



FiberSystems, Inc.

521 Kiser Street

Dayton, Ohio 45404-1641

Telephone (937) 222-9000 - Fax (937) 222-9020

Series 1200 Filament Wound FRP Composite Duct, Conduit, Bridge Drains, and Fittings

For general utility and industrial service

Uses and Applications:

Conduit for electrical and telephone cable
Conduit for fiber optics cable and installations
The containment pipe for dual containment piping systems
Highway bridge drains
Bridge crossing conduits
Waste water and sewage systems
Ventilation ducting and lines
Air ducting
Roof and floor drains
Water treatment piping
Sewer lines and sewer force mains
Brine and brackish water
General industrial service for mildly corrosive liquids

Description:

Filament-wound fiberglass reinforced epoxy composite pipe.
ASTM D-2996-71 Classification Type I, Grade 1, Class A.

Composition:

Pipe is provided with an unlined, resin rich pipe interior, followed by a fiberglass filament wound structural overwrap. A premium grade anhydride-reacted heat-cured epoxy resin, pigmented black or concrete gray for UV inhibition, is used throughout all laminates.
Operating temperatures up to 160° F.

Pipe & Conduit

Sizes:

1" thru 12" diameter duct, pipe, and conduit. Duct, pipe and conduit available built to iron pipe outside diameters (ASTM D-2996, Table 3), as well as pipe and conduit built to chemical process piping and conduit inside diameter standards. Special sizes of pipe (smaller and larger) are available upon request.

Pipe & Conduit

Lengths:

1" through 1-1/2" diameter conduit, duct, and pipe is built in 10 or 15 ft. lengths.
2" through 12" diameter conduit, duct, and pipe are available in 20 ft. lengths.

Performance:

Suitable corrosion resistance over a wide temperature range. Temperatures from sub-zero to 160°F.

Advantages:

Working pressures from NBS-PS-15-69 duct to 150 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.

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

Recommended for a wide range of corrosion applications. Consult with FiberSystems, or the resin manufacturer, for specific 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" diameter Other thread configurations available upon special order.

Flanges, all sizes through 12" diameter Including the superior filament wound socket flanges for sizes through 1/2" diameter through 12" diameter 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 12" diameter

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

Mechanical Couplings, including Victaulic and Taylor-Kerr.

Speed-Seal O-Ring true unions

Repair (maintenance) couplings.

Physical Properties:
Mechanical Properties:

See Table 1 for typical physical properties of Series 1200 filament wound FRP composite conduit, duct, and pipe. These are conservative properties that can be used for the design of filament wound FRP conduit, duct, and pipe for pressure, vacuum, supported span and burial conditions. Contact FiberSystems for recommendations on the appropriate design formulas to be used for FRP composite conduit, duct, and pipe.

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 conduit and 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 12" diameter are available as smooth radius. For ease of cable pulling, sweep extra-long radius "bends" are available for conduit applications.

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

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 FiberSystem's catalog "Reinforced Fiberglass Pipe Fittings & Accessories" for sizes, dimensions and tolerances. Fittings are available from 1/2" diameter through 12" diameter. We welcome the opportunity to work with our customers on special fittings.

Table 1

FiberSystems, Inc.

521 Kiser Street - Dayton, OH 45404-1641
Telephone (937) 222-9000 - Fax (937) 222-9020

Properties of Series 1200 FW FRP Composite Pipe, Duct, and Conduit

Corrosion Liner..... Unlined, resin rich pipe interior
Resin (Liner)..... Premium grade heat-cured epoxy
Structural Wall..... Filament wound overwrap
Resin (FW Overwrap)..... Premium grade heat-cured epoxy

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:

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