SPECIFICATION FOR CERTIFIED BreathSaver® XW FOR CORROSION PROOF 2-HOUR RATED CABLE SYSTEM (UL 2196 | FHIT 25C)

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SECTION 1: DESCRIPTION & LISTING

1.1 Description

This specification outlines the requirements for the design, construction and performance of the Extra Heavy Wall (XW) BreathSaver® reinforced thermosetting resin conduit (rtrc) and fittings.

1.2 Product application & use

Conduits and fittings are Class 1, Division 2 which can be subject to physical damage per NEC®.

1.3 Materials

Conduits and fittings shall consist of continuous E or E-CR glass roving in a cured corrosion resistant phenolic resin system pigmented with UV inhibiting carbon black dispersed homogeneously manufactured for use at temperatures ranging from –40 °F (-40 °C) to 1850 °F (1010 °C). No resorcinol resin based system shall be allowed.

Phenolic resin system shall be impervious to a wide spectrum of chemicals. Conduit shall contain no halogens as chlorine and shall not contain other toxic materials in excess of trace levels limits compliant with OSHA requirements.

1.4 Joining Method

Each length of conduit is supplied with an integral bell on one end and spigot on the other end. All joints shall be adhesive bonded inside a bell end of even socket depth through out the raceway. Adhesive shall be supplied by the manufacturer of the conduit and shall have a minimum joint pull out load of 1 000 lb, (454 kg) per inch diameter trade size.

1.5 Fittings

All fittings, adapters and elbows shall be constructed in the same manner as the conduit (filament wound) and shall have a socket depth and an inside bell design consistent with the conduit.

SECTION 2: DIMENSIONS

2.1 Sizes & wall thicknesses

Conduits and fittings shall be manufactured with nominal wall thicknesses as outlined below:

IPS IRON PIPE SIZE			
Diameter		Wall thickness	
in	mm	in	mm
¾	21	0.250	6.4
1	27	0.250	6.4
1 ¼	34	0.250	6.4
1 ½	41	0.250	6.4
8*	203	0.250	6.4

ID TUBULAR SIZE			
Diameter		Wall thickness	
in	mm	in	mm
2	53	0.250	6.4
2½	63	0.250	6.4
3	78	0.250	6.4
3½	91	0.250	6.4
4	103	0.250	6.4
5	129	0.250	6.4
6	155	0.250	6.4

SECTION 3: REQUIREMENTS

3.1 Workmanship

Conduits and fittings shall be free from defects and commercially practicable in color, opacity, density and other physical properties. The exterior surface finish shall be smooth per acceptable industry practices.

3.2 Marking

Conduits and fittings shall be marked with a suitable identifying mark printed on the outside of the product. Such marking shall contain:

(1) RTRC (2) for use -40 °F (40 °C) to 1850 °F (1010 °C) (3) trade size (4) manufacturer's name or trademark (5) part number (6) degrees and radii (elbows only) (7) date of manufacture.

3.2 Specifications

All conduits and Fittings are UL listed against UL 2515A following tests made in laboratory by Underwriters Laboratories (UL file #E53373).

Furthermore, products comply with the NFPA 130 as well as NFPA 502 for exposed installations, FT4 rated (CSA) and UL 2515A. Product identified in section 2.1 with "*" is not UL Listed as 8" is not a recognized trade size dimension per National Electric Code (NEC) and Canadian Electric Code (CEC).

SECTION 4: PRODUCT PROPERTIES & CHARACTERISTICS

4.1 Physical Properties	Test Results	Test Protocol
Glass Content	71% ± 3%	API 15LR
Specific Gravity	1.93 g/cm^3 ± 2	ASTM D792
Barcol Hardness	50 ± 2	ASTM D2583
Water Absorption	≤ 1.5%	ASTM D570 CSA C22.2 No. 2515
U.V. Resistance	> 3 500 Hrs (Xenon Arc)	CSA C22.2 No. 2515

4.2 Flame & Smoke Properties	Test Results		Test Protocol
Flame Spread Index	0	(max: 35)	ASTM E84
Smoke Optical Density @ 4 minutes	1	(max: 200)	ASTM E662
Light Absorption	0%	(no smoke generated)	SAV 242
Emissions NO^2	5 ppm	(max: 100 ppm)	SMP 800C
Emissions SO^2	1 ppm	(max: 500 ppm)	SMP 800C
Emissions HCl	< 2 ppm	(max: 100 ppm)	SMP 800C
Emissions HF	< 2 ppm	(max: 100 ppm)	SMP 800C
Emissions HBr	< 1 ppm	(max: 100 ppm)	SMP 800C
Emissions HCN	< 1 ppm	(max: 100 ppm)	SMP 800C
Emissions CO	604 ppm	(max: 3 500 ppm)	SMP 800C
Emissions CO^2	9585 ppm	(max: 90 000 ppm)	SMP 800C

4.3 Electrical Properties	Test Results	Test Protocol
Dielectric Strength	500 volts/mil (19.68 kV/mm)	ASTM D149
Dielectric Breakdown Voltage	29.7 kV	ASTM D149

4.4 Surface finish	
Exterior (average)	<2000 microinches (50.8 micrometers)
Interior (average)	<250 microinches (6.4 micrometers)
Color	Black (standard)

4.5 Thermal Properties	Test Results	Test Protocol
Coefficient of Thermal Expansion	1.40 E^{-5} m./m./°C	ASTM D696
Thermal Conductivity	1.067 Btu.in/ft^2.h. °F (0.154W/ m.K)	ASTM D335
Thermal Resistivity	0.938°F. ft^2.h/Btu.in (6.502 mK/W)	ASTM D335
Heat Deflection Temperature (HDT)	>482°F (>250°C)	ASTM D648

SECTION 5: MANUFACTURERS

Conduits and fittings shall be manufactured by FRE Composites. No substitute shall be accepted.