

SUBMITTAL DATA
FOR
AUTOMATIC SPRINKLER SYSTEMS

APRIL 22ND, 2025

HOME2 SUITES

**251 NE ALURA WAY
LEE'S SUMMIT, MO 64064**

INSTALLED / DESIGNED BY:

RANGER FIRE, INC.
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SUBMITTAL DATA

FOR

AUTOMATIC SPRINKLER SYSTEMS

INDEX:

- **EQUIPMENT LIST**
- **MANUFACTURER'S DATA SHEETS**
- **HYDRAULIC CALCULATIONS**
- **FLOW TEST**

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EQUIPMENT LIST

<u>DESCRIPTION</u>	<u>MODEL NUMBER</u>	<u>MANUFACTURER</u>
• STEEL PIPE	SCHEDULE 10 & 40	SAHA THAI, AKW, WHEATLAND, BULLMOOSE
• THREADED FITTINGS	DUCTILE IRON CAST IRON WARD MALLEABLE IRON	TITUS, SIGMA SIGMA, ANVIL, ANVIL, WARD
• GROOVED FITTINGS		RELIABLE VICTAULIC
• CPVC PIPE	FLAMEGUARD	SPEARS
• CPVC FITTINGS	FLAMEGUARD	SPEARS
• CPVC HANGERS	070,075,076,077	PHD
• LOOP HANGERS	141	PHD
• ALL-THREAD ROD	20	PHD
• RISER CLAMPS	550	PHD
• CHECK VALVE	G	RELIABLE
• CHECK VALVE	REL-CV	RELIABLE
• BUTTERFLY VALVE	BFG-300	RELIABLE
• BUTTERBALL VALVE	RBV	RELIABLE
• DRY PIPE VALVE	DDX-LP	RELIABLE
• AIR MAINTENANCE DEVICE	A 757	RELIABLE VICTAULIC
• HOSE VALVE	5015	CROKER
• HOSE VALVE CAP & CHAIN	5713	CROKER
• H.V. REDUCER – 2 1/2" X 1 1/2"	7245	CROKER
• STORZ F.D.C.	4"	RELIABLE
• RISER MANIFOLD	COMMERCIAL	RELIABLE
• RESIDENTIAL PENDENT SPRINKLER	F1Res49	RELIABLE
• RESIDENTIAL SIDEWALL SPRINKLER	F1Res44	RELIABLE
• PENDENT SPRINKLER	F1FR56	RELIABLE
• UPRIGHT SPRINKLER	F1FR56	RELIABLE
• SIDEWALL SPRINKLER	F1FR56	RELIABLE
• FLEXIBLE DRY PENDENT	V3506	VICTAULIC
• AUTOMATIC AIR VENT	AAV	RELIABLE
• SPARE SPRINKLER CABINET		RELIABLE
• FLOW SWITCH	VSR	POTTER ELECTRIC
• PRESSURE SWITCH	EPS10, EPS40	SYSTEM SENSOR
• OS&Y TAMPER SWITCH	OSY2	SYSTEM SENSOR
• WATER & AIR PRESSURE GAUGE	UA	RELIABLE
• AUTOMATIC BALL DRIP	C	RELIABLE
• TEST & DRAIN VALVE	TD	RELIABLE
• TRIM VALVES	GV, AGV, BL	RELIABLE
• FIRE CAULK & ASSEMBLIES	SPECSEAL LCI SEALANT	STI

ASTM A53 TYPE E GRADE A and B PIPE



SCOPE

Covers black and hot-dipped galvanized electric resistance welded, Grade A and B. Pipe is intended for mechanical and pressure applications and is acceptable for ordinary uses in steam, water, gas and air lines. SAHATHAI ASTM A53 is UL Listed, sizes 1/2" through 8" nominal. Pipe is suitable for welding, threading, grooving and bending. Pipe is furnished either non-expanded or cold expanded at the option of the manufacturer. Produced to ASTM A53/A53M latest revision.

MANUFACTURE

The weld seam of electric resistance welded pipe in Grade B sizes 4" through 8" nominal, shall be heat treated after welding to a min 1000 °F so that no untempered martensite remains.

HOT-DIP GALVANIZED

The average weight of zinc coating shall be not less than 1.8 oz. per sq. ft. of surface (inside and outside). When galvanized pipe is bent or otherwise fabricated to a degree which causes zinc coating to stretch or compress beyond the limit

CHEMICAL REQUIREMENTS

Composition, max. %

	C	Mn	P	S	Co ^A	Ni ^A	Cr ^A	Mo ^A	V ^A
Grade A	0.25 ^B	0.95	0.05	0.045	0.40	0.40	0.40	0.15	0.08
Grade B	0.30 ^C	1.20	0.05	0.045	0.40	0.40	0.40	0.15	0.08

A : The combination of these five elements shall not exceed 1.00%.

B : For each reduction of 0.01 % below the specified carbon maximum, an increase of 0.06 % manganese above the specified maximum will be permitted up to a maximum of 1.35 %.

C : For each reduction of 0.01 % below the specified carbon maximum, an increase of 0.06 % manganese above the specified maximum will be permitted up to a maximum of 1.65 %.

TENSILE REQUIREMENTS

	Grade A	Grade B
Tensile Strength, min, Psi	48 000	60 000
Yield Strength, min, Psi	30 000	35 000
Elongation in 2"	Refer to A53 Table x 4.1, latest	

BENDING TEST (COLD) FOR NPS 2 and UNDER:

	Degree of Bend	Diameter of Mandrel
Standard	90°	12 x outside pipe diameter
Close Coiling	180°	8 x outside pipe diameter

FLATTENING TEST - NPS 2-1/2 and Greater

Weld located 0/90 degree from line of direction of force.

Stage-1 : For weld ductility unit 2/3 of outside dia of specimen pipe.

Stage-2 : For ductility of steel unit 1/3 of outside dia of specimen pipe.

Stage-3 : Full flattening for testing of laminated and unsou

Rev.16/05/16

HYDROSTATIC TESTING

Hydrostatic test pressures for plain-end pipe are indicated below

NPS	0.188 in.		SCH 40		SCH 80	
	GR.A	GR.B	GR.A	GR.B	GR.A	GR.B
1/2" through 1	-	-	700	-	850	-
1-1/4"	-	-	1200	-	1800	-
1-1/2"	-	-	1200	-	1800	-
2"	-	-	2300	-	2500	-
2-1/2"	-	-	2500	-	2500	-
3	-	-	2220	-	2500	-
3-1/2"	-	-	2030	-	2800	-
4"	1500	1750	1900	2210	2700	2800
5"	1220	1420	1670	1950	2430	2800
6"	1020	1190	1520	1780	2350	2740
8"	780	920	1340	1570	-	-

DIMENSIONS and WEIGHTS

BLACK PLAIN END						
Nominal Size	OD Inches	Wall 0.188 in.	SCH 40		SCH 80	
		Weight Lb./Ft.	Wall Inches	Weight Lb./Ft.	Wall Inches	Weight Lb./Ft.
1/2"	.840	-	.109	.85	.147	1.09
3/4"	1.050	-	.113	1.13	.154	1.48
1"	1.315	-	.133	1.68	.179	2.17
1-1/4"	1.660	-	.140	2.27	.191	3.00
1-1/2"	1.900	-	.145	2.72	.200	3.63
2"	2.375	-	.154	3.66	.218	5.03
2-1/2"	2.875	-	.203	5.80	.276	7.67
3"	3.500	-	.216	7.58	.300	10.26
3-1/2"	4.000	-	.226	9.12	.318	12.52
4"	4.500	8.67	.237	10.79	.337	14.98
5"	5.563	10.80	.237	14.62	.375	20.78
6"	6.625	12.94	.28	18.97	.432	28.57
8"	8.625	16.96	.322	28.58	-	-

PERMISSIBLE VARIATIONS IN WALL THICKNESS

Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified.

PERMISSIBLE VARIATIONS IN OUTSIDE DIAMETER

NPS 1-1/2 and under $\pm .016"$

NPS 2 and over $\pm 1\%$

PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

Pipe shall not vary more than $\pm 10\%$ from the standard specified.

END FINISH

Plain End:

NPS 1-1/2 and smaller: unless otherwise specified on order, end finish shall be at the option of the manufacturer.

NPS 2 and larger: Sch 40 and Sch 80 weights: ends beveled to angle of 30°, +5°, -0° with a root face of 1/16" \pm 1/32".

Threaded: To ANSI Standard B 1.20.1

Couplings: To ASTM Standard A865.

PRODUCT MARKING

Each length of pipe 1/2 NPS and larger is continuously stenciled to show the manufacturer, the grade of pipe (ASTM A53), the kind of pipe (E for electric resistance welded, A,B for Grade A,B) the size, and length. Stencil markings indicate UL Listing Approval for sizes 1/2" through 8" nominal, Bar Coding is acceptable as a supplementary identification method.

All information contained herein is accurate as known at the time of publication.

STS reserves the right to change product specifications without notice and without incurring obligations.

SAHATHAI STEEL PIPE CO.,LTD – 78 MOO 3 POOCHAO ROAD, BANGYAPRAEK, PHRAPRADAENG, SAMUTHPRAKARN 10130 THAILAND

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ASTM A135 GRADE A and B PIPE



SCOPE

Covers two grade of electric resistance welded. steel piping to meet ASTM specifications A135 Grade A and Grade B that is often used in the conveying of gas, vapor, water or other liquids. While the ASTM A135 specification references nominal pipe sizes (NPS), SAHATHAI produces piping sizes up to 8" OD and in wall thicknesses up to 0.148" nominal that meet the requirements called out for in produced to ASTM A135/A135M latest revision.

MANUFACTURE

The weld seam of electric resistance welded pipe in Grade B sizes 3" through 8" nominal, shall be heat treated after welding to a min 1000 °F so that no untempered martensite remains.

CHEMICAL REQUIREMENTS

Composition, max. %

	C	Mn	P	S
Grade A	0.25	0.95	0.035	0.035
Grade B	0.30	1.20	0.035	0.035

TENSILE REQUIREMENTS

	Grade A	Grade B
Tensile Strength, min, MPa	330	415
Yield Strength, min, MPa	205	240
Elongation in 2 in. min, % :		
Wall thickness less than 1/16 in	56t+16.5	148t+14
Tested using a full-size	35	30

FLATTENING TEST

Weld located 0/90 degree from line of direction of force.

Stage-1 : For weld ductility unit 2/3 of outside dia of specimen pipe.

Stage-2 : For ductility of steel unit 1/3 of outside dia of specimen pipe.

Stage-3 : Full flattening for testing of laminated and unsound material.

PERMISSIBLE VARIATIONS IN WALL THICKNESS

Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified.

PERMISSIBLE VARIATIONS IN OUTSIDE DIAMETER

The outside diameter shall not vary more than $\pm 1\%$ from the nominal size specified.

PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

Pipe shall not vary more than $\pm 10\%$ from the standard specified.

DIMENSIONS, WEIGHTS AND TEST PRESSURES

NPS	DN	OD Inches	SCH 10		Test Pressure, psi	
			Wall Inches	Weight Lb./Ft.	Grade A	Grade B
3/4"	20	1.050	.083	.86	2500	-
1"	25	1.315	.109	1.40	2500	-
1-1/4"	32	1.660	.109	1.81	2400	-
1-1/2"	40	1.900	.109	2.09	2100	-
2"	50	2.375	.109	2.64	1700	-
2-1/2"	65	2.875	.120	3.53	1500	-
3"	80	3.500	.120	4.33	1200	1400
3-1/2"	90	4.000	.120	4.97	1000	1200
4"	100	4.500	.120	5.61	900	1100
5"	125	5.563	.134	7.77	850	1000
6"	150	6.625	.134	9.27	750	900
8"	200	8.625	.148	13.41	650	750

END FINISH

Plain End:

Schedule 10: Plain ends pipe for welding beveled to angle of 30°, +5°, -0° with a root face of 1/16" \pm 1/32".

Threaded: To ANSI Standard B 1.20.1

Couplings: To ASTM Standard A865.

PRODUCT MARKING

Each length of pipe 3/8 NPS and larger is continuously stenciled to show the manufacturer, the grade of pipe ASTM A135 (Electric Resistance Welded, A,B for Grade A,B) the size, and length. Bar Coding is acceptable as a supplementary identification method.

AS 1074

SCOPE

This Standard specifies the requirements for threaded steel tubes and tubular, and plain-end steel tube suitable for screwing as specified in AS1722.1, and of DN8 to DN150 inclusive (nominal size). Three wall thickness of tube, designated Light, Medium and Heavy

CHEMICAL REQUIREMENTS

Tubes shall be manufactured from steel which shows, not more than 0.045 percent of sulfur and not more than 0.045 percent of phosphorus. Carbon equivalent as calculated from the following equation shall not exceed 0.4

TENSILE REQUIREMENTS

Minimum Yield Strength 195 MPa
Minimum Tensile Strength 320 MPa
Minimum Elongation in $5.65\sqrt{S_0}$ 20 %

BENDING TEST (COLD) FOR DN 50 AND SMALLER:

	Degree of Bend	Diameter of Mandrel
Ungalvanized	180°	6 x outside pipe diameter
Galvanized	90°	8 x outside pipe diameter

FLATTENING TEST (COLD) FOR LARGER THAN DN 50 :

As a test for quality of the weld, position the weld at 90° from the direction between the plates is less than 75 % of the original outside diameter. No cracks or breaks in the metal elsewhere than in a weld shall occur unit the direction between the plates is less than 60 % of the original outside diameter of the tube

TOLERANCES FOR THICKNESS AND MASS

Thickness

Light welded tubes +unlimited, - 8%
Medium and heavy welded tubes +unlimited, - 10%

Mass

Standard mass for singer tube +10%, -8%

DIMENSIONS OF STEEL TUBE

LIGHT

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.2	13.6	1.8	0.515	0.519
DN 10	16.7	17.1	1.8	0.670	0.676
DN 15	21.0	21.4	2.0	0.947	0.956
DN 20	26.4	26.9	2.3	1.38	1.39
DN 25	33.2	33.8	2.6	1.98	2.00
DN 32	41.9	42.5	2.6	2.54	2.57
DN 40	47.8	48.4	2.9	3.23	3.27
DN 50	59.6	60.2	2.9	4.08	4.15
DN 65	75.2	76.0	3.2	5.71	5.83
DN 80	87.9	88.7	3.2	6.72	6.89
DN 100	113.0	113.9	3.6	9.75	10.0

MEDIUM

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.3	0.641	0.645
DN 10	16.8	17.4	2.3	0.839	0.845
DN 15	21.1	21.7	2.6	1.21	1.22
DN 20	26.6	27.2	2.6	1.56	1.57
DN 25	33.4	34.2	3.2	2.41	2.43
DN 32	42.1	42.9	3.2	3.10	3.13
DN 40	48.0	48.8	3.2	3.57	3.61
DN 50	59.8	60.8	3.6	5.03	5.10
DN 65	75.4	76.6	3.6	6.43	6.55
DN 80	88.1	89.5	4.0	8.37	8.54
DN 100	113.3	114.9	4.5	12.2	12.5
DN 125	138.7	140.6	5.0	16.6	17.1
DN 150	164.1	166.1	5.0	19.7	20.3

HEAVY

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.9	0.765	0.769
DN 10	16.8	17.4	2.9	1.02	1.03
DN 15	21.1	21.7	3.2	1.44	1.45
DN 20	26.6	27.2	3.2	1.87	1.88
DN 25	33.4	34.2	4.0	2.94	2.96
DN 32	42.1	42.9	4.0	3.80	3.83
DN 40	48.0	48.8	4.0	4.38	4.42
DN 50	59.8	60.8	4.5	6.19	6.26
DN 65	75.4	76.6	4.5	7.93	8.05
DN 80	88.1	89.5	5.0	10.3	10.5
DN 100	113.3	114.9	5.4	14.5	14.8
DN 125	138.7	140.6	5.4	17.9	18.4
DN 150	164.1	166.1	5.4	21.3	21.9

SCREW THREADS

The screw thread of all threaded tubes shall comply with AS 1722.1, except as provided below and except that on Light tubes the basic length of useful thread shall be reduce to 80% of the sum of the fitting.

GALVANIZING

Tubes ordered galvanized shall comply with AS1650.
Tubes which are to be threaded shall be galvanized before threading.

LEAK TIGHTNESS TEST

Every tube shall be tested at the manufacturer work by a hydrostatic test at a pressure of 5 MPa maintained for at least 5 s. The tube shall not leak during the test.

PRODUCT MARKING

Tube distinguished by color at one end as follows:
Light tube Brown.
Medium tube Blue.
Heavy tube Red.

All information contained herein is accurate as known at the time of publication.

STS reserves the right to change product specifications without notice and without incurring obligations.

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AS/NZS 1163

SCOPE

This Standard specifies the requirements for cold-formed, electric resistance-welded, carbon steel hollow sections used for structural purposes. It considers three strength grades, with or without impact properties, that are suitable for welding.

CHEMICAL REQUIREMENTS

Composition, max. %

Grade	C	Si	Mn	P	S	Cr	Mo	Al #1	Ti	Micro alloying elements	CE
C250, C250L0	0.12	0.05	0.50	0.03	0.03	0.15	0.10	0.10	0.04	0.03 #2	0.25
C350, C350L0	0.20	0.45	1.6	0.03	0.03	0.30	0.10	0.10	0.04	0.15 #3	0.43
C450, C450L0	0.20	0.45	1.7	0.03	0.03	0.50	0.35	0.10	0.04	0.15 #3	0.43

#1: Limits specified are for soluble or total aluminium.

#2: Applies to Ni, V only. However, Ni greater than 0.010% is not permitted

#3: Applies to Ni, V and Ti only. However, V greater than 0.10% is not permitted

TENSILE REQUIREMENTS

Grade	Yield strength	Tensile strength	Min. Elongation as a proportion of the Gauge length of 5.65√S ₀ , %					
			Circular : d ₀ /t			Rectangular : b/t, d/t		
			≤15	>15≤30	>30	≤15	>15≤30	>30
C250, C250L0	250	320	18	20	22	14	16	18
C350, C350L0	350	430	16	18	20	12	14	16
C450, C450L0	450	500	12	14	16	10	12	14

CHARPY V-NOTCH IMPACT REQUIREMENTS

Grade	Test Temp. °C	Min. Absorbed energy : Joules					
		Size of test piece					
		10 mm x 10 mm		10 mm x 7.5 mm		10 mm x 5 mm	
		Average 3 tests	Individual test	Average 3 tests	Individual test	Average 3 tests	Individual test
C250L0	0	27	20	22	16	18	13
C350L0							
C450L0							

COLD FLATTENING TEST

As a test for quality of the weld, position the weld for OD ≤ 60 mm : 45°, OD > 60 mm : 90° from the direction of force and flatten until the OD is 0.75 of the original outside diameter. No cracks shall occur along the inside or outside surface of the weld.

TOLERANCES FOR SHAPE AND MASS

Characteristic	Circular	Square and Rectangular
External dimensions	±1%, with min. of ±0.5 mm.	±1%, with min. of ±0.5 mm.
Thickness	±10%	±10%
Out-of-roundness	2% for hollow sections having a diameter to thickness ratio not exceeding 100	-
Concavity/convexity	-	Max.0.8% or 0.5 min.
Squareness of sides	-	90°±1°
Twist	-	2+0.5 mm/m length
Straightness	0.20% of total length	0.15% of total length
Mass	Not less than 0.96 times the specified mass on individual length	

EXTERNAL CORNER PROFILE

Perimeter mm.	External corner profile mm.
Equivalent to 50x50 or less	1.5t to 3.0t
Equivalent to greater than 50x50	1.8t to 3.0t

TOLERANCES ON LENGTH

Type of length	Range mm.	Tolerance
Random length	4000 to 6000 with a range of 2000 per order item	10% of section supplied may be below the minimum for the ordered range but not less than 75% of the minimum
Mill (or 'unspecified') length	All	+100 mm. 0
Precision length	< 6000 ≥ 6000 ≤ 10000 > 10000	+5 mm. 0 +15 mm. 0 +5 mm. +1 mm./m. 0

DIMENSIONS and WEIGHTS

Circular hollow section

Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m
17.2	2.3	0.845	60.3	3.6	5.03	76.1	2.3	4.19
	2.9	1.02		4.5	6.19		3.2	5.75
21.3	2.6	1.20		5.4	7.31	88.9	2.6	5.53
	3.2	1.43		3.6	6.44		3.2	6.76
	3.6	1.57	76.1	4.5	7.95		4.8	9.96
	2.6	1.56		5.9	10.2		5.5	11.3
26.9	3.2	1.87		4.0	8.38	101.6	2.6	6.35
	4.0	2.26	88.9	5.0	10.3		3.2	7.77
	3.2	2.41		5.9	12.1		3.2	8.77
33.7	4.0	2.93	101.6	4.0	9.63	114.3	3.6	9.83
	4.5	3.24		5.0	11.9		4.8	13.0
	3.2	3.09		4.5	12.2		6.0	16.0
42.4	4.0	3.79	114.3	5.4	14.5	139.7	3.0	10.1
	4.9	4.53		5.0	16.6		3.5	11.8
	3.2	3.56	139.7	5.4	17.9	165.1	3.0	12.0
48.3	4.0	4.37	165.1	5.0	19.7		3.5	13.9
	5.4	5.71		5.4	21.3	168.3	4.8	19.4
							6.4	25.6
							7.1	28.2
						219.1	4.8	25.4
							6.4	33.6
							8.2	42.6

Square and Rectangular hollow section

Square						Rectangular					
Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m
20	1.6	0.873	65	3.0	5.66	50	1.6	1.63	102	6.0	12.0
	2.0	1.05		4.0	7.23	x20	2.0	1.99		3.5	9.07
	1.6	1.12		5.0	8.75		2.5	2.42		5.0	12.5
25	2.0	1.36		6.0	10.1		3.0	2.83	x76	6.0	14.7
	2.5	1.64		2.5	5.56		1.6	1.75		3.0	8.96
	3.0	1.89		3.0	6.60	50	2.0	2.15	125	4.0	11.6
	1.6	1.38	75	3.5	7.53	x25	2.5	2.62	x75	5.0	14.2
30	2.0	1.68		4.0	8.49		3.0	3.07		2.0	5.57
	2.5	2.05		5.0	10.3		2.0	2.93		2.5	7.53
	3.0	2.38		6.0	12.0	65	2.5	3.60	150	3.0	8.96
	1.6	1.63		3.5	9.06	x35	3.0	4.25	x50	4.0	11.6
35	2.0	1.99	89	5.0	12.5		1.6	2.38		5.0	14.2
	2.5	2.42		6.0	14.6		2.0	2.93		4.0	14.8
	3.0	2.83		2.5	7.53	75	2.5	3.60	150x	5.0	18.2
	1.6	1.88		3.0	8.96	x25	2.0	3.72	100	6.0	21.4
40	2.0	2.31	100	4.0	11.6		2.5	4.58		9.0	30.6
	2.5	2.82		5.0	14.2	75	3.0	5.42	152x	5.0	16.4
	3.0	3.30		6.0	16.7	x50	4.0	6.92	76	6.0	19.4
	4.0	4.09		9.0	23.5		5.0	8.35		4.0	17.9
	1.6	2.38		4.0	14.8		6.0	9.67	200x	5.0	22.1
50	2.0	2.93	125	5.0	18.2		2.0	4.50	100	6.0	26.2
	2.5	3.6		6.0	21.4		2.5	5.56		9.0	37.7
	3.0	4.25		9.0	30.6	100	3.0	6.60			
	4.0	5.35		5.0	22.1		3.5	7.53			
	5.0	6.39	150	6.0	26.2		4.0	8.49			
65	2.0	3.88		9.0	37.7		5.0	10.3			
	2.5	4.78									

All information contained herein is accurate as known at the time of publication.

STS reserves the right to change product specifications without notice and without incurring obligations.

SAHATHAI STEEL PIPE CO.,LTD – 78 MOO 3 POOCHAO ROAD, BANGYAPRAEK, PHRAPRADAENG, SAMUTHPRAKARN 10130 THAILAND

Phone: (662)3859023 ► Fax: (662)3859288 ► EMAIL: export@sahathai.com

BS 1387 : 1985

SCOPE

This Standard specifies the requirements for screwed and socketed steel tubes and tubular, and plain-end steel tube suitable for welding or for screwing to BS 21 pipe threads. This standard is applicable to tube of nominal size DN8 to DN150 in three series of thickness, designated Light, Medium and Heavy

MACHANICAL PROPERTIES

The mechanical properties at room temperature

Chemical composition, Max.				Mechanical properties		
C	Mn	P	S	Tensile strength	Yield strength (Min.)	Elongation on gauge length $L_0 = 5.65\sqrt{S_0}$ (Min.),%
%	%	%	%	MPa	MPa	
0.20	1.20	0.045	0.045	320-460	195	20

BENDING TEST FOR DN 50 AND SMALLER:

	Degree of Bend	Diameter of Mandrel
Ungalvanized	180°	6 x outside pipe diameter
Galvanized	90°	8 x outside pipe diameter

FLATTENING TEST FOR GREATER THAN DN 50 :

As a test for quality of the weld, position the weld at 90° from the direction between the plates is less than 75 % of the original outside diameter. No cracks or breaks in the metal elsewhere than in a weld shall occur unit the direction between the plates is less than 60 % of the original outside diameter of the tube

TOLERANCES FOR THICKNESS AND MASS

Thickness

Light welded tubes +unlimited, - 8%

Medium and heavy welded tubes +unlimited, - 10%

Mass

Standard mass for singer tube +10%, -8%

DIMENSIONS OF STEEL TUBE

LIGHT

Nominal size	Outside diameter, mm		Thicknes s mm	Mass of black tube,Kg/m	
	Min	Max		Plain ends	Screwed and socketed
DN 8	13.2	13.6	1.8	0.515	0.519
DN 10	16.7	17.1	1.8	0.670	0.676
DN 15	21.0	21.4	2.0	0.947	0.956
DN 20	26.4	26.9	2.3	1.38	1.39
DN 25	33.2	33.8	2.6	1.98	2.00
DN 32	41.9	42.5	2.6	2.54	2.57
DN 40	47.8	48.4	2.9	3.23	3.27
DN 50	59.6	60.2	2.9	4.08	4.15
DN 65	75.2	76.0	3.2	5.71	5.83
DN 80	88.9	88.7	3.2	6.72	6.89
DN 100	113.0	113.9	3.6	9.75	10.0

MEDIUM

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.3	0.641	0.645
DN 10	16.8	17.4	2.3	0.839	0.845
DN 15	21.1	21.7	2.6	1.21	1.22
DN 20	26.6	27.2	2.6	1.56	1.57
DN 25	33.4	34.2	3.2	2.41	2.43
DN 32	42.1	42.9	3.2	3.10	3.13
DN 40	48.0	48.8	3.2	3.57	3.61
DN 50	59.8	60.8	3.6	5.03	5.10
DN 65	75.4	76.6	3.6	6.43	6.55
DN 80	88.1	89.5	4.0	8.37	8.54
DN 100	113.3	114.9	4.5	12.2	12.5
DN 125	138.7	140.6	5.0	16.6	17.1
DN 150	164.1	166.1	5.0	19.7	20.3

HEAVY

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.9	0.765	0.769
DN 10	16.8	17.4	2.9	1.02	1.03
DN 15	21.1	21.7	3.2	1.44	1.45
DN 20	26.6	27.2	3.2	1.87	1.88
DN 25	33.4	34.2	4.0	2.94	2.96
DN 32	42.1	42.9	4.0	3.80	3.83
DN 40	48.0	48.8	4.0	4.38	4.42
DN 50	59.8	60.8	4.5	6.19	6.26
DN 65	75.4	76.6	4.5	7.93	8.05
DN 80	88.1	89.5	5.0	10.3	10.5
DN 100	113.3	114.9	5.4	14.5	14.8
DN 125	138.7	140.6	5.4	17.9	18.4
DN 150	164.1	166.1	5.4	21.3	21.9

JOINTS

All screwed tubes and sockets shall be threaded in accordance with BS 21 except as provided below and except that on Light tubes the length of useful thread shall be reduce to 80% of that shown in column 12 of table2 of BS 21:1985.

HOT-DIP ZINC COATING

Where tubes are supplied hot-dip zinc coated, they shell first be thoroughly descaled, washed as necessary and then dipped in a bath of molten zinc, containing not less than 98.5% by mass of zinc.

LEAK TIGHTNESS TEST

Every tube shall be tested at the manufacturer work by a hydrostatic test at a pressure of 5 MPa maintained for at least 5 s. The tube shall not leak during the test.

PRODUCT MARKING

Tubes and tubular shall be marked with the appropriate color as follows:

Light tube	Brown.
Medium tube	Blue.
Heavy tube	Red.

All information contained herein is accurate as known at the time of publication.

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SAHATHAI STEEL PIPE CO.,LTD – 78 MOO 3 POOCHAO ROAD, BANGYAPRAEK, PHRAPRADAENG, SAMUTHPRAKARN 10130 THAILAND

Phone: (662)3859023 ► Fax: (662)3859288 ► EMAIL: export@sahathai.com

EN 10219 : 2006



SCOPE

This Standard specifies the technical delivery conditions for cold formed welded structural hollow section of circular, square or rectangular forms and applies to structural hollow section formed cold without subsequent heat treatment

CHEMICAL REQUIREMENTS

Composition, max. %

Grade	C	Si	Mn	P	S	N ^a
S235JRH	.17	-	1.40	.040	.040	.009
S275J0H	.20	-	1.50	.035	.035	.009
S275J2H	.20	-	1.50	.030	.030	-

a: The max. value for N does not apply if the chemical composition shows a min. total Al content of 0.020% with a min. Al/N ratio of 2:1, or if sufficient other N-binding elements are present. The N-binding elements shall be recorded in Inspection Document.

TENSILE AND IMPACT REQUIREMENTS

Grade	Min. yield strength MPa	Tensile strength MPa	Min. elongation A ^d %	Min. Impact Energy KV ^e J		
				At test temperature		
				Specified thickness mm.		
				≤ 16	< 3	≥ 3 ≤ 40
				≤ 40	-20°C	0°C 20°C
S235JRH ^a	235	360-510	360-510	24 ^b	-	- 27
S275J0H ^a	275	430-580	410-560	20 ^c	-	27 -
S275J2H					27	- -

a : The impact properties are verified only when Option 1.3 is specified.

b : For thicknesses >3 mm and section size D/T <15 (round) and (B+T)/2T <12.5 (square and rectangular) the min. elongation is reduced by2. For thicknesses ≤ 3mm. the min. value for elongation is 17%

c : For section sizes D/T <15 (circular) and (B/T)/2T < 12.5 (square and rectangular) the min. elongation is reduced by2.

d : For thickness <3mm. see 9.2.2

e : For impact properties for reduced section test pieces see 6.7.2

TOLERANCES FOR SHAPE AND MASS

Characteristic	Circular	Square and Rectangular
Outside dimensions	±1%, with min. of ±0.5 mm. And a max. of ± 10 mm.	H,B<100 = ±1%,with min. of ±0.5 mm. 100≤H,B≤200 = ±0.8%
Thickness	T ≤ 5mm = ±10% T > 5 mm. = ± 0.5 mm.	
Out-of-roundness	2% for hollow sections having a diameter to thickness ratio not exceeding 100	-
Concavity/conve xity	-	Max.0.8% with a min. of 0.5 mm.
External corner	-	T ≤ 6mm. = 1.6t to 2.4t 6 < T ≤ 10 mm. = 2.0t to 3.0t T > 10 mm. = 2.4t to 3.6t
Squareness of side	-	90° ±1°
Twist	-	2+0.5 mm/m length
Straightness	0.20% of total length and 3 mm. over any 1m. length	0.15% of total length and 3 mm. over any 1m. length
Mass	± 6 % on individual delivered lengths	

DIMENSIONS and WEIGHTS

Circular hollow section

Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m
21.3	2.0	0.95	76.1	2.0	3.65	114.3	4.0	10.90
	2.5	1.16		2.5	4.54		5.0	13.50
	3.0	1.35		3.0	5.41		6.0	16.00
26.9	2.0	1.23		4.0	7.11		6.3	16.80
	2.5	1.50		5.0	8.77		8.0	21.00
	3.0	1.77		6.0	10.40		3.0	10.10
33.7	2.0	1.56	88.9	6.3	10.80	139.7	4.0	13.40
	2.5	1.92		2.0	4.29		5.0	16.60
	3.0	2.27		2.5	5.33		6.0	19.80
42.4	2.0	1.99		3.0	6.36		6.3	20.70
	2.5	2.46		4.0	8.38		8.0	26.00
	3.0	2.91		5.0	10.3	168.3	3.0	12.20
	4.0	3.79		6.0	12.3		4.0	16.20
48.3	2.0	2.28	101.6	6.3	12.8		5.0	20.10
	2.5	2.82		2.0	4.91		6.0	24.00
	3.0	3.35		2.5	6.11		6.3	25.20
	4.0	4.37		3.0	7.29		8.0	31.60
60.3	5.0	5.34		4.0	9.63	219.1	4.0	21.20
	2.0	2.88		5.0	11.90		5.0	26.40
	2.5	3.56		6.0	14.10		6.0	31.50
	3.0	4.24		6.3	14.80		6.3	33.10
	4.0	5.55	114.3	2.5	6.89		8.0	41.60
	5.0	6.82		3.0	8.23			

Square and Rectangular hollow section

Square

Rectangular

Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m
20	2.0	1.05	80	3.0	7.07	40x20	2.0	1.68	200x100	6.3	27.40
25	2.0	1.36		4.0	9.22		2.5	2.03		8.0	33.90
	2.5	1.64		5.0	11.30		3.0	2.36		10.0	41.30
30	3.0	1.89	90	3.0	8.01	50x30	2.0	2.31		12.0	47.10
	2.0	1.69		4.0	10.50		2.5	2.82		12.5	48.70
	2.5	2.03		5.0	12.80		3.0	3.30			
40	3.0	2.36	100	3.0	8.96	60x40	2.0	2.93			
	2.0	2.31		4.0	11.70		2.5	3.60			
	2.5	2.82		5.0	14.40		3.0	4.25			
50	3.0	3.30	150	4.0	18.00	100x50	2.5	5.56			
	2.0	2.93		5.0	22.30		3.0	6.60			
	2.5	3.60		6.0	26.40		4.0	8.59			
	3.0	4.25		6.3	27.40	120x80	5.0	10.50			
60	4.0	5.45		8.0	33.90		4.0	11.70			
	2.0	3.56		10.0	41.30		5.0	14.90			
	3.0	5.19		12.0	47.10	150x100	4.0	18.00			
	4.0	6.71		12.5	48.70		5.0	22.30			
	5.0	8.13				200x100	6.0	26.40			

All information contained herein is accurate as known at the time of publication.

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SAHATHAI STANDARD MAKE TO ORDER ; MTO

SCOPE

This Standard specifies the technical delivery conditions for cold formed welded structural hollow section of circular, square or rectangular forms and applies to structural hollow section formed cold without subsequent heat treatment. Produced to SAHATHAI

MANUFACTURE

The weld seam of electric resistance welded pipe in Circular Hollow sections sizes 1/2" to 2-1/2", square hollow sections size 1"x1" to 4"x4" and rectangular hollow sections size 2"x1" to 6"x2".

HOT-DIP GALVANIZED

The average weight of zinc coating shall be not less than 300 g/m² of surface (inside and outside). When galvanized pipe is bent or otherwise fabricated to a degree which causes zinc coating to stretch or compress beyond the limit

CHEMICAL REQUIREMENTS

Composition, max. %

C	Mn	P	S
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

TENSILE REQUIREMENTS

Tensile Strength, min, MPa	330
Yield Strength, min, MPa	N/A
Elongation in 2" min, %	15

BENDING TEST FOR CHS SIZE 2 and UNDER:

	Degree of Bend	Diameter of Mandrel
Standard	90°	6 x outside pipe diameter
Close Coiling	180°	8 x outside pipe diameter

FLATTENING TEST FOR CHS SIZE 2-1/2:

As a test for quality of the weld, position the weld at 90° from the direction between the plates is less than 2/3 D of the original outside diameter. No cracks or breaks

DIMENSIONS and WALL THICKNESS

CHS		SHS		RHS	
SIZE	Thickness (mm.)	SIZE	Thickness (mm.)	SIZE	Thickness (mm.)
1/2"	1.4 - 2.0	1"	1.2 - 2.0	2" x 1"	1.2 - 2.0
3/4"		1-1/4"		3" x 1-1/2"	
1-1/4"		1-1/2"		4" x 2"	
1-1/2"		2"		5" x 3"	2.0 - 3.0
2"	2.0 - 2.6	3"	2.0 - 3.0	6" x 2"	
2-1/2"		4"			

PERMISSIBLE VARIATIONS IN WALL THICKNESS

Minimum wall thickness at any point shall not be more than 0.1 mm. under nominal wall thickness specified.

PERMISSIBLE VARIATIONS IN OUTSIDE DIAMETER

CHS +3 mm., -2 mm.

SHS, RHS ± 3 mm.

PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

Pipe shall not vary more than ± 10% from the standard specified.

HYDROSTATIC TESTING

Every tube galvanized threaded and threading; GTT shall be tested at the manufacturer work by a hydrostatic test at a pressure of 5 MPa maintained for at least 5 s. The tube shall not leak during the test.

Threaded: To ANSI Standard B 1.20.1

SUBMITTAL SHEET



www.akwsupply.com

TEL: 714-919-7814 FAX: 714-464-5474

Job Name: _____

Contractor: _____

Location: _____

Quantity: _____

Engineer: _____

Date: _____

Steel Pipes SCH 10

Features

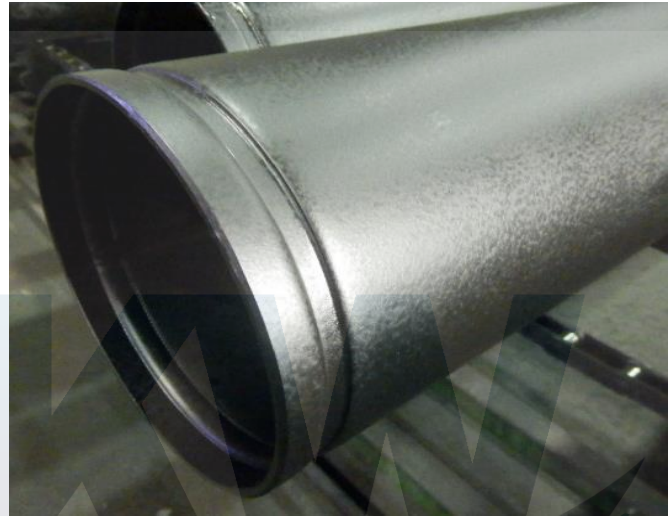
- * Manufactured According to ASTM A53
- * Sch 10, ERW, Grade A, Type E
- * Plain Ends or Grooved Ends
- * Black Color
- * Paint Coating
- * UL List & FM Approved

Chemical Composition (Max. %)

C	Mn	P	S
0.25	0.95	0.05	0.045

Tensile Strength (Min. Psi)

Yield	Tensile
30,000	48,000



Specification

Pipe Brand: STS

Country of Origin: Thailand

Nominal Pipe Size: 1-1/4" to 6"

Length: 21 Feet



Size	O.D.	I.D.	Lbs/Ft	Test Pressure	PCS/Bundle
1-1/4"	1.660"	1.442"	1.810	1,000 Psi	61
1-1/2"	1.900"	1.682"	2.090	1,000 Psi	61
2"	2.375"	2.157"	2.640	1,000 Psi	37
2-1/2"	2.875"	2.635"	3.530	1,000 Psi	19
3"	3.500"	3.260"	4.340	1,000 Psi	19
4"	4.500"	4.260"	5.620	1,200 Psi	19
6"	6.625"	6.357"	9.300	1,000 Psi	7

AKW Supply Co. product specifications and dimensions are approximate and are provided for reference only. It's the user's responsibility to observe and adapt such precautions as may be advisable for the protection of personnel and property in the handling and use of our products. AKW Supply Co. reserves the right to change or modify product design, construction, specification, model number or material without prior notice and without incurring any obligation to make such changes on AKW Supply Co. previously sold.

SUBMITTAL SHEET



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TEL: 714-919-7814 FAX: 714-464-5474

Job Name: _____

Contractor: _____

Location: _____

Quantity: _____

Engineer: _____

Date: _____

Steel Pipes SCH 40

Features

- * Manufactured According to ASTM A53
- * Sch 40, ERW, Grade A, Type E
- * Plain Ends or Threaded & Coupled
- * Black or Galvanized
- * Varnished Coating



Chemical Composition (Max. %)

C	Mn	P	S	Residual
0.25	0.95	0.05	0.045	Note 1

Note 1: Residual Elements Cu (0.4), Ni (0.4), Cr (0.4), Mo (0.15), and V (0.08) Combined Shall Not Exceed 1%.

Tensile Strength (Min. Psi)

Yield	Tensile
30,000	48,000



Specification

Brand: STS

Country of Origin: Thailand

Nominal Pipe Size: 1/2" to 2" NPT

Length: 10 Feet to 21 Feet

Size	O.D.	I.D.	Lbs/Ft	Test Pressure	PCS/Bundle
1/2"	0.840"	0.622"	0.850	700 Psi	127
3/4"	1.050"	0.824"	1.130	700 Psi	91
1"	1.315"	1.049"	1.680	700 Psi	61
1-1/4"	1.660"	1.380"	2.270	1,200 Psi	61
1-1/2"	1.900"	1.610"	2.720	1,200 Psi	61
2"	2.375"	2.067"	3.660	2,300 Psi	37

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Fire Sprinkler Pipe

Schedule 10

Submittal Data Sheet



FM Approved and Fully Listed Sprinkler Pipe

Wheatland Tube's Schedule 10 steel fire sprinkler pipe is FM Approved and UL® and C-UL Listed.

Wheatland Tube is the only manufacturer with FM Approval on 10 NPS Schedule 10 steel fire sprinkler pipe.

Approvals and Specifications

Schedule 10 meets or exceeds the following standards:

- ASTM A135, Type E, Grade A (Schedule 10, 1-10 NPS)
- NFPA® 13 and NFPA 14

Manufacturing Protocols

Schedule 10 is subjected to the toughest possible testing protocols to ensure the highest quality and long-lasting performance.

Finishes and Coatings

Schedule 10 can be ordered in black or hot-dip galvanized to meet FM/UL requirements for dry systems that meet the zinc coating specifications of ASTM A53 or A795.

Schedule 10 receives a proprietary mill coating to ensure a clean, corrosion-resistant surface that outperforms and outlasts standard lacquer coatings. This coating allows the pipe to be easily painted without special preparation.

Every black steel Schedule 10 pipe also receives our MIC SHIELD™ antimicrobial coating to limit corrosion from microbes on the interior of the pipe.

Product Marking

Each length of Wheatland fire sprinkler pipe is continuously stenciled to show the manufacturer, type of pipe, grade, size and length. Bar coding is acceptable as a supplementary identification method.

SUBMITTAL INFORMATION

PROJECT:

CONTRACTOR:

DATE:

ENGINEER:

SPECIFICATION REFERENCE:

SYSTEM TYPE:

LOCATIONS:

COMMENTS:

☐ BLACK

☐ HOT-DIP GALVANIZED



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Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

Fire Sprinkler Pipe

Schedule 10

Submittal Data Sheet



SCHEDULE 10 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H ₂ O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.097	27.9	0.109	2.77	1.405	1.814	70	2065	2360	2459	11.4
1¼	1.660	42.2	1.442	36.6	0.109	2.77	1.807	2.514	61	2315	2645	2756	7.3
1½	1.900	48.3	1.682	42.7	0.109	2.77	2.087	3.049	61	2673	3055	3183	5.8
2	2.375	60.3	2.157	54.8	0.109	2.77	2.640	4.222	37	2051	2344	2442	4.7
2½	2.875	73.0	2.635	66.9	0.120	3.05	3.354	5.895	30	2226	2544	2651	3.5
3	3.500	88.9	3.260	82.8	0.120	3.05	4.336	7.949	19	1730	1977	2060	2.6
4	4.500	114.3	4.260	108.2	0.120	3.05	5.619	11.789	19	2242	2562	2669	1.6
5	5.563	141.3	5.295	134.5	0.134	3.40	7.780	17.309	13	2124	2427	2529	1.5
6	6.625	168.3	6.357	161.5	0.134	3.40	9.298	23.038	10	1953	2232	2325	1.0
8	8.625	219.1	8.249	209.5	0.188	4.78	16.960	40.086	7	2493	2849	2968	1.7
10**	10.750	273.0	10.374	263.5	0.188	4.78	21.230	57.803	2	892	1019	1062	—

* Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).

** 10 NPS Schedule 10 is FM Approved but not UL Listed.



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Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

WFS-072921

Fire Sprinkler Pipe

Schedule 40

Submittal Data Sheet



FM Approved and Fully Listed Sprinkler Pipe

Wheatland Tube's Schedule 40 steel fire sprinkler pipe is FM Approved and UL® and C-UL Listed.

Approvals and Specifications

Schedule 40 meets or exceeds the following standards:

- ASTM A795, Type E, Grade A (Schedule 40, 1-2 NPS)
- ASTM A53, Type E, Grade B (Schedule 40, 2-8 NPS)
- ASTM A53, Type F, Grade A (Schedule 40, 1-4 NPS)
- NFPA® 13 and NFPA 14

Manufacturing Protocols

Schedule 40 is subjected to the toughest possible testing protocols to ensure the highest quality and long-lasting performance.

Finishes and Coatings

Schedule 40 can be ordered in black or hot-dip galvanized to meet FM/UL requirements for dry systems that meet the zinc coating specifications of ASTM A53 or A795.

Schedule 40 receives a proprietary mill coating to ensure a clean, corrosion-resistant surface that outperforms and outlasts standard lacquer coatings. This coating allows the pipe to be easily painted without special preparation.

Every black steel Schedule 40 pipe also receives our MIC SHIELD™ antimicrobial coating to limit corrosion from microbes on the interior of the pipe.

Product Marking

Each length of Wheatland fire sprinkler pipe is continuously stenciled to show the manufacturer, type of pipe, grade, size and length. Bar coding is acceptable as a supplementary identification method.

SUBMITTAL INFORMATION

PROJECT:

CONTRACTOR:

DATE:

ENGINEER:

SPECIFICATION REFERENCE:

SYSTEM TYPE:

LOCATIONS:

COMMENTS:

☐ BLACK

☐ HOT-DIP GALVANIZED



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Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

Fire Sprinkler Pipe

Schedule 40

Submittal Data Sheet



SCHEDULE 40 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT.	WT./FT. H ₂ O FILLED	PCS./LIFT	WT./LIFT 21'	WT./LIFT 24'	WT./LIFT 25'	UL
	in.	mm	in.	mm	in.	mm	lbs.	lbs.		lbs.	lbs.	lbs.	CRR*
1	1.315	33.4	1.049	26.6	0.133	3.38	1.68	2.055	70	2470	2822	2940	1.000
1¼	1.660	42.2	1.380	35.1	0.140	3.56	2.27	2.922	51	2431	2778	2894	1.000
1½	1.900	48.3	1.610	40.9	0.145	3.68	2.72	3.602	44	2513	2872	2992	1.000
2	2.375	60.3	2.067	52.5	0.154	3.91	3.66	5.109	24	1845	2108	2196	1.000
2½	2.875	73.0	2.469	62.7	0.203	5.16	5.80	7.871	20	2436	2784	2900	1.000
3	3.500	88.9	3.068	77.9	0.216	5.49	7.58	10.783	13	2069	2365	2464	1.000
3½	4.000	101.6	3.548	90.1	0.226	5.74	9.12	13.400	10	1915	2189	2280	1.000
4	4.500	114.3	4.026	102.3	0.237	6.02	10.80	16.311	10	2268	2592	2700	1.000
5	5.563	141.3	5.047	158.2	0.258	6.55	14.63	23.262	7	2151	2458	2560	1.000
6	6.625	168.3	6.065	154.1	0.280	7.11	18.99	31.498	5	1994	2279	2374	1.000
8**	8.625	219.1	7.981	202.7	0.322	8.18	28.58	50.240	5	3001	3430	3573	1.000

* Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VI-ZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).

** 8 NPS Schedule 40 is FM Approved but not UL Listed.



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Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

WFS-072921

APPROVALS AND SPECIFICATIONS

- ASTM A135, Grade A
- ASTM A795, Type E, Grade A
- Pressure rated to 300 psi
- Underwriters Laboratories—United States of America
- Underwriters Laboratories—Canada
- Factory Mutual
- NFPA-13
- NFPA-13R
- NFPA-14
- CIVIL DEFENSE APPROVAL—United Arab Emirates
- Made in the United States of America
- UL, ULC & FM listed for roll-groove, plain-end and welded joints for wet, dry, preaction and deluge sprinkler systems.
- LEED v4 Certified

FINISHES AND COATINGS

- Schedule 10 & 40 Sprinkler Pipe receives an OD mill coating of water-based paint which has corrosion protection expected with a painted carbon steel product, i.e. it would be expected to resist corrosion for an extended and indefinite period in a clean and dry environment and, as environmental conditions deteriorate, the corrosion protection would also diminish.
- Schedule 10 & 40 Sprinkler Pipe (black) receives an ID mill coating of Eddy Guard II MIC preventative coating. EG2 has been tested at independent laboratories to resist bacterial growth and maintain minimal bacterial count after multiple flushes (25) of the pipe.
- Schedule 10 & 40 Sprinkler Pipe when Hot Dip Galvanized by ASTM A123 and supplied by Bull Moose Tube is UL listed and FM approved.

PRODUCT IDENTIFICATION

- Every length of Bull Moose fire sprinkler pipe features large, easy-to-read, continuous stenciling, clearly identifying the manufacturer, type of pipe, size, and length.

Nominal Pipe Size (inches)		1	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
Schedule 10	O.D. (in)	1.315	1.660	1.900	2.375	2.875	3.500	4.500	6.625	8.625
	I.D. (in)	1.097	1.442	1.682	2.157	2.635	3.260	4.260	6.357	8.249
	Empty Weight (lb/ft)	1.410	1.810	2.090	2.640	3.530	4.340	5.620	9.290	16.940
	Water Filled Weight (lb/ft)	1.800	2.518	3.053	4.223	5.893	7.957	11.796	23.038	40.086
	C.R.R.*	15.27	9.91	7.76	6.27	4.92	3.54	2.50	1.158	1.805
	Pieces per Lift	91	61	61	37	30	19	19	10	7
Schedule 40	O.D. (in)	1.315	1.660	1.900	2.375	2.875	3.500	4.500		
	I.D. (in)	1.049	1.380	1.610	2.067	2.469	3.068	4.026		
	Empty Weight (lb/ft)	1.680	2.270	2.720	3.660	5.800	7.580	10.800		
	Water Filled Weight (lb/ft)	2.055	2.918	3.602	5.114	7.875	10.783	16.316		
	C.R.R.*	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
	Pieces per Lift	70	51	44	30	30	19	19		

*Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY **Not Eddy Guard II treated/Not produced by BMT

SUBMITTAL INFORMATION



Project

Contractor

Engineer

Specification Reference

Date System Type

Locations

Comments

☐ Schedule 10 - Black
 ☐ Schedule 10 - Hot Dip Galvanized
 ☐ Schedule 40 - Black
 ☐ Schedule 40 - Hot Dip Galvanized

SUBMITTAL SHEET



www.akwsupply.com

TEL: 714-919-7814 FAX: 714-464-5474

Job Name: _____

Contractor: _____

Location: _____

Quantity: _____

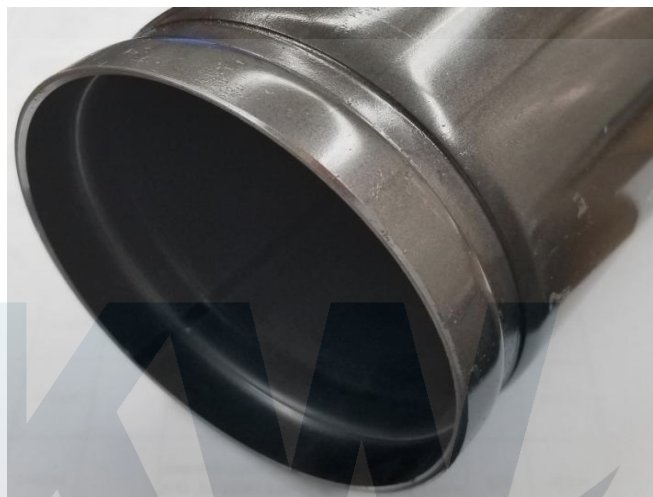
Engineer: _____

Date: _____

Steel Pipe Super Flow

Features

- * Manufactured According to ASTM A795
- * ERW, Grade A, Type E
- * Meets NFPA 13
- * Plain Ends or Grooved Ends
- * Corrosion Resistant Surface
- * Mill Lacquer Coated
- * 300 PSI Rated
- * UL List & FM Approved



Specification

Pipe Mill: MS Pipe

Country of Origin: South Korea

Nominal Pipe Size: 1-1/4" to 4"

Length: 21 Feet

Size	O.D.	I.D.	Empty		Pcs/Lft	CRR*
			Lbs/Ft	WFW**		
1-1/4"	1.660"	1.494"	1.399	2.194	61	3.70
1-1/2"	1.900"	1.710"	1.833	2.875	61	4.42
2"	2.375"	2.185"	2.315	4.016	37	3.58
2-1/2"	2.875"	2.709"	2.477	5.092	30	1.37
3"	3.500"	3.320"	3.281	7.207	19	1.27
4"	4.500"	4.298"	4.750	11.330	19	1.10

*CRR=Corrosion Resistance Ratio Calculated Using UL CRR Formula Under UL Category VIZY.

This Ratio Value Is Used to Measure the Ability of A Pipe to Withstand Corrosion.

**WFW=Water Filled Weight



AKW Supply Co. product specifications and dimensions are approximate and are provided for reference only. It's the user's responsibility to observe and adapt such precautions as may be advisable for the protection of personnel and property in the handling and use of our products. AKW Supply Co. reserves the right to change or modify product design, construction, specification, model number or material without prior notice and without incurring any obligation to make such changes on AKW Supply Co. previously sold.

Dyna-Flow®

High Strength Steel Pipe

- Exceptional hydraulics
- Lightweight and easy to install
- Available factory roll grooved
- ABFII coated ID
- UL and cUL listed
- FM approved

➤ The original high-strength light wall sprinkler pipe with superior hydraulics.

Dyna-Flow® is the “original” high-strength light wall sprinkler pipe. With outstanding hydraulic capabilities, Dyna-Flow is recognized as the most popular alternative to Schedule-10 pipe. Lightweight and easy to cut, Dyna-Flow is a valuable addition to any fire protection system.

With an inside diameter (ID) of up to 11% larger than Schedule-40 and up to 7% larger than Schedule -10, Dyna-Flow pipe hydraulics are exceptional. Larger ID's enable Dyna-Flow and related components to be down-sized within the system, increasing the potential for job cost savings. For complete Hazen Williams charts, refer to “Dyna-Flow Hydraulic Data Tables”.

Dyna-Flow pipe has metallurgical properties that provide excellent fabrication characteristics for end prep finishes, welding and roll grooving. There are no special processes or equipment needed for fabrication and installation

Dyna-Flow Specifications				
NPS In; mm	Nominal I.D. In; mm	Wt. Lbs/Ft; kg/m	Wt. (H2O Filled) Lbs/Ft; kg/m	CRR Unthreaded
1"	1.191	0.830	1.31	2.41
25	30.3	1.2	1.95	—
1¼"	1.536	1.059	1.87	1.55
32	39.0	1.6	2.78	—
1½"	1.728	1.667	2.71	3.44
40	43.9	2.5	4.03	—
2"	2.203	2.104	3.79	2.78
50	56.0	3.1	5.64	—
2½"	2.703	2.564	5.10	1.60
65	68.7	3.8	7.59	—
3"	3.314	3.387	7.18	1.48
80	84.2	5.0	10.69	—
4"	4.310	4.473	10.86	1.00
90	109.5	6.7	16.16	—



➤ Superior Coating

Dyna-Flow products are coated with an environmentally approved and specially formulated modified-acrylic or water-based coating. This durable coating is paintable and acts as an excellent primer while resisting weather and UV degradation from outdoor storage.

The internal surface of all black Allied Tube & Conduit Fire Sprinkler pipe products up to 4.500" in diameter is coated with our new Antibacterial Formula, “ABFII”. In scientific laboratory tests, ABFII proved to have superior resistance to microbial colonization of pipe walls, thereby inhibiting or possibly preventing the onset of Microbiologically Influenced Corrosion (MIC) upon installation and the first 25 flushes of the fire sprinkler system.*

➤ American Made

Meets “Buy American” requirement and is available through distributors in the USA, Canada, Mexico and Latin America.

➤ Specifications & Approvals

Dyna-Flow pipe is manufactured to meet ASTM A-795 Type E, Grade A and is in compliance with NFPA-13 and NFPA-14. All sizes of Dyna-Flow are UL and cUL listed and FM approved.

Dyna-Flow is UL and cUL listed for use with roll grooved, plain-end and welded joints for wet, dry, pre-action and deluge systems. It is FM approved for roll grooved, plain end and welded joints for wet systems. Dyna-Flow is available “hot-dip” galvanized** and has been specifically approved by FM for dry system uses. Dyna-Flow complies with NFPA 13 and is rated at 300 psi working pressure.

* See ABFII warranty

** must be ordered in 10 bundle increments

Dyna-Thread®

Full Line Schedule 40 Replacement

- Widely accepted substitute for Schedule 40
- No thread gauge warnings
- Standard hanger spacing
- ABFII coated ID
- UL and cUL listed
- FM approved

➤ Combining the safety and longevity of Sch-40 with quality and hydraulic advantages.

Dyna-Thread® pipe is the full line Schedule 40 replacement with the same CRR of Schedule 40, 1.00, providing Dyna-Thread with the same life expectancy as Sch-40. With outstanding hydraulic capabilities, Dyna-Thread is a more widely accepted product substitution than lightwall threadable pipe when Sch-40 is specified.

Dyna-Thread's inside diameter is up to 3.6% larger than Sch-40 and provides improved hydraulics. When used in combination with Dyna-Flow pipe, downsizing of pipe and related components often occurs, thereby reducing costs.

The consistent quality of steel used to make Dyna-Thread facilitates smooth threading and lower maintenance costs. Increased strength and lighter weight allows Dyna-Thread to reduce installation fatigue and makes it ideal for retro-fit applications.

Dyna-Thread Specifications					
NPS	Nominal I.D.	Wt.	Wt. (H2O Filled)	CRR	CRR
In; mm	In; mm	Lbs/Ft; kg/m	Lbs/Ft; kg/m	Unthreaded	Threaded
1"	1.080	1.330	1.75	11.39	1.00
25	27.4	2.0	2.60	—	—
1¼"	1.408	1.870	2.54	9.50	1.00
32	35.8	2.8	3.78	—	—
1½"	1.639	2.290	3.22	9.14	1.00
40	41.6	3.4	4.79	—	—
2"	2.104	3.050	4.57	8.41	1.00
50	53.4	4.5	6.80	—	—



➤ Superior Coating

Dyna-Thread products are coated with an environmentally approved and specially formulated modified-acrylic or water-based coating. This durable coating is paintable and acts as an excellent primer while resisting weather and UV degradation from outdoor storage.

The internal surface of all black Allied Tube & Conduit Fire Sprinkler pipe products up to 4.500" in diameter is coated with our new Antibacterial Formula, "ABFII". In scientific laboratory tests, ABFII proved to have superior resistance to microbial colonization of pipe walls, thereby inhibiting or possibly preventing the onset of Microbiologically Influenced Corrosion (MIC) upon installation and the first 25 flushes of the fire sprinkler system.*

➤ American Made

Meets "Buy American" requirement and is available through distributors in the USA, Canada, Mexico and Latin America.

➤ Specifications & Approvals

Dyna-Thread pipe is manufactured to meet ASTM A-135, Grade A, is in compliance with NFPA-13 and all sizes are rated at 300 psi working pressure. Dyna-Thread is UL and cUL listed for wet, dry deluge and pre-action sprinkler systems and FM approved for use in wet systems. Dyna-Thread can be hot dip galvanized** to meet FM requirements for use in dry systems. Dyna-Thread is approved for all threaded couplings and welded outlets and is suitable for all roll-grooved and plain end fittings.

* See ABFII warranty

** must be ordered in 10 bundle increments

APPROVALS AND SPECIFICATIONS

- ASTM A135, Grade A
- ASTM A795, Type E, Grade A
- Pressure rated to 300 psi
- Underwriters Laboratories—United States of America
- Underwriters Laboratories—Canada
- Factory Mutual
- NFPA-13
- NFPA-13R
- NFPA-14
- CIVIL DEFENSE APPROVAL—United Arab Emirates
- Made in the United States of America
- UL, ULC & FM listed for roll-groove, plain-end and welded joints for wet, dry, preaction and deluge sprinkler systems.
- LEED v4 Certified

FINISHES AND COATINGS

- Eddy Flow Sprinkler Pipe receives an OD mill coating of water-based paint which has corrosion protection expected with a painted carbon steel product, i.e. it would be expected to resist corrosion for an extended and indefinite period in a clean and dry environment and, as environmental conditions deteriorate, the corrosion protection would also diminish.
- Eddy Flow Sprinkler Pipe (black) receives an ID mill coating of Eddy Guard II MIC preventative coating. EG2 has been tested at independent laboratories to resist bacterial growth and maintain minimal bacterial count after multiple flushes (25) of the pipe.
- Eddy Flow Sprinkler Pipe when Hot Dip Galvanized by ASTM A123 and supplied by Bull Moose Tube is UL listed and FM approved.

PRODUCT IDENTIFICATION

- Every length of Bull Moose fire sprinkler pipe features large, easy-to-read, continuous stenciling, clearly identifying the manufacturer, type of pipe, size, and length.

Nominal Pipe Size (inches)	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
O.D. (in)	1.660	1.900	2.375	2.875	3.500	4.500
I.D. (in)	1.530	1.728	2.203	2.705	3.334	4.310
Empty Weight (lb/ft)	1.222	1.844	2.330	2.809	3.361	4.968
Water Filled Weight (lb/ft)	2.019	2.860	3.982	5.299	7.144	11.290
C.R.R.*	1.98	3.44	2.78	1.66	1.00	1.00
Pieces per Lift	61	61	37	30	19	19

*Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY



SUBMITTAL INFORMATION

Project

Contractor

Engineer

Specification Reference

Date System Type

Locations

Comments

☐ Eddy Flow - Black ☐ Eddy Flow - Hot Dip Galvanized

APPROVALS AND SPECIFICATIONS

- ASTM A135, Grade A
- ASTM A795, Type E, Grade A
- Pressure rated to 300 psi
- Underwriters Laboratories—United States of America
- Underwriters Laboratories—Canada
- Factory Mutual
- NFPA-13
- NFPA-13R
- NFPA-14
- CIVIL DEFENSE APPROVAL—United Arab Emirates
- Made in the United States of America
- UL, ULC & FM listed for roll-groove, plain-end and welded joints for wet, dry, preaction and deluge sprinkler systems.
- LEED v4 Certified

FINISHES AND COATINGS

- Eddythread Sprinkler Pipe receives an OD mill coating of water-based paint which has corrosion protection expected with a painted carbon steel product, i.e. it would be expected to resist corrosion for an extended and indefinite period in a clean and dry environment and, as environmental conditions deteriorate, the corrosion protection would also diminish.
- Eddythread Sprinkler Pipe (black) receives an ID mill coating of Eddy Guard II MIC preventative coating. EG2 has been tested at independent laboratories to resist bacterial growth and maintain minimal bacterial count after multiple flushes (25) of the pipe.
- Eddythread Sprinkler Pipe when Hot Dip Galvanized by ASTM A123 and supplied by Bull Moose Tube is UL listed and FM approved.

PRODUCT IDENTIFICATION

- Every length of Bull Moose fire sprinkler pipe features large, easy-to-read, continuous stenciling, clearly identifying the manufacturer, type of pipe, size, and length.

Nominal Pipe Size (inches)	1	1-1/4"	1-1/2"	2"
O.D. (in)	1.295	1.650	1.900	2.375
I.D. (in)	1.083	1.418	1.654	2.123
Empty Weight (lb/ft)	1.461	2.070	2.547	3.308
Water Filled Weight (lb/ft)	1.860	2.754	3.468	4.842
C.R.R.*	1.00	1.00	1.00	1.00
Pieces per Lift	70	51	44	30

*Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY



SUBMITTAL INFORMATION

Project	<input type="text"/>		
Contractor	<input type="text"/>		
Engineer	<input type="text"/>		
Specification Reference	<input type="text"/>		
Date	<input type="text"/>	System Type	<input type="text"/>
Locations	<input type="text"/>		
Comments	<input type="text"/>		

☐ Eddythread - Black
 ☐ Eddythread - Hot Dip Galvanized

TITUS DUCTILE IRON FITTINGS

- Fittings are manufactured in accordance with ASME B16.3
- Bushings and Plugs are manufactured in accordance with ASME B16.4
- Unions are manufactured in accordance with ASME B16.39
- Threads NPT per ASME B1.20.1
- Available in 1/2" - 2 1/2"
- Fittings are 100% air tested
- For current listing/approval details contact a Titus representative



CAST IRON	MALLEABLE IRON	DUCTILE IRON
Available in sizes from 1" to 2½", Class 125 Standard	Available in sizes from 1/8" to 6", Class 150	Available in sizes from 1/2" to 2", Class 150 Standard DI
UL / FM Approved at 300 psi	UL / FM Approved at 300 psi	UL / FM Approved at 500 psi
Air Tested	Air Tested	Air Tested

TITUS DUCTILE IRON FITTINGS - CONTINUED

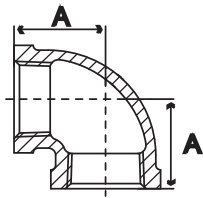


FIG. ADBL90 ELBOW 90°							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1/2	1.12			0.25	50	200	UL, FM
1	1.50			0.57	20	60	UL, FM
1 1/4	1.75			0.97	20	40	UL, FM
1 1/2	1.94			1.43	15	30	UL, FM
2	2.25			1.93	8	16	UL, FM
2 1/2	2.70			2.89	12	12	UL, FM

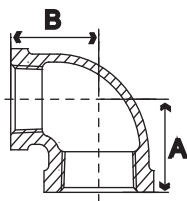


FIG. ADBRL REDUCING ELBOWS							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1 X 1/2	1.26	1.40		0.43	25	100	UL, FM
1 X 3/4	1.37	1.45		0.56	50	100	UL, FM
1 1/4 X 1/2	1.34	1.53		0.61	20	80	UL, FM
1 1/4 X 3/4	1.45	1.62		0.71	15	60	UL, FM
1 1/4 X 1	1.58	1.67		0.73	10	40	UL, FM
1 1/2 X 1/2	1.52	1.75		0.71	15	60	UL, FM
1 1/2 X 3/4	1.52	1.75		1.01	10	40	UL, FM
1 1/2 X 1	1.65	1.80		0.92	10	40	UL, FM
1 1/2 X 1 1/4	1.82	1.88		1.04	15	30	UL, FM
2 X 3/4	1.60	1.97		1.10	9	36	UL, FM
2 X 1	1.73	2.02		1.22	14	28	UL, FM
2 X 1 1/4	1.90	2.10		1.48	10	20	UL, FM
2 X 1 1/2	2.02	2.16		1.56	10	20	UL, FM

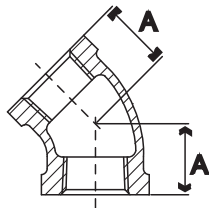


FIG. ADBL45 ELBOW 45°							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1	1.12			0.55	20	60	UL, FM
1 1/4	1.29			0.85	20	40	UL, FM
1 1/2	1.43			1.12	10	30	UL, FM
2	1.68			1.54	12	24	UL, FM

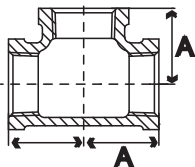
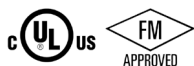


FIG. ADBT TEES							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1	1.50			0.83	20	40	UL, FM
1 1/4	1.75			1.30	14	28	UL, FM
1 1/2	1.94			1.68	12	24	UL, FM
2	2.25			2.79	8	16	UL, FM



TITUS DUCTILE IRON FITTINGS - CONTINUED

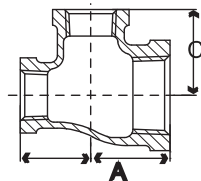


FIG. ABGRT REDUCING TEES

SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
3/4 X 3/4 X 1/2	1.20	1.20	1.22	0.52	20	80	UL, FM
3/4 X 3/4 X 1	1.45	1.45	1.37	0.63	40	80	UL, FM
3/4 X 3/4 X 1 1/4	1.62	1.62	1.45	0.82	20	60	UL, FM
1 X 1/2 X 1/2	1.26	1.12	1.40	0.48	20	80	UL, FM
1 X 1/2 X 3/4	1.37	1.22	1.45	0.54	20	80	UL, FM
1 X 1/2 X 1	1.50	1.22	1.45	0.69	15	60	UL, FM
1 X 3/4 X 1/2	1.26	1.20	1.40	0.58	20	80	UL, FM
1 X 3/4 X 3/4	1.37	1.31	1.44	0.66	15	60	UL, FM
1 X 3/4 X 1	1.50	1.45	1.50	0.75	30	60	UL, FM
1 X 1 X 1/2	1.26	1.26	1.40	0.64	15	60	UL, FM
1 X 1 X 3/4	1.37	1.37	1.45	0.70	12	48	UL, FM
1 X 1 X 1 1/4	1.67	1.67	1.58	1.09	11	44	UL, FM
1 X 1 X 1 1/2	1.80	1.80	1.65	1.22	9	36	UL, FM
1 X 1 X 2	2.02	2.02	1.93	1.54	12	24	UL, FM
1 1/4 X 1/2 X 1	1.58	1.36	1.67	0.88	20	40	UL, FM
1 1/4 X 1/2 X 1 1/4	1.75	1.53	1.75	1.03	20	40	UL, FM
1 1/4 X 3/4 X 3/4	1.45	1.31	1.62	0.81	10	40	UL, FM
1 1/4 X 3/4 X 1	1.58	1.45	1.67	0.94	10	40	UL, FM
1 1/4 X 3/4 X 1 1/4	1.75	1.62	1.75	1.09	20	40	UL, FM
1 1/4 X 1 X 1/2	1.34	1.26	1.53	0.83	20	40	UL, FM
1 1/4 X 1 X 3/4	1.45	1.37	1.62	0.87	20	40	UL, FM
1 1/4 X 1 X 1	1.58	1.50	1.67	1.01	20	40	UL, FM
1 1/4 x 1 x 1 1/4	1.75	1.67	1.75	1.16	15	30	UL, FM
1 1/4 x 1 x 1 1/2	1.88	1.88	1.82				UL, FM
1 1/4 x 1 1/4 x 1/2	1.34	1.34	1.53	0.87	20	40	UL, FM
1 1/4 x 1 1/4 x 3/4	1.45	1.45	1.62	0.97	20	40	UL, FM
1 1/4 x 1 1/4 x 1	1.58	1.58	1.67	1.06	20	40	UL, FM
1 1/4 x 1 1/4 x 1 1/2	1.88	1.88	1.82	2.13	12	24	UL, FM
1 1/4 x 1 1/4 x 2	2.10	2.10	1.90	1.83	12	24	UL, FM
1 1/2 x 1/2 x 1 1/2	1.94	1.66	1.94	1.46	12	24	UL, FM
1 1/2 x 3/4 x 1 1/2	1.94	1.75	1.94	1.44	12	24	UL, FM
1 1/2 x 1 x 1	1.65	1.50	1.80	1.21	15	30	UL, FM
1 1/2 x 1 x 1 1/4	1.82	1.67	1.88	1.33	12	24	UL, FM
1 1/2 x 1 x 1 1/2	1.94	1.80	1.94	1.58	12	24	UL, FM
1 1/2 x 1 1/4 x 1/2	1.41	1.34	1.66	1.01	12	24	UL, FM
1 1/2 x 1 1/4 x 3/4	1.52	1.43	1.75	1.10	12	24	UL, FM
1 1/2 x 1 1/4 x 1	1.65	1.58	1.80	1.25	12	24	UL, FM
1 1/2 x 1 1/4 x 1 1/4	1.82	1.75	1.88	1.41	12	24	UL, FM
1 1/2 x 1 1/4 x 1 1/2	1.94	1.88	1.94	1.54	12	24	UL, FM
1 1/2 x 1 1/4 x 2	2.16	2.16	2.02	2.02	8	16	UL, FM
1 1/2 x 1 1/2 x 1/2	1.41	1.41	1.66	1.03	18	36	UL, FM
1 1/2 x 1 1/2 x 3/4	1.52	1.52	1.75	1.28	15	30	UL, FM
1 1/2 x 1 1/2 x 1	1.65	1.65	1.80	1.40	10	30	UL, FM
1 1/2 x 1 1/2 x 1 1/4	1.82	1.82	1.88	1.51	12	24	UL, FM
1 1/2 x 1 1/2 x 2	2.16	2.16	2.02	2.05	8	16	UL, FM
2 x 1/2 x 2	2.25	1.88	2.25	2.20	8	16	UL, FM
2 x 3/4 x 2	2.25	1.97	2.25	1.62	8	16	UL, FM
2 x 1 x 1 1/2	2.02	1.80	2.16	1.89	10	20	UL, FM
2 x 1 x 2	2.25	2.02	2.25	2.20	8	16	UL, FM
2 x 1 1/4 x 1 1/4	1.90	1.75	2.10	1.76	8	16	UL, FM
2 x 1 1/4 x 1 1/2	2.02	1.88	2.16	2.21	8	16	UL, FM
2 x 1 1/4 x 2	2.25	2.10	2.25	2.20	8	16	UL, FM
2 x 1 1/2 x 1/2	1.73	1.65	2.02	1.70	10	20	UL, FM
2 x 1 1/2 x 1	1.73	1.65	2.02	1.60	10	20	UL, FM
2 x 1 1/2 x 1 1/4	1.90	1.82	2.10	1.76	8	16	UL, FM
2 x 1 1/2 x 1 1/2	2.02	1.94	2.16	1.90	8	16	UL, FM
2 x 1 1/2 x 2	2.25	2.16	2.25	1.88	8	16	UL, FM
2 x 2 x 1/2	1.49	1.49	1.88	1.71	10	20	UL, FM
2 x 2 x 3/4	1.60	1.60	1.97	1.70	10	20	UL, FM
2 x 2 x 1	1.73	1.73	2.02	1.80	10	20	UL, FM
2 x 2 x 1 1/4	1.90	1.90	2.10	2.05	8	16	UL, FM
2 x 2 x 1 1/2	2.02	2.02	2.16	2.09	8	16	UL, FM

TITUS DUCTILE IRON FITTINGS - CONTINUED

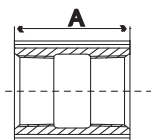


FIG. ADBS COUPLING							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1	1.67			0.47	25	100	UL, FM
1 1/4	1.93			0.66	16	64	UL, FM
1 1/2	2.15			0.94	18	36	UL, FM
2	2.53			1.49	12	24	UL, FM

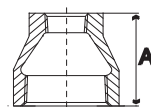


FIG. ADBRS REDUCING COUPLING							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
3/4 x 1/2	1.44			0.26	60	180	UL, FM
1 x 1/2	1.69			0.37	30	120	Hexagon small end, UL, FM
1 x 3/4	1.69			0.42	25	100	Hexagon small end, UL, FM
1 1/4 x 1/2	2.06			0.57	25	75	UL, FM
1 1/4 x 3/4	2.06			0.60	25	75	UL, FM
1 1/4 x 1	2.06			0.62	15	60	UL, FM

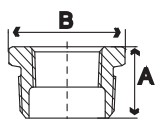


FIG. ADBBU BUSHINGS							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
3/4 x 1/2	1.02			0.14	75	300	outside head, UL, FM
1 x 1/2	1.14			0.28	50	200	outside head, UL, FM
1 x 3/4	1.14			0.19	50	200	outside head, UL, FM
1 1/4 x 3/4	1.30			0.37	30	120	outside head, UL, FM
1 1/4 x 1	1.30			0.30	30	120	outside head, UL, FM
1 1/2 x 1	1.34			0.52	25	75	outside head, UL, FM
1 1/2 x 1 1/4	1.34			0.37	25	75	outside head, UL, FM
2 x 1/2	1.50			0.90	20	60	inside head, UL, FM
2 x 3/4	1.50			0.67	20	60	inside head, UL, FM
2 x 1	1.50			0.88	20	60	inside head, UL, FM
2 x 1 1/4	1.50			0.79	20	60	outside head, UL, FM
2 x 1 1/2	1.50			0.66	20	60	outside head, UL, FM

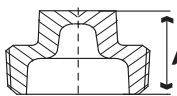


FIG. ADBP PLUGS							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1/2	0.95			0.10	50	600	hollow, UL, FM
3/4	1.07			0.16	35	420	hollow, UL, FM
1	1.25			0.26	20	240	hollow, UL, FM
1 1/4	1.36			0.31	40	120	hollow, UL, FM
1 1/2	1.42			0.55	30	90	hollow, UL, FM
2	1.57			0.65	20	60	hollow, UL, FM

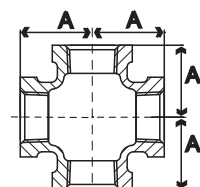


FIG. ADBCR CROSS							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1	1.50			0.98	15	30	UL, FM
1 1/4	1.75			1.55	10	20	UL, FM
1 1/2	1.94			1.84	8	16	UL, FM
2	2.25			3.26	5	10	UL, FM

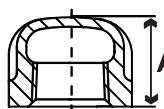
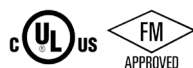


FIG. ADBC CAP							
SIZE (INCH)	A (in)	B (in)	C (in)	WEIGHT (LBS.)	INNER BOX PCS/BOX	MASTER Ctn. PCS/Ctn.	Remarks
1	1.16			0.32	25	100	UL, FM
1 1/4	1.28			0.49	20	80	UL, FM
1 1/2	1.33			0.67	18	54	UL, FM
2	1.45			0.88	12	36	UL, FM



THREADED FITTINGS

Specifications

Malleable Threaded Fittings

ALL MALLEABLE THREADED FITTINGS MANUFACTURED FOR AND BY SIGMA PIPING PRODUCTS CONFORM TO, COMPLY WITH, AND ARE MANUFACTURED TO THE FOLLOWING STANDARDS:

ASTM A 197	Standard Spec for Cupola Malleable Iron
ASTM A 153	Standard Spec for Zinc Coating (Hot Dip) on Iron and Steel
ANSI B 16.3	Malleable Iron Threaded Fittings Classes 150
ANSI B 16.39	Malleable Iron Threaded Union Classes 150
ANSI/ASME B1.20.1	Pipe Threads, General Purpose (Inch) NPT

Ductile Iron Threaded Fittings

ALL DUCTILE IRONS MANUFACTURED FOR AND BY SIGMA PIPING PRODUCTS CONFORM TO, COMPLY WITH, AND ARE MANUFACTURED TO THE FOLLOWING STANDARDS:

ASTM A 536	Grade 65-45-12
ASME B 16.3	Ductile Iron Threaded Fittings Classes 150
ANSI/ASME B1.20.1	Pipe Threads, General Purpose (Inch) NPT

Cast Iron Threaded Fittings

ALL CAST IRONS MANUFACTURED FOR AND BY SIGMA PIPING PRODUCTS CONFORM TO, COMPLY WITH, AND ARE MANUFACTURED TO THE FOLLOWING STANDARDS:

ASTM A 126	Class B Standard Spec for Cupola Cast Iron
ANSI B 16.4	Cast Iron Threaded Fitting Classes 125
ANSI/ASME B1.20.1	Pipe Threads, General Purpose (Inch) NPT

Merchant Steel Couplings

ALL STEEL THREADED FITTINGS MANUFACTURED FOR AND BY SIGMA PIPING PRODUCTS CONFORM TO, COMPLY WITH, AND ARE MANUFACTURED TO THE FOLLOWING STANDARDS:

ASTM A 865	Carbon Steel
ASTM B 633	Standard Spec for Electro Galvanized Fittings
ANSI/ASME B1.20.1	Pipe Threads, General Purpose (Inch) NPT

Steel Pipe Nipples

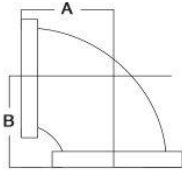
ALL STEEL PIPE NIPPLES MANUFACTURED FOR AND BY SIGMA PIPING PRODUCTS CONFORM TO, COMPLY WITH, AND ARE MANUFACTURED TO THE FOLLOWING STANDARDS:

ASTM A 733	Standard Spec for Welded Steel Nipple
ASTM A 53	Standard Spec for Black & Hot Dip Galvanized Steel Pipe
ANSI/ASME B1.20.1	Pipe Threads, General Purpose (Inch) NPT

THREADED FITTINGS

90 Elbow Ductile Iron

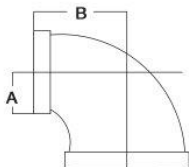
- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE BLK	DIMENSION (IN)		WEIGHT (LBS)
		A	B	
1"	1D90B0606	1.50	1.50	0.62
1-1/4"	1D90B0707	1.75	1.75	0.90
1-1/2"	1D90B0808	1.94	1.94	1.20
2"	1D90B0909	2.25	2.25	1.85

90 Reducing Elbow Ductile Iron

- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1

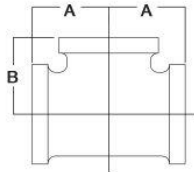


NOM SIZE	ITEM CODE BLK	DIMENSION (IN)		WEIGHT (LBS)
		A	B	
1" X 1/2"	1D90R0604	1.26	1.36	0.44
1" X 3/4"	1D90R0605	1.37	1.45	0.52
1 1/4" X 1/2"	1D90R0704	1.34	1.53	0.64
1 1/4" X 3/4"	1D90R0705	1.45	1.62	0.72
1 1/4" X 1"	1D90R0706	1.58	1.67	0.75
1 1/2" X 1"	1D90R0806	1.65	1.80	0.92
1 1/2" X 1 1/4"	1D90R0807	1.82	1.88	1.08
2" X 1/2"	1D90R0904	1.49	1.88	1.08
2" X 3/4"	1D90R0905	1.60	1.97	1.24
2" X 1"	1D90R0906	1.73	2.02	1.40
2" X 1 1/4"	1D90R0907	1.90	2.10	1.52
2" X 1 1/2"	1D90R0908	2.02	2.16	1.65

Notice: **D.I. Fittings** have higher tensile strength than that of steel pipe, over tightening can cause damage to pipe threads which may cause leakage.
D.I. Fitting should be tightened three turns beyond hand tight, no more than four turns.

