INTRODUCTION

Rubber insulating gloves are among the most important articles of personal protection for electrical workers. To be effective, the gloves must incorporate high dielectric and physical strength, along with flexibility and durability. A glove system may include:

**Rubber Insulating Gloves** that are classified by the level of voltage and protection they provide.

**Leather Protector Gloves** that are worn over rubber insulating gloves to provide the mechanical protection needed against cuts, abrasions and punctures. Look for those that are steam pressed on curved hand forms to ensure proper fit over rubber gloves.

**Liner Gloves** that can be used to reduce the discomfort of wearing rubber insulating gloves in all seasons. Liners provide warmth in cold weather, while they absorb perspiration in the warm months. These can have a straight cuff or knit wrist.

ELECTRICAL-PROTECTIVE GLOVE CLASSIFICATION

Employees who work in close proximity to live electrical current may require a variety of electrically insulating protective equipment. The Occupational Safety and Health Administration (OSHA) outlines this in their Electrical Protective Equipment Standard (29 CFR 1910.137) which provides the design requirements and in-service care and use requirements for electrical-insulating gloves and sleeves as well as insulating blankets, matting, covers and line hoses. Electrical-protective gloves are categorized by the level of voltage protection they provide and whether or not they’re resistant to ozone. Voltage protection is broken down into the following classes:

- Class - 00 - BEIGE - Maximum use voltage of 500 volts AC/proof tested to 5,000 volts AC. FOR WHOI USE
- Class 0 - RED - Maximum use voltage of 1,000 volts AC/proof tested to 5,000 volts AC. NOT EXPECTED FOR WHOI USE
- Class 1—Maximum use voltage of 7,500 volts AC/proof tested to 10,000 volts AC.
- Class 2—Maximum use voltage of 17,000 volts AC/proof tested to 20,000 volts AC.
- Class 3—Maximum use voltage of 26,500 volts AC/proof tested to 30,000 volts AC.
- Class 4—Maximum use voltage of 36,000 volts AC/proof tested to 40,000 volts AC.

For gloves, ozone resistance is covered by the “Type” designation. A Type I glove is not ozone-resistant, while a Type II is ozone-resistant.
AIR INFLATION TEST

Once the gloves have been issued, OSHA requires that “protective equipment shall be maintained in a safe, reliable condition”. This requires that gloves be inspected for any damage before each day’s use. Gloves must also be inspected immediately following any incident that may have caused damage. OSHA requires that insulating gloves be given an air test along with the inspection.

OSHA requires air testing, but doesn’t explain how to perform the test. The test method is described in ASTM F 496, Specification for In-Service Care of Insulating Gloves and Sleeves. Basically, the glove is filled with air, either manually or by an inflator, and then checked for leakage. The leakage is detected by either listening for escaping air or holding the glove against the tester’s cheek to feel air releasing. An example of a glove inflator test kit is attached.

As stated in ASTM specifications for In-Service Care and Use of Rubber Gloves and Sleeves, gloves and sleeves should be expanded no more than 1.5 times their normal size for type I, and 1.25 times normal for type II during the air test. The procedure should then be repeated with the glove turned inside out.

ELECTRICAL TEST

In addition to this daily testing, OSHA requires “Electrical protective equipment shall be subjected to periodic electrical tests.” OSHA does not elaborate on a time frame for these tests, but ASTM F 496 does provide direction. It states that gloves being used in the field must be electrically retested every six months.

Gloves that have not been placed into service after an electrical test shall not be placed into service unless they have been electrically tested within the previous 12 months.

DAILY VISUAL INSPECTION

In order to maintain the highest level of insulating protection and ensure long life, it is essential that gloves (and sleeves) are properly cared for and stored.

Before each use, gloves and sleeves should be inspected for holes, rips or tears, ozone cutting (the cutting action produced by ozone on rubber under mechanical stress cracks), UV checking, and signs of chemical deterioration.

Gloves and Sleeves should also be examined to determine if they show any damage as a result of chemical contamination, particularly from petroleum products. The first sign of exposure is swelling in the area of contamination. Should any rubber equipment be exposed to chemical contaminants or be suspect of any other physical damage, it should be turned in for inspection, cleaning and electrical testing.

Since sleeves cannot be inflated, they are inspected along the edge as they are rolled. Rolling will stretch the sleeve along the edge, making cuts, tears and ozone cutting more
visible. After the outside of the sleeve is inspected, the procedure should also be repeated with the sleeve turned inside out.

**COMMONLY ASKED QUESTIONS**

**Q. Can I just use the rubber glove only, and not have to buy the leather part?**

**A.** A leather protective glove should always be worn over rubber insulating gloves to provide the needed mechanical protection against cuts, abrasions, and punctures.

**Q. Would re-testing be needed if I don’t use the gloves very often and visually see no damage?**

**A.** Yes, re-testing is still needed to verify the integrity of the material and to ensure electrical safety is maintained for the user.

**Q. If I find a hole, can I just “patch it”--like a tire inner tube?**

**A.** No--because this would not comply with ASTM or OSHA Standards for Electrical Protective Gloves, and it would not pass Accredited Laboratory Testing.

**EXAMPLE GLOVE INFLATOR KIT**

*Portable Unit Makes Glove Inspection Easy*

Before using electrical insulating gloves, you must inspect them! This is the fast and easy method to stay in compliance. 

**Specifications:** Simply secure glove to portable glove inflator using the nylon strap and fasten with hook and pile, or a rubber O-ring. To inflate, pump bellow of inflator.