



Dualoy 3000/L Fiberglass Pipe and Fittings

nonmetallic underground piping for petroleum products, alcohols and alcohol-gasoline mixtures

Uses and applications

Service station product, vent and vapor recovery piping
 Bulk plant terminals and fueling terminals
 Central fuel oil systems
 Marinas and marine terminals
 All piping systems requiring UL or ULC listing for petroleum products, alcohols and alcohol-gasoline mixtures

Performance

Operating pressures to 300 psig (20 bar)
 Continuous operating temperatures to 150°F (66°C)
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.

Listings



Dualoy 3000/L is Listed in the U.S. with Underwriters Laboratories for nonmetallic underground piping for petroleum products, alcohols (such as methanol and ethanol) and alcohol-gasoline mixtures (File MH9162). Dualoy 3000/L pipe and fittings are also Listed with Underwriters Laboratories of Canada for petroleum products and oxygenated fuels (File CMH 715), in the Netherlands with KIWA (Ref. ATA no. 2062/1-E), in Sweden with AB Statens Anläggningsprovning (Certificate SA 1-1-9846) and with the French Ministry of the Environment (Arrêté 261 bis). In Great Britain the Dualoy 3000/L system has been tested and accepted by the London Fire and Civil Defence Authority.

Composition

Pipe — Filament-wound fiberglass reinforced epoxy pipe with integral epoxy liner and exterior coating. When classified in accordance with ASTM D2310 and ASTM D2996, the pipe meets the following cell limits: RTRP 11CX-5430.

Fittings — Compression-molded and filament-wound fiberglass reinforced epoxy

Adhesive — Ameron B20 ambient-cure, two-part epoxy for all services (including alcohols)

Joining system

Bell and spigot taper/taper adhesive-bonded joint

Pipe lengths

Standard 6.1 m (20-ft) random lengths 5.2 to 6.4 m (17 to 21 ft)
 Other lengths available on request

Fittings

Adapters: bell x NPT male ¹	Flange stub ends ¹
Adapters: bell x NPT female ²	Isolation bushings ¹
Adapters: spigot x NPT female ²	Nipples ²
Adapters: spigot x NPT male ²	Reducer bushings ¹
45° Elbows ¹	Repair couplings ¹
90° Elbows ¹	Sleeve couplings ²
End caps ¹	Tees ¹
Flange rings ¹	Dispenser pan penetration fittings ¹

- 1) Indicates molded fitting.
 2) Indicates filament-wound fitting.
 3) Other fittings available without UL listing.

Typical pipe dimensions and weights

Nominal Pipe Size		Pipe OD ¹		Pipe ID		Wall Thickness				Unit Volume		Pipe Weight	
						Total	Structural	(in)	(mm)	(gal/ft)	(l/m)	(lb/ft)	(kg/m)
(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(gal/ft)	(l/m)	(lb/ft)	(kg/m)
2	50	2.37	60	2.21	56	0.080	2.0	0.060	1.5	0.20	2.5	0.47	3.5
3	80	3.50	89	3.32	84	0.085	2.2	0.065	1.6	0.45	5.6	0.72	5.2
4	100	4.50	115	4.33	110	0.087	2.2	0.070	1.8	0.77	9.6	1.00	7.2
6	150	6.63	168	6.39	162	0.120	3.1	0.100	2.5	1.67	20.7	2.10	15.2

- 1) Typical outside diameters of 2 through 6-inch pipe are within API, ASTM and ANSI fiberglass and steel pipe dimensions.

Typical pipe performance

Nominal Pipe Size		Pressure Rating ¹		Ultimate Internal Pressure ¹		Ultimate Collapse Pressure ²	
		(psig)	(MPa)	(psig)	(MPa)	(psig)	(MPa)
(in)	(mm)	(psig)	(MPa)	(psig)	(MPa)	(psig)	(MPa)
2	50	300	2.07	3200	22.1	153	1.05
3	80	200	1.38	2400	16.5	90	0.62
4	100	175	1.21	2000	13.8	39	0.27
6	150	175	1.21	2000	13.8	38	0.26

- 1) At 150°F (66°C).
 2) At 80°F (27°C). For continuous service do not exceed 75% of these values.

