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Electric Arc Flash Protective Clothing

This report provides information on Flame Resistant Clothing (FRC) intended for protection against electric arcs. It does not address other types of PPE that may be necessary for safe electrical work, including insulated gloves or sleeves, face shields, eye or hearing protection, or specialized tools.

Persons who work around energized lines or electrical equipment are exposed to several hazards, including arc flash. An arc flash is an unexpected, sudden release of heat and light energy produced by electricity traveling through air, usually caused by accidental contact between live conductors. It is an extremely high temperature discharge produced by an electrical fault in air.

Electrical arcing gives off thermal radiation (heat) and intense light, which can cause severe burns. Several factors affect the degree of injury, including skin color, area of skin exposed, and type of clothing worn. A burn can become much worse if clothing melts to the skin, or if it continues to burn after ignition.

A high-voltage arc can also cause many of the copper and aluminum components in electrical equipment to melt. These droplets of molten metal can be blasted great distances by the pressure wave created when the surrounding air is heated. Although these droplets harden rapidly, they can still be hot enough to cause serious burns or cause ordinary clothing to catch fire.

The National Fire Protection Association (NFPA) estimates that more than 2,000 people are treated for serious burns from arc flashes annually. In fact, electrical accidents

produce more hospital admissions due to arc flash burns than electrical shocks. It has been estimated that 5 to 10 workers receive severe or fatal injuries each day from electric arc flash accidents. Hazards from electric arc flash also apply to bystanders or non-essential personnel who may be too close to the arc.

De-energizing live parts before they are worked on or near by means of lockout procedures can significantly reduce the likelihood of arc flash burn injury by reducing employee exposure to electrical hazards. If the parts cannot be de-energized, other methods of hazard control include isolating live circuits by use of shields, barriers, or insulation, or working safe distances from live circuits.

Personal protective equipment (PPE), including flame resistant clothing (FRC), can provide an additional safeguard against the hazards posed by electrical arcs. Arc rated FRC is designed to resist ignition and to protect against the thermal energy released by the arc. However, it does not offer protection against the physical injury that may occur from an arc blast, a high-pressure sound wave, which can accompany an arc flash.

This report provides information on selecting and using arc rated FRC. It does not address other types of PPE that may be necessary for safe electrical work, including insulated gloves or sleeves, face shields, footwear, eye or hearing protection, or other electrical protective equipment.

Types and Characteristics of Electric Arc Flash Protective Clothing

Arc rated FRC is clothing that may ignite when exposed to an ignition source, such as an electric arc, but burning will stop in the absence of the ignition source. Electric arc protective clothing includes items, such as shirts, pants, coveralls, hoods, jackets, rainwear, and parkas.

FRC is usually made out of cotton, cotton-synthetic blends, synthetics, or leather. Some synthetics, such as certain types of aramids and benzimidazoles, are inherently flame resistant. Other clothing may be chemically treated for flame resistance.

American Society for Testing and Materials (ASTM) International standard ASTM F 1506, *Standard Performance Specification for Flame Resistant Textile Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary Electric Arc and Related Thermal Hazards*, is the primary U.S. product safety standard for arc flash protective clothing. The standard provides specifications for testing clothing with an electric arc. Based upon the test results, arc flash ratings are determined for the clothing based on its resistance to the amount of incident thermal energy to which it is exposed from the arc. The rating assigned is based on the estimated onset of second-degree burns. No melting of the clothing at any temperature during the test is allowed.

The arc flash rating is called the Arc Thermal Performance Value (ATPV), which is expressed in calories per square centimeter (cal/cm^2) or joules per square centimeter (J/cm^2). The ATPV is an important parameter to look at when choosing PPE for protection against electric arc flashes. Clothing is available with ATPV ratings from approximately four to greater than $50 \text{ cal}/\text{cm}^2$ (16.7 to $209 \text{ J}/\text{cm}^2$). The arc rating can be found on the clothing label, per the labeling requirements of ASTM F 1506.

