

Atkore-FRE Composites

This product specification is written according to the Construction Specifications Institute MasterFormat, 2018 Update.

SECTION 26 05 33.13

CONDUIT FOR ELECTRICAL SYSTEMS - Reinforced Thermosetting Resin Conduit (“RTRC”)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections apply to this Section.

1.2 DEFINITIONS

- A. RTRC: Reinforced Thermosetting Resin Conduit-Phenolic

1.3 SUMMARY

- A. This Section includes the following:
- B. Reinforced Thermosetting Resin Conduit (“RTRC”)
- C. Related Sections
 - 1. Section 26 05 26 “Grounding and Bonding for Electrical Systems”
 - 2. Section 26 05 29 “Hangers and Supports for Electrical Systems”
 - 3. Section 26 05 33.16 “Boxes for Electrical Systems”
 - 4. Section 27 05 33 “Conduits and Backboxes for Communications Systems”
 - 5. Section 25 05 28.33 “Conduits and Backboxes for Integrated Automation”

1.4 REFERENCES

- A. UL 2515 Safety Standard - Aboveground Reinforced Thermosetting Resin Conduit and Fittings-For type XW Only
- B. UL 2515A Safety Standard - Supplemental Requirements for Extra Heavy Wall Reinforced Thermosetting Resin Conduit (RTRC) and Fittings- For Type XW Only
- C. CSA C22.2 NO. 2515:19 Aboveground reinforced thermosetting resin conduit (RTRC) and fittings-For type XW only (Binational standard with UL 2515)
- D. CSA: C22.2 No. 2515.1-13 Supplemental requirements for extra heavy wall (XW) reinforced thermosetting resin conduit (RTRC) and Fittings- For Type XW Only

- E. UL 2196 Safety Standard - Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables- For type XW Only
- F. NEMA TC-14AG and NEMA TC-14XW Standards for Reinforced Thermosetting Resin Conduit (“RTRC”). Note: These are NEMA Adoptive Standards: NEMA TC-14AG (UL 2515) & NEMA TC-14XW (UL 2515A).NEMA TC -14 Standard for Reinforced Thermosetting Resin Conduit (“RTRC”)
- G. NFPA 70 - National Electrical Code® (NEC®)
- H. CSA C22.1:21 Canadian Electrical Code, Part I, Safety Standard for Electrical Installations
- I. NFPA 130 - Standard for Fixed Guideway Transit and Passenger Rail Systems- For type XW Only
- J. NECA National Electrical Installation Standard (NEIS) 111, Standard for Installing Nonmetallic Raceways.

1.5 SUBMITTALS

- A. Manufacturer’s Product Data
- B. Certifications to applicable standards
- C. Domestic certifications where required to applicable standards.

1.5 QUALITY ASSURANCE

- A. Reinforced Thermosetting Resin Conduit and Fittings – Phenolic Type XW shall be UL Listed and manufactured in accordance with NEMA TC-14AG and TC-14XW.
- B. Reinforced Thermosetting Resin Conduit and Fittings – Phenolic Type XW shall be CSA Listed and manufactured in accordance with CSA C22.2 NO. 2515:19 and CSA: C22.2 No. 2515.1-13.
- C. Reinforced Thermosetting Resin Conduit – Type XW shall conform to NFPA 130 for 1 Hour Fire rating requirements including Wet Locations for fire resistive cables and NFPA 70 (NEC® 2020 Article 355).
- D. Reinforced Thermosetting Resin Conduit – Type XW shall conform to NFPA 502 for 2 Hour Fire rating requirements including Wet Locations for fire resistive cables and NFPA 70 (NEC® 2020 Article 355).
- E. Reinforced Thermosetting Resin Conduit shall conform to Canadian Electrical Code (CEC Article 12-200).
- F. Electrical equipment and materials shall be new and within one year of manufacture, complying with the latest codes and standards. No used, re-built, refurbished and/or re-manufactured electrical equipment and materials shall be furnished on this project.
- G. Testing Agency Qualifications: Testing/listing agency shall be one of the following Nationally Recognized Testing Laboratories:
 - 1. Underwriters Laboratories (UL)
 - 2. Canadian Standards Association (CSA)
 - 3. Intertek Testing Services (ETL)

1.6 STORAGE AND HANDLING

- A. Storage: Whenever possible, store the conduit indoors to prevent possible discoloration, the accumulation of dirt and to extend the life of the product. If conduit is stored outdoors, it should be in a shaded area to avoid as much as possible UV exposure. It shall be stored in such a way as to allow air circulation and water drain-off and shall not be directly covered with plastic.
- B. Conduits are shipped in self-supporting crates designed to be unloaded by forklift. Crates should not be dropped from the truck trailer flat beds. Each crate shall be legibly marked with the following information:
 - a. Manufacturer's identification
 - b. Product description
 - c. Purchase order number
 - d. Stock number
- C. Conduit crates should be stored on a level surface in an environment free from excessive dirt, dust, or other airborne contaminants. The vertical support of the wooden frames should line up so the load will be transferred to the wood frames rather than the conduit. The height of stacked conduit should be limited to twelve feet.
- D. Packing system for conduits and fittings shall be provided with adequate amount of interval support spacing during shipping and subsequent storage by the customer to mitigate any deflection or deformity.
- E. Elbows and accessories, when stored outdoors it should be in a shaded area to avoid as much as possible UV exposure amongst other elements.
- F. A two-part adhesive kit will have a minimum shelf life of 12 months from delivery date when stored per the manufacturer's recommendations. The manufacturing date should be printed on the cartridge's label. Storage and handling should comply with Manufacturer's storage and handling guidelines.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. FRE Composites, a part of Atkore.

