

SECTION 16130

UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS: CONDUIT SYSTEMS FOR USE IN CORROSIVE ENVIRONMENTS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes: Furnishing, installation, and assembly of PVC coated electrical rigid metal conduit (ERMC) systems and stainless steel fittings.
- B. Related Sections:
 - 1. Section 16070 - Hangers and Supports for Electrical Systems

1.2 REFERENCES

- A. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA RN1: Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- B. National Fire Protection Association (NFPA):
 - 1. NFPA 70: National Electrical Code (NEC).
- C. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 239: Standard Practice for Locating the Thinnest Spot in a Zinc (Galvanized) Coating on Iron or Steel Articles
- D. Underwriters Laboratories, Inc. (UL):
 - 1. UL 6: Safety Standard for Rigid Metal Conduit
 - 2. UL 514B: Safety Standard for Fittings for Conduit and Outlet Boxes
- E. American National Standards Institute (ANSI):
 - 1. ANSI C80.1: American National Standard for Rigid Steel Conduit-Zinc Coated
- G. Steel Tube Institute of North America:
 - 1. Guidelines for Installing Steel Conduit/Tubing

1.3 SUBMITTALS

- A. General: Submit in accordance with Section 01330.
- B. Product Data:
 - 1. Submit manufacturer's descriptive literature and product specifications for each product.
 - 2. Manufacturer's installation literature and training guide.
 - 3. Manufacturer's product drawings, when applicable.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Products shall be free of defects in material and workmanship.
- B. Installer Qualifications: Installer shall be trained and certified based on the acceptable manufacturers listed requirements.

PART 2 – PRODUCTS

2.1 GENERAL

- A. Furnish PVC coated ERM C of size as indicated. If not indicated, the smallest trade size shall be 3/4-inch. The PVC coated ERM C system shall include necessary PVC coated fittings, boxes and covers to form a complete encapsulated system.

2.2 MANUFACTURERS

- A. Acceptable Manufacturers: Thomas & Betts Corporation; 8155 T & B Blvd., Memphis, TN 38125. Tel: 901-252-5000. Web: www.tnb.com
- B. Substitutions: Not permitted
- C. Requests for substitutions will be considered in accordance with provisions of Section 01630.

2.3 MATERIALS / COMPONENTS

- A. PVC COATED RIGID STEEL CONDUIT:
The PVC coated rigid steel conduit shall be hot dip galvanized inside and out with hot dipped galvanized threads. The interior galvanizing shall be listed per UL 6. The exterior galvanizing shall be listed per UL 6 as primary corrosion protection. Thread protectors shall be used on the exposed threads of the PVC coated conduit. PVC coated ERM C- steel conduit shall comply with UL 6, ANSI C80.1, and NEMA RN-1 standards without exception.

The PVC coating, in compliance with NEMA RN-1, shall be nominal 40

mils in thickness continuous over the entire length of the conduit except at the threads, and be free of blisters, bubbles or pinholes. PVC shall be UL listed as a primary corrosion protection.

A blue urethane coating shall be uniformly and consistently applied to the interior of conduit. This internal coating shall be a nominal 2-mil thickness. All male threads on elbows and nipples shall be protected by this same application of urethane coating.

Coated couplings shall be used with coated conduit. The thickness of the coating on couplings shall be at least equal to the thickness of the coating on the conduit. Each coated coupling shall have a flexible PVC sleeve which extends from each end of the coupling and which will overlap the PVC coating on the conduit when the coupling has been installed on the conduit. The length of the sleeve extension(s) shall be at least equivalent to the nominal conduit size for sizes up through 2". For sizes 2" – 6", the length of the sleeve extension(s) shall be at least 2 in. The PVC sleeve shall be a nominal thickness of 40 mils in thickness. The inside diameter of the overlapping sleeve shall be less than the outside diameter of the PVC-coated conduit.

B. PVC COATED RIDIG ALUMINUM CONDUIT:

The PVC coated ERM- aluminum conduit prior to coating shall be UL listed. The PVC coated ERM- aluminum conduit shall be UL listed with the PVC as the primary corrosion protection.

The exterior of the conduit shall have a PVC coating of a minimum thickness of nominal 40 mils.

A blue urethane coating shall be uniformly and consistently applied to the interior of conduit. This internal coating shall be a nominal 2-mil thickness. All male threads on elbows and nipples shall be protected by this same application of urethane coating.

