TECHNICAL INFORMATION
(NCEEC Inc. / NAMCO Div.)

NCEEC, Inc. COATED RIGID CONDUIT SPECIFICATIONS For Station Work

1. The Conduit and fittings, shall be newly manufactured, and conform to the UL Specifications Standard 6 and Standard 514B, file E230701
2. Form 8, form 35 and mogul Condulets shall be supplied with plastic encapsulated stainless steel cover with Screws.
3. A polyurethane coating shall be uniformly and consistently applied to the exterior of all conduit and fittings. The coating shall have a range of 4 mils to 6 mils with 5 mils nominal thickness, .
4. The exterior coating applied to the conduit shall be 1 coat powdercoat primer at 2 mils thickness and 1 coat topcoat final color (2 mils) as specified by written purchase orders. All conduit and fittings shall have sufficient flexibility to permit field bending without cracking or flaking at the temperatures above 30□ F (-1□ C).
5. All male threads on conduit and all male and female threads on fittings or couplings shall be protected by application of a polyurethane coating with a minimum of 5 threads uncoated.
6. Test results are on file to confirm coating compliance under the following specifications:
    A) Conduit immersed in boiling water with minimum mean time to Adhesion failure of 24 hours. (ASTM D870).
    B) Conduit and condulet exposure to 150□F (65□C), And 95% relative humidity with a mean time to failure of 7 days. (ASTM D1151).
    C) The coating bond shall be confirmed using the Standard Method of Adhesion by Tape Test. (ASTM D3359).
    D) No trace of the coating on conduit or fitting shall be visible on a white Cloth, which has been wetted with acetone, following six wipes over the coating. (ASTM D1308).
7. Installation of NCEEC, Inc. Coated Rigid Conduit shall be performed in accordance with NCEEC, Inc. installation instructions. Contractor shall use proper tools to prevent damage to the coated conduit during installation.
8. Approved Material: Polyurethane Coated Conduit and fittings as manufactured by NCEEC, Inc. Any deviation from the above specifications must be submitted for review and approval by NYCTA engineers.

Conduit Performance Standards/Descriptions

Interior and exterior polyurethane coating performance shall be confirmed by the characteristics and tests listed below. Test samples shall be selected based upon quality assurance and quality control manuals.

Flammability

The polyurethane 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

All organic materials, (wood, paper, plastics), produce *potentially* harmful emissions when burned under uncontrolled conditions. The most common of these emissions are carbon monoxide and carbon dioxide. Prolonged exposure to heat greater than 200□ F or direct exposure to fire may cause the polyurethane coating to produce emission of carbon monoxide and carbon dioxide. Therefore, polyurethane use is not recommended in areas exposed to sustained atmospheric temperatures above 200□ F or direct flame. The polyurethane coating on the Conduit has been evaluated and found to produce no more harmful emissions than common organic materials like wood or paper.

Boil Adhesion Test

Acceptable coating bonds shall be confirmed if there is no coating disbondment after a minimum average of 24 hours in boiling water. The periodic increments between test shall not exceed 5 hours. The Standard Method of Adhesion by Tape Test (ASTM D3359) shall be utilized.
A 6” length of conduit shall be placed in boiling water. The specimen shall be periodically removed, cooled to ambient temperature and tested in accordance with the Standard Method of Adhesion by Tape Test. When the coating disbands, the time to failure in hours shall be recorded.

Heat/ Humidity Adhesion Test

Acceptable conduit and fittings coating bonds shall be confirmed by a minimum average of 7 days in the Heat and Humidity Test. The periodic increment between bond tests shall not exceed 1 day. The Standard Method of Adhesion by Tape Test (ASTM D3359) shall be utilized.
Conduit and fitting specimens shall be placed in a heat and humidity environment where the conditions are maintained at 150□ F and 95% relative humidity. The specimens are periodically removed and a bond test

performed. When the polyurethane 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 method of accelerated testing.

Chemical Resistance Test

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

Polyurethane Coating

The supplier shall confirm that the internal and external coating which meets the above conditions is polyurethane.

NCEEC, Inc. utilizes the following Standards to conduct testing.

NCEEC, Inc. has used American Society of Testing and Materials, (ASTM), standards test methods to provide comparable and consistent test data. A list of ASTM standards referenced in the above NCEEC, Inc. Rigid Coated Conduit Specification appears below; see letter from Sherwin Williams dated July 19, 2002, confirming compliance to the following ASTM Test.

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 D1735
Method for Water Fog Testing of Organic Coatings

ASTM D2247
Method of Testing coated Metal Specimens at 100% Relative Humidity

ASTM D3359
Method for Measuring Adhesion by Tape Test

ASTM D4585
Testing Water Resistance of Coatings Using Controlled Condensation

ASTM G23
Recommended Practice for Operating Light and Water Exposure Apparatus for Exposure of Non-metallic Materials

ASTM D1308
Effect of Chemical on Clear and Pigmented Organic Finishes