Straight Tee Ductile Iron

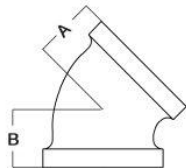
- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1DT060606	1.50	1.50	0.85
1-1/4"	1DT070707	1.75	1.75	1.22
1-1/2"	1DT080808	1.94	1.94	1.55
2"	1DT090909	2.25	2.25	2.45

45 Elbow Ductile Iron

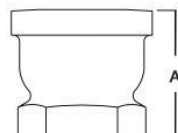
- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1D45B0606	1.12	1.12	0.46
1-1/4"	1D45B0707	1.29	1.29	0.73
1-1/2"	1D45B0808	1.43	1.43	0.92
2"	1D45B0909	1.68	1.68	1.50

Reducing Coupling Ductile Iron

- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)	WEIGHT (LBS)
	BLK	A	
1" X 1/2"	1DCR0604	1.69	0.39
1" X 3/4"	1DCR0605	1.69	0.53

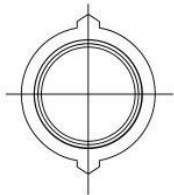
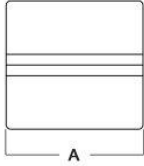
Notice: **D.I. Fittings** have higher tensile strength than that of steel pipe, over tightening can cause damage to pipe threads which may cause leakage.
D.I. Fitting should be tightened three turns beyond hand tight, no more than four turns.

THREADED FITTINGS

Coupling Ductile Iron



- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1

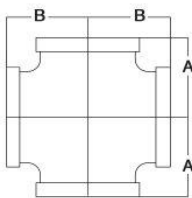


NOM SIZE	ITEM CODE	DIMENSION (IN)	WEIGHT (LBS)
	BLK	A	
1"	1DCP0606	1.50	0.85
1-1/4"	1DCP0707	1.75	1.22
1-1/2"	1DCP0808	1.94	1.55
2"	1DCP0909	2.25	2.45

Cross Ductile Iron



- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



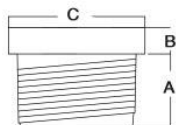
NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1DX0606	1.50	1.50	0.98
1 1/4"	1DX0707	1.75	1.75	1.50
1 1/2"	1DX0808	1.94	1.94	1.90
2"	1DX0909	2.25	2.25	2.95
1 1/4" X 1"	1DX0706	1.58	1.58	1.27
1 1/2" X 1"	1DX0806	1.65	1.65	1.45
2" X 1"	1DX0906	1.73	1.73	2.10

Notice: D.I. Fittings have higher tensile strength than that of steel pipe, over tightening can cause damage to pipe threads which may cause leakage. D.I. Fitting should be tightened three turns beyond hand tight, no more than four turns.

Bushing Ductile Iron



- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE BLK	DIMENSION (IN)			WEIGHT (LBS)
		A	B	C	
1" X 1/2"	1DBUS0604	0.75	0.25	1.42	0.22
1" X 3/4"	1DBUS0605	0.75	0.25	1.42	0.17
1 1/4" X 1"	1DBUS0706	0.80	0.28	1.76	1.28
1 1/2" X 1"	1DBUS0806	0.83	0.31	2.00	0.44
1 1/2" X 1 1/4"	1DBUS0807	0.83	0.31	2.00	0.30
2" X 1"	1DBUS0906	0.88	0.41	1.95	0.66
2" X 1 1/4"	1DBUS0907	0.88	0.34	2.48	0.72
2" X 1 1/2"	1DBUS0908	0.88	0.34	2.48	0.61

Cap Ductile Iron



- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



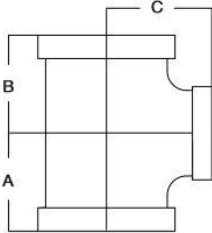
NOM SIZE	ITEM CODE	DIMENSION (IN)	WEIGHT (LBS)
	BLK	A	
1"	1DK06	1.16	0.32
1-1/4"	1DK07	1.28	0.43
1-1/2"	1DK08	1.33	0.60
2"	1DK09	1.45	0.91

Notice: D.I. Fittings have higher tensile strength than that of steel pipe, over tightening can cause damage to pipe threads which may cause leakage.
D.I. Fitting should be tightened three turns beyond hand tight, no more than four turns.

THREADED FITTINGS

Reducing Tee Ductile Iron

- Dimensions: ANSI B16.3 CLASS 150
- Material: Ductile Iron per ASTM A536 Grade 65-45-12
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



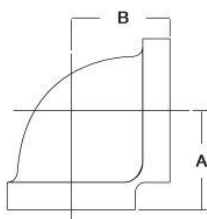
NOM SIZE	ITEM CODE	DIMENSION (IN)			WEIGHT (LBS)
		A	B	C	
1" x 1" x 1/2"	1DT060604	1.26	1.26	1.36	0.64
1" x 1" x 3/4"	1DT060605	1.37	1.37	1.45	0.73
1" x 1/2" x 1"	1DT060406	1.50	1.36	1.50	0.71
1" x 3/4" x 1"	1DT060506	1.50	1.45	1.50	0.76
1" x 1" x 1 1/4"	1DT060607	1.67	1.67	1.58	0.98
1" x 1" x 1 1/2"	1DT060608	1.80	1.80	1.65	1.16
1 1/4" x 1" x 1/2"	1DT070604	1.34	1.26	1.53	0.82
1 1/4" x 1" x 3/4"	1DT070605	1.45	1.37	1.62	0.90
1 1/4" x 1" x 1"	1DT070606	1.58	1.50	1.67	1.00
1 1/4" x 1" x 1 1/4"	1DT070607	1.75	1.67	1.75	1.08
1 1/4" x 1" x 1 1/2"	1DT070608	1.88	1.88	1.82	1.42
1 1/4" x 1 1/4" x 1/2"	1DT070704	1.34	1.34	1.53	0.86
1 1/4" x 1 1/4" x 3/4"	1DT070705	1.45	1.45	1.62	0.92
1 1/4" x 1 1/4" x 1"	1DT070706	1.58	1.58	1.67	0.95
1 1/4" x 1 1/4" x 1"	1DT070708	1.88	1.88	1.82	1.45
1 1/4" x 1 1/4" x 2"	1DT070709	2.10	2.10	1.90	1.75
1 1/2" x 1" x 1/2"	1DT080604	1.41	1.34	1.66	0.95
1 1/2" x 1" x 3/4"	1DT080605	1.52	1.37	1.75	1.14
1 1/2" x 1" x 1"	1DT080606	1.65	1.50	1.80	1.17
1 1/2" x 1" x 1 1/4"	1DT080607	1.82	1.67	1.88	1.34
1 1/2" x 1" x 1 1/2"	1DT080608	1.94	1.80	1.94	1.45
1 1/2" x 1 1/4" x 1/2"	1DT080704	1.41	1.34	1.66	1.05
1 1/2" x 1 1/4" x 3/4"	1DT080705	1.52	1.45	1.75	1.15
1 1/2" x 1 1/4" x 1"	1DT080706	1.65	1.58	1.80	1.25
1 1/2" x 1 1/4" x 2"	1DT080709	2.16	2.10	2.02	1.90
1 1/2" x 1 1/2" x 1/2"	1DT080804	1.41	1.41	1.16	1.15
1 1/2" x 1 1/2" x 3/4"	1DT080805	1.52	1.52	1.75	1.24
1 1/2" x 1 1/2" x 1"	1DT080806	1.65	1.65	1.80	1.30
1 1/2" x 1 1/2" x 1"	1DT080807	1.82	1.82	1.88	1.48
1 1/2" x 1 1/2" x 2"	1DT080809	2.16	2.16	2.02	1.98
2" x 1" x 2"	1DT090609	2.25	2.02	2.25	2.15
2" x 1 1/4" x 2"	1DT090709	2.25	2.10	2.25	2.30
2" x 1 1/2" x 1/2"	1DT090804	1.49	1.41	1.88	1.50
2" x 1 1/2" x 3/4"	1DT090805	1.60	1.52	1.97	1.62
2" x 1 1/2" x 1"	1DT090806	1.73	1.65	2.02	1.64
2" x 1 1/2" x 1 1/4"	1DT090807	1.90	1.82	2.10	1.80
2" x 1 1/2" x 1 1/2"	1DT090808	2.02	1.94	2.16	2.00
2" x 1 1/2" x 2"	1DT090809	2.25	2.16	2.25	2.35
2" x 2" x 1/2"	1DT090904	1.49	1.49	1.88	1.60
2" x 2" x 3/4"	1DT090905	1.60	1.60	1.97	1.68
2" x 2" x 1"	1DT090906	1.73	1.73	2.02	1.85
2" x 2" x 1 1/4"	1DT090907	1.90	1.90	2.10	2.04
2" x 2" x 1 1/2"	1DT090908	2.02	2.02	2.16	2.18
2" x 2" x 2 1/2"	1DT090910	2.60	2.60	2.39	3.61
2 1/2" x 2" x 3/4"	1DT100905	1.74	1.60	2.32	2.28

THREADED FITTINGS



90 Elbow Cast Iron

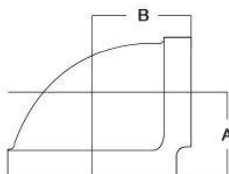
- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1C90B0606	1.50	1.50	0.85
1-1/4"	1C90B0707	1.75	1.75	1.22
1-1/2"	1C90B0808	1.94	1.94	1.55
2"	1C90B0909	2.25	2.25	2.45
2-1/2"	1C90B1010	2.70	2.70	4.80

90 Reducing Elbow Cast Iron

- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1

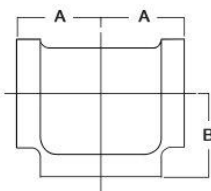


NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1" X 1/2"	1C90R0604	1.26	1.36	0.44
1" X 3/4"	1C90R0605	1.37	1.45	0.52
1 1/4" X 1/2"	1C90R0704	1.34	1.53	0.64
1 1/4" X 3/4"	1C90R0705	1.45	1.62	0.72
1 1/4" X 1"	1C90R0706	1.58	1.67	0.75
1 1/2" X 1/2"	1C90R0804	1.60	1.70	1.17
1 1/2" X 3/4"	1C90R0805	1.61	1.72	1.30
1 1/2" X 1"	1C90R0806	1.65	1.80	0.92
1 1/2" X 1 1/4"	1C90R0807	1.82	1.88	1.08
2" X 1/2"	1C90R0904	1.49	1.88	1.08
2" X 3/4"	1C90R0905	1.60	1.97	1.24
2" X 1"	1C90R0906	1.73	2.02	1.40
2" X 1 1/4"	1C90R0907	1.90	2.10	1.52
2" X 1 1/2"	1C90R0908	2.02	2.16	1.65

THREADED FITTINGS

Straight Tee Cast Iron

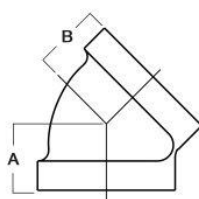
- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1CT060606	1.50	1.50	0.85
1-1/4"	1CT070707	1.75	1.75	1.22
1-1/2"	1CT080808	1.94	1.94	1.55
2"	1CT090909	2.25	2.25	2.45
2-1/2"	1CT101010	2.70	2.70	6.39

45 Elbow Cast Iron

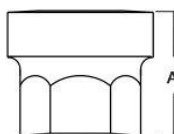
- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)		WEIGHT (LBS)
	BLK	A	B	
1"	1C45B0606	1.12	1.12	0.46
1-1/4"	1C45B0707	1.29	1.29	0.73
1-1/2"	1C45B0808	1.43	1.43	0.92
2"	1C45B0909	1.68	1.68	1.50

Reducing Coupling Cast Iron

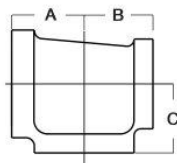
- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)	WEIGHT (LBS)
	BLK	A	
1" X 1/2"	1CCR0604	1.69	0.62
1" X 3/4"	1CCR0605	1.69	0.69

Reducing Tee Cast Iron

- Dimensions: ANSI B16.4 CLASS 125
- Material: Cast Gray Iron per ASTM 126 Class B
- Coating: Black
- Threads: Pipe Threads, General Purpose ASME B1.20.1



NOM SIZE	ITEM CODE	DIMENSION (IN)			WEIGHT (LBS)
		A	B	C	
1" x 1" x 1/2"	1CT060604	1.26	1.26	1.36	0.95
1" x 1" x 3/4"	1CT060605	1.37	1.37	1.45	1.10
1" x 1/2" x 1"	1CT060406	1.50	1.36	1.50	1.08
1" x 3/4" x 1"	1CT060506	1.50	1.45	1.50	1.18
1" x 1" x 1 1/4"	1CT060607	1.67	1.67	1.58	1.52
1" x 1" x 1 1/2"	1CT060608	1.80	1.80	1.65	1.73
1 1/4" x 1" x 1/2"	1CT070604	1.34	1.26	1.53	1.17
1 1/4" x 1" x 3/4"	1CT070605	1.45	1.37	1.62	1.38
1 1/4" x 1" x 1"	1CT070606	1.58	1.50	1.57	1.47
1 1/4" x 1" x 1 1/4"	1CT070607	1.75	1.67	1.75	1.80
1 1/4" x 1" x 1 1/2"	1CT070608	1.88	1.80	1.82	2.05
1 1/4" x 1 1/4" x 1/2"	1CT070704	1.34	1.34	1.53	1.37
1 1/4" x 1 1/4" x 3/4"	1CT070705	1.45	1.45	1.62	1.54
1 1/4" x 1 1/4" x 1"	1CT070706	1.58	1.58	1.67	1.65
1 1/4" x 1 1/4" x 1 1/2"	1CT070708	1.88	1.88	1.82	2.21
1 1/4" x 1 1/4" x 2"	1CT070709	2.10	2.10	1.90	2.55
1 1/2" x 1" x 1/2"	1CT080604	1.41	1.34	1.66	1.41
1 1/2" x 1" x 3/4"	1CT080605	1.52	1.37	1.75	1.65
1 1/2" x 1" x 1"	1CT080606	1.65	1.50	1.80	1.65
1 1/2" x 1" x 1 1/4"	1CT080607	1.82	1.67	1.88	2.00
1 1/2" x 1" x 1 1/2"	1CT080608	1.94	1.80	1.94	2.30
1 1/2" x 1 1/4" x 1/2"	1CT080704	1.41	1.34	1.66	1.58
1 1/2" x 1 1/4" x 3/4"	1CT080705	1.52	1.45	1.75	1.72
1 1/2" x 1 1/4" x 1"	1CT080706	1.65	1.58	1.80	1.85
1 1/2" x 1 1/4" x 1 1/4"	1CT080707	1.82	1.75	1.88	2.22
1 1/2" x 1 1/4" x 1 1/2"	1CT080708	1.94	1.88	1.94	2.45
1 1/2" x 1 1/4" x 2"	1CT080709	2.16	2.10	2.02	2.80
1 1/2" x 1 1/2" x 1/2"	1CT080804	1.41	1.41	1.66	1.76
1 1/2" x 1 1/2" x 3/4"	1CT080805	1.52	1.52	1.75	1.87
1 1/2" x 1 1/2" x 1"	1CT080806	1.65	1.65	1.80	1.94
1 1/2" x 1 1/2" x 1 1/4"	1CT080807	1.82	1.82	1.88	2.29
1 1/2" x 1 1/2" x 2"	1CT080809	2.16	2.16	2.02	3.28
2" x 1" x 2"	1CT090609	2.25	2.02	2.25	3.40
2" x 1 1/4" x 2"	1CT090709	2.25	2.10	2.25	2.80
2" x 1 1/2" x 1/2"	1CT090804	1.49	1.41	1.88	2.09
2" x 1 1/2" x 3/4"	1CT090805	1.60	1.52	1.97	2.40
2" x 1 1/2" x 1"	1CT090806	1.73	1.65	2.02	2.54
2" x 1 1/2" x 1 1/4"	1CT090807	1.90	1.82	2.10	2.85
2" x 1 1/2" x 1 1/2"	1CT090808	1.49	1.41	1.88	2.24
2" x 1 1/2" x 2"	1CT090809	2.25	2.16	2.25	3.75
2" x 2" x 1/2"	1CT090904	1.49	1.49	1.88	2.60
2" x 2" x 3/4"	1CT090905	1.60	1.60	1.97	2.71
2" x 2" x 1"	1CT090906	1.73	1.73	2.02	2.97
2" x 2" x 1 1/4"	1CT090907	1.90	1.90	2.10	3.32
2" x 2" x 1 1/2"	1CT090908	2.02	2.02	2.16	3.72
2" x 2" x 2 1/2"	1CT090910	2.60	2.60	2.39	5.10

90° Elbow (Class 125 Standard) Fig. 351



Standards and Specifications

Cast Iron Threaded Fittings

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
Class 125	ASME B16.4	ASTM A126 (A)	ASTM A153	ASME B1.20.1	ASME B16.4
Class 250	ASME B16.4	ASTM A126 (A)	ASTM A153	ASME B1.20.1	ASME B16.4

Cast Iron Plugs and Bushings

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
	ASME B16.14	ASTM A126 (A)	ASTM A153	ASME B1.20.1	ASME B16.14

Note:

* ASTM B633, Type I, SC 4, may be supplied as alternate zinc coating per applicable ASME B16 product standard.



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Building connections that last™

90° Elbow (Class 125 Standard) Fig. 351



Anvil standard and extra heavy cast iron threaded fittings are manufactured in accordance with ASME-B16.4 (except plugs and bushings, ASME B16.14). Dimensions also conform to Federal Specifications, WW-P-501 (except plugs and bushings WW-P-471).

Cast iron threaded fittings are available in both black and galvanized.

For Listings/Approval Details and Limitations, visit our website at www.asc-es.com or contact an ASC Engineered Solutions™ Representative.

See following page for standards and specifications.

Cast Iron Threaded Fittings Pressure - Temperature Ratings

Temperature	Pressure		Temperature	Pressure	
	Class 125	Class 250		Class 125	Class 250
°F/°C	PSI/bar	PSI/bar	°F/°C	PSI/bar	PSI/bar
-20°–150°	175	400	300°	140	310
-28.9°–65.6°	12.1	27.6	148.9°	9.7	21.4
200°	165	370	350°	125	300
93.3°	11.4	25.5	176.7°	8.6	20.7
250°	150	340	400°	—	250
121.1°	10.3	23.4	204.4°	—	17.2

Note:

Anvil standard and extra heavy cast iron threaded fittings are manufactured in accordance with ASME B16.4. Plugs and bushings are manufactured in accordance with ASME B16.14.

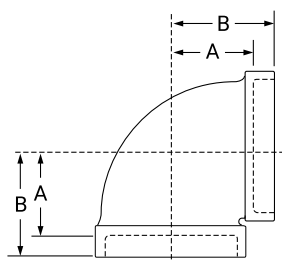
Figure 367 Concentric Reducers do not meet the overall length requirement of ASME B16.4. All other dimensions are in compliance.



PROJECT INFORMATION	APPROVAL STAMP
Project:	<input type="checkbox"/> Approved
Address:	<input type="checkbox"/> Approved as noted
Contractor:	<input type="checkbox"/> Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

90° Elbow (Class 125 Standard)

Fig. 351



Size	A	B	Unit Weight Black	Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	In./mm	In./mm	Lbs./kg
1/4	1/2	13/16	0.16	2 1/2	1 13/16	2 11/16	4.94
8	13	22	0.07	65	47	68	2.24
3/8	9/16	15/16	0.25	3	2 3/16	3 1/8	7.21
10	14	24	0.11	80	56	79	3.27
1/2	1 1/16	1 1/8	0.40	3 1/2	2 7/16	3 7/16	9.67
15	17	29	0.18	90	62	87	4.39
3/4	1 3/16	1 15/16	0.60	4	2 11/16	3 13/16	12.17
20	22	33	0.27	100	68	98	5.52
1	1 5/16	1 1/2	0.92	5	3 5/16	4 1/2	21.46
25	24	38	0.42	125	84	114	9.73
1 1/4	1 1/8	1 3/4	1.44	6	3 7/8	5 1/8	31.33
32	29	44	0.65	150	98	130	14.21
1 1/2	1 5/16	1 15/16	1.95	8	5 3/16	6 9/16	64.56
40	33	49	0.88	200	132	167	29.28
2	1 9/16	2 1/4	3.13				
50	40	57	1.42				

Note:

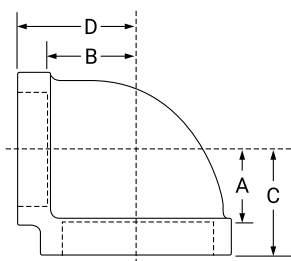
See first page for pressure-temperature ratings.



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Building connections that last™

90° Reducing Elbow (Class 125 Standard) Fig. 352



Size		A	B	C	D	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	Lbs./kg
1/2 15	1/4 8	5/8 16	3/4 19	1 1/16 27	1 1/16 27	0.40 0.18
	3/8 10	5/8 16	11/16 17	1 1/16 27	1 1/16 27	0.34 0.15
3/4 20	1/2 15	11/16 17	13/16 22	1 1/4 32	1 1/4 32	0.51 0.23
	1 25	11/16 17	15/16 24	1 3/8 35	1 3/8 35	0.67 0.30
1 25	3/4 20	13/16 22	15/16 24	1 7/16 37	1 7/16 37	0.76 0.34
	1/2 15	11/16 17	1 1/16 27	1 1/2 38	1 1/2 38	1.07 0.49
	3/4 20	13/16 22	1 1/8 29	1 5/8 41	1 5/8 41	1.02 0.46
1 1/4 32	1 25	15/16 24	1 1/8 29	1 11/16 43	1 11/16 43	1.21 0.55
	1/2 15	3/4 19	1 1/4 32	1 5/8 41	1 5/8 41	1.53 0.69
	3/4 20	7/8 22	1 5/16 33	1 13/16 47	1 13/16 47	1.55 0.70
1 1/2 40	1 25	1 25	1 1/4 32	1 13/16 47	1 13/16 47	1.44 0.65

Note:

See first page for pressure-temperature ratings.

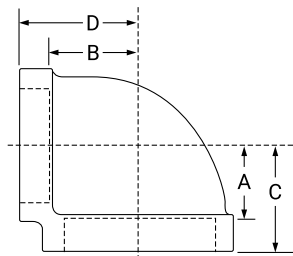


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Building connections that last™

90° Reducing Elbow (Class 125 Standard) Fig. 352

(Continued)



Size		A	B	C	D	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	Lbs./kg
1½ 40	1¼ 32	1⅜ 30	1¼ 32	1⅞ 48	1⅞ 48	1.74 0.79
	½ 15	1⅜ 30	1⅞ 37	1⅜ 35	1⅜ 35	2.22 1.01
2 50	¾ 20	1⅝ 33	1½ 38	2 51	2 51	2.20 1.00
	1 25	1⅞ 27	1⅞ 37	2 51	2 51	2.08 0.94
	1¼ 32	1⅜ 30	1⅞ 37	2⅞ 52	2⅞ 52	2.33 1.06
	1½ 40	1⅝ 33	1½ 38	2⅞ 54	2⅞ 54	2.59 1.17
	1 25	1 25	1¾ 44	2⅝ 59	2⅝ 59	2.93 1.33
2½ 65	1¼ 32	1⅜ 30	1¾ 44	2⅜ 60	2⅜ 60	3.41 1.55
	1½ 40	1⅝ 33	1⅞ 47	2⅞ 62	2⅞ 62	3.68 1.67
	2 50	1⅞ 40	1⅞ 48	2⅞ 65	2⅞ 65	4.01 1.82
	1¼ 32	1⅝ 41	2⅝ 59	2⅞ 75	2⅞ 75	5.98 2.71

Note:

See first page for pressure-temperature ratings.

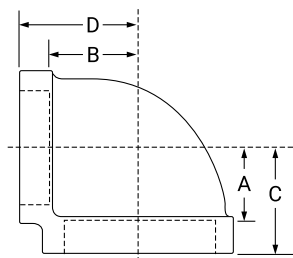


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Building connections that last™

90° Reducing Elbow (Class 125 Standard) Fig. 352

(Continued)



Size		A	B	C	D	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	Lbs./kg
3 80	1½ 40	1⅝ 41	2⅝ 59	2⅝ 75	2⅝ 75	5.65 2.56
	2 50	1⅝ 41	2¼ 57	2⅝ 75	2⅝ 75	5.25 2.38
	2½ 65	1⅞ 48	2⅜ 56	3⅛ 78	3⅛ 78	6.44 2.92
4 100	2 50	2⅜ 56	2⅝ 75	3⅝ 92	3⅝ 92	11.89 5.39
	2½ 65	2⅜ 56	2¾ 70	3⅝ 92	3⅝ 92	11.27 5.11
	3 80	2⅜ 56	2⅞ 68	3⅝ 92	3⅝ 92	10.63 4.82
5 125	4 100	2⅞ 73	3⅝ 84	4⅜ 111	4⅜ 111	16.47 7.47
6 150	3 80	2⅝ 59	3⅞ 98	4⅞ 124	4⅞ 124	19.43 8.81
	4 100	2⅞ 73	3⅞ 98	4⅞ 125	4⅞ 125	23.53 10.67
	5 125	3⅞ 86	3⅞ 98	5 127	5 127	26.66 12.09

Note:

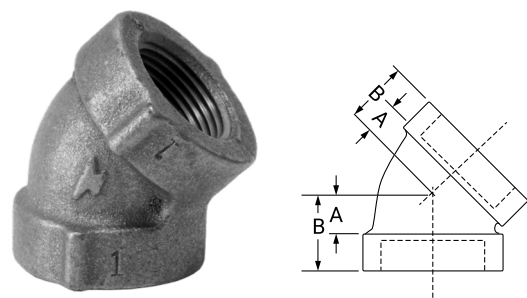
See first page for pressure-temperature ratings.



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Fig. 356
45° Elbow (Straight)



Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg
1/4 8	7/16 11	3/4 19	0.16 0.07
3/8 10	7/16 11	13/16 22	0.23 0.10
1/2 15	7/16 11	7/8 22	0.37 0.17
3/4 20	1/2 13	1 25	0.55 0.25
1 25	9/16 14	1 1/8 29	0.83 0.38
1 1/4 32	5/8 16	1 1/4 32	1.33 0.60
1 1/2 40	13/16 22	1 7/16 37	1.79 0.81
2 50	1 25	1 11/16 43	2.89 1.31

Note:
See first page for pressure-temperature ratings.

Fig. 356R
45° Reducing Elbow



Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg
2 1/2 65	1 1/16 27	1 15/16 49	4.29 1.95
3 80	1 3/16 30	2 3/16 56	6.44 2.92
3 1/2 90	1 3/8 35	2 3/8 60	8.42 3.82
4 100	1 9/16 40	2 5/8 67	10.64 4.83
6 150	2 3/16 56	3 7/16 87	26.02 11.80
8 200	2 7/8 73	4 1/4 108	50.17 22.75

Size	A	B	C	D	Unit Weight Black
NPS/DN	In./mm	In./mm	In./mm	In./mm	Lbs./kg
1 x 1/2 25 x 15	1/2 15	7/8 22	1 1/16 27	1 5/16 33	0.95 0.43

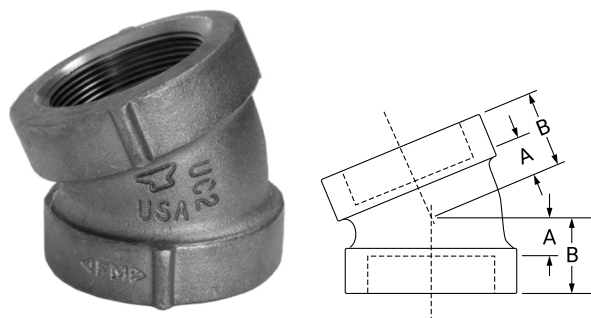


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Fig. 356A

22 1/2° Elbow (Class 125 Standard)



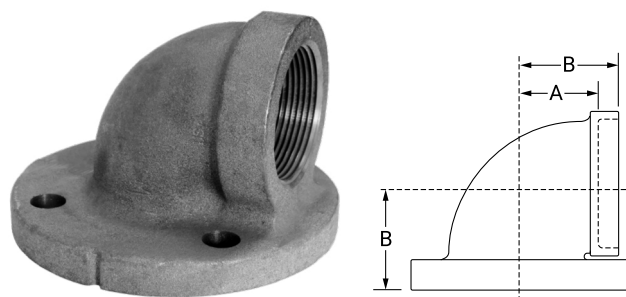
Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg
3/4	3/8	7/8	0.52
20	10	22	0.24
1	7/16	1	0.80
25	11	25	0.36
1 1/4	1/2	1 1/8	1.40
32	13	29	0.63
1 1/2	5/8	1 1/4	1.64
40	16	32	0.74
2	3/4	1 7/16	2.50
50	19	37	1.13
2 1/2	3/4	1 5/8	3.95
65	19	41	1.79

Note:

See first page for pressure-temperature ratings.

Fig. 371

90° Elbow, Flange & Screw (Class 125 Standard)



Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg
2 1/2	1 13/16	2 11/16	10.22
65	47	68	4.63
3	2 3/16	3 1/8	13.25
80	56	79	6.01
4	2 11/16	3 13/16	21.56
100	68	98	9.78
6	3 7/8	5 1/8	40.50
150	98	130	18.37

Notes:

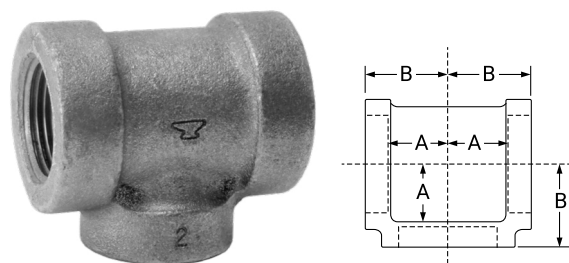
Nominal Pipe Sizes of 4" (100 DN) and larger have two holes tapped for stud or tap bolts.



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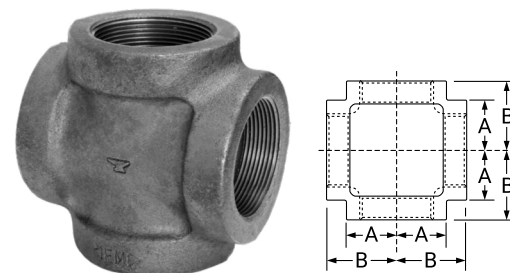
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Fig. 358
Tee



Size	A	B	Unit Weight Black	Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	In./mm	In./mm	Lbs./kg
1/4	1/2	13/16	0.22	2	1 9/16	2 1/4	4.23
8	13	22	0.10	50	40	57	1.92
3/8	5/8	1	0.35	2 1/2	1 13/16	2 11/16	6.67
10	16	25	0.16	65	47	68	3.02
1/2	1 1/16	1 1/8	0.56	3	2 3/16	3 1/8	10.00
15	17	29	0.25	80	56	79	4.54
3/4	1 3/16	1 5/16	0.84	3 1/2	2 7/16	3 7/16	13.29
20	22	33	0.38	90	62	87	6.03
1	1 5/16	1 1/2	1.25	4	2 11/16	3 3/4	16.33
25	24	38	0.57	100	68	95	7.41
1 1/4	1 1/8	1 3/4	2.03	5	3 5/16	4 1/2	27.33
32	29	44	0.92	125	84	114	12.39
1 1/2	1 5/16	1 15/16	2.70	6	3 7/8	5 1/8	40.85
40	33	49	1.22	150	98	130	18.53
Note: See first page for pressure-temperature ratings.				8	5 3/16	6 9/16	79.00
				200	132	167	35.83

Fig. 360
Cross



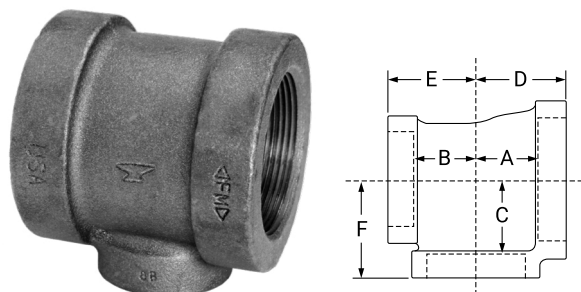
Size	A	B	Unit Weight Black
NPS/DN	In./mm	In./mm	Lbs./kg
1/2	9/16	13/16	2.80
15	14	22	1.27
3/4	1 3/16	1 5/16	1.03
20	22	33	0.47
1	1 5/16	1 1/2	1.59
25	24	38	0.72
1 1/4	1 1/8	1 3/4	2.42
32	29	44	1.10
1 1/2	1 5/16	1 15/16	3.21
40	33	49	1.46
2	1 9/16	2 1/4	5.28
50	40	57	2.39
2 1/2	1 13/16	2 11/16	8.07
65	47	68	3.66
3	2 3/16	3 1/8	11.84
80	56	79	5.37
4	2 3/4	3 13/16	19.63
100	70	98	8.90



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Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	Lbs./kg
1/2 15	1/2 15	1/4 8	1 1/16 17	11/16 17	13/16 22	1 1/8 29	1 1/8 29	1 1/8 29	0.57 0.26
		3/8 10	1 1/16 17	11/16 17	3/4 19	1 1/8 29	1 1/8 29	1 1/8 29	0.57 0.26
		3/4 20	1 3/16 22	13/16 22	11/16 17	1 1/4 32	1 1/4 32	13/16 22	0.68 0.31
		1 25	1 25	1 25	13/16 22	1 7/16 37	1 7/16 37	1 3/8 35	1.00 0.45
		1/2 15	1 1/16 17	11/16 17	13/16 22	13/16 22	1 1/8 29	1 1/4 32	0.64 0.29
3/4 20	3/4 20	1/2 15	1 1/16 17	11/16 17	13/16 22	13/16 22	1 1/8 29	1 1/4 32	0.75 0.34
		3/4 20	1 3/16 22	13/16 22	13/16 22	15/16 24	1 1/4 32	15/16 24	0.75 0.34
		1 25	1 5/16 24	15/16 24	13/16 22	1 7/16 37	1 7/16 37	1 3/8 35	0.99 0.45
		1/2 15	1 1/16 17	11/16 17	13/16 22	13/16 22	1 1/8 29	1 1/4 32	0.76 0.34
		3/8 10	1 1/16 17	11/16 17	15/16 24	13/16 22	13/16 22	1 1/4 32	0.75 0.34
1 25	1 25	1/2 15	1 1/16 17	11/16 17	13/16 22	13/16 22	1 1/8 29	1 1/4 32	0.91 0.41
		3/4 20	1 3/16 22	13/16 22	15/16 24	1 3/8 35	1 1/4 32	1 7/16 37	1.08 0.49
		1 25	1 5/16 24	15/16 24	15/16 24	1 1/2 38	1 3/8 35	1 1/2 38	1.08 0.49
		3/4 20	1 3/16 22	13/16 22	15/16 24	1 3/8 35	15/16 24	1 7/16 37	1.00 0.45
		1 25	1 5/16 24	15/16 24	15/16 24	1 1/2 38	1 7/16 37	1 1/2 38	1.13 0.51

Note:

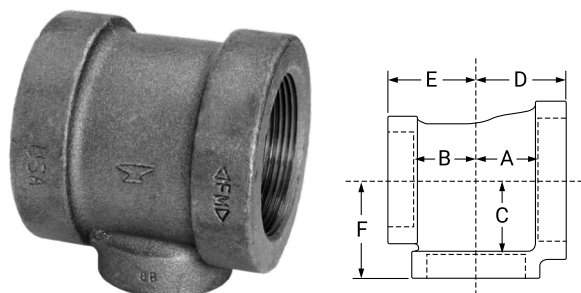
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Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
1 25	1 25	1/4 8	1 1/16 17	11/16 17	1 1/8 29	1 1/8 29	1 1/4 32	1 3/8 35	1.01 0.46
		1/2 15	1 1/16 17	11/16 17	15/16 24	1 1/4 32	1 1/4 32	1 3/8 35	1.01 0.46
		3/4 20	1 3/16 22	13/16 22	15/16 24	1 3/8 35	1 3/8 35	1 7/16 37	1.11 0.50
		1 1/4 32	1 1/8 29	1 1/8 29	15/16 24	1 11/16 43	1 11/16 43	1 9/16 40	1.49 0.68
		1 1/2 40	1 1/4 32	1 1/4 32	1 25	1 13/16 47	1 13/16 47	1 5/8 41	1.84 0.83
		2 50	1 7/16 37	1 7/16 37	1 25	2 50	2 50	1 3/4 44	2.70 1.22
1 1/4 32	1/2 15	1/2 15	1 3/16 22	13/16 22	1 1/8 29	1 7/16 37	15/16 24	1 5/8 41	1.00 0.45
		1 25	1 5/16 24	15/16 24	1 1/8 29	1 9/16 40	1 3/8 35	1 11/16 43	1.38 0.63
		1 1/4 32	1 1/8 29	1 1/8 29	1 1/8 29	1 3/4 44	1 9/16 40	1 3/4 44	1.64 0.74
		3/4 20	1 3/16 22	13/16 22	1 1/8 29	1 7/16 37	15/16 24	1 5/8 41	1.27 0.58
	3/4 20	1 25	1 5/16 24	15/16 24	1 1/8 29	1 9/16 40	1 7/16 37	1 11/16 43	1.43 0.65
		1 1/4 32	1 1/8 29	1 1/8 29	1 1/8 29	1 3/4 44	1 5/8 41	1 3/4 44	1.73 0.78
	1 25	1/2 15	1 1/16 17	11/16 17	1 1/8 29	15/16 24	1 1/4 32	1 9/16 40	1.27 0.58
		3/4 20	1 3/16 22	13/16 22	1 1/8 29	1 7/16 37	1 3/8 35	1 5/8 41	1.36 0.62
		1 25	1 5/16 24	15/16 24	1 1/8 29	1 9/16 40	1 9/16 40	1 11/16 43	1.53 0.69
		1 1/4 32	1 1/8 29	1 1/8 29	1 1/8 29	1 3/4 44	1 11/16 43	1 3/4 44	1.79 0.81
		1 1/2 40	1 1/4 32	1 1/4 32	13/16 22	1 7/8 48	1 13/16 47	1 13/16 47	2.07 0.94

Note:

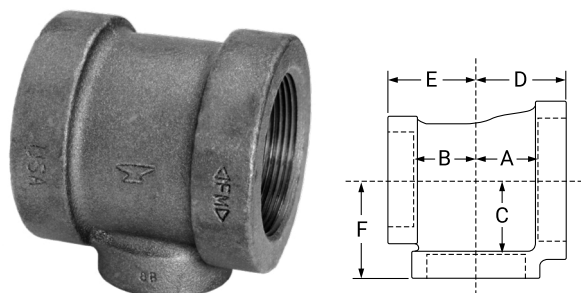
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Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
1 1/4 32	1 25	2 50	1 7/16 37	1 7/16 37	1 3/16 22	2 1/16 52	2 50	1 7/8 48	2.66 1.21
		1/2 15	1 1/16 17	1 1/16 17	1 1/8 29	1 5/16 24	1 5/16 24	1 9/16 40	1.47 0.67
	1 1/4 32	3/4 20	1 3/16 22	1 3/16 22	1 1/8 29	1 7/16 37	1 7/16 37	1 5/8 41	1.57 0.71
		1 25	1 5/16 24	1 5/16 24	1 1/8 29	1 9/16 40	1 9/16 40	1 11/16 43	1.73 0.78
		1 1/2 40	1 1/4 32	1 1/4 32	1 3/16 22	1 7/8 48	1 7/8 48	1 13/16 47	2.29 1.04
		2 50	1 7/16 37	1 7/16 37	1 3/16 22	2 1/16 52	2 1/16 52	1 7/8 48	2.81 1.27
	1/2 15	1 1/4 32	1 3/16 22	1 1/8 29	1 1/4 32	1 13/16 47	1 9/16 40	1 7/8 48	1.93 0.88
		1 1/2 40	1 5/16 24	1 1/4 32	1 5/16 24	1 15/16 49	1 11/16 43	1 15/16 49	2.14 0.97
	3/4 20	1 1/2 40	1 5/16 24	1 1/4 32	1 5/16 24	1 15/16 49	1 3/4 44	1 15/16 49	2.18 0.99
		1/2 15	1 3/16 22	3/4 19	1 1/4 32	1 7/16 37	1 5/16 24	1 11/16 43	1.75 0.79
	1 1/2 40	3/4 20	7/8 22	1 3/16 22	1 1/4 32	1 1/2 38	1 3/8 35	1 3/4 44	1.70 0.77
1 1/2 40	1 25	1 25	1 25	1 5/16 24	1 1/4 32	1 5/8 41	1 1/2 38	1 13/16 47	1.72 0.78
		1 1/4 32	1 3/16 22	1 1/8 29	1 1/4 32	1 13/16 47	1 11/16 43	1 7/8 48	2.08 0.94
		1 1/2 40	1 5/16 24	1 1/4 32	1 5/16 24	1 15/16 49	1 13/16 47	1 15/16 49	2.29 1.04
		2 50	1 1/2 38	1 7/16 37	1 5/16 24	2 1/8 54	2 50	2 51	2.91 1.32
	1 1/4 32	1/2 15	1 3/16 22	1 1/16 17	1 1/4 32	1 7/16 37	1 5/16 24	1 11/16 43	1.67 0.76
		3/4 20	7/8 22	1 3/16 22	1 1/4 32	1 1/2 38	1 7/16 37	1 3/4 44	1.79 0.81

Note:

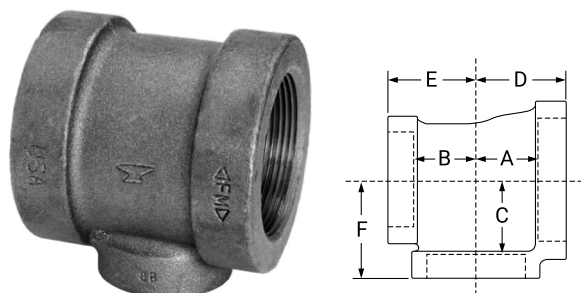
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Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
1 1/2 40	1 1/4 32	1 25	1 25	15/16 24	1 1/4 32	1 5/8 41	1 9/16 40	1 13/16 47	1.97 0.89
		1 1/4 32	13/16 22	1 1/8 29	1 1/4 32	1 13/16 47	1 3/4 44	1 7/8 48	2.28 1.03
		1 1/2 40	15/16 24	1 1/4 32	15/16 24	1 15/16 49	1 7/8 48	1 15/16 49	2.50 1.13
		2 50	1 1/2 38	1 7/16 37	15/16 24	2 1/8 54	2 1/16 52	2 51	3.07 1.39
	1 1/2 40	1/2 15	13/16 22	13/16 22	1 1/4 32	1 7/16 37	1 7/16 37	1 11/16 43	1.84 0.83
		3/4 20	7/8 22	7/8 22	1 1/4 32	1 1/2 38	1 1/2 38	1 3/4 44	1.95 0.88
		1 25	1 25	1 25	1 1/4 32	1 5/8 41	1 5/8 41	1 13/16 47	2.13 0.97
		1 1/4 32	13/16 22	13/16 22	1 1/4 32	1 13/16 47	1 13/16 47	1 7/8 48	2.44 1.11
	1 1/2 40	2 50	1 1/2 38	1 1/2 38	15/16 24	2 1/8 54	2 1/8 54	2 51	3.23 1.46
		2 1/2 65	1 13/16 47	1 13/16 47	15/16 24	2 7/16 62	2 7/16 62	2 3/16 56	4.15 1.88
	1/2 15	1 1/2 40	15/16 24	1 3/8 35	1 1/2 38	2 51	1 13/16 47	2 1/8 54	2.95 1.34
		2 50	1 9/16 40	1 7/16 37	1 9/16 40	2 1/4 57	1 7/8 48	2 1/4 57	3.30 1.50
	3/4 20	1 1/4 32	1 3/16 22	1 1/8 29	1 7/16 37	1 7/8 48	1 3/4 44	2 1/16 52	2.50 1.13
		1 1/2 40	1 5/16 24	15/16 24	1 1/2 38	2 51	1 13/16 47	2 1/8 54	3.40 1.54
		2 50	1 9/16 40	1 7/16 37	1 9/16 40	2 1/4 57	1 15/16 49	2 1/4 57	3.31 1.50
		1 25	11/16 17	11/16 17	1 7/16 37	1 3/4 44	1 5/8 41	2 51	2.70 1.22
2 50	1 25	1 1/4 32	13/16 22	1 1/8 29	1 1/2 38	1 7/8 48	1 3/4 44	2 1/16 52	2.94 1.33

Note:

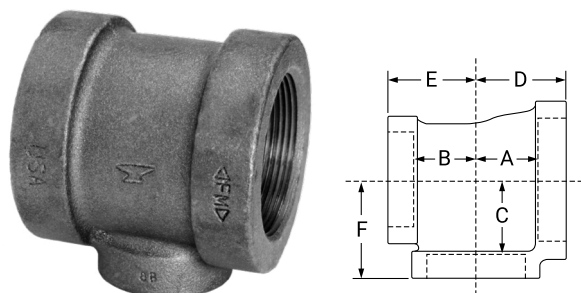
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Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
2 50	1 25	1½ 40	15/16 24	1¼ 32	1½ 38	2 51	1 13/16 47	2⅛ 54	2.85 1.29
		2 50	1 9/16 40	1 7/16 37	1 9/16 40	2¼ 57	2 51	2¼ 57	3.46 1.57
		2½ 65	1 7/8 48	1 13/16 47	1 9/16 40	2 5/16 65	2 3/8 60	2 7/16 62	4.88 2.21
	1¼ 32	½ 15	11/16 17	1 25	1 7/16 37	1¾ 44	1 5/8 41	2 51	2.48 1.12
		¾ 20	7/8 22	7/8 22	1 7/16 37	1 9/16 40	1½ 38	1 15/16 49	2.50 1.13
		1 25	11/16 17	1 25	1 7/16 37	1¾ 44	1 5/8 41	2 51	2.73 1.24
		1¼ 32	13/16 22	1⅝ 29	1 7/16 37	1 7/8 48	1¾ 44	2 1/16 52	2.90 1.32
		1½ 40	15/16 24	1¼ 32	1½ 38	2 51	1 7/8 48	2⅛ 54	3.13 1.42
		2 50	1 9/16 40	1 7/16 37	1 9/16 40	2¼ 57	2 1/16 52	2¼ 57	3.71 1.68
	1½ 40	2½ 65	1 7/8 48	1¾ 44	1 9/16 40	2 5/16 65	2 3/8 60	2 7/16 62	4.54 2.06
		½ 15	13/16 22	13/16 22	1 7/16 37	1½ 38	1 7/16 37	1 7/8 48	2.34 1.06
		¾ 20	7/8 22	7/8 22	1 7/16 37	1 9/16 40	1½ 38	1 15/16 49	2.46 1.12
		1 25	11/16 17	1 25	1 7/16 37	1¾ 44	1 5/8 41	2 51	2.66 1.21
		1¼ 32	13/16 22	13/16 22	1 7/16 37	1 7/8 48	1 13/16 47	2 1/16 52	2.98 1.35
		1½ 40	15/16 24	15/16 24	1½ 38	2 51	1 15/16 49	2⅛ 54	3.24 1.47
	2 50	2 50	1 9/16 40	1½ 38	1 9/16 40	2¼ 57	2⅛ 54	2¼ 57	3.70 1.68
		2½ 65	1 7/8 48	1 15/16 49	1 9/16 40	2 5/16 65	2 3/8 60	2 7/16 62	5.46 2.48

Note:

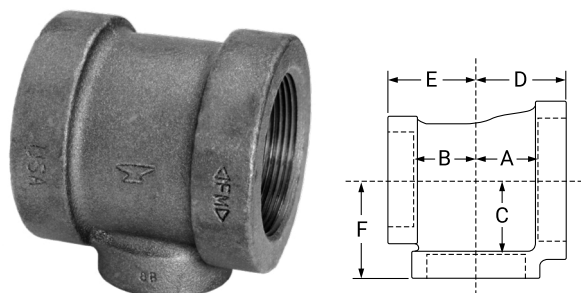
See first page for pressure-temperature ratings.



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Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
2 50	2 50	1/2 15	13/16 22	13/16 22	17/16 37	1 1/2 38	1 1/2 38	1 7/8 48	2.74 1.24
		3/4 20	7/8 22	7/8 22	1 7/16 37	1 9/16 40	1 9/16 40	1 15/16 49	2.86 1.30
		1 25	1 1/16 17	1 1/16 17	1 7/16 37	1 3/4 44	1 3/4 44	2 51	3.05 1.38
		1 1/4 32	13/16 22	13/16 22	1 7/16 37	1 7/8 48	1 7/8 48	2 1/16 52	3.38 1.53
		1 1/2 40	15/16 24	15/16 24	1 1/2 38	2 51	2 51	2 1/8 54	3.59 1.63
		2 1/2 65	1 7/8 48	1 7/8 48	1 9/16 40	2 9/16 65	2 9/16 65	2 7/16 62	5.17 2.34
		3 100	3 76	3 76	2 7/16 62	3 11/16 94	3 11/16 94	3 1/2 89	7.87 3.57
		1/2 15	2 1/2 65	1 13/16 47	1 13/16 47	1 13/16 47	2 11/16 68	2 11/16 68	5.20 2.36
		3/4 20	2 1/2 65	1 13/16 47	1 3/4 44	1 13/16 47	2 11/16 68	2 11/16 68	5.10 2.31
		1 25	2 50	1 9/16 40	1 9/16 40	1 7/8 48	2 7/16 62	2 1/8 54	5.03 2.28
		2 1/2 65	2 1/2 65	1 13/16 47	1 3/4 44	1 13/16 47	2 11/16 68	2 5/16 59	5.36 2.43
		1 1/4 32	2 50	1 9/16 40	1 1/2 38	1 7/8 48	2 7/16 62	2 1/8 54	4.96 2.25
2 1/2 65	1 1/4 32	2 1/2 65	1 13/16 47	1 3/4 44	1 13/16 47	2 11/16 68	2 3/8 60	2 11/16 68	5.40 2.45
		1 1/2 40	15/16 24	15/16 22	1 13/16 47	2 13/16 56	1 15/16 49	2 7/16 62	4.23 1.92
		2 50	1 9/16 40	1 1/2 38	1 7/8 48	2 7/16 62	2 1/8 54	2 9/16 65	4.85 2.20
		2 1/2 65	1 13/16 47	1 13/16 47	1 13/16 47	2 11/16 68	2 7/16 62	2 11/16 68	4.85 2.20
		2 50	1/2 19	3/4 22	1 3/4 44	1 11/16 43	1 1/2 38	2 3/16 56	5.82 2.64
		1 1/2 40	2 50	1 9/16 40	1 1/2 38	1 7/8 48	2 7/16 62	2 1/8 54	4.85 2.20
		2 1/2 65	1 13/16 47	1 13/16 47	1 13/16 47	2 11/16 68	2 7/16 62	2 11/16 68	4.85 2.20
		2 50	1/2 15	3/4 19	1 3/4 44	1 11/16 43	1 1/2 38	2 3/16 56	5.82 2.64

Note:

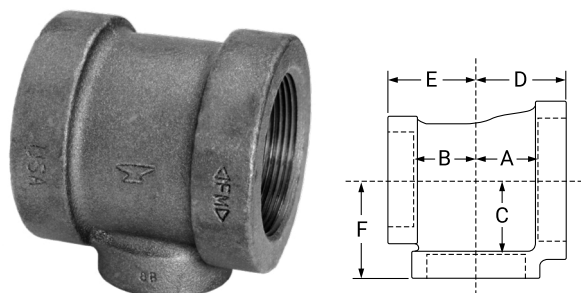
See first page for pressure-temperature ratings.



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Building connections that last™

Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
2 1/2 65	2 50	3/4	7/8	7/8	1 3/4	1 3/4	1 9/16	2 1/4	3.62
		20	22	22	44	44	40	57	1.64
		1	1	1 1/16	1 3/4	1 15/16	1 3/4	2 5/16	3.92
		25	25	17	44	49	44	59	1.78
		1 1/4	1 3/16	1 3/16	1 3/4	2 1/16	1 7/8	2 3/8	4.26
		32	22	22	44	52	48	60	1.93
		1 1/2	1 5/16	1 5/16	1 13/16	2 3/16	2	2 7/16	4.42
		40	24	24	47	56	51	62	2.00
	2 1/2 65	2	1 9/16	1 9/16	1 7/8	2 7/16	2 1/4	2 9/16	5.17
		50	40	40	48	62	57	65	2.34
		2 1/2	1 13/16	1 7/8	1 13/16	2 11/16	2 9/16	2 11/16	6.00
		65	47	48	47	68	65	68	2.72
		3	2 1/16	2 1/8	1 7/8	3	2 7/8	2 13/16	7.35
		80	52	54	48	80	73	73	3.33
		1/2	3/4	3/4	1 3/4	1 11/16	1 11/16	2 3/16	4.00
		15	19	19	44	43	43	56	1.81
	2 1/2 65	3/4	7/8	7/8	1 3/4	1 3/4	1 3/4	2 1/4	4.29
		20	22	22	44	44	44	57	1.95
		1	1	1	1 3/4	1 15/16	1 15/16	2 5/16	4.48
		25	25	25	44	49	49	59	2.03
		1 1/4	1 3/16	1 3/16	1 3/4	2 1/16	2 1/16	2 3/8	4.83
		32	22	22	44	52	52	60	2.19
		1 1/2	1 5/16	1 5/16	1 13/16	2 3/16	2 3/16	2 7/16	5.14
		40	24	24	47	56	56	62	2.33
3 80	2 1/2 65	2	1 9/16	1 9/16	1 7/8	2 7/16	2 7/16	2 9/16	5.88
		50	40	40	48	62	62	65	2.67
		3	2 1/16	2 1/16	1 7/8	3	3	2 13/16	8.09
		80	52	52	48	80	80	73	3.67
		4	2 3/4	2 13/16	2 7/16	3 11/16	3 11/16	3 1/2	14.03
		100	70	73	62	94	94	89	6.36
3 80	3 80	3/4	3	2 1/8	2 1/8	3 1/8	2 11/16	3 1/8	8.25
		20	80	54	54	79	68	79	3.74
3 80	3 80	1	3	2 1/8	2 1/8	3 1/8	2 11/16	3 1/8	8.30
		25	80	54	54	79	68	79	3.76

Note:

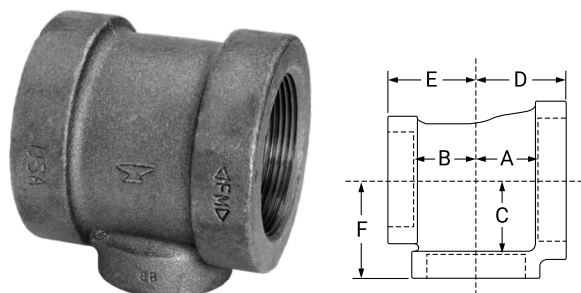
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Building connections that last™

Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
3 80	1 1/4 32	3 80	2 1/8 54	2 1/8 54	2 1/8 54	3 1/8 79	2 13/16 73	3 1/8 79	8.46 3.84
	1 1/2 40	3 80	2 1/8 54	2 3/16 56	2 1/8 54	3 1/8 79	2 13/16 73	3 1/8 79	8.13 3.69
	2 50	1 1/2 40	1 3/8 35	1 1/2 38	2 3/16 56	2 5/16 59	2 3/16 56	2 13/16 73	6.83 3.10
		2 50	1 9/16 40	1 9/16 40	2 3/16 56	2 9/16 65	2 1/4 57	2 15/16 75	7.29 3.31
		2 1/2 65	1 7/8 48	1 15/16 49	2 1/8 54	2 13/16 73	2 9/16 65	3 1/16 78	7.10 3.22
		3 80	2 1/8 54	2 3/16 56	2 1/8 54	3 1/8 79	2 15/16 75	3 1/8 79	8.79 3.99
	2 1/2 65	1 25	1 25	15/16 24	2 1/8 54	2 1/16 52	1 15/16 49	2 11/16 68	5.51 2.50
		1 1/4 32	1 1/4 32	13/16 22	2 1/8 54	2 3/16 56	2 1/16 52	2 3/4 70	5.92 2.68
		1 1/2 40	1 3/8 35	15/16 24	2 3/16 56	2 5/16 59	2 3/16 56	2 13/16 73	6.23 2.83
		2 50	1 9/16 40	1 1/2 38	2 3/16 56	2 9/16 65	2 7/16 62	2 15/16 75	6.81 3.09
		2 1/2 65	1 7/8 48	1 13/16 47	2 1/8 54	2 13/16 73	2 11/16 68	3 1/16 78	7.66 3.47
		3 80	2 1/8 54	2 1/8 54	2 1/8 54	3 1/8 79	3 1/16 78	3 1/8 79	9.13 4.14
		1/2 15	15/16 24	15/16 24	2 3/16 56	1 7/8 48	1 7/8 48	2 5/8 67	6.08 2.76
		3/4 20	15/16 24	15/16 24	2 1/8 54	1 7/8 48	1 7/8 48	2 5/8 67	6.06 2.75
	3 80	1 25	1 25	1 25	2 1/8 54	2 1/16 52	2 1/16 52	2 11/16 68	6.27 2.84
		1 1/4 32	1 1/4 32	1 1/4 32	2 1/8 54	2 3/16 56	2 3/16 56	2 3/4 70	6.75 3.06
		1 1/2 40	1 3/8 35	1 3/8 35	2 3/16 56	2 5/16 59	2 5/16 59	2 15/16 75	7.10 3.22

Note:

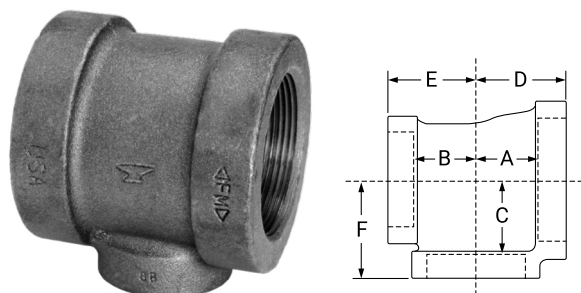
See first page for pressure-temperature ratings.



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Building connections that last™

Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
3 80	3 80	2 50	1 ⁹ / ₁₆ 40	1 ⁹ / ₁₆ 40	2 ³ / ₁₆ 56	2 ⁹ / ₁₆ 65	2 ⁹ / ₁₆ 65	2 ⁷ / ₈ 73	7.75 3.51
		2 ¹ / ₂ 65	1 ⁷ / ₈ 48	1 ⁷ / ₈ 48	2 ¹ / ₈ 54	2 ¹³ / ₁₆ 73	2 ¹³ / ₁₆ 73	3 ¹ / ₁₆ 78	8.92 4.05
		4 100	2 ¹¹ / ₁₆ 68	2 ¹¹ / ₁₆ 68	2 ⁷ / ₁₆ 62	3 ¹¹ / ₁₆ 94	3 ¹¹ / ₁₆ 94	3 ¹ / ₂ 89	12.80 5.80
3 ¹ / ₂ 90	3 ¹ / ₂ 90	1 ¹ / ₂ 40	1 ³ / ₈ 35	1 ³ / ₈ 35	2 ⁷ / ₁₆ 62	2 ³ / ₈ 60	2 ³ / ₈ 60	3 ¹ / ₁₆ 78	8.87 4.02
		2 50	1 ⁵ / ₈ 41	1 ⁵ / ₈ 41	2 ⁷ / ₁₆ 62	2 ⁵ / ₈ 67	2 ⁵ / ₈ 67	3 ³ / ₁₆ 81	9.94 4.51
		4 100	2 ³ / ₄ 70	2 ¹⁵ / ₁₆ 75	2 ³ / ₄ 70	3 ³ / ₄ 95	3 ¹ / ₂ 89	3 ³ / ₄ 95	13.52 6.13
4 100	1 25	4 100	2 ³ / ₄ 70	2 ¹⁵ / ₁₆ 75	2 ³ / ₄ 70	3 ³ / ₄ 95	3 ¹ / ₂ 89	3 ³ / ₄ 95	13.47 6.11
		1 ¹ / ₂ 40	2 ³ / ₄ 70	2 ⁷ / ₈ 73	2 ³ / ₄ 70	3 ³ / ₄ 95	3 ¹ / ₂ 89	3 ³ / ₄ 95	11.34 5.14
	2 50	2 50	1 ¹¹ / ₁₆ 43	1 ⁷ / ₈ 48	2 ³ / ₄ 70	2 ¹¹ / ₁₆ 68	2 ⁹ / ₁₆ 65	3 ¹ / ₂ 89	13.89 6.30
		4 100	2 ³ / ₄ 70	2 ³ / ₄ 70	2 ³ / ₄ 70	3 ³ / ₄ 95	3 ¹ / ₂ 89	3 ³ / ₄ 95	11.78 5.34
	2 ¹ / ₂ 65	2 ¹ / ₂ 65	1 ⁷ / ₈ 48	1 ¹³ / ₁₆ 47	2 ⁵ / ₈ 67	2 ¹⁵ / ₁₆ 75	2 ¹³ / ₁₆ 73	3 ⁹ / ₁₆ 90	15.75 7.14
		4 100	2 ³ / ₄ 70	2 ³ / ₄ 70	2 ³ / ₄ 70	3 ³ / ₄ 95	3 ⁵ / ₈ 92	3 ³ / ₄ 95	11.25 5.10
	3 80	2 ¹ / ₂ 65	1 ⁷ / ₈ 48	1 ⁷ / ₈ 48	2 ⁵ / ₈ 67	2 ¹⁵ / ₁₆ 75	2 ¹³ / ₁₆ 73	3 ⁹ / ₁₆ 90	12.50 5.67
		3 80	2 ¹ / ₄ 57	2 ¹ / ₈ 54	2 ¹¹ / ₁₆ 68	3 ¹ / ₄ 83	3 ¹ / ₈ 79	3 ⁵ / ₈ 92	15.04 6.82
		4 100	2 ³ / ₄ 70	2 ¹¹ / ₁₆ 68	2 ³ / ₄ 70	3 ³ / ₄ 95	3 ⁵ / ₈ 92	3 ³ / ₄ 95	10.40 4.72
	4 100	1 25	1 ³ / ₁₆ 22	1 ³ / ₁₆ 22	2 ³ / ₄ 70	2 ⁵ / ₁₆ 59	2 ⁵ / ₁₆ 59	3 ⁵ / ₁₆ 84	10.38 4.71
		1 ¹ / ₄ 32	1 ⁵ / ₁₆ 24	1 ⁵ / ₁₆ 24	2 ⁵ / ₈ 67	2 ⁵ / ₁₆ 59	2 ⁵ / ₁₆ 59	3 ⁵ / ₁₆ 84	10.75 4.88
		1 ¹ / ₂ 40	1 ⁷ / ₁₆ 37	1 ⁷ / ₁₆ 37	2 ¹¹ / ₁₆ 68	2 ⁷ / ₁₆ 62	2 ⁷ / ₁₆ 62	3 ⁵ / ₁₆ 84	

Note:

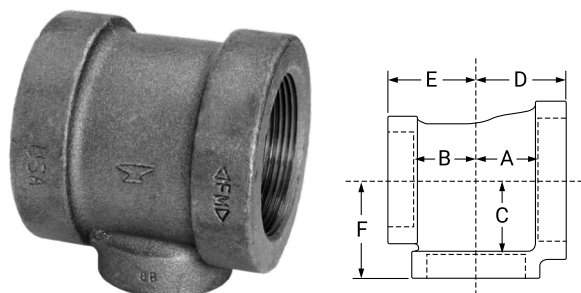
See first page for pressure-temperature ratings.



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Building connections that last™

Reducing Tee (Class 125 Standard) Fig. 359



Size			A	B	C	D	E	F	Unit Weight Black
NPS/DN	NPS/DN	NPS/DN	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	ln./mm	Lbs./kg
4 100	4 100	2	1 ¹¹ / ₁₆	1 ¹¹ / ₁₆	2 ³ / ₄	2 ¹¹ / ₁₆	2 ¹¹ / ₁₆	3 ¹ / ₂	11.63
		50	43	43	70	68	68	89	5.27
		2 ¹ / ₂	2	2	2 ⁵ / ₈	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	3 ⁹ / ₁₆	12.85
		65	51	51	67	75	75	90	5.83
		3	2 ¹ / ₄	2 ¹ / ₄	2 ¹¹ / ₁₆	3 ¹ / ₄	3 ¹ / ₄	3 ⁵ / ₈	14.12
		80	57	57	68	83	83	92	6.40
5 125	5 125	5	3 ³ / ₈	3 ³ / ₈	2 ¹³ / ₁₆	4 ³ / ₈	4 ³ / ₈	4	20.88
		125	86	86	73	111	111	102	9.47
		6	3 ⁷ / ₈	3 ⁷ / ₈	2 ⁷ / ₈	4 ¹⁵ / ₁₆	4 ¹⁵ / ₁₆	4 ¹ / ₁₆	26.36
		150	98	98	73	125	125	103	11.95
		2	1 ³ / ₄	1 ³ / ₄	3 ⁷ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	4 ¹ / ₈	17.43
		50	44	44	87	75	75	105	7.90
6 150	6 150	3	2 ⁵ / ₁₆	2 ⁵ / ₁₆	3 ¹ / ₄	3 ¹ / ₂	3 ¹ / ₂	4 ¹ / ₄	20.00
		80	59	59	83	89	89	108	9.07
		4	2 ¹³ / ₁₆	2 ¹³ / ₁₆	3 ³ / ₈	4	4	4 ³ / ₈	23.83
		100	71	71	86	102	102	111	10.81
		4	2 ⁷ / ₈	2 ¹³ / ₁₆	3 ⁷ / ₈	4 ¹ / ₁₆	4	4 ¹⁵ / ₁₆	30.00
		100	73	71	98	103	102	125	13.61
6 150	6 150	2 ¹ / ₂	2	2	3 ¹³ / ₁₆	3 ¹ / ₄	3 ¹ / ₄	4 ³ / ₄	25.67
		65	51	51	97	83	83	121	11.64
		3	2 ³ / ₈	2 ³ / ₈	3 ¹³ / ₁₆	3 ⁹ / ₁₆	3 ⁹ / ₁₆	4 ¹³ / ₁₆	27.46
		80	60	60	97	90	90	122	12.45
		4	2 ⁷ / ₈	2 ⁷ / ₈	3 ⁷ / ₈	4 ¹ / ₁₆	4 ¹ / ₁₆	4 ¹⁵ / ₁₆	32.44
		100	73	73	98	103	103	125	14.71
6 150	6 150	5	3 ³ / ₈	3 ³ / ₈	3 ¹³ / ₁₆	4 ⁵ / ₈	4 ⁵ / ₈	5	37.00
		125	86	86	97	117	117	127	16.78

Note:

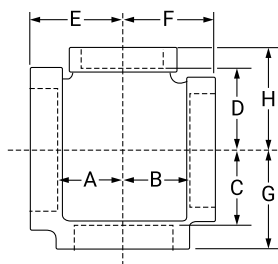
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Building connections that last™

Reducing Cross (Class 125 Standard) Fig. 361



2 NPS
3 NPS — 2 1/2 NPS
1 1/4 NPS

Read as:
3 x 2 1/2 x 2 x 1 1/4

50 DN
80 DN — 65 DN
32 DN

Read as:
80 x 65 x 50 x 32

Size				A	B	C	D	E, F	G, H	Unit Weight
NPS/DN	NPS/DN	NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	Lbs./kg
1 25	1 25	3/4 20	3/4 20	13/16 22	13/16 22	15/16 24	15/16 24	1 3/8 35	1 7/16 37	1.30 0.59
1 1/4 32	1 1/4 32	1 25	1 25	15/16 24	15/16 24	1 1/8 29	1 1/8 29	1 9/16 40	1 11/16 43	2.04 0.93
1 1/2 40	1 25	1 25	1 25	1 25	1 1/8 29	1 1/4 32	1 1/4 32	1 5/8 41	1 13/16 47	2.74 1.24
		1 1/4 32	1 25	1 25	1 25	1 1/4 32	1 1/4 32	1 5/8 41	1 13/16 47	2.67 1.21
	1 1/2 40	1 25	1 25	1 25	1 25	1 1/4 32	1 1/4 32	1 5/8 41	1 13/16 47	2.51 1.14
		1 1/4 32	1 25	1 1/8 29	1 1/8 29	1 3/16 22	15/16 24	1 13/16 47	1 7/8 48	3.90 1.77
			1 1/4 32	1 1/8 29	1 1/8 29	1 3/8 35	1 3/8 35	1 13/16 47	1 7/8 48	3.95 1.79
		1 25	1 25	11/16 17	1 1/8 29	1 7/16 37	1 7/16 37	1 3/4 44	2 51	3.57 1.62
2 50	1 1/2 40	1 25	1 25	1 1/8 29	13/16 22	1 1/2 38	1 7/16 37	1 7/8 48	2 1/8 54	4.25 1.93
		1 1/4 32	1 1/4 32	13/16 22	13/16 22	1 1/2 38	1 1/2 38	1 7/8 48	2 1/16 52	4.18 1.90
	2 50	1 25	1 25	11/16 17	11/16 17	1 7/16 37	1 7/16 37	1 3/4 44	2 51	3.22 1.46
		1 1/4 32	1 1/4 32	1 1/8 29	1 1/8 29	1 7/16 37	1 7/16 37	1 7/8 48	2 1/8 54	4.00 1.81
		1 25	1 25	11/16 17	11/16 17	1 7/16 37	1 7/16 37	1 3/4 44	2 51	3.22 1.46
		1 1/4 32	1 1/4 32	1 1/8 29	1 1/8 29	1 7/16 37	1 7/16 37	1 7/8 48	2 1/8 54	4.00 1.81

Note:

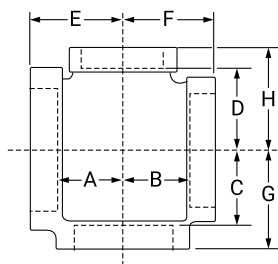
See first page for pressure-temperature ratings.



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Building connections that last™

Reducing Cross (Class 125 Standard) Fig. 361



2 NPS
3 NPS — 2 1/2 NPS
1 1/4 NPS

Read as:
3 x 2 1/2 x 2 x 1 1/4

50 DN
80 DN — 65 DN
32 DN

Read as:
80 x 65 x 50 x 32

Size				A	B	C	D	E, F	G, H	Unit Weight
NPS/DN	NPS/DN	NPS/DN	NPS/DN	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	Lbs./kg
2	2	1 1/2	1 1/2	1 1/4	1 1/4	1 7/16	1 7/16	2	2 1/8	4.08
50	50	40	40	32	32	37	37	51	54	1.85
2 1/2	65	1	1	1	1 1/16	1 3/16	1 3/16	1 15/16	2 5/16	5.11
		25	25	25	17	47	47	49	59	2.32
		1 1/2	1 1/2	1 1/4	1 5/16	1 7/8	1 7/8	2 3/16	2 7/16	6.13
		40	40	32	24	48	48	56	62	2.78
		2	2	1 1/2	1 3/4	1 7/8	1 7/8	2 7/16	2 9/16	7.23
		50	50	38	44	48	48	62	65	3.28
		1 1/4	1	1 3/16	1 3/16	1 3/4	1 13/16	2 1/16	2 3/8	5.39
		32	25	22	22	44	47	52	60	2.44
		1 1/4	1 1/4	1 1/8	1 1/8	1 13/16	1 13/16	2 1/16	2 3/8	5.26
		32	32	29	29	47	47	52	60	2.39
		1 1/2	1 1/2	1 1/4	1 1/4	1 7/8	1 7/8	2 3/16	2 7/16	5.68
		40	40	32	32	48	48	56	62	2.58
		2	2	1 9/16	1 9/16	1 15/16	1 15/16	2 7/16	2 9/16	6.82
		50	50	40	40	49	49	62	65	3.09
3	80	1 1/2	1 1/2	1 3/8	1 3/8	2 3/16	2 3/16	2 5/16	2 13/16	7.91
		40	40	35	35	56	56	59	73	3.59
		2	2	1 5/8	1 5/8	2 3/16	2 3/16	2 9/16	2 15/16	8.85
		50	50	41	41	56	56	65	75	4.01
4	4	2	2	2	2	2 11/16	2 11/16	2 3/4	3 7/16	12.00
100	100	50	50	50	50	68	68	70	87	5.44

Note:

See first page for pressure-temperature ratings.

