Arc flash suits and accessories

SUITS

What is the shelf life of an arc flash suit?
This is a challenging topic to consider as many variables must be considered when determining when an arc flash suit needs to be replaced. Things like the age of a suit, frequency of use, laundering care, and the environment your suit is stored in can all play roles in how long it will last. We recommend a pre- and post-inspection after every use of your arc flash suit. See Pub. No. 11275 for details on how to perform a visual inspection of our arc flash suits.

In the end, the final determination on when to replace your suit should be a part of your established electrical safety program. Please contact your local Bussmann™ series product representative if further assistance is needed.

How do I know what size to get?
Sizing information can be found on the product profile of each arc flash suit.

I know the voltage, which arc flash suit should I get?
Voltage does not determine the arc flash hazard. Knowing the voltage is only one piece of determining arc flash PPE. The electrode orientation, available fault current (amps), the working distance between the worker and the equipment, the clearing time of the circuit protection device, the spacing between conductors or from a conductor to ground, the number of phases, whether the conductors are in an enclosure, and the equipment configuration must all be considered when determining the potential severity of an arc flash hazard. NFPA 70E® provides two methods for the selection of arc flash PPE as part of an over arching requirement to complete an arc flash risk assessment. The two selection methods include the Incident Energy Analysis Method and the Arc Flash PPE Category Method. Reach out to your local Bussmann series sales representative for details on these methods.

The bottom line is that you can't rely on voltage alone to figure out what arc flash PPE you need. NFPA 70E requires the employer to complete an arc flash risk assessment. If additional protective measures are required, arc flash PPE can be applied as a control to mitigate the risk of an arc flash. Refer to the latest edition of the NFPA 70E Standard to learn more about the requirements for an arc flash risk assessment, or reach out to a Bussmann series expert.

What fabric is the best for arc flash clothing?
There are three different types of arc-rated flame resistant (FR) fabrics available on the market:

Treated non-inherently FR fabrics
Either 100% cotton or cotton blends, have no flame resistant properties and require a chemical treatment application to become flame resistant

Inherently FR fabrics
Engineered to be flame resistant and there is no chemical that needs to be added to them for their protective capabilities

Treated Inherently FR fabrics
Traditional Inherently FR fabrics that are treated using a similar process to non-inherently FR fabrics, resulting in a lightweight inherently FR fabric that provides more protection

Regardless of the type of FR fabric, the material must still be arc-rated with either an Arc Thermal Performance Value (ATPV) or an Energy Break-open Threshold (EBT).

From what fabrics are the Bussmann series arc flash suits made?
Our 12 calorie and 40 calorie arc flash suits are made from an Inherently FR fabric. Our 40 calorie comfort arc flash suit is made from an Inherently FR Aramid blend of fibers. (Aramid is a class of heat-resistant and strong synthetic fibers.)

Are Bussmann series fabrics lighter weight than fire resistant treated cotton?
Yes, absolutely. For example, our 40 calorie comfort arc flash suit is constructed of a proprietary Inherently FR fabric that has an arc rating of 46 cal/cm^2 and has a fabric weight of 10.9 ounces per square yard. A comparable chemically flame retardant treated cotton product, with a similar arc rating, would weigh nearly twice as much.

Additionally, an Inherently FR garment is less bulky and more comfortable to wear. Garments manufactured with Inherently FR fabrics are permanently flame resistant. Unlike some fire resistant treated cotton fabrics, you cannot impact the flame resistant characteristic with washing. Really, the only benefit to a fire resistant treated cotton product is the lower price. For the infrequent user, a fire resistant treated cotton garment can be a good solution. But for the industrial electrician, who will be using the garments frequently, the superior comfort and durability offered by an Inherently FR garment makes it the preferred choice.

How do I pre-use inspect my arc flash suit?
The NFPA 70E Standard requires that all arc flash PPE is pre-use inspected. See Pub. No. 11275 for details on how to perform a visual inspection of our arc flash suits. While inspecting your arc flash suit, if you identify a problem, do not use the product until the issue has been repaired, cleaned or replaced. When pre-use inspecting your Bussmann series arc flash suit, you should inspect each item one at a time.

