

RED THREAD™ HP FM Piping

Fire Protection Systems

NOV Fiber Glass Systems offers RED THREAD HP FM Factory Mutual Approved pipe and fittings for use in underground fire protection systems.

These specially labeled systems are available on request and have the physical and mechanical properties as described in this bulletin. **The 4"-6" pipe is available in 30 foot lengths and the 8"-24" pipe is available in 40 foot lengths.**



Significant features that make RED THREAD HP FM Fire Protection piping systems ideal:

- Internal and external corrosion resistance.
- Improved flow characteristics compared to traditional materials.
- Light weight and ease of installation.
- Pressure ratings up to 200 psig and a Mill Test Pressure of 400 psig.

Nominal Dimensional Data

Pipe Size in	Part Number	O.D. in	I.D. in	Wall Thickness in	Weight lbs/ft	Min. Bending Radius @ 75°F ft	Pipe Stiffness @ 5% Deflection psi
4	011040-073-3	4.55	4.36	0.095	1.1	195	87
6	011060-120-3	6.68	6.40	0.139	2.4	287	88
8	011080-126-3	8.64	8.36	0.145	3.3	371	45
10	011100-156-3	10.71	10.36	0.179	5.1	460	44
12	011120-185-3	12.70	12.28	0.212	7.2	545	44
14	011140-220-3	14.57	14.03	0.272	10.6	625	62
16	011160-250-3	16.65	16.03	0.311	13.8	714	62
18	011180-277-3	18.45	17.82	0.317	16.4	792	48
20	011200-286-3	20.48	19.83	0.327	18.8	879	38
24	011240-334-3	24.59	23.83	0.382	26.4	1055	35

Pipe Size mm	Part Number	O.D. mm	I.D. mm	Wall Thickness mm	Weight Kg/m	Min. Bending Radius @ 75°F m	Pipe Stiffness @ 5% Deflection MPa
100	011040-073-3	116	111	2.41	1.64	60	0.60
150	011060-120-3	170	163	3.53	3.68	87	0.61
200	011080-126-3	220	212	3.68	4.91	113	0.31
250	011100-156-3	272	263	4.55	7.59	140	0.30
300	011120-185-3	323	312	5.38	10.7	166	0.30
350	011140-220-3	370	356	6.91	15.8	191	0.43
400	011160-250-3	423	407	7.90	20.5	218	0.43
450	011180-277-3	469	453	8.05	24.4	241	0.33
500	011200-286-3	520	504	8.31	28.0	268	0.26
600	011240-334-3	625	605	9.70	39.3	322	0.24

RED THREAD HP FM piping systems should be installed according to instructions in **Matched Taper Joint Installation Handbook**.

RED THREAD HP FM piping for Factory Mutual Approved systems must be joined using **8000 series** adhesives. For installations that are installed in compliance with Factory Mutual procedures, anchoring (thrust blocking) must be in accordance with Factory Mutual installation standards.

Typical Properties				
Property	75°F	24°C	200°F	93°C
	psi	MPa	psi	MPa
Axial Tensile - ASTM D2105				
Ultimate Stress	9,530	65.7	6,585	45.4
Modulus of Elasticity	1.68 x 10 ⁶	11,583	1.42 x 10 ⁶	9,791
Poisson's Ratio $\nu_{a/h}$ ($\nu_{h/a}$)	0.35 (0.61)			
Axial Compression - ASTM D695				
Ultimate Stress	12,510	86.3	8,560	59.0
Modulus of Elasticity	0.68 x 10 ⁶	4,688	0.38 x 10 ⁶	2,620
Beam Bending - ASTM D2925				
Ultimate Stress	20,200	139.3	15,400	106.2
Modulus of Elasticity (Long Term)	2.6 x 10 ⁶	17,927	0.72 x 10 ⁶	4,964
Hydrostatic Burst - ASTM D1599				
Ultimate Hoop Tensile Stress	40,150	276.8	36,480	251.5
Hydrostatic Design - ASTM D2992, Procedure B - Hoop Tensile Stress				
Static 50 Year Life	LTHS		16,788	115.8
Static 20 Year Life	LCL 95%		14,689	101.3
Parallel Plate - ASTM D2412				
Hoop Modulus of Elasticity	3.02 x 10 ⁶	20,822	N/A	N/A