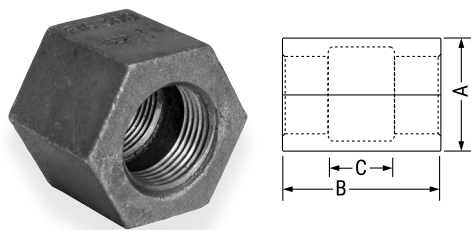


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Building connections that last™

Screwed Hex Coupling (Class 125 Standard)

Fig. 366



Size	Across Flats A	B	C	Unit Weight
				Black
NPS/DN	In./mm	In./mm	In./mm	Lbs./kg
1	1 15/16	1 11/16	9/16	0.82
25	49	43	14	0.37

Flanged Union Gasket Type (Class 125 Standard)

Assembled with gaskets

Fig. 487



Size	Diam. of Flanges	No. of Bolts	Unit Weight		Size	Diam. of Flanges	No. of Bolts	Unit Weight	
			Black	Galvanized				Black	Galvanized
NPS/DN	In./mm		Lbs./kg	Lbs./kg	NPS/DN	In./mm		Lbs./kg	Lbs./kg
3/4	3	3	2.00	2.00	3	6 3/8	4	11.00	11.00
20	76	3	0.91	0.91	80	162	4	4.99	4.99
1	3 1/4	3	2.25	2.25	3 1/2	6 7/8	4	12.75	—
25	83	3	1.02	1.02	90	175	4	5.78	—
1 1/4	4 3/16	4	4.75	4.75	4	7 11/16	5	18.00	18.00
32	106	4	2.15	2.15	100	195	5	8.16	8.16
1 1/2	4 3/8	4	5.00	5.00	5	8 15/16	5	22.00	—
40	111	4	2.27	2.27	125	227	5	9.98	—
2	5	4	6.50	6.50	6	10 1/4	6	30.00	30.00
50	127	4	2.95	2.95	150	260	6	13.61	13.61
2 1/2	5 5/8	4	8.50	8.50	8	12 15/16	8	51.00	51.00
65	143	4	3.85	3.85	200	329	8	23.13	23.13

Note:

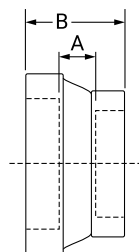
See first page for pressure-temperature ratings.



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Building connections that last™

Concentric Reducer (Class 125 Standard) Fig. 367



Size		A	B*	Unit Weight Black					
NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg
3/4	1/2	5/8	1 9/16	0.40	2	1/2	5/8	2	2.00
20	15	16	40	0.18		15	16	51	0.91
1	1/2 (Hex)	11/16	1 11/16	0.54		3/4	3/4	2	1.90
	15	17	43	0.24		20	19	51	0.86
25	3/4 (Hex)	7/16	1 1/2	0.63	50	1	3/4	2	1.83
	20	11	38	0.29		25	19	51	0.83
1 1/4	1/2	9/16	1 5/8	0.84		1 1/4	13/16	2 1/8	1.78
	15	14	41	0.38		32	22	54	0.81
	3/4	1	2 1/8	0.90		1 1/2	7/8	2 3/16	1.98
	20	25	54	0.41		40	22	56	0.90
1 1/2	1	15/16	2 1/8	1.07	2 1/2	1 1/2	3/4	2	3.10
	25	24	54	0.49		40	19	51	1.41
40	1/2	1/2	1 5/8	1.00		2	1	2 9/16	2.98
	15	13	41	0.45		50	25	65	1.35
	3/4	1/2	1 5/8	1.20		3/4	15/16	2 1/2	4.31
	20	13	41	0.54		20	24	64	1.95
	1	1/2	1 3/4	1.50	3	2	1 1/16	2 3/4	3.96
1 1/2	25	13	44	0.68		50	27	70	1.80
	1 1/4	1	2 1/4	1.45		2 1/2	15/16	2 13/16	4.40
	32	25	57	0.66		65	24	73	2.00

Note:

* Dimension "B" does not conform to ASME standard.

See first page for pressure-temperature ratings.



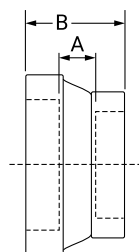
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Building connections that last™

Concentric Reducer (Class 125 Standard)

Fig. 367

(Continued)



Size		A	B*	Unit Weight Black	Size		A	B*	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg
4 100	2	1 ³ / ₁₆	2 ¹⁵ / ₁₆	6.50	6 150	4	1 ¹ / ₈	3 ⁷ / ₁₆	13.83
	50	30	75	2.95		100	29	87	6.27
	2 ¹ / ₂	1 ³ / ₁₆	3 ¹ / ₈	7.78		5	1 ¹ / ₈	3 ⁹ / ₁₆	15.53
5 125	65	30	79	3.53	8 200	125	29	90	7.04
	3	1 ¹ / ₁₆	3 ¹ / ₈	7.01		6	1 ¹ / ₄	3 ⁷ / ₈	29.10
	80	27	79	3.18		150	32	98	13.20
5 125	4	1 ¹ / ₁₆	3 ⁵ / ₁₆	10.48					
	100	27	84	4.75					

Note:

* Dimension "B" does not conform to ASME standard.

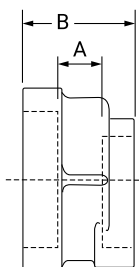
See first page for pressure-temperature ratings.



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Building connections that last™

Eccentric Reducer (Class 125 Standard) Fig. 368



Size		A	B*	Unit Weight Black	Size		A	B*	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg
$\frac{3}{4}$ 20	$\frac{1}{2}$ 15	$\frac{9}{16}$ 14	$1\frac{1}{2}$ 38	0.45 0.20	2 50	$\frac{1}{2}$ 15	$\frac{3}{4}$ 19	$1\frac{15}{16}$ 49	1.80 0.82
	$\frac{1}{2}$ 15	$\frac{1}{2}$ 13	$1\frac{7}{16}$ 37	0.57 0.26		$\frac{3}{4}$ 20	$\frac{3}{4}$ 19	2 51	1.83 0.83
1 25	$\frac{3}{4}$ 20	$\frac{7}{16}$ 11	$1\frac{1}{2}$ 38	0.61 0.28		1 25	$1\frac{1}{16}$ 17	$2\frac{1}{16}$ 52	1.86 0.84
	$\frac{1}{2}$ 15	$\frac{9}{16}$ 14	$1\frac{5}{8}$ 41	1.00 0.45		$1\frac{1}{4}$ 32	$1\frac{3}{16}$ 22	$2\frac{1}{8}$ 54	1.87 0.85
$1\frac{1}{4}$ 32	$\frac{3}{4}$ 20	$\frac{1}{2}$ 13	$1\frac{5}{8}$ 41	0.90 0.41	$2\frac{1}{2}$ 65	$1\frac{1}{2}$ 40	$\frac{7}{8}$ 22	$2\frac{3}{16}$ 56	1.93 0.88
	1 25	$\frac{1}{2}$ 13	$1\frac{11}{16}$ 43	1.00 0.45		1 25	$1\frac{3}{16}$ 22	$2\frac{1}{4}$ 57	2.74 1.24
$1\frac{1}{2}$ 40	$\frac{1}{2}$ 15	$1\frac{1}{16}$ 17	$1\frac{3}{4}$ 44	1.11 0.50		$1\frac{1}{4}$ 32	$\frac{7}{8}$ 22	$2\frac{3}{8}$ 60	2.80 1.27
	$\frac{3}{4}$ 20	$\frac{9}{16}$ 14	$1\frac{11}{16}$ 43	1.17 0.53		$1\frac{1}{2}$ 40	$\frac{7}{8}$ 22	$2\frac{3}{8}$ 60	2.94 1.33
	1 25	$\frac{9}{16}$ 14	$1\frac{3}{4}$ 44	1.21 0.55		2 50	1 25	$2\frac{9}{16}$ 65	2.95 1.34
	$1\frac{1}{4}$ 32	$\frac{5}{8}$ 16	$1\frac{7}{8}$ 48	1.26 0.57	3 80	1 25	$\frac{7}{8}$ 22	$2\frac{7}{16}$ 62	3.95 1.79

Note:

* Dimension "B" does not conform to ASME standard.

See first page for pressure-temperature ratings.



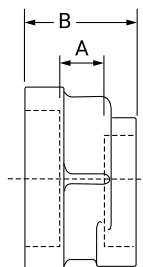
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Eccentric Reducer (Class 125 Standard)

Fig. 368

(Continued)



Size		A	B*	Unit Weight Black	Size		A	B*	Unit Weight Black
NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg	NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg
3 80	1 1/4 32	15/16 24	2 9/16 65	3.80 1.72	4 100	2 1/2 65	1 1/8 29	3 1/16 78	7.26 3.29
	1 1/2 40	15/16 24	2 9/16 65	4.16 1.89		3 80	1 1/16 27	3 1/8 79	7.64 3.46
	2 50	1 1/16 27	2 3/4 70	4.61 2.09	5 125	3 80	1 1/16 27	3 1/4 83	11.44 5.19
	2 1/2 65	15/16 24	2 13/16 73	4.80 2.18		4 100	1 1/16 27	3 5/16 84	11.19 5.07
4 100	1 1/4 32	1 1/16 27	2 3/4 70	6.58 2.98	6 150	3 80	1 1/16 27	3 5/16 84	14.66 6.65
	1 1/2 40	1 1/8 29	2 13/16 73	6.61 3.00		4 100	1 1/8 29	3 7/16 87	15.36 6.97
	2 50	1 3/16 30	2 15/16 75	6.91 3.13					

Note:

* Dimension "B" does not conform to ASME standard.

See first page for pressure-temperature ratings.



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Fig. 390CI
Countersunk Plugs
(Class 125 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
1 25	0.20 0.09	0.20 0.09	2 ½ 65	1.40 0.63	— —
1 ¼ 32	0.32 0.15	0.32 0.15	3 80	2.25 1.02	— —
1 ½ 40	0.47 0.21	0.47 0.21	3 ½ 90	3.02 1.37	— —
2 50	0.84 0.38	0.84 0.38	4 100	3.76 1.71	— —

Note:

See Fig. 390 in Malleable Iron for other available sizes.

Fig. 381
Cap (Class 125 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
2 ½ 65	2.55 1.16	— —	5 125	10.70 4.85	— —
3 80	4.10 1.86	— —	6 150	14.20 6.44	14.20 6.44
4 100	6.40 2.90	— —	8 200	27.23 12.35	27.23 12.35

Fig. 370
Locknut (Class 125 Standard)



Size	Minimum Dimensions				Unit Weight
	A	B	C	D	Black
NPS/DN	In./mm	In./mm	In./mm	In./mm	Lbs./kg
2 ½ 65	3.500 89	3.180 81	.590 15	0.90 2	1.13 0.51
3 80	4.270 108	3.840 98	.670 17	0.90 2	1.60 0.73
4 100	5.380 137	5.000 127	.800 20	.130 3	1.10 0.50

Note:

For nominal sizes smaller than 2 ½" (65 DN), see Fig. 1134 in the Malleable Iron Section.

Note:

According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

See first page for pressure-temperature ratings.



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Building connections that last™

Malleable Iron Hex Bushing Fig. 383



Outside Hex
Type A



Inside Hex
Type B

Size					Unit Weight				
			Black		Galvanized				
NPS/DN	Hex Type	NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Hex Type	NPS/DN	Lbs./kg	Lbs./kg
3/4 10	A	1/8 6	0.12 0.05	0.12 0.05	1 1/4 32	B	1/4 8	0.33 0.15	0.33 0.15
	A	1/4 8	0.14 0.06	0.14 0.06		B	3/8 10	0.27 0.12	0.27 0.12
	A	3/8 10	0.11 0.05	0.11 0.05		B	1/2 15	0.34 0.15	0.34 0.15
	A	1/2 15	0.09 0.04	0.09 0.04		A	3/4 20	0.39 0.18	0.39 0.18
1 25	B	1/8 6	0.24 0.11	0.24 0.11	1 1/2 40	A	1 25	0.30 0.14	0.30 0.14
	B	1/4 8	0.18 0.08	0.18 0.08		A	1 1/4 32	0.30 0.14	0.30 0.14
	B	3/8 10	0.18 0.08	0.18 0.08	2 50	A	1 1/2 40	0.64 0.29	0.64 0.29
	A	1/2 15	0.20 0.09	0.20 0.09	2 1/2 65	A	2 50	1.02 0.46	1.02 0.46
	A	3/4 20	0.16 0.07	0.16 0.07					

Note:

See Cast Iron section on next page for other available sizes.

Hexagon head or octagon head bushings 2 1/2 NPS (65 DN) and smaller reducing one size may be made of malleable iron, ductile iron or steel. Other sizes may be made of cast iron, ductile iron, malleable iron or steel. Face bushings 2 1/2 NPS (65 DN) and smaller may be made of malleable iron, ductile iron or steel. Face bushings 3NPS (80 DN) and larger reducing one size may be made of malleable iron, ductile iron or steel. Face bushings 3NPS (80 DN) and larger reducing two sizes or more may be made of cast or malleable iron, ductile iron, or steel. According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

Cast Iron Hex Bushings on next page.



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Cast Iron Hex Bushing Fig. 383



Outside Hex
Type A



Inside Hex
Type B

Size		Unit Weight			Size		Unit Weight		
NPS/DN	Hex Type/All Cast Iron	NPS/DN	Black Lbs./kg	Galvanized Lbs./kg	NPS/DN	Hex Type/All Cast Iron	NPS/DN	Black Lbs./kg	Galvanized Lbs./kg
1 1/2 40	B	1/4	0.47	0.47	2 1/2 65	B	1	1.16	1.16
	C	8	0.21	0.21		C	25	0.53	0.53
	B	3/8	0.47	0.47		B	1 1/4	1.24	1.24
	C	10	0.21	0.21		C	32	0.56	0.56
	B	1/2	0.42	0.42		A	1 1/2	1.29	1.29
	C	15	0.19	0.19		C	40	0.59	0.59
	B	3/4	0.47	0.47		B	1/2	1.93	1.93
	C	20	0.21	0.21		C	15	0.88	0.88
	A	1	0.50	0.50		B	3/4	1.92	1.92
	C	25	0.23	0.23		C	20	0.87	0.87
2 50	B	1/4	0.75	0.75	3 80	B	1	1.90	1.90
	C	8	0.34	0.34		C	25	0.86	0.86
	B	3/8	0.75	0.75		B	1 1/4	1.77	1.77
	C	10	0.34	0.34		C	32	0.80	0.80
	B	1/2	0.70	0.70		B	1 1/2	1.79	1.79
	C	15	0.32	0.32		C	40	0.81	0.81
	B	3/4	0.71	0.71		A	2	1.90	1.90
	C	20	0.32	0.32		C	50	0.86	0.86
	B	1	0.73	0.73		A	2 1/2	1.63	1.63
	C	25	0.33	0.33		C	65	0.74	0.74
2 1/2 65	A	1 1/4	0.81	0.81	3 1/2 90	B	1	2.42	2.42
	C	32	0.37	0.37		C	25	1.10	1.10
	B	1/2	1.28	1.28		B	1 1/4	2.56	2.56
	C	15	0.58	0.58		C	32	1.16	1.16
	B	3/4	1.25	1.25		B	1 1/2	2.65	2.65
	C	20	0.57	0.57		C	40	1.20	1.20

Note:

See Malleable Iron section on previous page for other available sizes.

According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

Additional Cast Iron Hex Bushings on next page.



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Cast Iron Hex Bushing Fig. 383

(Continued)



Outside Hex
Type A



Inside Hex
Type B

Size		Unit Weight			Size		Unit Weight		
NPS/DN	Hex Type/All Cast Iron	NPS/DN	Black Lbs./kg	Galvanized Lbs./kg	NPS/DN	Hex Type/All Cast Iron	NPS/DN	Black Lbs./kg	Galvanized Lbs./kg
3½ 80	B	2	2.54	2.54	5 125	A	3½ 90	4.00	—
	C	50	1.15	1.15		C	100	1.81	—
	A	2½ 65	3.23	3.23		A	4	3.94	3.94
	C	65	1.46	1.46		C	100	1.79	1.79
	A	3	1.96	1.96	6 150	B	2	8.00	8.00
	C	80	0.89	0.89		C	50	3.63	3.63
4 100	B	1	3.59	3.59		B	2½ 65	7.72	—
	C	25	1.63	1.63		C	65	3.50	—
	B	1¼ 32	3.54	3.54		B	3	7.75	7.75
	C	32	1.61	1.61		C	80	3.51	3.51
	B	1½ 40	3.44	3.44		B	4	6.83	6.83
	C	40	1.56	1.56		C	100	3.10	3.10
	B	2	3.11	3.11		A	5	5.24	5.24
	C	50	1.41	1.41		C	125	2.38	2.38
	B	2½ 65	3.29	3.29	8 200	B	3	15.50	—
	C	65	1.49	1.49		C	80	7.03	—
5 125	A	3	3.15	3.15		B	4	13.93	—
	C	80	1.43	1.43		C	100	6.32	—
	A	3½ 90	2.50	2.50		B	5	13.65	—
	C	90	1.13	1.13		C	125	6.19	—
	B	2	5.12	5.12		A	6	13.19	13.19
	C	50	2.32	2.32		C	150	5.98	5.98
	B	2½ 65	4.87	4.87	10 250	B	6	24.50	—
	C	65	2.21	2.21		C	150	11.11	—
	B	3	4.83	4.83		A	8	22.00	—
	C	80	2.19	2.19		C	200	9.98	—

Note:

See Malleable Iron section on first page for other available sizes.

According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

Additional Cast Iron Hex Bushings on previous page.



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Fig. 380

Bar Plugs, Solid
(Class 125 Standard)



Unit Weight		Unit Weight	
Size	Black	Size	Black
NPS/DN	Lbs./kg	NPS/DN	Lbs./kg
4	5.68	6	14.78
100	2.58	150	6.70
5	9.60		
125	4.35		

Fig. 387

Square Head Plugs, Cored
(Class 125 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
3/4* 20	0.13 0.06	0.13 0.06	2 1/2 65	1.32 0.60	1.32 0.60
1 25	0.25 0.11	0.25 0.11	3 80	1.87 0.85	1.87 0.85
1 1/4 32	0.39 0.18	0.39 0.18	3 1/2 90	2.50 1.13	2.50 1.13
1 1/2 40	0.50 0.23	0.50 0.23	4 100	4.00 1.81	4.00 1.81
2 50	0.82 0.37	0.82 0.37			

Note:

*Zinc Plated

Note:

According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

See first page for pressure-temperature ratings.



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Fig. 388

Square Head Plugs, Solid
(Class 125 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
1/2	0.10	0.10	2	1.23	1.23
15	0.05	0.05	50	0.56	0.56
3/4	0.17	0.17	2 1/2	2.00	2.00
20	0.08	0.08	65	0.91	0.91
1	0.32	0.32	3	3.18	3.18
25	0.15	0.15	80	1.44	1.44
1 1/4	0.53	0.53	3 1/2	4.38	—
32	0.24	0.24	90	1.99	—
1 1/2	0.76	0.76			
40	0.34	0.34			

Fig. 389

Bar Plugs, Cored
(Class 125 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
4	3.82	3.82	6	9.94	9.94
100	1.73	1.73	150	4.51	4.51
5	6.50	6.50	8	20.26	20.26
125	2.95	2.95	200	9.19	9.19

Note:

According to specifications, hex bushings and cored plugs should be used with 150# malleable iron and 125# cast iron. Solid plugs and face bushings are recommended for use with 250# and 300# fittings.

See first page for pressure-temperature ratings.



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Cast Iron Threaded Fittings						
	Dimensions	Threads	Material	Coating*	Pressure Rating	Federal Spec
Class 125	ASME B16.4	ASME B1.20.1	ASTM A126	ASTM A153	ASME B16.3	WW-P-501
Class 250	ASME B16.4	ASME B1.20.1	ASTM A126	ASTM A153	ASME B16.3	WW-P-501

* ASTM B633 Type I, SC 4 may be used as an alternate zinc coating per ASME B16.4

Cast Iron Threaded Fittings Pressure-Temperature Ratings		
Temperature (°F)	Working Pressure (psi)	
	Class 125	Class 250
-20 to 150	175	400
200	165	370
250	150	340
300	140	310
350	125 ⁽¹⁾	300
400		250 ⁽²⁾

(1) Permissible for service temperature up to 360° F, reflecting the temperature of saturated steam at 125 psi.

(2) Permissible for service temperature up to 406° F, reflecting the temperature of saturated steam at 250 psi.

90° Elbow (Class 150 Standard) Fig. 1101



Standards and Specifications

Malleable Iron Fittings

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
Class 150/PN 20	ASME B16.3	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.3
Class 300/PN 50	ASME B16.3	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.3

Malleable Iron Unions

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
Class 150/PN 20	ASME B16.39	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.39
Class 250	ASME B16.39	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.39
Class 300/PN 50	ASME B16.39	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.39

Note:

* ASTM B633, Type I, SC 4, may be supplied as alternate zinc coating per applicable ASME B16 product standard.



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90° Elbow (Class 150 Standard) Fig. 1101



ASC Engineered Solutions™ offers the broadest line of malleable iron fitting sizes in both black and galvanized finishes. Every fitting is manufactured and tested to meet ASC's strict quality standards. All Anvil Class 150 Malleable Iron Fittings conform to ASME B16.3 and unions conform to ASME B16.39. All elbows and tees $\frac{3}{8}$ " (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

For Listings/Approval Details and Limitations, visit our website at www.asc-es.com or contact an ASC Engineered Solutions™ Representative.

See following page for standards and specifications.

Anvil Class 150/300 Malleable Iron Fittings conform to ASME B16.3 and Unions conform to ASME B16.39.

All elbows and tees $\frac{3}{8}$ " (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

Malleable Iron Threaded Pipe Unions
Pressure - Temperature Ratings

Temperature	Pressure		
	Class 150	Class 250	Class 300
°F/°C	PSI/bar	PSI/bar	PSI/bar
-20°–150° -28.9°–65.6°	300 20.7	500 34.5	600 41.4
200° 93.3°	265 18.3	455 31.4	550 37.9
250° 121.1°	225 15.5	405 27.9	505 34.8
300° 148.9°	185 12.8	360 24.8	460 31.7
350° 176.7°	150 10.3	315 21.7	415 28.6
400° 204.4°	110 7.6	270 18.6	370 25.5
450° 232.2°	75 5.2	225 15.5	325 22.4
500° 260.0°	— —	180 12.4	280 19.3
550° 287.8°	— —	130 9.0	230 15.9

Malleable Iron Threaded Fittings
Pressure - Temperature Ratings

Temperature	Pressure Class 300			
	Class 150	Sizes $\frac{1}{4}$ "–1" (6–25mm)	Sizes 1 $\frac{1}{4}$ "–2" (32–51mm)	Sizes 2 $\frac{1}{2}$ "–3" (64–76mm)
°F/°C	PSI/bar	PSI/bar	PSI/bar	PSI/bar
-20°–150° -28.9°–65.6°	300 20.7	2000 137.9	1500 103.4	1000 68.9
200° 93.3°	265 18.3	1785 123.1	1350 93.1	910 62.7
250° 121.1°	225 15.5	1575 108.6	1200 82.7	825 56.9
300° 148.9°	185 12.8	1360 93.8	1050 72.4	735 50.7
350° 176.7°	150 10.3	1150 79.3	900 62.1	650 44.8
400° 204.4°	— —	935 64.5	750 51.7	560 38.6
450° 232.2°	— —	725 50.0	600 41.4	475 32.8
500° 260.0°	— —	510 35.2	450 31.0	385 26.5
550° 287.8°	— —	300 20.7	300 20.7	300 20.7

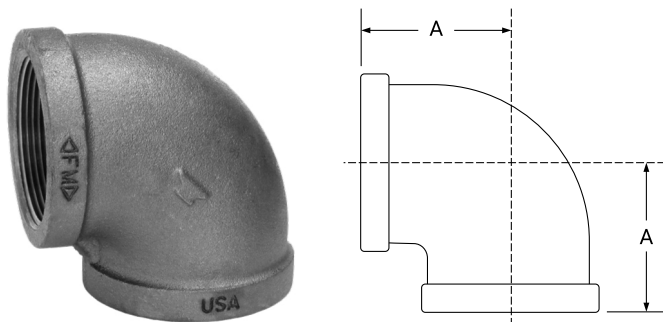
Note:

Unions with Copper or Copper Alloy seats are not intended for use where temperature exceeds 450°F.



PROJECT INFORMATION	APPROVAL STAMP
Project:	<input type="checkbox"/> Approved
Address:	<input type="checkbox"/> Approved as noted
Contractor:	<input type="checkbox"/> Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

90° Elbow (Class 150 Standard) Fig. 1101



Size	A	Unit Weight		Size	A	Unit Weight	
		Black	Galvanized			Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg	NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/8 6	11/16 17	0.06 0.03	0.06 0.03	1 1/2 40	1 15/16 49	1.30 0.59	1.30 0.59
1/4 8	13/16 22	0.11 0.05	0.11 0.05	2 50	2 1/4 57	2.06 0.93	2.06 0.93
3/8 10	15/16 24	0.17 0.08	0.17 0.08	2 1/2 65	2 11/16 68	3.55 1.61	3.55 1.61
1/2 15	1 1/8 29	0.30 0.14	0.30 0.14	3 80	3 1/16 78	5.46 2.48	5.46 2.48
3/4 20	1 5/16 33	0.45 0.20	0.45 0.20	3 1/2 90	3 7/16 87	7.10 3.22	7.10 3.22
1 25	1 1/2 38	0.73 0.33	0.73 0.33	4 100	3 13/16 98	8.95 4.06	8.95 4.06
1 1/4 32	1 3/4 44	0.97 0.44	0.97 0.44	5 125	4 1/2 114	13.90 6.30	13.90 6.30
				6 150	5 1/8 130	23.00 10.43	23.00 10.43

Note:

See first page for pressure-temperature ratings. Galvanized weights may vary.
Please contact your ASC Engineered Solutions™ Representative if you need verification.

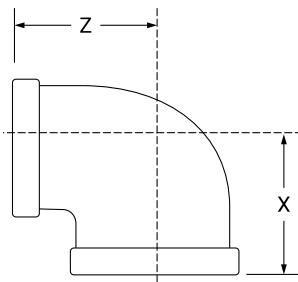
All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).



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Reducing Elbow (Class 150 Standard) Fig. 1101R



Size		X	Z	Unit Weight	
				Black	Galvanized
NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg	Lbs./kg
1/4	1/8	3/4	3/4	0.10	0.10
8	6	19	19	0.05	0.05
3/8	1/8	13/16	7/8	0.12	0.12
	6	22	22	0.05	0.05
10	1/4	7/8	15/16	0.14	0.14
	8	22	24	0.06	0.06
1/2	1/4	1	1	0.19	0.19
	8	25	25	0.09	0.09
15	3/8	1 1/16	1 1/16	0.22	0.22
	10	27	27	0.10	0.10
3/4	1/4	1 1/8	1 1/8	0.26	0.26
	8	29	29	0.12	0.12
20	3/8	1 1/8	1 1/8	0.29	0.29
	10	29	29	0.13	0.13
1	1/2	1 3/16	1 1/4	0.38	0.38
	15	30	32	0.17	0.17
25	3/8	1 3/16	1 1/4	0.41	0.41
	10	30	32	0.19	0.19
1 1/4	1/2	1 1/4	1 3/8	0.46	0.46
	15	32	35	0.21	0.21
32	3/4	1 3/8	1 7/16	0.56	0.56
	20	35	37	0.25	0.25
1 1/2	1/2	1 3/8	1 9/16	0.61	0.61
	15	35	40	0.28	0.28
2	3/4	1 7/16	1 5/8	0.71	0.71
	20	37	41	0.32	0.32
Size		X	Z	Unit Weight	
				Black	Galvanized
NPS/DN	NPS/DN	In./mm	In./mm	Lbs./kg	Lbs./kg
1 1/4	1	1 9/16	1 11/16	0.87	0.87
32	25	40	43	0.39	0.39
1 1/2	3/4	1 1/2	1 3/4	0.83	0.83
	20	38	44	0.38	0.38
40	1	1 5/8	1 13/16	1.02	1.02
	25	41	47	0.46	0.46
2	1 1/4	1 13/16	1 7/8	1.17	1.17
	32	47	48	0.53	0.53
50	3/4	1 5/8	2	1.30	1.30
	20	41	51	0.59	0.59
2 1/2	1	1 3/4	2	1.35	1.35
	25	44	51	0.61	0.61
65	1 1/4	1 7/8	2 1/8	1.53	1.53
	32	48	54	0.69	0.69
3	1 1/2	2	2 1/8	1.75	1.75
	40	51	54	0.79	0.79
80	1 1/2	2 3/16	2 1/2	2.50	2.50
	40	56	64	1.13	1.13
100	2	2 7/16	2 5/8	2.98	2.98
	50	62	67	1.35	1.35
4	2	2 9/16	2 15/16	3.75	3.75
	50	65	75	1.70	1.70
8	2 1/2	2 13/16	3	4.30	4.30
	65	73	76	1.95	1.95
16	3	3 5/16	3 3/8	7.87	7.87
	80	84	92	3.57	3.57

Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

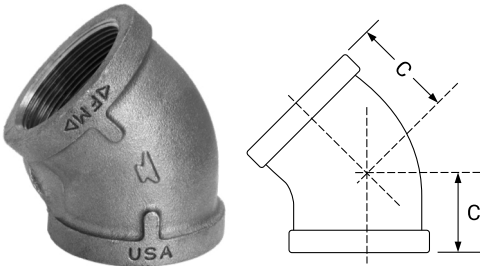


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Fig. 1102

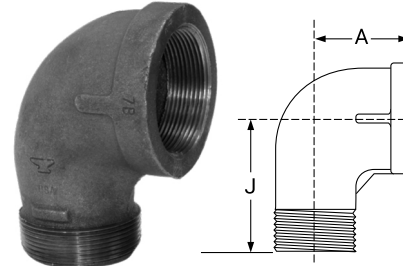
45° Elbow (Class 150 Standard)



Size	C	Unit Weight	
		Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/8	1 1/16	0.07	0.07
6	17	0.03	0.03
1/4	3/4	0.11	0.11
8	19	0.05	0.05
3/8	1 3/16	0.16	0.16
10	22	0.07	0.07
1/2	7/8	0.22	0.22
15	22	0.10	0.10
3/4	1	0.37	0.37
20	25	0.17	0.17
1	1 1/8	0.54	0.54
25	29	0.24	0.24
1 1/4	1 5/16	0.86	0.86
32	33	0.39	0.39
1 1/2	1 7/16	1.13	1.13
40	37	0.51	0.51
2	1 11/16	1.79	1.79
50	43	0.81	0.81
2 1/2	1 15/16	3.60	3.60
65	49	1.63	1.63
3	2 3/16	4.48	4.48
80	56	2.03	2.03
4	2 5/8	7.40	7.40
100	67	3.36	3.36
5	3 1/16	11.46	11.46
125	78	5.20	5.20
6	3 7/16	19.93	19.93
150	87	9.04	9.04

Fig. 1103, 1103R

90° Straight Street Elbow (Class 150 Standard)
90° Reducing Street Elbow (Class 150 Standard)



Size	A	J	Unit Weight	
			Black	Galv.
NPS/DN	In./mm	In./mm	Lbs./kg	Lbs./kg
1/8	1 1/16	1	0.06	0.06
6	17	25	0.03	0.03
1/4	1 3/16	1 3/16	0.10	0.10
8	22	30	0.05	0.05
3/8	1 5/16	1 7/16	0.17	0.17
10	24	37	0.08	0.08
1/2	1 1/8	1 5/8	0.28	0.28
15	29	41	0.13	0.13
3/4	1 5/16	1 7/8	0.41	0.41
20	33	48	0.19	0.19
1	1 1/2	2 1/8	0.62	0.62
25	38	54	0.28	0.28
1 1/4	1 3/4	2 7/16	1.09	1.09
32	44	62	0.49	0.49
1 1/2	1 15/16	2 11/16	1.44	1.44
40	49	68	0.65	0.65
2	2 1/4	3 1/4	2.85	2.85
50	57	83	1.29	1.29
2 1/2	2 11/16	3 7/8	4.00	4.00
65	68	98	1.81	1.81
3	3 1/16	4 1/2	6.06	6.06
80	78	114	2.75	2.75
4	3 13/16	5 11/16	10.53	10.53
100	98	144	4.78	4.78

Note:

First size denotes female end.

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

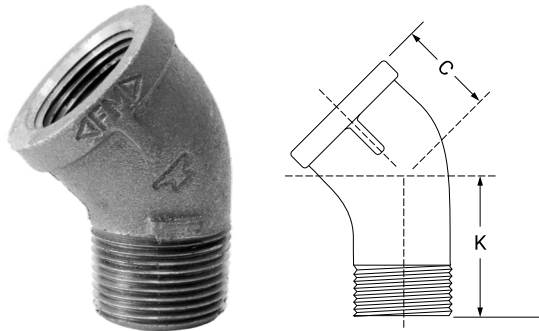
All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).



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Fig. 1104
45° Street Elbow (Class 150 Standard)



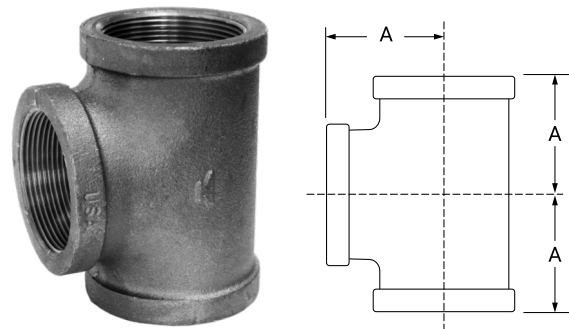
Size	C	K	Unit Weight	
			Black	Galvanized
NPS/DN	In./mm	In./mm	Lbs./kg	Lbs./kg
1/8	11/16	7/8	0.06	0.06
6	17	22	0.03	0.03
1/4	3/4	15/16	0.10	0.10
8	19	24	0.05	0.05
3/8	13/16	1	0.14	0.14
10	22	25	0.06	0.06
1/2	7/8	1 1/8	0.20	0.20
15	22	29	0.09	0.09
3/4	1	1 5/16	0.33	0.33
20	25	33	0.15	0.15
1	1 1/8	1 7/16	0.52	0.52
25	29	37	0.24	0.24
1 1/4	1 5/16	1 11/16	0.85	0.85
32	33	43	0.39	0.39
1 1/2	1 7/16	1 7/8	1.22	1.22
40	37	48	0.55	0.55
2	1 11/16	2 1/4	1.92	1.92
50	43	57	0.87	0.87

Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

Fig. 1105
Straight Tee (Class 150 Standard)



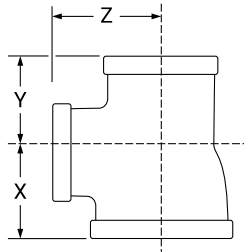
Size	A	Unit Weight	
		Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/8	11/16	0.09	0.09
6	17	0.04	0.04
1/4	13/16	0.15	0.15
8	22	0.07	0.07
3/8	15/16	0.23	0.23
10	24	0.10	0.10
1/2	1 1/8	0.41	0.41
15	29	0.19	0.19
3/4	1 5/16	0.60	0.60
20	33	0.27	0.27
1	1 1/2	0.90	0.90
25	38	0.41	0.41
1 1/4	1 3/4	1.31	1.31
32	44	0.59	0.59
1 1/2	1 15/16	1.73	1.73
40	49	0.78	0.78
2	2 1/4	2.52	2.52
50	57	1.14	1.14
2 1/2	2 11/16	4.90	4.90
65	68	2.22	2.22
3	3 1/16	7.13	7.13
80	78	3.23	3.23
3 1/2	3 7/16	9.00	9.00
90	87	4.08	4.08
4	3 13/16	11.32	11.32
100	98	5.13	5.13
5	4 1/2	19.42	19.42
125	114	8.81	8.81
6	5 1/8	25.50	25.50
150	130	11.56	11.56



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Reducing Tee (Class 150 Standard) Fig. 1105R



Size			X	Y	Z	Unit Weight	
NPS/DN	NPS/DN	NPS/DN				Black	Galv.
In./mm	In./mm	In./mm	Lbs./kg	Lbs./kg			
1/8 6	1/8 6	1/4 8	3/4 19	3/4 19	3/4 19	0.12 0.05	0.12 0.05
1/4 8	1/4 8	1/8 6	3/4 19	3/4 19	3/4 19	0.13 0.06	0.13 0.06
		3/8 10	15/16 24	15/16 24	7/8 22	0.19 0.09	0.19 0.09
3/8 10	1/4 8	1/4 8	7/8 22	13/16 22	15/16 24	0.19 0.09	0.19 0.09
		3/8 10	15/16 24	15/16 24	15/16 24	0.21 0.10	0.21 0.10
	3/8 10	1/4 8	7/8 22	7/8 22	15/16 24	0.21 0.10	0.21 0.10
		1/2 15	1 1/16 27	1 1/16 27	1 1/16 27	0.27 0.12	0.27 0.12
1/2 15	1/4 8	1/2 15	1 1/8 29	15/16 24	1 1/8 29	0.29 0.13	0.29 0.13
		3/8 10	1 1/16 27	1 25	1 1/16 27	0.28 0.13	0.28 0.13
	3/8 10	1/2 15	1 1/8 29	1 1/16 27	1 1/8 29	0.33 0.15	0.33 0.15
		1/4 8	1 25	1 25	1 25	0.27 0.12	0.27 0.12
1/2 15	1/2 15	3/8 10	1 1/16 27	1 1/16 27	1 1/16 27	0.30 0.14	0.3 0.14
		3/4 20	1 1/4 32	1 1/4 32	1 3/16 30	0.45 0.20	0.45 0.20
	1 25	1 25	1 3/8 35	1 3/8 35	1 1/4 32	0.55 0.25	0.55 0.25
		1/2 15	1 1/4 32	1 1/4 32	1 3/8 30	0.45 0.20	0.45 0.20
3/4 20	1/4 8	1/2 15	1 3/16 22	1 3/16 30	1 1/4 32	0.47 0.21	0.47 0.21
		1 25	1 7/16 37	1 7/16 37	1 3/8 35	0.62 0.28	0.62 0.28
	1/2 15	1 1/4 32	1 5/8 41	1 5/8 41	1 7/16 37	0.90 0.41	0.90 0.41
		1/4 8	1 1/2 38	1 5/16 33	1 1/2 38	0.69 0.31	0.69 0.31
1 25	1/2 15	1/2 15	1 1/4 32	1 1/8 29	1 3/8 35	0.70 0.32	0.70 0.32
		3/4 20	1 3/8 35	1 1/4 32	1 7/16 37	0.56 0.25	0.56 0.25
	1 25	1 25	1 1/2 38	1 3/8 35	1 1/2 38	0.76 0.34	0.76 0.34
		1/2 15	1 1/4 32	1 1/8 29	1 3/8 35	0.70 0.32	0.70 0.32

Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

See additional sizes on following page.



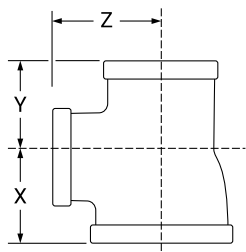
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Building connections that last™

Reducing Tee (Class 150 Standard)

Fig. 1105R

(Continued)



Size			X	Y	Z	Unit Weight	
NPS/DN	NPS/DN	NPS/DN				Black	Galv.
In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	Lbs./kg	Lbs./kg
1 25	3/4 20	1/2 15	1 1/4 32	1 3/16 30	1 3/8 35	0.59 0.27	0.59 0.27
		3/4 20	1 3/8 35	1 5/16 33	1 7/16 37	0.74 0.34	0.74 0.34
		1 25	1 1/2 38	1 7/16 37	1 1/2 38	0.78 0.35	0.78 0.35
		1/4 8	1 1/8 29	1 1/8 29	1 1/4 44	0.53 0.24	0.53 0.24
	1 25	3/8 10	1 3/16 30	1 3/16 30	1 1/4 32	0.60 0.27	0.60 0.27
		1/2 15	1 1/4 32	1 1/4 32	1 3/8 35	0.70 0.32	0.70 0.32
		3/4 20	1 3/8 35	1 3/8 35	1 7/16 37	0.82 0.37	0.82 0.37
		1 1/4 32	1 11/16 43	1 11/16 43	1 9/16 40	0.92 0.42	0.92 0.42
	1 1/4 32	1 1/2 40	1 13/16 47	1 13/16 46	1 5/8 41	1.19 0.54	1.19 0.54
		2 50	2 51	2 51	1 3/4 44	1.63 0.74	1.63 0.74
		1 25	1 9/16 40	1 3/8 35	1 11/16 43	0.87 0.39	0.87 0.39
		1 1/4 32	1 3/4 44	1 9/16 40	1 3/4 44	1.04 0.47	1.04 0.47
1 1/4 32	3/4 20	1 25	1 7/16 37	1 5/16 33	1 5/8 41	0.86 0.39	0.86 0.39
		1 1/4 32	1 9/16 40	1 7/16 37	1 11/16 43	0.91 0.41	0.91 0.41
	1 1/2 40	1 1/4 32	1 15/16 49	1 11/16 43	1 5/8 41	1.33 0.60	1.33 0.60
		1 1/2 40	1 15/16 49	1 11/16 43	1 5/8 41	1.41 0.64	1.41 0.64
	2 50	1 1/2 40	2 1/8 54	2 1/8 54	1 7/8 48	1.70 0.77	1.70 0.77
		2 50	2 1/8 54	2 1/8 54	1 7/8 48	1.70 0.77	1.70 0.77
1 1/2 40	3/4 20	1 25	1 9/16 40	1 3/8 35	1 11/16 43	0.87 0.39	0.87 0.39
		1 1/4 32	1 3/4 44	1 9/16 40	1 3/4 44	1.04 0.47	1.04 0.47
	1 1/2 40	1 1/4 32	1 15/16 49	1 11/16 43	1 5/8 41	1.33 0.60	1.33 0.60
		1 1/2 40	1 15/16 49	1 11/16 43	1 5/8 41	1.41 0.64	1.41 0.64
	2 50	1 1/2 40	2 1/8 54	2 1/8 54	1 7/8 48	1.70 0.77	1.70 0.77
		2 50	2 1/8 54	2 1/8 54	1 7/8 48	1.70 0.77	1.70 0.77

Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

See additional sizes on previous and following page.



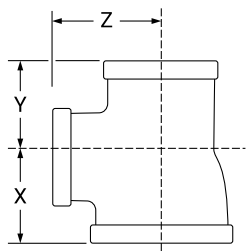
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Building connections that last™

Reducing Tee (Class 150 Standard)

Fig. 1105R

(Continued)



Size			X	Y	Z	Unit Weight	
NPS/DN	NPS/DN	NPS/DN				Black	Galv.
In./mm	In./mm	In./mm	Lbs./kg	Lbs./kg			
1 1/2 40	1 25	1	1 5/8	1 1/2	1 19/16	1.14	1.14
		25	41	38	47	0.52	0.52
		1 1/4	1 13/16	1 11/16	1 7/8	1.30	1.30
	1 1/4 32	32	47	43	48	0.59	0.59
		1 1/2	1 15/16	1 13/16	1 5/16	1.50	1.50
		40	49	47	49	0.68	0.68
	1/2 15	1/2	1 7/16	1 3/8	1 11/16	1.05	1.05
		15	37	35	43	0.48	0.48
		3/4	1 1/2	1 7/16	1 3/4	1.08	1.08
	3/4 20	3/4	38	37	44	0.49	0.49
		1 1/4	1 5/8	1 9/16	1 13/16	1.26	1.26
		25	41	40	47	0.57	0.57
2 50	1 1/4 32	1 1/4	1 13/16	1 3/4	1 7/8	1.52	1.52
		32	47	44	48	0.69	0.69
		1 1/2	1 15/16	1 7/8	1 5/16	1.50	1.50
	1/2 15	1/2	1 7/16	1 7/16	1 11/16	1.19	1.19
		15	37	37	43	0.54	0.54
		3/4	1 1/2	1 1/2	1 3/4	1.60	1.60
	3/4 20	3/4	38	38	44	0.73	0.73
		1 1/2	1 5/8	1 5/8	1 19/16	1.45	1.45
		25	41	41	47	0.66	0.66
	1 1/4 32	1 1/4	1 13/16	1 13/16	1 7/8	1.45	1.45
		32	47	47	48	0.66	0.66
		2	2 3/16	2 3/16	2	1.86	1.86
2 50	1/2 15	1/2	2 3/16	2 3/16	2	0.84	0.84
		15	56	56	51	0.84	0.84
		2	2 1/4	1 7/8	2 1/4	2.15	2.15
	3/4 20	3/4	2 1/4	1 7/8	2 1/4	0.98	0.98
		20	57	48	57	0.98	0.98
		1 1/2	1 5/8	1 5/8	1 19/16	1.45	1.45
	1 1/4 32	1 1/4	1 13/16	1 13/16	1 7/8	1.45	1.45
		32	47	47	48	0.66	0.66
		2	2 3/16	2 3/16	2	1.86	1.86
	1 1/2 40	1 1/2	1 15/16	1 7/8	1 5/16	1.50	1.50
		40	49	48	49	0.68	0.68
		1 1/4	1 13/16	1 3/4	1 7/8	1.52	1.52
2 50	1 1/4 32	1 1/4	1 13/16	1 3/4	1 7/8	1.52	1.52
		32	47	44	48	0.69	0.69
		1 1/2	1 15/16	1 7/8	1 5/16	1.50	1.50
	1/2 15	1/2	1 7/16	1 7/16	1 11/16	1.19	1.19
		15	37	37	43	0.54	0.54
		3/4	1 1/2	1 1/2	1 3/4	1.60	1.60
	3/4 20	3/4	38	38	44	0.73	0.73
		1 1/2	1 5/8	1 5/8	1 19/16	1.45	1.45
		25	41	41	47	0.66	0.66
	1 1/4 32	1 1/4	1 13/16	1 13/16	1 7/8	1.45	1.45
		32	47	47	48	0.66	0.66
		2	2 3/16	2 3/16	2	1.86	1.86
	1 1/2 40	1 1/2	1 15/16	1 7/8	1 5/16	1.50	1.50
		40	49	48	49	0.68	0.68
		1 1/4	1 13/16	1 3/4	1 7/8	1.52	1.52

Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

See additional sizes on previous and following page.



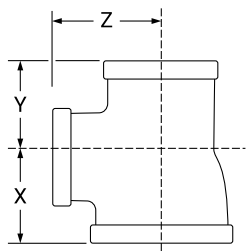
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Building connections that last™

Reducing Tee (Class 150 Standard)

Fig. 1105R

(Continued)



Size			X	Y	Z	Unit Weight		Size			X	Y	Z	Unit Weight		
						Black	Galv.							Black	Galv.	
NPS/DN	NPS/DN	NPS/DN	In./mm	In./mm	In./mm	Lbs./kg	Lbs./kg	NPS/DN	NPS/DN	NPS/DN	In./mm	In./mm	In./mm	Lbs./kg	Lbs./kg	
2½ 65	2 50	2½ 65	2⅝ 67	2⅝ 67	2⅜ 60	3.50	3.50	3 80	2½ 65	2 50	2½ 64	2⅜ 60	2⅞ 73	4.80	4.80	
						1.59	1.59							2.18	2.18	
	1½ 40	2 50	2⅜ 60	2⅜ 56	2⅝ 67	3.43	3.43			2½ 65	2½ 65	2⅜ 73	2⅞ 68	3 76	5.80	5.80
		1.56	1.56	2.63	2.63											
	2 50	2½ 65	2⅞ 68	2½ 64	2⅞ 68	3.80	3.80		3 80	¾ 20	1⅞ 48	1⅞ 48	2⅝ 67	4.03	4.03	
		1.72	1.72	1.83	1.83											
	2 50	2 50	2⅜ 60	2¼ 57	2⅝ 67	3.28	3.28		3 80	1 25	2 51	2 51	2⅝ 67	4.13	4.13	
		1.49	1.49	1.87	1.87											
	2½ 65	2½ 65	2⅞ 68	2⅝ 67	2⅞ 68	4.10	4.10		3 80	1¼ 32	2⅜ 56	2⅜ 56	2¾ 70	4.50	4.50	
		1.86	1.86	2.04	2.04											
	2½ 65	¾ 20	1¾ 44	1¾ 44	2⅝ 59	2.72	2.72		3 80	1½ 40	2⅝ 59	2⅝ 59	2⅜ 73	5.18	5.18	
		1.23	1.23	2.35	2.35											
	2½ 65	1 25	1⅞ 48	1⅞ 48	2⅜ 60	2.85	2.85		3 80	2 50	2½ 64	2½ 64	2⅞ 73	5.70	5.70	
		1.29	1.29	2.59	2.59											
	2½ 65	1¼ 32	2⅞ 52	2⅞ 52	2⅞ 62	3.36	3.36		3 80	2½ 65	2⅜ 73	2⅜ 73	3 76	6.09	6.09	
		1.52	1.52	2.76	2.76											
2½ 65	1½ 40	2⅜ 56	2⅜ 56	2½ 64	3.46	3.46	3 80	4 100	3⅜ 98	3⅝ 92	3⅜ 98	10.40	10.40			
	1.57	1.57	4.72	4.72												
2½ 65	2 50	2⅜ 60	2⅜ 60	2⅝ 67	3.65	3.65	3 80	1½ 40	2½ 65	2½ 65	3⅜ 86	7.47	7.47			
	1.66	1.66	3.39	3.39												
2½ 65	3 80	3 76	3 76	2⅜ 73	5.82	5.82	3 80	2 50	2¾ 70	2¾ 70	3⅞ 87	8.39	8.39			
	2.64	2.64	3.80	3.80												
3 80	2 50	2 50	2½ 64	2¼ 57	2⅞ 73	4.50	4.50	3 80	4 100	2½ 65	3⅞ 78	3⅞ 78	3½ 89	9.60	9.60	
		2.04	2.04	4.35	4.35											
		3 80	3⅜ 79	2⅞ 73	3⅜ 79	5.80	5.80			3 80	3⅝ 84	3⅝ 84	3⅝ 92	11.02	11.02	
		2.63	2.63	5.00	5.00											

Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees ¾" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

See additional sizes on previous page.

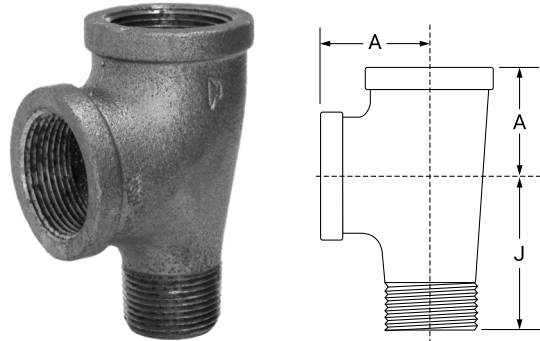


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Building connections that last™

Fig. 1106, 1106R

Straight Street or Service Tee (Class 150 Standard)
Reducing Street or Service Tee (Class 150 Standard)



Size	A	J	Unit Weight	
			Black	Galvanized
NPS/DN	In./mm	In./mm	Lbs./kg	Lbs./kg
1/4	1 3/16	1 3/16	0.15	0.15
8	30	30	0.07	0.07
3/8	1 5/16	1 7/16	0.24	0.24
10	33	37	0.11	0.11
1/2	1 1/8	1 5/8	0.34	0.34
15	29	41	0.15	0.15
3/4	1 5/16	1 7/8	0.61	0.61
20	33	48	0.28	0.28
1	1 1/2	2 1/8	0.96	0.96
25	38	54	0.44	0.44
1 1/4	1 3/4	2 7/16	1.39	1.39
32	44	62	0.63	0.63
1 1/2	1 15/16	2 11/16	1.93	1.93
40	49	68	0.88	0.88
2	2 1/4	3 1/4	3.16	3.16
50	57	83	1.43	1.43

Size female run x male run x outlet	Run		Outlet A	Unit Weight	
	A	J		Black	Galvanized
NPS/DN	In./mm	In./mm	In./mm	Lbs./kg	Lbs./kg
1 1/4 x 1 x 1 1/4	1 3/4	2 5/16	1 3/4	1.34	1.34
32 x 25 x 32	44	59	44	0.61	0.61

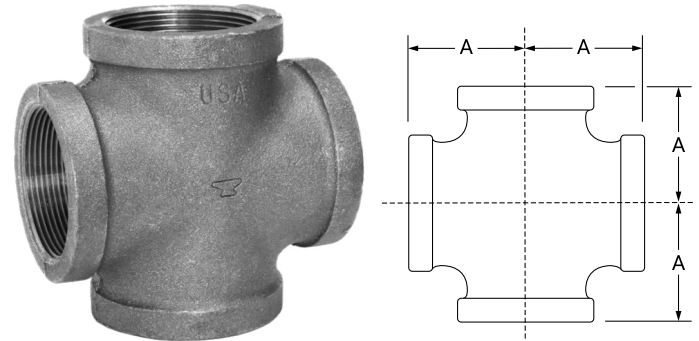
Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary.
Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).

Fig. 1107

Cross (Class 150 Standard)



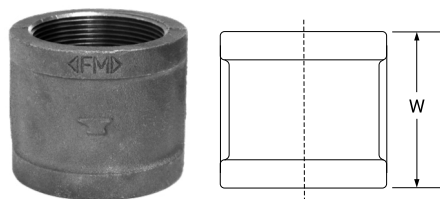
Size	A	Unit Weight	
		Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/8	1 1/16	0.12	0.12
6	17	0.05	0.05
1/4	1 3/16	0.18	0.18
8	22	0.08	0.08
3/8	1 5/16	0.28	0.28
10	24	0.13	0.13
1/2	1 1/8	0.42	0.42
15	29	0.19	0.19
3/4	1 5/16	0.69	0.69
20	33	0.31	0.31
1	1 1/2	1.12	1.12
25	38	0.51	0.51
1 1/4	1 3/4	1.44	1.44
32	44	0.65	0.65
1 1/2	1 15/16	1.98	1.98
40	49	0.90	0.90
2	2 1/4	3.30	3.30
50	57	1.50	1.50
2 1/2	2 11/16	5.90	5.90
65	68	2.68	2.68
3	3 1/16	7.94	7.94
80	78	3.60	3.60
4	3 13/16	13.50	13.50
100	98	6.12	6.12



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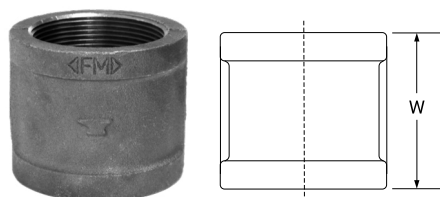
Building connections that last™

Fig. 1121
Coupling (Class 150 Standard)



Size	W	Unit Weight		Size	W	Unit Weight	
		Black	Galvanized			Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg	NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/8*	15/16	0.06	0.06	1 1/4	1 15/16	0.75	0.75
6	24	0.03	0.03	32	49	0.34	0.34
1/4	1 1/16	0.09	0.09	1 1/2	2 1/8	1.00	1.00
8	27	0.04	0.04	40	54	0.45	0.45
3/8	1 3/16	0.13	0.13	2	2 1/2	1.45	1.45
10	30	0.06	0.06	50	64	0.66	0.66
1/2	1 5/16	0.20	0.20	2 1/2	2 7/8	2.40	2.40
15	33	0.09	0.09	65	73	1.09	1.09
3/4	1 1/2	0.30	0.30	3	3 3/16	3.30	3.30
20	38	0.14	0.14	80	81	1.50	1.50
1	1 11/16	0.48	0.48	4	3 11/16	5.72	5.72
25	43	0.22	0.22	100	94	2.59	2.59

Fig. 1122
Right & Left Coupling
(Class 150 Standard)



Size	W	Unit Weight		Size	W	Unit Weight	
		Black	Galvanized			Black	Galvanized
NPS/DN	In./mm	Lbs./kg	Lbs./kg	NPS/DN	In./mm	Lbs./kg	Lbs./kg
1/2	1 5/16	0.20	0.20	1 1/4	1 15/16	0.75	0.75
15	33	0.09	0.09	32	49	0.34	0.34
3/4	1 1/2	0.30	0.30	1 1/2	2 1/8	1.00	1.00
20	38	0.14	0.14	40	54	0.45	0.45
1	1 11/16	0.48	0.48	2	2 1/2	1.45	1.45
25	43	0.22	0.22	50	64	0.66	0.66

Note:

*Offered in steel only.

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All Elbows & Tees 3/8" (10 DN) and Larger are 100% Gas Tested at a Minimum of 100 PSI. (6.9 bar)



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Fig. 1124
Cap (Class 150 Standard)



Size	Unit Weight		Size	Unit Weight	
	Black	Galvanized		Black	Galvanized
NPS/DN	Lbs./kg	Lbs./kg	NPS/DN	Lbs./kg	Lbs./kg
1/2 15	0.12 0.05	0.12 0.05	2 1/2 65	1.75 0.79	1.75 0.79
3/4 20	0.22 0.10	0.22 0.10	3 80	2.62 1.19	2.62 1.19
1 25	0.38 0.17	0.38 0.17	3 1/2 90	3.19 1.45	3.19 1.45
1 1/4 32	0.58 0.26	0.58 0.26	4 100	4.54 2.06	4.54 2.06
1 1/2 40	0.73 0.33	0.73 0.33	5 125	6.45 2.93	6.45 2.93
2 50	1.13 0.51	1.13 0.51	6 150	10.00 4.54	10.00 4.54

Note:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

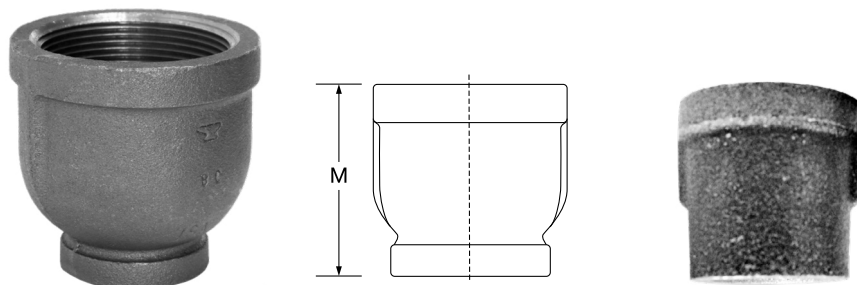
All Elbows & Tees 3/8" (10 DN) and Larger are 100% Gas Tested at a Minimum of 100 PSI. (6.9 bar)



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Reducer (Class 150 Standard) Fig. 1125



Size		M	Unit Weight		Size	M	Unit Weight	
			Black	Galvanized			Black	Galvanized
NPS/DN	NPS/DN	In./mm	Lbs./kg	Lbs./kg	NPS/DN	NPS/DN	Lbs./kg	Lbs./kg
1/4	1/8	1	0.07	0.07	1	1/2	0.39	0.39
8	6	25	0.03	0.03		15	0.18	0.18
3/8	1/8	1 1/8	0.11	0.11		3/4*	0.43	0.43
	6		0.05	0.05		20	0.20	0.20
	1/4		0.11	0.11	1 1/4	1/2	0.61	0.61
	8		0.05	0.05		15	0.28	0.28
1/2	1/8	1 1/4	0.14	0.14		3/4	0.64	0.64
	6		0.06	0.06		20	0.29	0.29
	1/4*		0.15	0.15		1	0.68	0.68
	8		0.07	0.07	1 1/2	1/2	0.78	0.78
3/4	3/8	1 7/16	0.17	0.17		15	0.35	0.35
	10		0.08	0.08		3/4	0.88	0.88
	1/8		0.24	0.24		20	0.40	0.40
20	6		0.11	0.11		1	0.88	0.88
	1/4	1 7/16	0.22	0.22	2	3/4	1.30	1.30
	8		0.10	0.10		15	0.59	0.59
	3/8		0.25	0.25		20	1.34	1.34
	10		0.11	0.11		1	1.40	1.40
1	1/2*	1 11/16	0.27	0.27	25	3/4	1.34	1.34
	15		0.12	0.12		20	0.61	0.61
	1/4		0.35	0.35		1	1.40	1.40
	8		0.16	0.16		25	0.63	0.63
25	3/8	43	0.35	0.35	50	3/4	1.34	1.34
	10		0.16	0.16		20	0.61	0.61
	1/2		0.35	0.35		1	1.40	1.40
	10		0.16	0.16		25	0.63	0.63

Notes:

*Sizes 1/2 x 1/4, 3/4 x 1/2 and 1 x 3/4 do not have bands at the reducing end.

See first page for pressure-temperature ratings. Galvanized weights may vary.
Please contact your ASC Engineered Solutions™ Representative if you need verification.

All Elbows & Tees 3/8" (10 DN) and Larger are 100% Gas Tested at a Minimum of 100 PSI. (6.9 bar)



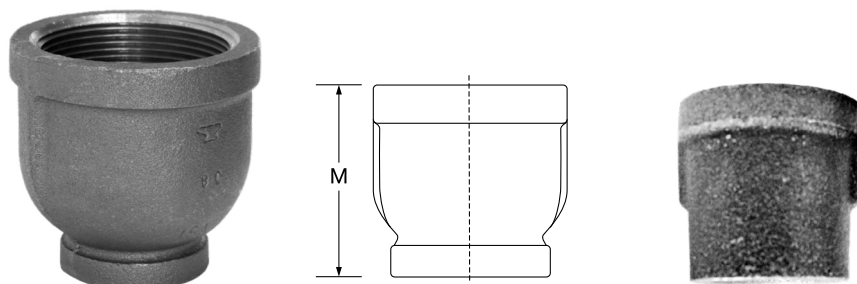
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Building connections that last™

Reducer (Class 150 Standard)

Fig. 1125

(Continued)



Size		M	Unit Weight		Size	M	Unit Weight	
			Black	Galvanized			Black	Galvanized
NPS/DN	NPS/DN	In./mm	Lbs./kg	Lbs./kg	NPS/DN	NPS/DN	Lbs./kg	Lbs./kg
2 50	1 1/4 32	2 13/16 73	1.53 0.69	1.53 0.69	3 1/2 90	2 50	4.32 1.96	4.32 1.96
	1 1/2 40		1.55 0.70	1.55 0.70		2 1/2 65	4.72 2.14	4.72 2.14
2 1/2 65	1 25	3 1/4 83	2.12 0.96	2.12 0.96	4 100	3 80	4.99 2.26	4.99 2.26
	1 1/4 32		2.09 0.95	2.09 0.95		1 1/2 40	4.90 2.22	4.90 2.22
	1 1/2 40		2.09 0.95	2.09 0.95		2 50	5.10 2.31	5.10 2.31
	2 50		2.51 1.14	2.51 1.14		2 1/2 65	5.93 2.69	5.93 2.69
3 80	1 25	3 11/16 94	3.16 1.43	3.16 1.43	5 125	3 80	6.55 2.97	6.55 2.97
	1 1/4 32		2.99 1.36	2.99 1.36		3 1/2 90	6.30 2.86	6.30 2.86
	1 1/2 40		3.30 1.50	3.30 1.50		4 100	9.57 4.34	9.57 4.34
	2 50		3.25 1.47	3.25 1.47		4 3/8 116	10.30 4.67	10.30 4.67
	2 1/2 65		3.31 1.50	3.31 1.50		4 1/2 124	10.30 4.67	10.30 4.67

Notes:

*Sizes 1/2 x 1/4, 3/4 x 1/2 and 1 x 3/4 do not have bands at the reducing end.

See first page for pressure-temperature ratings. Galvanized weights may vary.

Please contact your ASC Engineered Solutions™ Representative if you need verification.

All Elbows & Tees 3/8" (10 DN) and Larger are 100% Gas Tested at a Minimum of 100 PSI. (6.9 bar)



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Building connections that last™



Malleable Iron Threaded Fittings						
	Dimensions	Threads	Material	Coating*	Pressure	Federal Spec
Class 150	ASME B16.3	ASME B1.20.1	ASTM A197	ASTM A153	ASME B16.3	WW-P-521
Class 300	ASME B16.3	ASME B1.20.1	ASTM A197	ASTM A153	ASME B16.3	

* ASTM B633 Type I, SC 4 can be used as an alternate zinc coating per ASME B16.3

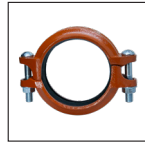
Malleable Iron Threaded Fittings Pressure-Temperature Ratings				
Temperature (° F)	Working Pressure (psi)			
	Class 150	Class 300		
		NPS 1/4 to 1	NPS 1-1/4 to 2	NPS 2-1/2 to 3
-20 to 150	300	2,000	1,500	1,000
200	265	1,785	1,350	910
250	225	1,575	1,200	825
300	185	1,360	1,050	735
350	150 ⁽¹⁾	1,150	900	650
400		935	750	560
450		725	600	475
500		510	450	385
550		300	300	300

(1) Permissible for service temperature up to 366° F reflecting the temperature of saturated steam at 150 psi.



Grooved Connections Submittal Sheet

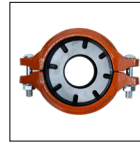
The selected products
are being submitted
for approval:



☐ RGD1 Rigid Angle
Pad Coupling



☐ FLX1 Flexible
Coupling



☐ RCD1 Reducing
Coupling



☐ E901 Grooved
Elbow 90°
Standard Radius



☐ E90S1 Grooved
Elbow Short Radius



☐ EOR1 End Elbow



☐ DR901 Grooved
Drain Elbow



☐ E451 Grooved
Elbow 45°
Standard Radius



☐ E221 22.5° Elbow



☐ E111 11.25° Elbow



☐ TE1 Grooved Tee
Standard Radius



☐ TESR1 Grooved
Tee Short Radius



☐ CRS1 Grooved
Cross Short Radius



☐ CRG1 Grooved
Concentric Reducer



☐ GRTG1 Grooved
Reducing Tee



☐ CP1 Cap



☐ ECP1 Cap w/
Eccentric Hole NPT



☐ FA1 Grooved
Flange



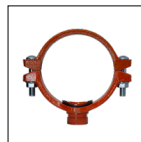
☐ GXFA1 Flange
Adaptor



☐ 041 U Bolt
Threaded Mech Tee



☐ MTT2 Threaded
Mech Tee



☐ MTG1 Grooved
Mech Tee

Specifications

Groove Specification:
AWWA-C606

Approval Standards:
UL 213, FM 1920

Fitting/Coupling Housing Material:
Ductile Iron per ASTM A536 Grade 65-45-12

Gasket Material:
Pre-lubricated Grade E EPDM

Bolts:
SAE J429, Grade 5, Zinc Electroplating

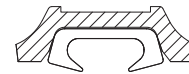
Maximum Working Pressure:
Up to 300 psi (20.7 bar) (depending on
specific model number and size)

Operating Temperature:
-30 °F to 230 °F

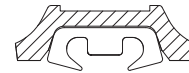
Listings and Approvals:
cULus, FM Approved

Finish:
☐ Standard Orange Paint
☐ Hot-dipped Galvanized per ASTM A-153

Gasket Style:
☐ Standard C-profile



☐ Flush Gap profile



☐ Not applicable

Approval	Project Information
<input type="checkbox"/> Approved <input type="checkbox"/> Approved as noted <input type="checkbox"/> Not approved Remarks:	Project:
	Address:
	Contractor:
	Engineer:
	Submittal Date:
	Notes 1:
	Notes 2:

Reliable®

Model RGD1 Angled Pad Coupling Rigid Grooved Coupling

cULus Listed, FM Approved
300 psi (20.7 bar)

RDG1 Angled Pad Coupling Technical Data

Operating Specifications

Maximum Working Pressure:

300 psi (20.7 bar)

Operating Temperature:

-30 °F to 230 °F (-34 °C to 110 °C)

Material Specifications

Housings: ASTM A536 Grade 65-45-12 Ductile Iron

Gasket: Pre-lubricated Grade E EPDM

Design Specification

Groove: AWWA-C606

Bolt Specification

SAE J429 Grade 5

Gasket Options

Standard

Flush Gap

Available Finishes

Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

Bolts:

Zinc Electroplating

Listings and Approvals

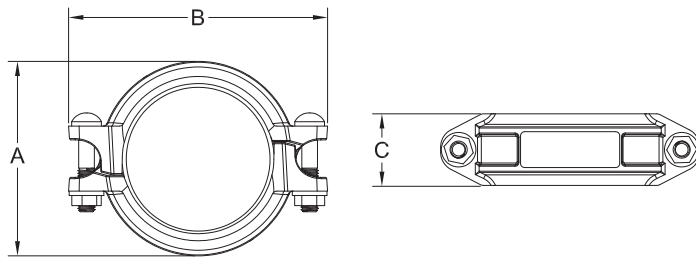
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RGD1 Angled Pad Coupling Dimensions

Figure 1



Gasket Options

Figure 2

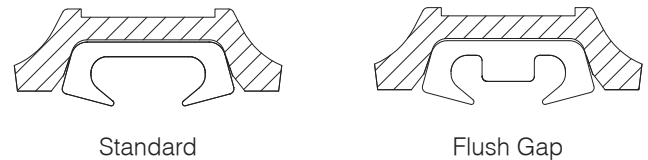


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Max. End Load Lbs (KN)	Pipe End Gap in (mm)	Bolts Size x Length in (mm)	Dimensions			Weight lb (kg)
					A in (mm)	B in (mm)	C in (mm)	
1 (25)	1.315 (33.7)	405 (1.8)	1/16 (1.6)	3/8 x 2-1/8	2-1/4 (56)	3-3/4 (96)	1-7/8 (47)	0.99 (0.45)
1-1/4 (32)	1.660 (42.2)	656 (2.92)	1/16 (1.6)	3/8 x 2-3/8	2-1/2 (64)	4-3/16 (106)	1-7/8 (47)	1.37 (0.62)
1-1/2 (40)	1.900 (48.3)	852 (3.79)	1/16 (1.6)	3/8 x 2-3/8	2-3/4 (69)	4-7/16 (113)	1-7/8 (47)	1.43 (0.65)
2 (50)	2.375 (60.3)	1327 (5.91)	1/16 (1.6)	3/8 x 2-3/8	3-1/2 (88)	4-13/16 (122)	1-7/8 (47)	1.74 (0.79)
2-1/2 (65)	2.875 (73.0)	1945 (8.66)	1/16 (1.6)	3/8 x 2-3/4	3-15/16 (100)	5-3/8 (137)	1-7/8 (47)	1.96 (0.89)
3 (80)	3.500 (88.9)	2885 (12.84)	1/16 (1.6)	3/8 x 2-3/4	4-9/16 (116)	6-1/16 (154)	1-7/8 (47)	2.27 (1.03)
4 (100)	4.500 (114.3)	4769 (21.22)	5/32 (4.1)	1/2 x 3	5-5/8 (142)	7-3/8 (188)	2-1/16 (52)	2.93 (1.33)
6 (150)	6.625 (168.3)	10340 (46)	5/32 (4.1)	1/2 x 3-1/8	7-13/16 (199)	9-11/16 (246)	2-1/16 (52)	5 (2.27)
8 (200)	8.625 (219.1)	17524 (77.97)	5/32 (4.1)	5/8 x 4-3/4	10-5/16 (262)	12-11/16 (322)	2-5/8 (66)	9.92 (4.50)
10 (250)	10.750 (273.0)	27206 (121.05)	5/32 (4.1)	3/4 x 6-7/10	12-13/16 (325)	15-3/4 (400)	2-5/8 (66)	24.26 (11)
12 (300)	12.750 (323.9)	38297 (170.39)	5/32 (4.1)	7/8 x 7-1/4	14-13/16 (376)	18-7/16 (468)	2-5/8 (67)	28.67 (13)

Nominal Size in (mm)	Groove Type	Pipe	Approvals
1 (25)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
1-1/4 (32)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
1-1/2 (40)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
2 (50)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
2-1/2 (65)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
3 (80)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
4 (100)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
6 (150)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM

RGD1 Pipe Compatibility (cont.)
Table B

Nominal Size in (mm)	Groove Type	Pipe	Approvals
8 (200)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus
		0.188 in. wall	FM
10 (250)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus
		0.188 in. wall	FM
12 (300)	Cut, Rolled	40	cULus, FM
	Rolled	0.188 in. wall	FM

Notes:

1. 10 refers to Schedule 10 steel pipe in accordance with NFPA 13.
2. 40 refers to Schedule 40 steel pipe in accordance with NFPA 13.
3. Fire-Flo Schedule 7 refers to Youngstown Tube Schedule 7 pipes.
4. Mega-Flow Schedule 7 refers to Listed Mega-Flow steel Pipe manufactured by Wheatland Tube Co.
5. Eddy Flow Schedule 7 refers to Listed Eddy Flow steel pipe manufactured by Bull Moose Tube Co.
6. Hydroflow Schedule 7 refers to Listed Nucor Hydroflow steel pipe manufactured by Nucor Tubular Products Inc.

Reliable®

Model FLX1 Flexible Coupling

cULus Listed, FM Approved
300 psi (20.7 bar)

FLX1 Flexible Coupling Technical Data

Operating Specifications
Maximum Working Pressure:
 300 psi (20.7 bar)
Operating Temperature
 -30 °F to 230 °F (-34 °C to 110 °C)

Material Specifications

Housings: ASTM A536 Grade 65-45-12 Ductile Iron
Gasket: Pre-lubricated Grade E EPDM

Design Specification

Groove: AWWA-C606

Bolt Specification:
 SAE J429 Grade 5

Available Finishes

Housing:

Standard orange paint
 Hot dipped galvanized (ASTM A-153)

Bolts:

Zinc Electroplating

Listings and Approvals

cULus Listed
 FM Approved



FLX1 Flexible Coupling Dimensions

Figure 1

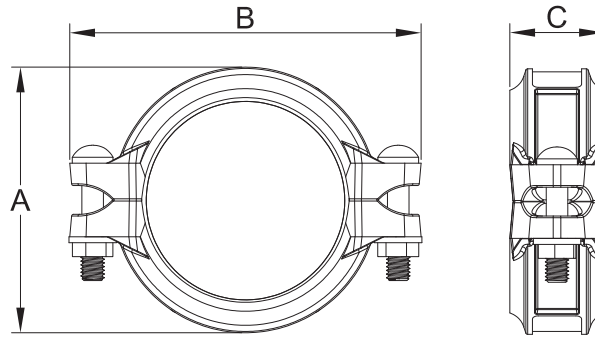


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Max. End Load Lbs (KN)	Pipe End Gap in (mm)	Bolts Size x Length in	Angular Movement from Centerline		Dimensions			Weight lb (kg)
					Per Coupling Deg.	Per Pipe in/ft (mm/m)	A in (mm)	B in (mm)	C in (mm)	
1 (25)	1.315 (33.7)	405 (1.8)	1/16 (1.6)	3/8 x 1-1/2	2.75°	0.58 (48)	2-3/16 (55)	3-13/16 (97)	1-3/4 (45)	0.99 (0.45)
1-1/4 (32)	1.660 (42.2)	656 (2.92)	1/16 (1.6)	3/8 x 1-3/4	2.17°	0.46 (38)	2-1/2 (64)	4-1/4 (108)	1-3/4 (45)	1.10 (0.50)
1-1/2 (40)	1.900 (48.3)	852 (3.79)	1/16 (1.6)	3/8 x 1-3/4	1.9°	0.4 (33)	2-3/4 (69)	4-1/2 (114)	1-3/4 (45)	1.17 (0.53)
2 (50)	2.375 (60.3)	1327 (5.91)	1/16 (1.6)	3/8 x 2-1/8	1.52°	0.32 (27)	3-5/16 (84)	4-7/8 (124)	1-13/16 (46)	1.50 (0.68)
2-1/2 (65)	2.875 (73.0)	1945 (8.66)	1/16 (1.6)	3/8 x 2-1/8	1.25°	0.26 (22)	3-7/8 (98)	5-3/8 (137)	1-13/16 (46)	1.85 (0.84)
3 (80)	3.500 (88.9)	2885 (12.84)	1/16 (1.6)	3/8 x 2-1/8	1.03°	0.22 (18)	4-1/2 (114)	6-1/8 (156)	1-13/16 (46)	2.16 (0.98)
4 (100)	4.500 (114.3)	4769 (21.22)	1/8 (3.2)	1/2 x 2-5/8	1.6°	0.34 (28)	5-9/16 (142)	7-7/16 (189)	2 (50)	3.02 (1.37)
6 (150)	6.625 (168.3)	10340 (46)	1/8 (3.2)	1/2 x 2-5/8	1.08°	0.23 (19)	7-13/16 (198)	9-7/8 (251)	2 (50)	4.63 (2.10)
8 (200)	8.625 (219.1)	17524 (77.97)	1/8 (3.2)	5/8 x 3-1/8	0.83°	0.18 (15)	10-1/16 (256)	12-7/16 (316)	2-3/8 (60)	8.27 (3.75)
10 (250)	10.750 (273.0)	27206 (121.05)	1/8 (3.2)	3/4 x 3-1/2	0.83°	0.14 (12)	12-9/16 (319)	15-1/2 (393)	2-1/2 (64)	14.22 (6.45)
12 (300)	12.750 (323.9)	38297 (170.39)	1/8 (3.2)	3/4 x 4-1/3	0.83°	0.12 (10)	14-3/4 (374)	17-13/16 (453)	2-1/2 (65)	18.95 (8.55)

Nominal Size in (mm)	Groove Type	Pipe	Approvals
1 (25)	Cut, Rolled	40	cULus, FM
	Rolled	10	FM
1-1/4 (32)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
1-1/2 (40)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
2 (50)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
2-1/2 (65)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
3 (80)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
4 (100)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Fire-Flo Schedule 7	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
6 (150)	Rolled	Cut, Rolled	cULus, FM
		10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM

FLX1 Pipe Compatibility (cont.)
Table B

Nominal Size in (mm)	Groove Type	Pipe	Approvals
8 (200)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus
		0.188 in. wall	FM
10 (250)	Cut, Rolled	40	cULus, FM
	Rolled	10	cULus
		0.188 in. wall	FM
12 (300)	Cut, Rolled	40	cULus, FM
	Rolled	ASME B36.10M-10	cULus
		0.188 in. wall	FM

Notes:

1. 10 refers to Schedule 10 steel pipe in accordance with NFPA 13.
2. 40 refers to Schedule 40 steel pipe in accordance with NFPA 13.
3. Fire-Flo Schedule 7 refers to Youngstown Tube Schedule 7 pipes.
4. Mega-Flow Schedule 7 refers to Listed Mega-Flow steel Pipe manufactured by Wheatland Tube Co.
5. Eddy Flow Schedule 7 refers to Listed Eddy Flow steel pipe manufactured by Bull Moose Tube Co.
6. Hydroflow Schedule 7 refers to Listed Nucor Hydroflow steel pipe manufactured by Nucor Tubular Products Inc.

