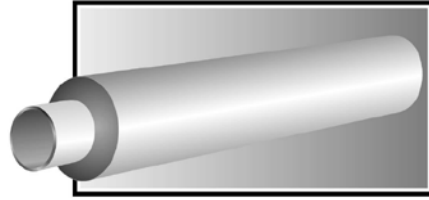


Submittal Data

Fiberglass Bondstrand 3000A Pipe



Uses and Applications

- Cooling water
- General service piping
- Jet fuel piping
- Mild chemicals
- Municipal waste
- Potable water
- Power plant, steel mill and industrial plant piping
- Sewer lines and sewer force mains
- Water mains
- Water treatment

Listing

- ML-P-29206A for jet fuels and petroleum liquids.

Performance

- Working pressure to 450 psig depending on pipe size.
- No thrust blocks are required at rated system pressure for most buried piping configurations and most soil conditions. Thrust blocks may be required for 350 – 400mm (14 and 16-in.) Bondstrand 3000A. For aboveground use, consult Ameron Fiberglass Pipe Division.
- Temperatures to 99°C (210°F) maximum.
- Full vacuum capabilities when buried and properly backfilled. For aboveground use, refer to collapse pressures listed below under pipe pressure performance.
- Recommended burial depth: 1-8m (3 to 25 ft.)
- Recommended for water, waste water (pH 1 to 12), moderately corrosive liquids and mild chemicals. Consult Ameron corrosion guide FP 132 or Ameron Applications Engineering for recommendations for your particular application.
- Bondstrand Series 3000A is available with the patented Pronto-Lock® and Pronto-Lock II mechanical joining systems and may be used to temperature as high as 99°C (210°F)
- Individual system components may not have the same ratings as the pipe. Refer to the detailed product information for the specific components to determine the pressure rating for the system as a whole.

Composition

Pipe

- Filament-wound fiberglass reinforced epoxy pipe with integral epoxy liner and exterior coating.

Nominal Pipe Size		ASTM Designation	
<i>in</i>	mm	(D2310)	D2996)
2-6	50-150	RTRP 11FX	RTRP 11FX-5430
8-16	200-400	RTRP 11FX	RTRP 11FX-3210

Fittings

50-150mm (2 to 6 in.)

- Compression-molded fiberglass reinforced epoxy elbows and tees
- Filament-wound and/or mitered crosses, wyes, laterals and reducers

200-400mm (8-16 in.)

- Filament-wound fiberglass reinforced epoxy elbows
- Filament-wound and/or mitered crosses, wyes, and laterals
- Contact-molded reducers

Flanges

- Flange rings:
Molded or filament-wound fiberglass
- Stub ends:
Molded or centrifugally cast fiberglass

Blind Flanges

- Compression-molded fiberglass or epoxy-coated cast iron or steel.

O-rings

- Buna-N standard.
- Other materials available on request.

Adhesive

- Ameron two-part epoxy adhesive for field fabrication. (Consult Ameron or Urecon for specifications)

Joining Systems

50-150mm (2 to 6 in.)

- Pronto-Lock mechanical coupling
- U.S. Patent No. 3,784,239.

200-400mm (8 to 16 in.)

- Pronto-Lock II mechanical coupling
- U.S. Patent No. 4,014,568.

50-400mm (2 to 16 in.)

- Bell and spigot taper/taper adhesive-bonded joint.

Pipe Lengths

- Standard 6.1 to 11.9m (20 and 39 ft.) random lengths.
- Other lengths available on request.

Typical pipe dimensions and weights

Nominal Pipe Size		Pipe Outside Diameter ¹		Pipe Inside Diameter		Wall Thickness			
						Total		Structural	
<i>in</i>	mm	<i>in</i>	mm	<i>in</i>	mm	<i>in</i>	mm	<i>in</i>	mm
2	50	2.38	60	2.21	56	0.072	1.8	0.064	1.6
3	80	3.50	90	3.32	84	0.081	2.1	0.071	1.8
4	100	4.50	114	4.33	110	0.086	2.2	0.074	1.9
6	150	6.63	168	6.39	162	0.119	3.0	0.105	2.7
8	200	8.63	219	8.30	211	0.150	3.8	0.125	3.2
10	250	10.75	273	10.41	264	0.175	4.4	0.150	3.8
12	300	12.75	324	12.30	312	0.200	5.1	0.175	4.4
14	350	14.44	367	14.01	356	0.215	5.4	0.190	4.8
16	400	16.50	419	16.02	407	0.235	6.0	0.210	5.3

1). Typical outside diameters of 50 through 300mm (2 through 12 in.) pipe is API, ASTM and ANSI fiberglass and steel pipe dimensions.