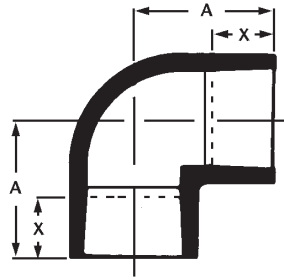
Thermal Expansion Coefficient - ASTM D696	8.5 x 10 ⁻⁶ in/in/°F	15.3 x 10 ⁻⁶ mm/mm/°C
Thermal Conductivity	0.23 BTU/hr-ft-°F	0.4 W/m-°C
Specific Gravity - ASTM D792	1.8	
Hazen-Williams Coefficient	150	
Absolute Surface Roughness	0.00021 Inch	0.0053 mm
Manning's Roughness Coefficient, N	0.009	

ASTM D2996 Designation	
4- 24 inch	RTRP-11AX1-3110
100-600 mm	

Fittings Dimensions

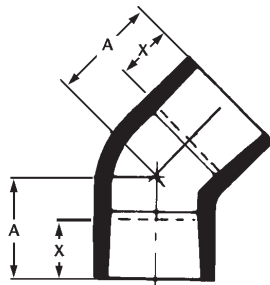
Available fittings are either molded (Type M) or filament wound (Type FW) as indicated in the tables below. The rated working pressure of all fittings is 200 psig (1.37 MPa).

90° Elbow



Pipe Size		Part Numbers	A		X ⁽¹⁾		Type
in	mm		in	mm	in	mm	
4	100	022040-360-3	5.13	130	1.50	38	M
6	150	022060-360-3	12.75	324	2.45	62	FW
8	200	022080-360-3	11.63	295	4.38	111	FW
10	250	022100-360-3	13.06	332	4.13	105	FW
12	300	022120-360-3	13.94	354	4.25	108	FW
14	350	022140-360-3	19.06	484	6.50	165	FW
16	400	022160-360-3	20.25	514	6.75	172	FW
18	450	022180-360-3	21.75	552	8.00	203	FW
20	500	022200-360-3	25.25	641	9.13	232	FW
24	600	022240-360-3	29.00	737	10.00	254	FW

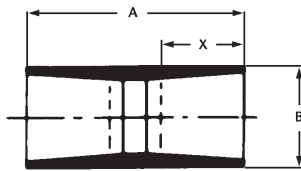
45° Elbow



Pipe Size		Part Number	A		X ⁽¹⁾		Type
in	mm		in	mm	in	mm	
4	100	022040-310-3	3.88	99	1.50	38	M
6	150	022060-310-3	7.50	191	2.45	62	FW
8	200	022080-310-3	8.13	207	4.38	111	FW
10	250	022100-310-3	8.63	219	4.13	105	FW
12	300	022120-310-3	9.50	241	4.25	108	FW
14	350	022140-310-3	12.50	318	6.50	165	FW
16	400	022160-310-3	13.25	337	6.75	172	FW
18	450	022180-310-3	14.75	375	8.00	203	FW
20	500	022200-310-3	17.63	448	9.13	232	FW
24	600	022240-310-3	20.19	513	10.00	254	FW

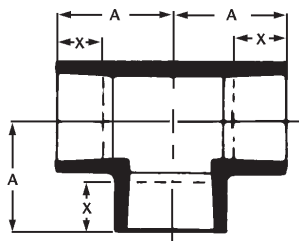
⁽¹⁾ X dimension is a nominal make-up dimension for drawing layout work only. Do not use for assembly dimensions.

Sleeve Couplings



Pipe Size		Part Numbers	A		B		X ⁽¹⁾		Type
in	mm		in	mm	in	mm	in	mm	
4	100	012040-101-5	7.00	178	4.88	123	1.87	48	FW
6	150	012060-101-3	8.38	213	7.13	181	2.50	64	FW
8	200	012080-101-3	10.00	254	9.00	229	3.19	81	FW
10	250	012100-101-3	10.50	267	11.13	283	3.69	94	FW
12	300	012120-101-3	11.00	279	13.50	343	3.88	99	FW
14	350	012140-101-3	15.00	381	15.50	394	4.33	110	FW
16	400	012160-101-3	17.00	432	17.63	448	4.49	114	FW
18	450	022180-101-3	21.00	533	20.05	509	6.87	174	FW
20	500	022200-101-3	26.00	660	22.10	561	7.81	198	FW
24	600	022240-101-3	29.50	749	26.15	664	8.62	218	FW