2.2 REINFORCED THERMOSETTING RESIN CONDUIT-Phenolic

- A. RTRC Conduit Type XW shall be available in trade sizes $\frac{3}{4}$ " up to $1\frac{1}{2}$ " IPS and 2" up to 6" ID trade sizes.
- B. RTRC Conduit shall be listed to UL 2515 or UL2215A and manufactured in accordance with NEMA TC-14-2515 and NEMA TC-14-2515A
- C. RTRC Conduit shall be listed to CSA and manufactured in accordance with CSA C22.2 NO. 2515:19 and CSA: C22.2 No. 2515.1-13

2.3 RTRC FIBERGLASS FITTINGS-Phenolic:

- A. Basis-of-Design Product: Subject to compliance with requirements, provide FRE Composites (a part of Atkore) RTRC fiberglass fittings.
- B. Fiberglass conduit fittings, elbows, and accessories shall be manufactured using the same filament winding process, methods, chemicals and materials as the conduits and have a minimum socket depth and an inside bell design consistent with the conduit. Sleeve shall not be permitted as a replacement to a Double Bell coupling in joining two conduit male ends.
- C. Manufacturing process.
 - a. Fittings shall use the same filament winding process, methods, and components as used to manufacture the fiberglass conduit.
- D. All elbows shall meet the nominal radius within plus or minus 3 degrees. Wall thicknesses shall meet tolerances as indicated in the applicable standards below.
- E. All type XW conduits, elbows and fittings shall be durably and legibly marked in accordance with NEMA TC 14-2515, NEMA TC14-2515A, CSA C22.2 NO. 2515:19 and CSA: C22.2 No. 2515.1-13 as applicable. In addition, the following information shall be included in the marking:
 - a. UL2515 and UL2515A (For Type XW Only)
 - b. CSA C22.2 NO. 2515:19 and CSA: C22.2 No. 2515.1-13 (For Type XW only)
 - c. Manufacturer and reseller (if conduit was modified or bent other than by manufacturer).
 - d. Date of manufacturing of conduit, elbows and fittings.
 - e. Elbows shall be marked with angle and radius.
 - f. Fittings, General: Listed and labeled for type of conduit, location, and use.
 - g. Fittings for RTRC shall comply with UL 2515 or UL2215A and manufactured in accordance with NEMA TC-14-2515 and NEMA TC-14-2515A
- H. Fittings for RTRC shall comply with CSA and manufactured in accordance with CSA C22.2 NO. 2515:19 and CSA: C22.2 No. 2515.1-13
- I. Adhesives: As recommended by conduit manufacturer.

2.4 2-HOUR FIRE RATED CONDUIT SYSTEM - RTRC Type XW

The conduit product listed below, shall be used.

- A. XW BreathSaver® Fiberglass Phenolic conduit by FRE Composites, a part of Atkore.
- B. Conduit Type XW shall be Certified for 2 Hour Fire rating installations (UL FHIT System No. 25C and 25D or FHIT7.25C for Canada).
- C. Conduit Type XW shall comply with the requirements of NFPA 130 for Noncombustible Material and Limited-Combustible Material for 1 Hour Fire rating including Wet Locations for fire resistive cables.

- D. Conduit Type XW shall comply with the applicable requirements for Noncombustible Material in NFPA 502 for 2 Hour Fire rating including Wet Locations for fire resistive cables.
- E. Provide a rigid non-metallic low smoke, zero halogen, phenolic RTRC conduit, couplings, expansion joints, elbows, split stop rings and box connectors as indicated on the Contract Drawings. Conduit shall be fire resistant and low smoke producing.
- F. Conduit and Fittings shall utilize Straight socket joint with a Dual Cartridge Adhesive Kit by FRE Composites or approved equal per Manufacturer's recommendations.
- G. Conduit shall have a flame spread index and a smoke developed index below 50 (i.e., a 25% rating) when tested per applicable standards.

3.1 INSTALLATION

- A. Reinforced Thermosetting Resin Conduit - Phenolic, elbows and fittings shall be installed in compliance with the latest version of the National Electrical Code® (NEC®) and other applicable codes and standards as indicated elsewhere in these specifications.
- B. Reinforced Thermosetting Resin Conduit - Phenolic, elbows and fittings shall be installed in compliance with the latest version of the CSA C22.1:21 Canadian Electrical Code (CEC), Part I, Safety Standard for Electrical Installations.
- C. RTRC - Phenolic Type XW conduit shall be acceptable in areas subject to physical damage Class 1 Division 2 Locations.
- D. Reinforced Thermosetting Resin Conduit - Phenolic, elbows and fittings shall be installed in accordance with NECA National Electrical Installation Standard (NEIS) 111, Standard for Installing Nonmetallic Raceways.