

ARC FLASH DANGERS/NFPA 70E OSHA IS WATCHING ALL CONTRACTORS AND OWNERS FOR COMPLIANCE

An arc flash explosion hotter than the sun erupts from a piece of electrical equipment. This superheated short-circuit can exceed temperatures of 14,000 degrees – high enough to melt metal and severely burn a worker. The intensity of the flash can damage an electrical worker's eyesight and the pressure waves from the discharge can potentially blow out an eardrum.

Arc flash explosions occur five to 10 times each day in the United States. An even greater number of electrical incidents and close calls go unreported. The frequency stems from a continued lack of knowledge about the hazards, as well as the lack of proper protective equipment. At the moment OSHA does not have a standard that addresses arc flash hazards.

Despite the absence of a government standard, the effort to improve electrical safety and to make people aware of the necessary protection is well under way. The introduction in August 2000 of the National Fire Protection Association's revised, voluntary consensus standard 70E for Electrical safety Requirements for Employee Workplaces, is largely responsible for the industry's growing awareness. The standard is a comprehensive document that details important information such as the hazards associated with electrical work, flash protection boundaries, how to de-energize equipment, and how to perform flash hazard analyses.

The NFPA standard also requires employees to wear "clothing resistant to flash flame whenever there is possible exposure to an electric arc flash," and offers fire-resistant personal protective equipment recommendations based on specific hazards. The clothing standards in NFPA 70E have made a significant impact on protecting workers from arc flash, but misconceptions abound about the kind of materials that can withstand the intensity of arc flash hazards. Many people are wearing regular cotton or poly-cotton work clothing. People think cotton is better than poly-cotton, but if ignited, neither one of them is a good option. It's basically a gamble on ignition or no ignition. But if the garment ignites, the consequences are severe.

Many companies have failed to follow NFPA 70E's standard for flame-resistant clothing because they think the garments recommended are uncomfortable or too expensive. However, the technology in flame-resistant fabrics and the engineering of flame resisting fabrics has advanced so much that often times it's difficult to determine flame-resistant garments from non-flame-resistant garments. The future of any PPE program for electrical workers should, and probably will, include flame-resistant garments to help protect against arc flash exposures.

NFPA 70E has made it easier for companies to both identify the necessary protection for electrical work and ensure safe practices. The NFPA 70E document lists a variety of different job tasks of an electrical or maintenance worker, and they break it down in voltage categories. They list a hazard risk category for each scenario. You can cross-reference that HRC with the corresponding arc thermal performance value to determine the level of performance your clothing system should meet.

While NFPA 70E educated workers on the need for proper protective clothing for arc flash, safety equipment should be the last line of defense. There are a number of things

that can be done on the front end from the initial engineering design of the equipment, to the maintenance of the equipment, to the training of the individual who operates the equipment.

The insulated tools aid you in preventing an event from starting should your tool possibly slip and contact two different potentials. The protective clothing lessens the degree of injury should there be an event. The education tells you how to determine the hazards associated with the task and the measures necessary to protect you from the hazard. Although NFPA 70E is a voluntary standard, OSHA is on the path to adopting the rules or at least some portion of them. Right now the agency considers NFPA 70E a recognized industry practice. OSHA has cited NFPA 70E in several accident reports and agency field inspectors carry copies of the standard to enforce arc flash safety.