

Conley Piping Specification

1.0 SCOPE

1.1 This piping specification covers the requirements for machine made reinforced thermosetting resin pipe and fittings, 1" - 30", manufactured according to ASTM D2996, the standard specification for filament wound pipe. These specifications shall cover **Conley FGD-AR (Ep or VE) Standard ABRASION RESISTANT** pipe and fittings especially formulated for applications in Flue Gas Desulphurization (FGD) limestone and gypsum slurry service and other abrasive applications.

Both Pipe and Fittings shall be manufactured with a minimum double Nexus® synthetic veil reinforced Premium Epoxy resin or Vinyl Ester resin internal corrosion barrier with Silicon Carbide filler to increase abrasion resistance, an Epoxy filament wound fiberglass reinforced cage, and a standard Nexus® reinforced external corrosion barrier. Pipe and fittings have a 25 year guarantee against ultraviolet degradation (fiber blooming). See the Conley Product Data for pressure/temperature ratings and span dimensions of each schedule.

2.0 MATERIAL

2.1 Raw materials will meet or exceed specifications for Epoxy and Vinyl Ester resin systems and fiberglass materials.

2.2 The resin, reinforcement, pigments, fillers and other materials, when combined as a composite structure shall produce a pipe that shall meet or exceed the

requirements of the classification system listed in ASTM D2310.

3.0 PIPE CONSTRUCTION

3.1 The pipe shall consist of three specific layers; the corrosion resistant minimum double **Nexus®** reinforced Epoxy (Ep) or Vinyl Ester (VE) internal corrosion/abrasion barrier, the filament wound reinforcement (cage) using aromatic amine cured Epoxy, and the corrosion / UV resistant external corrosion barrier. This material shall then be post-cured to form an integral structure and provide optimum cross-linking density.

3.1a The **60-mil (Sch 30 or 40) or 100-mil (Sch 50) internal corrosion barrier** (inner liner) shall consist of a minimum two layers of **Nexus®** synthetic veil saturated with Epoxy or Vinyl Ester resin plus silicon carbide filler. This layer shall be a maximum of 70% resin, 20% filler and 10% reinforcement to increase impact resistance.

3.1b The glass reinforcement, or cage, shall be continuous glass roving wound at an angle 54 3/4 degrees to the longitudinal axis of the pipe, using aromatic amine cured premium Epoxy resin, and shall be not less than 65% glass for maximum strength and flexibility.

3.1c The external corrosion barrier will be **Nexus®** synthetic veil reinforced for corrosion resistance and UV resistance. This is required to control the OD for straight socket design connections.

All fittings such as elbows, tees and reducers shall be equal or superior in strength to the adjacent pipe section and shall have the same internal diameter as the pipe. ***Fittings shall be filament wound, and have a minimum double Nexus® veil reinforced Epoxy or Vinyl Ester resin plus silicon carbide filler internal corrosion and abrasion resistant barrier (60 or 100 mils), filament wound and glass reinforced structural cage, and a Nexus® synthetic veil reinforced external corrosion barrier with standard 25 year guarantee against ultraviolet degradation (fiber blooming).***

4.1 Elbows - Manufactured in standard configurations with straight socket ends designed for the controlled O.D. of the pipe. Long radius highly recommended.

4.2 Reducers - Designed as concentric or eccentric gradual changes in diameter to minimally affect the fluid flow, and manufactured with straight socket ends.

5.0 CONNECTIONS

5.1 Prefabrication - When requested by the customer, the manufacturer shall prefabricate into shippable sub-assemblies to minimize the use of field-fabricated connections.

5.2 Straight Cement Socket Joints - Shall be used with both pipe to fitting connections as well as pipe to pipe connections using a coupling. Tapering or machining of the pipe shall not be allowed.

5.3 Flange connections - Shall be used to join the fiberglass pipe and fittings to other equipment. Flanges shall be designed for the operating pressure per the line requirements as a minimum. Flange dimensions shall conform to ANSI/ASME B16.5 150 lb drilling. Where flanges connect to raised face surfaces (valves,

etc.), a spacer ring shall be added to achieve a flat mating surface.

5.4 Gasket material - For flanged connections this shall be an elastomer which is compatible with the service. See 9.5.

6.0 STRAIGHT SOCKET CEMENT JOINTS

6.1 This type of joint shall be the only means of joining pipe to pipe and fittings. Tapering or machining of the pipe shall not be allowed, nor shall butt wrap joints. Pipe to pipe connections shall be made with straight socket cement couplings. The only exception to this specification shall be flanged connections as described in 5.3.

7.0 FLANGES

7.1 Flange Attachment - Flanges shall be attached to a pipe section only with straight socket cement joints.

7.2 Flange Face - Flanges through 12" diameter shall be grooved to allow use of a full face gasket, flanges larger than 12" shall be non-grooved. Full face gaskets are required.

8.0 PRESSURE AND VACUUM SERVICE

8.1 ***Please consult the Conley Product Data for specific rating of each size.***

9.0 RECOMMENDED INSTALLATION PRACTICE

9.1 Pipe hangers and spacing - Hangers shall be band type hangers contacting a minimum of 120 degrees of the pipe surface, and with a minimum width of 1" or pipe diameter divided by 6, whichever is greater.

9.2 Underground Installation - The pipe shall be designed for burial of 3 feet to 20 feet under standard soil and bedding conditions. Manufacturer shall design pipe for required burial conditions.

9.3 Expansion - The manufacturer shall specify thermal loads, expansion and contraction, and shall convey this design information to the end user or customer for consideration in the proper design of the piping system.

9.4 Bolts, Nuts, and Washers - Bolts, nuts, and washers shall be furnished by the customer. Metal SAE washers shall be used under all nut and bolt heads. All nuts, bolts and washers shall be of materials suitable for use in the exterior environment.

9.5 Gaskets - Gaskets shall be furnished by the customer. Recommended gasketing materials shall be a minimum of 1/8 inch in

thickness with a suitable chemical resistance to the service. Gaskets shall have a Shore A hardness of 50 to 70. **See the Conley Installation and Fabrication Manual for bolt torque requirements.**

9.6 Fabrication - Fabrication procedures and certification of fabricators shall be in accordance with the **Conley Installation and Fabrication Manual.**

10.0 QUALITY ASSURANCE AND INSPECTION

10.1 Conley's Quality Assurance program is in compliance with ISO 9001. Pipe and fittings shall be inspected and measured at each stage of manufacture, i.e. liner, reinforcement and external corrosion barrier. For optimum strength and corrosion resistance, all pipe and fittings shall be post cured.



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