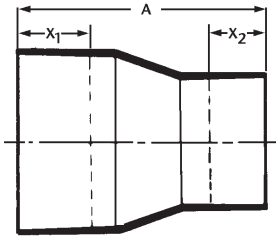
Tees



Pipe Size		Part Number	A		X ⁽¹⁾		Type
in	mm		in	mm	in	mm	
4	100	022040-410-3	5.13	130	1.50	38	M
6	150	022060-410-3	9.50	241	3.75	95	FW
8	200	022080-410-3	11.63	295	4.38	111	FW
10	250	022100-410-3	13.06	332	4.13	105	FW
12	300	022120-410-3	13.94	354	4.25	108	FW
14	350	022140-410-3	19.06	484	6.50	165	FW
16	400	022160-410-3	20.25	514	6.25	172	FW
18	450	022180-410-3	22.38	568	8.00	203	FW
20	500	022200-410-3	26.25	667	9.13	232	FW
24	600	022240-410-3	28.00	711	10.00	254	FW

⁽¹⁾ X dimension is a nominal make-up dimension for drawing layout work only. Do not use for assembly dimensions.

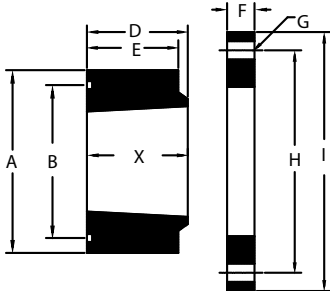
Concentric Reducers



Pipe Size		Part Numbers	A		X ₁ ⁽¹⁾		X ₂ ⁽¹⁾		Type
in	mm		in	mm	in	mm	in	mm	
6 x 4	150 x 100	022060-236-3	9.00	230	2.25	57	1.50	38	M
8 x 4	200 x 100	022080-237-3	18.75	476	4.38	111	2.78	70	FW
8 x 6	200 x 150	022080-235-3	14.75	375	4.38	111	3.75	95	FW
10 x 6	250 x 150	022100-237-3	20.00	508	4.13	105	3.75	95	FW
10 x 8	250 x 200	022100-235-3	16.50	419	4.13	105	4.38	111	FW
12 x 8	300 x 200	022120-237-3	23.06	586	4.25	108	4.38	111	FW
12 x 10	300 x 250	022120-235-3	17.75	451	4.25	108	4.13	105	FW
14 x 10	350 x 250	022140-237-3	28.63	727	6.50	165	4.13	105	FW
14 x 12	350 x 300	022140-235-3	22.75	578	6.50	165	4.25	108	FW
16 x 12	400 x 300	022160-237-3	33.75	857	6.75	172	4.25	108	FW
16 x 14	300 x 350	022160-235-3	28.06	713	6.75	172	6.50	165	FW
18 x 14	450 x 350	022180-237-3	28.88	730	8.00	203	6.50	165	FW
18 x 16	450 x 300	022180-235-3	28.75	654	8.00	203	6.75	172	FW
20 x 16	500 x 300	022200-237-3	31.88	810	9.13	232	6.75	172	FW
20 x 18	500 x 450	022200-235-3	32.00	813	9.13	232	8.00	203	FW
24 x 18	600 x 450	022240-237-3	53.75	1,365	10.00	254	8.00	203	FW
24 x 20	600 x 500	022240-235-3	46.25	1,175	10.00	254	9.13	232	FW

Van Stone Flanges

ANSI B16.5



Part Numbers

Pipe Size		Hub	Steel Ring	Class
in	mm			
18	450	022180-176-3	022180-179-3	#150
20	500	022200-176-3	022240-179-3	#150
24	600	022240-176-3	022240-179-3	#150

Pipe ⁽³⁾ Size in	A in	B in	X ⁽¹⁾ in	D in	E in	F in	G in	H in	I in	Bolt Torque ft • lbs	O-Ring ⁽²⁾ Size
18	21.54	19.92	7.50	7.50	7.00	2.25	1.25	22.75	25.00	200	469
20	21.60	21.92	8.50	8.50	8.00	2.25	1.25	25.00	27.50	200	471
24	28.00	25.90	10.00	10.00	9.50	2.25	1.38	29.50	32.00	200	475

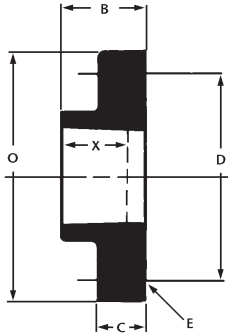
Pipe ⁽³⁾ Size mm	A mm	B mm	X ⁽¹⁾ mm	D mm	E mm	F mm	G mm	H mm	I mm	Bolt Torque n • m	O-Ring ⁽²⁾ Size
450	547	506	191	191	178	57	32	578	635	271	469
500	549	557	216	216	203	57	32	635	700	271	471
600	711	658	254	254	241	57	30	749	813	271	475

⁽¹⁾X dimension is a nominal make-up dimension for drawing layout work only. Do not use for assembly dimensions.

