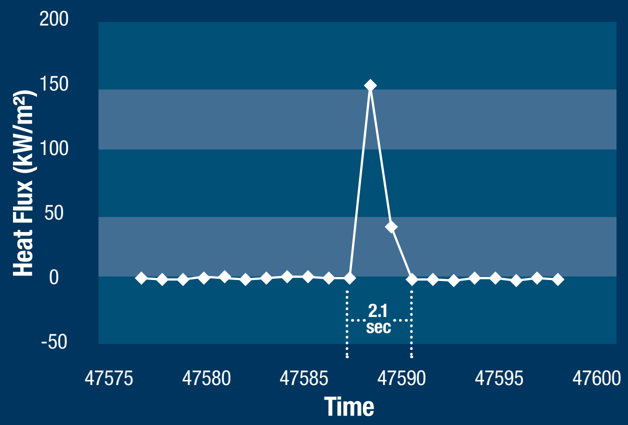
Preliminary Results

Once all the data was uploaded and assimilated, the results were presented as graphs for each individual sensor in each individual flash fire. The vertical axis tracks heat flux and the horizontal axis tracks time *(see chart on pg. 7)*. Thus, the typical look for an exposure is a pyramid Λ where the peak at the top represents maximum heat flux and the width of the opening at the bottom represents duration of the event at that location in the flash. No single sensor recorded a flash fire duration of 3 or more seconds. This was true regardless of position in the flash path, wind speed or direction, amount of propane released, etc. The vast majority of exposures were 2 to 2.25 seconds.

There are two ways to evaluate the duration results. The most conservative way, which yields the longest duration, is to count all time the sensor records heat above ambient conditions, which was the protocol for this work. A second alternative is to approach the data from a perspective closer to the lab flash fire and arc flash analysis, which are predicated on avoiding or minimizing second degree burn and worse. This can be done by looking at the total time each exposure spends above 1.2 cal/cm^2 sec (50kW/m^2), which is the threshold for a second-degree burn. This will typically yield a slightly lower duration, and represents the amount of time that flash was directly hazardous to exposed human skin. The two approaches generally yield data that differ by only fractions of a second.

Heat flux averages are discernible within a single location in a single exposure, across multiple locations in a single exposure, and across all exposures. The individual peak data showed somewhat greater variability than duration data, but average heat flux within an exposure and across all exposures was very consistent. Heat flux averaged 2 cal/cm^2 sec (84kW/m^2).

Results: Heat Flux vs. Time



The pictures and video clearly show that a flash fire is a moving flame front comprised of two or three sections. At ignition, there is a portion that is burning and a portion that has not yet ignited. Then, as the flame front moves into an area of fresh fuel, it becomes a three-phase event. Behind the flame front is an area where the fuel has been consumed and the fire is out, then an area of flame, and ahead an area of unignited fuel into which the flame is moving. The cube array sensors were able to confirm this observation.

> A moving flame front is, by definition, directional. That is, if it is moving toward your face rapidly, and self-extinguishing as it moves by consuming all the fuel, then you would not predict burns to your back.

If you are sprayed with a fire hose for a second or two while standing still, one side of you will be wet and one side of you will be dry. Similarly, if a flash fire is a moving flame front, it is directional and would be predicted to show a high heat flux on the sensor surface facing the flash, and a low heat flux on the surface on the back of the cube, in the "shadow" of the unit. This occurrence is exactly what the data showed. In each case, the side of the cube facing the oncoming flash fire recorded elevated heat flux consistent with the single sensor units, but the side of the cube facing away from the flash (a mere 6" from the high heat sensor) recorded very little or no elevated heat flux.

NFPA and CGSB each created standards to address the flash fire hazard in the mid and late 1990s. These standards committees were staffed by subject matter experts and highly experienced industry personnel, resulting in excellent non-commercial guidance and test protocol. The parameters of that testing were based on the best available science and accident investigations. They intended to require passing performance against a worst-case flash fire, which they defined as a rapidly moving flame front lasting typically 3 seconds or less. They set the heat flux at 2 cal/cm² sec(84kW/m²), because that is the average for hydrocarbon flash fire in air.

Based on these preliminary results, it's clear that the standards set forth by the NFPA and CGSB are consistent with what we've known all along about the duration, heat flux and speed of flash fires.

Look for detailed experiment results and conclusions in our next issue.