Nominal Pipe Size		Taper Angle	Taper Length		Pipe Weight	
<i>in</i>	mm	deg	<i>in</i>	mm	<i>lb/ft</i>	kg/m
2	50	1.75	1.5	38	0.5	.75
3	80	1.75	1.7	43	0.7	1.05
4	100	1.75	1.9	48	1.0	1.50
6	150	1.75	2.8	71	1.9	2.85
8	200	2.00	2.6	66	3.1	4.60
10	250	2.00	3.1	79	4.5	6.70
12	300	2.00	3.6	91	6.1	9.10
14	350	2.00	4.2	107	7.5	11.15
16	400	2.00	4.7	119	9.4	14.00

Typical pipe performance

Nominal Pipe Size		Static Pressure Rating		Ultimate Internal Pressure ¹		Ultimate Collapse Pressure ²			
						80°F	27°C	210°F	99°C
<i>in</i>	mm	<i>psig</i>	bar	<i>psig</i>	bar	<i>psig</i>	bar	<i>psig</i>	bar
2	50	450	30	3200	215	145	10.0	125	8.6
3	80	450	30	2400	160	50	3.4	45	3.1
4	100	375	25	2000	135	40	2.8	35	2.4
6	150	300	20	2000	135	35	2.4	30	2.1
8	200	150	10	900	60	25	1.7	21	1.4
10	250	150	10	900	60	18	1.2	12	0.8
12	300	150	10	900	60	12	0.8	9	0.6
14	350	150	10	900	60	10	0.7	7.5	0.5
16	400	150	10	900	60	10	0.7	7.5	0.5

1). Quality control minimum

2). For vacuum service above ground in sizes 200mm (8 in.) and above consult Ameron.

Fittings construction

- Fittings in 200-400mm (8 through 16 in.) nominal sizes shall be filament wound and incorporate a resin-rich liner of equal or greater thickness than the pipe liner and shall be constructed of the same glass and resin type for corrosion and abrasion resistance equal to that of the pipe. Fittings n 50 through 150mm (2 through 6 in.) nominal sizes may be compression molded from glass and resins similar to those used in

the pipe. Contact-molded, sprayed up or hand laid-up fittings shall not be permitted.

- Pipe and fittings shall be joined using bell and spigot taper/taper adhesive-bonded joints or mechanical screw-on type joints with O-ring seals inside the bell for rapid installation.

Fittings pressure ratings

Nominal Pipe Size		Elbows and Tees		Flanges		Blind Flanges	
<i>in</i>	mm	<i>psig</i>	bar	<i>psig</i>	bar	<i>psig</i>	bar
2	50	450	30	450	30	450	30
3	80	450	30	400	30	450	30
4	100	375	25	375	25	375	25
6	150	300	20	300	20	300	20
8	200	150	10	150	10	150	10
10	250	150	10	150	10	150	10
12	300	150	10	150	10	125	8
14	350	150	10	150	10	75	5
16	400	150	10	150	10	75	5

1). Ratings shown are for 90° and 45° elbows. Ratings in 200-400mm (8 to 16 in.) sizes are also applicable to elbows of other angles.

Nominal Pipe Size		Adapters		Laterals, Wyes and Crosses		Saddles	
<i>in</i>	mm	<i>psig</i>	bar	<i>psig</i>	bar	<i>psig</i>	bar
2	50	450	30	200	13	300	20
3	80	375	25	200	13	300	20
4	100	300	20	200	13	200	13
6	150	300	20	200	13	150	10
8	200	150	10	150	10	150	10
10	250	-	-	150	10	100	8
12	300	-	-	150	10	75	5
14	350	-	-	150	10	50	3
16	400	-	-	150	10	50	3

Typical Physical Properties

Pipe Property	Units	Value	Method	
Thermal Conductivity	Btu · in/(hrft ² F)	1.7	ASTM	ATM ¹
	W/m ^o C	0.25	C177	23
Coefficient of thermal Expansion (linear)	10 ⁻⁶ in/in/ ^o F	8.5	D696	21
	10 ⁻⁶ m/m/ ^o C	15.3		
200-400mm (8 – 16 in.)	10 ⁻⁶ in/in/ ^o F	12.0		
	10 ⁻⁶ m/m/ ^o C	21.6		
Flow coefficient	Hazen-Williams	150	--	156
Absolute roughness	10 ⁻⁶ ft	50	--	--
	10 ⁻⁶ m	15		
Specific gravity	--	1.81	D792	--
Barcol hardness	Impressor 934-1	65	D2583	--

1). Ameron test method.

Typical Mechanical Properties

Submittal Data

Fiberglass Bondstrand 3000A Pipe

Pipe Property ¹	Units	Value		Method	
		50-150mm (2-6 in.)	200-400mm(8-16 in.)	ASTM	ATM ²
Tensile strength					
Longitudinal	10 ³ psi	35.0	20.0	D2105	161
	MPa	240	138		
Circumferential	10 ³ psi	70.0	40.0	D1599	151
	MPa	480	275		
Tensile modulus					
Longitudinal	10 ⁶ psi	3.0	1.5	D2105	161
	Gpa	20.6	10.3		
Circumferential	10 ⁶ psi	4.2	2.3	--	--
	GPa	29.0	15.9		
Compressive strength					
Longitudinal	10 ³ psi	35.0	20.0	--	142
	MPa	240	138		
Compressive modulus					
Longitudinal	10 ⁶ psi	3.0	1.5	--	142
	GPa	20.6	10.3		
Long-term hydrostatic					
Design basis					
Static	10 ³ psi	21	21	D2992(B)	--
	MPa	145	145		
Cyclic	10 ³ psi	8	--	D2992(A)	--
	MPa	55	--		
Poisson's ratio ³					
V _{yx}	--	0.16	0.11	--	--
V _{xy}	--	0.26	0.19	--	--

- 1) Based on structural wall thickness.
- 2) Ameron test method.
- 3) The first subscript denotes the direction of contraction and the second that of the applied stress.
X denotes longitudinal direction.
Y denotes circumferential direction.