Clothing is sometimes referred to as offering Level 0-4 protection. These criteria come from NFPA 70E (2012 revision), *Standard for Electrical Safety in the Workplace*, published by the NFPA, which classifies the hazards of particular tasks using a simplified rating scale.

Flash Fire vs. Electric Arc Protective Clothing

It is important not to confuse protective clothing designed for use against flash fires with clothing that has been designed for use against electric arcs. PPE for flash fires is usually referred to as "NFPA 2112" or "NFPA 2113" clothing after the NFPA standards that address FRC rated for flash fire, i.e., NFPA 2112, *Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire*; and NFPA 2113, *Standard on Selection, Care, Use, and Maintenance of Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire*, respectively. The clothing is tested to different standards and has different acceptance criteria.

FRC intended for flash fires is only interchangeable with arc rated clothing if the manufacturer supplies a label or certification information that the clothing is also compliant with NFPA 70E. Substitution of an NFPA 2112 garment should not be considered for

an NFPA 70E garment without certification information to allow such substitution. The numerical thermal ratings in calories or joules per square centimeter generated from NFPA 2112 and NFPA 70E are not interchangeable because the values were obtained using different test methods. The same applies for the substitution of NFPA 70E clothing for NFPA 2112 clothing. Evidence to show that the garments are compliant with the relevant standards is required.

OSHA Requirements for Selection of Electric Arc Protective Clothing

The Occupational Safety and Health Administration (OSHA) provides requirements that address the use of PPE of any type, not just body protection. These general requirements for use of all PPE are listed in OSHA regulation 29 CFR 1910.132 and are part of the OSHA General Industry PPE standards.

General Requirements

OSHA's general requirements state that before using any PPE, the employer must conduct a hazard assessment, for all job tasks, to determine what hazards are present. Based upon the results, the employer must select the appropriate PPE, ensure that it fits properly, provide training to employees on how to use it, ensure that employees wear it, and communicate the results of the hazard assessment to affected employees. In addition, the employer must prepare a written certification verifying that the required hazard assessments have been completed. See Occupational Safety Report OS-12-39, *Personal Protective Equipment (PPE) Hazard Assessments*, and Client Handout CH-50-188, *Personal Protective Equipment Hazard Assessment*, for additional information.

Electrical Standards

The standard regulating electric power generation, transmission, and distribution [29 CFR 1910.269(l)(6)(iii)] does not require the use of flame resistant clothing to protect employees from electric arc flashes. The regulation merely states that employees must not wear clothing that would increase the extent of injury that would be sustained if exposed to flames or electric arcs. On June 15, 2005, OSHA proposed a revision to this standard, which would require the use of arc rated FRC under certain situations. This proposal has not been finalized.

Subpart S of the OSHA regulation, which covers electrical safety, was written prior to the time when FR clothing was widely available and does not require FR clothing. Instead, employers must take other steps to protect employees, such as using barriers or insulated tools. There is a 2006 compliance interpretation, which states that use of FR clothing as supplemental protection in case the primary safeguard fails, might qualify the person for advantageous treatment in any enforcement action.

Hazard Analysis and PPE Selection

While the OSHA regulations do not reference NFPA 70E, this national consensus standard provides detailed guidance on the selection and use of PPE for protection against electric arc flashes. However, OSHA has stated that NFPA 70E can be used by OSHA and employers as a guide in making hazard analyses and selecting control measures.

Arc Flash Hazard Analysis

Similar to the OSHA requirement to conduct a hazard assessment for the selection of PPE, NFPA 70E includes a requirement to conduct

an arc flash hazard analysis in order to select arc flash protective clothing. There are various methods outlined in NFPA 70E which can be used to conduct the arc flash hazard assessment. For example, IEEE 1584, *Guide for Performing Arc-Flash Hazard Calculations*, published by the Institute of Electrical and Electronics Engineers (IEEE), is one approach that can be used. An arc flash hazard analysis involves a review of the power distribution and electrical equipment that is located at the site. Because the analysis can be complex, it must be performed by experienced, qualified personnel. It should be modified whenever there is a change in the configuration of the electrical equipment and reviewed at least once every five years even if there are no known changes.

