Industrial Fiberglass Specialties, Inc.
521 Kiser Street
Dayton, Ohio 45404-1641
Telephone (937) 222-9000 - Fax (937) 222-9020

Series 5000 Fiberglass Pipe and Fittings

For severely corrosive industrial service

Uses and applications:

Chemical process piping
Organic chemicals
Acid drains
Corrosive and abrasive slurries
Waste water and sewage systems
Process plant piping
Power plant & fly ash piping
Bleach Processing
Chlorine and chlorinated water
Food processing plant piping
Plant piping
Water treatment piping
Brine and brackish water
Potable water
Piping systems for oxidizing chemicals and acids
Piping systems for alkalies and non-oxidizing acids
Industrial service for severely corrosive liquids

Description:

Filament-wound fiberglass reinforced vinylester/polyester composite pipe. ASTM D-2996 Classification Type I, Grade 2, Class E.

Composition:

Nominal 40 to 50 mil glass veil and/or Nexus reinforced corrosion liner, followed by a fiberglass filament wound structural overwrap.

A premium grade vinylester resin, pigmented dark grey for UV inhibition, is used in the corrosion liner/barrier. A premium grade vinylester and/or polyester resin is used in the filament wound structural overwrap portion of the laminate.

Operating temperatures up to 300^{o} F.

Pipe Sizes:

Pipe Lengths:

137+ different diameters, ranging from a teeny 3/8" dia. up to a mammoth 168" dia. Pipe available built to iron pipe outside diameters (ASTM D-2996, Table 3), as well as pipe built to chemical process piping inside diameter standards. A current list of pipe sizes is available upon request. New sizes are being added regularly.

1/2" dia. pipe and smaller is built in 5 ft. lengths.

3/4" & 7/8" dia. pipe is built in 7 ft. lengths.

1" through 1-1/2" dia. pipe is built in 10 ft. lengths.

2" through 6" dia. pipe is available in 20 ft. lengths.

8" dia through 84" dia. pipe is available in 40 ft. lengths.

For selected pipe sizes in 30" dia. and larger, 60 ft. lengths are available. Longer lengths mean fewer field joints.

Burial installations:

As a custom manufacturer of pipe and fittings, we can design and build pipe to handle burial conditions ranging from live loads due to highway and rail traffic - to earth loads of 100 ft. or greater. We even have experience with underwater installations. Our engineers will welcome the opportunity to work with you on a pipe design, backfill selection and installation methods to meet your specific requirements. The result will be your lowest cost per year of service life (installed basis).

Supported span installations:

Again, we can design and build pipe to provide you the lowest cost for supported span installed pipe. Since we are not limited to just a few pipe wall thicknesses and filament winding angles - we can select and choose the combination of pipe design and support design and cost that will provide your "best buy". Consult with our engineers for help with your specific requirements.

Fittings:

Elbows, standard are 22-1/2°, 30°, 45°, and 90°. Any angle elbow available on special order. Elbows through 48" dia. are available as smooth radius. Mitered elbows are available in all sizes.

Reducing elbows
Tees
Reducing tees
Concentric taper body reducers
Eccentric taper body reducers
Saddles, with FRP and stainless steel threaded outlets, bell outlets, spigot outlets and flanged outlets.
Wear pads (blank saddles)
Crosses
Reducing Crosses
Laterals
Reducing Laterals
True wyes.
P-Traps and 180° U-Bends.
Floor drains
Expansion joints
Pipe couplings
Threaded (NPT) couplings
Adapters, bell by NPT thread (male or female threads available).
Adapters, spigot by NPT thread (male or female threads available).
Pipe nipples
Threaded nipples
Reducing bushings and threaded adapter bushings.
Fitting and pipe plugs. Pipe caps.
Blind flanges
Threaded flanges
Reducing flanges
Orifice flanges

All fittings are available as adhesive socket, plain end, flanged end, bell and spigot O-Ring; or any combination. See full Industrial Fiberglass Specialties' catalog for sizes, dimensions and tolerances. Fittings are available from 1/2" dia. through 84" dia. We welcome the opportunity to work with our customers on special fittings.

