Setting the Standard

What you need to know about the use and in-service testing of rubber insulating products

By Richard Rivkin

There are several regulatory standards mandating the use and testing of in-service rubber insulating equipment to protect workers from electrical hazards. Regardless of the heavy fines, serious injuries, and deaths that occur from electrical incidents, compliance continues to remain an issue. What's even more shocking is that many workers are not using rubber insulating equipment because they simply don't know they need it.

In reality, almost every single facility has a need for electrical safety—whether the company is a larger facility with building engineers overseeing distribution, or a smaller facility with maintenance staff working around floor or wall sockets. There is quite a large number of possible end users. As such, awareness is paramount. Not only about the requirements for use, but also about the requirements for in-service inspection and testing of electrical protective equipment. This article will examine and answer some of the most frequently asked questions to help workers better identify the need for electrical safety and how to best utilize and maintain rubber insulating equipment for long-term safety, compliance, and cost savings.

What are the minimum requirements for use of rubber goods? OSHA, ASTM, and NFPA standards require the use and testing of in-service rubber insulating equipment when even the smallest probability of contact (50 volts AC or higher) exists. Insulating gloves and sleeves are critical PPE for electrical work on or near exposed energized parts. The OSHA "269" standard (29CFR 1910.269) requires that rubber insulating gloves along with leather protectors must be worn by 269-qualified employees within the Minimum Approach Distance to exposed energized conductors. Additionally, rubber insulating sleeves must also be worn if the upper arms or shoulders are within the Minimum Approach Distance to other exposed energized parts.

How do I determine the right class of rubber insulating gloves? According to the OSHA 29 CFR 1910.137 standard, rubber insulating gloves must be rated for the voltage to which a worker will be exposed (phase to ground or phase to phase) and marked to indicate their rating. Rubber insulating gloves are categorized by the level of voltage protection they provide. Voltage protection is broken down into the following classes, and each class of gloves is clearly marked with the maximum use voltage on the permanent color-coded label:

Tested gloves ready for marking and packing.

- **Class 00 BEIGE LABEL:** Max use voltage of 500 volts AC/ proof tested to 2,500 volts AC
- **Class 0 RED LABEL:** Max use voltage of 1,000 volts AC/ proof tested to 5,000 volts AC
- **Class 1 WHITE LABEL:** Max use voltage of 7,500 volts AC/ proof tested to 10,000 volts AC
- **Class 2 YELLOW LABEL:** Max use voltage of 17,000 volts AC/ proof tested to 20,000 volts AC
- **Class 3 GREEN LABEL:** Max use voltage of 26,500 volts AC/ proof tested to 30,000 volts AC
- **Class 4 ORANGE LABEL:** Max use voltage of 36,000 volts AC/ proof tested to 40,000 volts AC

What are the testing intervals for rubber insulating products? The interval between date of issue and tests should be based on work practices and test experience. For gloves, the interval shall not exceed 6 months except for industries, such as telecommunications, that utilize insulating gloves as precautionary protection, in which case the maximum interval may be increased to 9 months. For sleeves and blankets, the interval shall not exceed 12 months. For line hose and covers, no maximum interval is specified; electrical testing shall be performed if the periodic cleaning and visual inspection identifies conditions that might adversely affect performance and safety.

ABOUT THE AUTHOR

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What about retesting unused rubber insulating products? All electrical protective rubber insulating products are tested by the manufacturer prior to first shipment. End users (or end users' designee) may perform acceptance testing within the first 2 months after receipt. Rubber insulating products shall not be placed into service unless they have been tested electrically within the previous 12 months.

What is involved in the inspection and testing process? According to ASTM specifications, at a minimum the inspection and testing of rubber insulating products includes check-in, removing previous testing marking, washing using cleaning agents that will not degrade the insulating properties, visual inspection of all surfaces (inside and out), electrical test, final inspection, recordkeeping, marking, and packing in appropriate containers for storage or shipment. "Appropriate containers" means boxes, or similar sturdy packaging materials to prevent folding, creasing, or similar loose storage that can cause stress on the rubber.

Can rubber insulating products be repaired? While some test labs will perform repairs or trims on rubber insulating equipment, it is generally not a good practice. The best approach to ensuring electrical safety after identifying a defective or damaged rubber insulating product is to replace it with an electrically-tested and approved product.

Who is qualified to perform in-service inspection and testing of rubber insulating products? Many electric power utilities operate their own dielectric test facility to perform acceptance and in-service testing of rubber insulating products. There are also independent testing facilities that can perform the acceptance and in-service testing on behalf of end users.

What is "NAIL" and what does it mean to be a NAIL-accredited Test Lab? NAIL (or formally NAIL4PET) stands for National Association of Independent Laboratories for Protective Equipment Testing. It incorporates the only Laboratory Accreditation for the electrical equipment test labs program in North America. Accreditation criteria include laboratory facility, equipment, training, and knowledge of staff and quality control work procedures covering the inspection and testing of electrical protective equipment in accordance with ASTM specifications. Today, the NAIL program is recognized throughout North America as an important asset to the credentials of a testing facility.

Why should I test my old rubber insulating gloves when I can just purchase new goods? Throwing away your rubber insulating gloves when you can potentially retest and recertify them by a qualified test lab is like throwing money down the drain. For example, a pair of Class 2, 14-inch, black rubber insulating gloves costs approximately $160. Why spend that when you can test the gloves for usually less than $10/pair and save roughly 94 percent without sacrificing safety or compliance? Moreover, properly cared for rubber insulating gloves can sometimes last a decade or more for continued savings. ■