NOV Fiber Glass Systems™

Bulletin No. A2000
May 15, 2008

SILVER STREAK®

Abrasion Resistant Pipe

PRODUCT

Available in 2” through 24” diameter sizes, SILVER STREAK piping is designed especially for abrasive and corrosive services found in flue gas desulfurization (FGD) scrubber applications such as limestone, gypsum and ammonium sulfate slurries.

SILVER STREAK pipe is filament wound using epoxy resin and fiberglass reinforcement. Manufactured with a proprietary blend of abrasion-resistant additives, it is offered with a standard 80 mil nominal liner. Custom liner thicknesses are available on special order.

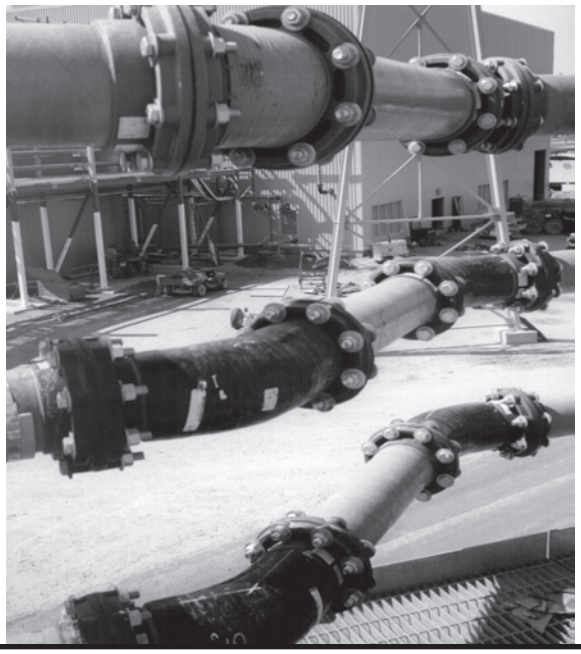
SILVER STREAK epoxy piping up to 24” is ideal for yard piping and is designed to operate at temperatures up to 225°F and pressures up to 225 psig. SILVER STREAK LD is available 30” through 48”, is ideal for recirculating piping, and operates at temperatures up to 200°F and pressures up to 150 psig.

FITTINGS

A complete line of standard fittings, including long radius elbows, is available. Fittings are constructed with the same abrasion-resistant additives as the pipe. All fittings, except compression molded, have a minimum corrosion/abrasion barrier of 100 mils. See Bulletin No. A2050 for standard fitting dimensions.

JOINING METHODS

The standard joining system for SILVER STREAK piping is the **matched tapered bell and spigot.** It is available in 2” through 24” diameter sizes. The tapered joints are made using 8000 series adhesive. Piping can also be joined with flanges.



FIELD INSTALLATION

SILVER STREAK pipe can be cut and tapered in the field using tools from Smith Fibercast. For detailed information, refer to Manual No. F6000, Matched Tapered Bell & Spigot Joint Pipe Installation Handbook, and to individual tool and adhesive sheets for SILVER STREAK products.

FEATURES & BENEFITS

- Entire 80 mil nominal liner contains 80 percent resin/abrasion-resistant additives and 20% reinforcement.
- Available with 2”-24” diameters standard.
- Designed to operate at temperatures up to 225°F and pressures up to 225 psig.
- Rated for full vacuum service at 175°F.
- Complete line of standard fittings, including long radius elbows, available—constructed with the same abrasion-resistant additives as the pipe.
- Pipe comes spigot x spigot in 2” through 8” sizes and spigot x spigot or bell x spigot in 8” through 24” sizes. Custom-fabricated assemblies are available upon request.
- Suggested specification guides for SILVER STREAK are
- available in Bulletin No. A2001.