Two fundamental parameters are derived from the arc flash hazard assessment—the Arc Flash Protection Boundary (AFPB) and the incident thermal energy to which a worker could be exposed. The level of PPE required to perform a specific task is based upon these two parameters.

Arc Flash Protection Boundary

The Arc Flash Protection Boundary (AFPB) is similar in concept to the “regulated area” found in many OSHA chemical-specific standards, which is defined by airborne concentrations above the Permissible Exposure Limit (PEL) for the specific chemical. Enter the regulated area, and PPE for that specific chemical must be worn. Cross the AFPB, and arc flash protective clothing is needed. NFPA 70E defines the AFPB as the distance at which a second-degree burn is likely to occur. The AFPB can be calculated using various methods described in NFPA 70E.

Incident Energy

The Arc Flash Hazard Analysis includes an incident energy analysis, which determines the amount of thermal energy each worker could be exposed to if an arc occurred. The thermal energy received by the worker’s face and chest, while performing the specific job, is calculated in calories per square centimeter. If the hands or other parts of the body are placed closer to the possible source of an arc, then the incident thermal energy for these body parts is greater.

Selection of Arc Flash Protective Clothing

NFPA 70E defines two primary ways to select arc flash PPE. One method is used if an Arc Flash Hazard Analysis was conducted, and the other uses tables contained within NFPA 70E which classify tasks into Hazard Risk Categories (HRCs). A third, simplified method can be used for industrial facilities.

Selection Based on Incident Energy Analysis

If an Arc Flash Hazard Analysis was conducted, the incident energy, which was calculated from the analysis, is used to select the appropriate PPE. If the incident energy is above 1.2 cal/cm² (5 J/cm²), then arc rated flame resistant clothing must be worn—this is considered the threshold value for a second-degree burn. Arc rated clothing with an ATPV equal to or higher than the calculated thermal incident energy is chosen. NFPA 70E, Table H.3(b), provides guidance on how to select FRC and other PPE based on the calculated incident energy.

Selection Based on NFPA Tables

If an Arc Flash Hazard Analysis was not conducted, there is a simplified way to choose PPE using two tables contained in NFPA 70E.

- Table 130.7(C)(15)(a) lists about 90 jobs performed on common electrical equipment using alternating current (AC) at various voltages, such as panelboards, switchboards, motor control centers, motor starters, switchgears, and other equipment. Table 130.7(C)(15)(b) lists about ten jobs involving direct current (DC). For each job, the tables assign a Hazard/Risk Rating ranging from 0 to 4 for the task and indicate whether insulating rubber gloves and insulated tools are required. A rating of 0 represents the lowest hazard, and a rating of 4 represents the highest hazard.
- Table 130.7(C)(16) lists the PPE required for each Hazard/Risk Rating. The table includes the minimum arc rating in cal/cm² required for the protective clothing, the types of clothing required (shirt, pants, etc.), as well as the flame-resistant protective equipment needed, such as hard hats, safety goggles, leather work shoes, etc.

If the Table method is used, all of the tables, as well as the entire NFPA 70E standard can be viewed online as a read-only document at: <http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=70E>.

In order to read the document, you will have to register. There is no fee to view the documents online.

A Hazard/Risk Category of 0 requires that clothing be non-melting, although it may be made of a flammable fabric, such as untreated cotton, wool, rayon, or blends of these fabrics with a minimum weight of 4.5 oz. per square yard (153 grams per square meter). A Hazard/Risk Category of 4 requires arc rated shirt, pants, coveralls, jacket, hood, full arc flash suit covering all parts of the body, etc.,

so that the total protection afforded by the system of clothing selected (see section on Layering of Clothing) has a minimum arc rating of 40 cal/cm² (167.36 J/cm²).

All of the tables in NFPA 70E are based upon certain assumptions and have numerous footnotes that must be read to ensure that the PPE selected is appropriate for the task. For this reason, the incident energy analysis method for selecting PPE is job-specific and preferred over the simplified Table method. If the Table method is used, reference must be made to the actual tables and notes in 70E.