Reliable®

Model RCD1 Grooved Reducing Coupling with Steel Ring

cULus Listed, FM Approved
300 psi (20.7 bar)

RCD1 Grooved Reducing Coupling with Steel Ring Technical Data

Operating Specifications
Maximum Working Pressure:
300 psi (20.7 bar)

Operating Temperature
-30 °F to 230 °F (-34 °C to 110 °C)

Material Specifications

Housings: ASTM A536 Grade 65-45-12 Ductile Iron

Gasket: Pre-lubricated Grade E EPDM

Design Specification:

Groove: AWWA-C606

Bolt Specification:
SAE J429 Grade 5

Available Finishes

Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

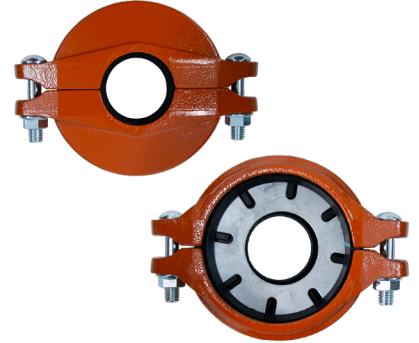
Bolts:

Zinc Electroplating

Listings and Approvals

cULus Listed

FM Approved



RCD1 Grooved Reducing Coupling with Steel Ring Dimensions

Figure 1

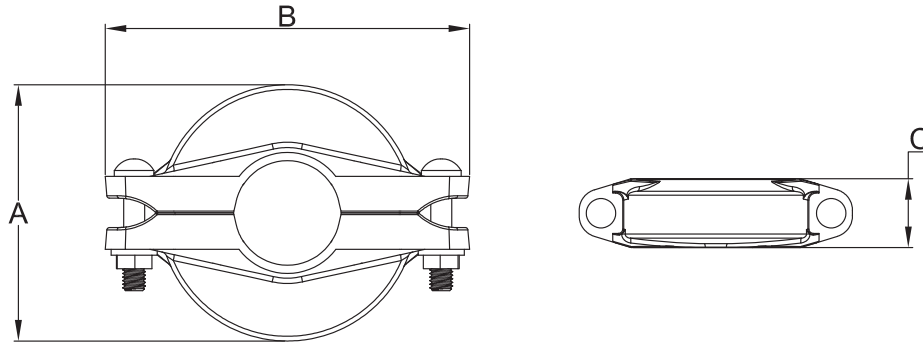


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Max. End Load Lbs (KN)	Pipe End Gap in (mm)	Bolt Size x Length in	Deflection		Dimensions			Weight lb (kg)
					Per Coupling Deg.	Per Pipe in/ft (mm/m)	A in (mm)	B in (mm)	C in (mm)	
1-1/2 x 1-1/4 (40 x 32)	1.900 x 1.660 (48.3 x 42.2)	852 (3.79)	1/16 (1.6)	3/8 x 2	1.9°	3/8 (33)	2-3/4 (70)	4-7/16 (113)	1-3/4 (45)	1.54 (0.70)
2 x 1-1/2 (50 x 40)	2.375 x 1.900 (60.3 x 48.3)	1327 (5.91)	1/16 (1.6)	3/8 x 2-1/8	1.52°	5/16 (27)	3-1/4 (82)	5-1/8 (130)	1-13/16 (46)	1.83 (0.83)
2-1/2 x 1-1/4 (65 x 32)	2.875 x 1.660 (73.0 x 42.2)	1945 (8.66)	1/16 (1.6)	3/8 x 2-1/8	1.25°	1/4 (22)	3-13/16 (97)	6 (151)	1-13/16 (46)	2.54 (1.15)
2-1/2 x 1-1/2 (65 x 40)	2.875 x 1.900 (73.0 x 48.3)	1945 (8.66)	1/16 (1.6)	3/8 x 2-1/8	1.25°	1/4 (22)	3-13/16 (97)	6 (151)	1-13/16 (46)	2.65 (1.20)
2-1/2 x 2 (65 x 50)	2.875 x 2.375 (73.0 x 60.3)	1945 (8.66)	1/16 (1.6)	3/8 x 2-1/8	1.25°	1/4 (22)	3-13/16 (97)	6 (151)	1-13/16 (46)	2.31 (1.05)
3 x 2 (80 x 50)	3.500 x 2.375 (88.9 x 60.3)	2885 (12.84)	1/16 (1.6)	1/2 x 2-5/8	1.03°	1/4 (18)	4-7/16 (112)	6-9/16 (167)	1-13/16 (46)	3.09 (1.4)
3 x 2-1/2 (80 x 65)	3.500 x 2.875 (88.9 x 73.0)	2885 (12.84)	1/16 (1.6)	1/2 x 2-5/8	1.03°	1/4 (18)	4-7/16 (112)	6-9/16 (167)	1-13/16 (46)	2.78 (1.26)
4 x 2 (100 x 50)	4.500 x 2.375 (114.3 x 60.3)	4769 (21.22)	1/8 (3.2)	1/2 x 2-5/8	1.6°	5/16 (28)	5-9/16 (141)	8 (200)	2 (50)	5.40 (2.45)
4 x 2-1/2 (100 x 65)	4.500 x 2.875 (114.3 x 73.0)	4769 (21.22)	1/8 (3.2)	1/2 x 2-5/8	1.6°	5/16 (28)	5-9/16 (141)	8 (200)	2 (50)	4.68 (2.12)
4 x 3 (100 x 80)	4.500 x 3.500 (114.3 x 88.9)	4769 (21.22)	1/8 (3.2)	1/2 x 2-5/8	1.6°	5/16 (28)	5-9/16 (141)	8 (200)	2 (50)	4.63 (2.10)
6 x 4 (150 x 100)	6.625 x 4.500 (168.3 x 114.3)	10340 (46)	1/8 (3.2)	5/8 x 3-1/8	1.1°	1/4 (20)	8 (199)	10-13/16 (275)	2-1/16 (52)	9.26 (4.20)
8 x 6 (200 x 150)	8.625 x 6.625 (219.1 x 168.3)	17524 (77.97)	1/8 (3.2)	3/4 x 4-1/3	0.83°	3/16 (15)	10-1/16 (256)	13-1/4 (336)	2-1/4 (58)	15.66 (7.10)

Nominal Size in (mm)	Groove Type	Pipe	Approvals
1-1/2 x 1-1/4 (40 x 32)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
2 x 1-1/2 (50 x 40)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
2-1/2 x 1-1/4 (65 x 32)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
2-1/2 x 1-1/2 (65 x 40)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
2-1/2 x 2 (65 x 50)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
3 x 2 (80 x 50)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
3 x 2-1/2 (80 x 65)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM

Nominal Size in (mm)	Groove Type	Pipe	Approvals
4 x 2 (100 x 50)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
4 x 2-1/2 (100 x 65)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
4 x 3 (100 x 80)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
6 x 4 (150 x 100)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus, FM
		Eddy Flow Schedule 7	cULus, FM
		Hydroflow Schedule 7	cULus, FM
		Fire-Flo Schedule 7	FM
	Cut, Rolled	40	cULus, FM
8 x 6 (200 x 150)	Rolled	10	cULus, FM
		Mega-Flow Schedule 7	cULus
	Cut, Rolled	40	cULus, FM

Notes:

1. 10 refers to Schedule 10 steel pipe in accordance with NFPA 13.
2. 40 refers to Schedule 40 steel pipe in accordance with NFPA 13.
3. Fire-Flo Schedule 7 refers to Youngstown Tube Schedule 7 pipes.
4. Mega-Flow Schedule 7 refers to Listed Mega-Flow steel Pipe manufactured by Wheatland Tube Co.
5. Eddy Flow Schedule 7 refers to Listed Eddy Flow steel pipe manufactured by Bull Moose Tube Co.
6. Hydroflow Schedule 7 refers to Listed Nucor Hydroflow steel pipe manufactured by Nucor Tubular Products Inc.
7. 1-1/4" x 1-1/2" RCD coupling does not use a steel reinforcing ring; the similarity in outlet sizing does not require one and all 3rd party qualification was performed without using a steel ring.

Reliable®

Model E901/E90X1 Grooved Elbow 90° Standard Radius

cULus Listed, FM Approved
300 psi (20.7 bar)

E901/E90X1 Grooved Elbow 90° Standard Radius Technical Data

Operating Specifications
Maximum Working Pressure
300 psi (20.7 bar)

Material Specifications

Body: ASTM A536 Grade 65-45-12 Ductile Iron

Nominal Sizes

E90X1: 1" (25 mm) - 1-1/2" (40 mm)

E901: 2" (50 mm) - 8" (200 mm)

Design Specifications
Groove: AWWA-C606

Available Finishes

Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed

FM Approved



E901/E90X1 Grooved Elbow 90° Standard Radius Dimensions

Figure 1

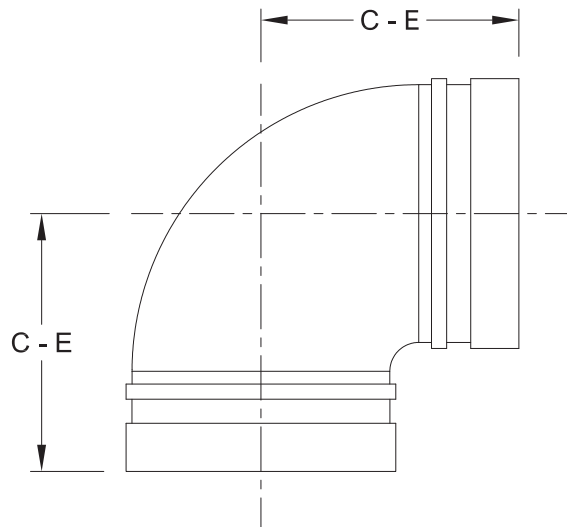


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Dimension in (mm)	Weight lb (kg)
		C - E	
1 (25)	1.315 (33.7)	2-1/4 (57)	0.66 (0.3)
1-1/4 (32)	1.660 (42.2)	2-3/4 (70)	0.95 (0.43)
1-1/2 (40)	1.900 (48.3)	2-3/4 (70)	1.06 (0.48)
2 (50)	2.375 (60.3)	3-1/4 (83)	1.65 (0.75)
2-1/2 (65)	2.875 (73.0)	3-3/4 (95)	2.47 (1.12)
3 (80)	3.500 (88.9)	4-1/4 (108)	3.31 (1.5)
4 (100)	4.500 (114.3)	5 (127)	5.20 (2.36)
6 (150)	6.625 (168.3)	6-1/2 (165)	13.89 (6.30)
8 (200)	8.625 (219.1)	7-3/4 (197)	22.27 (10.10)



Model E90S1 Grooved Elbow 90° Short Radius

cULus Listed, FM Approved
300 psi (20.7 bar)

E90S1 Grooved Elbow 90° Short Radius Technical Data

Operating Specifications

Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications

Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specifications

Groove: AWWA-C606

Available Finishes

Housing:

Standard orange paint
Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed
FM Approved



E90S1 Grooved Elbow 90° Short Radius Dimensions

Figure 1

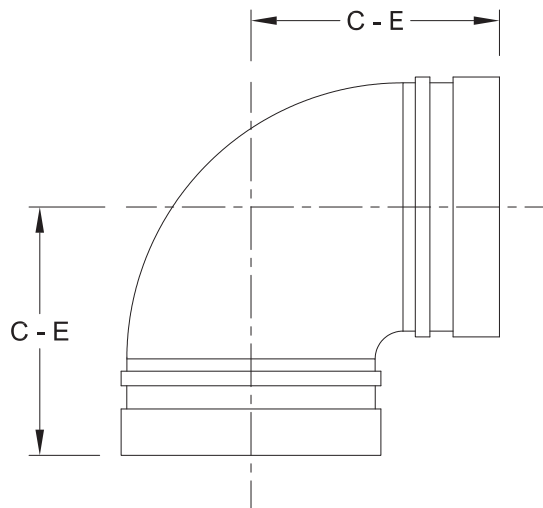


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Dimension in (mm)	Weight lb (kg)	Fitting Friction Loss Eq Feet of Pipe (m)
		C - E		
2 (50)	2.375 (60.3)	2-3/4 (70)	1.41 (0.64)	3.6 (1.1)
2-1/2 (65)	2.875 (73.0)	3 (76)	1.94 (0.88)	4.3 (1.3)
3 (80)	3.500 (88.9)	3-3/8 (85)	2.56 (1.16)	4.9 (1.5)
4 (100)	4.500 (114.3)	4 (102)	4.06 (1.84)	6.9 (2.1)
6 (150)	6.625 (168.3)	5-1/2 (140)	10.14 (4.60)	9.8 (3)
8 (200)	8.625 (219.1)	6-7/8 (175)	16.64 (8)	13.1 (4)
10 (250)	10.750 (273.0)	8-7/16 (215)	32.63 (14.80)	17.1 (5.2)
12 (300)	12.750 (323.9)	8-11/16 (220)	35.06 (15.90)	20.0 (6.1)

P/N 9999970638

Reliable®

Model EOR1 End Elbow 90° FNPT

cULus Listed, FM Approved
300 psi (20.7 bar)

EOR1 End Elbow 90° Technical Data

Operating Specifications
Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications

Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specifications

Thread: ASME B1.20.1

Groove: AWWA-C606

Available Finishes

Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed

FM Approved



EOR1 End Elbow 90° Dimensions

Figure 1

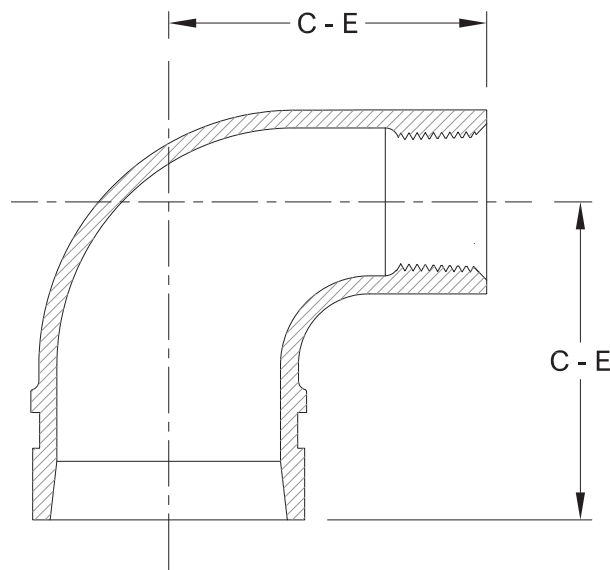


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Nominal Pipe Thread Size in (mm)	Dimension C - E in (mm)	Weight lb (kg)
1-1/4 (32)	1.660 (42.2)	1/2 (15)	2-3/8 (61)	0.77 (0.35)
1-1/4 (32)	1.660 (42.2)	3/4 (20)	2-3/8 (61)	0.88 (0.40)
1-1/4 (32)	1.660 (42.2)	1 (25)	2-3/8 (61)	0.88 (0.40)
1-1/2 (40)	1.900 (48.3)	1/2 (15)	2-1/2 (64)	0.88 (0.40)
1-1/2 (40)	1.900 (48.3)	3/4 (20)	2-1/2 (64)	0.93 (0.42)
1-1/2 (40)	1.900 (48.3)	1 (25)	2-1/2 (64)	1.06 (0.48)
2 (50)	2.375 (60.3)	1/2 (15)	2-3/4 (70)	0.84 (0.38)
2 (50)	2.375 (60.3)	3/4 (20)	2-3/4 (70)	0.90 (0.41)
2 (50)	2.375 (60.3)	1 (25)	2-3/4 (70)	1.32 (0.60)



Model DR901 Grooved Drain Elbow with 1" FNPT Outlet

cULus Listed, FM Approved
300 psi (20.7 bar)

DR901 Grooved Drain Elbow with 1" FNPT Outlet Technical Data

Operating Specifications

Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications

Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specifications

Thread: ASME B1.20.1

Groove: AWWA-C606

Available Finishes

Housing:

Standard orange paint
Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed
FM Approved



DR901 Grooved Drain Elbow with 1" FNPT Outlet Dimensions

Figure 1

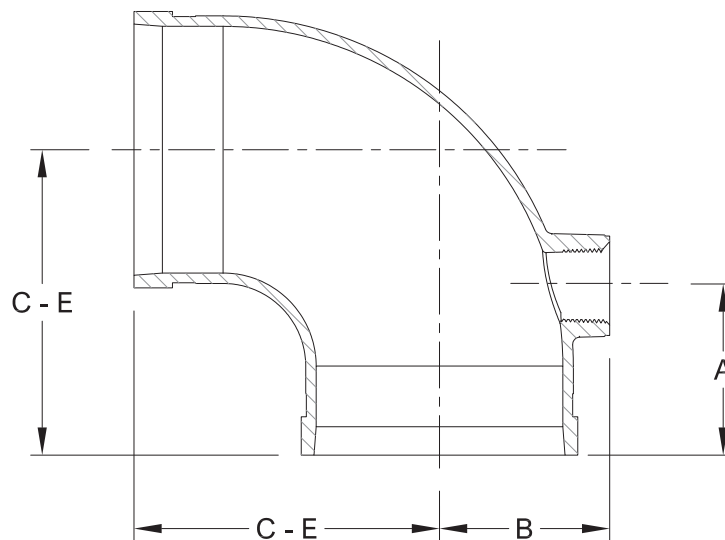


Table A

Nominal Size in (mm)	Pipe O.D. in/mm	Dimensions			Weight lb (kg)
		C - E in (mm)	A in (mm)	B in (mm)	
1-1/2 x 1 (40 x 25)	1.900 x 1.315 (48.3 x 33.7)	2-3/4 (70)	1-7/8 (48)	1-3/8 (36)	1.32 (0.60)
2 x 1 (50 x 25)	2.375 x 1.315 (60.3 x 33.7)	3-1/4 (83)	2-3/4 (70)	1-1/2 (38)	1.92 (0.87)
2-1/2 x 1 (65 x 25)	2.875 x 1.315 (73.0 x 33.7)	3-3/4 (95)	2-3/4 (70)	1-3/4 (45)	2.73 (1.24)
3 x 1 (80 x 25)	3.500 x 1.315 (88.9 x 33.7)	4-1/4 (108)	2-3/4 (70)	2-3/16 (55)	4.28 (1.94)
4 x 1 (100 x 25)	4.500 x 1.315 (114.3 x 33.7)	5 (127)	2-3/4 (70)	2-11/16 (69)	5.40 (2.45)
6 x 1 (150 x 25)	6.625 x 1.315 (168.3 x 33.7)	6-1/2 (165)	2-3/4 (70)	3-3/4 (96)	14.44 (6.55)

Reliable®

Model E451/E45X1 Grooved Elbow 45° Standard Radius

cULus Listed, FM Approved
300 psi (20.7 bar)

E451/E45X1 Grooved Elbow 45° Standard Radius Technical Data

Operating Specifications
Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications

Body: ASTM A536 Grade 65-45-12 Ductile Iron

Nominal Sizes

E45X1: 1" (25 mm) - 1-1/2" (40 mm)

E451: 2" (50 mm) - 12" (300 mm)

Design Specification
Groove: AWWA-C606

Available Finishes

Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed

FM Approved



E451/E45X1 Grooved Elbow 45° Standard Radius Dimensions

Figure 1

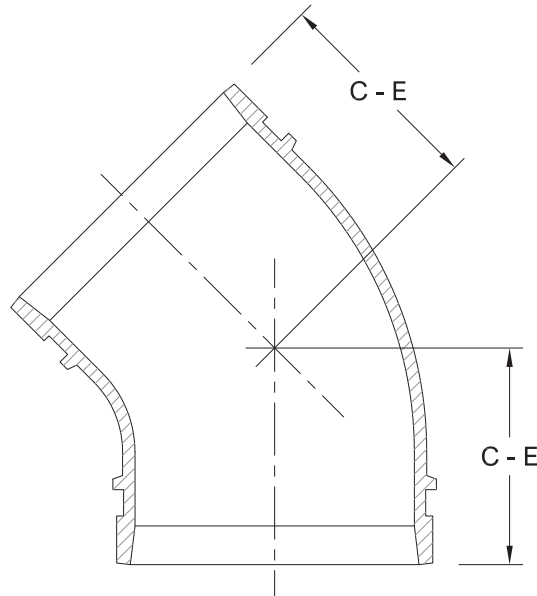


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Dimension in (mm)	Weight lb (kg)
		C - E	
1 (25)	1.315 (33.7)	1-3/4 (45)	0.50 (0.22)
1-1/4 (32)	1.660 (42.2)	1-3/4 (45)	0.68 (0.30)
1-1/2 (40)	1.900 (48.3)	1-3/4 (45)	0.77 (0.34)
2 (50)	2.375 (60.3)	2 (51)	1.31 (0.58)
2-1/2 (65)	2.875 (73.0)	2-7/16 (62)	2.03 (0.90)
3 (80)	3.500 (88.9)	2-3/4 (70)	2.48 (1.10)
4 (100)	4.500 (114.3)	3 (76)	4.16 (1.85)
6 (150)	6.625 (168.3)	3-1/2 (89)	8.10 (3.60)
8 (200)	8.625 (219.1)	4-1/4 (108)	14.63 (6.50)
10 (250)	10.750 (273.0)	4-3/4 (121)	34.88 (15.50)
12 (300)	12.750 (323.9)	5-1/4 (133)	49.73 (22.10)



Model E221 22.5° Elbow

cULus Listed, FM Approved
300 psi (20.7 bar)

E221 22.5° Elbow Technical Data

Operating Specifications
Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications
Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specification
Groove: AWWA-C606

Available Finishes
Housing:
Standard orange paint
Hot dipped galvanized (ASTM A-153)

Listings and Approvals
cULus Listed
FM Approved



E221 22.5° Elbow Dimensions

Figure 1

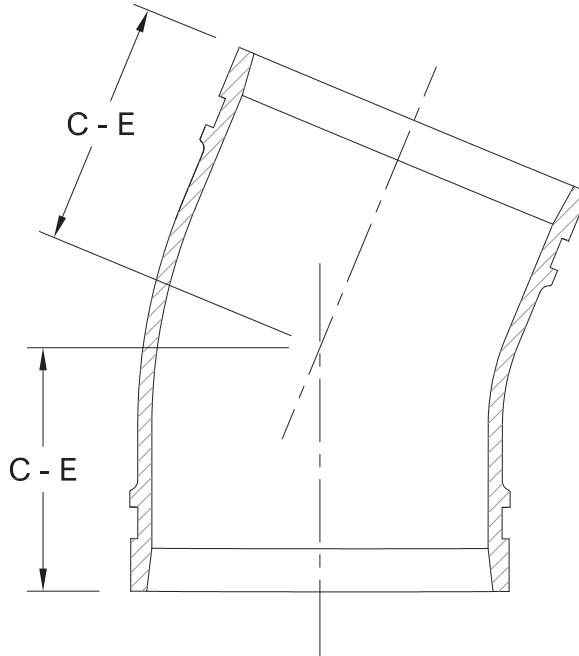


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Dimension in (mm)	Weight lb (kg)
		C - E	
1-1/4 (32)	1.660 (42.2)	1-3/4 (45)	0.59 (0.26)
1-1/2 (40)	1.900 (48.3)	1-3/4 (45)	0.59 (0.26)
2 (50)	2.375 (60.3)	1-7/8 (48)	1.13 (0.50)
2-1/2 (65)	2.875 (73.0)	2 (51)	1.85 (0.82)
3 (80)	3.500 (88.9)	2-1/4 (57)	2.48 (1.10)
4 (100)	4.500 (114.3)	2-7/8 (73)	3.71 (1.65)
6 (150)	6.625 (168.3)	3-1/8 (79)	8.37 (3.72)
8 (200)	8.625 (219.1)	3-7/8 (98)	11.93 (5.30)



Model E111 11.25° Elbow

cULus Listed, FM Approved
300 psi (20.7 bar)

E111 11.25° Elbow Technical Data

Operating Specifications

Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications

Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specification

Groove: AWWA-C606

Available Finishes

Housing:

Standard orange paint
Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed
FM Approved



E111 11.25° Elbow Dimensions

Figure 1

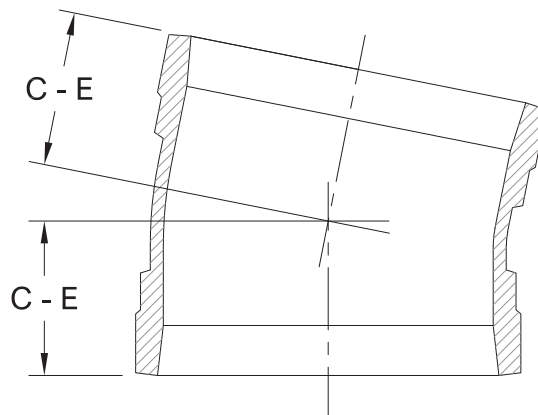


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Dimension in (mm)	Weight lb (kg)
		C - E	
1-1/4 (32)	1.660 (42.2)	1-3/8 (35)	0.57 (0.26)
1-1/2 (40)	1.900 (48.3)	1-3/8 (35)	0.62 (0.28)
2 (50)	2.375 (60.3)	1-1/2 (38)	0.88 (0.40)
2-1/2 (65)	2.875 (73.0)	1-1/2 (38)	1.59 (0.72)
3 (80)	3.500 (88.9)	1-1/2 (38)	1.65 (0.75)
4 (100)	4.500 (114.3)	1-3/4 (45)	2.76 (1.25)
6 (150)	6.625 (168.3)	2 (51)	5.91 (2.68)
8 (200)	8.625 (219.1)	2 (51)	7.50 (3.40)



Model TE1 Grooved Tee Standard Radius

cULus Listed, FM Approved
300 psi (20.7 bar)

TE1 Grooved Tee Standard Radius Technical Data

Operating Specifications
Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications

Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specification

Groove: AWWA-C606

Available Finishes

Housing:

Standard orange paint
Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed
FM Approved



TE1 Grooved Tee Standard Radius Dimensions

Figure 1

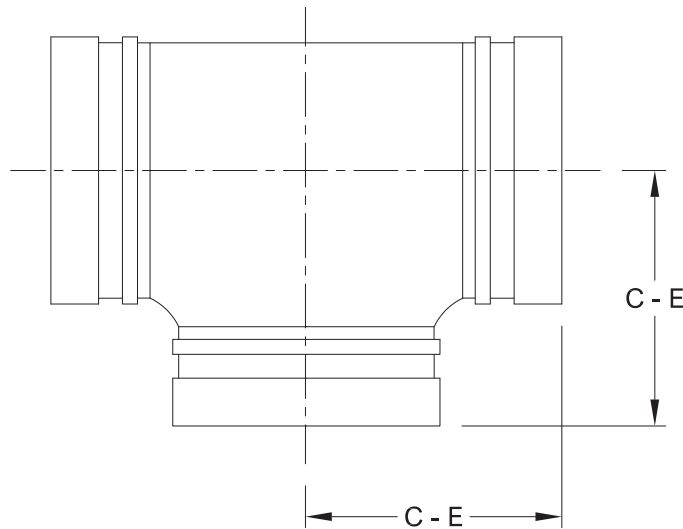


Table A

Nominal Size in (mm)	Pipe O.D. in/mm	Dimension C - E in (mm)	Weight lb (kg)
1 (25)	1.315 (33.7)	2-1/4 (57)	0.93 (0.42)
1-1/4 (32)	1.660 (42.2)	2-3/4 (70)	1.32 (0.60)
1-1/2 (40)	1.900 (48.3)	2-3/4 (70)	1.65 (0.75)
2 (50)	2.375 (60.3)	3-5/16 (84)	2.62 (1.19)
2-1/2 (65)	2.875 (73.0)	3-3/4 (95)	3.66 (1.66)
3 (80)	3.500 (88.9)	4-1/4 (108)	5.18 (2.35)
4 (100)	4.500 (114.3)	5 (127)	8.05 (3.65)
6 (150)	6.625 (168.3)	6-1/2 (165)	19.40 (8.80)
8 (200)	8.625 (219.1)	7-3/4 (197)	30.30 (13.74)



Model TESR1 Grooved Tee Short Radius

cULus Listed, FM Approved
300 psi (20.7 bar)

TESR1 Grooved Tee Short Radius Technical Data

Operating Specifications
Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications
Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specification
Groove: AWWA-C606

Available Finishes
Housing:
Standard orange paint
Hot dipped galvanized (ASTM A-153)

Listings and Approvals
cULus Listed
FM Approved



TESR1 Grooved Tee Short Radius Dimensions

Figure 1

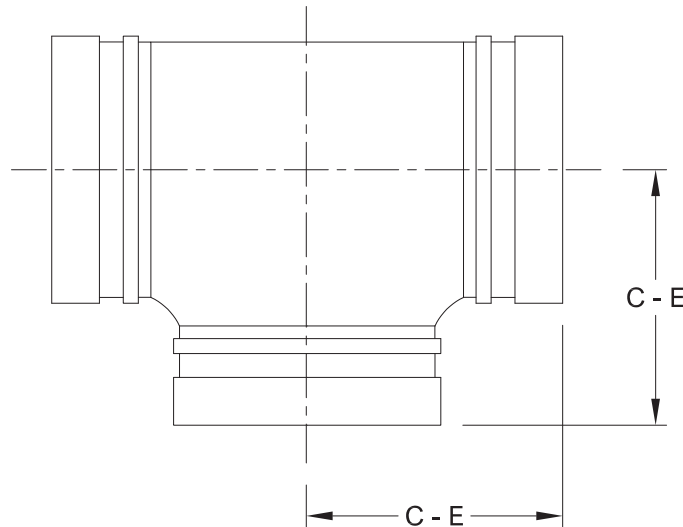


Table A

Nominal Size in (mm)	Pipe O.D. in/mm	Dimension C - E in (mm)	Weight lb (kg)	Run Friction Loss Eq Feet of Pipe (m)	Branch Friction Loss Eq Feet of Pipe (m)
2 (50)	2.375 (60.3)	2-3/4 (70)	2.25 (1.02)	3.6 (1.1)	8.5 (2.6)
2-1/2 (65)	2.875 (73.0)	3 (76)	2.76 (1.25)	4.3 (1.3)	10.8 (3.3)
3 (80)	3.500 (88.9)	3-3/8 (85)	3.77 (1.71)	4.9 (1.5)	13.1 (4)
4 (100)	4.500 (114.3)	4 (102)	5.47 (2.48)	6.9 (2.1)	16.1 (4.9)
6 (150)	6.625 (168.3)	5-1/2 (140)	13.41 (6.08)	9.8 (3)	24.9 (7.6)
8 (200)	8.625 (219.1)	6-7/8 (175)	26.46 (12)	13.1 (4)	33.1 (10.1)
10 (250)	10.750 (273.0)	8-1/2 (215)	37.15 (16.85)	17.1 (5.2)	41 (12.5)
12 (300)	12.750 (323.9)	8-11/16 (220)	55.35 (25.10)	20 (6.1)	49.9 (15.2)



Model CRS1 Grooved Cross Short Radius

cULus Listed, FM Approved
300 psi (20.7 bar)

CRS1 Grooved Cross Short Radius Technical Data

Operating Specifications
Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications

Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specification

Groove: AWWA-C606

Available Finishes

Housing:

Standard orange paint
Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed
FM Approved



CRS1 Grooved Cross Short Radius Dimensions

Figure 1

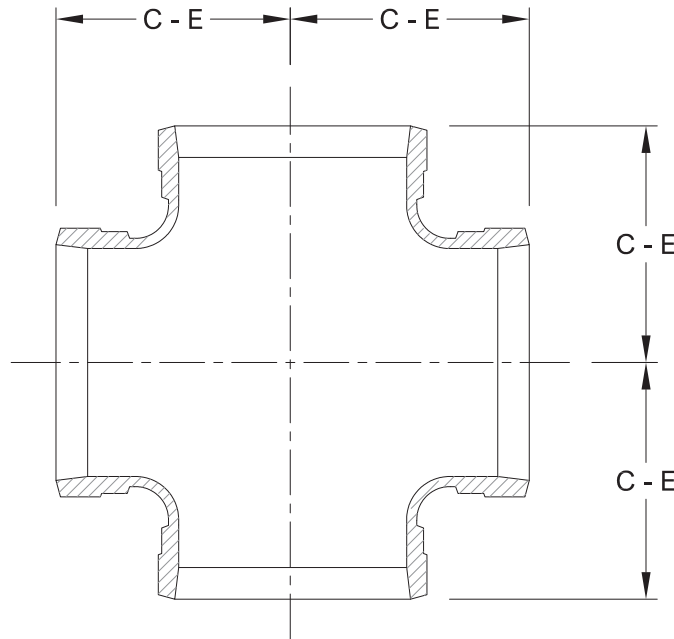


Table A

Nominal Size in (mm)	Pipe O.D. in/mm	Dimension C - E in (mm)	Weight lb (kg)	Run Friction Loss Eq Feet of Pipe (m)	Branch Friction Loss Eq Feet of Pipe (m)
2 (50)	2.375 (60.3)	2-3/4 (70)	2.65 (1.2)	3.6 (1.1)	8.5 (2.6)
2-1/2 (65)	2.875 (73.0)	3 (76)	4.19 (1.9)	4.3 (1.3)	10.8 (3.3)
3 (80)	3.500 (88.9)	3-3/8 (86)	4.41 (2)	4.9 (1.5)	13.1 (4)
4 (100)	4.500 (114.3)	4 (102)	7.83 (3.55)	6.9 (2.1)	16.1 (4.9)
6 (150)	6.625 (168.3)	5-1/2 (140)	17.09 (7.75)	9.8 (3)	24.9 (7.6)
8 (200)	8.625 (219.1)	6-7/8 (174)	28.99 (13.15)	13.1 (4)	33.1 (10.1)

P/N 9999970646



Model CRG1 Grooved Concentric Reducer

cULus Listed, FM Approved
300 psi (20.7 bar)

CRG1 Grooved Concentric Reducer Technical Data

Operating Specifications
Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications

Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specification

Groove: AWWA-C606

Available Finishes

Housing:

Standard orange paint
Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed
FM Approved



CRG1 Grooved Concentric Reducer Dimensions

Figure 1

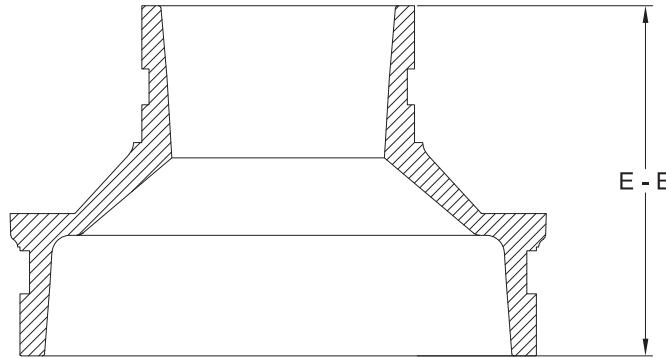


Table A

Nominal Size in (mm)	Pipe O.D. in/mm	Dimension E - E in (mm)	Weight lb (kg)
1-1/2 x 1-1/4 (40 x 32)	1.900 x 1.660 (48.3 x 42.2)	2-1/2 (64)	0.90 (0.41)
2 x 1-1/4 (50 x 32)	2.375 x 1.660 (60.3 x 42.2)	2-1/2 (64)	0.95 (0.43)
2 x 1-1/2 (50 x 40)	2.375 x 1.900 (60.3 x 48.3)	2-1/2 (64)	0.95 (0.43)
2-1/2 x 1-1/4 (65 x 32)	2.875 x 1.660 (73.0 x 42.2)	2-1/2 (64)	1.10 (0.50)
2-1/2 x 1-1/2 (65 x 40)	2.875 x 1.900 (73.0 x 48.3)	2-1/2 (64)	1.10 (0.50)
2-1/2 x 2 (65 x 50)	2.875 x 2.375 (73.0 x 60.3)	2-1/2 (64)	1.15 (0.52)
3 x 1-1/4 (80 x 32)	3.500 x 1.660 (88.9 x 42.2)	2-1/2 (64)	1.32 (0.60)
3 x 1-1/2 (80 x 40)	3.500 x 1.900 (88.9 x 48.3)	2-1/2 (64)	1.37 (0.62)
3 x 2 (80 x 50)	3.500 x 2.375 (88.9 x 60.3)	2-1/2 (64)	1.41 (0.64)
3 x 2-1/2 (80 x 65)	3.500 x 2.875 (88.9 x 73.0)	2-1/2 (64)	1.59 (0.72)
4 x 1-1/4 (100 x 32)	4.500 x 1.660 (114.3 x 42.2)	3 (76)	1.99 (0.90)
4 x 1-1/2 (100 x 40)	4.500 x 1.900 (114.3 x 48.3)	3 (76)	1.99 (0.90)
4 x 2 (100 x 50)	4.500 x 2.375 (114.3 x 60.3)	3 (76)	2.36 (1.07)
4 x 2-1/2 (100 x 65)	4.500 x 2.875 (114.3 x 73.0)	3 (76)	2.43 (1.10)
4 x 3 (100 x 80)	4.500 x 3.500 (114.3 x 88.9)	3 (76)	2.60 (1.18)
6 x 2 (150 x 50)	6.625 x 2.375 (168.3 x 60.3)	3-3/8 (85)	3.86 (1.75)
6 x 2-1/2 (150 x 65)	6.625 x 2.875 (168.3 x 73.0)	3-3/8 (85)	4.26 (1.93)
6 x 3 (150 x 80)	6.625 x 3.500 (168.3 x 88.9)	3-3/8 (85)	4.63 (2.10)
6 x 4 (150 x 100)	6.625 x 4.500 (168.3 x 114.3)	3-3/8 (85)	5.18 (2.35)
8 x 4 (200 x 100)	8.625 x 4.500 (219.1 x 114.3)	3-3/8 (85)	7.17 (3.25)
8 x 6 (200 x 150)	8.625 x 6.625 (219.1 x 168.3)	3-3/8 (85)	7.61 (3.45)



Model GRTG1 Grooved Reducing Tee

cULus Listed, FM Approved
300 psi (20.7 bar)

GRTG1 Grooved Reducing Tee Technical Data

Operating Specifications
Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications
Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specification
Groove: AWWA-C606

Available Finishes
Housing:
Standard orange paint
Hot dipped galvanized (ASTM A-153)

Listings and Approvals
cULus Listed
FM Approved



GRTG1 Grooved Reducing Tee Dimensions

Figure 1

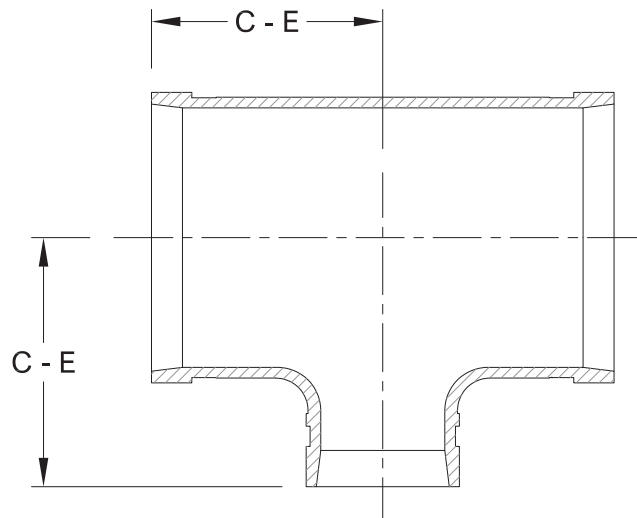


Table A

Nominal Size in (mm)	Pipe O.D. in/mm	Dimensions	Weight lb (kg)	Run Friction Loss Eq Feet of Pipe ft (m)	Branch Friction Loss Eq Feet of Pipe ft (m)
		C - E in (mm)			
4 x 2 (100 x 50)	4.500 x 2.375 (114.3 x 60.3)	4 (102)	5.0 (2.30)	6.9 (2.1)	8.5 (2.6)
4 x 2-1/2 (100 x 65)	4.500 x 2.875 (114.3 x 73.0)	4 (102)	6.04 (2.74)	6.9 (2.1)	10.8 (3.3)
4 x 3 (100 x 80)	4.500 x 3.500 (114.3 x 88.9)	4 (102)	5.73 (2.60)	6.9 (2.1)	13.1 (4)
6 x 2 (150 x 50)	6.625 x 2.375 (168.3 x 60.3)	5-1/8 (130)	12.68 (5.75)	9.8 (3)	8.5 (2.6)
6 x 2-1/2 (150 x 65)	6.625 x 2.875 (168.3 x 73.0)	5-1/2 (140)	13.67 (6.20)	9.8 (3)	10.8 (3.3)
6 x 3 (150 x 80)	6.625 x 3.500 (168.3 x 88.9)	5-1/2 (140)	14.22 (6.45)	9.8 (3)	13.1 (4)
6 x 4 (150 x 100)	6.625 x 4.500 (168.3 x 114.3)	5-1/2 (140)	13.56 (6.15)	9.8 (3)	16.1 (4.9)
8 x 4 (200 x 100)	8.625 x 4.500 (219.1 x 114.3)	6-7/8 (174)	21.17 (9.60)	13.1 (4)	16.1 (4.9)
8 x 6 (200 x 150)	8.625 x 6.625 (219.1 x 168.3)	6-7/8 (174)	25.47 (11.55)	13.1 (4)	24.9 (7.6)



Model CP1 Cap

cULus Listed, FM Approved
300 psi (20.7 bar)

CP1 Cap Technical Data

Operating Specifications
Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications

Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specification

Groove: AWWA-C606

Available Finishes

Housing:

Standard orange paint
Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed
FM Approved



CP1 Cap Dimensions

Figure 1

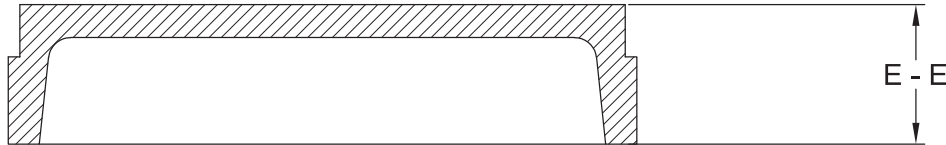


Table A

Nominal Size in (mm)	Pipe O.D. in/mm	Dimension E - E in (mm)	Weight lb (kg)
1 (25)	1.315 (33.7)	15/16 (24)	0.22 (0.10)
1-1/4 (32)	1.660 (42.2)	15/16 (24)	0.29 (0.13)
1-1/2 (40)	1.900 (48.3)	15/16 (24)	0.35 (0.16)
2 (50)	2.375 (60.3)	15/16 (24)	0.55 (0.25)
2-1/2 (65)	2.875 (73.0)	15/16 (24)	0.77 (0.35)
3 (80)	3.500 (88.9)	15/16 (24)	0.93 (0.42)
4 (100)	4.500 (114.3)	1 (25)	1.54 (0.70)
6 (150)	6.625 (168.3)	1 (25)	3.42 (1.55)
8 (200)	8.625 (219.1)	1-3/16 (30)	6.62 (3)
10 (250)	10.750 (273.0)	1-1/4 (32)	13.12 (5.95)
12 (300)	12.750 (323.9)	1-1/4 (32)	18.48 (8.38)



Model ECP1 Cap with Eccentric Hole NPT

cULus Listed, FM Approved
300 psi (20.7 bar)

ECP1 Cap with Eccentric Hole NPT Technical Data

Operating Specifications
Maximum Working Pressure:
300 psi (20.7 bar)

Material Specifications

Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specifications

Thread: B1.20.1

Groove: AWWA-C606

Available Finishes

Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed

FM Approved



ECP1 Cap with Eccentric Hole NPT Dimensions

Figure 1

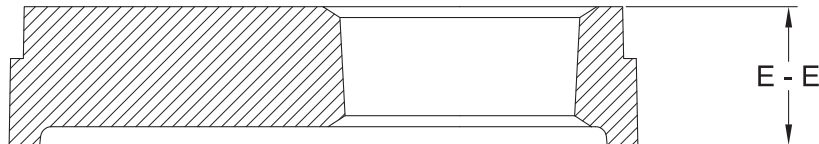


Table A

Grooved x Threaded Nominal Size in (mm)	Pipe O.D. in/mm	Dimension E - E in (mm)	Weight lb (kg)
2 x 1 (50 x 25)	2.375 x 1.315 (60.3 x 33.7)	15/16 (24)	0.68 (0.31)
2-1/2 x 1 (65 x 25)	2.875 x 1.315 (73.0 x 33.7)	15/16 (24)	0.84 (0.38)
3 x 1 (80 x 25)	3.500 x 1.315 (88.9 x 33.7)	15/16 (24)	1.28 (0.58)
4 x 1 (100 x 25)	4.500 x 1.315 (114.3 x 33.7)	1 (25)	1.87 (0.85)
6 x 1 (150 x 25)	6.625 x 1.315 (168.3 x 33.7)	1 (25)	4.19 (1.90)



Model FA1 Grooved Flange ANSI125/150

cULus Listed, FM Approved

FA1 Grooved Flange Technical Data

Operating Specifications
Maximum Working Pressure:

See Table B

Operating Temperature

-30 °F to 230 °F (-34 °C to 110 °C)

Material Specifications
Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specification
Groove: AWWA-C606

Flange: ASME B16.5 Class 125/150

Bolt Specification

SAE J429 Grade 5

Available Finishes
Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

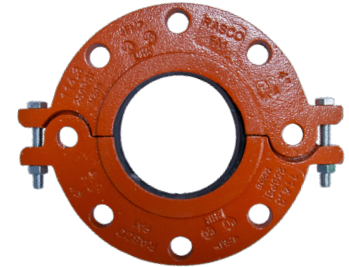
Bolts:

Zinc Electroplating

Listings and Approvals

cULus Listed

FM Approved



FA1 Grooved Flange Dimensions

Figure 1

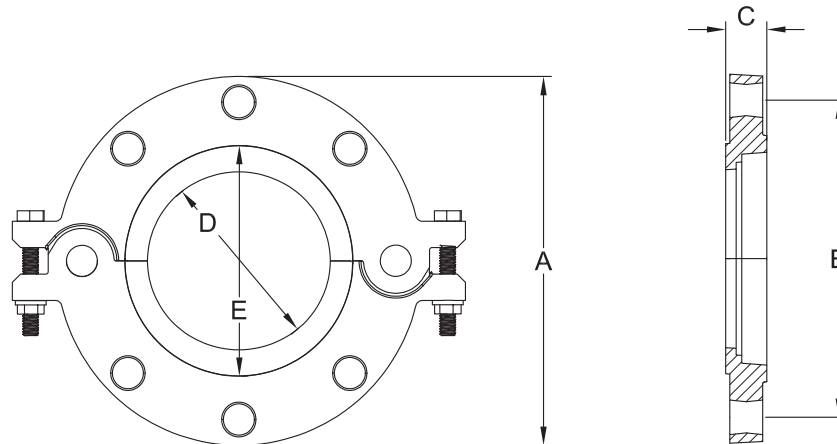


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Max. End Load lbs (KN)	Bolts Size in	Number of Bolts	Dimensions					Weight lb (kg)
					A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	
2 (50)	2.375 (60.3)	1330 (5.71)	5/8	4	6-1/8 (155)	4-3/4 (121)	5/8 (16)	2-1/2 (65)	3-1/16 (78)	4.19 (1.90)
2-1/2 (65)	2.875 (73.0)	1950 (8.37)	5/8	4	7-1/8 (180)	5-1/2 (140)	5/8 (16)	2-1/2 (65)	3-11/16 (93)	4.87 (2.21)
3 (80)	3.500 (88.9)	2880 (12.41)	5/8	4	7-1/2 (190)	6 (153)	3/4 (18)	2-1/2 (65)	4-3/16 (107)	5.18 (2.35)
4 (100)	4.500 (114.3)	4770 (20.51)	5/8	8	9-1/16 (230)	7-1/2 (191)	7/8 (22)	2-3/4 (70)	5-3/16 (131)	7.28 (3.30)
6 (150)	6.625 (168.3)	10340 (44.47)	3/4	8	11 (280)	8-1/2 (241)	7/8 (22)	2-3/4 (70)	7-1/4 (185)	10.54 (4.78)
8 (200)	8.625 (219.1)	17520 (75.37)	3/4	8	13-11/16 (345)	11-3/4 (299)	1 (25)	3-1/8 (80)	9-1/4 (234)	6.58 (14.51)
10 (250)	10.750 (273.0)	27210 (164.71)	1	12	15-15/16 (405)	14-1/4 (362)	1-3/16 (30)	10-3/4 (273)	11-9/16 (294)	24.81 (11.25)
12 (300)	12.750 (323.9)	38280 (164.71)	1	12	19-1/8 (485)	17 (432)	1-1/4 (32)	12-3/4 (324)	13-7/16 (341)	36.93 (16.75)

FA1 Pipe Compatibility
Table B

Nominal Size in (mm)	Groove Type	Pipe	Approvals	Pressure Rating psi (bar)
2 (50)	Rolled	10	cULus, FM	300 (20.7)
	Cut, Rolled	40		
2-1/2 (65)	Rolled	10	cULus, FM	300 (20.7)
	Cut, Rolled	40		
3 (80)	Rolled	10	cULus, FM	300 (20.7)
	Cut, Rolled	40		
4 (100)	Rolled	10	cULus, FM	300 (20.7)
	Cut, Rolled	40		
6 (150)	Rolled	10	cULus, FM	300 (20.7)
	Cut, Rolled	40		
8 (200)	Rolled	10	cULus	300 (20.7)
	Cut, Rolled	40	cULus	300 (20.7)
			FM	250 (17.2)
10 (250)	Rolled	10	cULus	300 (20.7)
	Cut, Rolled	40	cULus	300 (20.7)
			FM	250 (17.2)
12 (300)	Rolled	10	cULus	300 (20.7)
	Cut, Rolled	40	cULus	300 (20.7)
			FM	250 (17.2)



Model GXFA1 Flange Adaptor ANSI125/150

cULus Listed, FM Approved

GXFA1 Flange Adaptor Technical Data

Operating Specifications
Maximum Working Pressure:
 300 psi (20.7 bar)

Material Specifications
Body: ASTM A536 Grade 65-45-12 Ductile Iron

Design Specifications
Groove: AWWA-C606
Flange: ASME B16.5

Available Finishes
Housing:
 Standard orange paint
 Hot dipped galvanized (ASTM A-153)
Bolts:
 Zinc Electroplating

Listings and Approvals
 cULus Listed
 FM Approved



GXFA1 Flange Adaptor Dimensions

Figure 1

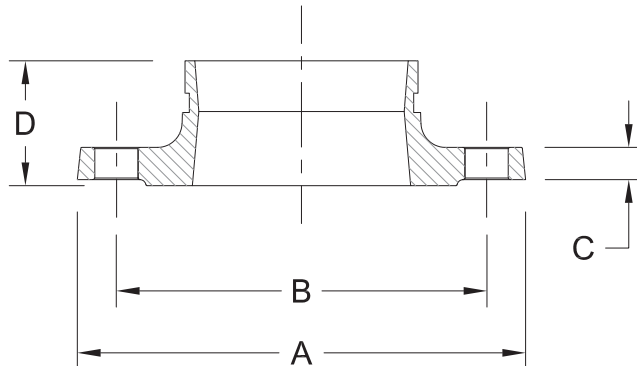


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Bolts Size in	Number of Bolts	Dimensions				Weight lb (kg)
				A in (mm)	B in (mm)	C in (mm)	D in (mm)	
2 (50)	2.375 (60.3)	5/8	4	6-1/8 (155)	4-3/4 (121)	5/8 (16)	2-1/2 (65)	4.19 (1.90)
2-1/2 (65)	2.875 (73.0)	5/8	4	7-1/8 (180)	5-1/2 (140)	5/8 (16)	2-1/2 (65)	6.28 (2.85)
3 (80)	3.500 (88.9)	5/8	4	7-1/2 (190)	6 (153)	3/4 (18)	2-1/2 (65)	6.06 (2.75)
4 (100)	4.500 (114.3)	5/8	8	9-1/16 (230)	7-1/2 (191)	7/8 (22)	2-3/4 (70)	9.48 (4.30)
6 (150)	6.625 (168.3)	3/4	8	11 (280)	8-1/2 (241)	7/8 (22)	2-3/4 (70)	15.44 (7)
8 (200)	8.625 (219.1)	3/4	8	13-11/16 (345)	11-3/4 (299)	1 (25)	3-1/8 (80)	26.46 (12)



Model 041 U Bolt Threaded Mechanical Tee FNPT

cULus Listed, FM Approved
300 psi (20.7 bar)

041 U Bolt Threaded Mechanical Tee FNPT Technical Data

Operating Specifications

Maximum Working Pressure:
300 psi (20.7 bar)

Operating Temperature

-30 °F to 230 °F (-34 °C to 110 °C)

Material Specifications

Housings: ASTM A536 Grade 65-45-12 Ductile Iron

Gasket: Grade E EDPM

Bolt Specification:

SAE J429 Grade 5

Thread Specification:

ASME B1.20.1

Available Finishes

Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed

FM Approved



041 U Bolt Threaded Mechanical Tee FNPT Dimensions

Figure 1

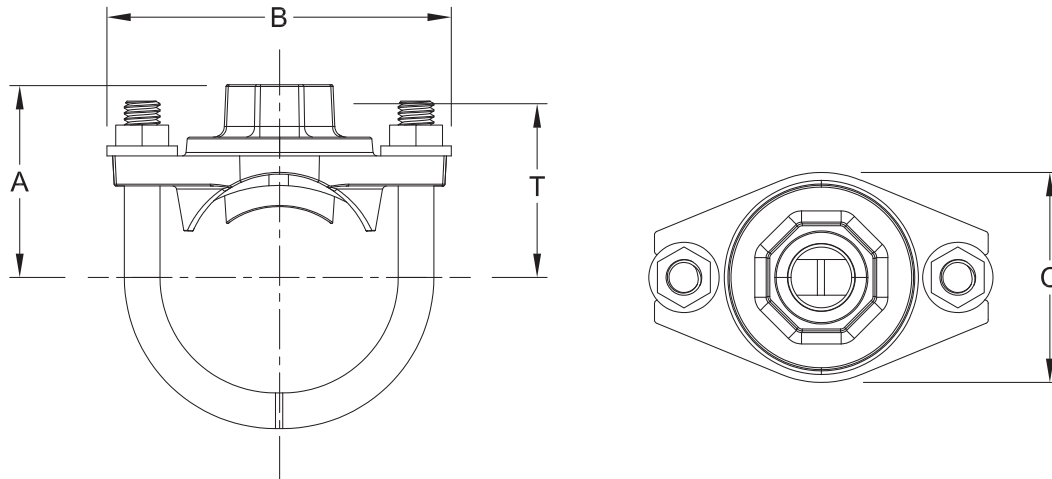


Table A

Nominal Size		Hole Saw Size in (mm)	Bolt Size in	Bolt Torque lbs-ft / N-M	Dimensions				Weight lb (kg)
Run Pipe in (mm)	Threaded Outlet in (mm)				A in/mm	B in/mm	C in/mm	Take Out T in/mm	
1-1/4 (32)	1/2 (15)	1-3/16 (30)	3/8	22-29 (30-40)	2-1/8 (53)	3-1/2 (89)	2-3/16 (56)	1-3/4 (44)	0.90 (0.41)
	3/4 (20)	1-3/16 (30)	3/8	22-29 (30-40)	2-1/8 (53)	3-1/2 (89)	2-3/16 (56)	1-3/4 (44)	0.95 (0.43)
	1 (25)	1-3/16 (30)	3/8	22-29 (30-40)	2-3/16 (56)	3-1/2 (89)	2-3/16 (56)	1-7/8 (47)	0.95 (0.43)
1-1/2 (40)	1/2 (15)	1-3/16 (30)	3/8	22-29 (30-40)	2-3/16 (55)	3-1/2 (89)	2-3/16 (56)	1-13/16 (46)	0.90 (0.41)
	3/4 (20)	1-3/16 (30)	3/8	22-29 (30-40)	2-3/16 (55)	3-1/2 (89)	2-3/16 (56)	1-13/16 (46)	0.93 (0.42)
	1 (25)	1-3/16 (30)	3/8	22-29 (30-40)	2-1/4 (58)	3-1/2 (89)	2-3/16 (56)	1-15/16 (49)	0.99 (0.45)
2 (50)	1/2 (15)	1-3/16 (30)	3/8	22-29 (30-40)	2-1/2 (64)	3-7/8 (98)	2-3/16 (56)	2-1/16 (53)	0.93 (0.42)
	3/4 (20)	1-3/16 (30)	3/8	22-29 (30-40)	2-1/2 (64)	3-7/8 (98)	2-3/16 (56)	2-1/16 (53)	0.97 (0.44)
	1 (25)	1-3/16 (30)	3/8	22-29 (30-40)	2-5/8 (67)	3-7/8 (98)	2-3/16 (56)	2-3/16 (56)	0.97 (0.44)
2-1/2 (65)	1/2 (15)	1-3/16 (30)	3/8	22-29 (30-40)	2-3/4 (69)	4-3/8 (111)	2-3/16 (56)	2-1/4 (58)	1.28 (0.58)
	3/4 (20)	1-3/16 (30)	3/8	22-29 (30-40)	2-3/4 (69)	4-3/8 (111)	2-3/16 (56)	2-1/4 (58)	1.28 (0.58)
	1 (25)	1-3/16 (30)	3/8	22-29 (30-40)	2-13/16 (72)	4-3/8 (111)	2-3/16 (56)	2-3/8 (61)	1.32 (0.60)
3 (80)	1 (25)	1-3/16 (30)	3/8	22-29 (30-40)	3-3/16 (81)	5-1/16 (128)	2-3/16 (56)	2-5/8 (67)	1.32 (0.60)

041 Pipe Compatibility

Table B

Nominal Size in (mm)	Pipe	Approvals
1-1/4 (32)	10	cULus, FM
	40	
1-1/2 (40)	10	cULus, FM
	40	
2 (50)	10	cULus, FM
	40	
2-1/2 (65)	10	cULus, FM
	40	
3 (80)	10	cULus, FM
	40	



Model MTT2 Threaded Mechanical Tee FNPT

cULus Listed, FM Approved
300 psi (20.7 bar)

MTT2 Threaded Mechanical Tee FNPT Technical Data

Operating Specifications

Maximum Working Pressure:

300 psi (20.7 bar)

Operating Temperature

-30 °F to 230 °F (-34 °C to 110 °C)

Material Specifications

Housings: ASTM A536 Grade 65-45-12 Ductile Iron

Gasket: Grade E EDPM

Bolt Specification:

SAE J429 Grade 5

Thread Specification:

ASME B1.20.1

Available Finishes

Housing:

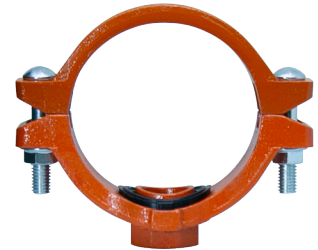
Standard orange paint

Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed

FM Approved



MTT2 Threaded Mechanical Tee FNPT Dimensions

Figure 1

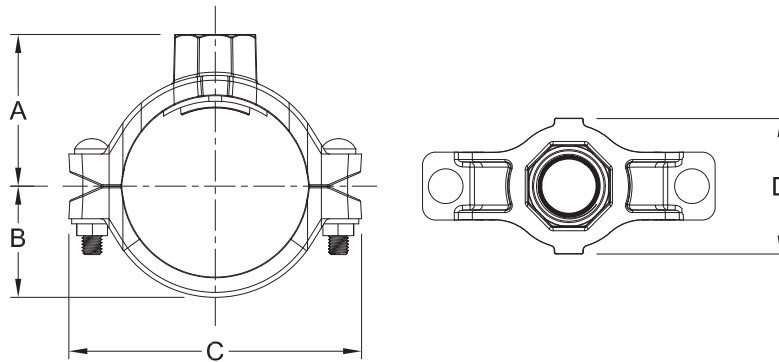


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Nominal Branch Pipe Size NPS (DN)	Bolt Size x Length in	Dimensions				Weight lb (kg)	Hole Saw Size in (mm)
				A in (mm)	B in (mm)	C in (mm)	D in (mm)		
2 (50)	2.375 (60.3)	1 (25)	3/8 x 2-3/8	1-7/8 (47)	1-5/8 (42)	4-3/4 (120)	3 (76)	1.85 (0.84)	1-1/2 (38)
		1-1/4 (32)	3/8 x 2-3/8	2-5/8 (52)	1-5/8 (42)	4-3/4 (120)	3-5/16 (84)	2.25 (1.02)	1-3/4 (45)
		1-1/2 (40)	3/8 x 2-3/8	2-13/16 (71)	1-5/8 (42)	4-3/4 (120)	3-5/16 (84)	2.47 (1.12)	1-3/4 (45)
2-1/2 (65)	2.875 (73.0)	1 (25)	1/2 x 2-5/8	2-7/16 (62)	1-7/8 (47)	5-5/8 (143)	3 (76)	2.32 (1.05)	1-1/2 (38)
		1-1/4 (32)	1/2 x 2-5/8	2-7/8 (74)	1-7/8 (47)	5-5/8 (143)	3-5/16 (84)	2.56 (1.16)	1-3/4 (45)
		1-1/2 (40)	1/2 x 2-5/8	2-1/4 (58)	1-7/8 (47)	5-5/8 (143)	3-9/16 (90)	2.93 (1.33)	2 (51)
3 (80)	3.500 (88.9)	1 (25)	1/2 x 2-5/8	2-3/4 (70)	2-3/16 (55)	6-1/4 (158)	3 (76)	3 (1.36)	1-1/2 (38)
		1-1/4 (32)	1/2 x 2-5/8	3-3/16 (81)	2-3/16 (55)	6-1/4 (158)	3-5/16 (84)	3 (1.36)	1-3/4 (45)
		1-1/2 (40)	1/2 x 2-5/8	3-3/16 (81)	2-3/16 (55)	6-1/4 (158)	3-9/16 (90)	3.15 (1.43)	2 (51)
		2 (50)	1/2 x 2-5/8	3-3/16 (81)	2-3/16 (55)	6-1/4 (158)	4 (101)	3.42 (1.55)	2-1/2 (64)
4 (100)	4.500 (114.3)	1 (25)	1/2 x 2-3/4	3-1/4 (82)	2-3/16 (55)	7-1/8 (181)	3 (76)	2.87 (1.30)	1-1/2 (38)
		1-1/4 (32)	1/2 x 2-3/4	3-11/16 (94)	2-3/16 (55)	7-1/8 (181)	3-5/16 (84)	3.31 (1.50)	1-3/4 (45)
		1-1/2 (40)	1/2 x 2-3/4	3-11/16 (94)	2-3/16 (55)	7-1/8 (181)	3-9/16 (90)	3.37 (1.53)	2 (51)
		2 (50)	1/2 x 2-3/4	3-11/16 (94)	2-3/16 (55)	7-1/8 (181)	4 (101)	3.68 (1.67)	2-1/2 (64)
		2-1/2 (65)	1/2 x 2-3/4	3-11/16 (94)	2-3/16 (55)	7-1/8 (181)	4-5/8 (117)	4.48 (2.03)	2-3/4 (70)
6 (150)	6.625 (168.3)	1 (25)	5/8 x 3-5/16	4-1/4 (109)	3-3/16 (97)	9-3/4 (248)	3 (76)	5.18 (2.35)	1-1/2 (38)
		1-1/4 (32)	5/8 x 3-5/16	4-1/4 (109)	3-3/16 (97)	9-3/4 (248)	3-5/16 (84)	5.42 (2.46)	1-3/4 (45)
		1-1/2 (40)	5/8 x 3-5/16	4-1/4 (109)	3-3/16 (97)	9-3/4 (248)	3-9/16 (90)	5.40 (2.45)	2 (51)
		2 (50)	5/8 x 3-5/16	4-1/4 (109)	3-3/16 (97)	9-3/4 (248)	4 (101)	5.65 (2.56)	2-1/2 (64)
		2-1/2 (65)	5/8 x 3-5/16	4-1/4 (109)	3-3/16 (97)	9-3/4 (248)	4-5/8 (117)	6.28 (2.85)	2-3/4 (70)

MTT2 Pipe Compatibility**Table B**

Nominal Size in (mm)	Pipe	Approvals
2 (50)	10	cULus, FM
	40	
2-1/2 (65)	10	cULus, FM
	40	
3 (80)	10	cULus, FM
	40	
4 (100)	10	cULus, FM
	40	
6 (150)	10	cULus, FM
	40	

Reliable®

Model MTG1 Grooved Mechanical Tee

cULus Listed, FM Approved
300 psi (20.7 bar)

MTG1 Grooved Mechanical Tee Technical Data

Operating Specifications

Maximum Working Pressure:
See Table A

Operating Temperature

-30 °F to 230 °F (-34 °C - 110 °C)

Material Specifications

Housings: ASTM A536 Grade 65-45-12 Ductile Iron

Gasket: Grade E EDPM

Bolt Specification:

SAE J429 Grade 5

Thread Specification:

ASME B1.20.1

Available Finishes

Housing:

Standard orange paint

Hot dipped galvanized (ASTM A-153)

Listings and Approvals

cULus Listed

FM Approved



MTG1 Grooved Mechanical Tee Dimensions

Figure 1

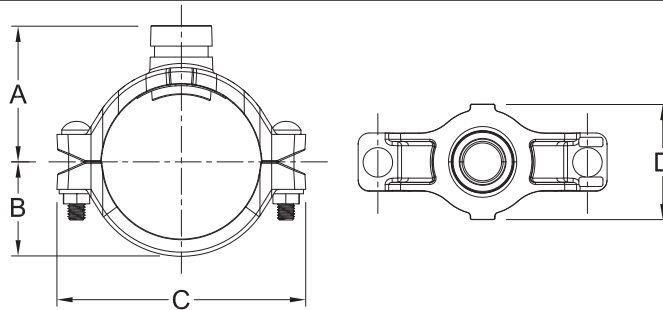


Table A

Nominal Size in (mm)	Pipe O.D. in (mm)	Nominal Branch Pipe Size NPS (DN)	Branch Pipe O.D. in (mm)	Bolt Size x Length in	Dimensions				Weight lb (kg)	Hole Saw Size in (mm)
					A in (mm)	B in (mm)	C in (mm)	D in (mm)		
2 (50)	2.375 (60.3)	1-1/4 (32)	1.660 (42.2)	3/8 x 2-3/8	2-7/8 (73)	1-5/8 (42)	4-3/4 (120)	3-5/16 (84)	2.12 (0.96)	1-3/4 (45)
		1-1/2 (40)	1.900 (48.3)					3-9/16 (90)	2.16 (0.98)	1-3/4 (45)
2-1/2 (65)	2.875 (73.0)	1-1/4 (32)	1.660 (42.2)	1/2 x 2-5/8	3-1/16 (79)	1-7/8 (47)	5-5/8 (143)	3-5/16 (84)	2.65 (1.20)	1-3/4 (45)
		1-1/2 (40)	1.900 (48.3)					3-9/16 (90)	2.80 (1.27)	2 (51)
3 (80)	3.500 (88.9)	1-1/4 (32)	1.660 (42.2)	1/2 x 2-5/8	3-3/8 (86)	2-3/16 (55)	6-1/4 (158)	3-5/16 (84)	2.80 (1.27)	1-3/4 (45)
		1-1/2 (40)	1.990 (48.3)		3-3/8 (86)			3-9/16 (90)	2.98 (1.35)	2 (51)
		2 (50)	2.375 (60.3)		3-7/16 (87)			4 (101)	3.31 (1.50)	2-1/2 (64)
4 (100)	4.500 (114.3)	1-1/4 (32)	1.660 (42.2)	1/2 x 2-3/4	3-7/8 (99)	2-9/16 (65)	7-1/8 (181)	3-5/16 (84)	4.15 (1.88)	1-3/4 (45)
		1-1/2 (40)	1.900 (48.3)					3-9/16 (90)	3.57 (1.62)	2 (51)
		2 (50)	2.375 (60.3)					4 (101)	3.90 (1.77)	2-1/2 (64)
		2-1/2 (65)	2.875 (73.0)					4-5/8 (117)	4.19 (1.90)	2-3/4 (70)
		3 (80)	3.500 (88.9)					5-3/8 (136)	4.63 (2.1)	3-1/2 (89)
6 (150)	6.625 (168.3)	1-1/4 (32)	1.660 (42.2)	5/8 x 3-5/16	4-15/16 (125)	3-13/16 (97)	9-3/4 (248)	3-5/16 (84)	5.31 (2.41)	1-3/4 (45)
		1-1/2 (40)	1.900 (48.3)		4-15/16 (125)			3-9/16 (90)	5.31 (2.41)	2 (51)
		2 (50)	2.375 (60.3)		4-15/16 (125)			4 (101)	5.58 (2.53)	2-1/2 (64)
		2-1/2 (65)	2.875 (73.0)		5 (127)			4-5/8 (117)	6.62 (3)	2-3/4 (70)
		3 (80)	3.500 (88.9)		5 (127)			5-3/8 (136)	6.79 (3.08)	3-1/2 (89)
		4 (100)	4.500 (114.3)		5-1/16 (129)			6-3/8 (162)	7.72 (3.50)	4-1/2 (114)
8 (200)	8.625 (219.1)	2 (50)	2.375 (60.3)	5/8 x 3-1/2	6 (152)	1-15/16 (125)	12-5/8 (322)	4 (101)	9.24 (4.19)	2-1/2 (64)
		2-1/2 (65)	2.875 (73.0)		6-1/16 (154)			4-5/8 (117)	10.06 (4.56)	2-3/4 (70)
		3 (80)	3.500 (88.9)		6-1/16 (154)			5-3/8 (136)	10.25 (4.65)	3-1/2 (89)
		4 (100)	4.500 (114.3)		6-3/16 (156)			6-3/8 (162)	11.69 (5.3)	4-1/2 (114)

MTG1 Pipe Compatibility
Table B

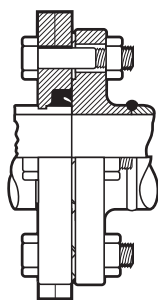
Nominal Size in (mm)	Nominal Branch Pipe Size in (mm)	Pipe	Approvals
2 (50)	1-1/4 (32)	10, 40	cULus, FM
	1-1/2 (40)		
2-1/2 (65)	1-1/4 (32)	10, 40	cULus, FM
	1-1/2 (40)		
3 (80)	1-1/4 (32)	10, 40	cULus, FM
	1-1/2 (40)		
	2 (50)		
4 (100)	1-1/4 (32)	10, 40	cULus, FM
	1-1/2 (40)		
	2 (50)		
	2-1/2 (65)		
	3 (80)		
6 (150)	1-1/4 (32)	10, 40	cULus, FM
	1-1/2 (40)		
	2 (50)		
	2-1/2 (65)		
	3 (80)		
	4 (100)		
8 (200)	2 (50)	10, 40	cULus, FM
	2-1/2 (65)		
	3 (80)		
	4 (100)		

Victaulic® Vic-Flange Adapters

Styles 741 and 743



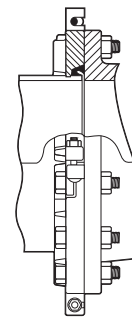
Style 741
2 – 12"/DN50 – DN300



Exaggerated for clarity



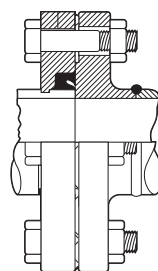
Style 741
14 – 24"/DN350 – DN600



Exaggerated for clarity



Style 743
2 – 12"/DN50 – DN300



Exaggerated for clarity

1.0 PRODUCT DESCRIPTION

Available Sizes

- **Style 741:** 2 – 24"/DN50 – DN600
- **Style 743:** 2 – 12"/DN50 – DN300

Maximum Working Pressure

- **Style 741:** Up to 300 psi/2068 kPa/20 Bar
- **Style 743:** Up to 720 psi/4964 kPa/49 Bar

Application

- Designed to transition from flanged to grooved piping systems

Pipe Material

- Carbon steel
- For use with stainless steel pipe, refer to Victaulic [publication 17.09](#) for pressure ratings and end loads.
- For use with PVC pipe, refer to Victaulic [publication 32.01](#) for pressure ratings.
- For use with aluminum pipe, refer to Victaulic [publication 21.04](#) for pressure ratings and end loads.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

2.0 CERTIFICATION/LISTINGS



NOTE

- See Victaulic [publication 02.06](#): Victaulic Potable Water Approvals ANSI/NSF for potable water approvals if applicable.

3.0 SPECIFICATIONS - MATERIAL

Housing: Ductile iron conforming to ASTM A536, Grade 65-45-12. Ductile iron conforming to ASTM A395, Grade 65-45-15, is available upon special request.

Housing Coating: (specify choice)

- ☐ Standard: Black enamel.
- ☐ Optional: Hot dipped galvanized.
- ☐ Optional: Contact Victaulic with your requirements for other coatings.

Gasket: (specify choice¹)

- ☐ **Victaulic Grade “E” EPDM**
EPDM (Green stripe color code). Temperature range –30°F to +230°F/–34°C to +110°C. May be specified for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL Classified in accordance with ANSI/NSF 61 for cold +73°F/+23°C and hot +180°F/+82°C potable water service and ANSI/NSF 372. **NOT COMPATIBLE FOR USE WITH PETROLEUM SERVICES OR STEAM SERVICES.**
- ☐ **Victaulic Grade “T” Nitrile**
Nitrile (Orange stripe color code). Temperature range 20°F to +180°F/29°C to +82°C. May be specified for oil related services, including air with oil vapor, this gasket may be specified for temperatures rated up to +180°F/+82°C. For water related services, this gasket may be specified for temperatures rated up to +150°F/+66°C. For oil free, dry air services, this gasket may be specified for temperatures rated up to +140°F/+60°C. **NOT COMPATIBLE FOR USE WITH HOT WATER SERVICES OR STEAM SERVICES.**
- ☐ **Others**
For alternate gasket selection, reference [publication 05.01](#): Victaulic Seal Selection Guide.

¹ Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to the latest [Victaulic Seal Selection Guide](#) for specific gasket service guidelines and for a listing of services which are not compatible.

Draw Bolts/Nuts (14 – 24”/DN350 – DN600 only):

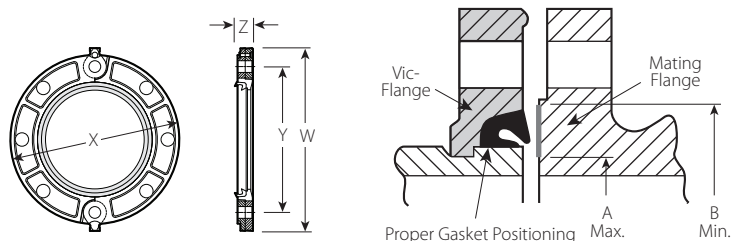
- ☐ Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (metric). Carbon steel hex flange nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial - heavy hex nuts) and ASTM A563M Class 9 (metric - hex nuts). Track bolts and hex flange nuts are zinc electroplated per ASTM B633 ZN/FE5, finish Type III (imperial) or Type II (metric).

4.0 DIMENSIONS

Style 741

2 – 12"/DN50 – DN300

ANSI Class 125 and 150 Flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		Assembly Bolt/Nut ²		Sealing Surface		Dimensions				Weight
Nominal inches DN	Actual Outside Diameter inches mm	Qty.	Size inches	"A" Max. inches mm	"B" Min. inches mm	W inches mm	X inches mm	Y inches mm	Z inches mm	Approximate (Each) lb kg
2 DN50	2.375 60.3	4	5/8 x 2 3/4	2.38 60	3.41 87	6.75 172	6.00 152	4.75 121	0.75 19	3.1 1.4
2 1/2	2.875 73.0	4	5/8 x 3	2.88 73	3.91 99	7.88 200	7.00 178	5.50 140	0.88 22	4.8 2.1
3 DN80	3.500 88.9	4	5/8 x 3	3.50 89	4.53 115	8.50 216	7.50 191	6.00 152	1.00 25	5.3 2.4
4 DN100	4.500 114.3	8	5/8 x 3	4.50 114	5.53 141	10.00 254	9.00 229	7.50 191	1.00 25	7.4 3.4
5	5.563 141.3	8	3/4 x 3 1/2	5.56 141	6.71 171	11.00 279	10.00 254	8.50 216	1.00 25	8.6 3.9
6 DN150	6.625 168.3	8	3/4 x 3 1/2	6.63 168	7.78 198	12.00 305	11.00 279	9.50 241	1.00 25	9.9 4.5
8 DN200	8.625 219.1	8	3/4 x 3 1/2	8.63 219	9.94 252	14.75 375	13.50 343	11.75 298	1.13 29	16.6 7.5
10 DN250	10.750 273.0	12	7/8 x 4	10.75 273	12.31 313	17.25 438	16.00 406	14.25 362	1.25 32	24.2 11.0
12 DN300	12.750 323.9	12	7/8 x 4	12.75 324	14.31 364	20.25 514	19.00 483	17.00 432	1.25 32	46.8 21.2

² Total assembly bolts required to be supplied by installer.

