

SECTION 02623 – FIBERGLASS REINFORCED PIPE

PART 1 - GENERAL

1.01 SUMMARY

- A. This section covers fiberglass reinforced polyester resin pipe, fittings, couplings and accessories for use in domestic, municipal and industrial sewage as an alternative material for all sewer piping with an inside diameter greater than or equal to 12 inches. Pipe shall be furnished complete with jointing materials and all other appurtenances necessary for installation.

1.02 SPECIFICATION MODIFICATIONS

- A. It is understood that throughout this section these Specifications may be modified by appropriate items in Section 01015 – Specific Project Requirements.

1.03 RELATED SECTIONS

- A. Section 01015 – Specific Project Requirements.
- B. Section 01300 – Submittals.
- C. Section 02250 – Trenching, Pipe Embedment and Backfill.
- D. Section 02687 – Laser Profiling.
- E. Section 02702 – Sewer Pipe and Manhole Testing.

1.04 CODES and STANDARDS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
 - 1. D3262 – Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.
 - 2. D3681 – Standard Test Method for Chemical Resistance of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition.
 - 3. D3754 – Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer and Industrial Pressure Pipe.
 - 4. D4161 – Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.
 - 5. F477 – Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- C. American Water Works Association (AWWA):
 - 1. C950 – Glass-Fiber Reinforced Thermosetting Resin Pipe.

1.05 QUALITY ASSURANCE

- A. The Contractor is responsible for the quality assurance and quality control of the Work. The Work shall be performed by a Contractor with a proven record of performance for similar installations. The Contractor shall submit the following certification and warranty:
 - 1. Manufacturers – Manufacturer shall be experienced in the design and manufacture of pipe, fittings, specials and appurtenances for a minimum period of 5 years.

2. Warranty:
 - a. Terms – Standard Manufacturer’s warranty.
 - b. Warranty Period – Standard Manufacturer’s warranty period.
- B. Control Tests:
 1. Control tests shall be made during the manufacture of the pipe to determine its physical characteristics. Control tests shall be witnessed by an independent testing laboratory at the expense of the Contractor.
 2. Control tests shall be performed on pipe of each diameter provided on the project in accordance with the appropriate governing standards. One set of tests shall be performed for each 100 pieces of pipe (sample size). The Contractor shall reject all pipe in the sample size if any test fails to comply with the specified requirements and standards.
 3. Pipes shall meet the chemical requirements of ASTM D3262. The compliance testing shall be completed per section 9 of ASTM D3681 and shall have been conducted on the pipe specimens manufactured at the same factory proposed to fabricate the pipe for the project. Testing of products manufactured in another country or testing per section 10 of ASTM D3681 (re-qualification) is prohibited.

1.06 CONTRACTOR SUBMITTALS

- A. Drawings, specifications, data and certificates covering all proposed materials being furnished shall be submitted to the Owner/Design Professional for review and approval in accordance with Section 01300 – Submittals and as defined in this Section.
- B. Prior to commencing with construction, the Contractor shall submit the following for each size and class of pipe to the Owner/Design Professional for approval:
 1. Shop Drawings:
 - a) Pipe and joint details.
 2. Product Data:
 - a) Specifications and product data sheets.
 - b) Color code and sample pipe piece illustrating exterior color.
 - c) Laying schedule (complete with an explanation of all abbreviations used in the schedule).
 - d) Gasket material data.
 3. Certificates:
 - a) Certificate of Compliance with applicable standards.
 - b) Test reports.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery, storage and handling of materials shall be in accordance with manufacturer’s recommendations.
- B. Pipe, fittings and accessories shall be handled in a manner that will ensure they are kept in a sound, undamaged condition during installation.
- C. Use of textile slings is required for proper handling.
- D. Use of chains, cables or hooks is prohibited for handling pipe and fittings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Pipe:

1. All materials used in the manufacture of pipe, fittings and accessories shall conform to ASTM D3754.
2. The manufacturer shall use only polyester resin systems with a silica sand filler which have a minimum of three years of successful performance in this particular application. The historical data shall have been acquired from the composite material of like composition to the proposed product for the project and shall be submitted to the OWNER when requested.
3. The reinforcing glass fibers shall be a commercial grade of E-glass filaments with binder and sizing compatible with the impregnating resins.
4. The sand shall be a minimum of 98 percent silica with a maximum moisture content of 2 percent.
5. Resin additives, such as pigments, dyes or other coloring agents, shall in no way be detrimental to the performance of the product.
6. Gaskets shall be suitable for the intended use, soil conditions and shall comply with ASTM F477.
7. Acceptable manufacturers shall be HOBAS USA, Inc., Flowtite or approved equal.
8. The internal corrosion liner resin shall be suitable for service as gravity sewer pipe and shall be fully resistant to exposure to sulfuric acid produced by the biological activity from hydrogen sulfide gases. The corrosion liner shall consist of non-reinforced thermoset polyester resin with a minimum thickness of 40 mils.
9. The minimum nominal pipe length shall be 20 feet.
10. The minimum pressure class shall be 50 psi for all pipe sizes.
11. The required pipe stiffness class (SN) shall be 115 PSI.
12. Each pipe or fitting shall have the following information plainly and permanently marked with a waterproof paint on the exterior surface:
 - a) Pipe stiffness.
 - b) Date of manufacture.
 - c) Manufacturer's name or trademark.
 - d) "Sewer Pipe".
 - e) "ASTM D3262".

B. All pipe, fittings and couplings exterior color shall be **GREEN**.

C. Joints:

1. All joints shall meet the performance requirements of ASTM D4161.
2. Pipe joints shall be formed using fiberglass sleeve couplings with elastomeric sealing rings.
3. Joints for tunnel carrier pipe shall be a low profile or a flush "jacking type" fiberglass bell and spigot type joint that utilizes an elastomeric sealing gasket contained in a groove on the spigot as the sole means of maintaining joint water tightness.

PART 3 - EXECUTION

3.01 SAFETY

- A. Perform all work in accordance with applicable OSHA standards.

3.02 INSTALLATION

- A. Excavation, bedding and backfill of the pipe shall conform to specification Section 02250 – Trenching, Pipe Embedment and Backfill.
- B. Joints shall be installed in accordance with the pipe manufacturer's recommendations.
- C. Immediately before the pipe sections are joined, all pipe ends and coupling components shall be thoroughly cleaned to remove all dirt and debris.
- D. Joint lubricant shall be applied to pipe ends and the rubber seals of the couplings. Only lubricant approved by the pipe manufacturer shall be used. The use of petroleum lubricants and animal-based lubricants is prohibited.
- E. Suitable auxiliary equipment shall be used to pull pipe joints together with the jointing force applied to the pipe wall and not to the coupling. Excess force shall not be applied in jointing the pipe.
- F. A shop-fabricated closure piece is required for all connections to existing sewer pipe. The fabricated closure piece shall ensure a water tight transition from the existing sewer to the new sewer.

3.03 Testing

- A. Testing shall conform to specifications Section 02687 and Section 02702.

END OF SECTION