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MORE THAN A UNIFORM,
IT'S BUILT TO PROTECT.
Carhartt AR & FR workwear meets current OSHA compliance standards.

OSHA FOCUSES ON DANGERS OF ARC-FLASH INJURIES

Carhartt AR/FR Apparel Can Assist Safety Professionals in Meeting Compliance Goals

In late November 2024, the Occupational Safety and Health Administration (OSHA) released its first major guidance update in nearly 20 years on Personal Protective Equipment (PPE). The update related to those working on or near energized electrical equipment to protect them against electrical arc hazards.

With the 2024 OSHA guidance update, 600,000+ workers who previously may not have had proper PPE to minimize the potential for injury or death from arc flash came under the National Fire Protection Association (NFPA) 70E: Standard for Electrical Safety in the Workplace.[1]

In recent years, OSHA has continued to increase its compliance activities around electrical safety in the workplace.[2] OSHA has taken a two-pronged approach:

- Focus on hazard elimination through increased emphasis on proper lockout and tagout procedures.
- Make sure the proper Personal Protective Equipment (PPE) is being utilized.

The Partnership for Electrical Safety (PES) formed in 2020 to advocate for proper PPE and arc-rated and flame-resistant (AR/FR) apparel for all Americans conducting work on or near energized electrical equipment. PES strongly supported OSHA's decision to expand its guidance and continues to urge OSHA to address arc flash PPE for the industrial electrical workers still without it.



For workers exposed to the dangers of arc flash, **Arc Rated (AR) PPE is critical safety gear, essential to protect skin, vision, and hearing from significant potential injury**. AR PPE includes heat- and flame-resistant apparel and gear. Insulated tools are a separate electrical safety measure.

Different jobsites have different levels of arc flash danger. Training and proper PPE are essential parts of a well-designed safety plan. In some situations, workers may just need AR long-sleeve shirts and pants, while in other cases they may be required to have a full arc flash suit over other AR protective clothing. It really depends on the level of arc flash danger in their work environment.

AS THE ELECTRIFICATION OF AMERICA MOVES FORWARD, IT MEANS THAT

MORE WORKERS

ON CONSTRUCTION SITES, IN MANUFACTURING SETTINGS, AND PERFORMING MAINTENANCE ON VARIOUS BUILDING AND INFRASTRUCTURE SYSTEMS WILL BE SPENDING TIME IN AREAS THAT HAVE ARC FLASH DANGERS.

OSHA's current guidance is of utmost importance for electrification projects across the U.S. Hundreds of data centers are being built for AI infrastructure, computing, and enterprise IT. Enhancements are being made to the electrical grid, while renewable energy generation and battery storage are being added at manufacturing, commercial, and residential facilities. Electric vehicles and direct current chargers are becoming more commonplace. New workers are being hired who have had limited training regarding arc flash dangers. Expanding AR PPE guidelines means that workers will be better protected from arc flash. To meet this growing need, Carhartt Company Gear has a variety of Arc Rated (AR) PPE in a range of sizes to meet the safety needs of your team.

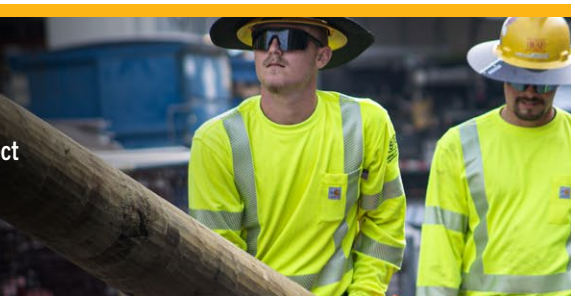
The current OSHA guidance may result in questions from your plant staff or workers on jobsites. **The following are some of the most frequently asked questions that can assist you in rolling out NFPA 70E standards** to people at your company working on or near energized electrical equipment.