⁽²⁾ 18" - 24" (450- 600 mm) use 60- 70 durometer shore A hardness 1/8" - 1/4" gaskets or 18" - 24" 60- 75 Durometer O-ring optional.

⁽³⁾ Bonded joint requires field fit. Refer to Matched Joint Installation Handbook for instructions

Flanges



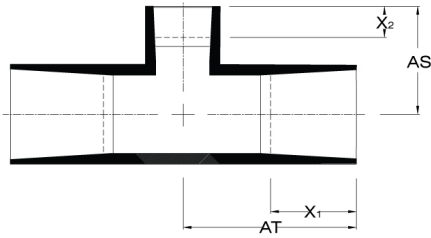
Pipe Size in	Part Numbers	B in	C in	D in	E in	O in	X ⁽¹⁾ in	Bolt ⁽²⁾ Torque ft • lbs	Type
4	022040-172-3	2.63	1.38	7.50	0.75 D-8 Holes	9.00	1.88	30	M
6	022060-172-3	3.00	1.50	9.50	0.88 D-8 Holes	11.00	2.00	30	M
8	022080-172-3	4.00	1.75	11.75	0.88 D-8 Holes	13.50	3.50	100	M
10	022100-172-3	4.75	2.00	14.25	1.00 D-12 Holes	16.00	3.50	100	FW
12	022120-172-3	5.00	2.25	17.00	1.00 D-12 Holes	19.00	3.88	100	FW
14	022140-172-3	5.00	4.38	18.75	1.13 D-12 Holes	20.75	3.00	100	FW
16	022160-172-3	5.00	4.38	21.25	1.13 D-12 Holes	23.31	3.00	100	FW

Pipe Size mm	Part Numbers	B mm	C mm	D mm	E mm	O mm	X ⁽¹⁾ mm	Bolt ⁽²⁾ Torque n • m	Type
100	022040-172-3	67	60	191	19 D-8 Holes	229	48	41	M
150	022060-172-3	76	38	241	22 D-8 Holes	279	51	41	M
200	022080-172-3	102	44	298	22 D-8 Holes	343	89	136	M
250	022100-172-3	121	51	362	25 D-12 Holes	406	89	136	FW
300	022120-172-3	127	57	432	25 D-12 Holes	483	99	136	FW
350	022140-172-3	127	111	476	29 D-12 Holes	527	76	136	FW
400	022160-172-3	127	111	540	29 D-12 Holes	592	76	136	FW

⁽¹⁾ X dimension is a nominal make-up dimension for drawing layout work only. Do not use for assembly dimensions.

⁽²⁾ Use 1/8" thick 60-70 Durometer Shore A hardness full-face gaskets materials.

Reducing Tees



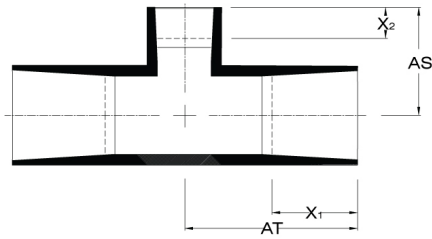
Pipe Size in	Part Number	AT in	AS in	X ₁ ⁽¹⁾ in	X ₂ ⁽¹⁾ in
8 x 6	022080-460-3	11.63	10.25	4.38	2.45
10 x 6	022100-460-3	13.06	11.75	4.13	2.45
10 x 8	022100-480-3	13.06	13.63	4.13	4.38
12 x 6	022120-460-3	13.94	13.25	4.25	2.45
12 x 8	022120-480-3	13.94	15.13	4.25	4.38
12 x 10	022120-490-3	13.94	15.06	4.25	4.13
14 x 6	022140-460-3	19.06	13.75	6.50	2.45
14 x 8	022140-480-3	19.06	15.63	6.50	4.38
14 x 10	022140-490-3	19.06	15.50	6.50	4.13
14 x 12	022140-492-3	19.06	15.94	6.50	4.25
16 x 6	022160-460-3	20.25	14.75	6.75	2.45
16 x 8	022160-480-3	20.25	16.63	6.75	4.38
16 x 10	022160-490-3	20.25	16.56	6.75	4.13
16 x 12	022160-492-3	20.25	16.94	6.75	4.25
16 x 14	022160-494-3	20.25	19.50	6.75	6.50
18 x 6	022180-460-3	22.38	17.80	8.00	2.45
18 x 8	022180-480-3	22.38	19.67	8.00	4.38
18 x 10	022180-490-3	22.38	19.62	8.00	4.13
18 x 12	022180-492-3	22.38	19.98	8.00	4.25
18 x 14	022180-494-3	22.38	20.52	8.00	6.50
18 x 16	022180-496-3	22.38	21.00	8.00	6.75
20 x 6	022200-460-3	26.25	19.80	9.13	2.45
20 x 8	022200-480-3	26.25	21.17	9.13	4.38
20 x 10	022200-490-3	26.25	21.13	9.13	4.13
20 x 12	022200-492-3	26.25	21.48	9.13	4.25
20 x 14	022200-494-3	26.25	22.00	9.13	6.50
20 x 16	022200-496-3	26.25	22.52	9.13	6.75
20 x 18	022200-498-3	26.25	22.77	9.13	8.00

