



Dualoy® 3000/MCX Coaxial Fiberglass Pipe and Fittings

contained fuel-handling system with rigid fiberglass primary and integral rigid fiberglass containment layers for aboveground and marina service

Uses and applications

Rigid fiberglass coaxial fuel handling systems for containment piping and primary lines conveying the following fuels:

alcohols	leaded gasolines
alcohol-gasoline mixtures	oxygenated fuels
diesel fuels	unleaded gasolines
MTBE fluids	

Description

Ameron Dualoy 3000/MCX rigid fiberglass coaxial piping is a cost-effective solution for contained piping systems. MCX is used for product delivery lines in marina fuel handling systems to convey fuel from the tank to the dispensers.

The MCX pipe is manufactured as an integral unit. The primary is made of chemically inert, non-permeable, fiberglass reinforced epoxy resin which is inherently resistant to deterioration due to water and microbial attack. This layer is covered with a porous sand layer to provide the small interstitial space which facilitates rapid leak detection. Then, the containment layer, comprised of the same material as the primary, is wound over the sand layers.

The containment system is installed with custom-designed Ameron clamshell containment fittings. Both the primary and containment systems are bonded for long-term, reliable performance.

- Dualoy 3000/MCX containment fittings are typically bolted in place while the adhesive cures.
- Dualoy 3000/MCX reduces installation and inspection time dramatically, retaining system integrity.
- Dualoy 3000/MCX containment fittings have one of each pair of clamshells pre-fitted with threaded nuts to speed assembly and allow assembly from one side of the fitting.
- The Dualoy 3000/MCX double wall design significantly improves impact resistance over single wall pipe.
- Dualoy 3000/MCX fittings provide true double wall design which permits communication of the interstitial space throughout the system.



Listings and approvals

UL Draft Standard 2248 is currently being drafted for this application.
Florida DEP Approval File No. EQ-562

Performance

Primary operating pressures to 250 psi (16 bar)

Continuous operating temperature to 150°F (66°C)

Containment system pressures to 40 psi (2.9 bar)

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

Primary pipe: Filament-wound fiberglass reinforced epoxy pipe with integral epoxy liner. When classified in accordance with ASTM D2310 and ASTM D2996, the pipe meets the following cell limits:RTRP-11FW-2230.

Pipe containment: Filament-wound fiberglass reinforced epoxy pipe.

Interstitial space: Dry particles secured in place with adhesive backed tape.

Fittings: Compression molded or filament-wound fiberglass reinforced epoxy primary fittings. Containment fittings are compression molded.

Adhesive: Ameron PSX™•20 or PSX™•34 ambient-cure, two-part epoxy for all services (including alcohols and MTBE).

Joining system

Primary: Bell and spigot taper/taper adhesive-bonded joint

Containment: Adhesive-bonded clamshell fittings. Parts are compression molded for exact fit and match. Material is identical to primary fittings.

Pipe lengths

Standard 20 ft. (6.1 m) random lengths 17 to 21 ft. (5.2 to 6.4 m).

Fittings

Primary–	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 ^{1,2}
	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
Containment–	45° elbows ¹	Couplings ¹
	90° elbows ¹	Tees ¹
	Termination sleeves ^{1,3}	

1 Molded fitting

2 Filament-wound fitting

3 Filament-wound or injection molded outer layer; molded outer layer is separate

Typical pipe dimensions and weights

Nominal Pipe Size in. • mm.	Primary		Primary Wall		Containment		Volume (gal/ft • l/m)	Weight (lb/ft • kg/m)
	I.D. in. • mm	O.D. in. • mm	Thickness in. • mm	O.D. in. • mm	O.D. in. • mm	O.D. in. • mm		
2 50	2.01	51	2.38	60	0.18	4.62	2.61 66	0.16 1.99 1.50 2.23
3 80	3.12	79	3.50	89	0.19	4.80	3.73 95	0.39 4.84 2.25 3.36
4 100	4.05	103	4.50	114	0.22	5.64	4.70 119	0.65 8.07 3.00 4.47

Typical primary pipe performance

Nominal Pipe Size		Pressure Rating ¹		Ultimate Internal Pressure ¹		Ultimate Collapse Pressure ²	
(in)	(mm)	(psig)	(MPa)	(psig)	(MPa)	(psig)	(MPa)
2	50	300	2.07	3900	27.0	1425	9.82
3	80	200	1.38	2750	19.0	460	3.18
4	100	175	1.21	2450	17.0	345	2.38

1) At 150°F (66°C).

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

Note: Values shown for primary only

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		Primary All Fittings ¹		Containment Clamshell Fittings	
(in)	(mm)	(psig)	(MPa)	(psig)	(kPa)
2	50	250	1.72	40	275
3	80	150	1.03	40	275
4	100	125	0.86	40	275

1) Some fittings have higher pressure ratings than shown.

Typical physical properties of primary pipe

Dualoy 3000/MCX piping systems are designed to function at temperatures ranging from -40 to 150°F (-40 to 66°C) at service pressures between -15 to 300 psi (-1 to 20 bar). Dualoy 3000/MCX 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	150.0	—	156
Absolute roughness	10 ⁻⁶ ft	17.4	—	—
	10 ⁻⁶ m	5.3		
Specific gravity	—	1.81	D792	—
Barcol Hardness	Impressor 934-1	65.0	D2583	—

1) Ameron test method.

Typical mechanical properties of primary pipe

Pipe Property ¹	Units	Value ¹	Method	
			ASTM	ATM ²
Tensile strength				
Longitudinal	10 ³ psi MPa	16.0 110.0	D2105	161
Circumferential	10 ³ psi MPa	32.0 220.0	D1599	151
Tensile modulus				
Longitudinal	10 ⁶ psi GPa	3.0 20.7	D2105	161
Circumferential	10 ⁶ psi GPa	4.2 29.0	—	—
Compressive strength				
Longitudinal	10 ³ psi MPa	35.0 241.0	—	142
Compressive modulus				
Longitudinal	10 ⁶ psi GPa	3.0 20.7	—	142
Long-term hydrostatic design basis				
Static	10 ³ psi MPa	16.0 110.0	D2992(B)	—
Cyclic	10 ³ psi MPa	8.0 55.0	D2992(A)	—
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.

Support Spacing

Recommended maximum support spacing for Dualoy 3000/MCX pipe when carrying liquid with a specific gravity of 1.0.

Pipe Size	(in) (mm)	Temperature (°F/°C)			
		(100/38)		(150/66)	
		(ft)	(m)	(ft)	(m)
2	50	11.8	3.60	11.2	3.40
3	80	13.4	4.10	12.7	3.85
4	100	15.2	4.65	14.4	4.40

Important Notice

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