Simplified Approach

Table H.2 in Annex H of NFPA 70E offers a simplified approach to PPE selection for industrial facilities. The majority of electrical tasks performed in industrial facilities falls into Hazard/Risk Categories 0 to 2. Workers who perform these tasks should be adequately protected if they wear long-sleeved shirts and pants, or coveralls, all of which have a minimum ATPV of 8 cal/cm² (33.47 J/cm²). For workers conducting tasks with Hazard/Risk Categories of 3 or 4, a full arc flash suit should suffice. This might consist of arc rated long-sleeve shirts, pants, coveralls, jacket, hood, full arc flash suit covering all parts of the body, etc. so that the total protection afforded by the system of clothing selected has a minimum ATPV of 40 cal/cm² (167.36 J/cm²).

Layering of Clothing

The required level of protection can be achieved by using a single arc rated layer of clothing with the needed ATPV, such as an arc flash suit, or by using multiple layers or arc rated clothing, such as a combination of coveralls, shirt, and pants. Although untreated cotton fiber will not melt, it will burn, and clothing made of untreated cotton that has not met the criteria of ASTM F 1506 should

not be used to increase the ATPV rating of the clothing combination for electric arc flash protection.

Undergarments and socks worn next to the skin must be made of non-meltable materials but can be flammable if flame resistant clothing is layered so that the flame resistant layer next to the undergarments will not break open. However, they must not be made out of synthetics, such as polyester or nylon, which could melt. Alternatively, undergarments made of flame resistant materials can be worn.

The total protection afforded by layering of arc rated clothing is not strictly additive, and it must be determined by testing the multilayers in the configuration in which they will be worn. As a result, the manufacturer of the clothing should be contacted for guidance on selection of clothing, which will be worn in layers. Additional guidance is provided in Annex M of NFPA 70E.

Need for Other PPE

It is important to remember that, based on the job task, other flame resistant personal protective equipment, such as non-conductive, arc flash rated face shields, gloves, hard hats, safety goggles, etc., might be needed to protect the worker's head, face, neck, and chin, as well as rubber gloves with leather protectors and leather shoes. Hair or beard nets must be flame resistant and must not melt.

For guidance on the selection of other PPE, refer to the various tables in NFPA 70E, such as Tables 130.7(C)(15)(a) and (b), Tables 130.7(C)(16), and Annex H.

PPE Requirements – Labeling of Electrical Equipment

Once the incident energy for the electrical equipment has been determined by conducting a hazard analysis or the level of PPE required has been determined from the NFPA tables, the electrical equipment should be labeled. Article 110.16

of NFPA 70, *National Electrical Code*, requires that electrical equipment “that are in other than dwelling units and are likely to require examination, adjustment, servicing, or maintenance while energized shall be field marked to warn qualified persons of potential electric arc flash hazards. The marking shall be located so as to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.” NFPA 70 then refers to NFPA 70E for the specific requirements for such marking, which are detailed in Article 130.5(C) of NFPA 70E.

If the electrical equipment was labeled before September 30, 2011, the label should display the incident energy or the level of PPE required. Electrical equipment labeled after September 20, 2011 must display three items: (1) at least one of the following: incident energy and associated working distance, required arc rating for FRC, required level of PPE, and Hazard Risk Category for the equipment; (2) system voltage; and (3) arc flash boundary.

Documentation should be available to substantiate the information displayed on the label. For example, the documentation may show that the labeling was based on the results of an incident energy analysis or the use of NFPA tables. In addition, the protective clothing and PPE worn by the workers can be checked to see that it conforms to the label requirements.

Use

Once the appropriate FRC has been selected, it is important that the clothing be worn properly to maintain its intended level of protection. Flammable items must not be worn over FRC nor should the clothing be allowed to become contaminated with flammable or combustible liquids. Coveralls should be fully closed and not worn open, and shirts should be worn with the collars and sleeves fastened—sleeves should not be rolled up.

