

CENTRICAST CL-2030 Piping System

SECTION 1 – Scope

This section covers the use of fiberglass reinforced plastic (FRP) pipe for chemical process and chemical handling up to 200°F and up to 150 psig pressure.

The piping shall be furnished and installed complete with all fittings, joining materials, supports, specials, and other necessary appurtenances.

SECTION 2 – General Conditions

2.01 Coordination - Material furnished and work performed under this section shall be coordinated with related work and equipment specified under other sections.

Valves Section _____

Supports Section _____

Equipment Section _____

2.02 Governing Standards - Except as modified or supplemented herein, all materials and construction methods shall comply with the applicable provisions of the following specifications and be tested using the following standards:

| Standard Specifications | |
|-------------------------|---|
| ASTMD2997 | Standard Specification for Centrifugal Cast “Fiberglass” (Glass-Fiber-Reinforced Thermosetting Resin) Pipe |
| AWWA M45 | Fiberglass Pipe Design |
| ASTMD5685 | Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced-Thermosetting Resin) Pressure Pipe Fittings |
| ASTMD4024 | Standard Specification for Reinforced Thermosetting Resin (RTR) Flanges |

| Standard Test Methods | |
|-----------------------|--|
| ASTM D2992 | Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for “Fiberglass” (Glass-Fiber-Reinforced-Thermosetting Resin) Pipe and Fittings |
| ASTM D1599 | Standard Test Method for Short-Time Hydraulic Failure Pressure of Plastic Pipe, Tubing and Fittings |
| ASTM D2105 | Standard Test method for Longitudinal Tensile Properties of “Fiberglass” (Glass-Fiber-Reinforced-Thermosetting Resin) Pipe and Tube |
| ASTM D2412 | Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading |
| ASME B31.3 | Process Piping |

2.03 ASTM D2997 Designation Codes

| | |
|-----------------|----------------|
| 1 in. - 1½ in. | RTRP-22BS-3446 |
| 2 in. - 6 in. | RTRP-22BS-4446 |
| 10 in. - 12 in. | RTRP-22BS-4444 |
| 14 in. | RTRP-22BS-4443 |

Mechanical properties cell classifications shown are minimums.

2.04 Operating Conditions - In addition to the above minimum design requirements, the system shall meet the following minimum operating conditions:

- a. Operating Pressure _____
- b. Operating Temperature _____
- c. Fluid Conveyed _____
- d. Test Pressure _____

2.05 Quality Assurance - Pipe manufacturer’s quality program shall be in compliance with ISO 9001.

2.06 Delivery, Storage, and Handling - Pipe and fittings shall be protected from damage due to impact and point loading. Pipe shall be properly supported to avoid damage due to flexural strains. The contractor shall not allow dirt, debris, or other extraneous materials to get into pipe and fittings. All factory machined areas shall be protected from sunlight until installed.

2.07 Acceptable Manufacturers - NOV Fiber Glass Systems (918) 245-6651 or approved equal.

SECTION 3 – Materials and Construction

3.01 1 in. - 14 in. Pipe - The pipe shall be manufactured by the centrifugal casting process using premium grade vinyl ester thermosetting resin to impregnate woven glass filaments. Pipe shall be heat cured and the degree of cure shall be confirmed using a Differential Scanning Calorimeter. All pipe shall have a 100% resin corrosion barrier and the cured thickness shall be 100 mils nominal.

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SECTION 3 - Materials and Construction (Continued)

All pipe shall have a resin-rich reinforced 10 mil nominal exterior layer with UV (ultraviolet) inhibitor.

The pipe shall have a minimum design pressure rating of 150 psig at 175°F following ASTM D2992 Procedure B.

Minimum Reinforced Wall Thickness

| | |
|----------------|--------------|
| 1 in. | 0.095 inches |
| 1½ in. | 0.120 inches |
| 2 in. | 0.150 inches |
| 3 in. | 0.180 inches |
| 4 in. - 14 in. | 0.220 inches |

3.02 Flanges and Fittings - All fittings shall be manufactured either by compression molding or contact molding. Fitting joints shall be either adhesive bonded socket or flanged. Flanges shall have ANSI B16.5 Class 150 bolt hole patterns.

3.03 Adhesive - Adhesive shall be manufacturer's standard for the piping system specified. All adhesive bonded joints shall be cured according to the manufacturer's instructions for maximum strength and corrosion resistance.

3.04 Gaskets - Gaskets shall be 3/16 in. thick, 60-70 durometer full-face type suitable for the service shown on the drawings and as recommended in the manufacturer's standard installation procedures.

3.05 Bolts, Nuts and Washers - ASTM F593, 304 stainless steel hex head bolts shall be supplied. Two each SAE size washers shall be supplied on all nuts and bolts.

3.06 Acceptable Products - Centricast CL-2030 as manufactured by NOV Fiber Glass Systems or approved equal.

Fiber Glass Systems

17115 San Pedro Avenue, Ste. 200, San Antonio, Texas 78232, USA
Phone: 210 477 7500 Fax: 210 477 7560

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SECTION 4 - Installation and Testing

4.01 Training and Certification - All joints installed or constructed in the field shall be assembled by employees of the contractor who have been trained by the pipe manufacturer. The pipe manufacturer or their authorized representative shall train the contractor's employees in the proper joining and assembly procedures required for the project, including hands-on participation by the contractor's employees. Each bondor shall fabricate one pipe-to-pipe and one pipe-to-fitting joint that shall pass the minimum pressure test for the application as stated in Section 2.04.d without leaking.

Only bondors who have successfully completed the pressure test shall bond pipe and fittings.

Certification by the manufacturer shall be in compliance with ASME B31.3 Section A328.2.

4.02 Pipe Installation - Pipe shall be installed as specified and indicated on the drawings and in accordance with the manufacturer's current published installation procedures.

4.03 Testing - A hydrostatic pressure test shall be conducted on the completed piping system. **The pipe shall be subjected to a steady pressure at 1½ times the design operating pressure as stated in Section 2.04a.** The pressure shall be held on the system for a minimum of 1 hour and the line inspected for leaks.

The test pressure should not exceed 1½ times the maximum rated operating pressure for the lowest rated element in the system.

The system shall be filled with water at the lowest point and air bled off from all the highest points. Systems shall be brought up to test pressure slowly to prevent water hammer or over pressurization.

All pipe joints shall be water tight. All joints that are found to leak by observation or during testing shall be repaired by the contractor and retested.