Performance:
Advantages:

Good corrosion resistance over a wide temperature range. Temperatures from sub-zero to 225°F.

Working pressures from NBS-PS-15-69 duct to 450 psi+, depending upon size and wall thickness.

Vacuum to -14.7 psig for all sizes, by selection of wall thicknesses, ribs and filament wind angle.

Available for earth burial, all depths, with selection of wall thicknesses, ribs and filament wind angle.

Weighs 1/6 as much as steel. Thus, lower installed costs.

The resins used in Series 5000-20 pipe meet the requirements of F.D.A. regulations 21-CFR-175.105 and 21CFR 177.2420.

Smooth inner surface produces very low frictional loss for reduced pumping and fan blower costs. Hazen-Williams flow coefficient under 150.

Recommended for a wide range of corrosion applications. Consult with Industrial Fiberglass Specialties, or the resin manufacturer, for specific project recommendations.

Joining systems:

Bell (socket) and spigot structural adhesive weld bonded joints. Adhesive bonded joints are available as your choice of straight/straight, straight/taper and taper/taper.

Threaded joints (NPT) through 12" dia. Other thread configurations available upon special order.

Flanges, all sizes through 84" dia. Including the superior filament wound socket flanges for sizes through 1/2" dia. through 36" dia. ANSI 150 lb., 300 lb. and 600 lb. all available as standard. Any pressure rating and drilling pattern available on order.

Van Stone, loose ring style, flanges

Flange Spacers - all diameters, bolt hole patterns and thicknesses, built to order.

Bell and spigot O-Ring joints, thru 84" dia.

Bell and spigot O-Ring joints with locking key for restrained ends.

Mechanical Couplings, including Victaulic and Taylor-Kerr.

Expansion Joints, including triple O-Ring style for fly ash lines

Speed-Seal O-Ring true unions

Repair (maintenance) couplings.

Physical Properties:
Mechanical Properties:

See Table 1 for typical physical properties of Series 5000 FW FRP Pipe. These are conservative properties that can be used for the design of FW pipe for pressure, vacuum, supported span and burial conditions. Contact Industrial Fiberglass Specialties, Inc. for recommendations on the appropriate design formulas to be used for FRP composite pipe.

Table 1

Industrial Fiberglass Specialties, Inc.

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Properties of Series 5000 Pipe

Corrosion Liner..... 40 to 50 mil Veil Reinforced
Resin (Liner)..... Premium grade Vinylester
Structural Wall..... Filament Wound Overwrap
Resin (FW Overwrap)..... Premium grade Vinylester

Elastic and Strength Properties of Glass Filament Reinforced Wall

Hoop Tensile: (Based on loading of pipe hydrostatically)

Ultimate (porosity)..... 20,000 psi
Yield..... 12,800 psi
Allowable..... 6,700 psi
Modulus of Elasticity..... 3,600,000 psi

Tensile: (Based on loading of pipe as a tension member)

Ultimate (rupture)..... 12,200 psi
Yield..... 5,000 psi
Allowable..... 3,300 psi
Modulus of Elasticity..... 1,800,000 psi

Flexural: (Based on loading of pipe as a beam)

Ultimate (rupture)..... 15,700 psi
Yield..... 6,100 psi
Allowable..... 4,000 psi
Modulus of Elasticity..... 1,700,000 psi

Torsion: (Based on loading of pipe as a shaft in torsion)

Ultimate (rupture)..... 16,200 psi
Allowable Shear..... 5,500 psi
Shear Modulus..... 750,000 psi

Compression: (Based on loading of pipe as a "short" column)

Ultimate (rupture)..... 11,200 psi
Yield..... 7,000 psi
Allowable..... 3,700 psi
Modulus of Elasticity..... 1,400,000 psi

Thermal Properties:

Coeficient of Thermal Expansion..... 0.0000085 in./in./deg. F
Thermal Conductivity..... 2.3 BTU/hr./sq. ft./deg. F/in. thick.