Flammable or meltable items should not be worn under arc rated clothing. However, as previously described, there is an exception for non-meltable, flammable undergarments that are worn next to a flame resistant layer that will not break open.

Clothing Fit

Proper clothing fit promotes comfort and use. If the clothing is too tight or too large, movement can be affected. Tight clothing can be more susceptible to tearing, and loose clothing might allow entry of chemicals into exposed areas or be caught in moving machinery. A variety of sizes should be offered to employees, especially to promote fit for women and men with smaller body sizes. Clothing can be evaluated by having employees simulate the use of the clothing for various tasks to see which size promotes functionality, comfort, and protection. Performing certain exercises, such as kneeling, squatting, partially climbing a ladder, extending the arms, reaching overhead, etc., will help evaluate the fit of the clothing. Check with the manufacturer for guidance on choosing the correct size.

Inspection

Clothing should be inspected daily before each use for the presence of flammable or combustible solvents, grease, or other contamination that could compromise the flame resistance of the garment, as well as for cuts, tears, holes, fraying or other worn areas, seams which are coming apart, missing buttons or closures, integrity of any repairs, or other signs of wear or alterations to the clothing that indicate the integrity and level of protection of the garment may have been compromised. The clothing must also be inspected to ensure that cleaning and repairs/alterations to the garment, if any, have not changed the fit of the clothing. Defective clothing should be replaced or repaired as instructed by the manufacturer. Some simple repairs might be able to be made by the user, but other repairs might require the services of trained personnel or

return of the garment to the manufacturer. Under no circumstances should unauthorized users attempt a repair, which is not recommended by the manufacturer.

Training

Training should be provided to workers who are required to use electric arc flash PPE. The training should be comprehensive, understandable, and specific to the PPE to be used. For example, manufacturer's recommendations, such as use, inspection, maintenance, decontamination, and storage, on items should be included in the training.

OSHA requires the employer to ensure that each employee demonstrate an understanding of the training and the ability to wear the PPE correctly before being allowed to perform any task that requires the use of the PPE. If the employee cannot demonstrate this knowledge, then the employee must be retrained. In addition, retraining must occur whenever changes in the workplace render previous training obsolete or if new PPE is introduced that was not covered by the training. If it is apparent that the employee has not retained the training, or the PPE is used incorrectly, then the employee must be retrained. A written certification must be prepared by the employer verifying that the employee was trained on the use of the PPE and that he/she understood the training. The certification must include the name of each employee trained and the dates of training, and it must be clearly identified as a written certification of training.

Care and Maintenance

FRC should be stored in a clean, dry location to prevent contamination with flammable or combustible materials that could compromise the level of protection afforded by the clothing.

Care must be taken to follow the decontamination and laundering instructions provided by the manufacturer to ensure that the PPE maintains its integrity. Some clothing cannot be washed with

bleach, and use of starch and softeners may not be recommended. Some clothing might need to be dry cleaned if contaminated with grease or certain solvents. Flame resistance of chemically treated garments can decrease with the number of washings, and failure to remove grease and solvents from inherently flame resistant or chemically treated PPE could compromise its protective properties.

There are two standards that provide guidance on industrial and home laundering of flame resistant PPE, i.e., ASTM F 1449-08, *Standard Guide for Industrial Laundering of Flame, Thermal, and Arc Resistant Clothing* and ASTM F 2757-09, *Standard Guide for Home Laundering Care and Maintenance of Flame, Thermal and Arc Resistant Clothing*, respectively. However, if the protective clothing is not provided with instructions on care from the manufacturer, it should not be used.

Recommendations regarding the service life of the garment provided by the manufacturer must be followed, and the clothing must be discarded under the stated conditions, if applicable (e.g., number of washings).

Under no circumstances should dirty clothing be outsourced to an industrial laundry without informing the laundry of the manufacturer's recommendations for cleaning. The practice of allowing employees to take PPE home to launder should also be discouraged, since this increases the chance that contamination from the workplace may be brought home.