NOTE

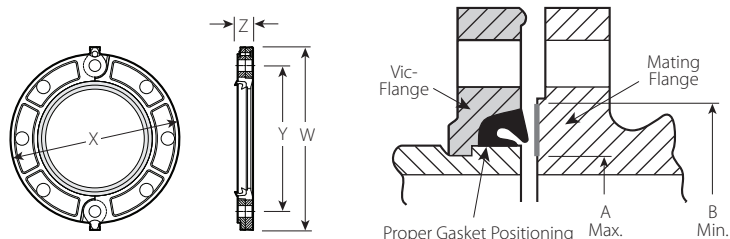
- IMPORTANT: Style 741 *Vic-Flange* adapters provide rigid joints when used on pipe with standard cut or roll groove dimensions and consequently allow no linear or angular movement at the joint. When used with Victaulic Series 700 butterfly valves, plastic pipe or light wall metallic pipe, small teeth in I.D. of key section should be removed and may be used on one side of the valve. Contact Victaulic for information on ISO 2084 (PN10); DIN 2532 (PN10) and JIS B-2210 (10K) flanges.

4.1 DIMENSIONS

Style 741

DN50 – DN300/2 – 12"

PN10 and PN16 Flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		PN10 Flanges		PN16 Flanges		Sealing Surface		Dimensions				Weight
Nominal DN inches	Actual Outside Diameter mm inches	Assembly Bolt/Nut ²		Assembly Bolt/Nut ²		"A" Max. mm inches	"B" Min. mm inches	W mm inches	X mm inches	Y mm inches	Z mm inches	Approximate (Each) kg lb
		Qty.	Size mm	Qty.	Size mm							
DN50 2	60.3 2.375	4	16	4	16	60 2.38	87 3.41	178 7.00	165 6.50	127 5.00	22 0.88	1.4 3.1
DN65	76.1 3.000	4	16	4	16	76 3.00	103 4.05	210 8.25	187 7.38	146 5.75	22 0.88	2.1 4.7
DN80 3	88.9 3.500	8	16	8	16	89 3.50	115 4.53	219 8.63	200 7.88	162 6.38	22 0.88	2.4 5.4
DN100 4	114.3 4.500	8	16	8	16	114 4.50	141 5.55	251 9.88	229 9.00	181 7.13	25 1.00	3.5 7.7
DN125	139.7 5.500	8	16	8	16	141 5.55	171 6.73	276 10.88	251 9.88	213 8.38	29 1.13	4.2 9.3
	159.0 6.250	8	20	8	20	159 6.25	187 7.36	314 12.38	289 11.38	241 9.50	29 1.13	4.5 10.0
	165.1 6.500	8	¾ x 3 ½	8	¾ x 3 ½	165 6.50	192 7.56	305 12.00	279 11.00	241 9.50	25 1.00	5.0 11.0
DN150 6	168.3 6.625	8	20	8	20	168 6.63	198 7.78	302 11.88	279 11.00	241 9.50	25 1.00	4.5 10.0
DN200 8	219.1 8.625	8	20	12	20	219 8.63	252 9.94	368 ³ 14.50	343 ³ 13.50	295 ³ 11.63	29 ³ 1.13	7.5 16.6
DN250 10	273.0 10.750	12	20	12	24	273 10.75	313 12.31	438 ⁴ 17.25	397 ⁴ 15.63	352 ⁴ 13.88	29 ⁴ 1.13	11.0 24.2
DN300 12	323.9 12.750	12	20	12	24	324 12.75	365 14.31	479 ⁵ 18.88	460 ⁵ 18.13	400 ⁵ 15.75	32 ⁵ 1.25	17.4 38.4

² Total assembly bolts required to be supplied by installer.

³ PN16 dimensions (mm/inches): W = 360/14.17; X = 340/13.38; Y = 295/11.63; Z = 32/1.25.

⁴ PN16 dimensions (mm/inches): W = 438/17.24; X = 406/16.00; Y = 356/14.00; Z = 32/1.25.

⁵ PN16 dimensions (mm/inches): W = 478/18.82; X = 445/17.50; Y = 410/16.13; Z = 32/1.25.

NOTES

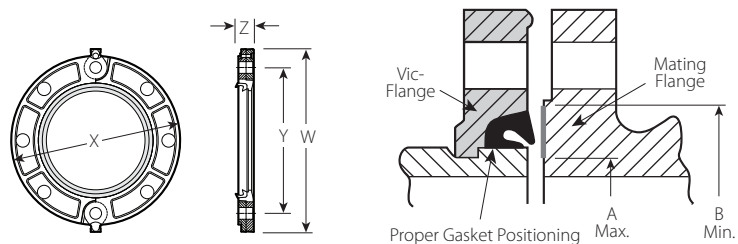
- Longer bolts required when flange utilized with wafer-type valves.
- IMPORTANT: Style 741 *Vic-Flange* adapters provide rigid joints when used on pipe with standard cut or roll groove dimensions and consequently allow no linear or angular movement at the joint. When used with Victaulic Series 700 butterfly valves, plastic pipe or light wall metallic pipe, small teeth in I.D. of key section should be removed and may be used on one side of the valve. Contact Victaulic for information on ISO 2084 (PN10); DIN 2532 (PN10) and JIS B-2210 (10K) flanges.

4.2 DIMENSIONS

Style 741

DN50 – DN200/2 – 8"

Australian Standard Table "E" Flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		Assembly Bolt/Nut ²		Sealing Surface		Dimensions				Weight
Nominal DN inches	Actual Outside Diameter mm inches	Qty.	Size inches	"A" Max. mm inches	"B" Min. mm inches	W mm inches	X mm inches	Y mm inches	Z mm inches	Approximate (Each) kg lb
DN50 ⁶ 2	60.3 2.375	4	5/8 x 2 3/4	60 2.38	84 3.31	165 6.50	152 6.00	114 4.50	19 0.75	1.9 4.1
DN80 3	88.9 3.500	4	5/8 x 3	89 3.50	113 4.44	200 7.88	191 7.50	146 5.75	25 1.00	2.4 5.4
DN100 4	114.3 4.500	8	5/8 x 3	114 4.50	131 5.16	251 9.88	229 9.00	178 7.00	25 1.00	3.3 7.2
DN150 6	168.3 6.625	8	3/4 x 3 1/2	168 6.63	192 7.56	286 11.25	279 11.00	235 9.25	25 1.00	4.5 9.9
DN200 8	219.1 8.625	8	3/4 x 3 1/2	219 8.63	247 9.72	368 14.50	343 13.50	292 11.50	29 1.13	5.7 12.5

² Total assembly bolts required to be supplied by installer.

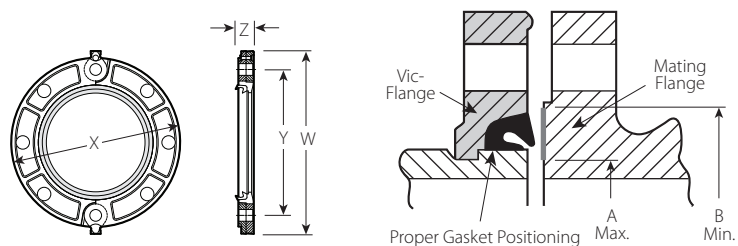
⁶ Contact Victaulic for details.

4.2 DIMENSIONS

Style 741

DN50 – DN200/2 – 8"

Chinese Standard Table "E" Flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		Assembly Bolt/Nut ²		Sealing Surface		Dimensions				Weight
Nominal DN inches	Actual Outside Diameter mm inches	Qty.	Size mm	"A" Max. mm inches	"B" Min. mm inches	W mm inches	X mm inches	Y mm inches	Z mm inches	Approximate (Each) kg lb
DN50 2	60.3 2.375	4	M16 X 70	60 2.38	87 3.41	172 6.75	152 6.00	121 4.75	19 0.75	1.4 3.1
DN65	76.1 3.000	4	M16 X 70	78 3.07	94 3.68	210 8.25	187 7.38	146 5.75	22 0.88	2.1 4.7
DN80 3	88.9 3.500	8	M16 X 76	89 3.50	115 4.53	213 8.38	191 7.50	152.4 6.00	25 1.00	2.4 5.4
	108.0 4.250	8	M16 X 76	110 4.33	126 4.97	248 9.75	222 8.75	181 7.13	25 1.00	3.5 7.7
DN100 4	114.3 4.500	8	M16 X 76	114 4.50	141 5.55	251 9.88	229 9.00	191 7.50	25 1.00	3.5 7.7
	133.0 5.250	8	M16 X 76	135 5.33	153 6.02	276 10.88	251 9.88	213 8.38	29 1.13	3.9 8.6
DN125	139.7 5.500	8	M16 X 76	142 5.59	160 6.28	276 10.88	251 9.88	213 8.38	29 1.13	3.9 8.6
	159.0 6.250	8	M20 X 89	159 6.25	187 7.36	314 12.38	289 11.38	241 9.50	29 1.13	4.5 10.0
	165.1 6.500	8	M20 X 89	165 6.50	195 7.68	305 12.00	280 11.00	241 9.50	29 1.13	4.5 10.0
DN200 8	219.1 8.625	12	M20 X 89	219 8.63	252 9.94	368 14.50	343 13.50	298 11.75	29 1.13	7.5 16.6

² Total assembly bolts required to be supplied by installer.

NOTES

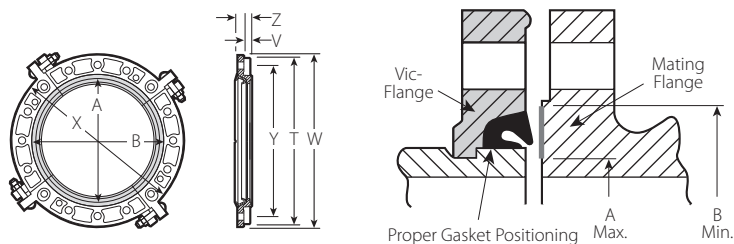
- IMPORTANT NOTE: Style 741 Vic-Flange adapters provide rigid joints when used on pipe with standard cut or roll groove dimensions and consequently allow no linear or angular movement at the joint. When used with Victaulic Series 700 butterfly valves, plastic pipe or light wall metallic pipe, small teeth in I.D. of key section should be removed and may be used on one side of the valve. Contact Victaulic for information on ISO 2084 (PN10); DIN 2532 (PN10) and JIS B-2210 (10K) flanges.

4.3 DIMENSIONS

Style 741

14 – 24"/DN350 – DN600⁷

ANSI Class 125 and 150 Flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		Bolt/Nut				Sealing Surface		Dimensions						Weight
Nominal inches DN	Actual Outside Diameter inches mm	Assembly ²		Draw ⁸		"A" Max. inches mm	"B" Min. inches mm	T inches mm	V inches mm	W inches mm	X inches mm	Y inches mm	Z inches mm	Approximate (Each) lb kg
		Qty.	Size inches	Qty.	Size inches									
14 DN350	14.000 355.6	12	1 x 4½	4	⅝ x 3½	14.00 356	16.39 416	19.38 492	1.00 25	24.50 622	21.00 533	18.75 476	2.50 64	62.0 28.1
16 DN400	16.000 406.4	16	1 x 4 ½	4	⅝ x 3½	16.00 406	18.39 467	21.50 546	1.00 25	27.13 689	23.50 597	21.25 540	2.50 64	79.0 35.8
18 DN450	18.000 457.0	16	1 ⅝ x 4 ¾	4	¾ x 4¼	18.00 457	20.00 508	22.25 565	1.00 25	29.00 737	25.50 648	22.75 578	2.75 70	82.3 37.3
20 DN500	20.000 508.0	20	1 ⅝ x 5 ¼	4	¾ x 4¼	20.00 508	22.50 572	25.00 635	1.00 25	31.50 800	27.50 699	25.00 635	2.75 70	103.3 46.9
24 DN600	24.000 610.0	20	1 ¼ x 5 ¾	4	¾ x 4¼	24.00 610	27.75 705	29.00 737	1.00 25	36.00 914	32.00 813	29.50 749	3.00 76	142.0 64.4

² Total assembly bolts required to be supplied by installer.

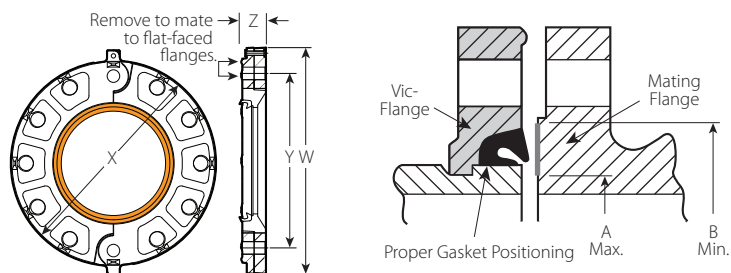
⁷ For cut groove systems only. For 14 – 24"/DN350 – DN600 roll groove systems, AGS (Advanced Groove System) products are used. Style 741 is not compatible with the AGS system.

⁸ Draw bolts supplied with 14 – 24"/DN350 – DN600 Vic-Flange adapters.

4.4 DIMENSIONS

Style 743

Grooved pipe adapter to ANSI Class 300 flanges



Shaded area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Exaggerated for clarity

Size		Assembly Bolt/Nut ²		Sealing Surface		Dimensions				Weight
Nominal inches DN	Actual Outside Diameter inches mm	Qty.	Size inches	"A" Max. inches mm	"B" Min. inches mm	W inches mm	X inches mm	Y inches mm	Z inches mm	Approximate (Each) lb kg
2 DN50	2.375 60.3	8	5/8 x 3	2.38 60	3.41 87	7.75 197	6.50 165	5.00 127	1.00 25	4.8 2.2
2½	2.875 73.0	8	¾ x 3¼	2.88 73	3.91 99	8.63 219	7.50 191	5.88 149	1.13 29	7.4 3.4
3 DN80	3.500 88.9	8	¾ x 3½	3.50 89	4.53 115	9.50 241	8.25 210	6.63 168	1.25 32	9.1 4.1
4 DN100	4.500 114.3	8	¾ x 3¾	4.50 114	5.53 141	11.38 289	10.00 254	7.88 200	1.38 35	15.3 6.9
5	5.563 141.3	8	¾ x 4	5.56 141	6.72 171	12.38 314	11.00 279	9.25 235	1.50 38	17.7 8.0
6 DN150	6.625 168.3	12	¾ x 4½	6.63 168	7.78 198	13.88 352	12.50 318	10.63 270	1.50 38	23.4 10.6
8 DN200	8.625 219.1	12	7/8 x 4¾	8.63 219	9.94 252	16.75 425	15.00 381	13.00 330	1.75 44	34.3 15.6
10 DN250	10.750 273.0	16	1 x 5¼	10.75 273	12.31 313	19.25 489	17.50 445	15.25 387	2.00 51	48.3 21.9
12 DN300	12.750 323.9	16	1 1/8 x 5¾	12.75 324	14.31 363	22.25 565	20.50 521	17.75 451	2.13 54	70.5 32.0

² Total assembly bolts required to be supplied by installer.

5.0 PERFORMANCE

Style 741

2 – 12"/DN50 – DN300

ANSI Class 125 and 150 Flanges

Size		Performance	
Nominal inches DN	Actual Outside Diameter inches mm	Maximum Working Pressure ⁹ psi kPa	Maximum End Load ⁹ lb N
2 DN50	2.375 60.3	300 2068	1330 5920
2 ½	2.875 73.0	300 2068	1950 8680
3 DN80	3.500 88.9	300 2068	2885 12840
4 DN100	4.500 114.3	300 2068	4770 21225
5	5.563 141.3	300 2068	7290 32440
6 DN150	6.625 168.3	300 2068	10350 46060
8 DN200	8.625 219.1	300 2068	17500 77875
10 DN250	10.750 273.0	300 2068	27215 121110
12 DN300	12.750 323.9	300 2068	38285 170270

⁹ Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

Style 741

DN50 – DN300/2 – 12"

PN10 and PN16 Flanges

Size		PN10 Flanges		PN16 Flanges	
Nominal DN inches	Actual Outside Diameter mm inches	Maximum Working Pressure ⁹ Bar psi	Maximum End Load ⁹ N lb	Maximum Working Pressure ⁹ Bar psi	Maximum End Load ⁹ N lb
DN50 2	60.3 2.375	10 145	2850 640	16 230	4561 1025
DN65	76.1 3.000	10 145	4540 1020	16 230	7275 1635
DN80 3	88.9 3.500	10 145	6210 1395	16 230	9925 2230
DN100 4	114.3 4.500	10 145	10260 2305	16 230	16420 3690
DN125	139.7 5.500	10 145	15330 3446	16 230	24520 5512
	159.0 6.250	10 145	19800 4450	16 230	31400 7056
DN150 6	168.3 6.625	10 145	22250 5000	16 230	35600 8000
DN200 8	219.1 8.625	10 145	37690 8470	16 230	60320 13555
DN250 10	273.0 10.750	10 145	58560 13160	16 230	93695 21055
DN300 12	323.9 12.750	10 145	82370 18510	16 230	131810 29620

⁹ Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

5.0 PERFORMANCE (Continued)

Style 741

DN50 – DN200/2 – 8"

Australian Standard Table "E" Flanges

Size		Performance	
Nominal DN inches	Actual Outside Diameter mm inches	Maximum Working Pressure ⁹ kPa psi	Maximum End Load ⁹ N lb
DN50 ¹⁰ 2	60.3 2.375	1400 203	3996 900
DN80 3	88.9 3.500	1400 203	8700 1955
DN100 4	114.3 4.500	1400 203	14374 3220
DN150 6	168.3 6.625	1400 203	31150 7000
DN200 8	219.1 8.625	1400 203	52777 11860

⁹ Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

¹⁰ Contact Victaulic for details.

NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

Style 741

DN50 – DN200/2 – 8"

Chinese Standard Table "E" Flanges

Size		Performance	
Nominal DN inches	Actual Outside Diameter mm inches	Maximum Working Pressure ⁹ kPa psi	Maximum End Load ⁹ N lb
DN50 2	60.3 2.375	1400 203	3996 900
DN65	76.1 3.000	1400 203	6365 1431
DN80 3	88.9 3.500	1400 203	8700 1955
	108.0 4.250	1400 203	12819 2882
DN100 4	114.3 4.500	1400 203	14374 3220
	133.0 5.250	1400 203	19440 4370
DN125	139.7 5.500	1400 203	21448 4822
	159.0 6.250	1400 203	27784 6246
	165.1 6.500	1400 203	29920 6726
DN200 8	219.1 8.625	1400 203	52777 11860

⁹ Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

5.0 PERFORMANCE (Continued)

Style 741

14 – 24"/DN350 – DN600

ANSI Class 125 and 150 Flanges

Size		Performance	
Nominal inches DN	Actual Outside Diameter inches mm	Maximum Working Pressure ⁹ psi kPa	Maximum End Load ⁹ lb N
14 DN350	14.000 355.6	300 2068	46180 205500
16 DN400	16.000 406.4	300 2068	60300 268335
18 DN450	18.000 457.0	300 2068	76340 339700
20 DN500	20.000 508.0	300 2068	94250 419400
24 DN600	24.000 610.0	300 2068	135700 603865

⁹ Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

Style 743

Grooved pipe adapter to ANSI Class 300 flanges

Size		Performance	
Nominal inches DN	Actual Outside Diameter inches mm	Maximum Working Pressure ⁹ psi kPa	Maximum End Load ⁹ lb N
2 DN50	2.375 60.3	720 4964	3190 14200
2½	2.875 73.0	720 4964	4670 20780
3 DN80	3.500 88.9	720 4964	6925 30815
4 DN100	4.500 114.3	720 4964	11445 50930
5	5.563 141.3	720 4964	17500 77875
6 DN150	6.625 168.3	720 4964	24805 110380
8 DN200	8.625 219.1	720 4964	42045 187100
10 DN250	10.750 273.0	720 4964	65315 290650
12 DN300	12.750 323.9	720 4964	91880 408870

⁹ Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

6.0 NOTIFICATIONS

- The Style 741 (2 – 12"/DN50 – DN300) design incorporates small teeth inside the key shoulder I.D. to prevent rotation. These teeth should be removed when *Vic-Flange* adapter is utilized with a Victaulic Series 700 grooved-end butterfly valve, Schedule 5 pipe or plastic pipe. *Vic-Flange* adapter Style 741 may only be used on one side of Victaulic Series 700 butterfly valve, sizes 2 – 4"/DN50 – DN100 fitted with standard or latch-lock handles.
- *Vic-Flange* adapter must be assembled so it does not interfere with handle operation. Because of the outside flange dimension, *Vic-Flange* adapter should not be used within 90° of one another on a standard fitting. When wafer or lug-type valves are used adjoining a Victaulic fitting, check disc dimensions to assure proper clearance.
- *Vic-Flange* adapters should not be used as anchor points for tie-rods across nonrestrained joints. Mating rubber faced flanges, valves, etc. requires the use of a *Vic-Flange* washer.
- Area A-B noted in the above drawing must be free from gouges, undulations or deformities of any type for effective sealing.
- *Vic-Flange* adapter gaskets must always be assembled with the color coded lip on the pipe and the other lip facing the mating flange.
- *Vic-Flange* hinge points must be oriented approximately 90° to each other when mated.
- Flange Washers: *Vic-Flange* adapters require a smooth hard surface at the mating flange face for effective sealing. Some applications for which the *Vic-Flange* adapter is otherwise well suited do not provide an adequate mating surface. In such cases, it is recommended that a metal (Type F phenolic for Style 641 with copper systems) Flange Washer be inserted between the *Vic-Flange* adapter and the mating flange to provide the necessary sealing surface.
- Typical applications where a Flange Washer should be used are:
 - A. When mating to a serrated flange: a flange gasket should be used adjacent to the serrated flange and then the Flange Washer is inserted between the *Vic-Flange* adapter and the flange gasket.
 - B. When mating to a wafer valve: where typical valves are rubber lined and partially rubber faced (smooth or not), the Flange Washer is placed between the valve and the *Vic-Flange* adapter.
 - C. When mating a rubber faced flange: the Flange Washer is placed between the *Vic-flanges* and the rubber faced flange.
 - D. When mating AWWA cast flanges to IPS flanges: the Flange Washer or Transition Ring is placed between two *Vic-Flange* adapters with the hinge points oriented 90° to each other. If one flange is not a *Vic-Flange* adapter (e.g., flanged valve), then a flange gasket must be placed adjacent to that flange and the Flange Washer inserted between the flange gasket and the *Vic-Flange* adapter. Transition rings rather than Flange Washers must be used when mating Style 741 to Style 341 Flange Adapters in sizes 14 – 24"/DN350 – DN600.
 - E. When mating to components (valves, strainers, etc.) where the component flange face has an insert: follow the same arrangement as in Application 1.
- When ordering Flange Washers, always specify product style (Style 741, 743, 341, 641, 994) and size to assure proper Flange Washer is supplied.

NOTE

- Style 741 is compatible with ANSI CL 125 or CL150, PN10/16 and Australian Standard Table E bolt hole patterns.

6.0 NOTIFICATIONS (Continued)

WARNING

- Victaulic RX roll sets must be used when grooving light-wall/thin-wall stainless steel pipe for use with Victaulic Couplings.

Failure to use Victaulic RX roll sets when grooving light-wall/thin-wall stainless steel pipe may cause joint failure, resulting in serious personal injury and/or property damage.

NOTICE

- Victaulic RX grooving rolls must be ordered separately. They are identified by a silver color and the designation RX on the front of the roll sets.

7.0 REFERENCE MATERIALS

[02.06: Victaulic Potable Water Approvals](#)

[05.01: Victaulic Seal Selection Guide](#)

[10.01: Victaulic Regulatory Approval Reference Guide](#)

[17.01: Victaulic Pipe Preparation for Use on Stainless Steel Pipe With Victaulic Products](#)

[17.09: Victaulic Pressure Ratings and End Loads for Victaulic Ductile Iron Grooved Couplings on Stainless Steel Pipe](#)

[29.01: Victaulic Terms and Conditions/Warranty](#)

[1-100: Victaulic Field Installation Handbook](#)

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

Intellectual Property Rights

No statement contained herein concerning a possible or suggested use of any material, product, service, or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Victaulic or any of its subsidiaries or affiliates covering such use or design, or as a recommendation for the use of such material, product, service, or design in the infringement of any patent or other intellectual property right. The terms "Patented" or "Patent Pending" refer to design or utility patents or patent applications for articles and/or methods of use in the United States and/or other countries.

Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at www.victaulic.com.

Warranty

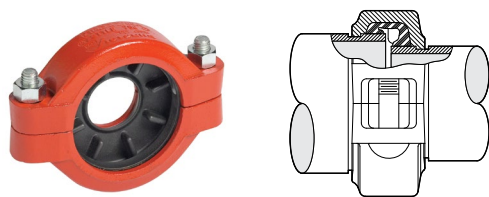
Refer to the Warranty section of the current Price List or contact Victaulic for details.

Trademarks

Victaulic and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.

Victaulic® Reducing Coupling

Style 750



1.0 PRODUCT DESCRIPTION

Available Sizes:

- 2 x 1" through 10 x 8"/DN50 x DN25 through DN250 x DN200

Pipe Material:

- Carbon steel

Maximum Working Pressure:

- Up to 500 psi/3447 kPa
- Working pressure dependent on material, wall thickness and size of pipe

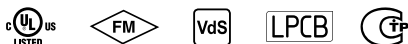
Application:

- Joins OGS roll grooved and cut grooved pipe, as well as OGS grooved fittings, valves and accessories
- Permits direct reduction on piping run
- Optional steel washer prevents telescoping of the smaller pipe inside the larger pipe during vertical system assembly

Pipe Preparation:

- Cut or roll grooved in accordance with [publication 25.01](#): Victaulic Standard Groove Specifications.

2.0 CERTIFICATION/LISTINGS



NOTES

- Download [publication 10.01](#) for Fire Protection Certifications/Listings Reference Guide.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

3.0 SPECIFICATIONS – MATERIAL

Housing: Ductile iron conforming to ASTM A536, Grade 65-45-12. Ductile iron conforming to ASTM A395, Grade 65-45-15, is available upon special request.

Housing Coating: (specify choice)

Standard: Orange enamel.

Optional: Hot dipped galvanized conforming to ASTM A153.

Optional: Contact Victaulic with your requirements.

Gasket: (specify choice¹)

Grade “E” EPDM

EPDM (Green stripe color code). Temperature range –30°F to +230°F/–34°C to +110°C. May be specified for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL Classified in accordance with ANSI/NSF 61 for cold +73°F/+23°C and hot +180°F/+82°C potable water service and ANSI/NSF 372. **NOT COMPATIBLE FOR USE WITH PETROLEUM SERVICES OR STEAM SERVICES.**

Grade “T” Nitrile

Nitrile (Orange stripe color code). Temperature range –20°F to +180°F/–29°C to +82°C. May be specified for petroleum products, hydrocarbons, air with oil vapors, vegetable and mineral oils within the specified temperature range; not compatible for hot dry air over +140°F/+60°C and water over +150°F/+66°C. **NOT COMPATIBLE FOR USE WITH HOT WATER SERVICES OR STEAM SERVICES.**

Others

For alternate gasket selection, reference [publication 05.01](#): Victaulic Seal Selection Guide.

¹ Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to the latest [Victaulic Seal Selection Guide](#) for specific gasket service guidelines and for a listing of services which are not compatible.

Bolts/Nuts (specify choice²):

Standard: Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (metric). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial – heavy hex nuts) and ASTM A563M Class 9 (metric – hex nuts). Track bolts and hex nuts are zinc electroplated per ASTM B633 ZN/FE5, finish Type III (imperial) or Type II (metric).

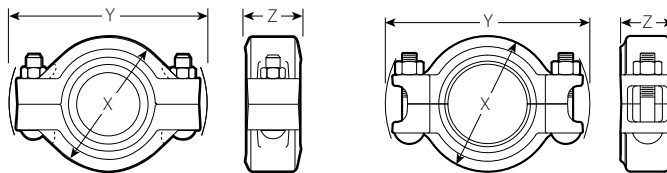
Optional (imperial): Stainless steel oval neck track bolts meeting the mechanical property requirements of ASTM F593, Group 2 (316 stainless steel), condition CW. Stainless steel heavy nuts meeting the mechanical property requirements of ASTM F594, Group 2 (316 stainless steel), condition CW, with galling reducing coating.

Assembly Washer (optional): Galvanized carbon steel.

² Optional bolts/nuts are available in imperial size only

4.0 DIMENSIONS

Style 750



Size		Pipe End Separation ²	Deflect. From CL ³		Bolt/Nut		Dimensions			Weight
Nominal inches DN		Allowable inches mm	Per Cplg. Degrees	Pipe In./Ft. mm/m	Qty.	Size inches mm	X inches mm	Y inches mm	Z inches mm	Approximate (Each) lb kg
2 DN50	x	1 DN25	0 - 0.07 0 - 1.8	0° - 57'	0.20 17	2 3/8 x 2	3.38 85	5.28 134	1.88 48	2.7 1.2
		1 1/2 DN40	0 - 0.07 0 - 1.8	0° - 57'	0.20 17	2 3/8 x 2	3.38 85	5.28 134	1.88 48	2.0 1.0
2 1/2	x	2 DN50	0 - 0.07 0 - 1.8	0° - 47'	0.16 14	2 3/8 x 2	4.00 102	5.93 151	1.88 48	3.1 1.4
DN65	x	2 DN50	0 - 0.07 0 - 1.8	0° - 47'	0.16 14	2 1/2 x 2 3/4	4.38 111	6.63 168	1.88 48	4.6 2.1
3 DN80	x	2 DN50	0 - 0.07 0 - 1.8	0° - 39'	0.13 11	2 1/2 x 2 3/4	4.75 121	7.13 181	1.88 48	4.9 2.2
		2 1/2	0 - 0.07 0 - 1.8	0° - 39'	0.13 11	2 1/2 x 2 3/4	4.75 121	7.13 181	1.88 48	4.3 2.0
		DN65	0 - 0.07 0 - 1.8	0° - 39'	0.13 11	2 1/2 x 2 3/4	4.75 121	7.13 181	1.88 48	4.2 1.9
4 DN100	x	2 DN50	0 - 0.13 0 - 3.2	1° - 19'	0.28 25	2 5/8 x 3 1/4	6.25 159	8.90 226	2.25 57	8.1 3.7
		2 1/2	0 - 0.13 0 - 3.2	1° - 19'	0.28 25	2 5/8 x 3 1/4	6.25 159	8.90 226	2.25 57	8.6 3.9
		DN65	0 - 0.13 0 - 3.2	1° - 19'	0.28 25	2 5/8 x 3 1/4	6.25 159	8.90 226	2.25 57	6.9 3.1
		3 DN80	0 - 0.13 0 - 3.2	1° - 19'	0.28 25	2 5/8 x 3 1/4	6.00 152	8.90 226	2.25 57	6.7 3.0
5	x	4 DN100	0 - 0.13 0 - 3.2	1° - 3'	0.22 19	2 3/4 x 4 1/4	7.18 182	10.70 272	2.13 54	11.2 5.1
165.1	x	4 DN100	0 - 0.13 0 - 3.2	0° - 55'	0.19 16	2 3/4 x 4 1/4	8.63 219	11.90 302	2.25 57	15.2 6.9
6 DN150	x	4 DN100	0 - 0.13 0 - 3.2	0° - 52'	0.18 15	2 3/4 x 4 1/4	8.63 219	11.90 302	2.25 57	16.7 7.6
		5	0 - 0.13 0 - 3.2	0° - 52'	0.18 15	2 3/4 x 4 1/4	8.31 211	11.90 302	2.25 57	12.9 5.9
8 DN200	x	165.1	0 - 0.13 0 - 3.2	0° - 38'	0.13 11	2 7/8 x 5	10.75 273	14.88 378	2.50 64	23.2 10.5
		6 DN150	0 - 0.13 0 - 3.2	0° - 38'	0.13 11	2 7/8 x 5	10.81 275	14.88 378	2.50 64	22.4 10.2
10 DN250	x	8 DN200	0 - 0.13 0 - 3.2	0° - 25'	0.90 8	1 x 5 1/2	13.12 333	17.26 438	2.62 67	31.4 14.2

³ Allowable Pipe End Separation and Deflection figures show the maximum nominal range of movement available at each joint for standard roll grooved pipe. Figures for standard cut grooved pipe may be doubled. These figures are maximums; for design and installation purposes, these figures should be reduced by: 50% for 3/4" - 3 1/2" DN20 - DN90; and 25% for 4" DN100 and larger.

NOTE

- Metric thread size bolts are available (color-coded gold) for all coupling sizes upon request. Contact Victaulic for details.

5.0 PERFORMANCE

Style 750

Size		Maximum Working Pressure ⁴	Maximum End Load ⁴
Nominal	inches DN		
2 DN50	x 1 DN25	350 2413	500 2,225
	1 ½ DN40	350 2413	1000 4,450
	2 DN50	500 3447	2215 9,850
2 ½ DN65	x 2 DN50	350 2413	1550 6,900
	3 DN80	350 2413	1550 6,900
3 DN80	x 2 DN50	350 2413	1550 6,900
	2 ½	500 3447	3250 14,460
	3 DN65	350 2413	2475 11,010
	4 DN100	350 2413	1550 6,900
4 DN100	x 2 DN50	350 2413	1550 6,900
	2 ½	350 2413	2275 10,125
	3 DN65	350 2413	2475 11,014
	4 DN80	500 3447	4810 21,400
5 DN150	x 4 DN100	350 2413	5565 24,765
	6 DN150	350 2413	5565 24,765
6 DN150	x 4 DN100	350 2413	5565 24,765
	5	350 2413	8500 37,825
	8 DN200	350 2413	11610 51,645
8 DN200	x 165.1	350 2413	11610 51,645
	6 DN150	350 2413	12060 53,645
	10 DN250	350 2413	20450 90,970

⁴ Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe and material. Maximum working pressure rating based on larger pipe size. Maximum end load rating based on smaller pipe size.

NOTES

- WARNING: FOR ONE-TIME FIELD USE ONLY, the Maximum Joint Working Pressure may be increased to 1 ½ times the figures shown.
- For joint pressure ratings on additional carbon steel wall thicknesses, see [publication 06.15](#).

5.1 PERFORMANCE

Flow Data - Head Loss

- Equivalent lengths of standard weight steel pipe are shown in the tables. All data is based on water flowing at +60°F/+16°C.

Flow Reducing

Size			Equivalent Pipe Length		
Nominal inches DN			Small Diameter ft m		
2 DN50	x	1 DN25	5.9 1.8		
		1 ½ DN40	2.0 0.6		
2 ½	x	2 DN50	1.9 0.6		
DN65	x	2 DN50	1.9 0.6		
		3 DN80	2 DN50	5.5 1.7	
2 ½	3.8 1.2				
	3.8 1.2				
DN65	3.8 1.2				
4 DN100	x	2 DN50	6.0 1.8		
		2 ½	6.0 1.8		
			6.0 1.8		
		DN65	6.0 1.8		
		3 DN80	6.0 1.8		
5	x	4 DN100	3.0 0.9		
		165.1	4 DN100	6.0 1.8	
6 DN150	x		4 DN100	6.0 1.8	
		5	4.5 1.4		
		8 DN200	x	165.1	7.3 2.2
6 DN150	7.3 2.2				
10 DN250	x			8 DN200	8.7 2.7

Flow Expanding

Size			Equivalent Pipe Length
Nominal inches DN			Small Diameter ft m
1 DN25	x	2 DN50	2.7 0.8
1 ½ DN40	x	2 DN50	1.9 0.6
2 DN50	x	2 ½	1.0 0.3
		DN65	1.0 0.3
		3 DN80	3.5 1.1
		4 DN100	3.0 0.9
2 ½	x	3 DN80	2.5 0.8
		4 DN100	3.0 0.9
DN65	x	3 DN80	2.5 0.8
		4 DN100	3.0 0.9
3 DN80	x	4 DN100	2.5 0.8
4 DN100	x	5	3.3 1.0
		165.1	4.6 1.4
		6 DN150	4.6 1.4
5	x	6 DN150	2.3 0.7
165.1	x	8 DN200	5.4 1.7
6 DN150	x	8 DN200	6.0 1.8
8 DN200	x	10 DN250	6.3 1.9

6.0 NOTIFICATIONS

⚠ WARNING



- Read and understand all instructions before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Wear safety glasses, hardhat, and foot protection.
- Only No. 61 bull plugs shall be used with Style 750 reducing couplings in systems where a vacuum may develop.

Failure to follow these instructions could result in death or serious personal injury and property damage.

7.0 REFERENCE MATERIALS

[05.01: Victaulic® Seal Selection Guide](#)

[10.01: Victaulic® Products for Fire Protection Piping Systems - Regulatory Approval Reference Guide](#)

[25.01: Victaulic® Original Groove System \(OGS\) Groove Specifications](#)

[26.01: Victaulic® Design Data](#)

[29.01: Victaulic® Terms and Conditions of Sale](#)

[I-100: Victaulic® Field Installation Handbook](#)

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

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Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at www.victaulic.com.

Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

Trademarks

Victaulic and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.



No. 20 Tee



No. 10 Elbow

1.0 PRODUCT DESCRIPTION

Available Sizes

- ¾ – 60"/DN20 – DN1500

Maximum Working Pressure

- Pressure ratings for Victaulic standard fittings conform to the ratings of Victaulic Style 177N couplings (refer to [publication 06.24](#) for more information).

Application

- Connects pipe, provides change in direction and adapts sizes or components
- Supplied with Victaulic OGS grooves
- Exclusively for use with Victaulic couplings, valves, accessories and pipe which feature ends formed with the Victaulic OGS groove profile

Pipe Materials

- Carbon steel or stainless steel

NOTE

- These fittings are not intended for use with Victaulic plain end couplings. Intended for use only in grooved piping systems. When connecting wafer or lug type butterfly valves directly to Victaulic fittings using Style 741 or Style 743 flange adapters, be sure to check disc clearance dimensions with I.D. dimension of fitting.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

1.0 PRODUCT DESCRIPTION (Continued)

Other Fitting Styles



AGS - Advanced Groove System
from 14 – 60"/DN350 – DN1500
[Publication 20.05](#)



Ductile Iron for AWWA size pipe
[Publication 23.05](#)



Stainless Steel
[Publication 17.16](#)



XL fittings for abrasive services
[Publication 07.07](#)



Galvanized
[Publication 07.01](#) for Original Groove Fittings
[Publication 20.05](#) for AGS Fittings



Aluminum
[Publication 21.03](#)



Extra Heavy EndSeal "ES"
[Publication 07.03](#)



Shouldered Ends
[Publication 07.06](#)



Copper
[Publication 22.04](#)



Plain End
[Publication 14.04](#)

2.0 CERTIFICATION/LISTINGS



NOTES

- When supplied as "hot dip galvanized" the following fittings are UL Classified in accordance with ANSI/NSF 61 and for use on cold +86°F/+30°C potable water service and ANSI/NSF 372: No. 10 90° Elbow, No. 11 45° Elbow, No. 12 22 ½° Elbow, No. 13 11 ¼° Elbow, No. 100 90° Long Radius Elbow, No. 110 45° Long Radius Elbow, No. 20 Tee, No. 25 Tee with Grooved Branch, No. 30 45° Lateral, No. 60 Cap, No. 50 Concentric Reducers, No. 51 Eccentric Reducers.
- The following Victaulic fittings are VdS approved: No.10 90° Elbow, No.11 45° Elbow, No.20 Tee and No.60 Cap.
- The following Victaulic fittings are LPCB approved: No.10 90° Elbow, No.11 45° Elbow, No.12 22 ½° Elbow, No.13 11 ¼° Elbow, No.30 45° Lateral, No.30-R Reducing Lateral, No.100 Long Radius Elbow, No.110 Long Radius Elbow, No.20 Tee, No.35 Cross, No.60 Cap, No.25 Reducing Tee, No.33 True Wye, No.50 Concentric Reducer, No.51 Eccentric Reducer and No.29M Tee with Threaded Branch.
- The following Victaulic fittings are FM approved: No.10 90° Elbow, No.11 45° Elbow, No.12 22 ½° Elbow, No.13 11 ¼° Elbow, No.30 45° Lateral, No.100 Long Radius Elbow, No.20 Tee, No.35 Cross, No.60 Cap, No.25 Reducing Tee and No.50 Concentric Reducer.

3.0 SPECIFICATIONS - MATERIAL

Fitting: (specify choice)

Standard: Ductile iron conforming to ASTM A536, Grade 65-45-12.

Optional: Segmentally welded steel as shown under nipples

Nipples: (specify choice)

¾ – 4"/DN20 – DN100: Carbon steel, Schedule 40, conforming to ASTM A53, Type F

5 – 6"/DN125 – DN150: Carbon steel, Schedule 40, conforming to ASTM A53, Type E or S, Gr. B

8 – 12"/DN200 – DN300: Carbon steel, Schedule 30 or 40, conforming to ASTM A53, Type E or S, Gr. B

Flanged Adapter Nipples: (specify choice)

Class 125 Flange: Cast iron conforming to ANSI B16.1

Class 150 Flange: Carbon steel conforming to ANSI B16.5, raised or flat face

Class 300 Flange: Carbon steel conforming to ANSI B16.5, raised or flat face

Fitting Coating: (specify choice)

Standard: Orange enamel

Optional: Hot dip galvanized and others. Some fittings supplied electroplated as standard – see product specifications

Flanged Adapter Nipple Coating: (specify choice)

Standard: None (Unfinished)

Optional: Orange enamel, hot dip galvanized and others

4.0 DIMENSIONS

Elbows

No. 10 90° Elbow

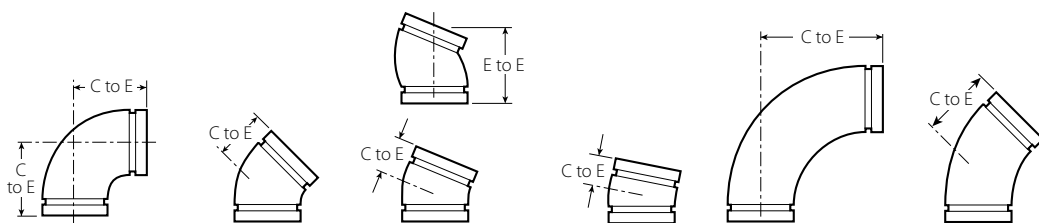
No. 11 45° Elbow

No. 12 22½° Elbow

No. 13 11¼° Elbow

No. 100 90° Long
Radius Elbow

No. 110 45° Long
Radius Elbow



Standard and
GSNK

Size		No. 10 90° Elbow		No. 11 45° Elbow		No. 12 22½° Elbow		No. 13 11¼° Elbow		No. 100 90° Long Radius Elbow		No. 110 45° Long Radius Elbow	
Nominal	Actual Outside Diameter	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)
inches DN	inches mm	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg
¾ DN20	1.050 26.9	2.25 57	0.5 0.2	1.50 38	0.5 0.2	1.63 (sw) 41	—	1.38 (sw) 35	—	2.50 (sw) 64	0.4 0.2	1.88 (sw) 48	0.3 0.1
1 DN25	1.315 33.7	2.25 57	0.6 0.3	1.75 44	0.6 0.3	3.25 ¹ 83	0.6 0.3	1.38 (sw) 35	0.3 0.1	2.88 (sw) 73	0.6 0.3	2.25 (sw) 57	0.5 0.2
1 ¼ DN32	1.660 42.4	2.75 70	1.0 0.5	1.75 44	0.9 0.4	1.75 44	0.8 0.4	1.38 (sw) 35	0.5 0.2	3.25 (sw) 83	1.1 0.5	2.38 (sw) 60	0.7 0.3
1 ½ DN40	1.900 48.3	2.75 70	1.2 0.5	1.75 44	0.9 0.4	1.75 44	0.8 0.4	1.38 (sw) 35	0.5 0.2	3.63 (sw) 92	2.2 1.0	2.50 (sw) 64	1.3 0.6
2 DN50	2.375 60.3	3.25 83	1.8 0.8	2.00 51	1.3 0.6	1.88 48	1.2 0.5	1.38 35	1.0 0.5	4.38 111	2.5 1.1	2.75 70	1.8 0.8
2 ½ DN65	2.875 73.0	3.75 95	3.2 1.5	2.25 57	2.2 1.0	4.00 ¹ 102	2.3 1.0	1.50 38	1.1 0.5	5.13 130	3.4 1.5	3.00 76	2.8 1.3
3 DN80	3.000 76.1	3.75 95	3.7 1.7	2.25 57	3.4 1.5	2.25 57	—	1.50 38	—	—	—	—	—
3 ½ DN90	3.500 88.9	4.25 108	4.5 2.0	2.50 64	3.1 1.4	4.50 ¹ 114	3.1 1.4	1.50 38	2.1 1.0	5.88 149	6.0 2.7	3.38 86	4.9 2.2
4 DN100	4.000 101.6	4.50 114	5.6 2.5	2.75 70	4.3 2.0	2.50 (sw) 64	4.0 1.8	1.75 (sw) 44	2.7 1.2	—	—	—	—
	4.500 114.3	5.00 127	7.1 3.2	3.00 76	5.6 2.5	2.88 73	5.6 2.5	1.75 44	3.6 1.6	7.50 191	12.3 5.6	4.00 102	7.3 3.3
	4.250 108.0	5.00 127	11.0 5.0	3.00 76	5.6 2.5	—	—	—	—	—	—	—	—
	5.000 127.0	5.25 (sw) 133	10.0 4.5	3.13 (sw) 79	6.0 2.7	3.50 (sw) 89	6.6 3.0	1.88 (sw) 48	4.2 1.9	—	—	—	—
5	5.563 141.3	5.50 140	11.7 5.3	3.25 83	8.3 3.8	2.88 (sw) 73	7.8 3.5	2.00 (sw) 51	5.0 2.2	9.25 (sw) 235	18.0 8.2	4.88 (sw) 124	14.8 6.7
	5.250 133.0	5.50 140	11.7 5.3	3.25 83	8.3 3.8	—	—	—	—	—	—	—	—
DN125	5.500 139.7	5.50 140	11.7 5.3	3.25 83	8.3 3.8	2.88 73	—	2.00 51	—	—	—	—	—
6 DN150	6.625 168.3	6.50 165	17.2 7.8	3.50 89	10.8 4.9	6.25 ¹ 159	12.2 5.5	2.00 51	7.0 3.2	10.75 273	30.4 13.8	5.50 140	17.4 7.9
	6.250 159.0	6.50 165	18.6 8.4	3.50 89	10.8 4.9	—	—	—	—	—	—	—	—
	6.500 165.1	6.50 165	15.5 7.0	3.50 89	9.8 4.4	3.13 79	11.4 5.2	2.00 51	7.4 3.4	10.75 (sw) 273	29.0 13.2	5.50 (sw) 140	19.0 8.6

¹ Gooseneck design, end-to-end dimension fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

4.0 DIMENSIONS (Continued)

Elbows

No. 10 90° Elbow

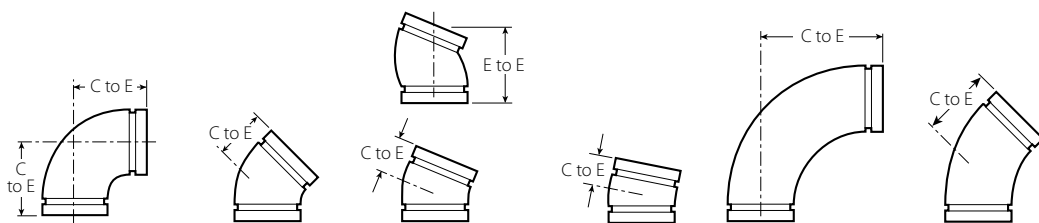
No. 11 45° Elbow

No. 12 22½° Elbow


No. 13 11¼° Elbow

No. 100 90° Long Radius Elbow

No. 110 45° Long Radius Elbow



Standard and
GSNK

Size		No. 10 90° Elbow		No. 11 45° Elbow		No. 12 22½° Elbow		No. 13 11¼° Elbow		No. 100 90° Long Radius Elbow		No. 110 45° Long Radius Elbow	
Nominal inches DN	Actual Outside Diameter inches mm	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. Each lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg
8 DN200	8.625 219.1	7.75 197	29.9 13.6	4.25 108	20.4 9.3	7.75 ¹ 197	20.0 9.1	2.00 51	10.1 4.6	14.25 362	66.0 30.0	7.25 184	36.0 16.3
10 DN250	10.750 273.0	9.00 229	63.3 28.7	4.75 121	37.5 17.0	4.38 (sw) 111	30.0 13.6	2.13 54	11.8 5.3	15.00 381	107.0 48.5	6.25 159	57.0 25.9
12 DN300	12.750 323.9	10.00 254	74.0 33.6	5.25 133	66.7 30.3	4.88 (sw) 124	40.0 18.1	2.25 57	29.3 13.3	18.00 457	156.0 70.8	7.50 191	90.0 40.8
14 ² DN350	14.000 355.6	14.00 356	136.0 61.7	5.75 146	65.0 29.5	5.00 (sw) 127	46.0 20.9	3.50 (sw) 89	32.0 14.5	21.00 (s) 533	164.0 74.4	8.75 222	82.0 37.2
	14.843 377.0	14.84 377	149.3 67.7	6.13 156	82.0 37.2	—	—	—	—	—	—	—	—
16 ² DN400	16.000 406.5	16.00 406	171.0 77.6	6.63 168	88.0 39.3	5.00 (sw) 127	58.0 26.3	4.00 (sw) 102	42.0 19.1	24.00 (s) 610	210.0 95.3	10.00 (s) 254	100.0 45.4
	16.773 426.0	16.75 425	198.6 90.1	7.00 178	101.3 45.9	—	—	—	—	—	—	—	—
18 ² DN450	18.000 457.2	18.00 457	228.0 103.4	7.50 190	108.0 50.0	5.50 (sw) 140	65.0 29.5	4.50 (sw) 144	53.2 24.1	27.00 (s) 686	273.0 123.8	11.25 (s) 286	135.0 61.2
	18.898 480.0	18.88 480	291.0 132.0	7.83 200	141.7 64.3	—	—	—	—	—	—	—	—
20 ² DN500	20.000 508.0	20.00 508	298.0 135.2	8.25 210	138.0 62.6	6.00 (sw) 152	78.6 36.0	5.00 (sw) 127	65.0 29.5	30.00 (s) 762	343.0 155.6	12.50 (s) 318	174.0 78.9
	20.866 530.0	20.88 530	355.0 161.0	8.63 219	179.0 81.2	—	—	—	—	—	—	—	—
24 ² DN600	24.000 609.6	24.00 610	438.0 198.7	10.00 254	221.0 100.2	7.00 (sw) 178	140.0 63.5	6.00 (sw) 152	60.0 27.2	36.00 (s) 914	516.0 234.1	15.00 (s) 381	251.0 113.9
	24.803 630.0	24.80 630	545.0 247.2	10.25 261	255.2 115.7	—	—	—	—	—	—	—	—
14 – 60 DN350 – DN1500		For AGS fitting information, see publication 20.05 											

¹ Gooseneck design, end-to-end dimension fittings in this size, contact your nearest Victaulic sales representative.

² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

NOTE

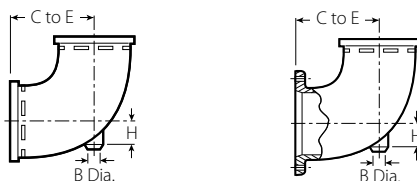
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

4.1 DIMENSIONS

Reducing Base Support Elbow

No. R-10G Grv. x Grv.

No. R-10F Grv. x Flange



Size			No. R-10 Reducing Base Support Elbow			Approx. Weight Each	
Nominal inches DN			C to E inches mm	H inches mm	B Diameter inches mm	Grv. x Grv. lb kg	Grv. x Flange lb kg
6 DN150	x	4 DN100	9.00 229	1.25 32	1.50 38	19.0 8.6	33.0 15.0
		5	9.00 229	1.50 38	1.50 38	23.0 10.4	38.0 17.2
8 DN200	x	6 DN150	10.50 267	2.13 24	1.50 38	33.0 15.0	52.0 23.6
10 DN250	x	8 DN200	12.00 305	2.40 61	1.50 38	61.0 27.7	88.0 39.9

4.2 DIMENSIONS

Adapter Elbow

No. 18 90° Adapter Elbow

No. 19 45° Adapter Elbow



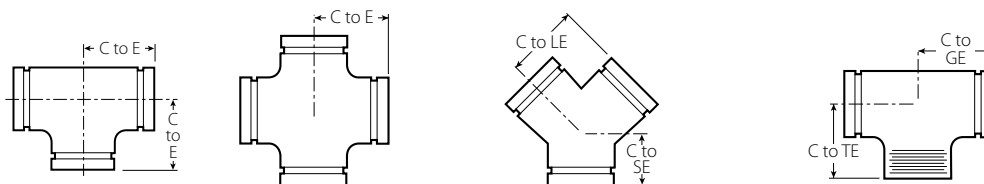
Size		No. 18 90° Adapter Elbow			No. 19 45° Adapter Elbow		
Nominal inches DN	Actual Outside Diameter inches mm	C to GE inches mm	C to TE inches mm	Approximate Weight (Each) lb kg	C to GE inches mm	C to TE inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	2.25 57	2.25 57	0.5 0.2	1.50 38	1.50 38	0.5 0.2
1 DN25	1.315 33.7	2.25 57	2.25 57	0.5 0.2	—	—	—
1¼ DN32	1.660 42.4	2.75 70	2.75 70	0.9 0.4	—	—	—
1½ DN40	1.900 48.3	2.75 70	2.75 70	1.1 0.5	1.75 44	1.75 44	0.9 0.4
2 DN50	2.375 60.3	3.25 83	4.25 108	2.5 1.1	—	—	—
2½ DN65	2.875 73.0	3.75 95	3.75 95	3.0 1.4	2.25 57	2.25 57	2.3 1.0
3 DN80	3.500 88.9	4.25 108	6.00 152	5.8 2.6	2.50 64	4.25 108	5.0 2.3
3½ DN90	4.000 101.6	4.50 114	6.25 159	8.0 3.6	5.25 133	5.25 133	8.8 4.0
6 DN150	6.625 168.3	6.50 165	6.50 165	17.6 8.0	3.50 89	3.50 89	12.7 5.8

NOTE

- Available with British Standard Pipe Threads, specify "BSP" clearly on order.

4.3 DIMENSIONS

Tees, Crosses and True Wyes



Size		No. 20 Tee		No. 35 Cross (sw)		No. 33 True Wye (sw)			No. 29M Tee with Threaded Branch		
Nominal inches DN	Actual Outside Diameter inches mm	C to E inches mm	Approx. Weight (Each) lb kg	C to E inches mm	Approx. Weight (Each) lb kg	C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg	C to GE inches mm	C to TE inches mm	Approx. Weight (Each) lb kg
3/4 DN20	1.050 26.9	2.25 57	0.6 0.3	2.25 57	0.9 0.4	2.25 57	2.00 51	0.7 0.3	2.25 57	2.25 (sw) 57	0.6 0.3
1 DN25	1.315 33.7	2.25 57	1.0 0.5	2.25 57	1.3 0.6	2.25 57	2.25 57	1.1 0.5	2.25 57	2.25 57	1.0 0.5
1 1/4 DN32	1.660 42.4	2.75 70	1.5 0.7	2.75 70	2.1 1.0	2.75 70	2.50 64	1.5 0.7	2.75 70	2.75 70	1.5 0.7
1 1/2 DN40	1.900 48.3	2.75 70	2.0 0.9	2.75 70	2.5 1.1	2.75 70	2.75 70	1.8 0.8	2.75 70	2.75 70	2.0 0.9
2 DN50	2.375 60.3	3.25 83	3.0 1.4	3.25 83	3.8 1.7	3.25 83	2.75 70	2.5 1.1	3.25 83	4.25 108	3.0 1.4
2 1/2	2.875 73.0	3.75 95	4.3 2.0	3.75 95	6.1 2.8	3.75 95	3.00 76	4.3 2.0	3.75 95	3.75 95	4.3 2.0
DN65	3.000 76.1	3.75 95	5.2 2.4	—	—	—	—	—	3.75 95	3.75 (sw) 95	5.2 2.4
3 DN80	3.500 88.9	4.25 108	6.8 3.0	4.25 108	10.5 4.8	4.25 108	3.25 83	6.1 2.8	4.25 108	6.00 152	6.8 3.1
3 1/2 DN90	4.000 101.6	4.50 (sw) 114	7.9 3.6	4.50 114	11.5 5.2	4.50 114	3.50 89	9.6 4.4	4.50 114	4.50 (sw) 114	7.9 3.6
	4.250 108.0	5.00 127	15.5 7.0	—	—	—	—	—	5.00 127	5.00 (sw) 127	15.5 7.0
4 DN100	4.500 114.3	5.00 127	11.9 5.4	5.00 127	15.8 7.2	5.00 127	3.75 95	9.8 4.4	5.00 127	7.25 184	11.9 5.4
	5.000 127.0	5.25 (sw) 133	15.0 6.8	5.25 133	18.5 8.4	—	—	—	5.25 133	5.25 (sw) 133	15.0 6.8
	5.250 133.0	5.50 140	17.8 8.1	—	—	—	—	—	5.50 140	5.50 (sw) 140	17.8 8.1
DN125	5.500 139.7	5.50 140	17.8 8.1	—	—	—	—	—	5.50 140	5.50 (sw) 140	17.8 8.1
5	5.563 141.3	5.50 140	17.8 8.1	5.50 140	20.0 9.1	5.50 140	4.00 102	15.0 6.8	5.50 140	5.50 (sw) 140	17.8 8.1
	6.250 159.0	6.50 165	27.1 12.3	—	—	—	—	—	6.50 165	6.50 (sw) 165	27.1 12.3
	6.500 165.1	6.50 165	22.0 10.0	6.50 165	28.0 12.7	—	—	—	6.50 165	6.50 (sw) 165	22.0 10.0
6 DN150	6.625 168.3	6.50 165	25.7 11.7	6.50 165	28.0 12.7	6.50 165	4.50 114	22.3 10.1	6.50 165	6.50 (sw) 165	25.7 11.7
8 DN200	8.625 219.1	7.75 197	47.6 21.6	7.75 197	48.0 21.8	7.75 197	6.00 152	36.0 16.3	7.75 197	7.75 197	47.6 21.6
10 DN250	10.750 273.0	9.00 229	99.0 44.9	9.00 229	121.5 55.1	9.00 229	6.50 155	69.9 31.7	9.00 229	9.00 229	99.0 44.9
12 DN300	12.750 323.9	10.00 254	133.0 60.3	10.00 254	110.0 49.9	10.00 254	7.00 178	80.0 36.3	10.00 254	10.00 254	133.0 60.3

(s) = Carbon Steel Direct Roll Groove (OGS)

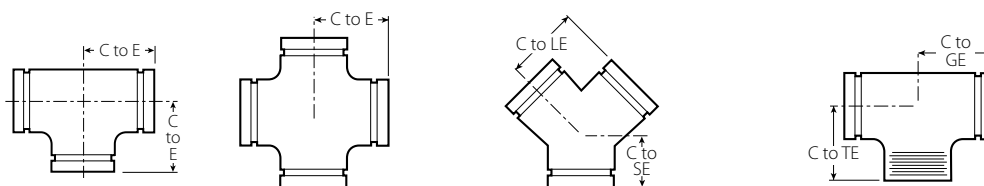
(sw) = Carbon Steel Segmentally Welded


NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

4.3 DIMENSIONS (Continued)

Tees, Crosses and True Wyes



Size		No. 20 Tee		No. 35 Cross (sw)		No. 33 True Wye (sw)			No. 29M Tee with Threaded Branch		
Nominal inches DN	Actual Outside Diameter inches mm	C to E inches mm	Approx. Weight (Each) lb kg	C to E inches mm	Approx. Weight (Each) lb kg	C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg	C to GE inches mm	C to TE inches mm	Approx. Weight (Each) lb kg
14 ² DN350	14.000 355.6	11.00 (sw) 279	145.0 65.8	11.00 279	198.0 89.8	11.00 279	7.50 191	134.2 60.8	—	—	—
	377.0	11.50 292	145.0 65.8	—	—	—	—	—	—	—	—
16 ² DN400	16.000 406.4	12.00 (sw) 305	186.0 84.4	12.00 305	250.0 113.4	12.00 305	8.00 203	167.0 75.7	—	—	—
	426.0	13.00 300	186.0 84.4	—	—	—	—	—	—	—	—
18 ² DN450	18.000 457.0	15.50 (sw) 394	260.0 117.9	15.50 394	350.0 158.8	15.50 394	8.50 216	234.0 106.1	—	—	—
	480.0	14.63 372	256.0 116.1	—	—	—	—	—	—	—	—
20 ² DN500	20.000 508.0	17.25 (sw) 438	336.0 152.4	17.25 438	452.0 205.0	17.25 438	9.00 229	281.0 127.5	—	—	—
	530.0	15.38 (sw) 391	339.0 153.8	—	—	—	—	—	—	—	—
24 ² DN600	24.000 610.0	20.00 (sw) 508	592.0 268.5	20.00 508	795.0 360.6	20.00 508	10.00 254	523.0 237.2	—	—	—
	630.0	17.38 (sw) 441	473.0 214.5	—	—	—	—	—	—	—	—
14 – 60 DN350 – DN1500		For AGS fitting information, see publication 20.05 									

² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

NOTE

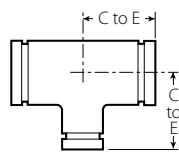
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

4.4 DIMENSIONS

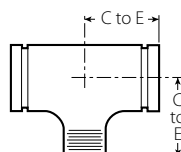
Reducing Tee

No. 25 Grooved Branch

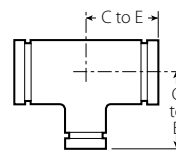
No. 29T Threaded Branch



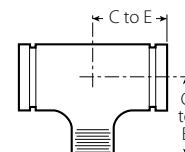
No. 25



No. 29T



No. 25



No. 29T

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	
1 DN25	x	1 DN25	2.25 (sw) 57	2.25 (sw) 57	1.0 0.5
1 1/4 DN32	x	1 1/4 DN32	2.75 (sw) 70	2.75 (sw) 70	1.3 0.6
1 1/2 DN40	x	1 1/2 DN40	2.75 (sw) 70	2.75 (sw) 70	1.5 0.7
		1 DN25	2.75 (sw) 70	2.75 (sw) 70	1.5 0.7
		1 1/4 DN32	2.75 (sw) 70	2.75 (sw) 70	1.7 0.8
2 DN50	x	2 DN50	3.25 83	3.25 83	2.5 1.1
		1 DN25	3.25 83	3.25 83	2.7 1.2
		1 1/4 DN32	3.25 (sw) 83	3.25 (sw) 83	1.8 0.8
		1 1/2 DN40	3.25 83	3.25 (sw) 83	3.0 1.4
2 1/2	x	2 1/2	3.75 (sw) 95	3.75 (sw) 95	3.9 1.8
		1 DN25	3.75 95	3.75 (sw) 95	3.8 1.7
		1 1/4 DN32	3.75 95	3.75 95	4.2 1.7
		1 1/2 DN40	3.75 95	3.75 95	3.9 1.8
		2 DN50	3.75 95	3.75 (sw) 95	4.5 2.0
3 DN80	x	3 DN80	4.25 (sw) 108	4.25 (sw) 108	5.7 2.6
		1 DN25	4.25 108	4.25 108	6.1 2.8
		1 1/4 DN32	4.25 108	4.25 108	8.0 3.6
		1 1/2 DN40	4.25 108	4.25 (sw) 108	6.5 2.9
		2 DN50	4.25 108	4.25 (sw) 108	6.2 2.8
		2 1/2	4.25 108	4.25 (sw) 108	6.4 2.9

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

NOTE

- Cast fitting available. Contact Victaulic for details.

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	
4 DN100	x	4 DN100	5.00 (sw) 127	5.00 (sw) 127	8.0 3.6
		1 DN25	5.00 127	5.00 127	7.8 3.5
		1 1/4 DN32	5.00 (sw) 127	5.00 (sw) 127	9.6 4.4
		1 1/2 DN40	5.00 127	5.00 127	10.2 4.6
		2 DN50	5.00 127	5.00 127	11.2 5.1
		2 1/2	5.00 127	5.00 127	11.4 5.2
		3 DN80	5.00 127	5.00 127	11.6 5.3
5	x	5	5.50 (sw) 140	5.50 (sw) 140	14.0 6.4
		1 1/2 DN40	5.50 (sw) 140	5.50 (sw) 140	14.3 6.5
		2 DN50	5.50 (sw) 140	5.50 (sw) 140	14.5 6.6
		2 1/2	5.50 140	5.50 (sw) 140	15.2 6.9
		3 DN80	5.50 140	5.50 (sw) 140	16.6 7.5
		4 DN100	5.50 140	5.50 (sw) 140	16.7 7.6
6 DN150	x	6 DN150	6.50 (sw) 165	6.50 (sw) 165	23.0 10.4
		1 1/2 DN40	6.50 (sw) 165	6.50 (sw) 165	24.0 10.9
		2 DN50	6.50 165	6.50 165	21.6 9.8
		2 1/2	6.50 165	6.50 165	21.4 11.7
		3 DN80	6.50 165	6.50 165	26.5 12.0
		4 DN100	6.50 165	6.50 165	25.0 11.3
		5	6.50 165	6.50 165	23.2 10.5
6 1/2	x	6 1/2	6.50 165	6.50 (sw) 165	24.0 10.9
		3 DN80	6.50 165	6.50 (sw) 165	25.0 11.3
		4 DN100	6.50 165	6.50 (sw) 165	25.0 11.3

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

NOTE

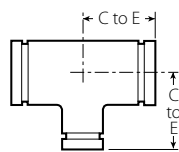
- Cast fitting available. Contact Victaulic for details.

4.4 DIMENSIONS (Continued)

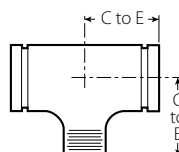
Reducing Tee

No. 25 Grooved Branch

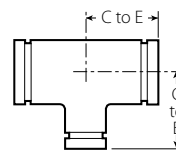
No. 29T Threaded Branch



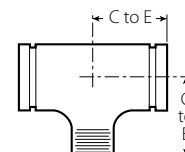
No. 25



No. 29T



No. 25



No. 29T

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	lb kg
8 DN200	x	8 DN200	1 1/2 DN40	7.75 (sw)	33.0
				197	15.0
				7.75 (sw)	33.5
				197	15.2
				7.75 (sw)	39.0
				197	17.7
				7.75 (sw)	33.6
				197	15.2
				7.75	41.8
				197	19.0
10 DN250	x	10 DN250	1 1/2 DN40	9.00 (sw)	62.0
				229	28.1
				9.00 (sw)	62.0
				229	28.1
				9.00 (sw)	62.4
				229	28.3
				9.00 (sw)	60.0
				229	27.2
				9.00 (sw)	61.0
				229	27.7
165.1mm	x	165.1mm	1 1/2 DN40	9.00 (sw)	52.0
				229	23.6
				9.00 (sw)	59.0
				229	26.8
				9.00 (sw)	64.7
				229	29.3

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

NOTE

- Cast fitting available. Contact Victaulic for details.

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	lb kg
12 DN300	x	12 DN300	1 DN25	10.00 (sw)	77.0
				254	34.9
				10.00 (sw)	80.0
				254	36.3
				10.00 (sw)	78.0
				254	35.4
				10.00 (sw)	82.0
				254	37.2
				10.00 (sw)	80.0
				254	36.3
14 ² DN350	x	14 DN350	4 DN100	11.00 (sw)	102.0
				279	46.3
				11.00 (sw)	108.2
				279	49.1
				11.00	112.0
				279	50.8
				11.00	120.0
				279	54.4
				11.00	129.1
				279	58.6
16 ² DN400	x	16 DN400	4 DN100	12.00	130.0
				305	59.0
				12.00 (sw)	133.5
				305	60.6
				12.00	145.0
				305	65.8
				12.00	149.5
				305	67.8
				12.00	154.0
				305	69.9
16 ² DN400	x	16 DN400	14 DN350	12.00 (sw)	167.0
				305	75.8

- ² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

NOTE

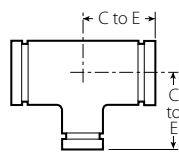
- Cast fitting available. Contact Victaulic for details.

4.4 DIMENSIONS (Continued)

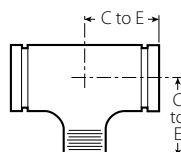
Reducing Tee

No. 25 Grooved Branch

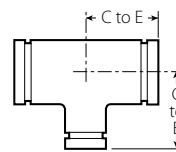
No. 29T Threaded Branch



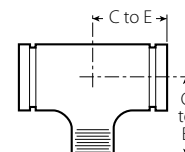
No. 25



No. 29T



No. 25



No. 29T

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	lb kg
18 ² DN450	x	18 DN450	4 DN100 15.50 (sw) 394	4 DN100 15.50 (sw) 394	194.0 88.0
		6 DN150		6 DN150 15.50 (sw) 394	200.0 90.7
		8 DN200		8 DN200 15.50 (sw) 394	202.0 91.6
		10 DN250		10 DN250 15.50 394	212.0 96.2
		12 DN300		12 DN300 15.50 394	222.6 101.0
		14 DN350		14 DN350 15.50 394	230.1 104.4
		16 DN400		16 DN400 15.50 394	247.6 112.3
		6 DN150		6 DN150 17.25 438	240.0 108.9
		8 DN200		8 DN200 17.25 438	244.0 110.7
		10 DN250		10 DN250 17.25 438	256.0 116.1
20 ² DN500	x	20 DN500	6 DN150 17.25 438	6 DN150 17.25 438	240.0 108.9
		8 DN200		8 DN200 17.25 438	244.0 110.7
		10 DN250		10 DN250 17.25 438	256.0 116.1
		12 DN300		12 DN300 17.25 438	264.0 119.8
		14 DN350		14 DN350 17.25 438	275.0 124.7
		16 DN400		16 DN400 17.25 438	288.6 130.9
18 DN450	x	18 DN450	4 DN100 15.50 (sw) 394	4 DN100 15.50 (sw) 394	194.0 88.0
		6 DN150		6 DN150 15.50 (sw) 394	200.0 90.7


² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

NOTE

- Cast fitting available. Contact Victaulic for details.

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each) lb kg		
Nominal inches DN			C to E inches mm	C to E inches mm			
24 ² DN600	x	24 DN600	x	8 DN200	20.00 508	20.00 508	340.0 154.2
		10 DN250	20.00 508	20.00 508	343.9 156.0		
		12 DN300	20.00 508	20.00 508	352.8 160.0		
		14 DN350	20.00 508	—	360.0 163.3		
		16 DN400	20.00 508	—	378.0 171.5		
		18 DN450	20.00 508	—	380.0 172.4		
		20 DN500	20.00 508	—	373.0 169.2		
		14 – 60 DN350 – 1500			For AGS fitting information, see publication 20.05 		

² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

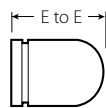
NOTES

- No. 29T Threaded Outlet Reducing Tees are supplied NPT and are available with British Standard threads. For British Standard specify "BSP" clearly on order.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).
- Cast fitting available. Contact Victaulic for details.

4.5 DIMENSIONS

Bull Plug

No. 61



No. 61

Size		No. 61 Bull Plug (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
2 DN50	2.375 60.3	4.00 102	2.5 1.1
2 ½	2.875 73.0	5.00 127	3.0 1.4
3 DN80	3.500 88.9	6.00 152	4.5 2.0
4 DN100	4.500 114.3	7.00 178	7.5 3.4
5	5.563 141.3	8.00 203	12.0 5.4
6 DN150	6.625 168.5	10.00 254	17.0 7.7

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

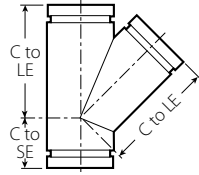
NOTES

- Steel dish caps available through 24"/DN600, contact Victaulic.
- No. 61 Bull Plugs should be used in vacuum service with Style 72 or 750 couplings.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

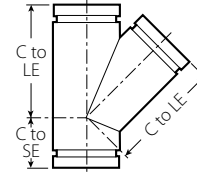
4.6 DIMENSIONS

45° Lateral

No. 30



No. 30



No. 30

Size		No. 30 45° Lateral		Weight
Nominal inches DN	Actual Outside Diameter inches mm	C to LE inches mm	C to SE inches mm	Approx. (Each) lb kg
¾ DN20	1.050 26.9	4.50 (sw) 114	2.00 (sw) 51	1.0 0.5
1 DN25	1.315 33.7	5.00 (sw) 127	2.25 (sw) 57	1.7 0.8
1¼ DN32	1.660 42.4	5.75 146	2.50 64	2.5 (d) 1.1
1½ DN40	1.900 48.3	6.25 (sw) 159	2.75 (sw) 70	3.5 1.6
2 DN50	2.375 60.3	7.00 (sw) 178	2.75 (sw) 70	5.0 2.3
2½	2.875 73.0	7.75 (sw) 197	3.00 (sw) 76	9.0 4.1
DN65	3.000 76.1	8.50 (sw) 216	3.25 (sw) 83	11.0 5.0
3 DN80	3.500 88.9	8.50 216	3.25 83	11.7 (d) 5.4
3½ DN90	4.000 101.6	10.00 (sw) 254	3.50 (sw) 89	17.8 8.1
4 DN100	4.500 114.3	10.50 267	3.75 95	22.2 (d) 10.1
5	5.563 141.3	12.50 (sw) 318	4.00 (sw) 102	21.8 9.9

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

Size		No. 30 45° Lateral		Weight
Nominal inches DN	Actual Outside Diameter inches mm	C to LE inches mm	C to SE inches mm	Approx. (Each) lb kg
	6.500 165.1	14.00 (sw) 356	4.50 (sw) 114	43.6 19.8
6 DN150	6.625 168.3	14.00 (sw) 356	4.50 (sw) 114	43.6 19.8
8 DN200	8.625 219.1	18.00 (sw) 457	6.00 (sw) 152	72.0 32.7
10 DN250	10.750 273.0	20.50 (sw) 521	6.50 (sw) 165	105.0 47.6
12 DN300	12.750 323.9	23.00 (sw) 584	7.00 (sw) 178	165.0 74.8
14² DN350	14.000 355.6	26.50 (sw) 673	7.50 (sw) 191	276.0 125.2
16² DN400	16.000 406.4	29.00 (sw) 737	8.00 (sw) 203	344.2 156.1
18² DN450	18.000 457.0	32.00 (sw) 813	8.50 (sw) 216	429.0 194.6
20² DN500	20.000 508.0	35.00 (sw) 889	9.00 (sw) 229	500.0 226.8
24² DN600	24.000 610.0	40.00 (sw) 1016	10.00 (sw) 254	715.0 324.3
14 – 60 DN350 – DN1500		For AGS fitting information, see publication 20.05		



² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

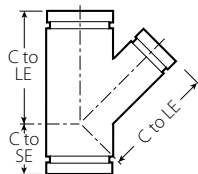
NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

4.7 DIMENSIONS

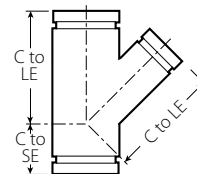
45° Reducing Lateral

No. 30-R



No. 30-R

Size				No 30-R 45° Reducing Lateral		
Nominal inches DN				C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg
3 DN80	x	3 DN80	2 DN50	8.50 216	3.25 83	9.8 4.4
			2½	8.50 216	3.25 83	9.8 4.4
4 DN100	x	4 DN100	2 DN50	10.50 267	3.75 95	10.0 4.5
			2½	10.50 267	3.75 95	10.0 4.5
			3 DN80	10.50 267	3.75 95	18.3 8.3
5	x	5	2 DN50	12.50 318	4.00 102	24.0 10.9
			3 DN80	12.50 318	4.00 102	27.0 12.2
			4 DN100	12.50 318	4.00 102	26.5 12.0
6 DN150	x	6 DN150	3 DN80	14.00 356	4.50 114	37.0 16.8
			4 DN100	14.00 356	4.50 114	36.0 16.3
			5	14.00 356	4.50 114	44.7 20.3
8 DN200	x	8 DN200	4 DN100	18.00 457	6.00 152	62.0 28.1
			5	18.00 457	6.00 152	75.5 34.2
			6 DN150	18.00 457	6.00 152	82.0 37.2
10 DN250	x	10 DN250	4 DN100	20.50 521	6.50 165	104.8 47.5
			5	20.50 521	6.50 165	99.0 44.9
			6 DN150	20.50 521	6.50 165	105.8 48.0
			8 DN200	20.50 521	6.50 165	118.0 53.5
12 DN300	x	12 DN300	5	23.00 584	7.00 178	122.0 55.3
			6 DN150	23.00 584	7.00 178	137.0 62.1
			8 DN200	23.00 584	7.00 178	147.0 66.7
			10 DN250	23.00 584	7.00 178	167.0 75.8



No. 30-R

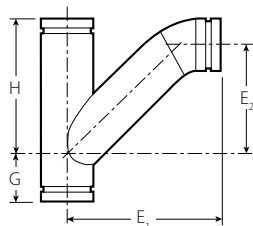
Size				No 30-R 45° Reducing Lateral			
Nominal inches DN				C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg	
14 ² DN350	x	14 DN350	x	4 DN100	26.50 673	7.50 191	172.0 78.0
				6 DN150	26.50 673	7.50 191	187.0 84.8
				8 DN200	26.50 673	7.50 191	205.8 93.4
				10 DN250	26.20 673	7.50 191	235.0 106.6
				12 DN300	26.50 673	7.50 191	250.0 113.4
				16 ² DN400	x	16 DN400	x
8 DN200	29.00 737	8.00 203	252.5 114.5				
10 DN250	29.00 737	8.00 203	265.0 120.2				
12 DN300	29.00 737	8.00 203	295.0 133.8				
14 DN350	29.00 737	8.00 203	305.0 138.3				
18 ² DN450	x	18 DN450	x				
				8 DN200	32.00 813	8.50 216	275.0 124.7
				12 DN300	32.00 813	8.50 216	347.0 157.4
				14 DN350	32.00 813	8.50 216	350.0 158.8
				16 DN400	32.00 813	8.50 216	362.0 164.2
				20 ² DN500	x	20 DN500	x
14 DN350	35.00 889	9.00 229	420.0 190.5				
16 DN400	35.00 899	10.00 229	425.0 192.8				
24 ² DN600	x	24 DN600	x				
				20 DN600	40.00 1016	10.00 254	570.0 258.6
				14 – 60 DN350 – DN1500			

² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

4.8 DIMENSIONS

Tee Wye

No. 32



No. 32

Size			No. 32 Tee Wye (sw)					Approx. Weight (Each)
Nominal inches DN			G inches mm	H inches mm	E ₁ inches mm	E ₂ inches mm		
2 DN50	x	2 DN50	2.75 70	7.00 178	9.00 229	4.63 118	6.4 2.9	
2½	x	2½	3.00 76	7.75 197	10.50 267	5.75 146	11.5 5.2	
3 DN80	x	3 DN80	3.25 83	8.50 216	11.50 292	6.50 165	14.3 6.5	
3½ DN90	x	3½ DN90	3.25 89	10.00 254	13.00 330	7.75 197	22.9 10.4	
4 100	x	4 DN100	3.75 95	10.50 267	13.63 346	8.13 207	26.0 11.8	
5	x	5	4.00 102	12.50 318	16.13 410	10.00 254	48.0 21.8	
6 DN150	x	6 DN150	4.50 114	14.00 356	18.25 464	11.50 292	60.5 27.4	
8 DN200	x	8 DN200	6.00 152	18.00 457	23.25 591	15.25 387	127.1 57.7	
10 DN250	x	10 DN250	6.50 165	20.50 521	27.25 692	18.00 457	190.0 86.2	
12 DN300	x	12 DN300	7.00 178	23.00 584	31.00 787	20.50 521	240.0 108.9	

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

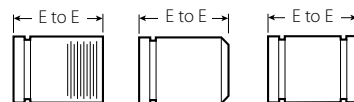
4.9 DIMENSIONS

Adapter Nipple

No. 40¹² Grv. x Thd.