The True Cost
of a $50 Arc Rated Shirt

By Mike D. Wright
President, 70E Solutions
www.70esolutions.com

Electrical incidents causing severe burn injuries occur in the workplace more than 7,000 times annually, of which 2,000 are severe enough to put victims into long-term burn center treatment.

A Chicago newspaper article reported a tragic workplace fatality of a worker at an area elementary school doing electrical work. According to the County Medical Examiner, he was exposed to an electrical arc flash that caused his clothing to catch on fire. Less than a week later he died from severe burn injuries caused by this electrical incident. Left behind were his spouse and children who will pay a lifetime price for an accident that lasted less than a fraction of a second. As tragic as this event was, however, many pieces of this story are nothing more than typical.

Severe incidents are occurring in the workplace in the neighborhood of 5-10 times per day. While thermal burns are dangerous and harmful, the resulting severity and risk of fatality are more directly related to the onset of garment ignition. In nearly all of these instances the resulting severe burn injuries can be avoided or minimized, eliminating the potential for loss of human life.

The question the author of the article does not answer is if this worker was wearing polyester or cotton apparel. OSHA prohibits the use of nylons, acetates, and polyesters alone or in blend with cotton where the work around

thermal exposure could create the potential for these fibers melting and sticking to the skin. Many companies, therefore, require electrical workers to wear clothing with natural fibers of 100% cotton while working in these situations. While it is commonly thought that cotton is a safer alternative to polyester and polyester blends of fabric, cotton also presents a harmful risk due to the very low arc flash incident energy that is necessary to cause the cotton fabric to ignite. In an arc flash, molten copper and metal with temperatures in excess of 1,800 degrees Fahrenheit will likely cover major portions of the shirt and pants being worn, and in most instances cause ignition of the clothing. In either circumstance, burning garments or burning and melting garments predictably increase the severity and extent of injury to the point of risk of fatality.

OSHA (Occupational Safety and Health Administration) and MSHA (Mine Safety and Health Administration) recognize the dangers of wearing improper clothing when exposed to arc flash hazards. MSHA has cited NFPA 70E as a best practice in electrical "Hazard Alerts" and have stated, "Wear appropriate personal protective equipment (PPE) as defined in NFPA 70E (Standard for Electrical Safety in the workplace) when doing any electrical work." OSHA has requirements in their safety standards for electrical utilities and companies in general industry to ensure that clothing worn in these environments does not contribute to severe burn injuries or fatalities. For general industry, OSHA takes their requirements a step further to require that Personal Protective Equipment, including flame resistant clothing, be worn to protect exposed areas of the body from electrical hazards to the level of the potential hazard (29CFR 1910.335(a)(1)(i)). Wearing arc resistant clothing while working on or near energized equipment is very beneficial to the wearer as garment ignition is prevented, significantly lessening the severity and extent of the burn injury. Furthermore, the insulative characteristics of protective clothing defined as an arc rating (AR), or arc thermal performance value (ATPV), can be measured so that selected AR clothing systems will have higher arc ratings to minimize severity and extent of body burn.

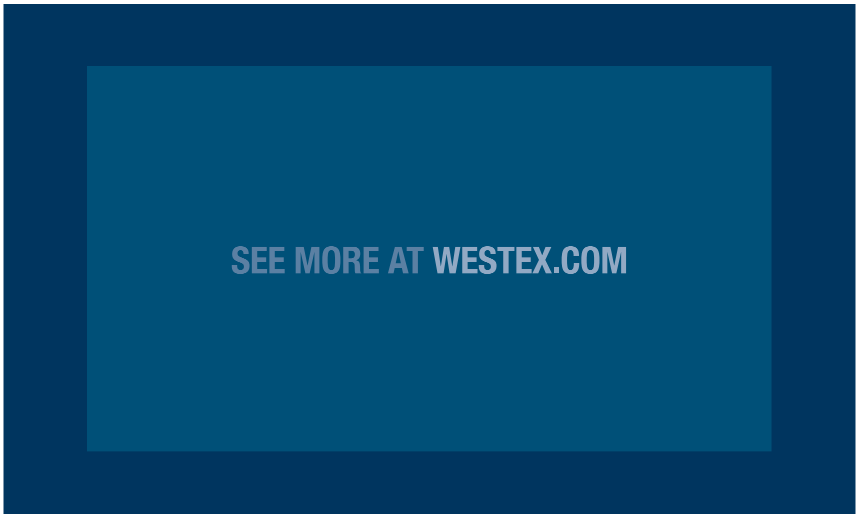
OSHA references NFPA 70E as an acceptable means to determine what levels of hazardous energy could be present if an arc flash were to occur and what combinations of PPE would result in a survivable or minimal burn related injury. In fact, the NFPA 70E Standard provides several different means to calculate the potential hazard levels and the appropriate levels of

