Red Thread™ IIA

(Product Data)

FUEL HANDLING

Applications

- Service Station
- Vent/Vapor Recovery
- Bulk Plant Terminals
- Fueling Terminals
- Central Fuel Oil Systems
- Marinas Terminals
- Ethanol Fuel Blends
- Biodiesel Fuel
- Diesel Exhaust Fluid
- UL/ULC Systems that require MV, HB, CT, A&M Fuels

Materials and Construction

All pipe is manufactured by filament winding process using amine-cured epoxy thermosetting resin to impregnate strands of continuous glass filaments with a resin-rich interior surface. The operating pressure of the pipe is up to 250 psig (17.2 bar) with continuous operating temperature to 150°F (66°C).

Red Thread IIA is Listed with Underwriters Laboratories Standard 971-2004 for non-metallic underground piping for motor vehicle (MV), high blend (HB), concentrated (CT) and aviation and marine (A&M) fuels. The pipe and fittings are also Listed with Underwriters Laboratories of Canada with both Listings under File MH9162.

Fittings

Fittings are manufactured with the same chemical and temperature capabilities as the pipe. Depending on the configurations and size, the fittings construction method will be compression molded, contact molded, fabricated or filament wound and are described in FH1250.

Testing

Installed pipe systems should be tested prior to use to assure soundness of all joints and connections. Locate pressure gauge in close proximity to the pressurizing equipment, not directly on the piping system. A pressure gauge with the test pressure at mid-scale is recommended.

Joining System

- **T.A.B.™** - The primary joining method for pipe joints promoting fast, positive make-up and prevents "backout" during curing.
- **Bell & Spigot** - The primary joining method for fitting joints.

These joints assist the installer and assures a fast trouble-free installation. Adhesive for this system is Series 8000. T.A.B. spigots can be bonded into tapered bells and tapered spigots can be Bonded into T.A.B. bells using standard bonding procedures for tapered joints.

ASTM D2996 Designation Code - RTRP-11AW13110

Nominal Dimensional Data

Pipe Size		Inside Diameter		Outside Diameter		Wall Thickness		Weight		Pressure/ Temperature Max. Rating at 150°F (66°C)		Mill Test Pressure		Minimum Bending Radius	
in	mm	in	mm	in	mm	in	mm	lbs.ft	kg/m	psig	MPa	psig	MPa	ft	m
2	50	2.238	57	2.371	60	0.067	1.70	0.42	0.63	250	1.72	376	2.59	102	31.0
3	80	3.363	85	3.559	90	0.098	2.49	0.92	1.37	175	1.21	300	2.07	153	46.5
4	100	4.364	111	4.553	116	0.095	2.41	1.10	1.64	125	0.86	265	1.83	195	59.5
6	150	6.408	163	6.686	170	0.139	3.53	2.47	3.68	20	0.14	265	1.83	287	87.4

View of Joint Illustrations

T.A.B.

Bell & Spigot

Typical Mechanical Properties

Pipe Property	75°F	24°C	200°F	93°C	Method
	psi	MPa	psi	MPa	
Axial Tensile					
Ultimate Stress	9,530	65.7	6,585	45.4	ASTM D2105
Modulus of Elasticity	1.68×10^6	11,584	1.42×10^6	9,791	ASTM D2105
Poisson's Ratio, ν_{ah} (ν_{ha})[1]	0.35 (0.61)				
Axial Compression					
Ultimate Stress	12,510	86.3	8,560	59.0	ASTM D695
Modulus of Elasticity	0.677×10^6	4,668	0.379×10^6	2,613	ASTM D695
Beam Bending					
Modulus of Elasticity (Long Term)	2.6×10^6	17,927	0.718×10^6	4,951	ASTM D2925
Hydrostatic Burst					
Ultimate Hoop Tensile Stress	40,150	277	36,480	252	ASTM D1599
Hydrostatic Hoop Design Stress					
Static 20 Year Life LTHS - 95% LCL	-	-	18,203 - 14,689	125.5 - 101.3	ASTM D2992 - Procedure B
Static 50 Year Life LTHS - 95% LCL	-	-	16,788 - 13,142	115.7 - 90.6	ASTM D2992 - Procedure B
Parallel Plate					
Hoop Modulus of Elasticity	3.02×10^6	20,822	-	-	ASTM D2412
Shear Modulus	1.36×10^6	9,343	1.15×10^6	7,895	-

Typical Physical Properties

Pipe Property	Value	Value	Method
Thermal Conductivity	0.23 BTU/hr•ft•°F	0.4 W/m°C	ASTM D177
Thermal Expansion	8.5×10^{-6} in/in °F	15.3×10^{-6} mm/mm °C	ASTM D696
Absolute Roughness	0.00021 in	0.00053 mm	
Specific Gravity	1.8		ASTM D792

[1] ν_{ha} = The ratio of axial strain to hoop strain resulting from stress in the hoop direction.
ν_{ah} = The ratio of hoop strain to axial strain resulting from stress in the axial direction.

[2] The differential pressure between internal and external pressure which causes collapse.

[3] A 0.67 design factor is recommended for short duration vacuum service. A full vacuum is equal to 14.7 psig (0.101 MPa) differential pressure at sea level.

[4] A 0.33 design factor is recommended for sustained (long-term) differential collapse pressure design and operation.

Ultimate Collapse Pressure

Size		Collapse Pressure[2][3][4]			
		psig		MPa	
in	**mm**	**75°F**	**150°F**	**24°C**	**66°C**
2	50	177	133	1.22	0.92
3	80	171	129	1.18	0.89
4	100	69	51	0.48	0.35
6	150	69	51	0.48	0.35

Pipe Length

Size		Standard		Random	
in	**mm**	**ft**	**m**	**ft**	**m**
2-6	50-150	15	4.57	22-25	6.7-7.62

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