

Bondstrand 7000 Specification Guide

Scope

This specification defines the reinforced thermosetting resin (RTR) piping system to be used in those services that may produce a dangerous build-up of static electrical charges. Such services include above-ground jet fuel lines, double contained jet fuel lines, and transmission of refined petroleum products, gases, or non-polar fluids at high velocities.

References, Quality Assurance

References are made to other standards and tests which are a part of this section as modified. Where conflict exists between the requirements of this specification and listed references, the specification shall prevail.

Physical and Mechanical Properties

Typical Pipe Property	Units	70°F (21°C)	200°F (93°C)	ASTM Method
Circumferential Tensile Stress at Weeping	10 ³ psi MPa	24.0 165.0	- -	D1599
Circumferential Tensile Modulus	10 ⁶ psi GPa	3.65 25.5	3.20 22.1	
Circumferential Poisson's Ratio	-	0.56	0.70	
Longitudinal Tensile Strength	10 ³ psi MPa	8.50 59.0	6.90 44.6	D2105
Longitudinal Tensile Modulus	10 ⁶ psi GPa	1.6 11.0	1.24 8.5	D2105
Longitudinal Poisson's Ratio	-	0.37	0.41	
Hydrostatic Design Basis(cyclic) (at 150°F(66°C))	10 ³ psi MPa	6.0 41.4		D2992(A)
Beam Apparent Elastic Modulus	10 ⁶ psi GPa	1.7 11.7	1.0 6.9	D2925
		Value		
Flow Coefficient	Hazen Williams 150			
Thermal Conductivity Pipe Wall	BTU-in./(hr.ft. ² °F) W/M °C		2.3 0.33	
Grounding Resistance at 1500 volts	10 ⁶ ohms		1.0 max.	
Coefficient of Thermal Expansion, Linear	10 ⁻⁶ in./in.°F 10 ⁻⁶ mm/mm/ 24°C		10 18	D696

The pipe shall meet or exceed the requirements of MIL-P-29206A and ASTM 05677-95. Pipe dimensions must conform to Iron Pipe Size (IPS) outside diameters. In sizes 2" through 16" the piping must be rated for a minimum internal pressure rating of 165 psig at 200°F. In 2" through 16" sizes the pipe shall have full vacuum capabilities at 70°F when installed above ground.

Pipe shall be manufactured in accordance with ASTM 02996 Specifications for RTRP, with designations as follows:

2", 3"	RTRP-11AE-1112	8", 10", 12"	RTRP-11AE-1114
4", 6"	RTRP-11AE-1113	14"	RTRP-11AE-1115
		16"	RTRP-11AE-1116

Materials

Pipe Construction

The conductive filament wound fiberglass reinforced epoxy resin pipe shall be Bondstrand 7000 as manufactured by FGS Fiberglass Pipe Group or approved equal. The piping system will be made electrically continuous by using conductive filaments in the pipe wall, conductive adhesive in the bonded joints, and may be grounded by use of filament wound fiberglass saddles with stainless steel grounding cable. External or field installed techniques such as conductive wire or mesh, for achieving conductivity along the length of the pipe shall not be allowed.

Structural wall

The pipe shall have the following nominal wall thickness:

Pipe end preparation options

The piping manufacturer will provide standard pipe joint lengths up to 30 feet RL in sizes 2" through 8" to reduce field labor assembly time. The pipe manufacturer will prepare the bell end and the spigot end of each joint in the factory to reduce field labor assembly time.

Nominal Pipe Diameter	Nominal Wall Thickness	
	in	mm
2	0.16	4.1
3	0.16	4.1
4	0.20	5.2
6	0.20	5.2
8	0.25	6.3
10	0.32	8.1
12	0.38	9.6
14	0.41	10.4
16	0.47	11.9

Fittings

It is important to maintain compatibility of fittings, piping and adhesives to ensure that the system performs as specified. Pipe, fittings and adhesive shall be supplied by the same manufacturer.

Fittings will be constructed with epoxy resin and conductive material, filament wound to specific dimensions. Flanges will be filament wound with epoxy resin and conductive filaments.

Spray up or hand lay-up fittings shall not be allowed.

Testing

The RTRP manufacturer will provide test and repair procedures in the event field repairs are required. The installed piping shall be hydrostatically tested with water at 1½ times the design pressure of the lowest rated piping system component.

Hydrostatic and conductivity testing of buried systems will be completed prior to backfill.

Installation

Installation procedures and techniques as well as system design criteria including burial, anchoring, guiding and supporting shall be in accordance with manufacturer's recommendations.

Piping system installers and fitters will be trained by a direct factory employee of the piping system manufacturer and certified by the trainer prior to system assembly in the field.

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