Standard for NFPA 70E Safety Requirements for Employee Workplaces — 2012 Edition.		
HAZARD RISK CATEGORY	CLOTHING DESCRIPTION	MINIMUM ARC RATING (cal/cm^2)
0	Non-melting flammable materials	N/A
1	Arc rated FR Shirt and FR Pants or FR Coverall	4
2	Arc rated FR Shirt and FR Pants or FR Coverall	8
3	Arc rated FR Shirt and FR Pants or FR Coverall, and arc flash suit selected so that the system arc rating meets the required minimum	25
4	Arc rated FR Shirt and FR Pants or FR Coverall, and arc flash suit selected so that the system arc rating meets the required minimum	40

protection needed to prevent garment ignition, the root cause of the fatality mentioned above.

The most commonly referenced method is through utilization of the Hazard Risk Category task tables and Typical Protective Clothing Systems table. These task tables identify more common electrical tasks and assign Hazard Category (HRC) numbers of 0 through 4 based on potential incident energies for these tasks. The problem is that assumptions are made on the available fault current and the clearing times of the protective devices within the infrastructure, information that is rarely known. The Protective Clothing table makes recommendations for the minimum protective clothing arc ratings for each category, 0 through 4. Another method is the Simplified, Two-Category, ARC-Rated Clothing System within Annex H of the standard, it is almost universal in protective clothing implementation because of its “simplified and complete approach.” Under this method, arc rated daily wear apparel with an arc rating of 8 cal/cm^2 is utilized with protection to meet the requirements of Hazard Categories 0, 1 and 2. The second step in this approach is to utilize arc flash gear protecting to at least 40 cal/cm^2 for tasks that fall within the exposure ranges of Hazard Categories 3 and 4. Although the NFPA 70E Standard and the above methods are widely recognized tools for determining hazard potentials, there are a variety of software calculation tools also available that can be used in combination with the 70E Standard or on their own. Performing a Hazard Analysis through software calculations is the most effective and reliable means to determine the necessary protection level needed for workers. In circumstances where an organization has taken the steps to conduct a full hazard analysis using the available software options, a PPE model identical to the Simplified, Two-Category Approach is implemented almost without exception. HRC 2 compliant apparel worn daily in combination with HRC 4 arc flash suits are the most common configuration of protection.

We do not have an account of why this worker conducted a task while the equipment was energized, and do not know why proper arc rated apparel was not worn. We can, however, make a few general assumptions based on typical behavior in our workplace. In this case, it is possible that this individual did not receive the necessary safe electrical work practices training, or his employer possibly made the decision to not make a small investment above the typical costs of everyday work wear for an arc rated shirt and pants to protect the body from thermal burns or garment ignition.



While price points for protective apparel made from market proven, branded AR fabrics are higher than all cotton industrial work wear, studies have shown that several types of compliant cotton and synthetic blended, arc rated fabrics are as economical over time or nearly identical in costs to everyday flammable/100% cotton work wear. This is achieved by using arc rated fabrics engineered with special fibers to enhance abrasion resistance, extending garment service life expectancy for the arc rated daily wear.

The overall costs between what once had been perceived as protective and compliant, non-AR 100% cotton work apparel that we now know can contribute directly to severe burn injury or fatalities vs. NFPA 70E HRC 0, 1 and 2 compliant clothing solutions are minimal.

In the above scenario, a relatively small investment in an arc rated shirt and pants would have allowed this worker to return to his home and family at the end of the workday and not become another typical and tragic story of a preventable workplace fatality caused by an electrical incident allowing the ignition of clothing. Positive changes are occurring as many electrical workers today are receiving the proper training to work in these conditions safely and are making the necessary investments to purchase and wear appropriate HRC2 compliant arc rated clothing. Hopefully this will result in seeing fewer or ideally eliminating stories such as this in the news moving forward. Remember when exposed to an arc flash hazard to cover every part of your body that you want to keep with the appropriate level of PPE.

