



1219

Aurora Center Of Excellence
Title: PRODUCT STANDARD

Document Number

Revision **05**

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Product Standard

for

FIRE RESISTANT LINEAR LOW DENSITY POLYTHYLENE TUBING

Date of Original Standard (8/24/71)

Changes: (DK-90-3735) (DK-94-4304) (DK-98-4797)(DK-01-5284a)(05-6610)

FORM: QFT-002



DESCRIPTION

Eaton's "FR" tubing is made from a proprietary linear low density polyethylene compound. It combines the physical characteristics and long-term stability of linear low density polyethylene with flame retardant properties.

PRODUCT TECHNICAL DATA

Part number	Dimensions					
	Wall Thickness	O.D. Nominal	O.D. Tolerance	I.D. Nominal	I.D. Tolerance	T.I.R.
1219-130*X	0.030"	0.156"	+0.004" -0.002"	0.096"	+0.004" -0.002"	0.003" Max.
1219-440*X	0.040"	0.250"	+0.003" -0.005"	0.170"	+0.002" -0.006"	0.004" Max.
1219-662*X	0.062"	0.375"	+0.003" -0.006"	0.251"	+0.005" -0.005"	0.004" Max.
1219-862*X	0.062"	0.500"	+0.001" -0.007"	0.370"	+0.005" -0.003"	0.004" Max.

Part Number	Min. Bend Radius	Max. Pulling Strength	Net Weight Per 100'
1219-130*X	1/2"	7 lbs.	0.57 lbs.
1219-440*X	1.0"	15 lbs.	1.25 lbs.
1219-662*X	1-1/2"	35 lbs.	2.90 lbs.
1219-862*X	1-7/8"	50 lbs.	4.06 lbs.

X = Length Designator: 2 = 100' 3 = 250' 4 = 500' 5 = 1,000'
* = Color Designator as per following chart:

(see next page)



Color Availability	Color Number	Available in		
		1/4"	3/8"	1/2"
Black	0	X	X	X
White Stripe	A	X	X	X
Red Stripe	B	X	X	X
Orange Stripe	C	X	X	X
Yellow Stripe	D	X	X	X
Green Stripe	E	X	X	X
Blue Stripe	F	X	X	X
Violet Stripe	G	X	X	X

PHYSICAL PROPERTIES OF "FR" TUBING

Property	Units	Test Method	Value
Melt Index	dg/min.	ASTM D 1238	0.5 - 1.0
Density, 23°C	g/cc	ASTM D 1505	1.05 - 1.10
Tensile Strength	PSI	ASTM D 638	1,600 min.
Elongation (pull at 20"/min.)	%	ASTM D 638	400 min.
Oxygen Index	%	ASTM D 2863	24.5 min.
Environmental Stress Crack Resistance	hours	See Note (a)	No failure
Vertical Flame Test	Pass	UL 94	V2
Horizontal Flame Test	in/min.	ASTM D 635	Self Extinguishing
Water Absorption	%	ASTM D 570	0.1 Max.
Brittleness Temperature	°C	ASTM D 746	-55
Maximum Service Temperature	°F	See Note (b)	150

Note: (a) Modified version of ASTM D 1693 to evaluate quality of tubing. Sections of tubing 1-1/2" long are bent into a "V" and inserted into test tubes. The sizes of the test tubes are 18mm for 5/32" O.D. tubes and 25mm for 1/4" O.D. tubes. Five (5) specimens are evenly spaced in the test tube, then the test tube is filled with a 10% solution of Igepal CO-630. The test tube is then placed at 50°C (122°F) either in a water bath or a circulating air oven. Any crack or split in the stressed section of the tube constitutes failure. Samples must exhibit no failure at 240 hours (10 days) to be considered satisfactory for extended use.

(b) Maximum service temperature is specified for applications involving the transfer of clean, dry air or gas. The presence of moisture in the application will diminish the life of the product, especially at elevated temperatures.

PERFORMANCE CHARACTERISTICS

Table 1
BURST PRESSURE (PSI) VS. TEMPERATURE

Tube Size	75°F	100°F	125°F	150°F
5/32" & 1/4"	500	400	275	225
3/8"	500	400	275	225
1/2"	350	250	200	150

Table 2
RECOMMENDED WORKING PRESSURE (PSI) AT VARIOUS TEMPERATURES

Note: 5:1 safety factor to burst pressures

Tube Size	75°F	100°F	125°F	150°F
5/32" & 1/4"	100	80	55	45
3/8"	100	80	55	45
1/2"	70	50	40	30

Note: When striped "FR" tubing is subjected to ultra-violet light, a 15% reduction is recommended in working pressures, due to stripe failure from UV light. Also, when striped "FR" is subjected to temperatures greater than 150°F, a 15% reduction in working pressure is advised.

PRODUCT ADVANTAGES

1. "FR" will not support combustion
2. Light weight
3. High level of flexibility
4. Exceptional corrosion and chemical resistance
5. Good mechanical abuse characteristics
6. Ease of installation
7. Freedom from stress concentrations and imperfections
8. Offers excellent protection against thermal and environmental degradation
9. High stress cracking resistance