[1] https://partnershipforelectricalsafety.org
[2] https://www.osha.gov/electrical/flash-hazards

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WHAT IS NFPA 70E?

The National Fire Protection Association (NFPA) established NFPA 70E, a set of standards to protect workers from contact with live electrical equipment and protect them from arc flash dangers. The Occupational Safety and Health Administration (OSHA) views NFPA 70E as the consensus standard for electrical hazards and uses it as a guide for developing regulatory standards.



What is the current OSHA guidance for AR PPE?

The OSHA guidance is in four parts. There is a detailed guide for employers and three one-page documents for workers. The guidance is focused on the two leading causes of arc flash injuries and fatalities in the U.S.:

- The first is assuming equipment is de-energized without following full OSHA lockout/tagout procedures and NFPA 70E Electrically Safe Work Condition standards. Workers are handling equipment that has not been properly locked out or tagged—and failing to wear Arc-Rated (AR) clothing or PPE as a result.
- The second is choosing to work energized and not wearing proper PPE, when voltage is low (120/208, 277) because of the dangerous myth that low voltage is not hazardous.

OSHA's guidance makes it clear that low voltage can result in arc flash, produce molten metal, ignite flammable clothing, and cause severe injuries. Energized work at 50V or more may require a permit and arc-rated PPE through a risk assessment.

Who is covered by this OSHA guidance?

OSHA's arc flash guidance applies to all commercial, industrial, and residential electrical workers in the U.S., and to operators, maintenance, and other personnel who work on or near energized electrical equipment at 50V and above. **The Partnership for Electrical Safety wants companies to stress the dangers of arc flash and the need for AR PPE by reminding workers:**

"DON'T WEAR FUEL"



What is an Electrical Arc Flash?

According to OSHA, an electrical arc is a type of **electrical explosion that produces a bright flash of hot gas, with temperatures in excess of 35,000°F (19,400°C).** That is nearly four times the heat of the sun's surface. The energy released in the arc rapidly heats and vaporizes the metal conducting the electricity, producing an explosive arc blast resulting in deafening noises, supersonic concussive forces, and super-heated shrapnel. Most arc flash burn injuries are a result of the arc igniting flammable clothing or improper wear.

4X THE HEAT OF THE SUN'S SURFACE

What causes an Arc Flash?

Several conditions contribute to arc flashes:

- Damaged, dirty, poorly maintained, or faulty electrical equipment leads to an increased risk of an arc flash incident.
- Accidental contact with exposed energized parts, especially with conductive tools, can initiate an arc flash.
- Regular maintenance of electrical equipment lowers the potential for arc flash, including proper lockout/tagout (LOTO) upon servicing.

Is Arc Flash a serious issue?

According to OSHA's arc-flash safety guidance, specific arc flash statistics are difficult to quantify, and multiple sources provide differing information, but they all present alarming data. NFPA estimates, in its *70E Standard for Electrical Safety in the Workplace*, **that five to ten arc flash explosions occur daily** across the U.S. Similarly, *Industrial Safety & Hygiene News* states that up to ten arc flash incidents occur every day, "totaling more than 3,600 disabling electrical contact injuries each year."

WHAT MAKES A GARMENT AR?

AR clothing must meet the American Society for Testing and Materials (ASTM) F1506 standard and be labeled with an arc rating. Based on the arc rating, a corresponding PPE Category (1-4) can be assigned. Select PPE using either incident energy analysis or the PPE-category method; do not combine the two methods for the same equipment. AR fabrics have the ability to self-extinguish flames once an ignition source has been removed. FR properties can be from inherent FR fibers such as Meta-Aramids (Nomex, Kermel), Para-Aramids (Kevlar, Twaron), Modacrylics (Protex), or Rayons (Lenzing FR), while FR cotton features chemical and mechanical treatments.

