OSHA Regulations and ASTM Specifications for the Inspection, Testing and Care of Rubber Insulating Products

Richard Rivkin
The Power of **ELECTRICITY**

**ELECTRICITY KILLS!**
A MATTER OF LIFE AND DEATH
SHOCKING News
Electrical Burns Are **SERIOUS**

**Entrance Wound**
Electrical Burns Are **SERIOUS**

Exit Wound
<table>
<thead>
<tr>
<th>Type of Equipment</th>
<th>When to Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber insulating line hose</td>
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</tr>
<tr>
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</tr>
<tr>
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<td>Before first issue and every 12 months thereafter. 1 upon indication that insulating value is suspect and after repair.</td>
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<td>Rubber insulating gloves</td>
<td>Before first issue and every 6 months thereafter. 1 upon indication that insulating value is suspect and after repair.</td>
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1 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.
An 8-hour low voltage qualified course focuses on electrical safety training for employees who work on 600V and below.

Ideal for:
- Safety directors
- Electrical contractors
- Maintenance electricians
- Linemen
- Owners and managers
- Supervisors working directly with 480V or greater equipment or overseeing personnel who do
NFPA 70E® STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE
WARNING
ARC FLASH AND SHOCK HAZARD
Appropriate PPE and Tools Required when working on this equipment.
NFPA 70E® STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE
What Does This Mean for Your Workplace?

50 Volts AC
Glove Selection

When selecting gloves for arc flash exposures, two considerations must be followed:

1. Assess the hazard for shock first.

2. Assess the arc flash hazard from a realistic distance from the hazard.
Glove Selection

Arc rated gloves without rubber insulating gloves can only be used in three circumstances

1. “Heavy duty leather gloves” for arc flash protection (NFPA 70E Standard for Electrical Safety in the Workplace requires these for jobs without shock hazards). When there was no arc rating test method for gloves, they were required to be of a certain thickness. Now the gloves can be made thinner and still meet the required arc protection.

2. To replace “heavy duty leather gloves” when they are inadequate for other multiple threats. Non-leather gloves are being worn in more workplaces today. Non-leather specialty gloves that grip when wet or oily can be engineered to make the gloves more task-specific and ergonomically designed. Now these gloves can also be arc rated so a machine operator who is operating a disconnect will have no need to change gloves for arc flash, and the glove can also be cut-resistant para-aramid.

3. The 2015 NFPA 70E Table 130.7(C)(16) Personal Protective Equipment requires “arc rated gloves” for tasks under PPE categories 3 and 4; Now there will be “arc rated gloves” for the non-shock hazard tasks which have arc flash potential. [Note (3) states: “The combination of rubber insulating gloves with leather protectors satisfies the arc flash protection requirement.”]
Steps for Protection

#1. Analysis
Steps for Protection

#2. Awareness
Steps for Protection

#3. Training
Steps for Protection

#4. Lockout Tagout
Steps for Protection

#5. Dress for Safety in Daily Wear

Flame Resistance ≤ Arc Flash Rated
Steps for Protection

#6. Use Insulated Tools
Steps for Protection

#7. Use A Voltage Detector
Steps for Protection

#8. Wear Rubber Insulating Gloves
<table>
<thead>
<tr>
<th>Class Color</th>
<th>Proof Test Voltage AC / DC</th>
<th>Max. Use Voltage* AC / DC</th>
<th>Rubber Molded Products Label</th>
<th>Insulating Rubber Glove Label</th>
<th>Insulating Rubber Dipped Sleeve Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 Beige</td>
<td>2,500 / 10,000</td>
<td>500 / 750</td>
<td></td>
<td>10 SALISBURY</td>
<td></td>
</tr>
<tr>
<td>0 Red</td>
<td>5,000 / 20,000</td>
<td>1,000 / 1,500</td>
<td>10 SALISBURY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 White</td>
<td>10,000 / 40,000</td>
<td>7,500 / 11,250</td>
<td>10 SALISBURY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Yellow</td>
<td>20,000 / 50,000</td>
<td>17,000 / 25,500</td>
<td>10 SALISBURY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Green</td>
<td>30,000 / 60,000</td>
<td>26,500 / 39,750</td>
<td>10 SALISBURY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Orange</td>
<td>40,000 / 70,000</td>
<td>36,000 / 54,000</td>
<td>10 SALISBURY</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Rubber Insulating Gloves
Rubber Insulating Gloves

Designation: F696

Standard Specification for Leather Protectors for Rubber Insulating Gloves and Mittens

ASTM INTERNATIONAL
Rubber Insulating Gloves

<table>
<thead>
<tr>
<th>Class</th>
<th>Insulation Thickness</th>
</tr>
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<tbody>
<tr>
<td>Class 00 and 0</td>
<td>½ inch</td>
</tr>
<tr>
<td>Class 1</td>
<td>1 inch</td>
</tr>
<tr>
<td>Class 2</td>
<td>2 inches</td>
</tr>
<tr>
<td>Class 3</td>
<td>3 inches</td>
</tr>
<tr>
<td>Class 4</td>
<td>4 inches</td>
</tr>
</tbody>
</table>
Designation: D120

Standard Specification for Rubber Insulating Gloves
Minimum Specified Re-Test Intervals:

Rubber Insulating Gloves – every 6 months except telecom can increase to 9 months

Other Rubber Products – according to OSHA Table I-5 or when field inspection or company policy warrant

Insulated Tools – every 2 years

Designation F496

Standard Specification for In-Service Care of Insulating Gloves and Sleeves
# Re-Testing Intervals