Where normal 100% cotton work apparel is replaced routinely due to garment wear or damage caused in the workplace, the added durability of specialty AR fabrics allows multi-year or significantly greater lifespan than the abbreviated 12-18 month period of cotton.

70E Solutions provides high quality electrical protective equipment, testing of that equipment and expert advice to those in the electrical field. President Michael Wright has over 34 years of experience in the electrical field. He is currently an IBEW local #5 inside journeyman wireman. In past years he was an electrical contractor, IBEW journeyman lineman and safety manager.

Flame-Resistant Clothing:

The Forgotten Element in Combustible Dust Safety

By Jason Reason
Vice President of Safety and Health Services,
Consultant—Combustible Dust, Safety & Health, Lewellyn Technology
www.lewellyn.com

The safety and health hazards posed by combustible dusts such as, but not limited to organic and metal dusts are unique and extremely complex. Most employers are aware of the deflagration and explosion hazards associated with combustible dust(s). However, the flash fire hazard posed by combustible dust(s) often goes unrecognized and unmitigated.

The result of a combustible dust deflagration and/or explosion is often significant damage to equipment, processes and the facility at large. While employees can potentially be injured during a deflagration and explosion, many of the injuries and fatalities associated with combustible dust(s) are caused by direct employee exposure to flash fires.

flash fire ***noun***

a fire that spreads by means of a flame front rapidly through a diffuse fuel, such as dust, gas or the vapors of an ignitable liquid, without the production of damaging pressure.[1]

Flash fires associated with combustible dusts are usually short-lived, ranging from the order of 10 milliseconds inside small equipment to the order of seconds in a large room.[2] Flash fires from any source (including combustible dust) can also generate vast amounts of heat. Persons and objects exposed to flash fires are subjected to temperatures on the order of approximately 2,240 °F to 6,740 °F.[2]

Although employee exposure to a combustible dust flash fire is typically short in duration, the flame(s) generated from flash fires can be fatal to unprotected employees within and near the expanding flame(s). Employees exposed to high thermal radiation (heat) levels wearing flammable clothing can potentially experience third degree burns to bare skin and 50% lethality in less than 10 seconds.[2] Due to the severity of the hazards posed by a combustible dust flash fire, it is imperative that employees who are potentially exposed to combustible dust flash fires be required to wear appropriate flame resistant clothing (FRC).

Employee Protection from Combustible Dust Flash Fires

When properly designed, installed and maintained, explosion protection and prevention systems (explosion vents, explosion suppression systems, etc.) protect employees from the explosion hazards posed by combustible dust(s). However, these systems provide little to no protection for employees who are exposed to combustible dust flash fires. FRC (also called flame-resistant garments (FRGs)) can help protect employees from thermal and other hazards associated with combustible dust flash fires. Prior to being certified as FRC, any clothing or garments must meet the various design, construction, evaluation and certification requirements listed in the National Fire Protection Association's (NFPA) *Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire* (NFPA 2112).

Most of the injuries associated with combustible dust flash fires result in employees sustaining minor to severe burns (especially on the area(s) of the body that were directly exposed to the flash fire). In most of the incidents where employees were severely burned during combustible dust flash fires, these employees were wearing clothing that was not designed and certified as FRC. Although FRC cannot completely prevent burns sustained during a combustible dust flash fire, FRC can drastically reduce the severity of burn injuries resulting from short-duration thermal exposures or accidental exposure to combustible dust flash fires.

OSHA and Combustible Dust Flash Fire Hazards

In the last five years, the Occupational Safety and Health Administration (OSHA) has vastly increased its enforcement activities for combustible dust. OSHA is aggressively targeting any facilities that manufacture, process, blend, convey, repackage and/or handle combustible dust(s). Currently, there is not an OSHA Standard that specifically addresses all of the hazards associated with the various types of combustible dusts. Thus, OSHA is primarily using the General Duty Clause to address the fire, deflagration and/or explosion hazards associated with combustible dust(s). OSHA's General Duty Clause (Section 5(a)(1)) states that the employer must "furnish to each of his employees, employment and a place of employment which are free from recognized hazards that are causing, or likely to cause death or serious physical harm." General Duty Clause citations are frequently issued to address combustible dust hazards such as, but not limited to lack of explosion protection and isolation systems on dust collection equipment.

