



Fiberglass Reinforced Polymer Mortar (FRPM) Pipe – Pressure Service

Specifications

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GENERAL

Fiberglass Reinforced Polymer Mortar (FRPM) Pipe for Pressure Service

References

1. ASTM D3754 – Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer and Industrial Pressure Pipe.
2. AWWA C950 – Standard for Fiberglass Pressure Pipe
3. ASTM D3517 – Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe.
4. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
5. ASTM D4161 – Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.
6. D2992 - Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for Fiberglass Pipe and Fittings

Specifications

1. The specifications contained herein govern, unless otherwise agreed upon between the purchaser and supplier.

PRODUCTS

Materials

1. **Resin Systems** The manufacturer shall use only polyester resin systems with a proven history of performance in this particular application. The historical data shall have been acquired from a composite material of similar construction and composition as the proposed product.
2. **Glass Reinforcements** The reinforcing glass fibers used to manufacture the components shall be of highest quality commercial grade glass filaments with binder and sizing compatible with impregnating resins.
3. **Silica Sand** Sand shall be minimum 98% silica with a maximum moisture content of 0.2%.
4. **Additives** Resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., when used, shall not detrimentally effect the performance of the product.
5. **Elastomeric Gaskets** Gaskets shall meet ASTM F477 and be supplied by qualified gasket manufacturers and be suitable for the service intended.

Manufacture and Construction

1. **Pipes** Manufacture pipe utilizing a machine-made process to result in a dense, nonporous, corrosion-resistant, consistent composite structure. The pipe nominal pressure class (PN) shall be equal to or greater than the maximum sustained operating pressure of the line. The maximum transient (operating plus surge) pressure of the line shall not exceed the pipe nominal pressure class by more than 40%.

(continued)

PRODUCTS

Manufacture and Construction (continued)

- 2. Joints** Unless otherwise specified, the pipe shall be field connected with fiberglass sleeve couplings that utilize elastomeric sealing gaskets as the sole means to maintain joint watertightness. The joints must meet the performance requirements of ASTM D4161. Tie-ins, when needed, may utilize gasket-sealed mechanical couplings.
- 3. Fittings** Flanges, elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glassfiber reinforced overlays. Properly protected standard ductile iron, fusion-bonded epoxy-coated steel and stainless steel fittings may also be used.
- 4. Acceptable Manufacturer** Hobas Pipe USA, Inc.

Dimensions

- 1. Diameters** The actual outside diameter (18" to 48") of the pipes shall be in accordance with AWWA C950. For other diameters, OD's shall be per manufacturer's literature.
- 2. Lengths** Per manufacturer.
- 3. Wall Thickness** The minimum wall thickness shall be the stated design thickness.
- 4. End Squareness** Pipe ends shall be square to the pipe axis with a maximum tolerance of 1/8"

Testing

- 1. Pipes** Pipes shall be manufactured accordance with the applicable standard.
- 2. Joints** Coupling joints shall meet the requirements of ASTM D4161.
- 3. Stiffness** Minimum pipe stiffness when tested in accordance with ASTM D2412 shall normally be 36 psi.
- 4. Tensile Strength** Pipe hoop tensile strength for pressure pipe shall be verified as specified in applicable standard (ASTM D3754, D3517 or AWWA C950) or by random burst testing at the same sampling frequency. All pipes shall be capable of withstanding a test pressure of two (2) times the maximum sustained operating pressure of the line for sizes ≥ 54 ", and 1.5 times for > 54 " up to 96" without leaking or cracking. For sizes greater than 96", frequency and test pressure shall be as agreed to between purchaser and manufacturer. This performance shall be verified as agreed between the buyer and seller.

Customer Inspection

- The Owner or other designated representative shall be entitled to inspect pipes or witness the pipe manufacturing.
- 2. Manufacturer's Notification to Customer** Should the Owner request to see specific pipes during any phase of the manufacturing process, the manufacturer must provide the Owner with adequate advance notice of when and where the production of those pipes will take place.

Packaging, Handling, Shipping

- Packaging, handling, and shipping shall be done in accordance with the manufacturer's instructions.

EXECUTION

Installation

- 1. Installation** The installation of pipe and fittings shall be in accordance with the project plans and specifications and the manufacturer's requirements..
- 2. Pipe Handling** Use textile slings, other suitable materials or a forklift. Use of chains or cables is not recommended.
- 3. Jointing**
 - a. Clean ends of pipe and coupling components.
 - b. Apply joint lubricant to pipe ends and the elastomeric seals of coupling. Use only lubricants approved by the pipe manufacturer.
 - c. Use suitable equipment and end protection to push or pull the pipes together.
 - d. Do not exceed forces recommended by the manufacturer for coupling pipe.
 - e. Join pipes in straight alignment then deflect to required angle. Do not allow the deflection angle to exceed the deflection permitted by the manufacturer.

4. Field Tests

- a. Pressure Test – Pressure pipes may be field tested after completion of the installation (including required thrust restraints) at a maximum pressure of 1.5 times the system operating pressure not to exceed 1.5 x PN. Prior to testing, assure that all work has been properly completed. When filling the line assure that all air is expelled to avoid dangerous build-up of compressed air potential energy. Pressurize the line slowly, so pressure surges exceeding test pressures are not developed. Check for leaks when the test pressure has stabilized.
- b. Deflection – Maximum Allowable long-term deflection is 5% of the initial diameter.