

## Sample Polymer Specification

*Purpose: To ensure a suitable service life of polymer insulating materials.*

### I. Material Design Tests

- The following must be performed to certify a material for use in production.

1. **Tracking Test:** Performed on a sample of material inclined at 30° and electrodes positioned 35mm apart. Samples are sprayed with a conductive solution (400Ω-cm) and energized at 10kV. the cycle is repeated every 90 seconds. The sample passes if there is:
  1. No carbonization or tracking.
  2. No current flow at the end of 90 seconds.The sample must pass 15,000 test cycles.

2. **Ultraviolet Test:** Samples of the rubber must be tested in a QUV tester or equivalent. These samples must be exposed to high ultraviolet and high humidity without cracking, checking or becoming hydrophilic.

The sample is judged to have passed this test if it exceeds 8,000 hours of exposure without damage.

3. **Corona Cutting:** Samples 5 cm by 7 cm are subjected to mechanical stress of 300,000 microstrain by bending samples around a grounded electrode. A needle-like electrode is placed 1 mm from the surface of the sample and energized at 12kV.

The sample is judged to have passed this test if there is no splitting or cutting. Samples must pass 1,000 hours of exposure to this test.

4. **Oxidative Stability:** Samples of the polymer compound are tested using differential scanning calorimetry. Samples are heated rapidly in a nitrogen atmosphere to the test temperature of 200°C. The atmosphere is then changed to air and the temperature is maintained until the antioxidant is consumed, as measured by an exothermic chemical reaction. The time to this reaction must exceed 300 minutes.

5. **Tear Strength:** Rubber test slabs are prepared in accordance with ASTM Standards and are tested to determine tear strength of the material. The minimum acceptable tear strength is 100 lb./in.

### II. Other Requirements:

- the manufacturer must supply upon request a listing of routine tests performed to ensure production compliance with design tests.
- All external polymer insulation material in the assembled product must be of the same compound.

# ESP™ Polymer Products From Ohio Brass

*Designed & Tested To Be Only the Best*



*Anytime, Anywhere, In Any Weather*



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NOTE: Because Hubbell has a policy of continuous product improvement, we reserve the right to change design and specifications without notice.

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**Bulletin EU1278-HR**



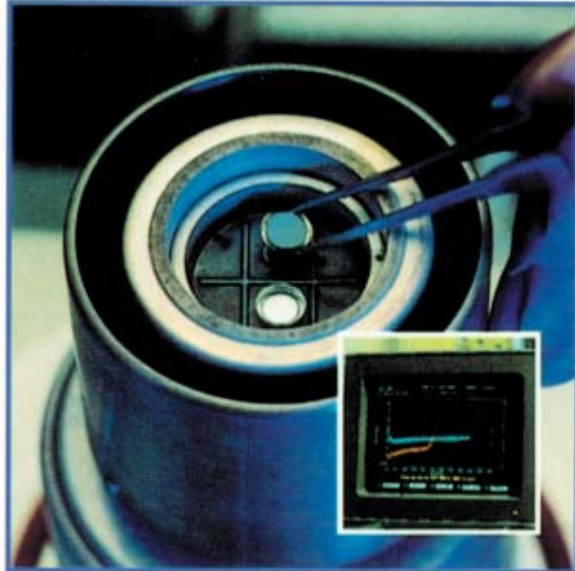
**OHIO BRASS**

*Ohio Brass has over 20 years of successful high-voltage polymer experience.  
Materials are evaluated by specially developed accelerated aging tests.*



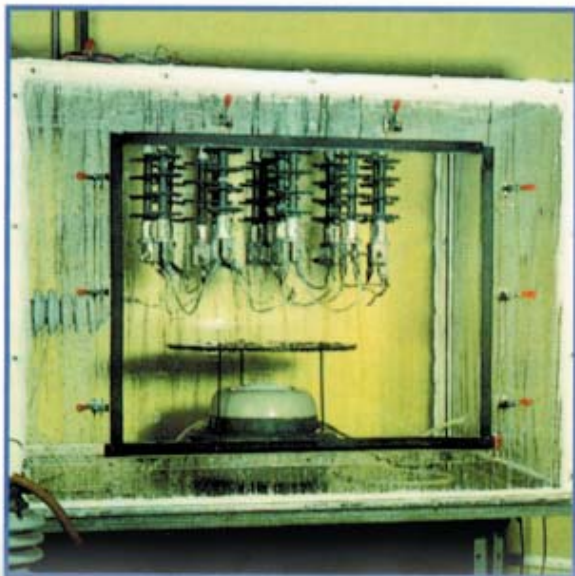
## Tracking Test

- Alternates contamination and high-voltage.
- Sample must maintain electrical integrity for at least 15,000 test cycles.
- ESP does 50,000 cycles!



## Oxidative Stability

- Evaluates long term ability to resist oxidative decomposition.
- Measures time to exothermic oxidative reaction at 200° C.
- ESP does 440+ minutes!

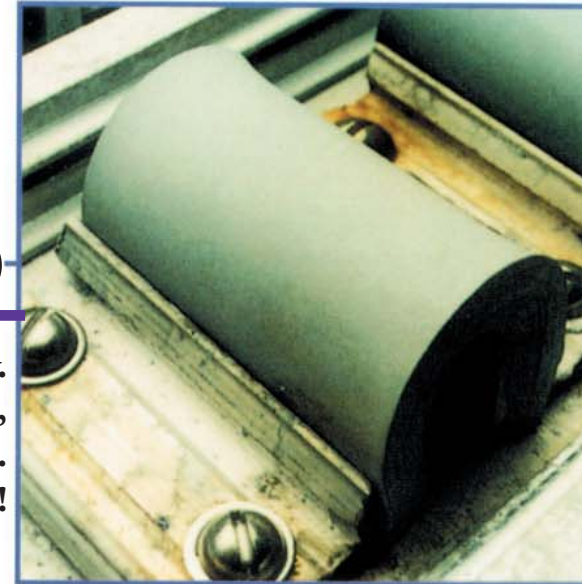


## Salt Fog

- Constant salt fog and high-voltage.
- Samples must pass at least 500 hours without degradation.
- ESP does 500+ hours!

## Ultraviolet (QUV)

- Alternates high UV and high humidity.
- Samples must pass 8,000 hours without checking, cracking or becoming hydrophilic.
  - ESP does 17,500+ hours!



## Corona Cutting

- Accelerates aging.
- Combines mechanical and electrical stress.
  - Compound must exceed 1,000 hours.
  - ESP does 3,000 hours!



## Routine Tests

*Performed to ensure consistent polymer Characteristics.*

- Oscillating Disk Rheometer
  - Measures cure of polymer
- Modulus
  - Measure of stiffness at 100% strain
- Tensile Strength
  - Force / unit area to tear sample
  - Measure of ruggedness of rubber
- Hardness
  - Measure of cure state & batch consistency
- Specific Gravity
  - Ratio of Weight of sample to weight of water
  - Verifies compounding