## TABLE I-5 RUBBER INSULATING EQUIPMENT, TEST INTERVALS

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  ¹ upon indication that insulating value is suspect and after repair. |
| Rubber insulating sleeves         | Before first issue and every 12 months thereafter.  
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¹ 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.
In-Service Standards

Designation: F496 – 14a

Standard Specification for In-Service Care of Insulating Gloves and Sleeves
In-Service Care – In the Field
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NO!
In-Service Care – In the Field
In-Service Care – In the Field
At The Electrical Testing Facility
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CLASS 4 TESTED AT 40 kV

DATE OF TEST MARCH - 09 - 2009

103
At The Electrical Testing Facility
Review
Steps for Protection:

1. Analysis
2. Awareness
3. Training
4. Lockout Tagout
5. Suit Up in Proper Daily Wear
6. Use Insulated Tools
7. Use A Voltage Detector
8. Glove Up and Go for It!
Designation F496

Standard Specification for In-Service Care of Insulating Gloves and Sleeves

1
COMMON RUBBER PRODUCT PROBLEMS TO LOOK FOR

- Cracking & Cutting: Shown above is damage caused by prolonged folding or compressing.
- UV Checking: Shown in area exposed to prolonged sunlight causes UV checking.
- Chemical Attack: This photo shows swelling caused by oils and petroleum compounds.
- Avoid Folding: The strain on rubber at a folded point is equal to stretching the rubber to twice its length.
- Snag: Damage shown here is due to wood or metal splinters and other sharp objects.
- Physical Damage: Rope burns, cuts and punctures hazards are cause for injection.

RUBBER GOODS CARE & SAFETY IS A 2 STEP PROCESS:

1) Daily inspection in the field, using the guidelines on this poster.
2) Periodic visual inspections and electrical testing according to ASTM standards and your company's safety program.

RUBBER GOODS CARE & SAFETY

Review

COMMON GLOVE PROBLEMS TO LOOK FOR

- Contamination: Avoid contact with oil or petroleum compounds.
- Embedded Wire: Inspect for embedded wires or metal shavings that could puncture rubber gloves.
- Avoid Storing Inside Out: Storing reverse gloves stretches the rubber severely and promotes ozone cutting.

RUBBER GOODS CARE & SAFETY

Before Use: Inspect gloves and sleeves for holes, rips, tears, ozone, cutting, UV checking and signs of chemical deterioration.

Proper Gloves Information: Selecting gloves makes the task of rips, tears or ozone damage easier to detect. Expand no more than 1.5 times their normal size for Type I, and 2.5 times normal for Type II SALTIPOR. Listen for escaping air to detect holes. If a portable inflator is available, roll the cuff tightly to trap air inside, then apply pressure to areas of the glove to test for escaping air. Repeat procedure with glove turned inside out.

Storage Information: Store gloves in the same manner as for Type I, but store Type II gloves in a box, with the same care and attention as Type I. A storage area should be airtight and free from oils and chemicals. Type II gloves should be stored separately from Type I gloves.

RUBBER GOODS CARE & SAFETY

GLOVE INSULATION

Type I (not resistant to ozone) and Type II SALTIPOR synthetic rubber (resistant to ozone) both provide electrical workers with the highest level of electrical insulation protection. However, in order to maintain this level of protection and ensure long life, it is essential that rubber goods are properly cared for and stowed. Before each use, rubber goods should be visually inspected for holes, rips or tears, ozone cutting, UV checking and signs of chemical deterioration, contamination, physical damage and embedded wires. Refer to NFPA 1149, standard guide for visual inspection of electrical protective rubber products for additional information.

INSULATING RUBBER GLOVE & SLEEVE CARE

MAXIMUM INFLATION SIZE:
- Type I Gloves: 1.5 Times Normal
- Type II Gloves: 2.5 Times Normal

Sleeve Inspections: Impact sleeves along the edge so they are rolled. Rolling will stretch the sleeve along the edge, making cuts, tears and ozone cuttings more visible. Inspect with sleeve turned inside out.

Storage: Store gloves in the same manner as for Type I, but store Type II gloves in a box, with the same care and attention as Type I. A storage area should be airtight and free from oils and chemicals. Type II gloves should be stored separately from Type I gloves.

INSULATING RUBBER BLANKET CARE

Blanket Care & Storage: Blankets should always be stored flat or rolled in blanket rolls or containers. They should never be folded, crumpled or compressed in any manner. When more than one blanket is stored, the most convenient method of handling is to roll and insert each blanket into the container independently. A single blanket can then be removed without removing the others. Do not use type of any type to hold the blankets in the rolled position. The adhesive plasticizer can damage the blanket surfaces. Both Type I and Type II SALTIPOR® electronic component blankets are subject to damage by petroleum base products. Also, never store or place blankets on the ground. This will increase the possibility of cuts, rips, tears, and punctures.

INSULATING RUBBER LINE HOSE CARE

Before Use: Rubber insulating hose, boots, and covers should be thoroughly inspected inside and outside for cuts, scratches, ozone, cutting, holes, tears, punctures, ageing, rope or wire burns and other injuries such as swelling, softening, hardening, becoming sticky or malleable.

Line Hose Care & Storage: If mechanical damage occurs to the wall thickness of the hose or hose or if there are signs of chemical deterioration, they should be removed from service. Hose, boots and covers should be removed by each of any petroleum base product as soon as possible after contact. They should be kept in a stored position, without distortion and mechanical stress. Hose shall not be used to store these items when shipped or stored.

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Review
Thank You!

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