

Perma-Cote Performance Standards/Descriptions

Exterior PVC and interior urethane coating performance shall be confirmed by the characteristics and tests listed below. Test samples shall be selected at random.

FLAMMABILITY

The PVC coating will burn if subjected to sustained flame or heat above 400°F, however, it will self extinguish upon removal of the heat source or flame.

TOXICITY

Prolonged exposure to heat greater than 200°F or exposure to fire may cause the PVC coating to release harmful emissions which could pose a potential health hazard. Therefore, PVC use is not recommended in areas exposed to sustained temperatures above 200°F. If exposed to fire, particularly in closed areas, users should be aware and observe proper caution.

BOIL TEST

Acceptable conduit coating bonds shall be confirmed if there is no disbondment after a minimum average of 200 hours in boiling water or exposure to steam vapor at one atmosphere. The periodic increments between bond tests shall not exceed 5 hours for the first 25 hours, then it may be lengthened by mutual consent. The RN1 Bond Test and the Standard Method for Measuring Adhesion by Tape Test shall be utilized.

Exterior Adhesion

A 6" length of conduit test specimen shall be placed in boiling water. The specimen shall be periodically removed, cooled to ambient temperature and immediately tested according to the bond test (RN1). When the PVC coating separates from the substrate, the boil time to failure in hours shall be recorded. ASTM D870 describes this test method for accelerated testing of coating adhesive bonds.

Interior Adhesion

A 6" conduit test specimen shall be cut in half longitudinally and placed in boiling water or directly above boiling water with the urethane surface facing down. The specimen shall be periodically removed, cooled to ambient temperature and tested in accordance with the Standard Method of Adhesion by Tape Test (ASTM D3359). When the coating disbands, the time to failure in hours shall be recorded.

HEAT/HUMIDITY TEST

Acceptable conduit coating bonds shall be confirmed by a minimum average of 30 days in the Heat and Humidity Test. The periodic increment between bond tests shall not exceed 5 days for the first 30 days, then may be lengthened by mutual consent. The RN1 Bond Test and the Standard Method for Measuring Adhesion by Tape Test shall be utilized.

Exterior Adhesion

Conduit specimens shall be placed in a heat and humidity environment where the temperature is maintained at 150°F (66°C) and 95% relative humidity. The specimens shall be periodically removed and a bond test (RN1) performed. When the PVC coating separates from the substrate, the exposure time to failure in days shall be recorded. ASTM D1151, D1735, D2247 AND D4585 are the basis for this accelerated method of evaluating adhesive bonding.

Interior Adhesion

The conditions for interior adhesion testing of conduit specimens are the same as those for external adhesion. ASTM D3359 is used to determine adhesive failure.

ETL-VERIFIED PVC-001:

The PVC coating adhesion performance of this product has been ETL verified to the Intertek ETL SEMKO High Temperature H₂O PVC Coating Adhesion Test Procedure for 200 hours.

CHEMICAL RESISTANCE TEST

No trace of the internal coating shall be visible on a white cloth following six wipes over the coating which has been wetted with acetone (ASTM D1308).

POLYURETHANE

The supplier shall confirm that the internal coating which meets the above condition is a polyurethane.

Perma-Cote has used the American Society for Testing and Materials (ASTM) standards to provide comparable and consistent test data. A list of ASTM standards referenced in the Perma-Cote Coated Conduit Specification appears below.

ASTM B1117

Standard Practice for Operating Salt Spray (Fog) Apparatus

ASTM D149

Test Methods for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies

ASTM D638

Test Method for Tensile Properties of Plastics

ASTM D746

Test Method for Brittleness Temperature of Plastics and Elastomers by Impact

ASTM D870

Method for Water Immersion Test of Organic Coatings on Steel

ASTM D1151

Test Method for Effect of Moisture and Temperature on Adhesive Bonds

ASTM D1654

Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

ASTM D1735

Method for Water Fog Testing of Organic Coatings

ASTM D2240

Test Method for Rubber Property-Durometer Hardness

ASTM D2247

Method of Testing Coated Metal Specimens at 100% Relative Humidity

ASTM D2444

Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tap (Falling Weight)

ASTM D3359

Method for Measuring Adhesion by Tape Test

ASTM D4585

Testing Water Resistance of Coatings Using Controlled Condensation

ASTM D1308

Effect of Chemicals on Clear and Pigmented Organic Finishes

ASTM G153

Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Non-Metallic Materials

ASTM G155

Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