No. 42 Grv. x Bev.

No. 43 Grv. x Grv.



No. 40

No. 42

No. 43

Size		No. 40, 42, 43 Adapter Nipple (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	3.00 76	0.3 0.1
1 25	1.315 33.7	3.00 76	0.4 0.2
1¼ DN32	1.660 42.4	4.00 102	0.8 0.4
1½ 40	1.900 48.3	4.00 102	0.9 0.4
2 DN50	2.375 60.3	4.00 102	1.2 0.5
2½	2.875 73.0	4.00 102	1.9 0.9
3 DN80	3.500 88.9	4.00 102	2.5 1.1
3½ DN90	4.000 101.6	4.00 102	2.1 0.9
4 DN100	4.500 114.3	6.00 152	5.5 2.5
5	5.563 141.3	6.00 152	7.4 3.4
6 DN150	6.625 168.3	6.00 152	9.5 4.3
8 DN200	8.625 219.1	6.00 152	14.2 6.4
10 DN250	10.750 273.0	8.00 203	27.0 12.2
12 DN300	12.750 323.9	8.00 203	33.0 15.0

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

NOTES

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).
- For pump package nipples with 1 ½/40 mm hole cut to receive Style 923 *Vic-Let* or Style 924 *Vic-O-Well* request special No. 40, 42 or 43 nipples and specify No. 40-H, 42-H or 43-H on order. NOTE: 4 – 12"/DN100 – DN300 diameter — 8"/200 mm minimum length required.
- For roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.
- Available with British Standard Pipe Threads, specify "BSP" clearly on order.

4.10 DIMENSIONS

Cap

No. 60




No. 60



No. 60

Size		No. 60 Cap	
Nominal inches DN	Actual Outside Diameter inches mm	"T" Thickness inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	0.88 22	0.2 0.1
1 25	1.315 33.7	0.88 22	0.3 0.1
1¼ DN32	1.660 42.4	0.88 22	0.3 0.1
1½ DN40	1.900 48.3	0.88 22	0.5 0.2
2 DN50	2.375 60.3	0.88 22	0.6 0.3
2½	2.875 73.0	0.88 22	1.0 0.5
DN65	3.000 76.1	0.88 22	1.2 0.5
3 DN80	3.500 88.9	0.88 22	1.2 0.5
3½ DN90	4.000 101.6	0.88 22	2.5 1.1
	4.250 108.0	1.00 25	2.3 1.0
4 DN100	4.500 114.3	1.00 25	2.5 1.1
	5.250 133.0	1.00 25	4.5 2.0
DN125	5.500 139.7	1.00 25	4.5 2.0
5	5.563 141.3	1.00 25	4.6 2.1

Size		No. 60 Cap	
Nominal inches DN	Actual Outside Diameter inches mm	"T" Thickness inches mm	Approx. Weight (Each) lb kg
	6.250 159.0	1.00 25	6.8 3.1
	6.500 165.1	1.00 25	7.3 3.3
6 DN150	6.625 168.3	1.00 25	6.1 2.8
8 DN200	8.625 219.1	1.19 30	13.1 5.9
10 DN250	10.750 273.0	1.25 32	21.0 9.5
12 DN300	12.750 323.9	1.25 32	35.6 16.2
14 ² DN350	14.000 355.6	9.50 (s) 241	+
16 ² DN400	16.000 406.4	10.00 (s) 254	+
18 ² DN450	18.000 457.0	11.00 (s) 279	+
20 ² DN500	20.000 508.0	12.00 (s) 305	+
24 ² DN600	24.000 610.0	13.50 (s) 343	+
14 – 60 DN350 – DN1500	For AGS fitting information, see publication 20.05 		

² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details.

NOTES

- No. 60 cap is not suitable for use in vacuum service with Style 72 or 750 couplings. No. 61 bull plugs should be used.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

4.11 DIMENSIONS

Flanged Adapter Nipple

No. 41 ANSI Class 125

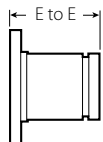
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No. 45R ANSI Class 150 Raised Face

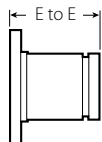
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No. 46R ANSI Class 300 Raised Face

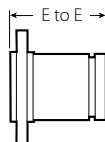
No. 45RE PN10/PN16 Raised Face



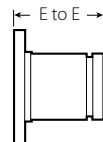
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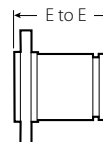
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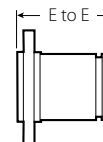
No. 45R



No. 46F



No. 46R



No. 45RE

Size		No. 41 ANSI 125 Flange Adapter Nipple		No. 45F and No. 45R ANSI 150 Flanged Adapter Nipple (s)		No. 46F and No. 46R ANSI 300 Flanged Adapter Nipple (s)		No. 45RE Flanged Adapter Nipple	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	3.00 76	—	3.00 76	2.3 1.0	3.00 76	3.3 1.5	—	—
1 DN25	1.315 33.7	3.00 76	2.5 1.1	3.00 76	2.7 1.2	3.00 76	3.9 1.8	—	—
1¼ DN32	1.660 42.4	4.00 102	3.0 1.4	4.00 102	3.3 1.5	4.00 102	4.8 2.2	—	—
1½ DN40	1.900 48.3	4.00 102	3.5 1.6	4.00 102	3.9 1.8	4.00 102	6.9 3.1	—	—
2 DN50	2.375 60.3	4.00 102	5.5 2.5	4.00 102	6.0 2.7	4.00 102	8.2 3.7	2.50 64	5.3 2.4
2½	2.875 73.0	4.00 102	8.0 3.6	4.00 102	9.9 4.5	4.00 102	11.9 5.4	—	—
DN65	3.000 76.1	—	—	—	—	—	—	2.50 64	6.5 2.9
3 DN80	3.500 88.9	4.00 102	9.5 4.3	4.00 102	11.7 5.3	4.00 102	16.5 7.5	2.50 64	8.2 3.7
3½ DN90	4.000 101.6	4.00 102	12.0 5.4	4.00 102	15.1 6.8	4.00 102	20.1 9.1	—	—
4 DN100	4.500 114.3	6.00 152	16.7 7.6	6.00 152	18.5 8.4	6.00 152	27.4 12.4	2.75 70	10.0 45
5	5.563 141.3	6.00 152	21.5 9.8	6.00 152	21.3 9.7	6.00 152	35.3 16.0	—	—
DN125	5.500 139.7	—	—	—	—	—	—	2.75 70	16.3 7.4
6 DN150	6.625 168.3	6.00 152	26.5 12.0	6.00 152	27.5 12.5	6.00 152	47.5 21.5	2.75 70	16.3 7.4
	6.500 165.1	—	—	—	—	—	—	—	—
8 DN200	8.625 219.1	6.00 152	39.0 17.7	6.00 152	41.3 18.8	6.00 152	70.3 31.9	—	—
10 DN250	10.750 273.0	8.00 203	57.0 25.9	8.00 203	59.3 27.1	8.00 203	100.8 45.7	—	—
12 DN300	12.750 323.9	8.00 203	41.0 18.6	8.00 203	40.0 40.0	8.00 203	146.2 66.3	—	—
14 ² DN350	14.000 355.6	8.00 203	—	8.00 203	+	8.00 203	+	—	—
16 ² DN400	16.000 406.4	8.00 203	—	8.00 203	+	8.00 203	+	—	—
18 ² DN450	18.000 457.0	8.00 203	—	8.00 203	+	8.00 203	+	—	—

² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

4.11 DIMENSIONS (Continued)

Flanged Adapter Nipple

No. 41 ANSI Class 125

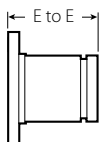
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No. 45R ANSI Class 150 Raised Face

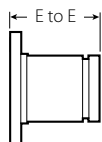
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No. 46R ANSI Class 300 Raised Face

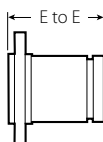
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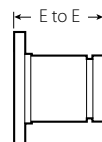
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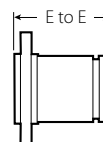
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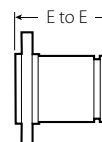
No. 45R




No. 46F



No. 46R



No. 45RE

Size		No. 41 ANSI 125 Flange Adapter Nipple		No. 45F and No. 45R ANSI 150 Flanged Adapter Nipple (s)		No. 46F and No. 46R ANSI 300 Flanged Adapter Nipple (s)		No. 45RE Flanged Adapter Nipple (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
20 ² DN500	20.000 508.0	8.00 203	—	8.00 203	+	8.00 203	+	—	—
24 ² DN600	24.000 610.0	8.00 203	—	8.00 203	+	8.00 203	+	—	—
14 – 60 DN350 – DN1500	For AGS fitting information, see publication 20.05 								

² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details

NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

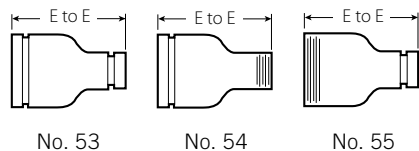
4.12 DIMENSIONS

Swaged Nipple

No. 53 Grv. x Grv.

No. 54 Grv. x Thd.

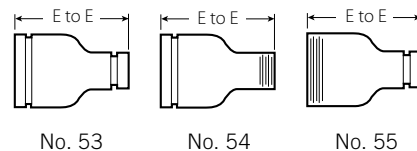
No. 55 Thd. x Grv.



No. 53

No. 54

No. 55



No. 53

No. 54

No. 55

Size			No. 53, 54, and 55 Swaged Nipples (s)	
Nominal inches DN			E to E inches mm	Approx. Weight (Each) lb kg
2 DN50	x	1 DN25	6.50 165	2.0 0.9
		1¼ DN32	6.50 165	2.0 0.9
		1½ DN40	6.50 165	2.0 0.9
2½	x	1 DN25	7.00 178	3.0 1.4
		1¼ DN32	7.00 178	3.0 1.4
		1½ DN40	7.00 178	3.0 1.4
		2 DN50	7.00 178	3.0 1.4
3 DN80	x	1 DN25	8.00 203	4.5 2.0
		1¼ DN32	8.00 203	4.5 2.0
		1½ DN40	8.00 203	4.5 2.0
		2 DN50	8.00 203	4.5 2.0
		2½	8.00 203	4.5 2.0
3½ DN90	x	3 DN80	8.00 203	6.8 3.1
4 DN100	x	1 DN25	9.00 229	7.5 3.4
		1¼ DN32	9.00 229	7.5 3.4
		1½ DN40	9.00 229	7.5 3.4
		2 DN50	9.00 229	7.5 3.4
		2½	9.00 229	7.5 3.4
		3 DN80	9.00 229	7.5 3.4
		3½ DN90	9.00 229	7.5 3.4

Size			No. 53, 54, and 55 Swaged Nipples (s)	
Nominal inches DN			E to E inches mm	Approx. Weight (Each) lb kg
5	x	2 DN50	11.00 279	11.5 5.2
		3 DN80	11.00 279	11.3 5.1
		4 DN100	11.00 279	11.5 5.2
6 DN150	x	1 DN25	12.00 305	17.0 7.7
		1¼ DN32	12.00 305	17.0 7.7
		1½ DN40	12.00 305	17.2 7.8
		2 DN50	12.00 305	17.4 7.9
		2½	12.00 305	17.4 7.9
		3 DN80	12.00 305	17.4 7.9
		3½ DN90	12.00 305	17.4 7.9
		4 DN100	12.00 305	17.5 7.9
		4½	12.00 305	17.5 7.9
		5	12.00 305	17.5 7.9
8 DN200	x	6 DN150	+	20.0 9.1

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details

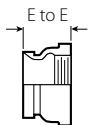
NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

4.13 DIMENSIONS

Female Threaded Adapter

No. 80



No. 80

Size		No. 80 Female Threaded Adapter	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	2.00 51	1.0 0.5
1 DN25	1.315 33.7	2.06 52	1.0 0.5
1¼ DN32	1.660 42.4	2.31 (sw) 59	1.5 0.7
1½ DN40	1.900 48.3	2.31 (sw) 59	1.5 0.7
2 DN50	2.375 60.3	2.50 64	1.4 0.6
2½ DN65	2.875 73.0	2.75 70	1.5 0.7
3 DN80	3.500 88.9	2.75 70	2.9 1.3
4 DN100	4.500 114.3	3.25 83	4.5 2.0

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

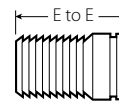
NOTES

- Available with British Standard Pipe Threads, specify "BSP" clearly on order.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

4.14 DIMENSIONS

Hose Nipple

No. 48



No. 48

Size		No. 48 Hose Nipple (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	3.12 79	0.3 0.1
1 DN25	1.315 33.7	3.38 86	0.4 0.2
1¼ DN32	1.660 42.4	3.88 98	0.6 0.3
1½ DN40	1.900 48.3	3.88 98	0.8 0.4
2 DN50	2.375 60.3	4.50 114	1.1 0.5
2½ DN65	2.875 73.0	5.38 137	2.0 0.9
3 DN80	3.500 88.9	5.75 146	3.2 1.5
4 DN100	4.500 114.3	7.00 178	4.9 2.2
5 DN125	5.563 141.3	8.75 222	8.0 3.6
6 DN150	6.625 168.3	10.13 257	14.3 6.5
8 DN200	8.625 219.1	11.88 302	24.7 11.2
10 DN250	10.750 273.0	12.50 318	40.1 18.2
12 DN300	12.750 323.9	14.50 368	62.0 28.1

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

NOTE

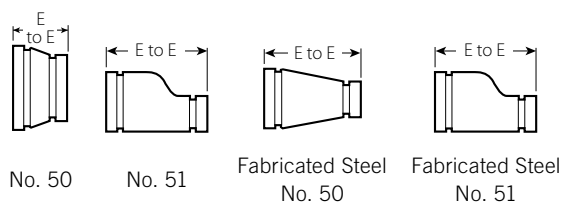
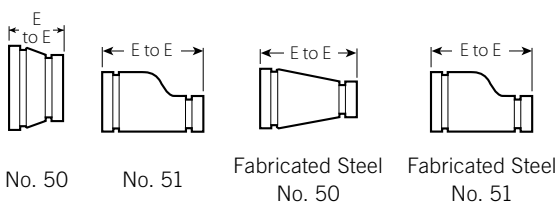
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

4.15 DIMENSIONS

Concentric/Eccentric Reducer

No. 50 Concentric

No. 51 Eccentric



Size	No. 50 Concentric Reducer		No. 51 Eccentric Reducer	
Nominal inches DN	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
1 1/4 DN32 x 3/4 DN20	+	1.9 0.9	—	—
1 DN25	+	1.9 0.9	—	—
1 1/2 DN40 x 3/4 DN20	+	1.4 0.6	—	—
1 DN25	2.50 64	0.8 0.4	8.50 (sw) 216	4.5 2.0
1 1/4 DN32	2.50 64	1.0 0.5	—	—
2 DN50 x 3/4 DN20	2.50 64	0.9 0.3	9.00 (sw) 229	2.0 0.9
1 DN25	2.50 64	0.7 0.3	9.00 (sw) 229	2.3 1.0
1 1/4 DN32	2.50 64	1.2 0.5	9.00 (sw) 229	4.6 2.1
1 1/2 DN40	2.50 64	1.0 0.5	3.50 89	1.1 0.5
2 1/2 x 3/4 DN20	+	1.3 0.6	+	3.3 1.5
1 DN25	2.50 64	1.1 0.5	9.50 241	3.5 1.6
1 1/4 DN32	3.50 89	3.3 1.5	3.50 89	1.4 0.6
1 1/2 DN40	2.50 64	3.6 1.6	9.50 (sw) 241	3.7 1.7
2 DN50	2.50 64	3.9 1.8	3.50 89	4.3 2.0
3 DN80 x 3/4 DN20	+	1.5 0.7	+	4.5 2.0
1 DN25	2.50 64	1.3 0.6	9.50 (sw) 241	4.8 2.2
1 1/4 DN32	2.50 64	1.4 0.6	+	4.8 2.2
1 1/2 DN40	2.50 64	5.1 2.3	9.50 (sw) 241	5.1 2.3
2 DN50	2.50 64	1.6 0.7	3.50 89	6.0 2.7
2 1/2	2.50 64	1.8 0.8	3.50 89	7.0 3.2
DN65	2.50 64	2.1 1.0	—	—
3 1/2 DN90 x 3 DN80	2.50 64	2.0 0.9	9.50 (sw) 241	7.0 3.2
4 DN100 x 1 DN25	3.00 76	3.0 1.4	13.00 (sw) 330	6.5 2.9

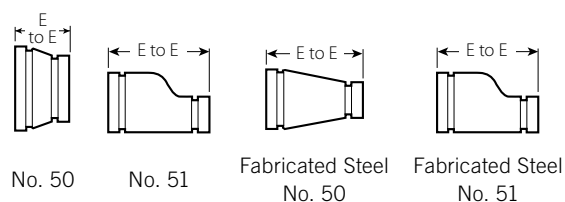
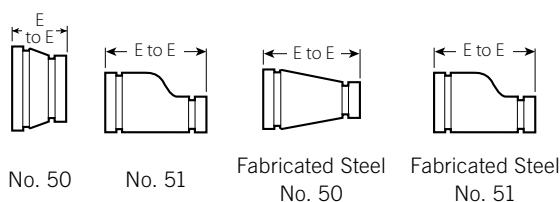
Size	No. 50 Concentric Reducer		No. 51 Eccentric Reducer	
Nominal inches DN	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
1 1/4 DN32	+	4.6 2.1	—	—
1 1/2 DN40	3.00 (sw) 76	2.6 1.2	10.00 (sw) 254	8.1 3.7
2 DN50	3.00 76	2.4 1.1	4.00 102	3.3 1.5
2 1/2	3.00 76	2.7 1.2	4.00 102	3.4 1.5
3 DN80	3.00 76	3.2 1.4	4.00 102	3.5 1.6
3 1/2 DN90	3.00 76	2.9 1.3	10.00 (sw) 254	8.0 3.6
5 x 2 DN50	11.00 (sw) 279	9.0 4.1	11.00 (sw) 279	5.2 2.4
2 1/2	4.00 102	4.3 2.0	11.00 (sw) 279	10.8 4.9
3 DN80	4.00 102	5.5 2.5	11.00 (sw) 279	11.1 5.0
4 DN100	3.50 89	4.3 1.9	5.00 127	12.0 5.4
6 DN150 x 1 DN25	4.00 102	5.0 2.3	11.50 (sw) 292	14.5 6.6
1 1/2 DN40	+	5.5 2.5	+	+
2 DN50	4.00 102	6.6 3.0	11.50 (sw) 292	14.5 6.6
2 1/2	4.00 102	6.4 2.9	11.50 (sw) 292	14.2 6.4
3 DN80	4.00 102	6.4 2.9	5.50 140	15.0 6.8
4 DN100	4.00 102	6.5 2.9	5.50 140	17.0 7.7
5	4.00 102	6.4 2.9	5.50 140	17.0 7.7
8 DN200 x 2 1/2	16.00 406	7.9 3.6	12.00 (sw) 305	26.1 11.8
3 DN80	5.00 127	9.3 4.2	12.00 (sw) 305	22.0 10.0
4 DN100	5.00 127	10.4 4.8	12.00 (sw) 305	23.0 10.4
5	5.00 127	11.6 5.2	12.00 (sw) 305	23.0 10.4
6 DN150	5.00 127	11.9 5.4	6.00 152	24.0 10.9

4.15 DIMENSIONS (Continued)

Concentric/Eccentric Reducer

No. 50 Concentric

No. 51 Eccentric



Size		No. 50 Concentric Reducer		No. 51 Eccentric Reducer	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
10 DN250 x 4 DN100	5	+	33.0 15.0	+	34.6 15.7
	6 DN150	6.00 152	20.0 9.1	13.00 (sw) 330	36.9 16.7
	8 DN200	6.00 152	22.0 10.0	7.00 178	21.6 9.8
12 DN300 x 4 DN100	6 DN150	7.00 178	24.6 11.2	14.00 (sw) 356	50.0 22.7
	8 DN200	7.00 178	52.0 23.6	14.00 (sw) 356	53.5 24.3
	10 DN250	7.00 178	39.0 17.7	14.00 (sw) 356	57.0 25.9
14 ² DN350 x 6 DN150	8 DN200	13.00 330	65.0 29.5	13.00 330	60.0 27.2
	10 DN250	13.00 330	66.0 29.9	13.00 330	65.0 29.5
	12 DN300	13.00 330	68.0 30.8	13.00 330	66.0 29.9
16 ² DN400 x 8 DN200	10 DN250	14.00 356	73.0 33.1	14.00 355	73.0 33.1
	12 DN300	14.00 356	73.0 33.1	14.00 355	73.0 33.1
	14 DN350	14.00 356	73.0 33.1	14.00 355	73.0 33.1
18 ² DN450 x 10 DN250	12 DN300	15.00 381	91.0 41.3	15.00 381	91.0 41.3
	14 DN350	15.00 381	91.0 41.3	15.00 381	91.0 41.3
	16 DN400	15.00 381	91.0 41.3	15.00 381	91.0 41.3

² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

Size		No. 50 Concentric Reducer		No. 51 Eccentric Reducer	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
20 ² DN500 x 10 DN250	12 DN300	20.00 508	110.0 49.9	20.00 508	177.0 80.3
	14 DN350	20.00 508	120.0 54.4	20.00 508	120.0 54.4
	16 DN400	20.00 508	149.0 67.9	20.00 508	149.0 67.9
	18 DN450	20.00 508	120.0 54.4	20.00 508	120.0 54.4
24 ² DN600 x 10 DN250	12 DN300	20.00 508	136.0 61.7	20.00 508	136.0 61.7
	14 DN350	20.00 508	142.0 64.4	20.00 508	142.0 64.4
	16 DN400	20.00 508	150.0 68.0	20.00 508	150.0 68.0
	18 DN450	20.00 508	162.0 73.5	20.00 508	162.0 73.5
14 – 60 DN350 – DN1500	20 DN500	20.00 508	162.0 73.5	20.00 508	162.0 73.5
		20.00 508	151.0 68.5	20.00 508	190.0 86.2

For AGS fitting information, see [publication 20.05](#)



² For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details.

NOTES

- Available with male threaded small end No. 52.
- Cast fitting available for JIS size. Contact Victaulic for details.
- Steel eccentric reducers available through 30"/DN750, contact Victaulic for dimensions.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

4.16 DIMENSIONS

Small Threaded Reducer

No. 52

No. 52F



No. 52



No. 52F



No. 52



No. 52F

Size		No. 52 Small Threader Reducer		No. 52F Concentric Reducer with BSPT Female Threaded End	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E mm	Approx. Weight (Each) kg
1½ DN40	x 1 DN25	2.50 64	0.8 0.4	—	—
	x 1¼ DN32	2.50 64	0.9 0.4	—	—
2 DN50	x ¾ DN20	2.50 64	0.9 0.4	—	—
	x 1 DN25	2.50 64	0.7 0.3	—	—
	x 1¼ DN32	2.50 64	1.2 0.5	—	—
	x 1½ DN40	2.50 64	1.0 0.5	—	—
	x 2 DN50	2.50 64	1.1 0.5	—	—
2½	x 1 DN25	2.50 64	1.1 0.5	—	—
	x 1¼ DN32	2.50 (sw) 64	1.2 0.5	—	—
	x 1½ DN40	2.50 (sw) 64	1.3 0.6	—	—
	x 2 DN50	2.50 64	1.4 0.6	—	—
DN65	x 1½ DN40	64	0.8	64	0.8
	x 2 DN50	—	—	64	0.9
3 DN80	x ¾ DN20	+(sw)	1.5 0.7	—	—
	x 1 DN25	2.50 64	1.3 0.6	—	—
	x 1¼ DN32	2.50 64	1.5 0.7	—	—
	x 1½ DN40	2.50 (sw) 64	1.5 0.7	—	—
	x 2 DN50	2.50 64	1.5 0.7	—	—
	x 2½ DN60	2.50 64	2.4 1.1	—	—
88.9mm	x 42.4mm	64	0.9	64	0.8
	x 48.3mm	64	0.9	64	0.9
	x 60mm	—	—	64	0.9

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details.

Size		No. 52 Small Threader Reducer		No. 52F Concentric Reducer with BSPT Female Threaded End	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E mm	Approx. Weight (Each) kg
4 DN100	x 1 DN25	3.00 76	2.3 1.0	—	—
	x 1½ DN40	3.00 76	2.7 1.2	—	—
	x 2 DN50	3.00 76	2.6 1.2	—	—
	x 2½ DN60	3.00 76	2.6 1.2	—	—
	x 3 DN80	3.00 76	2.5 1.1	—	—
108.0mm	x 42.4mm	76	1.3	76	1.3
	x 48.3mm	76	1.3	76	1.4
	x 60mm	—	—	76	1.4
114.3mm	x 42.4mm	76	1.3	76	1.3
	x 48.3mm	76	1.3	76	1.3
	x 60mm	76	1.3	76	1.4
5	x 4 DN100	+	4.5 2.0	—	—
133.0mm	x 60mm	—	—	114	2.2
139.0mm	x 60mm	—	—	114	2.3
6 DN150	x 1 DN25	4.00 102	5.5 2.5	—	—
	x 2 DN50	4.00 102	5.7 2.6	—	—
	x 2½ DN60	4.00 102	5.8 2.6	—	—
	x 3 DN80	4.00 102	5.8 2.6	—	—
	x 4 DN100	+(sw)	6.5 2.9	—	—
	x 5 DN125	+(sw)	2.0 0.9	—	—
	x 6 DN150	—	—	—	—
159.0mm	x 42.4mm	114	2.2	144	2.5
	x 48.3mm	114	2.2	114	2.5
	x 60mm	—	—	114	2.6

4.16 DIMENSIONS (Continued)

Small Threaded Reducer

No. 52

No. 52F



No. 52



No 52F

Size		No. 52 Small Threader Reducer		No. 52F Concentric Reducer with BSPT Female Threaded End	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E mm	Approx. Weight (Each) kg
165.1mm x 42.4mm		102mm	2.4	102	2.9
	48.3mm	102mm	2.6	102	3.0
	60mm	—	—	102	3.0
8 DN200 x 2 DN50		16.00	1.5	—	—
		406	0.7	—	—
	2 ½	16.00	1.7	—	—
		406	0.8	—	—

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

NOTES


- Available with British Standard Pipe Threads, specify "BSP" clearly on order.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

5.0 PERFORMANCE

Flow Data

(Frictional Resistance)

The chart expresses the frictional resistance of various Victaulic fittings as equivalent feet of straight pipe. Fittings not listed can be estimated from the data given, for example, a 22½° elbow is approximately one-half the resistance of a 45° elbow. Values of mid-sizes can be interpolated.

Size		Dimensions					
Nominal inches DN	Actual Outside Diameter inches mm	90° Elbows		45° Elbows		Tees	
		No. 10 Std. Radius feet meters	No. 100 1 ½ D Long Radius feet meters	No. 11 Std. Radius feet meters	No. 110 1 ½ D Long Radius feet meters	Branch feet meters	Run feet meters
1 DN25	1.315 33.7	1.7 0.5	—	0.8 0.2	—	4.2 1.3	1.7 0.5
2 DN50	2.375 60.3	3.5 1.1	2.5 0.8	1.8 0.5	1.1 0.3	8.5 2.6	3.5 1.1
DN65	3.000 76.1	4.3 1.3	—	2.1 0.7	—	10.8 3.3	4.3 1.3
3 DN80	3.500 88.9	5.0 1.5	3.8 1.2	2.6 0.8	1.6 0.5	13.0 4.0	5.0 1.5
	4.250 108.0	6.4 2.0	—	3.2 0.9	—	15.3 4.7	6.4 2.0
4 DN100	4.500 114.3	6.8 2.1	5.0 1.5	3.4 1.0	2.1 0.6	16.0 4.9	6.8 2.1
	5.250 133.0	8.1 2.5	—	4.1 1.2	—	20.0 6.2	8.1 2.5
DN125	5.500 139.7	8.5 2.6	—	4.2 1.3	—	21.0 6.4	8.5 2.6
5	5.563 141.3	8.5 2.6	—	4.2 1.3	—	21.0 6.4	8.5 2.6
	6.250 159.0	9.4 2.9	—	4.9 1.5	—	25.0 7.6	9.6 2.9
	6.500 165.1	9.6 2.9	—	5.0 1.5	—	25.0 7.6	10.0 3.0
6 DN150	6.625 168.3	10.0 3.0	7.5 2.3	5.0 1.5	3.0 0.9	25.0 7.6	10.0 3.0
8 DN200	8.625 219.1	13.0 4.0	9.8 3.0	6.5 2.0	4.0 1.2	33.0 10.1	13.0 4.0
10 DN250	10.750 273.0	17.0 5.2	12.0 3.7	8.3 2.5	5.0 1.5	41.0 12.5	17.0 5.2
12 DN300	12.750 323.9	20.0 6.1	14.5 4.4	10.0 3.0	6.0 1.8	50.0 15.2	20.0 6.1
14 DN350	14.000 355.6	24.5 ⁴ 7.5	15.8 4.8	18.5 ⁴ 5.6	11.0 3.4	70.0 21.3	23.0 7.0
16 DN400	16.000 406.4	28.0 ⁴ 8.5	18.0 5.5	21.0 ⁴ 6.4	13.0 4.0	80.0 24.4	27.0 8.2
18 DN450	18.000 457.0	31.0 ⁴ 9.5	20.0 6.1	23.5 ⁴ 7.2	14.0 4.3	90.0 27.4	30.0 9.1
20 DN800	20.000 508.0	34.0 ⁴ 10.4	22.5 6.9	25.5 ⁴ 7.8	16.0 4.9	100.0 30.5	33.0 10.1
24 DN600	24.000 610.0	42.0 ⁴ 12.8	27.0 8.2	29.5 ⁴ 9.0	19.0 5.8	120.0 36.6	40.0 12.2
AGS fittings available up to 60"/DN1500. Contact Victaulic for details.							
							

⁴ Fitting flow data for 14-24"/DN350-DN600 size No. 10 and No. 11 Elbows is based on fittings for Style 07 and 77 couplings. For flow data on AGS fittings (No. W10 and No. W11 Elbows), refer to [publication 20.05](#).

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

Intellectual Property Rights

No statement contained herein concerning a possible or suggested use of any material, product, service, or design is intended, or should be constructed, to grant any license under any patent or other intellectual property right of Victaulic or any of its subsidiaries or affiliates covering such use or design, or as a recommendation for the use of such material, product, service, or design in the infringement of any patent or other intellectual property right. The terms "Patented" or "Patent Pending" refer to design or utility patents or patent applications for articles and/or methods of use in the United States and/or other countries.

Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at www.victaulic.com.

Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

Trademarks

Victaulic and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.



Material Specifications:

Fitting:

Ductile iron conforming to ASTM A-536, grade 65-45-12.

Fitting Coating:

Orange enamel

Red enamel in Europe, Middle East, Africa, and India

Optional: Hot dipped galvanized

Approvals/Listings:



Product Description:

FireLock® products comprise a unique system specifically designed for fire protection services. FireLock full-flow elbows and tees feature CAD-developed, hydrodynamic design, affording a shorter center-to-end dimension than standard fittings. A noticeable bulge allows the water to make a smoother turn to maintain similar flow characteristics as standard full flow fittings.

FireLock fittings are designed for use exclusively with Victaulic couplings that have been Listed or Approved for Fire Protection Services. Use of other couplings or flange adapters may result in bolt pad interference.

Refer to the appropriate listing agency or approval body for pressure ratings. Pressure ratings vary by agency.

Job/Owner

System No.	
Location	

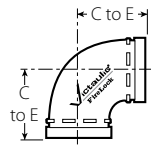
Contractor

Submitted By	
Date	

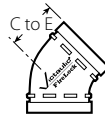
Engineer

Spec Section	
Paragraph	
Approved	
Date	

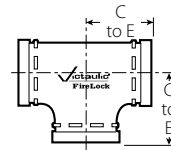
Dimensions:



NO. 001



NO. 003



NO. 002



No. 006

Nominal Size inches mm	Actual Outside Diameter inches mm	No. 001 90° Elbow		No. 003 45° Elbow		No. 002 Straight Tee		No. 006 Cap	
		C to E inches mm	Approx. Weight Each Lbs. kg	C to E inches mm	Approx. Weight Each Lbs. kg	C to E inches mm	Approx. Weight Each Lbs. kg	C to E inches mm	Approx. Weight Each Lbs. kg
1 ¼ 32	1.660 42.4	—	—	—	—	—	—	0.82 21	0.3 0.1
1 ½ 40	1.900 48.3	—	—	—	—	—	—	0.82 21	0.4 0.2
2 50	2.375 60.3	2.75 70	1.7 0.8	2.00 51	1.8 0.8	2.75 70	2.4 1.1	0.88 22	0.6 0.3
2 ½ 65	2.875 73.0	3.00 76	3.1 1.4	2.25 57	2.2 1.0	3.00 76	3.6 1.6	0.88 22	1.0 0.5
76.1 mm	3.000 76.1	3.00 76	3.30 1.5	2.25 57	2.4 1.1	3.00 76.2	3.8 1.7	—	—
3 80	3.500 88.9	3.38 86	4.0 1.8	2.50 64	3.1 1.4	3.38 86	5.3 2.4	0.88 22	1.2 0.5
108 mm	4.250 108.0	4.00 102	5.7 2.6	3.00 76	5.1 2.3	4.00 102	7.5 3.4	—	—
4 100	4.500 114.3	4.00 102	6.7 3.0	3.00 76	5.6 2.5	4.00 102	8.7 3.9	1.00 25	2.4 1.1
5 125	5.563 141.3	4.88 124	12.6 5.7	3.25 83	8.3 3.8	4.88 124	15.7 7.1	1.00 25	4.1 1.9
139.7 mm	5.500 139.7	4.88 124.0	12.4 5.6	3.25 82.6	8.2 3.7	4.88 124.0	15.4 6.9	—	—
159 mm	6.250 158.8	5.50 140	12.6 5.7	3.50 89	9.2 4.2	5.50 140	17.9 8.0	—	—
6 150	6.625 168.3	5.50 140	18.3 8.3	3.50 89	11.7 5.3	5.50 140	22.7 10.3	1.00 25	5.9 2.7
165.1 mm	6.500 165.1	5.43 139.7	17.6 7.9	3.50 88.9	11.4 5.2	5.50 139.7	22.0 9.9	—	—
8 200	8.625 219.1	6.81 173	25.5 11.6	4.25 108	20.4 9.3	6.94 176	38.7 17.6	1.13 29	12.7 5.8

Flow Data:

Nominal Size inches mm	Actual Outside Diameter inches mm	Frictional Resistance Equivalent Feet/meters of Straight Pipe ¹			
		Elbows		No. 002 Straight Tee	
		No. 001 90° Elbow	No. 003 45° Elbow	Branch	Run
1 ¼ 32	1.660 42.4	— —	— —	— —	— —
1 ½ 40	1.900 48.3	— —	— —	— —	— —
2 50	2.375 60.3	3.5 1.1	1.8 0.5	8.5 2.6	3.5 1.1
2 ½ 65	2.875 73.0	4.3 1.3	2.2 0.7	10.8 3.3	4.3 1.3
76.1 mm	3.000 76.1	4.5 1.4	2.3 0.7	11.0 3.4	4.5 1.4
3 80	3.500 88.9	5.0 1.5	2.6 0.8	13.0 4.0	5.0 1.5
108 mm	4.250 108.0	6.4 2.0	3.2 0.9	15.3 4.7	6.4 2.0
4 100	4.500 114.3	6.8 2.1	3.4 1.0	16.0 4.9	6.8 2.1
5 125	5.563 141.3	8.5 2.6	4.2 1.3	21.0 6.4	8.5 2.6
139.7 mm	5.500 139.7	8.3 2.5	4.1 1.3	20.6 6.3	8.3 2.5
159 mm	6.250 158.8	9.4 2.9	4.9 1.5	25.0 7.6	9.6 2.9
6 150	6.625 168.3	10.0 3.0	5.0 1.5	25.0 7.6	10.0 3.0
165.1 mm	6.500 165.1	9.8 3.0	4.9 1.5	24.5 7.5	9.8 3.0
8 200	8.625 219.1	13.0 4.0	5.0 1.5	33.0 10.1	13.0 4.0

¹ The flow data listed is based upon the pressure drop of Schedule 40 pipe.

General Notes:

NOTE: When assembling FireLock EZ couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For FireLock EZ Style 009N/009H couplings, use FireLock No. 006 end caps containing the “EZ” marking on the inside face or No. 60 end caps containing the “QV EZ” marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009/009V/009H couplings.

Installation

Reference should always be made to the [I-100 Victaulic Field Installation Handbook](#) for the product you are installing. Handbooks are included with each shipment of Victaulic products for complete installation and assembly data, and are available in PDF format on our website at www.victaulic.com.

Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Trademarks

Victaulic® is a registered trademark of Victaulic Company.

Style 744 FireLock® Flange Adapter

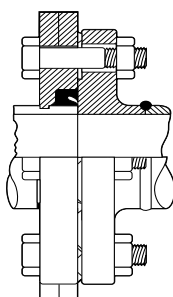
with Vic-Plus™ Gasket System



PRODUCT DESCRIPTION



2 - 8" Sizes



(Exaggerated for clarity)

Style 744 FireLock Flange adapter is designed for directly incorporating flanged components with ANSI CL. 125 or CL. 150 bolt hole patterns into a grooved pipe system. Sizes 2 - 8" (50 - 200 mm) are hinged for easy handling with integral end tabs which facilitate assembly.

The design incorporates small teeth inside the key shoulder I.D. to prevent rotation.

Because of the outside flange dimension, FireLock Flange adapters should not be used on FireLock fittings. When wafer or lug-type valves are used adjoining a Victaulic fitting, check disc dimensions to assure proper clearance.

FireLock Flange adapters should not be used as anchor points for tie-rods across nonrestrained joints. Mating rubber faced flanges, valves, etc., require the use of a FireLock Flange washer.

FireLock Flange adapters with Vic-Plus gaskets do not require lubrication. The gasket must always be assembled with the color coded lip on the pipe and the other lip facing the mating flange.

Style 744 FireLock Flange Adapters with the Vic-Plus™ Gasket System are designed and recommended for use ONLY on fire protection systems.

Vic-Plus Gasket System:

Victaulic® now offers a gasket system which requires no field lubrication on wet pipe systems. The Vic-Plus™ System (patented) is dry, clean, and non-toxic. It reduces assembly time substantially and eliminates the mess and chance of over-lubrication. Please refer to the latest copy of the Victaulic Field Installation Handbook (I-100) for supplemental lubrication requirements.

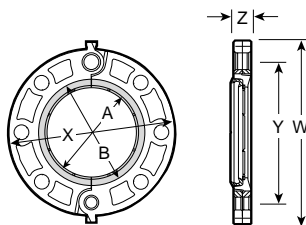


See Victaulic publication 10.01 for details.

DIMENSIONS

Style 744

Sizes 2 - 8" (50 - 200 mm)
ANSI Class 125 and 150 Flange



Note: Gray area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Pipe Size		Max. Work Press.* PSI kPa	Max. End Load* Lbs. N	No. Bolts † Req'd.	Bolt Size † Inches	Sealing Surface Inches/mm		Dimensions Inches/millimeters				Aprx. Wgt. Each Lbs. kg
Nominal Diameter In./mm	Actual Outside Diameter In./mm					"A" Max.	"B" Min.	W	X	Y	Z	
2 50	2.375 60.3	175 1200	775 3450	4	5/8 X 2 3/4	2.38 60	3.41 87	6.75 172	6.00 152	4.75 121	0.75 19	2.7 1.2
2 1/2 65	2.875 73.0	175 1200	1135 5050	4	5/8 X 3	2.88 73	3.91 99	7.88 200	7.00 178	5.50 140	0.88 22	4.2 1.9
3 80	3.500 88.9	175 1200	1685 7500	4	5/8 X 3	3.50 89	4.53 115	8.44 214	7.50 191	6.00 152	0.94 24	4.8 2.2
4 100	4.500 114.3	175 1200	2780 11045	8	5/8 X 3	4.50 114	5.53 141	9.94 252	9.00 229	7.50 191	0.94 24	7.1 3.2
5 125	5.563 141.3	175 1200	4250 18920	8	3/4 X 3 1/2	5.56 141	6.71 171	11.00 279	10.00 254	8.50 216	1.00 25	8.3 3.8
6# 150	6.625 168.3	175 1200	6030 26840	8	3/4 X 3 1/2	6.63 168	7.78 198	12.00 305	11.00 279	9.50 241	1.00 25	9.3 4.2
8# 200	8.625 219.1	175 1200	10219 45475	8	3/4 X 3 1/2	8.63 219	9.94 252	14.63 372	13.50 343	11.75 298	1.13 29	13.9 6.3

*Refer to notes below.

†Total bolts required to be supplied by installer. Bolt sizes for conventional flange-to-flange connection. Larger bolts are required when Vic-Flange adapter is utilized with wafer-type valves.

Not available with Vic-Plus gasket system. Lubrication is required.

NOTES

* Working Pressure and End Load are total, from all internal and external loads, based on standard weight steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1 1/2 times the figures shown.

Style 744 FireLock Flange adapters provide rigid joints when used on pipe with standard roll or cut groove dimensions and consequently allow no linear or angular movement at the joint.

WARNING: Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.

VIC-FLANGE ADAPTER NOTES

- 1 The Style 744 (2 - 8"/50 - 200 mm) design incorporates small teeth inside the key shoulder I.D. to prevent rotation.
- 2 FireLock Flange adapter should not be used on FireLock fittings. When wafer or lug-type valves are used adjoining a Victaulic fitting, check disc dimensions to assure proper clearance.
- 3 FireLock Flange adapters should not be used as anchor points for tie-rods across nonrestrained joints. Mating rubber faced flanges, valves, etc. require the use of a FireLock Flange washer.
- 4 Area A-B noted in the above drawing must be free from gouges, undulations or deformities of any type for effective sealing.
- 5 FireLock Flange adapter gaskets must always be assembled with the color coded lip on the pipe and the other lip facing the mating flange.
- 6 Flange Washers: FireLock Flange adapters require a smooth hard surface at the mating flange face for effective sealing. Some applications for which the Vic-Flange adapter is otherwise well suited do not provide an adequate mating surface. In such cases, it is recommended that a metal Flange Washer be inserted between the FireLock Flange adapter and the mating flange to provide the necessary sealing surface.

Typical applications where a Flange Washer should be used are:

- A When mating to a serrated flange: a standard flat flange gasket should be used adjacent to the serrated flange and then the Flange Washer is inserted between the FireLock Flange adapter and the flange gasket.
- B When mating to a wafer valve: where typical valves are rubber lined and partially rubber faced (smooth or not), the Flange Washer is placed between the valve and the FireLock Flange adapter.
- C When mating a rubber faced flange: the Flange Washer is placed between the FireLock Flange adapters and the rubber faced flange.
- D When mating AWWA cast flanges to IPS flanges: the Flange Washer is placed between two FireLock Flanges. The hinge points must be oriented approximately 90° to each other. If one flange is not a FireLock Flange adapter (e.g. flanged valve), then a standard flat flange gasket must be placed adjacent to that flange and the Flange Washer inserted between the flange gasket and the FireLock Flange adapter.
- E When mating to components (valves, strainers, etc.) where the component flange face has an insert: follow the same arrangement as in Application 1.
- F When mating to a Series 705-W Butterfly valve, Style 744 may only be used on one side of the connection.

When ordering Flange Washers, always specify product style (Style 744) and size to assure proper Flange Washer is supplied.

MATERIAL SPECIFICATIONS

Flange Housing: Ductile iron conforming to ASTM A-536, grade 65-45-12. Ductile iron conforming to ASTM A-395, grade 65-45-15, is available upon special request.

Coating: Black enamel

- **Optional:** Hot dipped galvanized

Bolts/Nuts: Supplied by installer

Gasket:

- **Grade "E" EPDM - Type A Vic-Plus Gasket System Δ**
(Violet color code). FireLock products have been Listed by Underwriters Laboratories Inc. and Approved by Factory Mutual Research for wet and dry (oil free air) sprinkler services up to the rated working pressure using the Grade "E" Type A Vic-Plus Gasket System, requiring no field lubrication for most installation conditions.

Δ Standard gasket approved for dry pipe systems to -40°F (-40°C). Based on "typical" pipe surface conditions, supplemental lubricant is recommended for services installed below 0°F (-18°C) and for all dry pipe systems or systems to be subjected to air tests prior to being filled with water. Supplemental lubrication may also be required on pipe with raised or undercut weld seams or pipe that has voids and/or cracks at the weld seams.

Victaulic FireLock™ Innovative Groove System | IGS™ for 1"/DN25 Sprinkler Pipe



1.0 PRODUCT DESCRIPTION

Pipe Material

- Carbon steel, Schedule 10, Schedule 40. For use with alternative materials please contact Victaulic.

Maximum Working Pressure

- Up to 365 psi/2517 kPa/25 bar

Pipe Preparation

- Cut (Sch. 40) or roll (Sch. 10 or Sch. 40) grooved in accordance with [publication 25.14](#): Victaulic /IGS Groove Specifications.

RG2100 Grooving Capability

- 1"/DN25
- Workstation designed to cut, ream and form a roll groove on carbon steel, Sch. 10 or Sch. 40 pipe.
- This tool has a minimum pipe length requirement of 4 ½"/114 mm.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

2.0 CERTIFICATION/LISTINGS



NOTES

- Approvals listed above do not apply to the RG2100 Roll Grooving Tool, and the WB-1 and NAP-1 IGS™ Weld Plunger Cones.

3.0 SPECIFICATIONS – MATERIAL

Housing: Ductile iron conforming to ASTM A536, Grade 65-45-12

Housing Coating:

- Orange enamel
- Red enamel (Europe)
- Optional: Hot dipped galvanized

Gasket:

Victaulic Grade “E” EPDM (Type A) Vic-Plus™ Pre-lubricated Gasket

EPDM (Violet Color Code). Applicable for wet and dry (oil-free air) fire protection systems only. Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems at -40°F/-40°C and above. NOT COMPATIBLE FOR USE WITH HOT WATER SERVICES OR STEAM SERVICES.

NOTES:

- Reference should always be made to [publication I-100](#), Victaulic Field Installation Handbook for gasket lubrication instructions.
- Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to [publication 05_01](#), Victaulic Gasket Selection Guide for specific gasket service guidelines and for a listing of services which are not compatible.

Bolts/Nuts:

Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (M10-M16) Class 8.8 (M20 and greater). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial - heavy hex nuts) and ASTM A563M Class 9 (metric - hex nuts). Track bolts and hex nuts are zinc electroplated per ASTM B633 Fe/Zn 5, finish Type III (imperial) or Type II (metric).

Coupling Linkage: High Strength Steel with comparable physical properties to that of the Track Bolt (ASTM A449). Linkage is zinc electroplated per ASTM B633 Fe/Zn 5, Type III Finish

No. 140, 141, 142, 143, 144, 148: Carbon steel meeting the chemical and mechanical property requirements of ASTM A53 Grade A, Type E or S

No. 65, 145, 146, 147: Ductile iron conforming to ASTM A536, Grade 65-45-12

No. WB-1: Steel Alloy

No. NAP-1: Aluminum Alloy

RG2100 Roll Grooving Tool:

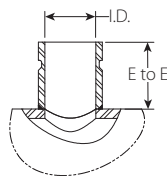
Required Power Supply: Power Drive with Foot Switch (½ HP, Universal reversible motor, single-phase, 25-60 HZ)

Accessories/Components:

- Tool head assembly
- Carriage assembly - accepts RG2100 tool head assembly, Standard Cutter, Standard Reamer and Standard Lever

4.0 DIMENSIONS

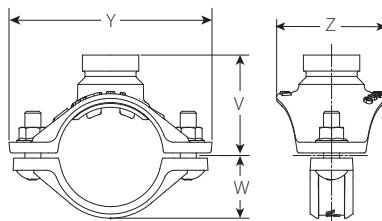
No. 142 Welded Outlet



Nominal	Actual Outside Diameter	Inside Diameter		Weight
inches DN	inches mm	I.D. inches mm	E to E inches mm	Approximate (Each) lb kg
Run x Branch	Run x Branch			
1 ¼ – 1 ½ DN32 – DN40	1.660 – 1.900 42.4 – 48.3	1.049 26.6	1.00 25.4	0.2 0.1
1 ½ – 2 DN40 – DN50	1.900 – 2.375 48.3 – 60.3	1.049 26.6	1.00 25.4	0.2 0.1
2 – 2 ½ DN50 – DN65	2.375 – 3.000 60.3 – 76.1	1.049 26.6	1.00 25.4	0.2 0.1
2 ½ – 3 DN65 – DN80	2.875 – 3.500 73.0 – 88.9	1.049 26.6	1.00 25.4	0.2 0.1
3 – 4 DN80 – DN100	3.500 – 4.500 88.9 – 114.3	1.049 26.6	1.00 25.4	0.2 0.1

4.1 DIMENSIONS

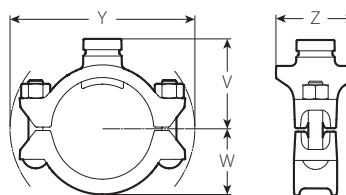
Style 922 Outlet-T



Size		Bolt/Nut		Dimensions						Weight
Nominal inches DN	Actual Outside Diameter inches mm		Size	Minimum Hole Diameter/Hole Saw Size inches mm	Maximum Hole Diameter/ Hole Saw Size inches mm	Y inches mm	V inches mm	W inches mm	Z inches mm	Approximate (Each) lb kg
Run x Branch	Run x Branch	Qty.	inches mm							
1 ¼ DN32	1.660 42.4	2	¾ x 1 ¾	1 ⅜ 30.0	1 ¼ 32.0	4.13 105.0	1.98 50.3	1.10 27.9	2.70 68.6	1.1 0.5
1 ½ DN40	1.900 48.3	2	¾ x 1 ¾	1 ⅜ 30.0	1 ¼ 32.0	4.25 108.0	2.11 53.6	1.22 31.0	2.70 68.7	1.2 0.5
2 DN50	2.375 60.3	2	¾ x 1 ¾	1 ⅜ 30.0	1 ¼ 32.0	4.75 120.6	2.34 59.4	1.46 37.1	2.56 65.1	1.2 0.5
2 ½ DN65	2.875 73.0	2	¾ x 1 ¾	1 ⅜ 30.0	1 ¼ 32.0	5.50 139.7	2.67 67.8	1.71 43.4	2.56 65.1	1.6 0.7
	76.1	2	¾ x 1 ¾	1 ⅜ 30.0	1 ¼ 32.0	5.52 140.3	2.75 69.8	1.71 43.4	2.56 65.1	1.7 0.8

4.2 DIMENSIONS

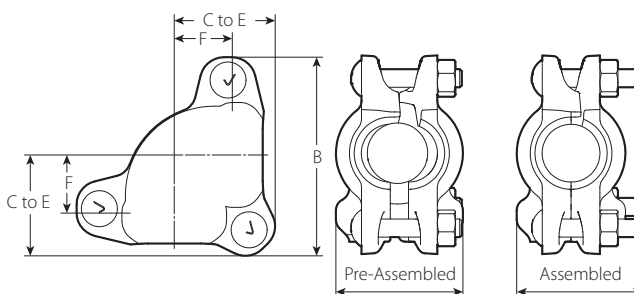
Style 920N Mechanical-T Outlet



Size				Bolt/Nut		Dimensions						Weight
Nominal inches DN		Actual Outside Diameter inches mm				Minimum Hole Diameter/Hole Saw Size inches mm	Maximum Hole Diameter/ Hole Saw Size inches mm	Y inches mm	V inches mm	W inches mm	Z inches mm	Approximate (Each) lb kg
Run x Branch		Run x Branch		Qty.	Size inches mm							
3 DN80	1 DN25	3.500 88.9	1.315 33.7	2	½ x 2 ¾	1 ½ 38.1	1 ⅝ 41.0	6.42 163.0	3.12 79.2	2.28 57.9	2.75 69.9	2.7 1.2
4 DN100		4.500 114.3		2	½ x 2 ¾	1 ½ 38.1	1 ⅝ 41.0	186.6 7.35	3.62 91.9	2.69 68.3	2.75 69.10	3.0 1.4

4.3 DIMENSIONS

No. 101 Installation-Ready 90° Elbow



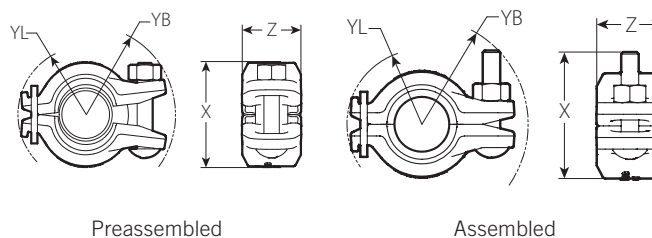
Size		Bolt/Nut		Dimensions					Weight
Nominal inches DN	Actual Outside Diameter inches mm	Qty.	Size inches mm	F Take Out inches mm	C to E inches mm	B inches mm	Pre-Assembled inches mm	Assembled inches mm	Approximate (Each) lb kg
1 DN25	1.315 33.7	3	3/8 x 2 M10 x 50	1.25 32	2.13 54	4.25 108	2.75 70	2.75 70	2.2 1.0

NOTE

- Not for use with grooved sprinklers, for grooved sprinkler connections please refer to [publication 10.65](#) for the Style V9 sprinkler coupling.

4.4 DIMENSIONS

Style 108 Installation-Ready Rigid Coupling



Size		Pipe End Separation ¹	Bolt/Nut		Dimensions								Weight
Nominal inches DN	Actual Outside Diameter inches mm	Allowable inches mm	Qty.	Size inches mm	Pre-Assembled				Assembled				Approx (Each) lb kg
					YL inches mm	YB inches mm	X inches mm	Z inches mm	YL inches mm	YB inches mm	X inches mm	Z inches mm	
1	1.315	0.14	1	3/8 x 2	1.66	2.17	2.58	1.43	1.61	2.29	2.27	1.43	1.5
DN25	33.7	3.6		M10 x 50	42.2	55.2	65.5	36.3	41.0	58.2	57.5	36.3	0.7

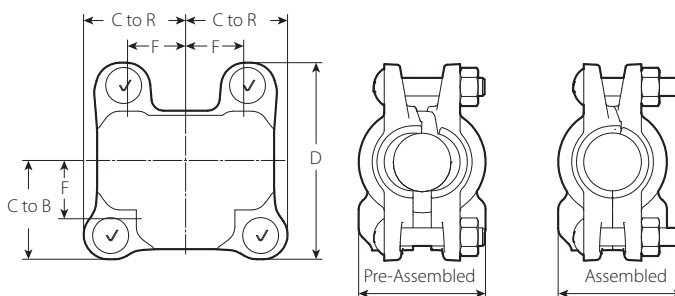
¹ The allowable pipe end separation dimension shown is for system layout purposes only. FireLock™ Style 108 rigid couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

NOTE

- Not for use with grooved sprinklers, for grooved sprinkler connections please refer to [publication 10.65](#) for the Style V9 sprinkler coupling.

4.5 DIMENSIONS

No. 102 Installation-Ready Tee



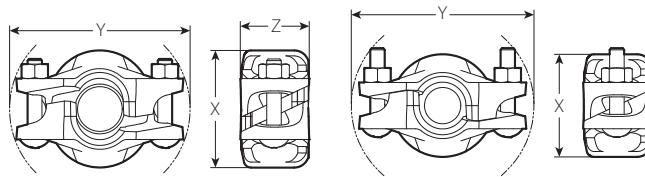
Size		Bolt/Nut		Dimensions						Weight
Nominal inches DN	Actual Outside Diameter inches mm	Qty.	Size inches mm	F Take Out inches mm	C to B inches mm	C to R inches mm	D inches mm	Pre-Assembled inches mm	Assembled inches mm	Approximate (Each) lb kg
1	1.315	4	3/8 x 2	1.25	2.13	2.13	4.13	2.75	2.75	3.0
DN25	33.7		M10 x 50	32	54	54	105	70	70	1.4

NOTE

- Not for use with grooved sprinklers, for grooved sprinkler connections please refer to [publication 10.65](#) for the Style V9 sprinkler coupling.

4.6 DIMENSIONS

Style 115 OGS x /GS Reducing Coupling



Pre-Assembled

Assembled

Size				Pipe End Separation ²	Bolt/Nut		Dimensions						Weight
							Pre-Assembled			Assembled			
Nominal inches DN		Actual Outside Diameter inches mm		Allowable inches mm	Qty.	Size inches mm	X inches mm	Y inches mm	Z inches mm	X inches mm	Y inches mm	Z inches mm	Approximate (Each) lb kg
1 ¼ DN32	x DN25	1.660 42.4	x 1.315 33.7	0.14 3.6	2	¾ x 2 M10 x 50	3.13 79	4.75 121	1.75 44	2.63 67	4.75 121	1.75 44	1.9 0.9
1 ½ DN40		1.900 48.3		0.14 3.6		2	¾ x 2 M10 x 50	3.25 83	4.88 124	1.75 44	2.88 73	4.88 124	1.75 44

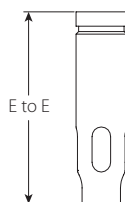
² The allowable pipe end separation dimension shown is for system layout purposes only. FireLock™ Style 115 rigid couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

NOTE

- Not for use with grooved sprinklers, for grooved sprinkler connections please refer to [publication 10.65](#) for the Style V9 sprinkler coupling.

4.7 DIMENSIONS

No. 148 Sprinkler Reducer



Length	Size		Threaded Outlet Size		Weight
E to E inches mm	Nominal inches DN	Actual Outside Diameter inches mm	inches DN	inches DN	Approximate (Each) lb kg
3 76	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.4 0.2
3.5 89	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.5 0.2
4 102	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.6 0.3
4.5 114	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.6 0.3
5 127	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.7 0.3
5.5 140	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.8 0.3
6 152	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	0.8 0.4
12 305	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	1.7 0.8
18 457	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	2.5 1.1
24 610	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	3.4 1.5
30 762	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	4.2 1.9

NOTE

- NPT or BSPT available
- It is acceptable to cut and groove any No. 148 longer than 6"/152mm. The minimum allowable cut length is 6"/152mm for a No. 148.

No. 148 Double Ended Sprinkler Reducer



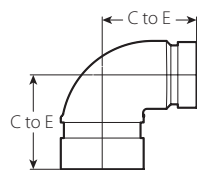
Length	Size		Threaded Outlet Size		Weight
E to E inches mm	Nominal inches DN	Actual Outside Diameter inches mm	inches DN	inches DN	Approximate (Each) lb kg
36 914	1 DN25	1.315 33.7	1/2 DN15	3/4 DN20	5.0 2.3

NOTE

- 36"/914mm size features sprinkler outlet on both ends for field fabrication.

4.8 DIMENSIONS

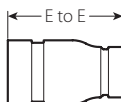
No. 65 /GS Grooved End of Run Fitting



Size		Dimensions		Weight
Nominal inches DN	Actual Outside Diameter inches mm	C to E inches mm	Approximate (Each) lb kg	
1 ¼ DN32	1.660 42.4	1.88 48	0.7 0.3	
1 ½ DN40	1.900 48.3	2.00 51	0.8 0.4	
2 DN50	2.375 60.3	2.25 57	1.2 0.5	
2 ½	2.875 73.0	2.50 64	1.6 0.7	
3 DN80	3.500 88.9	2.75 70	2.6 1.2	

4.9 DIMENSIONS

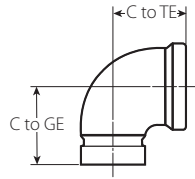
No. 144 OGS x /GS Grooved Concentric Reducer



Size		Dimensions		Weight
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approximate (Each) lb kg	
1 ¼ DN32	1.660 42.4	3.00 76	0.5 0.2	
1 ½ DN40	1.900 48.3	3.00 76	0.6 0.2	

4.10 DIMENSIONS

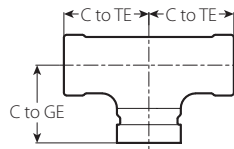
No. 145 Female Threaded x Groove 90° Elbow



Size				Dimensions		Weight
Nominal inches DN		Actual Outside Diameter inches mm		C-TE inches mm	C-GE inches mm	Approximate (Each) lb kg
Threaded Outlet	Grooved Outlet	Threaded Outlet	Grooved Outlet			
1/2 DN15		0.840 21.3		1.45 36.8	1.60 40.6	0.5 0.2
3/4 DN20	x 1 DN25	1.050 26.9	x 1.315 33.7	1.45 36.8	1.60 40.6	0.5 0.2
1 DN25		1.315 33.7		1.50 38.1	1.60 40.6	0.5 0.2

4.11 DIMENSIONS

No. 147 Back-To-Back Sprinkler Tee



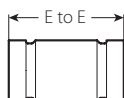
Size						Dimensions		Weight
Nominal inches DN			Actual Outside Diameter inches mm			C-TE inches mm	C-GE inches mm	Approximate (Each) lb kg
Threaded Outlet	Threaded Outlet	Grooved Outlet	Threaded Outlet	Threaded Outlet	Grooved Outlet			
1/2 DN15	x 1/2 DN15	x 1 DN25	0.840 21.3	x 0.840 21.3	x 1.315 33.7	1.75 44.5	1.60 40.6	0.7 0.3

NOTE:

- Approved for use with one or two 1/2" NPT Sprinklers threaded directly into outlet connection(s).

4.12 DIMENSIONS

No. 143 Close Nipple

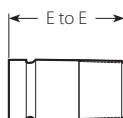


Size		Dimensions	Weight
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approximate (Each) lb kg
1 DN25	1.315 33.7	1.5 ³ 38	0.2 0.1
		2 51	0.3 0.1
		2.5 64	0.4 0.2
		3 76	0.4 0.2
		3.5 89	0.5 0.2
		4 102	0.6 0.3
		4.5 114	0.6 0.3
		5 127	0.7 0.3

³ Bolt pad interferences may occur in some installation configurations.

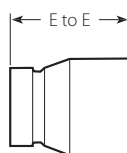
4.13 DIMENSIONS

No. 140 Male Threaded x Groove Adapter



Size		Dimensions	Weight
Nominal inches DN	Actual Outside Diameter inches mm	E-E inches mm	Approximate (Each) lb kg
1 DN25	1.315 33.7	2.50 63.5	0.3 0.1

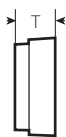
No. 141 Female Threaded x Groove Adapter



Size		Dimensions	Weight
Nominal inches DN	Actual Outside Diameter inches mm	E-E inches mm	Approximate (Each) lb kg
1 DN25	1.315 33.7	2.00 50.8	0.5 0.2

4.14 DIMENSIONS

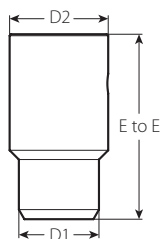
No. 146 Cap



Size		Dimensions	Weight
Nominal inches DN	Actual Outside Diameter inches mm	T inches mm	Approximate (Each) lb kg
1 DN25	1.315 33.7	0.55 14.0	0.2 0.1

4.15 DIMENSIONS

WB-1 Weld Plunger Cone



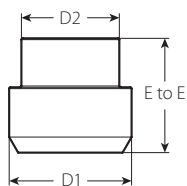
Dimensions			Weight
E to E inches mm	D1 inches mm	D2 inches mm	Approximate (Each) lb kg
3.75 95.3	1.63 41.3	2.00 50.8	2.2 51.0

NOTE

- WB-1 Weld Plunger Cones are for use with the No. 142 weld outlets and protect the groove during weld process.

4.16 DIMENSIONS

NAP-1 Weld Plunger Cone



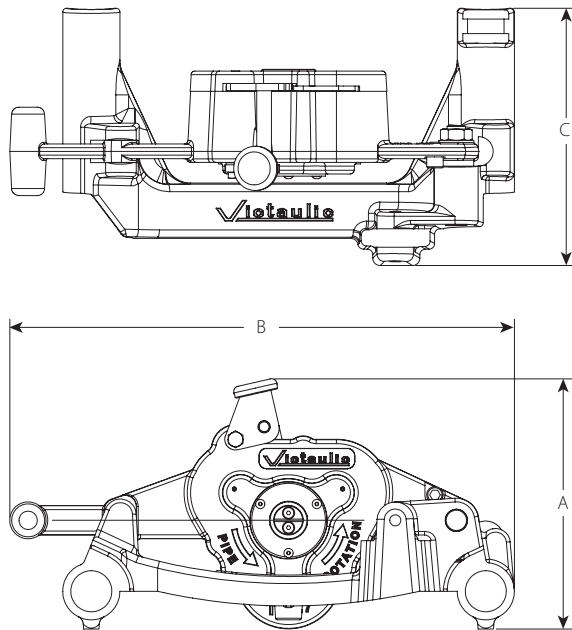
Dimensions			Weight
E to E inches mm	D1 inches mm	D2 inches mm	Approximate (Each) lb kg
1.75 44.5	1.88 47.6	1.50 38.0	0.3 0.2

NOTE

- NAP-1 Weld Plunger Cones are for use with the No. 142 weld outlets and protect the groove during weld process.

4.17 DIMENSIONS

RG2100 Roll Grooving Tool



A	B	C	Tool Weight
inches	inches	inches	lb
mm	mm	mm	kg
8.5	17.1	8.7	37.5
216	435	222	17.0

5.0 PERFORMANCE

Friction Flow Data

Size		Equivalent Length of 1" Sch. 40 Pipe (C=120)							
Nominal inches DN	Actual Outside Diameter inches mm	Style 922	Style 920N	No. 101 feet meters	No. 102 (Branch) feet meters	No. 102 (Run) feet meters	Style 115 feet meters	No. 148 feet meters	No. 144 feet meters
1 DN25	1.315 33.7	See publication 10.52	See publication 11.02	2.0 0.61	5.0 1.52	2.7 0.82	–	See note	–
1 ¼ DN32	x 1 DN25	–	–	–	–	–	5.7 1.74	–	3.9 1.19
1 ½ DN40	–	–	–	–	–	–	5.0 1.52	–	4.3 1.31

NOTE

- In accordance with NFPA 13, friction loss shall be excluded for fittings directly connected to a sprinkler. For hydraulic calculations, Victaulic recommends using the installed length (E-E or cut length) of the No. 148 Sprinkler Reducer as the equivalent length of 1" DN25 Sch. 40 pipe.

5.0 PERFORMANCE (CONTINUED)

Maximum Working Pressure

Style/No.	cULus psi kPa bar	FM psi kPa bar	LPCB psi kPa bar	VdS psi kPa bar
142 ⁴	365 2517 25	365 2517 25	365 2517 25	232 1600 16
922 ⁴	300 2100 21	300 2100 21	365 2517 25	232 1600 16
920N ⁴	365 2517 25	300 2100 21	365 2517 25	232 1600 16
101 ⁵	365 2517 25	365 2517 25	365 2517 25	232 1600 16
108 ⁵	365 2517 25	365 2517 25	365 2517 25	232 1600 16
102 ⁵	365 2517 25	365 2517 25	365 2517 25	232 1600 16
115 ⁴	365 2517 25	365 2517 25	365 2517 25	232 1600 16
148	365 2517 25	365 2517 25	365 2517 25	232 1600 16
65	365 2517 25	365 2517 25	365 2517 25	232 1600 16
144	365 2517 25	365 2517 25	365 2517 25	232 1600 16
145	365 2517 25	365 2517 25	365 2517 25	232 1600 16
147	365 2517 25	365 2517 25	N/A	N/A
143	365 2517 25	365 2517 25	365 2517 25	232 1600 16
140	365 2517 25	365 2517 25	365 2517 25	232 1600 16
141	365 2517 25	365 2517 25	365 2517 25	232 1600 16
146	365 2517 25	365 2517 25	365 2517 25	232 1600 16

- ⁴ Maximum pressure rating is 300 psi/21 bar when installed on lightwall steel pipe, as follows:
 Mega-Flow and Mega-Flow-GF steel pipe manufactured by Wheatland Tube Co.
 Mega-Thread steel pipe manufactured by Wheatland Tube Co.
 MLT steel pipe manufactured by Wheatland Tube Co.
 WLS steel pipe manufactured by Wheatland Tube Co.
 Eddy Flow steel pipe manufactured by Bull Moose Tube Co.
 Eddythread steel pipe manufactured by Bull Moose Tube Co.
 EZ-Thread steel pipe manufactured by Youngstown Tube Co.
 Fire-Flo steel pipe manufactured by Youngstown Tube Co.
 Easy-Flow pipe manufactured by Borusan Mannesmann

- ⁵ Maximum pressure rating is 300 psi / 21 bar when installed on lightwall steel pipe, as follows:
 Mega-Thread steel pipe manufactured by Wheatland Tube Co.
 MLT steel pipe manufactured by Wheatland Tube Co.
 WLS steel pipe manufactured by Wheatland Tube Co.
 Eddythread steel pipe manufactured by Bull Moose Tube Co.
 EZ-Thread steel pipe manufactured by Youngstown Tube Co.

6.0 NOTIFICATIONS

WARNING



- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Wear safety glasses, hardhat, and foot protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.

- These products shall be used only in fire protection systems that are designed and installed in accordance with current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards, or equivalent standards, and in accordance with applicable building and fire codes. These standards and codes contain important information regarding protection of systems from freezing temperatures, corrosion, mechanical damage, etc.
- The installer shall understand the use of this product and why it was specified for the particular application.
- The installer shall understand common industry safety standards and potential consequences of improper product installation.
- It is the system designer's responsibility to verify suitability of materials for use with the intended fluid media within the piping system and external environment.
- The material specifier shall evaluate the effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on materials to confirm system life will be acceptable for the intended service.

Failure to follow installation requirements and local and national codes and standards could compromise system integrity or cause system failure, resulting in death or serious personal injury and property damage.

WARNING



Failure to follow instructions and warnings could result in serious personal injury, property damage, and/or product damage.

- Before operating or servicing any grooving tools, read all instructions in the manual and all warning labels on the tool.
- Wear safety glasses, hardhat, foot protection, and hearing protection while working around the tool.
- Save the operating and maintenance manual in a place accessible to all operators of the tool

If you need additional copies of any literature, or if you have questions concerning the safe and proper operation of the tool, contact Victaulic, P.O. Box 31, Easton, PA 18044-0031, Phone: 1-800-PICK VIC, E-Mail: pickvic@victaulic.com.

7.0 REFERENCE MATERIALS

[10.06: FireLock Installation-Ready Fittings](#)

[10.52: Style 922 Outlet Tee](#)

[10.85: VicFlex Series AH2 ad AH2-CC Braided Hose](#)

[11.02 Mechanical-T Bolted Branch Outlets](#)

[25.14: Victaulic IGS Groove Specification](#)

[I-101-103: FireLock™ Installation-Ready™ Fittings Installation Instruction](#)

[I-102: FireLock™ Installation-Ready™ Fittings Installation Instruction](#)

[I-108: FireLock™ Installation-Ready™ Coupling](#)

[I-115: FireLock EZ™ Installation-Ready™ Reducing Coupling Installation Instruction](#)

[I-ENDCAP: Victaulic End Cap Installation Safety Instructions](#)

[I-V9: Style V9 Victaulic FireLock™ IGS™ Installation-Ready™ Sprinkler Coupling](#)

[TM-RG2100: Operating and Maintenance Instructions Manual](#)

Victaulic No. 148		
Length	½" DN15 outlet	¾" DN20 outlet
E to E inches mm	Equivalent Length of 1" Sched. 40 Pipe (C=120) feet meters	
≤6 152	6.6 2.0	3.8 1.2
6 – 12 152 – 305	5.5 1.7	3.8 1.2
12 – 18 305 – 457	6.2 1.9	4.3 1.3
18 – 24 457 – 610	6.7 2.0	4.7 1.4
24 – 30 610 – 762	7.1 2.2	5.2 1.6
30 – 36 762 – 914	7.4 2.3	5.4 1.6

NOTE

- When installed in pipe to pipe connections or it is required by the authority having jurisdiction, the equivalent length data in the table above may apply.

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

Intellectual Property Rights

No statement contained herein concerning a possible or suggested use of any material, product, service, or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Victaulic or any of its subsidiaries or affiliates covering such use or design, or as a recommendation for the use of such material, product, service, or design in the infringement of any patent or other intellectual property right. The terms "Patented" or "Patent Pending" refer to design or utility patents or patent applications for articles and/or methods of use in the United States and/or other countries.

Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Installation

Reference should always be made to the [Victaulic installation handbook](#) or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at www.victaulic.com.

Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

Trademarks

Victaulic and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.

Victaulic® FireLock™ Installation-Ready™ Rigid Couplings

Style 009N and Style 109



Patented



Patented

1.0 PRODUCT DESCRIPTION

Available Sizes

- Style 009N: 1 ¼ – 12"/DN32 – DN300
- Style 109: 1 ¼ – 2 ½"/DN32 – 73.0 mm

Pipe Material

- Schedule 10, Schedule 40 or specialty carbon steel pipe listed in Section 5. For use with alternative materials and wall thicknesses please contact Victaulic.

Maximum Working Pressure

- Up to 365 psi/2517 kPa.

Function

- Joins carbon steel pipe with grooved ends conforming to [publication 25.01](#).
- Provides a rigid pipe joint designed to restrict axial or angular movement.

2.0 CERTIFICATION/LISTINGS



C104-1a/36

EN 10311
Regulation (EU)
No. 305/2011

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	



3.0 SPECIFICATIONS – MATERIAL

Housing: Ductile iron conforming to ASTM A 536, Grade 65-45-12. Ductile iron conforming to ASTM A 395, Grade 65-45-15, is available upon special request.

Housing Coating: (specify choice)

- Orange enamel (North America, Asia Pacific)
- Red enamel (Europe)
- Optional for Style 009N: Hot dipped galvanized

Gasket: (specify choice)

Grade “E” EPDM (Type A) Vic-Plus™ Pre-lubricated Gasket

EPDM (Violet Color Code). Applicable for wet and dry (oil-free air) fire protection systems only. Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems at -40°F/-40°C and above. Not compatible for use with hot water services or steam services.

NOTES

- Reference should always be made to [publication I-100](#), Victaulic Field Installation Handbook for gasket lubrication instructions.
- Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to [publication 05.01](#), Victaulic Gasket Selection Guide for specific gasket service guidelines and for a listing of services which are not compatible.