Can arc flash PPE be shared between workers?
No, due to personal hygiene and the risk of spreading infectious disease. While hard, non-porous surfaces can be effectively disinfected (such as the arc flash hood visor, hard hat and other plastic components), we do not believe that fabrics can be safely shared between workers due to the ineffectiveness of disinfectant sprays or wipes on a porous surface. In the new Coronavirus world, we feel the most effective way to keep workers safe and healthy is for all arc flash PPE to be individually assigned.

HOODS AND FACE SHIELDS

Do I need to wear safety spectacles under the face shield?
Yes, applicable Standards including NFPA 70E require safety glasses/spectacles to be worn as primary eye protection. An arc-rated face shield or suit hood is designed to protect your face. Both safety glasses and arc-rated protection is required when an arc flash incident is likely to occur.

The ANSI™ Z87.1 standard covers industrial eye and face protective devices and their use in the marketplace. It defines safety glasses and safety/cover goggles as primary eye protective devises. Their job is to protect your eyes! A face shield is defined as a secondary protective device, requiring the use of a primary protective device underneath. The standard envisions the face shield protecting the face, even though your eyes are a part of your face.

Should I tuck the balaclava into my shirt or coverall to meet OSHA™ 1910.260 or NFPA 70E?
Although no standard specifically covers it, we recommend tucking the balaclava in to prevent a possible arc from coming up underneath the flap of the balaclava.

How do I pre-use inspect the face shield?
The NFPA 70E Standard requires that all arc flash PPE is pre-use inspected. While inspecting your arc flash face shield, if you identify a problem, do not use the product until the issue has been repaired, cleaned or replaced. When pre-use inspecting your Bussmann series arc flash suit, you should inspect each item one at a time. The following steps apply when pre-use inspecting your arc flash face shield:

1. Check the face shield visibility, inspect for excessive scratching. If visibility is impaired or the shield is cracked or damaged, remove from use (replace with appropriate lens).
2. Manually adjust the shield mounting mechanism (adapters) to ensure wing nuts are firmly in place, do not over tighten or the shield won't be able to operate correctly.
3. Inspect adapters for cracks or damage, ensure fingers are locked into hard hat slots.
4. Check hard hat slots and inspect for cracks that could allow the adapter to slip out.
5. Ensure the nuts and bolts fastening a lower chin guard (double crown) are tight before use.

How do I activate the anti-fog coating?
Bussmann series arc flash face shields and suit hood shield windows are available with anti-fog coatings. Before each and every use, the anti-fog coating must be activated. Workers must use humidity to activate the anti-fog properties by pulling the inside of the face shield or hood lens towards them and breathe on the surface. It's important for your shield lens to be at room temperature for best results.

When using a Bussmann series arc flash suit hood, consider using a hood ventilation system that circulates air to your breathing zone. Our system delivers the external air directly down the inside of the hood shield window to reduce fogging in extreme conditions.

How do I clean the inside of the arc flash hood?
The first step to cleaning and disinfecting a Bussmann series hood is to disassemble your hood. Once done, if the shield has dirt or grit, flush it off with room temperature tap water.

The next step to disinfecting is to take a soft cloth with isopropyl alcohol or use a Lysol® wipe and gently clean both sides of the shield. This process may leave streaks as the surface dries. Once dry, use a soft clean cloth and lightly wipe off any streaks or film left on the shield from impurities in the wipes.

As an alternative method a 2% solution of Clorox® Bleach (Sodium Hypochlorite or NaOCL) and cool water can be used. Apply the solution by gently spraying the face shield and then allowing it to evaporate. Once dry, the shield can be rinsed off with cool tap water.

To clean and disinfect the fabric portion of a hood, first remove the shield and launder the hood per the washing instructions on the hood label. The steps above will help to remove most of the dirt, germs, and possible viruses that could be on the hood after use.

Will the Hood Ventilation System pull in toxic smoke after an arc flash incident?
This is highly unlikely. Workers need the fresh air provided by a hood ventilation system to properly function during a work task execution. The risk of heat stress causing disorientation and dizziness is far more severe than the likelihood of the fan unit pulling in toxic fumes from an arc flash. Bussmann series hood ventilation systems have been tested and no observations have been made of the fan causing any increased harm to the worker. When the fan unit is directly exposed to an arc flash incident, the motor was rendered inoperable.

