



SPECIFICATION Fiberglass Utility Conduit Systems

1. GENERAL
 - 1.1 The conduit shall be filament wound reinforced epoxy as manufactured to comply with the specifications outlined in the latest revisions of NEMA TC 2002 and UL 1684. The conduit shall be free from defects including delaminations, foreign inclusions, etc. It shall be nominally uniform (as commercially practical) in color, density and physical properties. It shall be straight and the ends shall be cut square to the inside diameter.
2. JOINING METHOD
 - 2.1 The conduit shall be supplied with an integrally wound tapered bell and machine tapered spigot to be used with an adhesive- which shall be supplied by the manufacturer of the conduit. The strength of the joint must meet or exceed the conduit tensile strength when tested in accordance with ASTM D 2105. The joint shall have a minimum pullout force of 1500 lbs. per section 5.9 UL 1684.
 - 2.2 OPTIONAL JOINING METHODS
 - 2.21 The conduit shall be supplied with an EPDM gasket O-ring in the tapered bell end to provide a non-adhesive, moisture resistant mechanical joint capable of withstanding a minimum pullout force of 500 lbs. Coupled conduit and joints shall not leak when tested in accordance with Clause 5.8.2 of UL 1684/NEMA TC 2002.
3. FITTINGS
 - 3.1 A complete line of fittings, adaptors and elbows shall be available and shall be manufactured from the same materials and process as the conduit.
4. SIZES
 - 4.1 Conduit and fittings shall be manufactured to IPS and ID trade sizes and shall meet the dimensional requirements of NEMA TC 2002 and UL 1684 as outlined in the catalog sheets.
5. ULTRA VIOLET PROTECTION
 - 5.1 Conduit and fittings shall be manufactured with carbon black as a UV inhibitor to meet the requirements of NEMA TC 2002 and UL 1684. An additional UV solution will be added to the resin matrix which exceeds the requirements of NEMA TC 2002 and UL 1684 for prolonged outdoor storage and use.
6. COLOR
 - 6.1 Conduit and fittings shall be pigmented black. Alternate colors are available as an option.
7. FIRE RESISTANCE* (For indoor and heat sensitive applications)
 - 7.1 A flame with a temperature of 950 +/- 50°C (1742 +/- 90°F) shall be applied for 15 seconds, and then removed for 15 seconds until five such applications have been made. The flame shall not be reapplied while the material is still burning. When the material burns for more than 30 seconds after any of the first four applications, the test shall be discontinued. When the material burns for more than 15 seconds but less than 30 seconds, the flame shall be immediately reapplied upon cessation of the flame.
 - 7.2 The material shall not support combustion for more than 60 seconds after the fifth application of the test flame.
8. Halogen Content
 - 8.1 The halogen content shall not exceed 0.2% by weight, using the calculated method.
9. Hangers and Supports
 - 9.1 When supporting or hanging conduit from a structure, the manufacturer supplying the conduit shall also supply the hangers and supports. Third party materials shall not be allowed.



10. Properties and Specifications

SURFACE

Interior Finish < 125 micro inches
Clean, smooth and free of abrasive surfaces

EXTERIOR FINISH

< 2000 micro inches
Shall contain UV 9 Absorber Solution and pigmented carbon black or gray

COEFFICIENT OF FRICTION

0.385 (PVC cable)
0.233 (XLP cable)
0.160 (concentric neutral cable)

ELECTRICAL

Dielectric Strength > 500 volts/mil per ASTM D 149
Dissipation Factor 0.5% per ASTM-D 150
Volume Resistivity 3.8 x 10¹⁴ ohm per ASTM D 150
Surface Resistivity 1.1 x 10¹⁴ ohms per ASTM D 257
Dielectric Constant 3.5 (at 103 cps) per ASTM D 150

MECHANICAL

Tensile Strength (axial) 11,000 psi per ASTM D 2105
Compressive Strength (axial) 11,000 psi per ASTM D 695
Ultimate Elongation 2%
Modulus of Elasticity 1,250,000 psi per ASTM D 2105
Modulus of Elasticity in Tension 1,250,000 psi per ASTM D 2105

PHYSICAL

Specific Gravity 1.9 – 2.0 per ASTM-D792
Glass Content 68% +/- 2% per API SPEC 15 LR
Water Absorption < 1% per ASTM D 570
Barcol Hardness 55 +/- .75 per ASTM D 2583

THERMAL

Heat Deflection Temp. 312° F per ASTM D 648
Continuous Operating Temp. -40° to 230° F (-40° C to 110° C)
Maximum Operating Temp. -60° to 260° F (-60° to 130° F)
Coefficient of Thermal Expansion 1.25 x 10⁵ in/in/F per ASTM D 696

FLAMMABILITY

Conforms to UL 1684
HB Rating UL 94



Impact Resistance Table

The minimum impact resistance values shown in ft-lb as required by UL 1684/NEMA TC 2002 and tested at 74° F and 32° F in accordance with ASTM D2444.

Nominal Size	SW	MW	HW
2"	40	-	-
3"	60	-	-
4"	70	-	110
5"	100	140	160
6"	100	160	200

Compression Resistance Table

The internal diameter of the conduit shall not decrease by more than 25% during application of the force specified in the table below when tested in accordance with UL 1684 Clause 5.2.2 to 5.2.4. The conduit shall show no evidence of cracking or buckling after removal from the compression machine.

Nominal Size	Metric	Force	N(lbf)
2"	53	2800	650
3"	78	1780	400
4"	103	980	220
4" HW	103	2000	450
5"	129	1780	400
6"	155	1780	400

Pipe Stiffness

The minimum conduit stiffness at 5% deflection for all sizes of conduit shall not be less than the values shown below when tested at 74° F and 32°F in accordance with ASTM D2412.

Nominal Size	SW	MW	HW
2"	320	-	-
3"	140	-	-
4"	50	-	130
5"	40	75	90
6"	30	55	65