References

1. American Society for Testing and Materials (ASTM) International. *Standard Guide for Home Laundering Care and Maintenance of Flame, Thermal and Arc Resistant Clothing*. ASTM F 2757-09. West Conshohocken, PA: ASTM International, 2009.
2. —. *Standard Guide for Industrial Laundering of Flame, Thermal, and Arc Resistant Clothing*. ASTM F 1449-08. West Conshohocken, PA: ASTM International, 2008.
3. —. *Standard Performance Specification for Flame Resistant Textile Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary Electric Arc and Related Thermal Hazards*. ASTM F 1506. West Conshohocken, PA: ASTM International, 2002a.
4. —. *Standard Test Method for Evaluation of Flame Resistant Clothing for Protection Against Flash Fire Simulations Using an Instrumented Manikin*. ASTM F1930-00. West Conshohocken, PA: ASTM International, 2009.
5. Burkhart, Elizabeth F. "The Danger of Arc Flash." *Fire Engineering* 162 (July 2009): 102-103.
6. Engineering & Safety Service. *Electric Arc Flash Protective Clothing Checklist*. Client Handout CH-50-195. Jersey City, NJ: ISO Services, Inc., 2011.
7. —. *Electrical Safety*. Occupational Safety Report OS-30-10. Jersey City, NJ: ISO Services, Inc., 2002.
8. —. *Electricity—Burns*. Client Handout CH-15-34. Jersey City, NJ: ISO Services, Inc., 2010.
9. —. *Personal Protective Equipment Hazard Assessment*. Client Handout CH-50-188. Jersey City, NJ: ISO Services, Inc., 2011.
10. —. *Personal Protective Equipment (PPE) Hazard Assessments*. Occupational Safety Report OS-12-39. Jersey City, NJ: ISO Services, Inc. 2011.

11. Floyd II, H. Landis. "Arc Flash. Designing and Implementing an Effective Mitigation Program." *Professional Safety* 55 (November 2010): 33-39.
12. Hoagland, E. H. "Choosing the Proper PPE for Electric Arc Exposure." *Electrical Construction & Maintenance*. 1 March 2010. EC&M. 6 July 2011. http://ecmweb.com/ops_maintenance/choosing-ppe-arc-exposure-20100301/index.html.
13. —. "Disposable FR Garments: What Are the Differences?" *Electrical Construction & Maintenance*. 1 January 2008. EC&M. 6 July 2011. http://ecmweb.com/mag/electric_disposable_fr_garments/index.html?smt=wr.
14. National Fire Protection Association (NFPA). *Standard for Electrical Safety in the Workplace®*. NFPA 70E®. Quincy, MA: NFPA, 2012.
15. —. *Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire*. NFPA 2112. Quincy, MA: NFPA, 2012.
16. —. *Standard on Selection, Care, Use, and Maintenance of Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire*. NFPA 2113. Quincy, MA: NFPA, 2012.
17. Neitzel, Dennis K. "How Much Do You Know About Electrical Safety." *Professional Safety* 52 (August 2007): 23, 26.
18. Occupational Safety and Health Administration. *Directive Number CPL 02-01-050, 29 CFR Part 1910, Subpart I, Enforcement Guidance for Personal Protective Equipment in General Industry*. Washington, DC: DOL, 2011.
19. —. *Personal Protective Equipment*. OSHA 3151-12R. Washington, DC: DOL, 2003.
20. —. OSHA Office of Training and Education. *Personal Protective Equipment* (PowerPoint presentation). Washington, DC: DOL.
21. Ontario Women's Directorate and the Industrial Accident Prevention Association. *Personal Protective Equipment for Women. Addressing the Need*. Toronto, ON: IAPA. 2011.
22. Saner, Mark. "Tackling the Task of Choosing Flame-Resistant Garments." *Industrial Safety & Hygiene News* 44 (September 2010): 65-66.
23. Weigel, Joseph. "Code Changes Help Utility Workers Choose Appropriate Personal Protective Equipment." *Power Engineering* 111 (June 2007): 72.
24. —. "Electrical Arc Flash. How to Avoid Devastating Accidents." *Professional Safety* 55 (November 2010): 49-51.

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