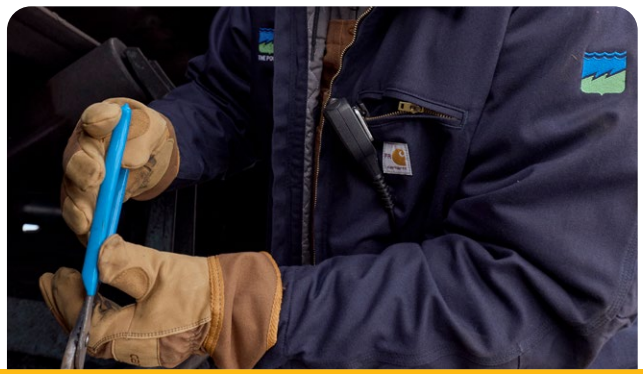
Does AR PPE really work?

Yes, but there are still a significant number of arc flash injuries and deaths. **Since AR apparel was first introduced more than 30 years ago, injuries and deaths from arc flash are down about 50%.** According to the Partnership for Electrical Safety, when NFPA 70E was put in place in 2000, during the next decade arc flash injuries and fatalities went down at the same rate as compliance with NFPA 70E and the use of AR clothing went up. However, this significant safety progress has leveled off, largely because many workers do not use proper AR PPE.

50%
REDUCTION OF INJURY & DEATH

Are AR and FR PPE the same thing?

No. AR stands for Arc Rated; FR stands for Flame Resistant. Employers need to be sure their teams are wearing the correct personal protective equipment for the hazards on their jobs. One rule of thumb you can use is that **all AR fabrics are FR, but not all FR fabrics offer AR protection.** Keep in mind that certain environments with molten metal and welding sparks require specific PPE-rated workwear for its ability to shed molten metal and welding slag.



What AR PPE should workers wear?

- AR apparel should include a long-sleeve shirt and long pants, or AR coveralls or flash suit. Safety experts recommend layering protective gear.
- An AR jacket, parka, or raingear is also essential in certain situations, including for workers exposed to the elements.
- Additionally, select a hard hat, arc-rated face shield or hood, safety glasses/goggles, hearing protection, suitable gloves, and leather footwear according to the assessed arc-flash and shock hazards.

Wearing the wrong PPE or too little PPE can expose workers to serious, even fatal, injuries. An arc rating is established for every AR garment and must be displayed on the garment label. PPE must have an arc rating equal to or greater than the potential incident energy.

What should workers know about the clothing they wear?

For workers in a potential arc flash environment, garments worn as underlayers (underwear) that neither ignite nor melt and drip in the course of an exposure to the electric arc and related thermal hazard may provide additional thermal insulation. Clothing worn next to the skin should not include materials that might melt. Workers should be instructed to wear underlayers made from AR fabrics or natural fibers and should avoid tight-fitting clothing, as loose-fitting apparel provides additional thermal insulation. Layering of AR apparel can be effective in achieving greater arc protection.

How often do you need to replace AR PPE apparel?

AR apparel and other PPE should be inspected before each use. Damaged PPE or protective items that have encountered exposure to oil, grease, flammable liquids, or combustible material should not be used. Always wear clean AR apparel. Chlorine bleach should never be used on AR or FR clothing. It is best to wash AR apparel with a mild detergent in warm water and tumble dry on low. Employees and laundry services need to closely follow manufacturer care instructions and be aware of guidelines related to recommended product lifecycle and replacement periods. Carhartt FR is guaranteed effective for the life of the garment provided all care instructions are followed correctly.







AT CARHARTT COMPANY GEAR™, WE UNDERSTAND THE CRITICAL ROLE AR AND FR APPAREL PLAYS IN KEEPING CREWS SAFE AND COMPLIANT WITH OSHA'S CURRENT GUIDELINES.

From reducing the risk of arc-flash injuries to meeting NFPA 70E standards, our durable, high-performance gear is built to protect workers in the toughest conditions. Let us help you find the right solutions to safeguard your team and ensure compliance every step of the way.