Pipe Size in	Part Number	AT in	AS in	X ₁ ⁽¹⁾ in	X ₂ ⁽¹⁾ in
24 x 6	022240-460-3	28.00	22.30	10.00	2.45
24 x 8	022240-480-3	28.00	23.67	10.00	4.38
24 x 10	022240-490-3	28.00	23.63	10.00	4.13
24 x 12	022240-492-3	28.00	23.98	10.00	4.25
24 x 14	022240-494-3	28.00	24.52	10.00	6.50
24 x 16	022240-496-3	28.00	25.00	10.00	6.75
24 x 18	022240-498-3	28.00	25.27	10.00	8.00
24 x 20	022240-499-3	28.00	27.77	10.00	9.13

All Reducing Tees are filament wound.

⁽¹⁾ X dimension is a nominal make-up dimension for drawing layout work only. Do not use for assembly dimensions.

Reducing Tees



Pipe Size mm	Part Number	AT mm	AS mm	$X_1^{(1)}$ mm	$X_2^{(1)}$ mm
200 x 150	022080-460-3	295	260	111	62
250 x 150	022100-460-3	332	298	105	62
250 x 200	022100-480-3	332	346	105	143
300 x 150	022120-460-3	354	337	108	62
300 x 200	022120-480-3	354	384	108	143
300 x 250	022120-490-3	354	382	108	105
350 x 150	022140-460-3	484	349	265	62
350 x 200	022140-480-3	484	397	265	111
350 x 250	022140-490-3	484	394	265	105
350 x 300	022140-492-3	484	405	265	108
400 x 150	022160-460-3	514	375	172	62
400 x 200	022160-480-3	514	422	172	111
400 x 250	022160-490-3	514	421	172	105
400 x 300	022160-492-3	514	430	172	108
400 x 350	022160-494-3	514	495	172	165
450 x 150	022180-460-3	568	452	203	62
450 x 200	022180-480-3	568	500	203	111
450 x 250	022180-490-3	568	499	203	105
450 x 300	022180-492-3	568	507	203	108
450 x 350	022180-494-3	568	521	203	165
450 x 400	022180-496-3	568	533	203	172
500 x 150	022200-460-3	667	503	232	62
500 x 200	022200-480-3	667	538	232	111
500 x 250	022200-490-3	667	537	232	105
500 x 300	022200-492-3	667	556	232	108
500 x 350	022200-494-3	667	560	232	165
500 x 400	022200-496-3	667	572	232	172
500 x 450	022200-498-3	667	578	232	203

Pipe Size mm	Part Number	AT mm	AS mm	$X_1^{(1)}$ mm	$X_2^{(1)}$ mm
600 x 150	022240-460-3	711	566	254	62
600 x 200	022240-480-3	711	601	254	111
600 x 250	022240-490-3	711	600	254	105
600 x 300	022240-492-3	711	609	254	108
600 x 350	022240-494-3	711	623	254	165
600 x 400	022240-496-3	711	635	254	172
600 x 450	022240-498-3	711	642	254	203
600 x 500	022240-499-3	711	705	254	232

All Reducing Tees are Filament Wound

⁽¹⁾ X dimension is a nominal make-up dimension for drawing layout work only. Do not use for assembly dimensions.

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