Fittings pressure performance

For dimensions of fittings, consult Ameron publication DUALOY 3000/L FITTINGS DIMENSIONS, FP266. Pressure ratings of fittings without UL listing are available on request.

Nominal Pipe Size		All fittings ¹	
		(psig)	(MPa)
(in)	(mm)	(psig)	(MPa)
2	50	250	1.72
3	80	150	1.03
4	100	125	0.86
6	150	100	0.69

- 1) Some fittings have higher pressure ratings than shown.

Typical physical properties

Dualoy 3000/L piping systems are designed to function at temperatures ranging from -40 to 150°F (-40 to 66°C) at service pressures between -1 and 20 bar. Dualoy 3000/L pipe conforms to ASTM D2310, D2517 and D2996.

Pipe Property ¹	Units	Value	Method	
			ASTM	ATM ¹
Thermal conductivity	Btu·in/(h·ft ² ·°F)	1.7	C177	23
	W/m·°C	7.6		
Linear thermal expansion	10 ⁻⁶ in/in/°F	8.5	D696	21
	10 ⁻⁶ cm/cm/°C	15.3		
Friction factor	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

Pipe Property ¹	Units	Value ¹	Method		
			ASTM	ATM ²	
Tensile strength Longitudinal	10 ³ psi	35.0	D2105	161	
	MPa	241			
Circumferential	10 ³ psi	70.0	D1599	151	
	MPa	483			
Tensile modulus Longitudinal	10 ⁶ psi	3.0	D2105	161	
	GPa	20.7			
Circumferential	10 ⁶ psi	4.2	—	—	
	GPa	29.0			
Compressive strength Longitudinal	10 ³ psi	35.0	—	142	
	MPa	241			
Compressive modulus Longitudinal	10 ⁶ psi	3.0	—	142	
	GPa	20.7			
Long-term hydrostatic design basis Static	10 ³ psi	31.5	D2992(B)	—	
	MPa	217			
Cyclic	10 ³ psi	8.0	D2992(A)	—	
	MPa	55			
Poisson's ratio ³					
	ν_{yx}	—	0.16	—	—
	ν_{xy}	—	0.26	—	—

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		Stiffness Factor ¹	
(in)	(mm)	(lb·in ³ /in ²)	(N·m)
2	50	45	5.1
3	80	75	8.5
4	100	60	6.8
6	150	275	31.1

1) At 5% deflection.

Bending radius

Nominal Pipe Size		Minimum Bending Radius ¹		Maximum Deflection per 20-ft Joint	Minimum Length Required for 10° Change	
(in)	(mm)	(ft)	(m)	(deg)	(ft)	(m)
2	50	75	23	15	13	4
3	80	100	30	10	20	6
4	100	150	46	7.5	27	8
6	150	200	61	5	40	12

1) At rated pressure. Sharper bends may create excessive stress concentrations. **Do not** bend pipe until adhesive has cured.

Conversions

1 psi = 6895 Pa = 0.07031 kg/cm²
1 bar = 10⁵ Pa = 14.5 psi = 1.02 kg/cm²
1 MPa = 10⁶ Pa = 145 psi = 10.2 kg/cm²
1 GPa = 10⁹ Pa = 145,000 psi = 10,200 kg/cm²
1 in = 25.4 mm
1 ft = 0.3048 m
1 lb·in = 0.113 N·m
°C = $\frac{5}{9}$ (°F - 32)

Important notice

This literature and the information and recommendations it contains are based on data reasonably believed to be reliable. However, such factors as variations in environment, application or installation, changes in operating procedures, or extrapolation of data may cause different results. Ameron makes no representation or warranty, express or implied, including warranties of merchantability or fitness for purpose, as to the accuracy, adequacy or completeness of the recommendations or information contained herein. Ameron assumes no liability whatsoever in connection with this literature or the information or recommendations it contains.



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Manufacturing plants: Burkburnett, Texas; Spartanburg, South Carolina; Geldermalsen, The Netherlands and Singapore. Bondstrand pipe is also manufactured in Saudi Arabia.