OSHA's *Status Report on Combustible Dust National Emphasis Program* states that a total of approximately 4,926 combustible dust citations were issued between October 2007 and June 2009.[4] Approximately 11% of these combustible dust citations (226 citations) pertained to personal protective equipment (PPE) such as, but not limited to flame resistant clothing.

In addition to the General Duty Clause, OSHA also uses several current OSHA standards to address the hazards associated with combustible dust(s). Although most of these current OSHA standards do not specifically mention combustible dust, these standards are used to address some of the safety and health hazards associated with combustible dust. One such OSHA standard that is used to address the flash fire hazard associated with combustible dust is 29 CFR 1910.132 (Personal Protective Equipment, General Requirements).

The number of OSHA citations issued to address employee protection from combustible dust flash fire hazards (i.e. lack of appropriate flame resistant clothing) may surprise some employers. OSHA's Status Report on Combustible Dust National Emphasis Program states that a total of approximately 4,926 combustible dust citations were issued between October 2007 and June 2009.[4] Approximately 11% of these combustible dust citations (226 citations) pertained to personal protective equipment (PPE) such as, but not limited to flame resistant clothing.

In terms of citations related to combustible dust hazards, the only OSHA standards (including the General Duty Clause) that were cited more frequently than 29 CFR 1910.132 (PPE) were 29 CFR 1910.1200 (Hazard Communication (HazCom)) and 29 CFR 1910.22 (Housekeeping).

How Hazard Assessments Relate to FRC

Although there are no specific OSHA standards for FRC in terms of combustible dust, OSHA's Personal Protective Equipment (PPE) Standard (29 CFR 1910.132(d)(1)) requires employers to

> "assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of PPE."

29 CFR 1910.132(d)(1) further states that

> "if such hazards are present, or likely to be present, the employer shall select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment."

Although 29 CFR 1910.132(d)(1) requires each employer to perform a PPE hazard assessment, the standard does not specifically describe how this assessment should be performed, or what information should be examined and documented during the assessment. Thus, employers tend to focus on requiring employees to wear PPE that protects them from easily

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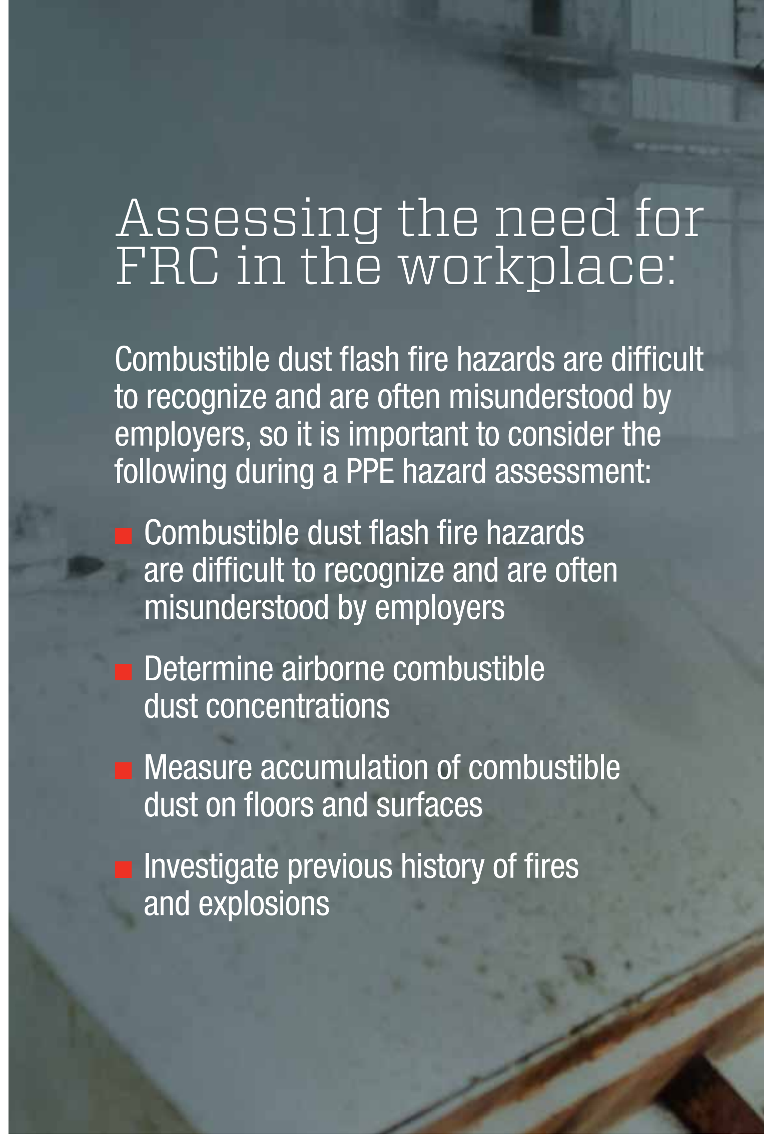