Bolts/Nuts: (specify choice)

Standard: Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (M10-M16) Class 8.8 (M20 and greater). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial) and ASTM A563M Class 9 (metric). Track bolts and hex nuts are zinc electroplated per ASTM B633 Fe/Zn 5, finish Type III (imperial) or Type II (metric).

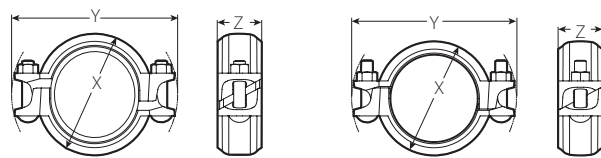
Optional for Style 009N: Stainless steel oval neck track bolts meeting the requirements of ASTM F593, Group 2 (316 stainless steel), condition CW. Stainless steel Heavy Hex nuts meeting the requirements of ASTM F594, Group 2 (316 stainless steel), condition CW, with galling-resistant coating.¹

¹ Optional bolts/nuts are available in imperial size only.

Coupling Linkage: High Strength Steel with comparable physical properties to that of the Track Bolt (ASTM A449). Linkage is zinc electroplated per ASTM B633 Fe/Zn 5, Type III Finish.

4.0 DIMENSIONS

Style 009N Two-Bolt Installation-Ready Coupling



Style 009N Pre-Assembled

Style 009N Joint Assembled

Size		Maximum Working Pressure ²	Maximum End Load ²	Allow. Pipe End Separation ³	Bolt/Nut		Dimensions					Weight
Nominal	Actual Outside Diameter				Qty.	Size	Pre-assembled		Joint Assembled		Z	Approx. (Each)
							X	Y	X	Y		
inches DN	inches mm	psi kPa	lb N	inches mm		inches mm	inches mm	inches mm	inches mm	inches mm	lb kg	
1 ¼ DN32	1.660 42.4	365 2517	790 3514	0.10 2.54	2	¾ × 2 M10 x 51	3.13 79	5.00 127	2.75 70	5.00 127	2.00 51	1.4 0.6
1 ½ DN40	1.900 48.3	365 2517	1035 4604	0.10 2.54	2	¾ × 2 M10 x 51	3.38 86	5.13 130	3.00 76	5.13 130	2.00 51	1.5 0.7
2 DN50	2.375 60.3	365 2517	1617 7193	0.12 3.05	2	¾ × 2 ½ M10 x 63	4.00 102	5.63 143	3.50 89	5.63 143	2.00 51	1.9 0.9
2 ½	2.875 73.0	365 2517	2370 10542	0.12 3.05	2	¾ × 2 ½ M10 x 63	4.50 114	6.13 156	4.00 102	6.13 156	2.00 51	2.1 1.0
DN65	3.000 76.1	365 2517	2580 11476	0.12 3.05	2	¾ × 2 ½ M10 x 63	4.63 118	6.00 152	4.13 105	6.13 156	2.00 51	2.1 1.0
3 DN80	3.500 88.9	365 2517	3512 15622	0.12 3.05	2	¾ × 2 ½ M10 x 63	5.13 130	6.75 171	4.63 117	6.75 171	2.00 51	2.3 1.0
4 DN100	4.500 114.3	365 2517	5805 25822	0.17 4.32	2	¾ × 2 ½ M10 x 63	6.00 152	7.88 200	5.63 143	7.50 191	2.13 54	2.9 1.3
	4.250 108.0	365 2517	5178 23020	0.17 4.32	2	¾ × 2 ½ M10 x 63	5.63 152	7.38 187	5.38 137	7.38 187	2.13 54	3.1 1.4
5	5.563 141.3	365 2517	8872 39456	0.17 4.32	2	½ × 3 M12 x 76	7.25 184	9.25 235	6.75 171	9.13 232	2.25 57	5.0 2.3
	5.250 133.0	365 2517	7901 35106	0.17 4.32	2	½ × 3 M12 x 76	6.63 168	9.00 229	6.38 162	9.00 229	2.25 57	4.8 2.2
DN125	5.500 139.7	365 2517	8672 38529	0.17 4.32	2	½ × 3 M12 x 76	6.88 175	9.25 235	6.75 171	9.13 232	2.25 57	4.9 2.2
	6 DN150	6.625 168.3	365 2517	12582 44469	0.17 4.32	2	½ × 3 ¼ M12 x 83	8.38 213	10.38 264	7.88 200	10.13 257	2.25 57
	6.250 159.0	365 2517	11198 49753	0.17 4.32	2	½ × 3 ¼ M12 x 83	7.88 200	10.00 254	7.38 187	9.88 251	2.25 57	5.6 2.5
		6.500 165.1	365 2517	12112 53813	0.17 4.32	2	½ × 3 ¼ M12 x 83	8.00 203	10.25 260	7.75 197	10.13 257	2.25 57
8 DN200	8.625 219.1	365 2517	21326 94863	0.17 4.32	2	¾ × 4 M16 x 101	10.88 276	13.38 340	10.25 260	13.13 333	2.50 64	11.4 5.2
		8.500 216.0	365 2517	20712 55968	0.17 4.32	2	¾ × 4 M16 x 101	10.63 270	13.25 337	10.25 260	10.13 257	2.63 67
10 DN250	10.750 273.0	300 2068	27229 121121	0.25 6.4	2	7/8 × 6 ½ M22 x 165	13.75 349	17.00 432	13.25 337	17.13 435	2.75 70	22.6 10.3
	12 DN300	12.750 323.9	300 2068	38303 170380	0.25 6.4	2	7/8 × 6 ½ M22 x 165	16.00 406	19.00 483	15.50 394	19.13 486	2.75 70

² Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. See the Listings/Approvals section of this publication for ratings on other pipe.

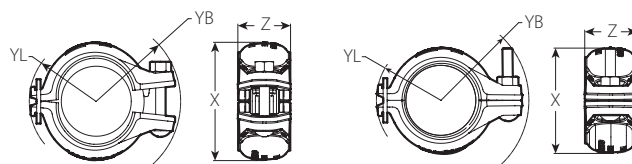
³ The allowable pipe separation dimension shown is for system layout purposes only. Style 009N couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

NOTES

- When assembling Style 009N or Style 109 couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For Style 009N or Style 109 couplings, use FireLock No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009N or Style 109 couplings. IMPORTANT: Gaskets intended for the Style 009 or Style 009V couplings cannot be used with the Style 009N or Style 109 coupling. There is no interchanging of gaskets or housings between coupling styles.
- Use Of FlushSeal Gaskets For Dry Pipe Systems** Style 009N or Style 109 couplings are supplied with Grade "E" Type A gaskets. These gaskets include an integral pipe stop, that once installed provides the similar benefits as a FlushSeal gasket for dry pipe systems. It should be noted that standard Victaulic FlushSeal gaskets cannot be used with the Style 009N or Style 109 couplings.

4.1 DIMENSIONS

Style 109 One-Bolt *Installation-Ready* Coupling



Style 109 Pre-Assembled

Style 109 Joint Assembled

Size		Maximum Working Pressure ⁴	Maximum End Load ⁴	Pipe End Separation Allowable ⁵	Bolt/Nut		Dimensions								Weight
Nominal	Actual Outside Diameter				Qty.	Size	Pre-assembled				Joint Assembled				Approx. (Each)
							YL	YB	X	Z	YL	YB	X	Z	
inches mm	inches mm	psi kPa	lb N	inches mm		inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	lb kg
1 ¼ DN32	1.660 42.4	365 2517	790 3514	0.10 2.54	1	¾ x 2 ¼ M10 x 57	1.88 48	2.50 64	3.13 79	1.88 48	1.88 48	2.63 67	2.75 70	1.88 48	1.4 0.6
1 ½ DN40	1.900 48.3	365 2517	1035 4604	0.10 2.54	1	¾ x 2 ¼ M10 x 57	2.00 51	2.63 67	3.25 83	1.88 48	2.00 51	2.75 70	3.00 76	1.88 48	1.5 0.7
2 DN50	2.375 60.3	365 2517	1616 7193	0.12 3.05	1	¾ x 2 ½ M10 x 63	2.25 57	2.88 73	3.88 98	2.00 51	2.25 57	3.13 79	3.50 89	2.00 51	1.8 0.8
2 ½	2.875 73.0	365 2517	2370 10542	0.12 3.05	1	¾ x 2 ½ M10 x 63	2.50 64	3.13 79	4.38 111	2.00 51	2.50 64	3.38 86	3.88 98	2.00 51	2.1 0.9

⁴ Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. See the Listings/Approvals section of this publication for ratings on other pipe.

⁵ The allowable pipe separation dimension shown is for system layout purposes only. Style 109 couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

NOTES

- When assembling Style 009N or Style 109 couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For Style 009N or Style 109 couplings, use FireLock No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009N or Style 109 couplings. IMPORTANT: Gaskets intended for the Style 009 or Style 009V couplings cannot be used with the Style 009N or Style 109 coupling. There is no interchanging of gaskets or housings between coupling styles.
- Use Of FlushSeal Gaskets For Dry Pipe Systems** Style 009N or Style 109 couplings are supplied with Grade "E" Type A gaskets. These gaskets include an integral pipe stop, that once installed provides the similar benefits as a FlushSeal gasket for dry pipe systems. It should be noted that standard Victaulic FlushSeal gaskets and cannot be used with the Style 009N or Style 109 couplings.

5.0 PERFORMANCE

Style 009N Two-Bolt *Installation-Ready Coupling Listings/Approvals*⁶

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approval agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus ¹¹		FM ¹¹		VdS	LPCB
Nominal inches DN	Actual Outside Diameter inches mm	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar	psi kPa bar	psi kPa bar
1 ¼ DN32	1.660 42.4	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
1 ½ DN40	1.900 48.3	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
2 DN50	2.375 60.3	365 2517 25	365 2517 25	363 2503 25	363 2500 25	363 2500 25	363 2500 25
2 ½	2.875 73.0	365 2517 25	365 2517 25	363 2503 25	363 2500 25	363 2500 25	363 2500 25
DN65	3.000 76.1	365 ⁷ 2517 ⁷ 25 ⁷	N/A	363 ⁸ 2503 ⁸ 25 ⁸	N/A	363 2500 25	363 2500 25
3 DN80	3.500 88.9	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
4 DN100	4.500 114.3	365 2517 25	365 2517 25	363 2503 25	363 2503 25	363 2500 25	363 2500 25
	4.250 108.0	N/A	N/A	363 2503 25	363 2503 25	N/A	N/A
5	5.563 141.3	290 2000 20	365 2517 25	363 2503 25	363 2503 25	232 1600 16	363 2500 25
	5.250 133.0	N/A	N/A	363 ⁸ 2503 ⁸ 25	N/A	N/A	N/A
DN125	5.500 139.7	290 ⁹ 2000 ⁹ 20 ⁹	N/A	363 ⁸ 2503 ⁸ 25 ⁸	N/A	232 1600 25	363 2500 25
6 DN150	6.625 168.3	300 2068 20	365 2517 25	363 2503 25 ⁷	363 2503 25	232 1600 16	363 2500 25
	6.250 159.0	N/A	N/A	363 ⁸ 2503 ⁸ 25	N/A	N/A	N/A
	6.500 165.1	290 ¹⁰ 2000 ¹⁰ 20	N/A	363 ⁸ 2503 ⁸ 25 ⁸	N/A	N/A	363 2500 25

⁶ Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic [Installation Manual I-009N](#) for details concerning when supplemental lubrication is required.

⁷ cULus listed for DIN 2458 (EN 10220) 2.6 mm pipe wall.

⁸ FM approved for BS 1387 (EN 10255) Medium 3.6 mm pipe wall.

⁹ cULus listed for EN 10220 4.0 mm pipe wall.

¹⁰ cULus listed for EN 10255 4.5 mm pipe wall.

¹¹ With optional stainless steel fasteners, cULus Listed to 175psi/1207 kPa/12 bar and FM Approved to the FM ratings shown in the above table. The stainless steel fasteners have a marking designation of "316" on the end face of the bolt.

¹² cUL listed to 250 psi/1720 kPa /17 bar.

5.0 PERFORMANCE (CONTINUED)

Style 009N Two-Bolt *Installation-Ready* Coupling Listings/Approvals⁶

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approval agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus ¹¹		FM ¹¹		VdS	LPCB
Nominal inches DN	Actual Outside Diameter inches mm	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar	psi kPa bar	psi kPa bar
8 DN200	8.625 219.1	300 2068 20	365 2517 25	363 2503 25	363 2503 25	232 1600 16	363 2500 25
	8.500 216.0	290 2000 20	N/A	363 ⁸ 2503 ⁸ 25 ⁷	N/A	N/A	N/A
10 DN250	10.750 273.0	300 2068 20	300 2068 20	300 2068 20	300 2068 20	N/A	N/A
12 DN300	12.750 323.9	300 ¹² 2068 ¹² 20 ¹²	300 2068 25	250 1720 17	300 2068 20	N/A	N/A

⁶ Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic [Installation Manual I-009N](#) for details concerning when supplemental lubrication is required.

⁷ cULus listed for DIN 2458 (EN 10220) 2.6 mm pipe wall.

⁸ FM approved for BS 1387 (EN 10255) Medium 3.6 mm pipe wall.

⁹ cULus listed for EN 10220 4.0 mm pipe wall.

¹⁰ cULus listed for EN 10255 4.5 mm pipe wall.

¹¹ With optional stainless steel fasteners, cULus Listed to 175psi/1207 kPa/12 bar and FM Approved to the FM ratings shown in the above table. The stainless steel fasteners have a marking designation of "316" on the end face of the bolt.

¹² cUL listed to 250 psi/1720 kPa /17 bar.

5.1 PERFORMANCE

Style 109 One-Bolt *Installation-Ready* Coupling Listings/Approvals¹³

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approvals agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Size		cULus		FM	
Nominal inches DN	Actual Outside Diameter inches mm	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar	Sch. 10 psi kPa bar	Sch. 40 psi kPa bar
1 ¼ DN32	1.660 42.4	365 2517 25	365 2517 25	365 2517 25	365 2517 25
1 ½ DN40	1.900 48.3	365 2517 25	365 2517 25	365 2517 25	365 2517 25
2 DN50	2.375 60.3	365 2517 25	365 2517 25	365 2517 25	365 2517 25
2 ½	2.875 73.0	365 2517 25	365 2517 25	365 2517 25	365 2517 25

¹³ Listed/Approved for continuous use in wet and dry systems. Listed/Approved for dry systems -40° F/C and above. Please see the Victaulic [Installation Manual I-109](#) for details concerning when supplemental lubrication is required.

5.2 PERFORMANCE

Specialty Pipe

Style 009N Two-Bolt *Installation-Ready* Coupling Listings/Approvals

Pipe Type	Size	Pressure Rating	
	inches DN	cULus psi kPa bar	FM psi kPa bar
EF	1 ¼ – 4 DN32 – DN100	300 2068 20	N/A
EL	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
ET40	1 ¼ – 2 DN32 – DN50	300 2068 20	N/A
EZF	3 – 4 DN80 – DN100	300 2068 20	N/A
EZT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
FF	1 ½ – 4 DN40 – DN100	300 2068 20	N/A
GL	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MF	1 ¼ – 4 DN32 – DN100	300 2068 20	300 2068 20
	6 DN150	175 1205 12	175 1205 12
MT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MLT	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
TF	2 ½ – 4 73.0 mm – DN100	N/A	300 2068 20
WG5, WG5E, WF5, WG7, WG7E, WL7	1 ¼ – 4 DN32 – DN100	175 1205 12	300 2068 20
WLS	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20

NOTES

- EF = EDDY FLOW steel pipe manufactured by Bull Moose Tube Co.
- EL = EDDYLITE steel pipe manufactured by Bull Moose Tube Co.
- ET40 = Eddythread 40 steel pipe manufactured by Bull Moose Tube Co.
- EZF = EZ-Flow steel pipe manufactured by Northwest Pipe Co.
- EZT = EZ-Thread steel pipe manufactured by Youngstown Tube Co.
- FF = Fire-Flo steel pipe manufactured by Youngstown Tube Co.
- GL = GL steel pipe manufactured by Wheatland Tube Co.
- MF = Mega-Flow steel pipe manufactured by Wheatland Tube Co.
- MT = Mega-Thread steel pipe manufactured by Wheatland Tube Co.
- MLT = MLT steel pipe manufactured by Wheatland Tube Co.
- TF = Tex-Flow steel pipe manufactured by Tex-Tube Co.
- WG5, WG5E, WF5 = WGalweld 5, WGalweld 5E, WFlow 5 steel pipe manufactured by Wuppermann Stahl GmbH.
- WG7, WG7E, WL7 = WGalweld 7, Wgalweld 7E, WLight 7 steel pipe manufactured by Wuppermann Stahl GmbH
- WLS = WLS steel pipe manufactured by Wheatland Tube Co.

5.3 PERFORMANCE

Specialty Pipe

Style 109 One-Bolt *Installation-Ready* Coupling Listings/Approvals

Pipe Type	Size	Pressure Rating	
	inches	cULus psi kPa bar	FM psi kPa bar
	DN		
EF	1 ¼ – 2 ½ DN32 – 73.0 mm	N/A	300 2068 20
	1 ½ – 2 ½ DN40 – 73.0 mm	300 2068 20	N/A
Easy-Flow	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
EL	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
ET40	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
EZT	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
	1 ½ – 2 DN40 – DN50	300 2068 20	N/A
FF	1 ½ – 2 ½ DN40 – 73.0 mm	300 2068 20	300 2068 20
GL	1 ¼ – 2 DN32 – DN50	N/A	300 2068
MF	1 ¼ – 2 ½ DN32 – 73.0 mm	300 2068 20	300 2068 20
MT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
MLT	1 ¼ – 2 DN32 – DN50	300 2068 20	300 2068 20
TF	2 ½ 73.0 mm	N/A	300 2068 20
WG7, WG7E	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20
WLS	1 ¼ – 2 DN32 – DN50	N/A	300 2068 20

NOTES

- EF = EDDY FLOW steel pipe manufactured by Bull Moose Tube Co.
- Easy-Flow = Easy-Flow steel pipe manufactured by Borusan Mannesmann Boru.
- EL = EDDYLITE steel pipe manufactured by Bull Moose Tube Co.
- ET40 = Eddythread 40 steel pipe manufactured by Bull Moose Tube Co.
- EZT = EZ-Thread steel pipe manufactured by Youngstown Tube Co.
- FF = Fire-Flo steel pipe manufactured by Youngstown Tube Co.
- GL = GL steel pipe manufactured by Wheatland Tube Co.
- MF = Mega-Flow steel pipe manufactured by Wheatland Tube Co.
- MT = Mega-Thread steel pipe manufactured by Wheatland Tube Co.
- MLT = MLT steel pipe manufactured by Wheatland Tube Co.
- TF = Tex-Flow steel pipe manufactured by Tex-Tube Co.
- WG7, WG7E = WGalweld 7 and WGalweld 7E steel pipe manufactured by Wuppermann Stahl GmbH.
- WLS = WLS steel pipe manufactured by Wheatland Tube Co.

6.0 NOTIFICATIONS

WARNING



- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Wear safety glasses, hardhat, and foot protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.

- These products shall be used only in fire protection systems that are designed and installed in accordance with current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards, or equivalent standards, and in accordance with applicable building and fire codes. These standards and codes contain important information regarding protection of systems from freezing temperatures, corrosion, mechanical damage, etc.
- The installer shall understand the use of this product and why it was specified for the particular application.
- The installer shall understand common industry safety standards and potential consequences of improper product installation.
- It is the system designer's responsibility to verify suitability of materials for use with the intended fluid media within the piping system and external environment.
- The material specifier shall evaluate the effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on materials to confirm system life will be acceptable for the intended service.

Failure to follow installation requirements and local and national codes and standards could compromise system integrity or cause system failure, resulting in death or serious personal injury and property damage.

7.0 REFERENCE MATERIALS

[05.01: Seal Selection Guide](#)

[25.01: Original Groove System \(OGS\) Groove Specifications](#)

[I-009N: Installation Instructions FireLock EZ™ Rigid Coupling Style 009N](#)

[I-100: Victaulic Field Installation Handbook](#)

[I-109: Installation Instructions FireLock™ One-Bolt Rigid Coupling Style 109](#)

[I-ENDCAP: Victaulic End Caps Installation Instructions](#)

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

Intellectual Property Rights

No statement contained herein concerning a possible or suggested use of any material, product, service, or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Victaulic or any of its subsidiaries or affiliates covering such use or design, or as a recommendation for the use of such material, product, service, or design in the infringement of any patent or other intellectual property right. The terms "Patented" or "Patent Pending" refer to design or utility patents or patent applications for articles and/or methods of use in the United States and/or other countries.

Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at www.victaulic.com.

Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

Trademarks

Victaulic and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.

Mechanical-T® Bolted Branch Outlets

STYLES 920 AND 920N



Victaulic Mechanical-T® Outlet provides a direct branch connection at any location a hole can be cut in pipe. The hole is cut oversize to receive a “holefinder” locating collar which secures the outlet in position permanently. A pressure responsive gasket seals on the pipe O.D.

Cross-type connections can be achieved by utilizing two upper housings of the same style and size, with the same or differing branch size connections. NOTE: Style 920 and Style 920N housings cannot be mated to each other to achieve a cross connection.

Style 920 and Style 920N Mechanical-T outlets are available with grooved or female threaded outlet. Specify choice on order. Units are supplied painted with plated bolts. Galvanized housings are available, supplied with plated bolts.

All sizes of Style 920 and 920N are rated at 500 psi/3450 kPa working pressure on Schedule 10 and 40 carbon steel pipe. They may also be used on high density polyethylene or polybutylene (HDPE) pipe. Pressure ratings on HDPE are dependent on the pipe rating. Contact Victaulic for ratings on other pipe. **Style 920 and 920N are not recommended for use on PVC plastic pipe.**

Standard piping practices dictate that the Mechanical-T Styles 920 and 920N must be installed so that the main and branch connections are a true 90° angle when permanently attached to the pipeline surface.

Additionally, the Vic-Tap II® hole cutting tool, which allows for hole cutting capabilities on pressurized systems, utilizes the Style 920 Mechanical-T in conjunction with the Series 726 Vic-Ball Valve to create the Style 931 Vic-Tap II Mechanical-T unit. See page 8 for further information.



STYLES 920 AND 920N

STYLE 920 CROSS

PATENTED

MATERIAL SPECIFICATIONS

Housing/Coating: Ductile iron conforming to ASTM A-536, grade 65-45-12, with orange enamel coating. Ductile iron conforming to ASTM A-395, grade 65-45-15, is available upon special request.

- **Optional:** Hot dipped galvanized

Gasket: (Specify choice*)

- **Grade “E” EPDM**

EPDM (Green color code). Temperature range –30°F to +230°F/–34°C to +110°C.

Recommended for cold and hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL Classified in accordance with ANSI/NSF 61 for cold +86°F/+30°C and hot +180°F/+82°C. NOT RECOMMENDED FOR PETROLEUM SERVICES.

- **Grade “T” nitrile**

Nitrile (Orange color code). Temperature range –20°F to +180°F/–29°C to +82°C.

Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range. Not recommended for hot water services over +150°F/+66°C or for hot dry air over +140°F/+60°C.

*Services listed are General Service Recommendations only. It should be noted that there are services for which these gaskets are not recommended. Reference should always be made to the latest Victaulic Gasket Selection Guide for specific gasket service recommendations and for a listing of services which are not recommended.

Bolts/Nuts: Heat-treated plated carbon steel, trackhead meeting the physical and chemical requirements of ASTM A-449 and physical requirements of ASTM A-183.

JOB/OWNER

System No. _____

Location _____

CONTRACTOR

Submitted By _____

Date _____

ENGINEER

Spec Sect _____ Para _____

Approved _____

Date _____

www.victaulic.com

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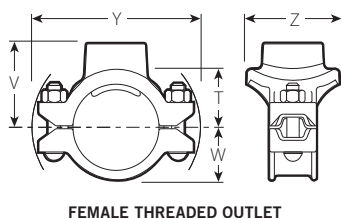
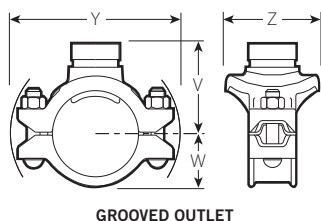


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Mechanical-T® Bolted Branch Outlets

STYLES 920 AND 920N

DIMENSIONS



- Provides a direct branch connection at any location where a hole can be cut in the pipe
- A pressure responsive gasket provides the seal
- Request Publication 11.03 for Mechanical-T cross assemblies
- Pressure rated up to 500 psi/3450 kPa on steel pipe; also available for use with HDPE pipe
- Sizes from 2 × ½"/50 × 15 mm through 8 × 4"/200 × 100 mm

IMPORTANT NOTES:

Style 920 and Style 920N housings cannot be mated to one another to achieve cross connections.

Size Run × Branch Nominal Size Inches mm	Style No. 920 or 920N	Max. Work Pressure@ psi kPa	Dimensions							Approx. Weight Each	
			Hole Diameter +0.13 -0.00 Inches mm	T** Inches mm	V † # Thd. Inches mm	V † Grv. Inches mm	W Inches mm	Y Inches mm	Z Inches mm	Female Thd. Lbs. kg	Grv. Lbs. kg
2 50 × ½ (a) □	920N	500 3450	1.50 38.1	2.00 51	2.53 64	—	1.61 41	5.35 136	2.75 70	3.1 1.5	—
	920N	500 3450	1.50 38.1	1.97 50	2.53 64	—	1.61 41	5.35 136	2.75 70	3.1 1.5	—
	920N	500 3450	1.50 38.1	1.85 47	2.53 64	—	1.61 41	5.35 136	2.75 70	3.0 1.4	—
	920N	500 3450	1.75 44.5	2.05 52	2.75 70	3.00 76	1.61 41	5.35 136	3.00 76	3.5 1.7	3.2 1.5
	920N	500 3450	1.75 44.5	2.03 52	2.75 70	3.12 79	1.61 41	5.35 136	3.25 83	3.6 1.7	3.2 1.5
2½ 65 × ½ (a) §	920N	500 3450	1.50 38.1	2.21 56	2.74 70	—	1.82 46	5.64 143	2.75 70	3.0 1.4	—
	920N	500 3450	1.50 38.1	2.18 55	2.74 70	—	1.82 46	5.64 143	2.75 70	3.0 1.4	—
	920N	500 3450	1.50 38.1	2.06 52	2.74 70	—	1.82 46	5.64 143	2.75 70	2.9 1.4	—
	920N	500 3450	1.75 44.5	2.30 58	3.00 76	3.25 83	1.82 46	6.29 160	3.00 76	3.5 1.7	3.2 1.5
	920N	500 3450	2.00 50.8	2.28 58	3.00 76	3.25 83	1.82 46	6.26 159	3.25 83	3.6 1.7	3.3 1.6
76.1 × ½ (a) □	920N	300 2065	1.50 38.1	2.22 56	2.75 70	—	2.25 57	6.46 164	3.18 81	3.9 1.8	—
	920N	300 2065	1.50 38.1	2.19 56	2.75 70	—	2.25 57	6.46 164	3.18 81	3.9 1.8	—
	920N	300 2065	1.50 38.1	2.07 53	2.75 70	—	2.25 57	6.46 164	3.18 81	3.8 1.7	—
	920N	500 3450	1.75 44.5	2.30 58	3.00 76	3.31 84	1.92 49	6.29 160	3.00 76	3.5 1.6	3.2 1.5
	920N	500 3450	2.00 50.8	2.28 58	3.00 76	3.31 84	1.92 49	6.29 160	3.25 83	3.5 1.6	3.3 1.5
3 80 × ½ (a) □	920N	500 3450	1.50 38.1	2.52 64	3.05 78	—	2.28 58	6.15 156	2.75 70	3.4 1.6	—
	920N	500 3450	1.50 38.1	2.49 63	3.05 78	—	2.28 58	6.15 156	2.75 70	3.4 1.6	—
	920N	500 3450	1.50 38.1	2.38 61	3.06 78	—	2.28 58	6.15 156	2.75 70	3.3 1.6	—
	920N	500 3450	1.75 44.5	2.55 65	3.25 83	3.56 90	2.28 58	6.15 156	3.00 76	3.8 1.8	3.7 1.8
	920N	500 3450	2.00 50.8	2.78 71	3.50 89	3.56 90	2.28 58	6.15 156	3.25 83	4.1 1.9	3.8 1.8
	920N	500 3450	2.50 63.5	2.75 70	3.50 89	3.56 90	2.28 58	6.75 172	3.88 99	4.9 2.3	4.6 2.1
3½ 90 × 2 50	920N	500 3450	2.50 63.5	3.00 76	—	3.75 95	2.44 62	6.72 171	3.88 99	—	3.8 1.8

TABLE CONTINUED ON PG. 3

** Center of run to engaged pipe end, female threaded outlet only (dimensions approximate).

† Available with grooved or female threaded outlet. Specify choice on order.

‡ Center of run to end of fitting.

Female threaded outlets are available to NPT and BSPT specifications.

@ See page 7 for Fire Protection approvals and pressure ratings.

(a) British Standard female pipe threaded outlet is available as listed. Specify "BSPT" clearly on order.

(b) For 76.1 mm threaded outlet, specify 2½" BSPT clearly on order.

§ Vds approved for fire protection services

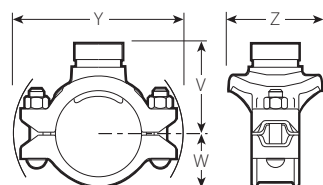
□ LPCB approved for fire protection services

Ø Approved for use in China by Tianjin Approvals Company.

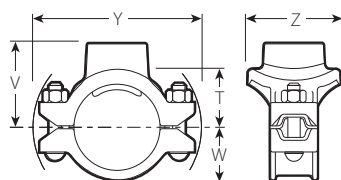
Mechanical-T® Bolted Branch Outlets

STYLES 920 AND 920N

DIMENSIONS



GROOVED OUTLET



FEMALE THREADED OUTLET

- Provides a direct branch connection at any location where a hole can be cut in the pipe
- A pressure responsive gasket provides the seal
- Request Publication 11.03 for Mechanical-T cross assemblies
- Pressure rated up to 500psi/3450kPa on steel pipe; also available for use with HDPE pipe
- Sizes from 2 × ½"/50 × 15mm through 8 × 4"/200 × 100mm

IMPORTANT NOTES:

Style 920 and Style 920N housings cannot be mated to one another to achieve cross connections.

Size	Style No.	Max. Work Pressure@	Dimensions							Approx. Weight Each		
Run x Branch Nominal Size Inches mm	920 or 920N	psi kPa	Hole Diameter +0.13 -0.00	T** Inches mm	V ‡ # Thd. Inches mm	V ‡ Grv. Inches mm	W Inches mm	Y Inches mm	Z Inches mm	Female Thd. Lbs. kg	Grv. Lbs. kg	
TABLE CONTINUED FROM PAGE 2												
4 100 ×	½ (a) □ 15	920N	500 3450	1.50 38.1	3.03 77	3.56 90	—	2.69 68	7.01 178	2.75 70	3.7 1.8	—
	¾ (a) □ 20	920N	500 3450	1.50 38.1	3.00 76	3.56 90	—	2.69 68	7.01 178	2.75 70	3.7 1.8	—
	1 (a) □ 25	920N	500 3450	1.50 38.1	2.88 73	3.56 90	—	2.69 68	7.01 178	2.75 70	3.6 1.8	—
	1¼ (a) † 32 (b)		500 3450	1.75 44.5	3.08 78	3.78 96	4.00 102	2.69 68	7.01 178	3.00 76	4.0 1.9	3.6 1.8
	1½ (a) † 40 (b)	920N	500 3450	2.00 50.8	3.28 83	4.00 102	4.00 102	2.69 68	7.01 178	3.25 83	4.2 2.0	3.9 1.9
	2 (a) † 50	920N	500 3450	2.50 63.5	3.25 83	4.00 102	4.00 102	2.69 68	7.01 178	3.88 99	5.0 2.3	4.6 2.1
	2½ (a) † 65	920	500 3450	2.75 69.9	2.88 73	4.00 102	4.00 102	2.69 68	7.34 186	4.63 118	5.8 2.6	5.0 2.3
	76.1 mm	920	500 3450	2.75 69.9	2.88 73	—	4.00 102	2.69 68	7.34 186	4.63 118	—	6.4 2.9
	3 (a) 80	920	500 3450	3.50 88.9	3.31 84	4.50 114	4.12 105	2.69 68	7.73 196	5.12 130	8.4 3.8	6.4 2.9
108.0 ×	1¼ (a) □ 32	920N	500 3450	1.75 44.5	3.08 78	3.78 96	—	2.63 67	7.64 194	3.05 78	5.0 2.3	—
	1½ (a) □ 40	920N	500 3450	2.00 50.8	3.28 83	4.00 102	—	2.63 67	7.64 194	3.25 83	5.0 2.3	—
	2 (a) 50	920N	500 3450	2.50 63.5	3.25 83	4.00 102	—	2.63 67	7.64 194	4.00 102	4.0 1.9	—
	76.1 mm	920	500 3450	2.75 69.9	2.88 73	4.00 102	4.00 102	2.63 67	7.64 194	4.29 109	8.0 3.6	7.8 3.5
	3 (a) 80	920	500 3450	3.50 88.9	3.31 84	4.50 114	4.50 114	2.63 67	7.63 194	4.88 124	6.8 3.1	6.5 3.0
5 125 ×	1½ (a) † 40	920	500 3450	2.00 50.8	4.03 102	4.75 121	4.75 121	3.16 80	9.70 246	3.69 94	7.4 3.4	7.6 3.4
	2 (a) † 50	920	500 3450	2.50 63.5	4.00 102	4.75 121	4.75 121	3.16 80	9.70 246	4.38 111	8.2 3.7	8.0 3.6
	2½ (a) † 65	920	500 3450	2.75 69.9	3.63 92	4.75 121	4.75 121	3.16 80	9.70 246	4.63 118	8.3 3.8	7.9 3.6
	76.1 mm □	920	500 3450	2.75 69.9	3.75 95	—	4.75 121	3.16 80	9.70 246	4.63 118	—	8.0 3.6
	3 (a) † 80	920	500 3450	3.50 88.9	3.81 97	5.00 127	4.63 118	3.16 80	9.70 246	5.31 135	8.4 3.8	8.8 4.0
133.0 ×	2 50	920N	500 3450	2.50 63.5	3.75 95	4.50 114	—	3.17 81	8.00 203	3.88 99	8.0 3.6	—
	3 80	920	500 3450	3.50 88.9	3.81 97	5.00 127	—	3.00 76	9.46 240	5.31 135	8.0 3.6	—
TABLE CONTINUED ON PG. 4												

** Center of run to engaged pipe end, female threaded outlet only (dimensions approximate).

† Available with grooved or female threaded outlet. Specify choice on order.

‡ Center of run to end of fitting.

Female threaded outlets are available to NPT and BSPT specifications.

@ See page 7 for Fire Protection approvals and pressure ratings.

(a) British Standard female pipe threaded outlet is available as listed. Specify "BSPT" clearly on order.

(b) For 76.1 mm threaded outlet, specify 2½" BSPT clearly on order.

§ Vds approved for fire protection services

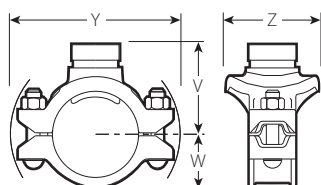
□ LPCB approved for fire protection services

∅ Approved for use in China by Tianjin Approvals Company.

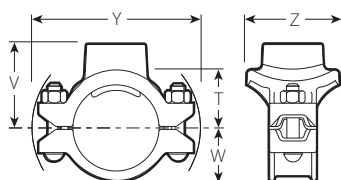
Mechanical-T® Bolted Branch Outlets

STYLES 920 AND 920N

DIMENSIONS



GROOVED OUTLET



FEMALE THREADED OUTLET

- Provides a direct branch connection at any location where a hole can be cut in the pipe
- A pressure responsive gasket provides the seal
- Request Publication 11.03 for Mechanical-T cross assemblies
- Pressure rated up to 500 psi/3450 kPa on steel pipe; also available for use with HDPE pipe
- Sizes from 2 × ½"/50 × 15 mm through 8 × 4"/200 × 100 mm

IMPORTANT NOTES:

Style 920 and Style 920N housings cannot be mated to one another to achieve cross connections.

Size	Style No.	Max. Work Pressure@	Dimensions							Approx. Weight Each			
Run × Branch Nominal Size Inches mm	920 or 920N	psi kPa	Hole Diameter +0.13 -0.00	T** Inches mm	V † # Thd. Inches mm	V † Grv. Inches mm	W Inches mm	Y Inches mm	Z Inches mm	Female Thd. Lbs. kg	Grv. Lbs. kg		
TABLE CONTINUED FROM PAGE 3													
139.7 ×	1 ½ † 40	920N	500 3450	2.00 50.8	3.78 96	4.50 114	—	3.30 84	8.23 209	3.25 83	7.0 3.2	—	
	2 † 50	920N	500 3450	2.50 63.5	3.75 95	4.50 114	—	3.30 84	8.23 209	3.88 99	9.0 4.1	—	
6 150 ×	1 ¼ (a) 32 (b)	920N	500 3450	1.75 44.5	4.43 112	5.13 130	5.13 130	3.79 96	9.15 232	3.25 83	5.1 2.3	4.8 2.2	
	1 ½ (a) † 40 (b)	920N	500 3450	2.00 50.8	4.40 112	5.13 130	5.13 130	3.79 96	9.15 232	3.25 83	5.4 2.4	5.1 2.3	
	2 (a) † 50	920N	500 3450	2.50 63.5	4.38 111	5.13 130	5.13 130	3.79 96	9.15 232	3.88 99	6.0 2.7	5.6 2.5	
	2 ½ 65	920	500 3450	2.75 69.9	4.01 110	5.13 130	5.12 130	3.69 94	10.51 267	4.63 118	8.3 3.8	7.6 3.4	
	76.1 mm	920	500 3450	2.75 69.9	4.15 105	—	5.21 132	3.69 94	10.51 267	4.63 118	—	8.4 3.8	
	3 (a) † 80	920	500 3450	3.50 88.9	4.31 110	5.50 140	5.13 130	3.69 94	10.51 267	5.31 135	9.9 4.5	8.4 3.8	
	4 (a) † 100	920	500 3450	4.50 114.3	3.81 97	5.75 146	5.38 137	3.69 94	10.51 267	6.25 159	10.1 4.6	10.1 4.6	
	159.0 ×	1 ½ (a) 40	920N	500 3450	2.00 50.8	4.41 112	5.13 130	—	3.63 92	9.40 239	3.25 83	7.8 3.5	—
		2 (a) 50	920N	500 3450	2.50 63.5	4.38 111	5.13 130	—	3.63 92	9.40 239	3.88 99	8.0 3.6	—
76.1 mm		920	500 3450	2.75 69.9	4.38 111	5.50 140	5.13 130	3.63 92	9.40 239	4.63 118	9.5 4.3	9.5 4.3	
3 80		920	500 3450	3.50 88.9	4.31 110	5.50 140	5.13 130	3.63 92	9.40 239	5.31 135	8.1 3.7	14.0 6.4	
108.0 mm		920	500 3450	4.50 114.3	4.45 113	—	5.38 137	3.63 92	9.40 239	6.12 155	—	10.0 4.5	
4 100	920	500 3450	4.50 114.3	3.81 96.80	5.75 146	—	3.63 92	9.40 239	6.25 159	18.0 8.2	—		
TABLE CONTINUED ON PG. 5													

** Center of run to engaged pipe end, female threaded outlet only (dimensions approximate).

† Available with grooved or female threaded outlet. Specify choice on order.

‡ Center of run to end of fitting.

Female threaded outlets are available to NPT and BSPT specifications.

@ See page 7 for Fire Protection approvals and pressure ratings.

(a) British Standard female pipe threaded outlet is available as listed. Specify "BSPT" clearly on order.

(b) For 76.1 mm threaded outlet, specify 2 ½" BSPT clearly on order.

§ Vds approved for fire protection services

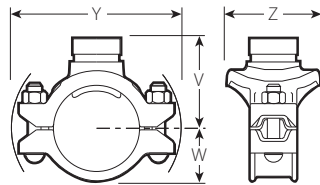
⌘ LPCB approved for fire protection services

⌘ Approved for use in China by Tianjin Approvals Company.

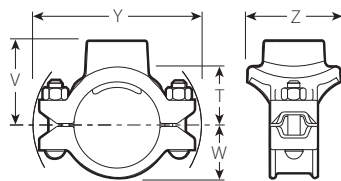
Mechanical-T[®] Bolted Branch Outlets

STYLES 920 AND 920N

DIMENSIONS



GROOVED OUTLET



FEMALE THREADED OUTLET

- Provides a direct branch connection at any location where a hole can be cut in the pipe
- A pressure responsive gasket provides the seal
- Request Publication 11.03 for Mechanical-T cross assemblies
- Pressure rated up to 500 psi/3450 kPa on steel pipe; also available for use with HDPE pipe
- Sizes from 2 × 1/2"/50 × 15 mm through 8 × 4"/200 × 100 mm

Size		Style No.	Max. Work Pressure@	Dimensions							Approx. Weight Each	
Run × Branch Nominal Size Inches mm	920 or 920N	psi kPa	Hole Diameter +0.13 -0.00	T** Inches mm	V ‡ # Thd. Inches mm	V ‡ Grv. Inches mm	W Inches mm	Y Inches mm	Z Inches mm	Female Thd. Lbs. kg	Grv. Lbs. kg	
TABLE CONTINUED FROM PAGE 4												
165.1 ×	1 25	920N	500 3450	1.50 38.1	3.88 99	4.56 116	—	3.79 96	9.34 237	2.75 70	8.0 3.6	—
	1¼ ¨ 32	920N	500 3450	1.75 44.5	4.43 113	5.13 130	—	3.79 96	9.34 237	3.25 83	8.4 3.8	—
	1½ (a) † ¨ 40	920N	500 3450	2.00 50.8	4.41 112	5.13 130	5.13 130	3.79 96	9.34 237	3.25 83	8.4 3.8	5.4 2.4
	2 (a) † 50	920N	500 3450	2.50 63.5	4.38 111	5.13 130	5.13 130	3.79 96	9.34 237	3.88 99	8.5 3.9	6.0 2.7
	76.1 mm	920	500 3450	2.75 69.9	4.01 110	5.13 130	5.21 132	3.63 92	10.51 267	4.63 118	8.6 3.9	7.6 3.4
	3 (a) † ¨ 80	920	500 3450	3.50 88.9	4.31 110	5.50 140	5.13 130	3.63 92	10.51 267	5.31 135	10.2 4.6	8.4 3.8
	4 (a) † ¨ 100	920	500 3450	4.50 114.3	3.81 97	5.75 146	5.38 137	3.63 92	10.51 267	6.25 159	10.5 4.8	8.4 3.8
	8 200 ×	2 (a) † 50	920	500 3450	2.75 69.9	5.44 138	6.19 157	6.25 159	4.81 122	12.42 316	4.50 114	11.6 5.3
2½ (a) † 65		920	500 3450	2.75 69.9	5.07 129	6.19 157	6.19 157	4.81 122	12.42 316	4.50 114	11.6 5.3	11.6 5.3
76.1 mm ¨		920	500 3450	2.75 69.9	5.25 133	—	6.25 159	4.81 122	12.42 316	4.56 116	—	11.6 5.3
3 (a) † ¨ 80		920	500 3450	3.50 88.9	5.31 135	6.50 165	6.50 165	4.81 122	12.42 316	5.31 135	12.6 5.7	11.6 5.3
4 (a) † ¨ 100		920	500 3450	4.50 114.3	4.81 122	6.75 171	6.38 162	4.81 122	12.42 316	6.25 159	15.3 6.9	12.5 5.7

** Center of run to engaged pipe end, female threaded outlet only (dimensions approximate).

† Available with grooved or female threaded outlet. Specify choice on order.

‡ Center of run to end of fitting.

Female threaded outlets are available to NPT and BSPT specifications.

@ See page 7 for Fire Protection approvals and pressure ratings.

(a) British Standard female pipe threaded outlet is available as listed. Specify "BSPT" clearly on order.

(b) For 76.1 mm threaded outlet, specify 2 1/2" BSPT clearly on order.

§ Vds approved for fire protection services

▣ LPCB approved for fire protection services

Ø Approved for use in China by Tianjin Approvals Company.

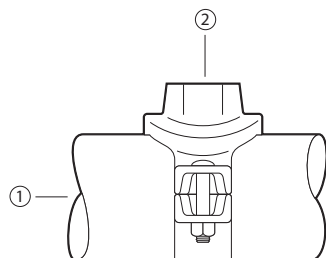
IMPORTANT NOTES:

Style 920 and Style 920N housings cannot be mated to **each other** to achieve cross connections.

Mechanical-T® Bolted Branch Outlets

STYLES 920 AND 920N

FLOW DATA



Exaggerated for clarity

Flow test data has shown that the total head loss between point (1) and (2) for the Style 920, 920N and 929 Mechanical-T® fittings can best be expressed in terms of the pressure difference across the inlet and branch. The pressure difference can be obtained from the relationship below.

C_v and K_v Values

Values for flow of water at +60°F/+16°C are shown in the table below.

Formulas for C_v/K_v Values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:

Q = Flow (GPM)

ΔP = Pressure Drop (psi)

C_v = Flow Coefficient

$$\Delta P = \frac{Q^2}{K_v^2}$$

$$Q = K_v \times \sqrt{\Delta P}$$

Where:

Q = Flow (m³/hr)

ΔP = Pressure Drop (Bar)

K_v = Flow Coefficient

OUTLET SIZE		Equivalent Length of Outlet Size Schedule 40 Carbon Steel Pipe (per UL 213, Sec. 16) (C = 120)† FT		C _v /K _v Values	
NOMINAL DIAMETER In/mm	ACTUAL O.D. In/mm	GROOVED	THREADED	GROOVED	THREADED
½	0.840	-	2	-	11
15	21.3	-		-	9.4
¾	1.050	-	4	-	16
20	26.7	-		-	13.7
1	1.315	3**	8	-	21
25	33.7			-	1.8
1 ¼	1.660	5 ½	6	50	48
32	42.7			42.9	41.1
1 ½	1.900	11	11	53	53
40	48.3			45.4	45.4
2	2.375	9	10 ½	112	104
50	60.3			96	89.1
2 ½	2.875	20	12 ½	119	150
65	73.0			102	128.5
76.1 mm	3.000	16*	-	161	-
	76.1			138.1	
3	3.500	14	15 ½	249	237
80	88.9			213.4	203.1
4	4.500	20	22	421	401
100	114.3			360.8	343.6

† Hazen-Williams coefficient of friction is 120.

* Pipe with a wall thickness of 0.165in./4.2mm.

** 1" FireLock™ Innovative Groove System (IGS) outlet

Mechanical-T[®] Bolted Branch Outlets

STYLES 920 AND 920N

FIRE PROTECTION APPROVALS AND PRESSURE RATINGS

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approvals agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Run Size		Outlet Size	Pipe	Approval Agency Rated Working Pressures – psi/kPa					
Nominal Size Inches/mm	Actual Outside Diameter Inches/mm			UL	ULC	FM	LPCB	Vds	
		Inches/mm	Schedule					(Style 920)	(Style 920N)
2 1/2 - 6 65 - 150	2.875 - 6.625 73.0 - 168.3	All	10, 40	400 2755	400 2755	400 2755	290 1999	232 1599	362 2496
2 1/2 - 4 65 - 100	2.875 - 4.500 73.0 - 114.3	All	DF	300 2065	300 2065	300 2065	290 1999	232 1599	362 2496
2 1/2 - 4 65 - 100	2.875 - 4.500 73.0 - 114.3	All	SF	300 2065	300 2065	300 2065	290 1999	232 1599	362 2496
6 150	6.625 168.3	3, 4	10	300 2065	300 2065	250 1724	290 1999	232 1599	362 2496
6 150	6.625 168.3	3, 4	30, 40	300 2065	300 2065	300 2065	290 1999	232 1599	362 2496
8 200	8.625 219.1	2 1/2	10, 40	400 2755	—	—	—	145 1000	—
8 200	8.625 219.1	3, 4	10	300 2065	—	250 1724	—	145 1000	—
8 200	8.625 219.1	3, 4	30, 40	300 2065	—	300 2065	—	145 1000	—

NOTES:

10 refers to Listed/Approved Schedule 10 steel sprinkler pipe.

40 refers to Listed/Approved Schedule 40 steel sprinkler pipe.

DF refers to Listed/Approved Dyna-Flow steel sprinkler pipe manufactured by American Tube Company.

SF refers to Listed/Approved Super-Flo steel sprinkler pipe manufactured by Allied Tube and Conduit Corporation.

VIC-TAP II HOLE CUTTING TOOL FOR 4 - 8"/100 - 200MM CARBON STEEL PIPE



The Vic-Tap II hole cutting tool is designed for use with the Style 931 Vic-Tap II Mechanical-T unit, which is a combination of the Style 920 Mechanical-T and Series 726 Vic-Ball Valve. The Vic-Tap II is capable of tapping into carbon steel pipe systems under pressures up to 500 psi/3450 kPa.

The Style 931 Vic-Tap II Mechanical-T unit is a full port ball valve which can be mounted on 4"/100mm, 5"/125mm, 6"/150mm and 8"/200mm diameter pipe. The Style 931 comes with a 2 1/2"/65mm grooved outlet.

The drill motor is an electric motor with ground fault circuit interrupter (GFCI) in accordance with safety codes.

For more information, refer to publication 24.01.

Mechanical-T[®] Bolted Branch Outlets

STYLES 920 AND 920N

INSTALLATION

Reference should always be made to the I-100 Victaulic Field Installation Handbook for the product you are installing. Handbooks are included with each shipment of Victaulic products for complete installation and assembly data, and are available in PDF format on our website at www.victaulic.com.

WARRANTY

Refer to the Warranty section of the current Price List or contact Victaulic for details.

NOTE

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

For complete contact information, visit www.victaulic.com

11.02 1480 REV 0 UPDATED 11/2018

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FlameGuard® Technical
FlameGuard® System Overview



Complete System of Pipe, Fittings & Solvent Cement
Corrosion Resistant • Superior Flow • Ease of Installation



Spears® **FlameGuard®** CPVC Fire Sprinkler Products provide a cost effective alternative to metal systems with advantages of high corrosion resistance, improved system hydraulics, ease of installation and quick assembly with readily available tools. CPVC Fire Sprinkler Systems are based on proven products that have been in continuous service for over 40 years. Spears® **FlameGuard®** products are approved by UL®, FM® Global, LPCB and Certified by NSF International for potable water use. Check local codes for restrictions and limitations.



Made in the U.S.A.

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas
See Spears® Product Sourcebook for product Offerings



Spears® FlameGuard® . . . The Leader in Innovative CPVC Fire Sprinkler System Products

Corrosion Resistant CPVC Material Does Not Sustain Biological Growth

Unlike metal systems, **FlameGuard®** CPVC products never rust, scale or pit and do not sustain biological growth - a cause of Microbiologically Influenced Corrosion (MIC) which can destroy metal fire sprinkler systems from the inside out.

Superior Flow Characteristics for Lower Friction Losses

The smooth-wall interior surfaces of **FlameGuard®** CPVC systems result in reduced friction loss over metal systems. The design flow characteristics remain constant throughout the life of the product because there is no interior corrosion in the system due to microbiological activity.

Pressure Rated to 175 psi (1200kpa) @ 150°F (65°C)

FlameGuard® CPVC Products are produced in combinations of Schedule 40 and Schedule 80 Fitting configurations conforming to ASTM F 438 or F 439 standards and **FlameGuard®** SDR 13.5 CPVC Fire Sprinkler Pipe conforming to ASTM F 442 standards. UL® Rated working pressure is 175 psi (1200kpa) @ 150°F (65°C) (LPCB rated to 120°F) (49°C).

Easy Installation for Lower Costs

FlameGuard® CPVC system installations significantly reduce costs over conventional metal piping by virtually eliminating prefabrication. Systems can be fully installed on site using solvent cement joining methods.

UL® Listed for U.S. and Canada in NFPA 13, 13R & 13D Systems

FlameGuard® CPVC Fire Sprinkler Products are UL® listed for U.S. and Canada applications for Light Hazard occupancies as defined in NFPA 13, Residential occupancies up to and including 4-stories as defined in NFPA 13R, and Residential occupancies for one and two family dwellings and manufactured homes as defined in NFPA 13D. Consult Spears® **FlameGuard®** CPVC Fire Sprinkler Products Installation Instructions and NFPA Standards for additional applications including air plenum, system risers, concealed, exposed, underground, combustible attic, garage, basement and low pressure dry piping installations.

Full Limited Lifetime Warranty

FlameGuard® CPVC Fire Sprinkler Products carry a limited lifetime warranty against defects in material or workmanship. Consult Spears® warranty for additional details.

Pioneer in Molded-in Metal Insert Head Adapters

Spears® pioneered the development of the **FlameGuard®** molded-in-place metal thread insert for connection of sprinkler heads to CPVC fire sprinkler systems, plus Metal FIPT threaded female adapters for metal-to-plastic transitions.

Developed the Special Reinforced (SR) Head Adapters

Spears® **FlameGuard®** continuous improvement program developed the technology to produce a superior patented plastic threaded fitting - the Special Reinforced (SR) Design. This unique design incorporates a patented thermoplastic compression process that equalizes stresses generated by tapered thread joint make-up. All CPVC plastic body and threads provide a more uniform construction and improved corrosion resistance.



Now, the Revolutionary TorqueSafe™ Gasket Sealed Head Adapter

- Requires NO Thread Sealants • Eliminates Stress • Prevents Over Tightening • Provides Easy Frame Alignment •

Spears® revolutionary design features a special molded-in-place Brass Thread Insert fitted with an elastomer gasket seal at the base of the threads. The gasket seal allows a modified thread design that eliminates radial stress and associated problems typical with tapered thread joint make up. The insert is designed to rotate for easy sprinkler frame alignment without overtightening. Patent No. 7,458,613.

Full Assortment of Specialty Products & Fitting Configurations

Spears® **FlameGuard®** provides the specialty fittings needed in today's fire sprinkler systems, Such as the adjustable drop nipple for fine-tuning to finished ceiling height, and ringed head adapter for ease of locating during installation. Plus, Spears® **FlameGuard®** line offers a full assortment of CPVC fire sprinkler fitting configurations including Tees, Elbows, Flanges, Couplings, Caps, Male Adapters, Grooved Coupling Adapters and Unions, sizes 3/4" through 3"; with new 3/4" and 1" Repair Couplings.

Complete Size Range of CPVC Pipe

Spears® **FlameGuard®** CPVC Fire Sprinkler Pipe is available in sizes 3/4" to 3". Conforms to ASTM F 442 standard for SDR 13.5 CPVC pipe.



Spears® Solvent Cements & Thread Sealant

FlameGuard® products should be installed using Spears® FS-5 One-Step Solvent Cement. For threaded joints, use Spears® **BLUE 75™** Thread Sealant that has been tested for compatibility with **FlameGuard®** CPVC Fire Sprinkler Products. Spears® **TorqueSafe™** Gasket Sealed Adapter requires no sealant. Consult sprinkler head manufacturer prior to use.





SPEARS® MANUFACTURING COMPANY
CORPORATE OFFICE
15853 OLDEN STREET • SYLMAR, CALIFORNIA 91342
MAILING ADDRESS: P.O. BOX 9203 • SYLMAR, CALIFORNIA 91392
Telephone (818) 364-1611 • Fax (818) 364-6945
www.spearsmfg.com

CERTIFICATE OF COMPLIANCE

FLAMEGUARD® CPVC FIRE SPRINKLER PRODUCTS

Spears® FlameGuard® CPVC Fire Sprinkler Products are fully tested and approved for use in wet pipe fire sprinkler systems by Underwriters Laboratories Inc., FM Global and the Loss Prevention Certification Board.

FlameGuard® CPVC Fire Sprinkler Products are approved for use in Low Pressure Dry Pipe and Pre-Action Systems by Underwriters Laboratories Inc.

FlameGuard® CPVC Fire Sprinkler Products are listed by NSF International for use in potable water systems.

FlameGuard® CPVC Fire Sprinkler Products may be used only in connection with UL®, FM and NSF® certified CPVC products of other manufacturers. Use of Spears® FlameGuard® CPVC Fire Sprinkler Products in connection with CPVC products of other manufacturers which are not UL®, FM and NSF® certified may result in inappropriate product application and inconsistent determinations in the event of warranty claims.

Spears® Manufacturing Company recommends that our FlameGuard® CPVC Fire Sprinkler Products be used in accordance with their listings and installed according to the manufacturer's installation instructions, NFPA Standards 13, 13R & 13D & local codes.

Alan Lunt
Vice President, Technical Services
alunt@spearsmfg.net

January 2016



FlameGuard®, LabWaste® and EverTUFF® CTS CPVC Installer Protection Plan Approved Products List

Updated 10-05-2016

FGAPL-7

The following commercial products have been tested and evaluated by Spears® for acceptable use with Spears® CPVC Products:

1. Firestop Sealants, Caulks & Sleeves

- Boss Fire & Safety - FireMastic-HPE Firestop Sealant
- Boss Fire & Safety - FireMastic-300 Firestop Sealant
- Boss® Products - BOSS® 813 Firestop
- Boss® Products - BOSS® 816 Intumescent Firestop Sealant
- Boss® Products - BOSS® 333 Polyurethane Expanding Foam
- Hilti - FS-One High Performance Intumescent Firestop Sealant
- Hilti - FS-One Max High Performance Intumescent Firestop Sealant
- Hilti - CP 606 Flexible Firestop Sealant
- Hilti - CP 601S Elastomeric Firestop Sealant
- Hilti - CP 506 Smoke and Acoustic Sealant
- Hilti - CFS-S SIL GG Firestop Sealant
- Jayco Firestop™
- Specified Technologies (STI) – SpecSeal® SSS Sealant
- Specified Technologies (STI) – SpecSeal® LCI Sealant
- Specified Technologies (STI) – BlazeStop™ WF300 Intumescent Firestop Caulk
- Specified Technologies (STI) – SpecSeal® LC Sealant
- Specified Technologies (STI) – SpecSeal® SIL Sealant
- Specified Technologies (STI) – SpecSeal® SIL S/L Sealant
- Specified Technologies (STI) – SpecSeal® SNS Sealant
- Specified Technologies (STI) – SpecSeal® AS Spray
- Specified Technologies (STI) – SpecSeal® SNS Spray
- FPPI/Tremco® – Caulk & Walk Firestop Sealant
- 3M™ Fire Barrier Water Tight Sealant 1003 SL
- 3M™ Fire Barrier Water Tight Sealant 1000 NS
- 3M™ Fire Barrier Water Tight Sealant 3000 WT
- 3M™ Fire Barrier Sealant IC 15WB+
- 3M™ Ultra GS Wrap Strip GS-40 Firestop Wrap
- RectorSeal® Metacaulk® 1000 Firestop Sealant
- RectorSeal® Metacaulk® MC 150+ Firestop Sealant
- RectorSeal® Metacaulk® 350i Firestop Sealant
- Walraven BIS Pacifyre® MK II Fire Sleeve Insulation
- White Lightning® Flame Buster®
- Handi-Foam® Fireblock Sealant by Fomo Products, Inc.
- Dow® – Great Stuff “Gaps & Cracks” Foam Sealant (non-professional version)
- Dow Corning® 795 Silicone Building Sealant

2. Fire Barriers

- Flame Safe Fire Poly FPCC
- Contego Fire Barrier Latex Primer

FlameGuard®, LabWaste® and EverTUFF®
CTS CPVC Installer Protection Plan
Approved Products List
Updated 10-05-2016

3. Antifreeze

- Follow NFPA Guidelines – DO NOT use Glycol antifreeze solutions.
- J. C. Whitlam Frost-Proof GL48

NOTE: Not a Listed Antifreeze per NFPA Requirements, contact local AHJ for approval

4. Anti MIC Coated Antimicrobial Metal Pipe

NOTE: Factory applied coatings only, after market coatings are NOT covered.

Antimicrobial Internally Coated Steel Pipe on Hybrid Systems

FM Approvals is one of several nationally recognized testing laboratories in the United States and offers information on the compatibility of antimicrobial internally coated steel pipe. FM's approval relates only to the acceptability of manufacturer's applied anti-mic coatings to steel pipe. [Click Here for FM Approvals](#) (Requires Website Registration)

5. Thread Sealants

- Spears® BLUE 75™ Thread Sealant
- Generic: PTFE Tape Thread Sealant (3.5 mil minimum), or use Spears® Gasket Sealed SofTorque™ and TorqueSafe™ head adapters that require NO Tape or Paste.
- FPPI® PipeFit® Thread Sealant
- J.C. Whitlam Blue Magic Industrial Thread Compound
- J. C. Whitlam Talon PTFE Compound Zero V.O.C Thread Sealant
- Permabond® LH056 Thread Sealant - For metal threads only. Approved for use in combination with metal systems.
- Mill-Rose Blue Monster™ Heavy-Duty Industrial Grade with PTFE
- Mill-Rose Blue Monster™ Paste Thread Sealant
- RectorSeal® T Plus 2 Pipe Thread Sealant with PTFE
- Oatey Great White Pipe Joint Compound with PTFE
- LA-CO® Leak-Tite® Blue
- LA-CO® Slick-Tite® Paste with PTFE

6. Thread Anti-Seize

- IMS High Heat Copper Flake Thread Lube and Anti-Seize #103783
- LA-CO EZ Break® Copper Grade

7. Cutting Oils

- Fire Protection Products, Inc. (FPPI®) - ThreadFit® Clear Cutting Oil
- Ridgid® Company - Ridgid® NU Clear
- Lube-Tech® / Lubrication Technologies - Ace Transul-Kut 3200
- Walker industries - CL-Free Plus
- Brecco Brecoil

8. Gasket Lubricant

- FPPI® LubeFit Gasket Lubricant

9. Foam Insulation

- Nomaco® Imcolock® Foam Insulation
- Nomaco® Nomalock® Foam Insulation
- Hilti CF 810 CJ Insulating Foam
- Hilti CF-AS CJP Insulating Foam

FlameGuard[®], LabWaste[®] and EverTUFF[®]
CTS CPVC Installer Protection Plan
Approved Products List
Updated 10-05-2016

10. Wood Protectant Coatings

- Eco Building Products – Eco Red Shield™
- Anabec Systems newBUILD White
- Anabec Systems newBUILD Clear
- Anabec Systems newBUILD Blue
- Anabec Systems X70 Clear
- Anabec Systems X70 White
- Anabec Systems X70 Blue
- Anabec Systems X90

11. Hangers/Supports*

- Clic[®] (NOTE: Clic hangers are not approved for FlameGuard[®] applications)
- Tolco
- B-Line
- PHD Manufacturing[®]

*It is the installing contractor's responsibility to ensure that the hangers & supports used are appropriate for the application and have any and all required listings and/or approvals

12. Miscellaneous Ancillary Products

- 3M™ Super 77™ Multipurpose Spray Adhesive
- Hart/Cooley F114 Residential Series Flexible Air Ducts
- Fiberlock AfterShock Fungicidal Coating
- InCide Technologies "Board Defense" Insecticide, Termiticide and Fungicide.
- FlexHead Flexible Drops (For FlameGuard[®] only)
- Erico Caddy Easy Snap Grommet
- Kolbi Wrap Around Pipe Marker
- Henkel OSI SC-175 Draft and Acoustical Sound Sealant
- Atco Flexible Duct System
- K-Flex[®] Isul-Tube[®]
- Skyline 5S105 Strapping Tape
- Abatix[®] Max[®] Heavy-Duty Spray Adhesive
- Ward Flex CSST Gas Tubing
- Raychem XL-Trace Heat Cable with Tape
- HDX Black 3.5 mil Plastic Sheeting
- Victaulic[®] Vic-Flex™ Sprinkler Fittings Series AH2 Braided Flexible Hose
- Victaulic[®] VicFlex™ Dry Sprinkler Style VS1

FlameGuard®, LabWaste® and EverTUFF®
CTS CPVC Installer Protection Plan
Approved Products List
Updated 10-05-2016

This Installer Protection Plan does NOT cover:

- Pipe that has been allowed to freeze by homeowner or contractor.
- “Acts of God”, i.e., tornadoes, earthquakes, landslides, etc.
- Poor workmanship and installation errors.

Spears® laboratory testing has shown these products to be compatible with satisfactory performance in normal installation of CPVC products. However, the potential for compatibility problems can be present in installations where CPVC materials are highly stressed. Such situations include, but are not limited to, inadequate compensation for thermal expansion and contraction, excessive bending beyond specified limits, improper pipe hanger or anchor selection or installation, over tightening of threaded joints, and other improper CPVC installation practices yielding high stress loads. Proper installation of each product in accordance with the manufacturer’s published Installation Instructions, Spears® FlameGuard® CPVC Fire Sprinkler Products Installation Instructions, EverTUFF® CTS CPVC Installation Instruction, and LabWaste® CPVC Corrosive Waste Drainage System Installation Instructions is essential. PLEASE NOTE: Not all products listed are suitable for all applications. Check product requirements.



CPVC

Fire Sprinkler Products

INSTALLATION INSTRUCTIONS



Visit our website:
www.spearsmfg.com

FlameGuard® LIMITED LIFETIME WARRANTY

Except as otherwise mandated by law or herein provided, Spears® Manufacturing Company ("Company") warrants Standard Catalog Products ("Products") which have been directly manufactured by them to be free from defects in material and workmanship for as long as the original intended end user of the Products ("End User") retains ownership and possession of the Products and complies with this Warranty ("Warranty Period"). Products installed with pipe, fittings, valves, solvent cements, threads sealants or other related products, not manufactured by this company, are subject to review and may be exempt at the sole discretion of the Company. Each other person or entity acquiring or employing the Products, including buyers, contractors and installers ("Buyer") and End Users ("Buyer/End User") agrees that this Warranty shall be effective only during the Warranty Period so long as the Products are used solely for the normal purposes for which they are intended and in conformance with industry established standards, engineering, installation, operating, and maintenance specifications, recommendations and instructions including explicit instructions by the Company; the Products are properly installed, operated and used, and have not been modified; and all the other terms of this Warranty are complied with. Any violation thereof shall void this Warranty and relieve Company from all obligations arising from this Warranty and the Products.

Upon receipt or discovery of any Products that appear questionable or defective each Buyer/End User shall promptly inspect and return any such Product to the Company at 15853 Olden Street, Sylmar, California 91342, accompanied by a letter stating the nature of any problems. If the Products are determined by Company to be defective in materials or workmanship directly provided by Company, Company, at its sole option, may either repair or replace the defective Products, or reimburse applicable Buyer/End User for the cost of such Products. The applicable Buyer/End User shall bear all applicable shipping costs. THIS SHALL BE BUYERS/END USERS' SOLE REMEDY. EACH BUYER/END USER AGREES THAT COMPANY WILL NOT BE RESPONSIBLE FOR ANY OTHER OBLIGATIONS RELATING TO THE PRODUCTS, INCLUDING ANY OTHER MATERIALS OR LABOR COSTS, LOSS OF USE OR ANY OTHER ITEM OR FOR ANY DELAYS IN COMPLYING WITH THIS WARRANTY BEYOND COMPANY'S REASONABLE CONTROL.

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BY ITS ACCEPTANCE OF THE PRODUCTS, EACH BUYER/END USER EXPRESSLY WAIVES ALL OTHER LIABILITY OR OBLIGATION OF ANY KIND OR CHARACTER OF COMPANY, INCLUDING LIABILITY PREDICATED UPON CONTRACT, TORT, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE GROUNDS, AND ALL, IF ANY, DAMAGES AND LOSSES AS A RESULT THEREOF, INCLUDING ALL, IF ANY, COMPENSATORY, GENERAL, SPECIAL, CONSEQUENTIAL, INCIDENTAL, OR PUNITIVE DAMAGES. WITH RESPECT TO SUCH WAIVERS, EACH BUYER/END USER EXPLICITLY WAIVES CALIFORNIA CIVIL CODE §1542 WHICH STATES "A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THIS RELEASE, WHICH IF KNOWN BY HIM MUST HAVE MATERIALLY ADVERSELY AFFECTED HIS SETTLEMENT WITH DEBTOR" AND ALL OTHER SIMILAR STATUTORY, COMMON AND CASE LAW RIGHTS, DEFENSES AND LIMITATIONS.

Having previously independently inspected the Products, or a sample, as fully as desired, or having the opportunity to and having not done so, upon acceptance of delivery of the Products, and except as otherwise herein explicitly provided, each Buyer/End User by acceptance or use of the Products accepts them in their "AS IS" and "WITH ALL FAULTS" condition without any other warranty, expressed, implied or otherwise, and accepts and assumes the entire risk and cost of all servicing, remediation and consequences thereof. This Warranty shall be governed by California law and any unenforceable provisions severed without affecting the remaining provisions. As used herein, "including" includes "without limitation."

TABLE OF CONTENTS

Warranty _____	Inside Cover
IMPORTANT INFORMATION _____	4
Use of this Manual • Hazards & Information Definitions _____	4
System Engineering, Installation & Maintenance _____	4
Installer Training _____	5
General Installation Safety Instructions _____	5
Introduction _____	5
Handling & Storage _____	6
Pipe & Fittings _____	6
One-Step Solvent Cement _____	6
Listing, Approvals, Application & Use _____	7
Light Hazard Occupancies _____	7
Residential Occupancies _____	8
Low Pressure Dry Pipe and Pre-action Systems _____	8
Concealed Installations _____	9
Combustible Concealed Installation with Specific Use Sprinklers _____	10
Combustible Attic Spaces with Specific Use Sprinklers _____	10
Exposed Installations _____	10
Expanded Use with Light Hazard Extended Coverage and Residential Sprinklers _____	11
Unfinished Basement with Exposed Solid Wood Joist Installation _____	12
Extended Coverage Quick Response Sprinklers _____	16
Return Air Plenum Installation • Garage Installations _____	17
Ambient Temperature Limitations • High Temperature Areas _____	17
Cold Temperature Areas _____	18
Fire Sprinkler System Risers _____	19
Underground Fire Service • C-UL Listing Requirements _____	20-21
Factory Mutual Approvals _____	22
Loss Prevention Certification Board LPCB _____	22-23
NSF International _____	23
Penetrating Fire-related Walls & Partitions _____	23
Heat Sources & Open Ceiling Areas _____	23
Use With Other Manufacturers' Pipes, Fittings & Solvent Cement _____	24
Installation & Joining _____	24
Solvent Cement Welded Joints _____	24
Solvent Cement Requirements _____	29
Threaded Connections _____	29-30
TorqueSafe™, QuickTorque™ & SofTorque™ Gasket Sealed Thread Connections _____	31-32
GripLoc™ Fitting Connections _____	33
Painting Pipe & Fittings • Cleaning _____	34
Transition to Other Materials • Flanged Connections _____	34
Flange Data & Bolt Torque • Grooved Coupling Adapters _____	35-36
Adjustable Sprinkler Head Adapter Installation _____	37
Flushing System _____	38
System Acceptance Testing (Hydrostatic Pressure Test) _____	39
Recommended Cut-in Procedures for Systems Modification or Repair _____	39
Engineering Data _____	41
Pipe & Fitting Specifications • Hydraulic Design _____	42
Allowance for Friction Loss in Fittings _____	42
Hanger & Supports _____	43
Riser Support _____	46
Exposed Installations • Earthquake Bracing • Trenching _____	47
Snaking/Deflection of Pipe _____	48
Backfilling _____	49
Material Properties _____	50
Expansion & Contraction _____	51
Expansion Loop & Offset Configurations _____	52-54
Review - Do's & Don'ts _____	56-57
Material Safety Data Sheet _____	58-65

IMPORTANT INFORMATION

Please Read the Following Section Before Proceeding

Use of this Manual

Spears® FlameGuard® CPVC Fire Sprinkler Products are approved for use in combination with other listed manufacturers' products (see, "Use With Other Manufacturers' Pipes, Fittings, and Solvent Cements" section). However, specific application approvals may not be the same amongst manufacturers. **It is the installer's responsibility to verify suitability of products used in combination according to each manufacturer's installation instructions.** Engineering data related to the installation and use of CPVC Fire Sprinkler Pipe provided in this manual is based on product manufactured by Spears® Manufacturing Co. (Spears® FlameGuard®). If products other than Spears® are used, follow the appropriate manufacturer's installation instructions. Contact Spears® if questions on any application are not addressed in this manual.

This manual is intended for use by specifiers, installers, and users in the selection, design, installation, and inspection of Spears® FlameGuard® CPVC Fire Sprinkler Products for fire protection service. Due to the critical safety and loss prevention uses of such systems, all information contained herein is considered vital to obtain proper system performance and **must be read and understood carefully before starting the installation.** The information contained within this manual is accurate at the time of publication to the best of our knowledge. It is not meant as a replacement for formal installer training. We do not make any guarantees nor assume any liabilities arising out of its use. If you need additional copies, or if you have any questions about the safe installation and use of these products, contact Spears® Manufacturing Company, P.O. Box 9203, Sylmar, CA 91392 or call (800) 862-1499. Additional copies of this manual may be downloaded from our web site: www.spearsmfg.com.

Hazards & Information Definitions

Definitions for identifying the various hazard levels are as follows:

- **WARNING** - The use of the word "WARNING" identifies the presence of hazards or unsafe practices that could result in severe personal injury if instructions, including recommended precautions, are not followed.
- **CAUTION** - The use of the word "CAUTION" identifies possible hazards or unsafe practices that could result in personal injury, product damage, and/ or property damage if instructions, including precautions, are not followed.
- **NOTICE** - The use of the word "NOTICE" identifies special instructions that are highly important but not related to hazards.
- Text information in bold print – **Text in bold print identifies additional important information that may or may not be related to a hazard, according to the topic and context.**

System Engineering, Installation & Maintenance

CPVC Fire Sprinkler Systems must be engineered, installed and maintained in accordance with local codes, standards and Spears® FlameGuard® CPVC Fire Sprinkler Products Installation Instructions. Code requirements and field conditions may differ. It is the responsibility of the installing contractor to ensure that the product is suitable for the intended use and that all requirements have been satisfied.

Installer Training

Spears® Manufacturing Company recommends that installers receive proper installation training and that training be renewed every two (2) years. Training will be provided at no charge by contacting an authorized Spears® FlameGuard® CPVC Fire Sprinkler Products distributor or your nearest Spears® Regional Distribution Center.

General Installation Safety Instructions

- Use only recommended accessories. Use of improper accessories or unapproved system components in conjunction with Spears® FlameGuard® CPVC Fire Sprinkler Products will void the warranty and may result in improper operation of the system.
- **CAUTION:** Avoid dangerous environments. If utilizing electrically powered tools for installation, be sure that the area is free of moisture or wetness that could create an unsafe condition. Keep work area clean and well illuminated. Allow sufficient space for measuring and system dry-fit to accommodate proper installation.
- Prevent back injury. Always practice safe lifting and installation techniques.
- Use only tools specifically designed for plastic pipe and fittings.
- Inspect the products. Be sure that all parts are included and that you have all necessary tools available to properly install the system.

CAUTION: Follow all workplace safety requirements. Wear safety glasses, hardhat, and safety footwear. Always practice safety first.

- When solvent cementing, always work in a well-ventilated area. Avoid sources of heat or open flames. DO NOT smoke. Wear protective gloves. PVA-coated protective gloves are recommended for use while solvent cementing. If hands come in contact with solvent cement, use a waterless, abrasive soap.
- Wear ear protection. Protect your hearing if you are exposed to long periods of very noisy job-site operations.

INTRODUCTION



Spears® FlameGuard® CPVC Fire Sprinkler Products are manufactured from high quality, Post-Chlorinated Poly Vinyl Chloride (CPVC), a specialty thermoplastic material tested and approved by certifying agencies for use in CPVC fire sprinkler systems. Spears® FlameGuard® CPVC Fire Sprinkler Products provide unique advantages over traditional metal fire sprinkler systems through superior hydraulics, ease of installation and handling and quick assembly using readily available, inexpensive tools.

Handling & Storage

Pipes & Fittings

Spears® FlameGuard® CPVC Fire Sprinkler Products resist attack from a large group of chemicals that are corrosive to metallic piping. However, care must be taken to avoid contact with chemicals that are harmful to CPVC including those found in some common construction products. Specific chemicals or chemical vapors that contact CPVC can weaken or severely damage the system. Consult with the chemical manufacturer or Spears® before use.

WARNING: DO NOT expose Spears® FlameGuard® CPVC Fire Sprinkler Products to edible oils, esters, ketones, or petroleum-based products, such as cutting oils, packing oils, traditional pipe thread pastes or dopes, and some lubricants. Do not store or install CPVC products in direct contact with plasticizer containing materials such as electrical tape or certain wire and cable insulations. Consult with the chemical manufacturer for compatibility with CPVC or Spears® before use. Contact with incompatible chemicals could cause serious personal injury, property damage, and product damage.

Spears® FlameGuard® CPVC Fire Sprinkler Pipe should be stored indoors with a maximum storage temperature of 110° F (43° C). If storing outdoors, the products must be covered with a non-transparent material to prevent extended exposure to sunlight. Brief exposure to direct sunlight on the job site may result in color fade, but it will not affect the physical properties. Spears® FlameGuard® CPVC Fire Sprinkler Fittings should be stored indoors in their original containers to keep them free from dirt and to help reduce the possibility of damage.

WARNING: Spears® FlameGuard® CPVC Fire Sprinkler Products must not be subjected to prolonged sunlight exposure. The use of pipe and fittings that have been damaged due to improper storage could cause serious personal injury, property damage, and product damage.