Coated couplings shall be used with coated conduit. The thickness of the coating on couplings shall be at least equal to the thickness of the coating on the conduit. Each coated coupling shall have a flexible PVC sleeve which extends from each end of the coupling and which will overlap the PVC coating on the conduit when the coupling has been installed on the conduit. The length of the sleeve extension(s) shall be at least equivalent to the nominal conduit size for sizes up through 2". For sizes 2" – 6", the length of the sleeve extension(s) shall be at least 2 in. The PVC sleeve shall be a nominal thickness of 40 mils in thickness. The inside diameter of the overlapping sleeve shall be less than the outside diameter of the PVC-coated conduit.

C. PVC COATED ORDINARY LOCATION FITTINGS

PVC coated ferrous and aluminum fittings for general service and corrosive locations must be UL listed. The PVC coating shall be minimum 40 mils in thickness, and be free of blisters, bubbles or pinholes. Female threads on fittings shall be protected by application of urethane coating.

All female ends of PVC coated conduit fittings shall have a flexible PVC sleeve which extends from the female ends of the fitting and which will overlap the PVC coating on the conduit when the fitting has been installed on the conduit. The length of the sleeve extension(s) shall be at least equivalent to the nominal conduit size for sizes up through 2". For sizes 2" – 6", the length of the sleeve extension(s) shall be at least 2 in. The PVC sleeve shall be a nominal thickness of 40 mils in thickness. The inside diameter of the overlapping sleeve shall be less than the outside diameter of the PVC-coated conduit.

1. The PVC coating on all form 8 covers shall form a gasket-like flange of at least 5/16" wide and minimum 40 mils covering the top of the fitting around the opening and the bottom of the cover/matting with the flange of the fitting.

A blue urethane coating shall be uniformly and consistently applied to the interior, exterior and threads of all conduit bodies, including but not limited to, form 8 and form 7 conduit bodies. This coating shall be a nominal 2-mil thickness.

Stainless steel encapsulated screws shall be supplied with all form 7 and form 8 fittings.

2. Rigid Hubs shall have a nominal 40 mils PVC coating thickness with a nominal 2 mils of blue urethane on interior and threads. The male threads and locknut of the hub shall remain uncoated.
3. Liquid-Tight fittings shall have an exterior PVC coating of a minimum thickness of nominal 40 mils.

D. PVC COATED HAZARDOUS LOCATION FITTINGS:
Hazardous location fittings, prior to PVC coating must be UL listed.

All female ends of PVC coated conduit fittings shall have a flexible PVC sleeve which extends from the female ends of the fitting and which will overlap the PVC coating on the conduit when the fitting has been installed on the conduit. The length of the sleeve extension(s) shall be at least equivalent to the nominal conduit size for sizes up through 2". For sizes 2" – 6", the length of the sleeve extension(s) shall be at least 2 in. The PVC sleeve shall be a nominal thickness of 40 mils in thickness. The inside diameter of the overlapping sleeve shall be less than the outside diameter of the PVC-coated conduit.

E. PVC COATED STRUT, HANGERS, AND CLAMPS:
Right angle beam clamps and U-bolts shall be specially formed and sized to snugly fit the outside diameter of the PVC coated conduit. Support products such as ferrous strut, beam clamps, pipe straps, clamp back spacers, conduit clamp hangers and all thread rods shall have minimum 15 mil PVC coating by the manufacturer of the ERM conduit and system components.

- F. STAINLESS STEEL FITTINGS:
Stainless steel Liquid-Tight fittings shall be made of 304-grade stainless steel or better.
- G. STAINLESS STEEL STRUTS, HANGERS, ETC.
Stainless steel strut, beam clamps, pipe straps, clamp back spacers, conduit clamp hangers and all thread rods shall be made of 304-grade stainless steel or better.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. The PVC coated ERM and system components have been selected for use in an atmosphere considered to be corrosive for this project. The corrosive atmosphere is considered to be more damaging than merely the presence of moisture. Accordingly, conduit and the corresponding fittings for it must have PVC protection as described under Part 2 Products. Conduit and fittings that are merely galvanized for this purpose are insufficient.

3.2 PREPARATION

- A. Preparation shall be done in accordance with manufacturer's printed instructions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's printed instructions and manufacturer's installation training.

3.4 QUALITY CONTROL

- A. General: Comply with requirements of Section 01730.

3.5 MANUFACTURER'S FIELD SERVICES

- A. Free on-site installation training course by company representative. This representative must conduct the onsite training course in order to qualify for the installation certificate. The time required for this training is estimated to be two (2) hours.
- B. After the on site training installation, the representative shall then register the installer in his database and provide certification for installation.

END OF SECTION