How do I clean and disinfect the face shield?
To clean and disinfect a Bussmann series face shield, it is best to use a damp, soft cloth and gently wipe away any dirt or grit. Once this is done, gently flush them off with room temperature tap water.

GLOVES

How long do I have to put new gloves into service?
The user has 12 months from the test date to put new gloves into service. It is important to note that the user must document when the gloves are put into service to comply with OSHA 1910.137 guidelines.

Why do rubber electrical gloves have a date stamp on them?
According to OSHA in 29 Code of Federal Regulations (CFR) 1910.137(c)(2)(viii), all electrical gloves must be tested periodically and prior to being placed into service. All glove manufacturers incorporate some form of production code or date coding to indicate the date of initial testing. Rubber insulating gloves must be tested before first issue and every six months thereafter or upon indication that the insulating value is suspect; after repair; and after use without protectors. Also, if the insulating equipment has been electrically tested but not issued for service, the insulating equipment may not be placed into service unless it has been electrically tested within the previous 12 months. For additional information on in-service care of electrical gloves, reference ASTM F496-14a.

These testing requirements can sometimes be a little confusing to interpret. Here's an example: You're considering using your electrical gloves for the first time on January 1, 2022, and notice the date stamp is November 1, 2021. Would you need to get the gloves retested before use? No, because you will be putting the gloves into service within the allowable 12-month window.

How are Bussmann series electrical gloves tested?
Every glove is electrically tested prior to shipment. Each batch of gloves is also subjected to a battery of physical and electrical tests to ensure that the gloves meet the D120 Standards. It is the responsibility of the employer to ensure that the gloves have passed the required electrical test within the specified time.

What are the OSHA requirements for a glove inspection?
OSHA requires that "protective equipment be maintained in a safe, reliable condition." Gloves should be inspected for tears, holes, ozone cuts and other defects before each use. For more information, refer to the ASTM F1236-16 standard guide for the visual inspection of electrical protective rubber products. Also, gloves should be inspected for any swelling, which is generally caused by chemical contamination (specifically petroleum products). Even the slightest swelling can be an issue. If the electrical gloves show any signs of the defects discussed above upon inspection, they should be taken out of service for cleaning and retesting (even if it hasn't met the six month "in-service" rule or the 12-month shelf life rule discussed in the date stamp section of this article) per ASTM D120-14a requirements.

Does Bussmann provide testing on gloves?
Not at this time. Gloves should be sent to an accredited laboratory for retesting. To find a laboratory in your area, you can visit the North American Independent Laboratories for Protective Equipment Testing (NAIL for PET) site: http://www.nail4pet.org.

What is the arc flash protection offered by leather gloves and should they be arc-rated?
If rubber insulating gloves with leather protectors are required as per your shock risk assessment, additional leather or arc-rated gloves are not required. Leather protectors can be arc-rated, but it's not required. The most important consideration when selecting hand protection is to first identify and understand your hazards.

If a shock hazard exists, the worker shall wear shock protection. If no shock hazard exists, the NFPA 70E Standard identifies that heavy duty leather gloves or arc-rated gloves are required when an arc flash hazard is likely to exist. Heavy-duty leather gloves are described as being made entirely of leather with a minimum thickness of 0.03 in (0.7 mm) and are unlined or lined with non-flammable, non-melting fabrics. Heavy-duty gloves that meet this requirement have been shown to have arc ratings in excess of 10 cal/cm^{2}ATPV.

Gloves not used for shock protection (i.e. not rubber insulating) can be arc-rated, including leather protectors. Refer to the ASTM F2675 Standard Test Method for Determining Arc Ratings of Hand Protective Products Developed and Used for Electrical Arc Flash Protection for more information.

Eaton
Bussmann Division
114 Old State Road
Ellisville, MO 63021
United States
Eaton.com/bussmannseries

Publication No. 11274
February 2022

Powering Business Worldwide

For complete details on Bussmann series arc flash products, services and training, visit: Eaton.com/bussmannseries/arcflash