



Industrial Fiberglass Specialties, Inc.

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Series 5000-A Abrasion Resistant FRP Composite Pipe and Fittings

**For corrosive and severe abrasion industrial
service**

Uses and applications:

Fly ash slurry handling lines
Waste water and sewage systems
Lime slurry handling lines
Water lines where abrasive service exists
Ventilation ducting and lines where abrasive dust is present
Cooling water piping
Process plant piping
Air ducting for abrasive environments
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: Composition:

Filament-wound fiberglass reinforced polyester composite pipe.

ASTM D-2996 Classification Type I, Grade 2, Class E.

Nominal 40 to 50 mu synthetic veil reinforced combination abrasion resistant and corrosion liner/barrier, followed by a fiberglass filament wound structural overwrap.

A rubber modified, "toughened" premium grade vinylester resin, pigmented dark grey for UV inhibition, is used in the abrasion and corrosion liner/barrier. The internal corrosion liner/barrier is further modified with a special abrasion resistant armoring modifier that provides a service life of up to ten times that available from pipe made with a standard resin matrix.

A premium grade vinylester resin, pigmented dark grey for LW inhibition, is used in the filament wound structural overwrap and flanges.

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 6 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.

Performance Advantages:

Good corrosion resistance over a wide temperature range. Temperatures from sub-zero to 240°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.

Fire-retardant pipe and duct systems available. ASTM E-84 flame spreads under 25.

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 Industrial Fiberglass Specialties, 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.

Plain ends for butt and strap welding.

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.

Speed-Seal O-Ring true unions

Repair (maintenance) couplings.

**Physical Properties:
Mechanical Properties:**

See Table 1 for typical physical properties of Series 5000-A 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.

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

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 "Reinforced Fiberglass Pipe Fittings & Accessories" 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.

Table 1

INDUSTRIAL FIBERGLASS SPECIALTIES, INC

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Properties of Series 5000-A Abrasion Resistant FRP Composite Pipe

| | |
|---------------------|--|
| Corrosion Liner | 50 mil Veil and Fiberglass Reinforced |
| Resin (Liner) | Abrasion Modified Premium grade Vinylester |
| Structural Wall | Filament Wound Overwrap |
| Resin (NW 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:

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