Nominal Pipe Size		Change in Length Due to Pressure ¹		Stiffness Factor ²	
<i>in.</i>	mm	<i>in./100ft/100psi</i>	mm/m/bar	<i>lb in.³/in²</i>	Nm
2	50	.284	343	42	4.7
3	80	.394	476	75	8.5
4	100	.477	576	60	6.8
6	150	.493	596	275	31.1
8	200	1.14	1376	500	56.5
10	250	1.19	1437	750	85
12	300	1.20	1450	1250	140
14	350	1.26	1523	1600	180
16	400	1.31	1583	2000	225

- 1). In an unrestrained system due to pressure effects alone.
- 2). At 5% deflection.

Support Spacing

Values are based on a 12mm (½ in) deflection at midspan.

Nominal Pipe Size		Single Span ¹						Continuous Span ²					
		Gases		1.00 ³		1.25		Gasses		1.00		1.25	
<i>in</i>	mm	<i>ft</i>	m	<i>ft</i>	m	<i>ft</i>	m	<i>ft</i>	m	<i>ft</i>	m	<i>ft</i>	m
2	50	14.4	4.4	9.7	3.0	9.3	2.8	21.5	6.6	14.5	4.4	13.9	4.2
3	80	17.7	5.4	11.1	3.4	10.6	3.2	26.4	8.0	16.6	5.1	15.8	4.8
4	100	20.0	6.1	12.1	3.7	11.5	3.5	29.9	9.1	18.1	5.5	17.2	5.2
6	150	24.9	7.6	14.6	4.5	13.9	4.2	37.2	11.3	21.9	6.7	20.8	6.3
8	200	23.8	7.3	13.9	4.2	13.2	4.0	35.6	10.9	20.8	6.3	19.7	6.0
10	250	26.9	8.2	15.4	4.7	14.6	4.5	40.2	12.3	23.0	7.0	21.9	6.7
12	300	29.3	8.9	16.7	5.1	15.9	4.8	43.8	13.4	25.0	7.6	23.7	7.2
14	350	31.3	9.5	17.6	5.4	16.7	5.1	46.8	14.3	26.3	8.0	25.0	7.6
16	400	33.5	10.2	18.7	5.7	17.8	5.4	50.1	15.3	27.9	8.5	26.6	8.1

- 1). For fluid temperatures above 25°C (78°F) the span lengths decrease by 9 mm/°C. (0.2 in./°F)
- 2). For intermediate spans. End spans may be calculated by multiplying the single span length by 1.8.
- 3). Fluid specific gravity.

Bending Radius

Nominal Pipe Size		Minimum Bending Radius ¹		Maximum Deflection per 11.9m (39-ft) Joint	Minimum Length Required for 10° Change	
in	mm	ft	m	deg	ft	m
2	50	75	23	30°	13'	4
3	80	100	30	20	20	6
4	100	150	46	15	27	8
6	150	200	61	10	40	12
8	200	300	91	7+2=9 ³	57-13=44'	12
10	250	350	107	6+2=8	67-13=54	16
12	300	400	123	5+2=7	80-13=67	20
14	350	450	137	4+2=6	100-13=87	27
16	400	500	152	3+2=5	133-13=120	37

1). At rated pressure. Sharper bends may create excessive concentrations. Do no bend pipe until adhesive has cured.

2). 50-150mm (2 – 6 in.): pipe only.

3). 200-400mm (8 – 16 in.): pipe deflection plus 2° Pronto-Lock II coupling deflection.

4). 200-400mm (8 – 16 in.): minimum minus 4m (13ft) effect of Pronto-Lock II coupling deflection.

Physical and Mechanical Requirements

- Values for physical and mechanical properties shall be no less than 95% of those shown tabulated above under Typical Physical Properties and Typical Mechanical Properties.

Workmanship

- The pipe and fittings shall be free from all defects, including delaminating, indentations, pinholes, foreign inclusions, bubbles and resin-starved areas that, due to their nature, degree of extent, detrimentally affect the strength and serviceability of the pipe or fittings. Pigments or dyes may be used in the resin as long as the product is sufficiently translucent to verify the structural integrity of the structural wall. The pipe and fittings shall be as uniform as commercially practicable in color, density and other physical properties.

Testing

- Quality Control testing – Samples of pipe and fittings shall be tested at random based on standard quality control practices to determine conformance of the materials to the following ASTM guidelines for testing fiberglass pipe product: ASTM D1599, D2105, D2992A or D2992B. Test samples may be

hydrostatically tested by the manufacturer to 1.5 times the pressure rating for signs of leakage.

Important Notice

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