

Bondstrand Series 2000M-FP Fire-Resistant Specification Guide

Pipe Construction

The structural wall of fiberglass pipe in 1 through 16 inch sizes shall have continuous glass fibers wound at a 54 $\frac{3}{4}$ ° helical angle in a matrix of aromatic amine cured epoxy resin. The integral reinforced resin-rich liner shall consist of C-glass and a resin/hardener system identical to that of the structural wall, and shall have a 20 mil nominal thickness. Non-reinforced pure resin-type corrosion barriers (liners) shall not be allowed due to their potential for severe fracturing during transportation, installation and operation of the pipe.

Pipe in 1 through 16 inch sizes shall be rated for a minimum of 150 psig at 200°F and shall have a full vacuum capability with a safety factor of 3:1.

Pipe shall be manufactured according to ASTM D2996 Specification for filament-wound reinforced thermosetting resin pipe (RTRP). When classified under ASTM D2310, the pipe shall meet Type 1, Grade 1 and Class F (RTRP-11FE) cell limits.

Pipe and fittings shall meet the requirements of ASTM F1173 for fiberglass-reinforced epoxy pipe and fittings for shipboard applications.

Fittings Construction

Fittings in 1 through 16 inch sizes shall be filament wound with a reinforced resin-rich liner of equal or greater thickness than the pipe liner and of the same glass and resin type as the pipe. Unlined fittings shall not be substituted.

When classified in accordance with ASTM D4024, filament-wound epoxy-resin flanges shall meet or surpass Type 1, Grade 1 and Class C (RTRF-113D or 113E) standards.

Compression-molding, contact-molding, spray-up or hand-layup construction shall not be allowed in standard fittings.

Pipe and fittings in 1 through 6 inch diameters shall be joined using a bell x straight spigot joint with a 0.5° taper and pipe stop inside the bell to allow precise makeup. Pipe and fittings in 8 through 16 inch sizes shall be joined with taper x taper bell and spigot joints.

Intumescent Coating

Dry systems: Fiberglass pipe and fittings shall be furnished with a thick uniform coating of an intumescent material pre-applied at the factory to form a solid barrier against high temperature hydrocarbon fire exposure. The intumescent coating shall have a minimum thickness of 5 mm (0.2 inches) for dry deluge systems or 8 mm (0.3 inches) nominal for systems potentially subjected to jet fires. Manufacturer shall provide other coating thicknesses on request. Flanged connections in 1 through 8 inch sizes shall be protected against fire by means of half-shell covers shaped to permit assembly and disassembly of flanged fittings in the field without damaging the intumescent coating. Flanged connections in 10 through 16 inch sizes shall be permanently field-coated. Dry systems in an empty condition shall be able to withstand no less than 5 minutes' exposure to a 1100°C (2000°F) hydrocarbon without loss of functionality.

Wet systems in a full-flow condition shall be able to withstand no less than 3 hours' exposure to a 1100°C (2000°F) hydrocarbon without loss of functionality.

Testing

Samples of pipe and couplings shall be tested at random, based on standard quality control practices to determine conformance of the materials to American Society for Testing and Materials guidelines for testing fiberglass pipe products: ASTM D1599, D2105, D2992A or D2992B. All fittings shall be 100% pressure tested prior to shipping.

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