www.smithfibercast.com

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DIMENSIONAL DATA

Nominal Liner Thickness - 0.080”/1.8 mm

Nominal Pipe Size	Nominal I.D.		Nominal O.D.		Nominal Wall Thickness		Nominal Weight		Max. Support Spacing(1) @ 150°F	
(In.)	(In.)	(mm.)	(In.)	(mm.)	(In.)	(mm.)	(lbs./ft.)	(kg./m.)	(ft.)	(m.)
2	2.00	51	2.40	61	.200	5.1	1.1	1.6	14.0	4.2
3	3.28	83	3.65	93	.186	4.7	1.6	2.4	15.7	4.8
4	4.28	109	4.66	118	.190	4.8	2.1	3.1	17.0	5.2
6	6.35	161	6.75	171	.197	5.0	3.1	4.6	19.2	5.9
8	8.36	212	8.82	224	.227	5.7	4.8	7.1	21.7	6.6
10	10.36	263	10.82	275	.230	5.8	6.1	9.1	23.1	7.0
12	12.29	312	12.77	324	.240	6.1	7.5	11.2	24.5	7.5
14	14.04	357	14.60	371	.278	7.1	10.1	15.0	26.6	8.1
16	16.04	407	16.66	423	.309	7.8	12.8	19.1	28.5	8.7
18	17.83	453	18.48	469	.326	8.3	15.1	22.5	29.8	9.1
20	19.83	504	20.54	522	.354	9.0	18.3	27.5	31.4	9.6
24	23.83	605	24.64	626	.404	10.3	25.2	37.4	34.3	10.4

TYPICAL PHYSICAL PROPERTIES

Property	Value (psi)		Value (MPa)	
	@75°F	@225°F	@24°C	@107°C
Axial Tensile - ASTM D2105				
Ultimate Stress	10,550	7,160	72.7	49.4
Design Stress	2,637	1,790	18.2	12.3
Modulus of Elasticity	1.75×10^6	1.03×10^6	12,093	7,102
Poisson’s Ratio $V_{a/h}$ ($V_{h/a}$)	.35 (0.56)			
Axial Compression - ASTM D694				
Ultimate Stress	33,300	17,800	229.6	122.7
Design Stress	8,325	4,450	57.4	30.7
Modulus of Elasticity	1.26×10^6	0.54×10^6	8,687.4	3,723
Beam Bending - ASTM D2925				
Ultimate Stress	23,000	16,000	158.6	110.3
Design Stress	2,900	2,000	20.0	13.8
Modulus of Elasticity (Long Term)	2.18×10^6	1.11×10^6	15,030	7,653
Hydrostatic Burst - ASTM D1599				
Ultimate Hoop Tensile Stress	46,300	49,500	319.2	341.3
Ring Tensile - ASTM D2990				
Minimum Hoop Tensile Stress	27,280	-	188.1	-
Hydrostatic Hoop Design Stress ASTM D2992 - Procedure B				
20 Year Static Life at 200°F (LCL)	122,400	14,654	154.4	101.0
Coefficient of Linear Thermal Expansion ASTM D696	1.26×10^{-5} in./in./°F		2.27×10^{-5} mm/mm/°C	
Thermal Conductivity	0.23 BTU/(ft.)(hr.)(°F)		0.4 W/(m)(°C)	
Specific Gravity - ASTM D792	1.8			
Hazen-Williams Flow Factor, C	150			

(1) Based on 1/2” deflection at mid-span.

THERMAL EXPANSION

The effects of thermal gradients on piping systems may be significant and should be considered in every piping system stress analysis. Pipe line movements due to thermal expansion or contraction may cause high stresses or even buckle a pipe line if improperly restrained. Several piping system designs are used to manage thermal expansion and contraction in above ground piping systems. They are listed below according to economic preference:

1. Use of inherent flexibility in directional changes,
2. Restraining axial movements and guiding to prevent buckling,
3. Use expansion loops to absorb thermal movements,
4. Use mechanical expansion joints to absorb thermal movements.

To perform a thermal analysis the following information is required:

1. Isometric layout of piping system
2. Physical and material properties of pipe
3. Design temperatures
4. Installation temperature (Final tie in temperature)
5. Terminal equipment load limits
6. Support movements

A comprehensive review of temperature effects on fiberglass pipe may be found in Smith Fibercast's "Engineering and Piping Design Guide", Manual No. E5000, Section 3.

OTHER CONSIDERATIONS

Water (Fluid) Hammer

A pressure surge will occur when fluid flow in a piping system is abruptly changed during events such as rapid pump startup or a quick closing valve. This surge can be significantly reduced by controlling pump startup and valve closure rates.

The maximum pressure surge in psi caused by water hammer can be calculated by multiplying the fluid velocity in ft/sec times the constant listed in the "Fluid (Water) Hammer Constants" Table. The peak pressure for the system will equal the water hammer surge plus the operating pressure at the time the water hammer occurred.

Fluid (Water) Hammer Constants[(1)]

Pipe Size (In.)	Fluid (Water) Hammer Constants[(1)]
2	35
3	28
4	25
6	22
8	21
10	19
12	19
14	19
16	19
18	19
20	19
24	19

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