Assessing the need for FRC in the workplace:

Combustible dust flash fire hazards are difficult to recognize and are often misunderstood by employers, so it is important to consider the following during a PPE hazard assessment:

- Combustible dust flash fire hazards are difficult to recognize and are often misunderstood by employers
- Determine airborne combustible dust concentrations
- Measure accumulation of combustible dust on floors and surfaces
- Investigate previous history of fires and explosions

recognized hazards (safety glasses, hearing protection, gloves, etc.). Although combustible dust flash fire hazards should be examined during the PPE hazard assessment, these hazards are often overlooked or ignored because these hazards are not easily recognized or understood by most employers.

When Is FRC Required to be Worn?
NFPA's *Standard on Selection, Care, Use, and Maintenance of Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire* (NFPA 2113-2012) recommends that employees wear FRC in facilities or areas where combustible dust is present during normal operation. However, the decision to require employees to wear FRC depends on many factors including, but not limited to the airborne combustible dust concentrations, amount of accumulated combustible dust on floors and surfaces, and previous history of fires and explosions. Prior to determining the need (or lack thereof) for FRC, all of these and other factors should be thoroughly examined during the PPE/workplace hazard assessment.

There are certain jobs and processes that are prevalent throughout many industries where FRC should be required to be worn. In addition to posing a significant flash fire hazard during normal operation, all of these jobs and processes have been shown to have the potential to produce significant airborne combustible dust concentrations (sometimes inside of the fixed volume of an enclosure). One of the primary jobs and processes that pose a combustible dust flash fire hazard are operations involving cleaning and removing of accumulated combustible dust from surfaces, floors, equipment, etc. Due to the inherent flash fire hazard present, FRC should be required to be worn whenever these cleaning operations are performed. However, the use of FRC is not exclusive to these cleaning operations alone. In order to determine if FRC is required for other jobs or processes, the employer must thoroughly evaluate each job or process where employees are directly or indirectly exposed to combustible dust(s).

Summary:
Combustible dust fires and explosions continue to occur on a regular basis. The benefits of explosion protection methods such as, but not limited to explosion venting and explosion suppression systems are relatively well known. However, FRC continues to be overlooked by most industries and employers because the flash fire hazard posed by combustible dust(s) is not fully recognized or understood. Although often overlooked, FRC can help

protect employees from the thermal and other hazards associated with combustible dust flash fires. Compared to other methods for mitigating combustible dust hazards, FRC is cost effective and relatively easy to implement. FRC has and will continue to save the lives of employees who are exposed to combustible dust flash fires. However, this will only happen if more employers begin to understand the flash fire hazard posed by combustible dust.

Jason Reason is Vice President of Safety and Health Services for Lewellyn Technology and a combustible dust consultant throughout the United States. He was formerly a Compliance Safety and Health Officer (CSHO) for Indiana OSHA (IOSHA) for 12.5 years where he participated in combustible dust inspections and investigated accidents and fatalities caused by combustible dust fires, deflagrations and/or explosions. He also teaches Compliance Officers how to properly perform combustible dust inspections during courses at the OSHA Training Institute (OTI) in Arlington Heights, Illinois.

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ASK WESTEX

"How are FR fabrics made flame resistant?"

Bob, Atlanta, Georgia

Answer: There are various ways, which include engineering petroleum-based fibers from chemicals, adding FR chemistry to fibers or adding FR chemicals after fabrics have been dyed. In the case of Westex, we have spent decades perfecting our highly technical, proprietary flame resistant fabric technology which guarantees that Westex UltraSoft AC®, UltraSoft® and Indura® brand fabrics are flame resistant for the life of the garment. Westex's proprietary production process combines advanced custom-engineered machinery with sophisticated computer equipment to conduct the "ammonia cure" system which impregnates a long-chain flame retardant polymer into the core of each cotton fiber. Note that not all FR fabrics are the same and this process is specific to only Westex brand fabrics. To learn more about the proprietary, state-of-the-art Westex technology visit www.westex.com.

