



Electrical Safety Advancements in PPE Powering the Utility Industry

Being dressed for safety is more than fashionable, it is a life saver.

By Richard A. Rivkin, Contributor

The utilities industry (including electricity, communication, gas, water, and sewage) is undeniably one of the most crucial industries for the U.S. economy. It is also among the most dangerous for workers, especially those involved in power generation, transmission, and distribution. Utility workers must encounter several different daily hazards while performing their jobs, ranging from high-voltage contact, working at heights, working in confined spaces, challenging weather conditions (rain and snow), arc flash, and fires and explosions to name a few.

Given the many risks these workers face, it

is no surprise that the utility industry has the highest rate of fatal and non-fatal electrical injuries. According to the U.S. Bureau of Labor Statistics (BLS), utilities averaged 25.6 fatalities a year from 2016 to 2020. Injuries are even more common. The incidence rate for nonfatal injuries in utility system construction, for example, was 73.6 per 10,000 full-time workers in 2020 alone. As such, these workers need the best personal protective equipment (PPE) to keep them safe.

For utility workers, being dressed for safety is more than fashionable, it is a life saver. Rubber insulating products such as gloves,

blankets, sleeves, line hose and hoods used by utility workers today are manufactured in accordance with industry consensus specifications under the auspices of the American Society for Testing and Materials (ASTM). However, rubber gloves are the only protective gear designed for constant contact with, and protection from, energized conductors and equipment. To be effective, rubber insulating gloves must incorporate high dielectric and physical strength, along with comfort, flexibility, and durability to increase the likelihood that they will be used. Flexibility and proper fit are key.

INSULATING GLOVES AND LEATHER PROTECTORS HAVE IMPROVED

Fortunately, both rubber insulating gloves and leather protectors have improved dramatically in recent years to directly address these concerns as well as others. Newer rubber formulations of insulating gloves offer increased flexibility and dexterity to minimize hand fatigue so that linemen can wear them for extended periods of time without their hands cramping. This increased flexibility makes them ideal for working on high-voltage lines and equipment. Furthermore, there are also outdoor sun protection products that are available in formulas that will not harm the rubber, so linemen can effectively protect themselves from both the sun and electrical hazards without worry!

Rubber insulating gloves are also now made in a wider range of sizes to accommodate even more workers. Typically manufactured in sizes 8-12, often in half sizes, some manufacturers now also offer rubber insulating gloves as small as size 7 and as large as size 13. A proper fit will increase the likeliness that the workers will wear the gloves, as gloves that are too big or bulky can affect tactile sensitivity, while gloves that are too small can cause discomfort.

Equal care and consideration have also been given to how leather protector gloves are made. Grain cowhide leather has been utilized



Various leather protector styles now have grip enhancers. *Image courtesy of Saf-T-Gard International, Inc.*

more for its water-repellent properties, as linemen work in all types of weather. Moreover, various leather protector styles now also include additional grip enhancers to deliver a wet or dry grip that will not slip or affect the ergonomics of the gloves even when working in the rain.

NEW STANDARDS DRIVE INNOVATION

The new ASTM F3258-21 Arc Rated Protector Standard Published by ASTM F18 now also allows many non-leather materials to be used in leather protector gloves. For several decades, the only option for protector gloves was “grain cowhide, buffed grain cowhide, grain deerskin, grain pigskin, grain horsehide, or grain goatskin” of a certain thickness. No specifications existed for puncture, tear, cut, seam strength, or the cuff flame resistance. Fortunately, leather has performed well for flame and cut-resistance, but leather still had issues with grip (when wet), dexterity, and chemical resistance. Until now, there was no performance-based standard available to address these issues.

ASTM F3258-21 Standard Specification for Protectors for Rubber Insulating Gloves

Meeting Specific Performance Requirements goes beyond the ASTM F696-06 Standard Specification for Leather Protectors for Rubber Insulating Gloves and Mittens to require arc, cut- and puncture-resistance testing and reporting with optional abrasion resistance testing and reporting.

With the introduction of ASTM F3258-21, the ASTM F18 committee will continue to drive innovation by allowing non-leather materials like para-aramids, flame-resistant threads, and other innovations to enter the marketplace with tested performance characteristics. Previously, there was also no requirement for leather protector glove cuffs to be flame resistant. However, now any glove dual certified to both ASTM F696 and ASTM F3258, or certified to ASTM F696, arc rated by ASTM F2675, and passing the ignition withstand test in F2675, will no longer have a cuff material that can ignite, melt, or continue to burn.

ARC RATED PPE IMPROVEMENTS

Durable and comfortable PPE has long been a trend within the utility industry and arc rated clothing is no exception. Heavy clothing can become hot and irritating after prolonged use, which can contribute to worker fatigue and lead to mistakes and lost productivity. Industry-leading manufacturers are now producing new and improved high-performance arc rated apparel that provides utility workers with exceptional PPE without compromising quality. For example, GORE® PYRAD® fabric technology is now being utilized to deliver 40 cal/cm² arc rated clothing that is 20% lighter, 39% more flexible and 48% thinner than competitive premium lightweight solutions.

Face protection is also a necessary safety component for utility workers when there is exposure to arc flash, and there have been many recent advancements made to arc rated face shields as well. Most face shields have historically had a cylindrical curve in which the surface of the shield has a curve that is parallel

to the wearer's face. However, in recent years, toric-shaped face shields, which have a curved surface that follows the shape of the face, have become increasingly more popular.

Toric-shaped face shields offer many advantages over cylindrical face shields, including better protection, increased comfort, clearer vision, enhanced style, lower-profile fit, and higher likelihood of compliance. Furthermore, newer styles of arc flash face shields are also now incorporating nanoparticle technology to enable full color recognition. This enhancement ensures utility workers can always differentiate between similarly-colored objects. It also increases general visibility, especially when working indoors in poorly-lit rooms.

All in all, while new safety technologies and standards continue to play a huge role in improving utility worker comfort and performance, a culture of safety and compliance should always be the top priority at the end of the day. By implementing strong safety measures and promoting a safety-first culture in addition to utilizing the appropriate PPE, utility companies can lower accident rates, reduce worker downtime, and improve operational efficiency. **ESW**

Richard A. Rivkin is CEO and Chairman of the Board at Saf-T-Gard International, Inc., a privately-held family-owned and -operated global supplier of industrial safety products based in Northbrook, Illinois. Founded in 1936 as Latex Glove Company, Saf-T-Gard carries on the tradition that was started more than 85 years ago: bringing customers the products, training, and service they need to keep employees safe in the workplace. Saf T Gard actively operates the Voltgard® Test Lab, one of the largest, independent, NAIL4PET-accredited test labs for rubber insulating products in the United States. To learn more, please visit www.saftgard.com or call 1-800-548-GARD (4273).