Tom Moore
Westex Southeast Market Manager

HAVE A QUESTION OF YOUR OWN?

Submit it to insights@westex.com
or contact the regional manager in your area.

"Do I have to use FR fabric to patch garments?"

Leonardo, Rio de Janeiro, Brazil

Answer: Repairs to FR garments should be made with the same materials as the original garment, meaning the same weight and brand of fabric as well as flame resistant thread. Contact Westex or your garment manufacturer for more information regarding garment repairs.

Maria Chies
Westex South America Market Manager

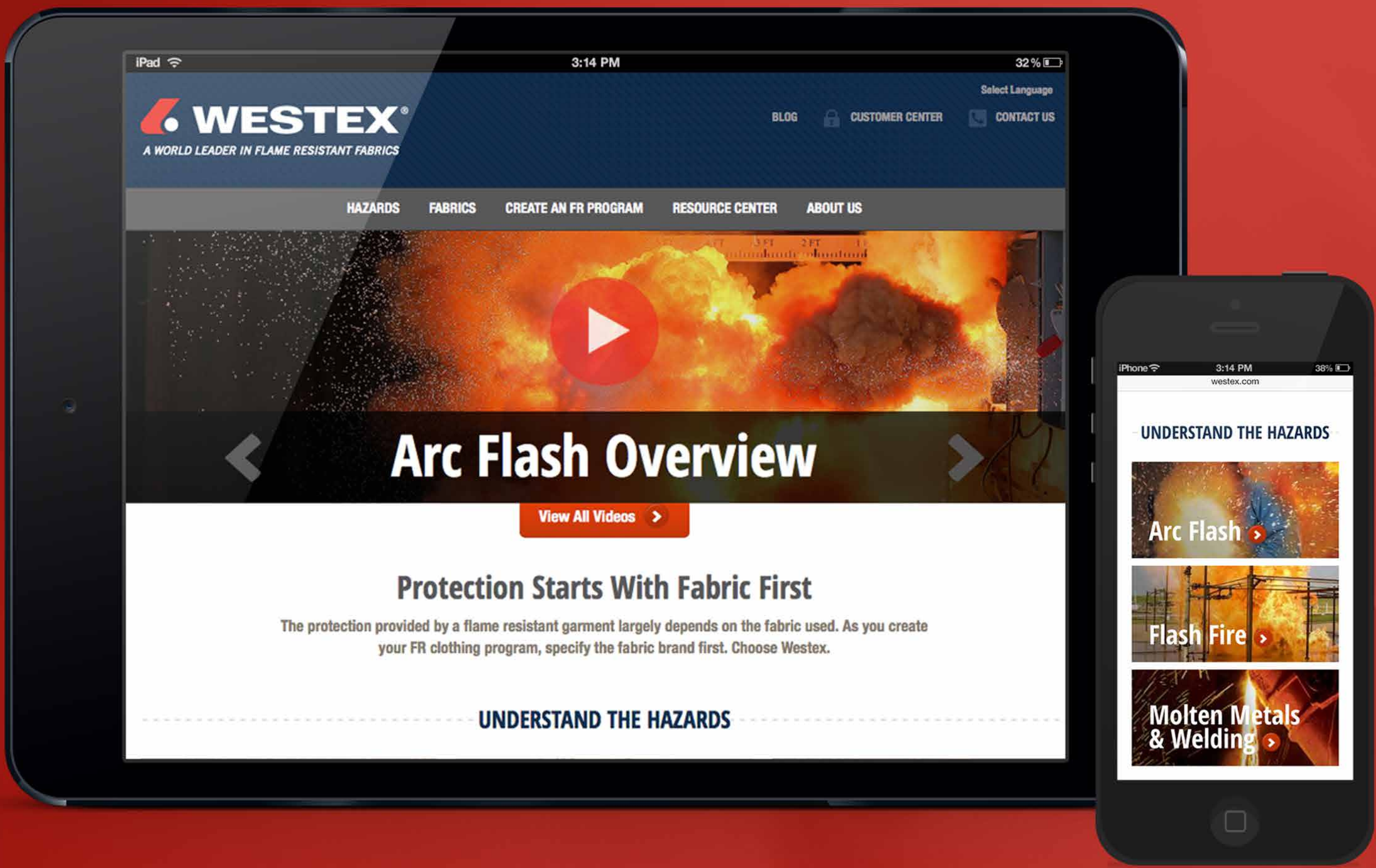
"Can you please confirm if the 100% cotton coveralls that we are using are FR or contain any FR properties?"

Alicia, Lethbridge, Alberta

Answer: There is a HUGE difference between regular 100% cotton and fabric such as UltraSoft® that has been engineered to be flame resistant for the life of the garment. If you are currently wearing non-flame resistant 100% cotton coveralls then there is the potential for the fabric/garment to ignite and continue to burn if exposed to an arc flash, flash fire, molten metal or welding hazard. There are multiple videos on the Westex website demonstrating the difference between regular 100% cotton non-FR and UltraSoft® brand fabric.

Greg Kelly
Westex Western Canada Market Manager

Introducing:



The New Westex.com

Last quarter, Westex unveiled their new website. The site upgrades, which feature both enhanced content and a redesigned format, provide a better overall user experience. A few of the new additions to the site include a resource center, blog, customer care center and soon to come a where to buy page.

The resource center on the redesigned site is the best tool for all your technical needs. It offers a wide range of content from live arc flash and flash fire testing videos to articles and white papers and so much more. One great feature of the resource center is the ability to download or share all Westex videos directly from the website. Whether you are looking for a certain piece of content or want to learn more about a general topic, the information you're looking for is easily accessible in the resource center.

Westex has taken their social skills to the next level with the launch of the Westex Blog. Not only can you connect with Westex on Facebook, Twitter, LinkedIn and YouTube but now their technical experts will be blogging about the latest in arc flash and flash fire hazards and standards along with other relevant industry topics.

Another great feature of the redesigned site is the customer care center and the soon to come where to buy page. The customer care center gives Westex's direct customers access to a plethora of information just by logging into the site. Whereas the where to buy page will easily connect anyone looking to purchase garments made with Westex brand fabrics directly with a garment manufacturer that offers what they are looking for.

UP-TO-THE-MINUTE NEWS AND INSIGHTS

Connect with Westex on social media now!

Like us today to:

- Interact with other FR program managers
- Watch exclusive training and testing videos
- Get your FR program questions answered

Be the first to hear about:

- Exclusive events
- Product news
- Special giveaways

Follow Westex for:

- Internal company updates
- Interaction with our team
- In-depth product information

Get expert advice on:

- Implementing an FR clothing program
- Evaluating FR fabrics
- FR safety hazards and standards

Volume 03 Preview:

Be on the lookout for more FR tips, advice and insights in our next issue — coming in April.

Connect With Westex:

Have specific arc flash and flash fire concerns? Reach out to your regional manager for advice, or email insights@westex.com. We may feature your question in an upcoming edition of our eZine!

About Westex:

Established in 1919, Westex has nearly 100 years of experience in the textile industry, with over 50 years of experience manufacturing flame resistant fabrics. The Westex technology combines custom-engineered equipment with additional proprietary processing steps at nearly every stage of the engineering process. This superior technology led to the market-proven flame resistance guarantee for the life of the garment, making Westex a world leader in flame resistant fabrics. The popular Westex UltraSoft AC®, UltraSoft® and Indura® brands are specified by thousands of end users globally because of their proven track record of protection, comfort and value.

The information in this publication is based on testing conducted by or conducted on behalf of Westex and represents our analysis of the test results. It is not intended to substitute for any testing that may be unique and necessary for your facility for you to determine the suitability of our products for your particular purpose. Since we cannot anticipate all variations in end-user conditions, Westex makes no warranties and assumes no liability whatsoever in connection with any use of this information. All test results reported are based on standard laboratory tests related to exposure to arcs, flames and heat. Manikin tests yield laboratory predictions of relative burn injury based on factors such as fabric type, fabric weight, garment styling and fit, laundering, exposure energy, and exposure time. The results reported should not be used to predict garment performance in actual fire situations. For maximum maintenance of the protective properties of garments made from flame resistant fabrics, garments should be properly cleaned for the thorough removal of greases, oily soil and other contaminants that may affect flame resistance of the fabric. Consult with the fabric supplier, garment manufacturer and launderer for recommendations of proper cleaning techniques.

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