Reasonable care must be exercised in handling Spears® FlameGuard® CPVC Fire Sprinkler Products. DO NOT drop the products or drop anything on them.

WARNING: DO NOT install Spears® FlameGuard® CPVC Fire Sprinkler Products that have been scratched, split, or gouged. The use of pipe and fittings that have been damaged due to improper handling could cause serious personal injury, property damage, and product. Damaged fittings or sections of pipe must be discarded

One-Step Solvent Cement

Spears® FS-5 One-Step Low VOC Solvent Cement must be stored out of direct sunlight in an ambient temperature between 40° F (4° C) and 90° F (32° C). The solvent cement may be used for a period of two years from the date stamped on the container. Expired solvent cement must be discarded in an environmentally friendly fashion, in accordance with local regulations. To prolong the life of the cement, the containers must be kept tightly closed when not in use and covered as much as possible when in use.

WARNING:

- Spears® FS-5 One-Step Low VOC Solvent Cement is highly flammable. Eliminate all ignition sources.
- Avoid breathing vapors. Use only with adequate ventilation. Explosion-proof, general mechanical ventilation or local exhaust is recommended to maintain vapor concentrations below

recommended exposure limits. In confined or partially enclosed areas, a NIOSH approved organic vapor cartridge respirator with a full face-piece is recommended. Avoid frequent contact with skin. It is recommended that you wear PVA coated gloves and an impervious apron.

- Avoid contact with eyes. Splash-proof chemical goggles are recommended.
- Review the Material Safety Data Sheet (MSDS) and the important product information provided on the label for Spears® FS-5 One-Step Low VOC Solvent Cement.
- Failure to follow the above recommendations could result in death or serious personal injury.

Listings, Approvals, Application & Use

Spears® FlameGuard® CPVC Fire Sprinkler Products are fully tested and approved for use in wet pipe fire sprinkler systems by Underwriters Laboratories Inc., FM Global, and the Loss Prevention Certification Board. Spears® FlameGuard® CPVC Fire Sprinkler Products are approved for use in low pressure dry pipe or pre-action systems by Underwriters Laboratories Inc. Spears® FlameGuard® CPVC Fire Sprinkler Products are listed by NSF International for use in potable water systems, except where specifically stated otherwise. For specific listing information not covered in this manual concerning Factory Mutual, The Loss Prevention Certification Board or NSF International, please contact your nearest Spears® Regional Distribution Center.

NOTICE: National Fire Protection Association (NFPA) Standards 13, 13R, and 13D is the authority on fire sprinkler system design and installation and must be referenced in conjunction with this manual and all local codes. This manual is reviewed and approved by Underwriters Laboratories and all UL/ULC statements herein are considered an extension of Spears® FlameGuard® UL Listings

CAUTION: Spears® FlameGuard® CPVC Fire Sprinkler Products are NOT listed for outdoor applications. Outdoor installation could result in product failure and property damage and will not be covered under the Spears® FlameGuard® CPVC Fire Sprinkler Products warranty.

CAUTION: Spears® FlameGuard® CPVC Fire Sprinkler Products are to be used in wet pipe systems only, except as provided for dry pipe or pre-action systems in this manual. A wet pipe system is one that contains water and is connected to a water supply system so that the water will discharge immediately when the sprinkler is opened. A low pressure dry pipe or pre- action system is a piping system containing air or nitrogen under pressure that is released with the opening of a sprinkler which activates a special dry pipe valve allowing water to flow into the piping system and to the open sprinkler.

WARNING: Spears® FlameGuard® CPVC Fire Sprinkler Products must never be used for distribution of compressed air or other gases except as provided for under Low Pressure Dry Pipe and Pre-action Systems specified in this manual. Failure to follow this warning could result in product failure, property damage and severe personal injury or death.

Light Hazard Occupancies

Spears® FlameGuard® CPVC Fire Sprinkler Products are UL Listed for use in Light Hazard Occupancies, as defined in the NFPA 13. In accordance with NFPA 13, 2016 Edition paragraph 6.3.9.6, "Non-Metallic pipe listed for light hazard occupancies shall be permitted to be installed

in ordinary hazard rooms of otherwise light hazard occupancies where the room does not exceed 400 square feet.” NOTICE: Local jurisdictions must approve of this exception.

Residential Occupancies

Spears® FlameGuard® CPVC Fire Sprinkler Products are UL Listed for use in: Residential occupancies up to and including four stories in height, as defined in NFPA 13R.

Residential occupancies, as defined in the Standard for the Installation of Sprinkler Systems in One and Two-Family Dwellings and Manufactured Homes, NFPA 13D.

Low Pressure Dry Pipe and Pre-action Systems

In accordance with the UL® Listing, Spears® FlameGuard® CPVC Fire Sprinkler Products may be used in Low Pressure Dry Pipe and Pre-action System applications in Light Hazard and Residential occupancies in accordance with NFPA 13, 13D and 13R when subject to the following additional limitations:

A CPVC Low Pressure Dry Pipe or Pre-action System is a piping system intended for use where piping could be subjected to freezing temperatures and water filled pipe cannot be utilized. The minimum rated temperature is -20° F (-29° C). Low Pressure Dry Pipe systems contain compressed air or nitrogen (gas) having an internal gage pressure of not more than 15 psig (105 kPa). These specially designed systems require separate control valve mechanisms for this application (supplied by others) that activate to release water into the dry piping section and to the sprinkler heads. The water-filled portion of the system control device must be in an area protected from freezing. It is the installer’s responsibility to be sure the system is installed in accordance with the limitations of this manual and specifications of a Dry Pipe or Pre-action Fire Sprinkler System Design Engineer for proper control devices, pipe sizing, and other important design and maintenance criteria applicable to each project. CPVC dry systems must be designed with the following maximum water delivery time delay.

Occupancy Hazard*	Remote Sprinklers Open	Water Delivery Delay, sec.
Residential	1	15
Light	1	60

*As described in NFPA 13, Standard for the Installation of Sprinkler Systems.

Spears® FlameGuard® CPVC Fire Sprinkler Products are UL® Listed for use in Dry Pipe or Pre-action type systems when installed with UL® Listed Spears® FlameGuard®, or BlazeMaster® brands of CPVC Fire Sprinkler Products that are also Listed for this application.

CPVC installation in a Dry Pipe or Pre-action sprinkler system must be concealed (protected) by either:

- (1) A 3/8 in. thick or thicker gypsum wallboard;
- (2) A suspended membrane ceiling with lay-in panels or tiles having a weight of not less than 0.35 lb/ft2 when installed with metallic support grids; or
- (3) 1/2 in. plywood soffits.

CPVC pipe and fittings used in a Dry Pipe or Pre-action System are not for use in combustible concealed spaces where sprinklers are required by NFPA 13, 13D and 13R.

Pipe and fittings are for indoor use only, down to a minimum temperature of -20° F (-29° C).

CPVC pipe in Dry Pipe or Pre-action Systems must be installed with proper pitch to allow system drainage for removal of water. NFPA 13 requires a minimum pitch of 1/2 inch per 10 feet (4 mm/m) for main lines and branch lines in areas subject to freezing.

The following types of sprinklers and arrangements shall be permitted for dry pipe systems, current NFPA 13:

- (1) Upright sprinklers;
- (2) *Listed dry sprinklers;
- (3) Pendent sprinklers and sidewall sprinklers installed on return bends, where the sprinklers, return bend, and branch line piping are in an area maintained at or above 40° F (4° C);
- (4) Horizontal sidewall sprinklers installed so that water is not trapped;
- (5) Pendent sprinklers and sidewall sprinklers, where the sprinklers and branch line piping are in an area maintained at or above 40° F (4° C), the water supply is potable, and the piping for the dry pipe system is copper or CPVC specifically listed for dry pipe applications.

Residential sprinklers used in CPVC Dry Pipe Systems shall be specifically listed for such use.

Low Pressure Dry Systems have a maximum installed air pressure of 15 psi (1 BAR). Air (or Nitrogen) supply for charging the system must be filtered, clean, oil-free, and must be pressure regulated to assure that the 15 psi (1 BAR) pressurization is not exceeded.

WARNING – Oil in the air (or Nitrogen) supply can cause environmental stress cracking in CPVC materials.

WARNING – Over pressurization can result in system damage or serious injury.

The system must be hydrostatically tested in accordance with System Acceptance Testing (Hydrostatic Pressure Test) as specified in this manual.

Concealed Installations

In concealed installations, the minimum protection shall be one layer of 3/8-inch gypsum wallboard, 1/2-inch plywood soffits, or a suspended membrane ceiling with lay-in panels or tiles having a minimum weight of not less than 0.35 lbs/ft² when installed with metal support grids. The minimum protection for residential occupancies, defined in NFPA 13D and 13R, may consist of one layer of 1/2-inch plywood.

Spears® FlameGuard® CPVC Fire Sprinkler Products must be used in sprinkler systems employing sprinkler heads rated at 225° F (107° C) or lower.

NOTICE

- Spears® FlameGuard® CPVC Fire Sprinkler Products CANNOT be installed
- in spaces designated by NFPA 13 as combustible, concealed spaces that require sprinklers, unless the space is protected by sprinklers that are specifically Listed for the application.
- NFPA 13D and NFPA 13R permit the omission of sprinklers in combustible, concealed spaces. Spears® FlameGuard® CPVC Fire Sprinkler Products can be installed in these areas when sprinkling residential occupancies in accordance with these standards.

Combustible Concealed Installations with Specific Use Sprinklers

In accordance with UL Listing, Spears® FlameGuard® CPVC Fire Sprinkler Products can be used in specific light-hazard, combustible and noncombustible concealed spaces that require sprinkler protection when installed with UL Listed specific application sprinklers. The system must be installed in accordance with the applicable sprinkler manufacturer's information contained in their designated data sheets shown in parenthesis "()". These include: Victaulic Model V2502 (Submittal 40.09, Rev D) Upright Quick Response Sprinkler; Tyco Fire Products Model CC1 – 2.8 K-Factor (TFP630, July 2015) or Model CC2 – 5.6 K-Factor (TFP632, August 2016) or Model CC3 – 4.2 and 5.6 K-Factor (TFP633, December 2016) Combustible Concealed Space Sprinklers, Specific Application Upright; Viking VK900 COIN™ (Form F_110503 16.12.22 Rev 16.1) or VK901 COIN™ (Form F_021607 16.12.22 Rev 16.1) or VK950 COIN™ (Form F_081216 16.12.15 Rev 16.1) Quick Response Upright Sprinklers for Specific Application; Reliable Model KFR-CCS 5.6 K-Factor (Bulletin 044 Rev C) Combustible Concealed Space Upright Sprinkler; and Globe Model "IC" GL5608 (Bulletin GL5608, September 2015) Interstitial Combustible Specific Application Upright Sprinkler.

NOTICE: When installing Spears® FlameGuard® CPVC Fire Sprinkler Products in combustible concealed areas where sprinklers are required, the specific application sprinkler must be used in accordance with its UL Listing. Contact the local authority having jurisdiction with questions concerning code requirements.

Combustible Attic Spaces with Specific Use Sprinklers

Product Description

In accordance with the UL Listing, Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed within the attic space provided the attic space is protected with UL Listed Specific Application Attic Sprinklers. Specific Application Attic Sprinklers are sprinklers designed to provide protection of specific light hazard combustible, as well as non-combustible, attic spaces requiring sprinkler protection.

Installation Requirements

When using the Specific Application Attic Sprinklers, Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed to feed the wet system sprinklers below the ceiling and exposed to feed wet system specific application attic sprinklers provided the system is installed in accordance with the applicable sprinkler manufacturer's information contained in their designated data sheets shown in parenthesis "()". These include: Tyco Fire Products Models BB, SD, HIP and AP (TFP610, August 2014) Specific Application Sprinklers for Protecting Attics; Reliable Models DD56-6, DD26-27, DD80-6 and DD80-27 (Bulletin 056, December 2016) Specific Application, Attic Sprinklers; Viking Model VK696 (Form F_042815 16.01.28 Rev 16.1) Attic Upright Specific Application Sprinkler or Model V-BB (Form F_042915 16.08.04 Rev 16.2) Specific Application Attic Sprinkler or Model V-SD (Form F_043015 16.02.19 Rev 16.1) Specific Application Attic Sprinkler.

Exposed Installations

Spears® FlameGuard® CPVC Fire Sprinkler Products are UL Listed for use in installations without protection (exposed), with the following restrictions:

Exposed CPVC Fire Sprinkler piping is installed below a smooth, flat, horizontal ceiling construction utilizing UL Listed support devices.

- Listed, Quick-Response, ordinary temperature-rated pendent sprinklers having deflectors installed within 8 inches from the ceiling. Listed, Residential, ordinary temperature-rated, pendent sprinklers located in accordance with their Listing. The maximum distance between sprinklers must not exceed 15 feet. The piping must be mounted directly to the ceiling.
- Listed, Quick-Response, ordinary temperature-rated horizontal sidewall sprinklers having deflectors installed within 6 inches from the ceiling and within 4 inches from the sidewall. Listed, Residential, ordinary temperature rated horizontal sidewall sprinklers located in accordance with their Listing. The maximum distance between sprinklers must not exceed 14 feet. The piping must be mounted directly to the sidewall.
- Listed, Quick-Response, upright sprinklers having a maximum temperature rating of 155° F (68° C) must be installed so that the deflectors are a maximum of 4" from the ceiling. The maximum distance from the ceiling to the centerline of the main run of pipe must be 7-1/2". The distance between a hanger and the centerline of an upright sprinkler shall not be less than 3in. (75mm). Rigid pipe hangers secured to the ceiling must be used.

Expanded Use with Light Hazard Extended Coverage and Residential Sprinklers

In accordance with the UL Listing, Spears® CPVC Fire Sprinkler products may be installed without protection (exposed) when subject to the following additional limitations.

The following installations shall be below a smooth, flat, horizontal ceiling construction and require the use of FS-5 one step solvent cement. The piping shall be mounted directly to the sidewall.

Listed quick response, 200° F (93° C) maximum temperature rated, horizontal sidewall sprinklers having deflectors installed within 12 inches (304 mm) from the ceiling and within 6 inches (152 mm) from the sidewall or Listed residential, 200° F (93° C) maximum temperature rated, horizontal sidewall sprinklers located in accordance with their Listing and a maximum distance between sprinklers not to exceed 14 feet (4.27 m).

The following installations shall be below a smooth, flat, horizontal ceiling construction, are limited to unobstructed construction, require the use of Schedule 80 fittings for sizes 1-1/2 in. and greater, and require the use of FS-5 one step solvent cement. The piping shall be mounted directly to the sidewall. • Listed light hazard, extended coverage, quick response, 175° F (79° C) maximum temperature rated, horizontal sidewall sprinklers having deflectors installed within 12 inches (304 mm) from the ceiling and within 6 inches (152 mm) from the sidewall, a maximum distance between sprinklers not to exceed 16 feet (4.87 m), and an application density not less than 0.10 gpm/ft² (4.08 mm/min).

- Listed residential, 165° F (74° C) maximum temperature rated, horizontal sidewall sprinklers having deflectors installed within 12 inches (304 mm) from the ceiling and within 6 inches (152 mm) from the sidewall, a maximum distance between sprinklers not to exceed 18 feet (5.48 m), and an application density not less than 0.10 gpm/ft² (4.08 mm/min).
- Listed light hazard, extended coverage, quick response 165° F (74° C) maximum temperature rated, horizontal sidewall sprinklers having deflectors installed within 12 inches (304 mm) from the ceiling and within 6 inches (152 mm) from the sidewall, a maximum distance

between sprinklers not to exceed 18 feet (5.48 m), and an application density not less than 0.10 gpm/ft² (4.08 mm/min).

- Listed light hazard, extended coverage, quick response, 155° F (68° C) maximum temperature rated, horizontal sidewall sprinklers (manufactured by Reliable Automatic Sprinkler Co. Inc. SIN RA0362) having deflectors installed within 12 inches (304 mm) from the ceiling and within 6 inches (152 mm) from the sidewall, a maximum distance between sprinklers not to exceed 24 feet (7.31 m), and a flow not less than 40 gpm (152 L/min) per sprinkler.

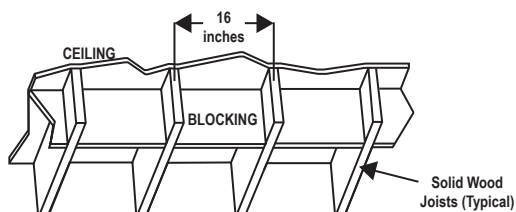
Spears® FG-3 installation instructions must be referenced for complete information regarding installation. Additional requirements may be listed in NFPA 13, 13D and 13R.

Unfinished Basements with Exposed Solid Wood Joist

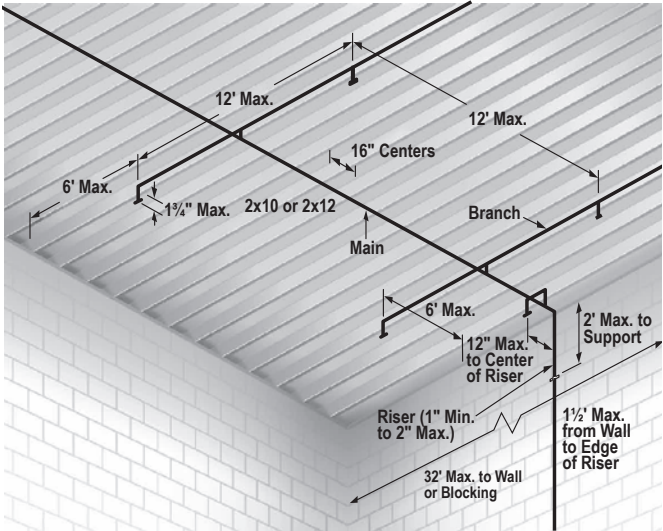
NOTICE: Use of Spears® FlameGuard® CPVC Fire Sprinkler Products is limited to basements where the quantity and combustibility of contents is low and fires with relatively low rates of heat release are expected. Refer to NFPA 13D, "Standard for Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes", for more information regarding installation in unfinished basements with exposed, solid wood joists.

Spears® FlameGuard® CPVC Fire Sprinkler Products can be installed in unfinished basements with exposed, solid wood joists with the following limitations:

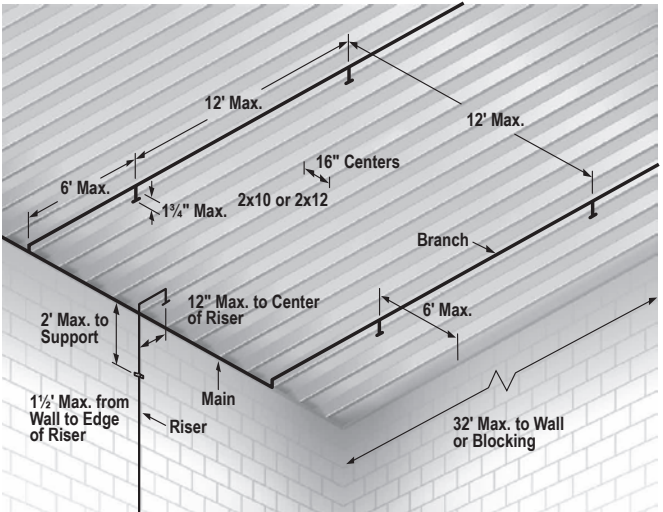
1. The ceiling shall be horizontal and constructed utilizing nominal 2 in. x 10 in. solid wood joists on 16 in. centers.
- OR -
The ceiling must be horizontal and constructed utilizing nominal 2 in. x 12 in. solid wood joists on 16 in. centers. When installing Spears® FlameGuard® CPVC Fire Sprinkler Products in conjunction with 2 in. x 12 in. solid wood joists, the maximum system working pressure under flowing conditions must not exceed 100 psi and the maximum system working pressure under non-flowing conditions must not exceed 175 psi.
2. Schedule 80 fittings are required for installations involving 1-1/2" through 3" piping.
3. The distance from the floor to the bottom of the solid wood joists must be between 7 ft and 8 ft.
4. All system mains shall be run perpendicular to the joists. All branch lines shall be run parallel to the joists.
5. When the total protected area exceeds 1,000 square feet, blocking shall be utilized to divide the area into individual compartments not exceeding 1,000 square feet.
6. The maximum length along the joist must not exceed 32 feet. When the length exceeds 32 feet, blocking must be utilized. The blocking must be constructed of minimum 1/2 in. plywood and shall be the full depth of the wood joists. Refer to drawing below.



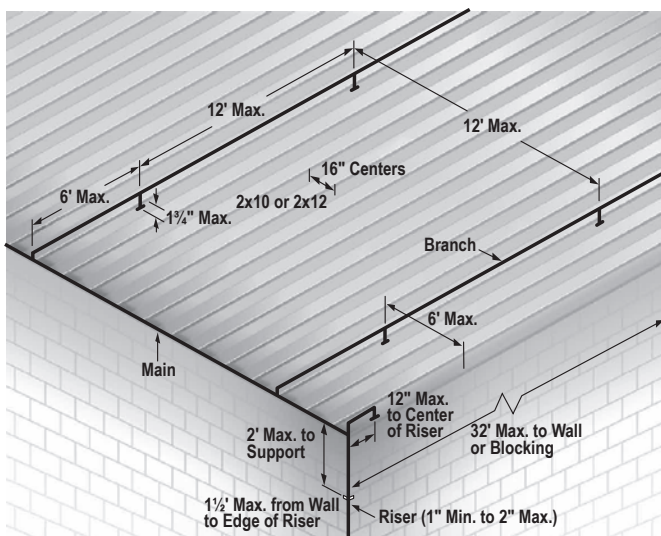
Center Wall Riser with Center Room Main



Center Wall Riser with Main at Wall



Riser in Corner



7. Listed residential pendent sprinklers with a maximum temperature rating of 155° F and a minimum K-factor of 3.0 must be used for this type of installation. **NOTE:** The maximum sprinkler spacing shall not exceed 12 feet.
8. The system must be designed to UL Listed flows for the sprinklers being used. However, the flow must not be less than 11 gpm per sprinkler. Sprinklers must be installed with the deflectors below the solid wood joists for future installation of a finished ceiling. However, deflector placement must not exceed 1-3/4 inches below the solid wood joist (refer to following Figures "A" and "B"). For more information, refer to NFPA 13D, "Standard for Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes".

Branches Supported with Blocking

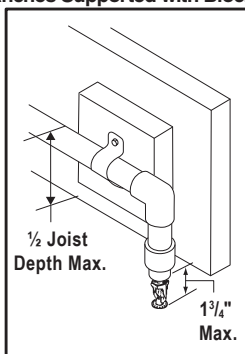


FIGURE "A"

Branches Supported with Hangers

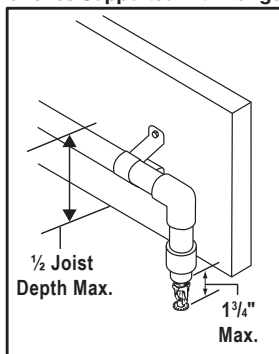


FIGURE "B"

9. When installing Spears® FlameGuard® CPVC Fire Sprinkler Products perpendicular (system mains) to the solid wood joists, UL Listed support devices for thermoplastic sprinkler piping or other UL Listed support devices shall be used which mount the piping directly to the bottom of the solid wood joists. In addition, it is acceptable to cut holes in the solid wood joists at or below the center of the depth of the solid wood joist for support. Holes must be oversized to allow for movement and must be located in an area that will not compromise joist integrity. Consult the authority having jurisdiction for more information regarding structural integrity.
10. When installing Spears® FlameGuard® CPVC Fire Sprinkler Products parallel (branch lines) to the solid wood joists, the pipe and fittings must be installed in the cavity below the bottom of the ceiling and above the bottom of the joist. Branch lines must be located at or below the center of the depth of the solid wood joist. UL Listed support devices must be used to mount piping directly to nominal 2 in. wood blocking. In addition, UL Listed support devices can be used that offset the pipe a nominal distance of 1-1/2 in. from the solid wood joists.

Unfinished Basements with Exposed Composite Wood I-Joists or Exposed Solid Wood Joists with Expanded Sprinkler Spacing in accordance with NFPA 13D

In accordance with UL Listings, Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed without protection (exposed) in unfinished basements in accordance with NFPA 13D when installed to the following additional limitations:

1. The ceiling shall be horizontal and constructed utilizing composite wood I-joists with a nominal depth of 11-7/8 inches on up to 24-inch centers, or utilizing solid wood joists with a nominal size of depth of 12 inches or less on up to 24-inch centers.
2. The distance from the floor to the bottom of the solid wood joist or composite wood I-joists shall be between 7 feet and 10 feet.
3. Listed residential pendent sprinklers with a maximum temperature rating of 155°F and a minimum K-factor of 4.9 are to be used for this installation. The maximum sprinkler spacing shall not exceed 16 feet. The maximum sprinkler coverage area is to be 16 feet by 14 feet spaced with the 16-foot dimension along the joists and the 14-foot dimension across the joists. Lesser areas are also permitted. The system is to be designed based upon the listed flows for the sprinkler selected except that the flow for a single sprinkler or for multiple sprinklers flowing is to be not less than 13 gpm per sprinkler. The sprinklers are to be installed with their deflectors a maximum of 1-3/4 inches below the bottom of the solid wood joist or composite wood I-joists in anticipation of future installation of a finished ceiling. (see NFPA 13D, Section 8.2.4, 2010 Edition)
4. All system mains shall be run perpendicular to the joists. All branch lines shall be run parallel to the joists. Schedule 80 fittings shall be used for sizes 1-1/2 inch and larger.
5. All solvent cement joints shall be made with FlameGuard® FS-5 One Step Solvent Cement (or with competitor TFP-500, BM-5, FP-1000.).
6. When the total protected area exceeds 1,000 square feet, blocking shall be utilized to divide the area into individual compartments not exceeding 1,000 square feet. The maximum length along the joist shall not exceed 32 feet. When the length exceeds 32 feet, blocking shall be utilized. The blocking shall be constructed of minimum 1/2 inch

plywood or batt insulation with a minimum thickness of 3-1/2 inches. These blocking materials shall be the full depth of the joists. When batt insulation is used as blocking, it must be a single piece secured in place with metal wire netting which must encase the insulation on both of the exposed sides. The metal wire netting is required to hold the insulation in place and prevent it from being dislodged or repositioned over time. It is acceptable for items such as piping, wires, ducts, etc. to penetrate the blocking. The gap between the item penetrating the blocking and the blocking should be minimized. For installations where the gap exceeds 1/4 inch, the gap shall be filled with insulation, caulking, or other suitable material.

7. When installing Spears® FlameGuard® CPVC Fire Sprinkler piping perpendicular (system mains) to the joists, listed support devices for thermoplastic sprinkler piping or other listed support devices shall be used which mount the piping directly to the bottom of the solid wood joist or composite wood I-joists. As an alternative to mounting the pipe and fittings below the solid wood joist or composite wood I-joists, it is also acceptable to cut holes in the joists at or below the center of the depth of the joist for support – the holes should be oversized to allow for movement and located to not impair the structural integrity of the joists. Refer to the composite wood I-joist manufacturer's product data for specific instructions concerning the placement of any holes in the joists.

NOTICE: When drilling holes in the solid wood joists or composite wood I-joists, the structural integrity must be maintained. Consult the Authority Having Jurisdiction (AHJ) or building code for requirements.

8. When installing Spears® FlameGuard® CPVC Fire Sprinkler piping parallel (branch lines) to the solid wood joist or composite wood I-joists, the pipe and fittings shall be installed in the cavity below the bottom of the ceiling and above the bottom of the joist. The branch lines shall be located at or below the center of the depth of the joist. The pipe shall be installed utilizing listed support devices for thermoplastic sprinkler piping or other listed support devices which mount the piping directly to nominal 2-inch wood blocking or listed support devices for thermoplastic sprinkler piping which offset the pipe a nominal distance of 1-1/2 in. from the joists.

This application for Spears® FlameGuard® CPVC Fire Sprinkler Products is limited to basements where the quantity and combustibility of contents is low and fires with relatively low rates of heat release are expected.

Extended Coverage Quick Response Sprinklers

In accordance with the UL Listing, Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed without protection (exposed) when subject to the following additional limitations:

1. Exposed piping is to be installed below a smooth, flat, horizontal ceiling construction.
2. Listed pendent, light hazard, quick response, extended coverage sprinklers, 155° F maximum temperature rating having deflectors installed within 8 in. from the ceiling and a maximum distance between sprinklers not to exceed 20 ft. with an application density of at least 0.10 gpm/sqft.
3. Listed pendent residential sprinklers, 155° F maximum temperature rating having deflectors installed within 8 in. from the ceiling and a maximum distance between sprinklers not to exceed 20 ft. with an application density of at least 0.10 gpm/sqft.

4. Listed horizontal sidewall, light hazard, quick response, extended coverage sprinklers, 165° F maximum temperature rating having deflectors installed within 6 in. from the ceiling and within 4 in. from the sidewall and a maximum distance between sprinklers not to exceed 18 ft. with an application density of at least 0.10 gpm/sqft.
5. Listed horizontal sidewall residential sprinklers, 165° F maximum temperature rating having deflectors installed within 6 in. from the ceiling and within 4 in. from the sidewall and a maximum distance between sprinklers and not to exceed 18 ft. with an application density of at least 0.10 gpm/sqft.
6. When using fittings in the 1-1/2 in. and greater size only Schedule 80 fittings may be used.
7. The end use application is limited to unobstructed construction.
8. All solvent cement joints shall be made with Spears® FS-5 One Step Solvent Cement, or any other cements referenced on page 23 of this manual.

Return Air Plenum Installation

Spears® FlameGuard® CPVC Fire Sprinkler Products meet the combustibility requirements for thermoplastic sprinkler pipe, as described in the Standard for Installation of Air Conditioning and Ventilating Systems, NFPA 90A. Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed in the plenum space adjacent to, but not over, an opening in the ceiling, such as a ventilation grill.

Garage Installations

Spears® FlameGuard® CPVC Fire Sprinkler Products are suitable for use in garages requiring sprinklers, as defined in NFPA 13R, with the following requirements:

Minimum protection consisting of either one layer of 3/8-inch thick gypsum or 1/2-inch thick plywood must be provided.

Listed pendent or sidewall sprinklers with a maximum temperature rating of 225° F (107° C) must be used.

All sprinklers must be installed per the manufacturer's published installation instructions.

The system must be installed per the requirements of NFPA 13R and these installation instructions.

Ambient Temperature Limitations

Spears® FlameGuard® CPVC Fire Sprinkler Products are suitable for use in areas where ambient temperatures are within the range of 35° F (2° C) to 150° F (65° C). The Loss Prevention Certification Board (LPCB) listing states the maximum ambient temperature shall not exceed 120° F (50° C).

High Temperature Areas

Spears® FlameGuard® CPVC Fire Sprinkler Products can be installed in areas, such as an attic, where the ambient temperature exceeds 150° F (65° C) if ventilation is provided or if insulation is used around the product to maintain a cooler environment.

WARNING: DO NOT install Spears® FlameGuard® CPVC Fire Sprinkler Products in areas where the ambient temperature exceeds 150° F (65° C) without adequate ventilation or insulation around the product to maintain a cooler environment.

Cold Temperature Areas

Spears® FlameGuard® CPVC Fire Sprinkler Products can be used in areas where the ambient temperature remains above 35° F (2° C). These products can also be used in an area subject to freezing temperatures if the sprinkler system installation is protected from freezing. Many standard cold weathers piping design and installation practices can be used to protect the system from freezing, including, but not limited to the use of low pressure dry pipe and pre-action systems (see titled section in this manual), the use of glycerin, insulation installation techniques, and pipe insulation. Contact the manufacturers for compatibility of their products with Spears® FlameGuard® CPVC Fire Sprinkler Products.

NOTE: Attention must be given to local insulating techniques and codes that require a particular method. Since very cold weather will make Spears® FlameGuard® CPVC Fire Sprinkler Products more susceptible to damage, extra care should be taken to avoid rough handling or impact to these products.

WARNING: DO NOT allow a sprinkler system to freeze. A frozen system will deactivate and the pressures built up can cause the sprinkler heads to open or damage the pipe and fittings.

Factory Pre-mixed antifreeze solutions of water and USP grade GLYCERIN are acceptable for use with Spears® FlameGuard® CPVC Fire Sprinkler Products. **Refer to NFPA 13, NFPA 13R, NFPA 13D and consult the local authority having jurisdiction before using glycerin solutions in fire sprinkler applications.**

WARNING: DO NOT use glycol-based antifreeze solutions. Glycol solutions are not chemically compatible with the CPVC material and can cause damage to the CPVC Fire Sprinkler System.

The following information can be used to determine the quantity of a pre-mixed glycerin based antifreeze solution needed to protect the piping system.

Nominal Pipe Size -inch	Actual mm Size	US Gallons of Water Per Foot
3/4 (DN20)	26,9	.0311
1 (DN25)	33,7	.0494
1-1/4 (DN32)	42,4	.0792
1-1/2 (DN40)	48,3	.1042
2 (DN50)	60,3	.1636
2-1/2 (DN65)	73,0	.2395
3 (DN80)	88,9	.3555

NOTE: The gallons per foot column can be used for calculations when adding pre-mixed glycerin antifreeze to the piping system for freeze protection. All fire protection systems winterized with glycerin solutions must conform to local, state, and NFPA requirements. Pre-mixed Glycerin based solutions are the only antifreeze solutions recommended for use. Glycol solutions are not chemically compatible with the CPVC material, and their use may result in damage to the CPVC Fire Sprinkler System.

Fire Sprinkler System Risers

In accordance with the UL Listing, Spears® FlameGuard® CPVC Fire Sprinkler Products may be used as system risers in accordance with NFPA 13D and 13R when subject to the following additional limitations:

1. When installed protected (concealed), the minimum protection shall consist of either one-layer of 3/8 in. (9.5 mm) thick gypsum wallboard or 1/2 in. (12.7 mm) thick plywood.
2. When installed without protection (exposed), the following limitations shall apply:

a) The riser shall be installed below a smooth, flat, horizontal ceiling construction. A Listed residential pendent sprinkler is to be installed with its deflector at the distance from the ceiling specified in the sprinkler Listing.

OR

The riser shall be installed below a horizontal unfinished basement ceiling (in accordance with NFPA 13D) constructed utilizing nominal 2 in. x 10 in. or nominal 2 in. x 12 in. exposed solid wood joists on 16 in. centers. A Listed residential pendent sprinkler is to be installed with its deflector a maximum of 1-3/4 in. below the bottom of the solid wood joist in anticipation of future installation of a finished ceiling.

- When installing Spears® FlameGuard® CPVC Fire Sprinkler Products in conjunction with 2 in. x 12 in. solid wood joists, the maximum system working pressure under flowing conditions shall not exceed 100 psi and the maximum system working pressure under static (nonflowing) conditions shall not exceed 175 psi.

b) The Listed residential pendent sprinkler is to have a maximum temperature rating of 155° F and a minimum K-factor of 3.0 and is to be installed at a maximum horizontal distance of 12 inches from the centerline of the riser. The system is to be designed based upon the Listed flows for the sprinkler being used. However, the flow must not be less than 11 gpm per sprinkler.

c) The riser shall be supported vertically within 2 feet of the ceiling or bottom of the joist.

d) The minimum riser diameter shall be 1 in. and the maximum riser diameter shall be 2 in.

e) The maximum distance between the wall(s) and the outside surface of the riser pipe shall be 1-1/2 in.

f) All solvent cement joints shall be made with Spears® FS-5, or any of the solvent cements referenced on page 25 of this manual.

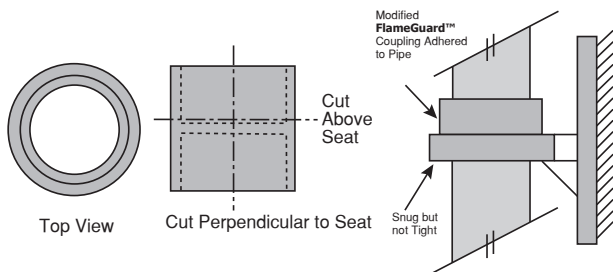
g) These installations require the use of Schedule 80 fittings for riser sizes 1-1/2 in. and larger.

3. The system shall be installed per the requirements of NFPA 13, Support of Risers. Sections 9.2.5 (2016 Edition).
4. Spears® FlameGuard® CPVC Fire Sprinkler Products shall be installed

per the manufacturer's installation and design manual and this addendum.

5. Risers shall be supported by pipe clamps or by hangers located on the horizontal connection close to the riser. Only Listed hangers and clamps shall be used.
6. Vertical lines must be supported at intervals, described in 7 & 8 below, to avoid placing excessive load on a fitting at the lower end. Do this by using riser clamps or double bolt pipe clamps Listed for this service. The clamps must not exert compressive stresses on the pipe. If possible, the clamps should be located just below a fitting so that the shoulder of the fitting rests against the clamp. If necessary, a coupling can be modified and adhered to the pipe as a bearing support such that the shoulder of the fitting rests on the clamp. Follow the manufacturer's recommended cure time.
7. Recommended method for securing CPVC fire sprinkler pipe vertically. Place clamp below shoulder of fitting.

WARNING: Modified riser collar shall only be used to provide support to the riser and shall not be used to join two pieces of pipe.



8. Do not use riser clamps that squeeze the pipe and depend on compression of the pipe to support the weight.
9. Hangers and straps shall not compress, distort, cut or abrade the piping and shall allow for free movement of the pipe to allow for thermal expansion and contraction.
10. Maintain vertical piping in straight alignment with supports at each floor level, or at 10 feet (3.05 m) intervals, whichever is less.
11. CPVC risers in vertical shafts or in buildings with ceilings over 25 feet (7.62 m), shall be aligned straight and supported at each floor level, or at 10 feet (3.05 m) intervals, whichever is less.

Underground Fire Service

Spears® FlameGuard® CPVC Sprinkler Products are UL Listed for use in underground water service when installation is in accordance with:

- ASTM D 2774, "Standard Recommended Practice for Underground Installation of Thermoplastic Pressure Piping"
- ASTM F 645, "Standard Guide for Selection, Design and Installation of Thermoplastic Water Pressure Piping Systems"
- NFPA 24, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances"

The installation procedures detailed in this manual apply to CPVC Fire Sprinkler Products with solvent cemented joints in sizes 3/4 inch

through 3 inches.

C-UL Listing Requirements

Spears® FlameGuard® CPVC Fire Sprinkler Products are C-UL Listed in accordance with Canadian requirements for use in:

Light Hazard occupancies defined in the Standard for Installation of Sprinkler Systems, NFPA 13.

Residential occupancies as defined in the Standard for Installation of Sprinkler

Systems in Residential Occupancies up to Four Stories in Height, NFPA 13R.

Residential occupancies as defined in the Standard for Installation of Sprinkler Systems in One and Two-Family Dwelling and Manufactured Homes, NFPA 13D.

Protected Installations

When used with standard response sprinklers, protection shall be provided for Spears® CPVC piping products by ceilings, walls or soffits consisting of the following minimum protection: lath and plaster, 9.5 mm thick gypsum wallboard, 13 mm thick plywood or a suspended membrane ceiling with lay-in panels or tiles, classified with respect to surface burning characteristics having mass of not less than 1.7 kg/sq m and installed in steel suspension grids. The effectiveness of this protection can be impaired if penetrated by openings such as ventilation grills, exhaust fans connected to metal ducts serving washrooms excepted. Where such penetration is present, individual openings exceeding 0.03 sq m but not exceeding 0.71 sq m in an area must be located so that the distance from the edge of the opening to the nearest sprinkler does not exceed 300 mm. This piping shall not be used where such openings exceed 0.71 sq m in area. The effect of the presence of non-rated recessed lighting fixtures, public address speakers and other interruptions of the protective membrane has not been investigated.

Exposed Installations

As an alternative to the protection requirements, Spears® FlameGuard® CPVC Fire Sprinkler Products may be installed without protection (exposed) when subject to the following additional limitations:

- Exposed piping is to be installed below a smooth, flat, horizontal, fixed ceiling construction.
- Listed Quick-Response pendent sprinklers having deflectors installed within 8 inches from ceiling or Listed Residential pendent located in accordance with their Listing and a maximum distance between sprinklers not to exceed 15 feet.
- Listed Quick-Response horizontal sidewall sprinklers having deflectors installed within 6 inches from the ceiling and within 4 inches of the sidewall or Listed Residential horizontal sidewall sprinklers located in accordance with their Listing and a maximum distance between sprinklers not to exceed 14 feet.

During remodeling or repair, appropriate precautions shall be implemented to properly shield the piping from the protected occupancy.

Spears® FlameGuard® CPVC Fire Sprinkler Piping Products are to be installed in accordance with the requirements specified in NFPA 13, NFPA 13R or NFPA 13D and the National Building Code of Canada. Spears® FlameGuard® CPVC Fire Sprinkler Piping Products must be

installed in accordance with the other special installation and design criteria relative to handling, assembly, pipe hanger spacing, piping and sprinkler restraint, sprinkler temperature rating, piping location, testing procedures, friction loss characteristics and other applicable requirements specified in the manual. The use of Spears® FlameGuard® CPVC Fire Sprinkler Products in ceiling spaces above non-sprinklered areas has not been investigated.

Spears® FlameGuard® CPVC Fire Sprinkler Piping Products are Listed for use in wet pipe systems only, and are not Listed for outdoor use.

Spears® FlameGuard® CPVC Fire Sprinkler Products are C-UL Listed in accordance with Canadian requirements for use in combination with CPVC sprinkler products Listed in accordance with Canadian requirements and manufactured by GF Harvel (pipe), Ipex (pipe and fittings), TYCO Fire Products (pipe and fittings), Viking (pipe), or Nibco (fittings).

NOTICE: While Spears® FlameGuard® CPVC Fire Sprinkler Products are Listed for use in combination with other listed manufacturers' products, specific application approvals may not be the same amongst manufacturers. It is the installer's responsibility to verify suitability of products used in combination according to each manufacturer's installation instructions. Contact Spears® if you have questions on any application not addressed.

Spears® recommends the use of FS-5 One Step Low VOC Solvent Cement. However, Victaulic 899; Ipex BM-5; Central Sprinkler CSC-500; Nibco FP-1000 and TYCO Fire Products TFP-500 CPVC Solvent Cements can also be used in place of the FS-5 One Step Low VOC Solvent Cement, provided that the assembly and curing information referenced within this manual is used.

Factory Mutual Approvals



Spears® FlameGuard® CPVC Fire Sprinkler Products have been approved by Factory Mutual for use in exposed environments in Light Hazard Occupancies as defined in:

NFPA 13, the Standard for "Installation of Sprinkler Systems."

Residential occupancies, as defined in NFPA 13R, the Standard for "Installation of Sprinkler Systems in Low-Rise Residential Occupancies."

Residential occupancies, as defined in NFPA 13D, the Standard for "Installation of Sprinkler Systems in One and Two-Family Dwellings and Manufactured Homes."

Spears® FlameGuard® CPVC Fire Sprinkler Products are FM Approved for use with Fire Resistant Barriers for CPVC Pipe and Fittings in Light Hazard Occupancies under FM Approval of the Soffi-Steel™ System manufactured by Grice Engineering, Inc. Installation is to be made in accordance with the FM Approval requirements for the Soffi-Steel™ System.

Loss Prevention Certification Board LPCB



Spears® FlameGuard® CPVC Fire Sprinkler Products are approved for use as agreed between plastics suppliers, purchaser/installer, authority having jurisdiction and/or insurer in accordance with documented supplier Installation Instructions but subject to the following criteria taking precedence:

- Use of plastic pipe and fittings is subject to water authority agreement for the territory concerned.
- LPCB Approved quick response sprinklers shall be used with exposed (i.e., fire exposure) plastic pipe and fittings,
- Installation shall be made in accordance with Spears® publication FGUK-3, Design & Installation Manual for the UK.
- Plastic pipe and fittings are suitable for use only with wet pipe systems.
- Care should be exercised to ensure that joints are adequately cured, in accordance with the manufacturer's installation instructions prior to pressurization.
- Plastic pipe and fittings shall not be installed outdoor or used in underground water services.
- Where plastic pipe and fittings are exposed (i.e., fire exposure), the system shall be installed close to a flat ceiling construction.
- Sprinkler systems which employ plastic pipe and fittings shall be designed where possible to ensure no "no flow" sections of pipework in the event of sprinkler operation.

In addition, the maximum normal ambient temperature shall not exceed 120° F (50° C). The product shall only be installed in the UK by LPCB Certificated or Registered installing companies or by firms outside the UK who can provide evidence of personnel training in the installation of the product.

NSF International

Spears® FlameGuard® CPVC Fire Sprinkler Products have been approved by NSF® for potable water applications (unless otherwise noted). These products meet all applicable performance standards for a pressure rated application, as required in ANSI/NSF® Standard 14, and they comply with ANSI/NSF® Standard 61 for health effects. Spears® FlameGuard® CPVC Fire Sprinkler Products are tested against ASTM Standards F 438 and F 439.



Penetrating Fire-rated Walls & Partitions

Before beginning, consult the building codes and authorities having jurisdiction in your area. Several UL Classified, through-penetration firestop systems are approved for use with CPVC pipe. Consult the UL Building Materials Directory, the UL Fire Resistance Directory, and the system manufacturer for proper selection and application. Consult Spears® Manufacturing Company for further information.

Heat Sources & Open Ceiling Areas

Piping systems using Spears® FlameGuard® CPVC Fire Sprinkler Products must be laid out so that the piping is not closely exposed to heat producing sources, such as light fixtures, ballasts, and steam lines. Pipe must not be positioned directly over open ventilation grills. During remodeling or ceiling repair, appropriate precautions must be implemented to properly protect the piping.

Use With Other Manufacturers' Pipes, Fittings, & Solvent Cements

Spears® FlameGuard® CPVC Fire Sprinkler Products may be used only in connection with UL, FM and NSF certified CPVC products of other manufacturers. Use of Spears® FlameGuard® CPVC Fire Sprinkler Products in connection with CPVC products of other manufacturers which are not UL, FM and NSF certified may result in inappropriate product application and inconsistent determinations **in the event of warranty claims.**

Spears® FlameGuard® CPVC Fire Sprinkler Products are UL Listed for use in combination with UL Listed CPVC sprinkler products manufactured by GF Harvel (pipe), Ipex (pipe and fittings), TYCO Fire Products (pipe and fittings), Viking (pipe), or Nibco (fittings).

NOTICE: While Spears® FlameGuard® CPVC Fire Sprinkler Products are UL Listed for use in combination with other listed manufacturers' products, specific application approvals may not be the same amongst manufacturers. It is the installer's responsibility to verify suitability of products used in combination according to each manufacturer's installation instructions. Contact Spears® if you have questions on any application not addressed in this manual.

Spears® recommends the use of FS-5 One Step Low VOC Solvent Cement. However, Ipex BM-5; Nibco FP-1000 and TYCO Fire Products TFP-500 CPVC Solvent Cements can also be used in place of the FS-5 One Step Low VOC Solvent Cement, provided that the assembly and curing information referenced within this manual is used.

Installation & Joining

Make sure you follow all assembly and curing information referenced within this manual when installing Spears® FlameGuard® CPVC Fire Sprinkler Products. Failure to follow this instruction could cause improper curing, resulting in serious personal injury, significant property damage, joint leakage, or joint failure.

Before assembling any Spears® FlameGuard® CPVC Fire Sprinkler Products, you must inspect all components for cuts, scratches, gouges, split ends, or any other irregularities that have occurred during shipping and handling.

Solvent Cement Welded Joints

STEP 1 Cut Pipe Square.

CPVC pipe can be easily cut with a ratchet cutter, a wheel-type plastic tubing cutter, a power saw or a fine-toothed saw. Tools used to cut CPVC must be designed for plastic use and must be in good condition in accordance with the tool manufacturer's recommendations. It is important to cut the pipe square. A square cut provides the surface of the pipe with maximum bonding area.



If any indication of damage or cracking is evident at the pipe end, cut off at least 2 inches (50 mm) beyond any visible crack.

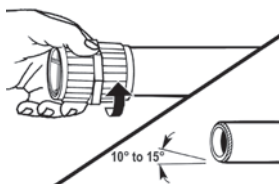
Notice: Avoid splitting the pipe when using ratchet cutters. Failure to do so may result in pipe failure or leakage.

- Only use ratchet cutters that contain a sharp blade (blades dull quickly).
- Only use ratchet cutters at temperatures of 50° F (10° C) or warmer.

- Only use well-maintained, good quality ratchet cutters capable of consistently cutting the pipe squarely.

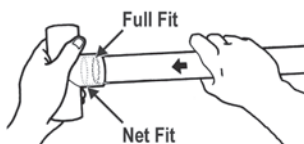
STEP 2 Deburr & Bevel Pipe.

Burrs and filings can prevent proper contact between pipe and fitting during assembly, and must be removed from the outside and the inside of the pipe. A chamfering/reaming tool or a file is suitable for this purpose. A slight bevel (approximately 10° to 15°) shall be placed at the end of the pipe to ease entry of the pipe into the socket. This will minimize the chance that the edges of the pipe will wipe solvent cement from the fitting socket during the insertion of the pipe.



STEP 3 Fitting Preparation

The pipe should enter the fitting socket easily one-third to two-thirds of the way (full interference fit). Contact between the pipe and fitting is essential in making a good joint. If the pipe bottoms with little interference (net fit), use extra solvent cement in making the joint. This contact allows the solvent cement (which is applied in the next step) to effectively join the pipe and fitting.



Using a clean, dry rag, wipe loose dirt and moisture from the fitting socket and pipe end. Moisture can slow the cure time and at this stage of assembly, excessive water can reduce joint strength.

STEP 4 Solvent Cement Application

CAUTION: Prior to using Spears® FS-5 One-Step CPVC solvent cement, or other approved CPVC fire sprinkler cement, review and follow all precautions found on the container labels, material safety data sheet, and Standard Practice for Safe Handling ASTM F 402. Failure to follow precautions may result in injury.

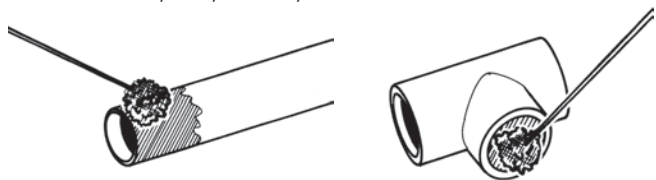
Special care shall be exercised when assembling CPVC fire sprinkler systems in temperatures below 40° F (4° C). In colder temperatures extra time must be allowed for the solvent cement to set and cure. Extra care should be taken to prevent damaging the pipe during handling. When solvent welding pipe and fittings in colder temperatures, make certain that the cement has not become lumpy or has "gelled". Gelled cement must be discarded.

At temperatures above 80° F (27° C) make sure both surfaces to be joined are still wet with cement during assembly. Higher temperatures and/or wind accelerate the evaporation of the volatile solvents in the cement. Pipe stored in direct sunlight may have surface temperatures 20° F to 30° F above the air temperature. If possible store the pipe and fittings, or, at least, the ends to be solvent welded, out of the direct sunlight prior to cementing. The solvents will penetrate hot surfaces more deeply. In conditions like this it is very important to avoid puddling the solvent cement inside the fitting socket.

Use a dauber that is properly sized for the pipe, no less than 1/2 the diameter of the pipe being assembled.

Only use solvent cements that have been specifically formulated and listed/approved for use with CPVC fire sprinkler systems and approved by the pipe and fitting manufacturers.

Vigorously apply a heavy, even coat of cement to the outside pipe end. Apply a medium coat to the fitting socket. Pipe sizes 1-1/4 inch (DN32, 32mm) and above shall always receive a second cement application on the pipe end. **FIRST APPLY CEMENT ON THE PIPE END, THEN IN THE FITTING SOCKET, AND, FINALLY, ON THE PIPE END AGAIN.**

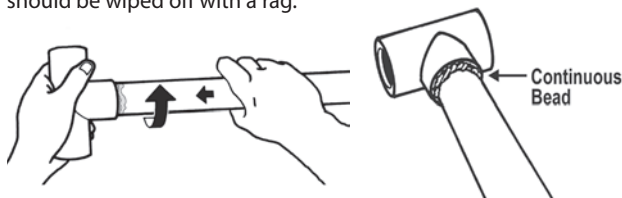


Notice: Too much solvent cement can cause clogged waterways or weaken the wall of the pipe or fitting and result in pipe failure or leakage.

- Do not allow excess cement to puddle in the pipe and fitting assembly. To prevent this puddling, apply a lighter coating of solvent cement to the inside of the fitting socket than the outside of the pipe.
- Wipe off excess cement on the outside of the joint. The solvents will evaporate, but the solvent cement inside the fitting will stay there.
- Take care to prevent cement from running into the threads of Sprinkler Head Adapters and Adjustable Sprinkler Head Adapters. Where possible, it is recommended to pre-install head adapters on to pre-cut Drops (section of pipe) and allow to achieve initial set in the inverted position. The head adapter and drop combination can then be installed into the system fitting.

STEP 5 Assembly

After applying cement, immediately insert the pipe into the fitting socket, while rotating the pipe one-quarter turn until the pipe bottoms out at the fitting stop. Rotate the pipe as it is inserted into the fitting not after it has bottomed out in the fitting. Properly align the fitting for the installation at this time. Pipe must bottom to the stop. Hold the assembly for 30 seconds to ensure initial bonding. A bead of solvent cement should be evident around the pipe and fitting juncture. If this bead is not continuous around the socket shoulder, it may indicate that insufficient cement was applied. If insufficient cement is applied, the fitting must be cut out and discarded. Cement in excess of the bead should be wiped off with a rag.



Notice: Failure to allow sprinkler head adapter fitting joints to cure before installing sprinklers may result in cement in the sprinkler waterway.

- Install sprinkler heads only after all the CPVC pipe and fittings, including the sprinkler head adapters, are solvent welded and allowed to cure for a minimum of 30 minutes.
- Do not install sprinklers in the fittings prior to the fittings being cemented in place.

- Prior to installing any sprinklers, Spears® recommends the entire system including drops must be thoroughly flushed to remove all pipe shavings, dirt and debris left from installation. Fill lines slowly and bleed air from the farthest and highest point, then flush with full flow.

Exercise care when installing sprinklers. Allow sprinkler head fittings and previously joined fittings to cure for a minimum of 30 minutes prior to installing the sprinkler. When installing sprinklers, be sure to anchor or hold the pipe drop securely to avoid rotating the pipe in previously cemented connections.

Notice: Too much solvent cement can cause clogged waterways.

- Visually inspect sprinkler fittings to ensure that the waterway and threads are clear of any excess cement.
- Once the installation is complete and cured per Table I, II or III, then test the system as described in the System Acceptance Testing (Hydrostatic Pressure Test) section of this manual.

STEP 6 Set and Cure Times

Notice: Inadequate curing of solvent cement joints may cause pipe failure or leakage. Solvent cement set and cure times are a function of pipe size, temperature, relative humidity, and tightness of fit.

Cure times should be increased when moisture is present such as during cut-ins to live sprinkler lines. (NOTE: refer to Recommended Cut-In Procedures for System Modification or Repair section in this manual.) The assembly must be allowed to set, without any stress on the joint, for 5 minutes, depending on pipe size and temperature. Following the initial set period, the assembly can be handled carefully, avoiding significant stresses to the joint.

Refer to Tables I, II, and III for MINIMUM cure times prior to pressure testing.

Table 1: Minimum Cure Time Table for Pressure Test up to 225 psi (15.5 bar) Ambient Temperature During Cure			
Nominal Pipe Sizes	60° F to 120° F (16° C to 49° C)	40° F to 59° F (4° C to 15° C)	0° F to 39° F (-18° C to 3° C)
3/4" (DN20)	1 hour	4 hours	48 hours
1" (DN25)	1-1/2 hours	4 hours	48 hours
1-1/4" & 1-1/2" (DN32 & DN40)	3 hours	32 hours	10 days
2" (DN50)	8 hours	48 hours	Note 1
2-1/2" & 3" (DN65 & DN80)	24 hours	96 hours	Note 1

Table 2: Minimum Cure Time Table for Pressure Test up to 200 psi (13.8 bar) Ambient Temperature During Cure			
Nominal Pipe Sizes	60° F to 120° F (16° C to 49° C)	40° F to 59° F (4° C to 15° C)	0° F to 39° F (-18° C to 3° C)
3/4" (DN20)	45 minutes	1-1/2 hours	24 hr.
1" (DN25)	45 minutes	1-1/2 hours	24 hr.
1-1/4" & 1-1/2" (DN32 & DN40)	1-1/2 hours	16 hours	120 hours
2" (DN50)	6 hours	36 hours	Note 1
2-1/2" & 3" (DN65 & DN80)	8 hours	72 hours	Note 1

Note 1: For these sizes, the solvent cement can be applied at temperatures below 40° F (4° C). However, the sprinkler system temperature must be raised to a temperature of 40° F (4° C) or above and allowed to cure per the above recommendations prior to pressure testing.

Table 3: Minimum Cure Time Table for Pressure Test up to 100 psi (6.9 bar) Ambient Temperature During Cure			
Nominal Pipe Sizes	60° F to 120° F (16° C to 49° C)	40° F to 59° F (4° C to 15° C)	0° F to 39° F (-18° C to 3° C)
3/4" (DN20)	15 minutes	15 minutes	30 minutes
1" (DN25)	15 minutes	30 minutes	30 minutes
1-1/4" (DN32)	15 minutes	30 minutes	2 hours

NOTICE: 1-1/2-inch and larger must be tested ONLY in accordance with Table 1 and Table 2.

WARNING: Make sure you allow the cement to cure according to the times listed in the charts for the pipe size and ambient temperature. These cure times have been tested and approved for Spears® FlameGuard® CPVC Fire Sprinkler products. DO NOT install any sprinkler heads until the piping system has cured for a minimum of 30 minutes.

The following guidelines provide an estimate of the quantities of Spears® FS-5 Low VOC Solvent Cement that you will need to complete the assembly.

Solvent Cement Requirements

Nominal Fitting Sizes	Solvent Cement Number of Joints Per Quart (estimated)
3/4" (DN20)	270
1" (DN25)	180
1-1/4" (DN32)	130
1-1/2" (DN40)	100
2" (DN50)	70
2-1/2" (DN65)	50
3" (DN80)	40

Threaded Connections

WARNING: Use only thread sealant recommended by Spears®. Other joint compounds or pastes may contain substances that could cause stress cracks in the CPVC. Cutting oils used in metal pipe threading cause stress cracking in CPVC materials. All cutting oils must be removed (Spears® recommends using a commercially available dishwashing soap). THE METAL PIPE MUST BE THOROUGHLY FLUSHED and degreased prior to assembly with CPVC systems. Some soap residues can damage CPVC piping.

STEP 1 APPLY SEALANT ONLY TO MALE THREAD

DO NOT use a combination of tape and paste sealants.

DO NOT clog waterway with excessive sealant.

DO NOT use any sealant on any Gasket Sealed Head Adapters.

RECOMMENDED SEALANT:

Spears® Manufacturing Company recommends the use of Spears® BLUE 75™ thread sealant, which has been tested for compatibility with Spears® products. Please follow the sealant Manufacturer's Application/Installation instructions. Choice of another appropriate thread sealant is at the discretion of the installer.

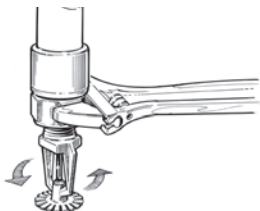


STEP 2 ASSEMBLE JOINT BY HAND

Thread Sprinkler Head in “finger tight” for initial assembly.

STEP 3 WRENCH MAKE-UP

Use an adjustable wrench on the flats of the Head Adapter and Wrench recommended by Sprinkler Manufacturer for the Head. Generally, wrench make-up of 1 to 2 turns beyond finger tight is sufficient. Avoid “backing up” the wrenched assembly.



For Sprinkler Head Adapter connections:

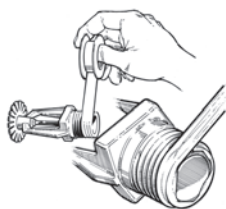
	Standard Metal Thread	Special Reinforced (SR) Plastic Thread
Min. Torque:	15 ft.-lbs.	5 ft.-lbs.
Max. Torque:	20 ft.-lbs.	10 ft.-lbs.

For Female Adapter transitions to metal pipe, tighten hand-tight plus 1-1/2 turns.

DO NOT over-tighten.

IF A TAPE SEALANT MUST BE USED:

1. Use TFE tape no less than 3.5 mil thick.
2. **Initial wrap must fully cover the thread end.**
3. Wrap clockwise with standard pipe threads.
4. For Head Adapters, use **ONLY 2 - 3 wraps** of tape and tighten to specified torque.
5. For Female Adapter transition to metal pipe, use **ONLY 5 - 5-1/2 wraps** of tape and tighten hand-tight plus 1-1/2 turns.



Do Not use any sealant on any Gasket Sealed Head Adapters

WARNING: Always use commercially available strap wrenches. Do not use conventional pipe wrenches that can damage fitting.

WARNING: DO NOT over-torque any threaded connections. Generally, one to two turns beyond finger-tight are required to make a threaded connection. Factory testing has indicated that 15 - 20 ft.-lbs of torque on Metal Thread Head Adapters and 5 - 10 ft.-lbs on Special Reinforced (SR) Plastic Thread Head Adapters is adequate to obtain a leak free seal for Sprinkler Head Installations. Transitions to metal pipe using Female Adapters should be hand tight plus 1-1/2 turns.

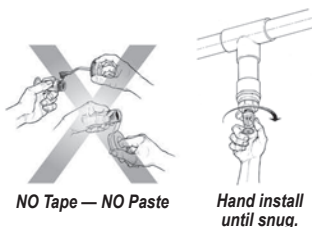
NOTICE: Sprinkler heads must be installed only after all fire sprinkler pipe fittings, including the sprinkler head adapters, are cemented to the piping and have been allowed to cure for a minimum of 30 minutes. Plastic, threaded plugs are available for use in pressure testing. Before installing the sprinkler head, the sprinkler head fittings must be visually inspected or probed with a wooden dowel to ensure that the waterway and threaded areas are free of any excess cement that may restrict the flow of water.

TorqueSafe™ Gasket Sealed Thread Connections

This type of connection can only be made when using the FlameGuard® TorqueSafe™ Gasket Female Sprinkler Head Adapter. This special adapter has a special thread with gasket for sealing the sprinkler head. The adapter provides a special thread insert that can be rotated for proper frame alignment during installation. **Warning: DO NOT USE ANY TYPE OF THREAD SEALANT** when installing this adapter. Use of tape or paste sealant may impair proper sealing and function of the adapter.

STEP 1 INSTALL SPRINKLER HEAD BY HAND

Check that elastomer gasket and threads are clean, dry and gasket is seated at the base of the adapter thread. Install sprinkler head hand tight into adapter. **DO NOT use any thread sealant!**

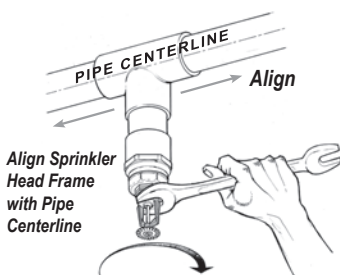


STEP 2 WRENCH ALIGNMENT

With wrench on sprinkler head, rotate sprinkler head clockwise until frame is properly aligned (Brass insert and Sprinkler head will rotate together. This will require approximately 10 to 25 ft-lbs torque at final orientation). **Caution: DO NOT use back-up wrench on brass insert flats.**

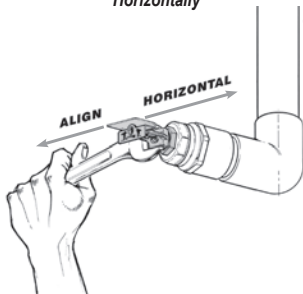
NEVER Reverse or Back up Threaded Assembly. If over-adjusted, continue to rotate clockwise until properly aligned.

NOTE: Back-up wrench may be applied to brass insert flats ONLY for removal of sprinkler head if required.



NOTICE: Sprinkler heads must be installed only after all fire sprinkler pipe fittings, including the sprinkler head adapters, are cemented to the piping and have been allowed to cure for a minimum of 30 minutes. Plastic, threaded plugs are available for use in pressure testing. Before installing the sprinkler head, the sprinkler head fittings must be visually inspected or probed with a wooden dowel to ensure that the waterway and threaded areas are free of any excess cement that may restrict the flow of water.

Align Sidewall Sprinkler Head & Frame Horizontally

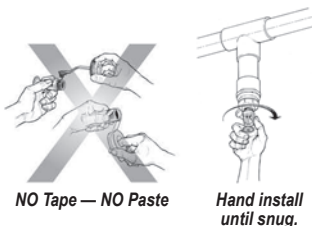


QuickTorque & SofTorque™ Gasket Sealed Thread Connections

This type of connection can only be made when using the FlameGuard® QuickTorque™ or SofTorque™ Gasket Female Sprinkler Head Adapter. These adapters both install the same. The difference being that the QuickTorque™ has a metal thread and the SofTorque™ has the patented Special reinforced (SR) thread. These special adapters have a special compressible gasket for sealing the sprinkler head. The Gasket can be compressed as specified for installation and can be further compressed for proper frame alignment during installation. **Warning: DO NOT USE ANY TYPE OF THREAD SEALANT** when installing these adapters. Use of tape or paste sealant may impair proper sealing and function of the adapter.

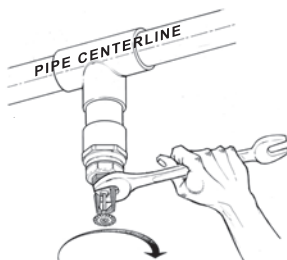
STEP 1 INSTALL SPRINKLER HEAD BY HAND

Check that elastomer gasket and threads are clean, dry. Install sprinkler head finger tight into adapter. **DO NOT use any thread sealant!**



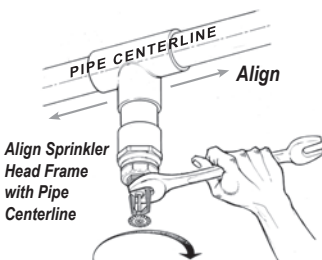
STEP 2 WRENCH TIGHTEN 1-TURN

With wrench on sprinkler head, rotate sprinkler head clockwise 1-Turn.



STEP 3 WRENCH ALIGNMENT

With wrench on sprinkler head, additionally rotate sprinkler head clockwise a maximum of 1 additional turn until frame is properly aligned. Follow this step for either vertical or horizontal head alignment.



NOTICE Back-up wrench may be applied to the Adapter flats for removal of sprinkler head if required.

GripLoc™ Fitting Connections – Approved

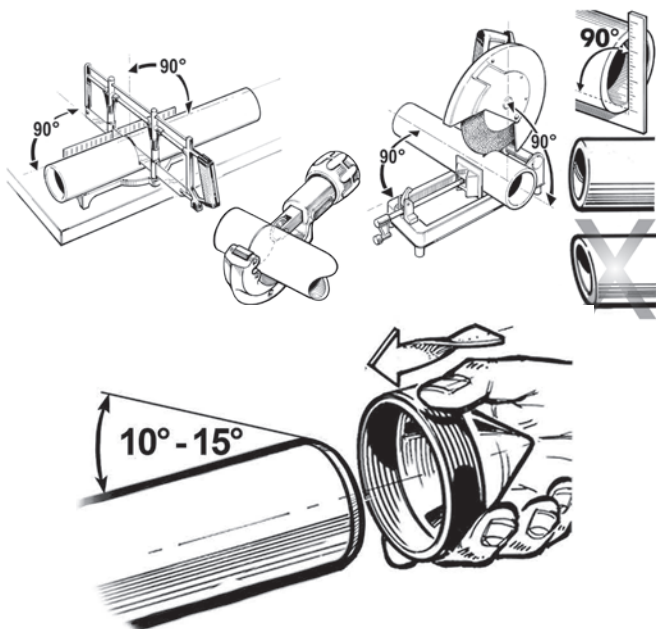
Spears® GripLoc™ fittings include a variety of configurations including head adapters, repair couplings, tees, elbows and caps. These use an engineered joint that incorporates a stainless steel gripper and gasket for direct connection to CPVC pipe using NO SOLVENT CEMENT. It is designed for quick fitting connections when adding or repairing system components.

NOTE: Spears® GripLoc™ fittings are not UL listed.

WARNING: DO NOT INSERT FINGERS INTO GRIPPER END. Gripper teeth are quite sharp

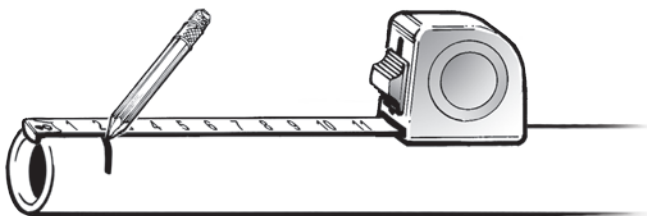
STEP 1 CUT, CLEAN & BEVEL PIPE END Clean

Cut pipe square at 90°. Remove all dirt and debris, deburr and bevel pipe end 10°-15°



STEP 2 MEASURE FITTING & MARK PIPE

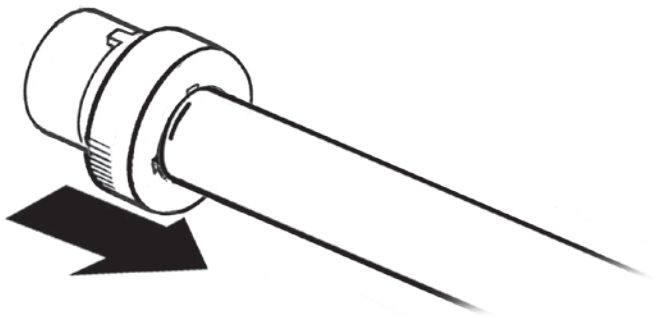
Measure depth of fitting to its pipe stop. Mark this distance on pipe end.



STEP 3 INSTALL PIPE

Insert pipe and Push in all the way to mark on pipe end.

NOTICE: GripLoc™ Expansion Repair Couplings will require thrust blocking restraints to keep unit from expanding under pressure



Painting Pipe & Fittings

CAUTION: The UL Listing DOES NOT cover painted CPVC fire sprinkler piping products. Use of certain paints, such as oil-based, can damage CPVC fire sprinkler piping products. **Use only a water-based latex or acrylic paint.** Before painting any CPVC fire sprinkler piping products, you must consult with your local authority having jurisdiction for restrictions.

Cleaning

Spears® FlameGuard® CPVC Fire Sprinkler Products can be cleaned using clean water and a soft towel. DO NOT use ammonia or other harsh chemical cleaners.

Transitions to Other Materials

Specifically designed female threaded adapters, grooved coupling adapters, and flanges are Listed for connecting systems incorporating Spears® FlameGuard® CPVC Fire Sprinkler Products to other materials, valves, and accessories. A special, reinforced female threaded adapter is available for connection to the sprinkler head.

Flanged Connections

Piping runs joined to the flanges must be installed in a straight line in relation to the flange to avoid stress at the flange due to misalignment. In addition, piping must be secured and supported to prevent lateral movement, which can create stress and damage the flange. Use only full-faced, Grade E, EPDM, 1/8" thick flange gaskets.

STEP 1 Attach Flange to Pipe.

The flange must be attached to UL Listed CPVC pipe following procedures for Solvent Cement Welded Joints in this manual.

NOTICE: When using “One-Piece” type flanges (fixed flange ring), care must be taken to align bolt holes with mating flange during solvent welding installation to pipe, or assure that pipe in system can be adequately rotated for correct hole alignment.

STEP 2 Position Gasket & Align Flanges.

With gasket between flanges, align gasket and mating flange bolt holes by rotating flange ring (see notice above).

STEP 3 Install Bolts, Nuts, & Washers.

Bolts should be lubricated with an acceptable anti-seize lubricant (such as IMS Copper Flake). Insert required bolts through flange bolt holes being sure to use two (2) flat washers per bolt, one at head and one below nut. Make sure that mating flanges are flush against gasket and properly aligned. Tighten nuts by hand until snug.

WARNING: Certain lubricants can cause stress cracking in CPVC materials.

STEP 4 Tighten Flange Bolts.

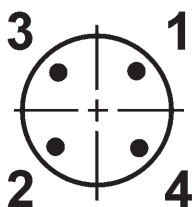
Establish uniform pressure over the flange face by tightening bolts in 5-ft. lbs. increments using the sequence shown in Figure 1 and specified torque values.

CAUTION: DO NOT use bolts to draw together improperly mated flanges. Care must be taken to avoid “bending” the flange ring when attached to a raised-face flange or wafer style valves.

Flange Data & Bolt Torque

The following recommendations are based on the use of two standard flat washers, standard nuts, and 1/8-inch thick EPDM full-face gasket. Actual field conditions may require a variation in these recommendations.

FIG. 1



Flange Size Nominal In.	Recommended Torque ft-lbs (N-m)
3/4 to 1-1/2 (DN20 - DN40)	12 (16,3)
2 to 3 (DN50 - DN80)	25 (33,9)

Flange Size Nominal in.	Bolt Holes	Bolt Diameter inches (mm)	Minimum Bolt Length inches (mm)
3/4 (DN20)	4	1/2	2 (50,8)
		(12,7)	
1 (DN25)	4	1/2	2-1/4 (57,2)
		(12,7)	
1-1/4 (DN32)	4	1/2	2-1/4 (57,2)
		(12,7)	
1-1/2 (DN40)	4	1/2	2-1/2 (63,5)
		(12,7)	
2 (DN50)	4	5/8	3 (76,2)
		(15,9)	
2-1/2 & 3 (DN65 & DN80)	4	5/8	3-1/4 (85,6)
		(15,9)	

Grooved Coupling Adapters

Spears® FlameGuard® CPVC Grooved Coupling Adapters are designed for use with Victaulic Style 75 and Style 77 Flexible Couplings. Other UL Listed couplings of similar flexible design may be used.

CAUTION: The use of rigid style couplings will damage the Grooved Coupling Adapter. Consult coupling manufacturer for proper selection.

STEP 1 Inspect Pipe & Adapter.

Check to ensure that both pipe and Grooved Coupling Adapter are free of indentations, projections, or roll marks on the gasket seating areas. Pipe end must be cut square and any loose scale, paint or dirt removed.

NOTICE: Use a standard grade "E" (EPDM) compound gasket with a green stripe or a grade "E," type "A" gasket with a purple stripe that is suitable for wet fire sprinkler service.

STEP 2 Inspect & Lubricate Gasket.

Be sure the gasket is clean and free of any cracks, cuts, or other defects that could cause leaks. DO NOT allow solvent cement to contact the sealing surface of the gasket. Lubricate the gasket with a compatible lubricant to prevent pinching and to assist in the seating and alignment process. Apply a thin layer of lubricant to the gasket lips and exterior surface. Pre-lubricated gaskets may be used. It is the installer's responsibility to determine both the gasket suitability and chemical compatibility of any lubricants. Consult gasket and lubricant manufacturers.

WARNING: Certain lubricants may contain petroleum based or other chemical that can damage the gasket or adapter. Verify the suitability of the lubricant with the manufacturer before use.

STEP 3 Align Components & Install Gasket.

Place the gasket over the pipe end making sure the gasket lip does not overhang the end of the pipe. Align the grooved coupling adapter with the end of the pipe and slide the gasket over the seating surface of the adapter, centering the gasket between the two grooves. Make sure the gasket is not pinched between the pipe and the adapter fitting. No portion of the gasket should extend into the grooves.

STEP 4 Install Coupling.

Place the coupling housings over the gasket, making sure the housing keys engage into the grooves of the pipe and the adapter fitting. Insert the bolts and apply the nuts finger-tight. Using a socket wrench or other appropriate tool, tighten the nuts alternately and equally until you achieve metal-to-metal contact at the housings' bolt pads.

WARNING: You must tighten the bolts alternately and evenly to achieve metal-to-metal contact at the housings' bolt pads.

Inspect the joints before and after pressure testing. Look for gaps between the bolt pads and for housing keys that are not inside the grooves. Ensure that the pipe alignment does not place undue stress on the grooved coupling adapters. The maximum recommended pipe hanger distance from the grooved coupling adapter fitting is shown in the following table.

Nominal Pipe Sizes	Maximum Recommended Hanger Spacing feet (meters)
1-1/4 (DN32)	6-1/2 (2,0)
1-1/2 (DN40)	7 (2,1)
2 (DN50)	8 (2,4)
2-1/2 (DN65)	9 (2,7)
3 (DN80)	10 (3,0)

As an added precaution to enhance the structural design of the system, it is suggested that a hanger or support be located at or near the grooved coupling adapter joint. This hanger or support can be on either side of the coupling. However, this is not a requirement, since the hanger spacing shown in the above table meets the minimum requirements established by UL.

Adjustable Sprinkler Head Adapter Installation

Spears® FlameGuard® CPVC Adjustable Fire Sprinkler Head Adapter comes pre-assembled. There is no need for lubrication. It is recommended that the adjustable sprinkler head adapter be adjusted completely "in" by hand before beginning the installation process.

STEP 1 Install Adapter on Drop.

The Adjustable Sprinkler Head Adapter must be installed in accordance with the approved procedures for Solvent Cement Welded Joints, as outlined in this manual. It is recommended that the drop/riser pipe be solvent cemented into the adjustable sprinkler head adapter first, and then into the drop/riser tee or elbow.

CAUTION: Care must be taken to prevent solvent cement from coming in contact with the internal O-ring seal or sealing surface. All pipe shavings, dirt and debris must be flushed from the drop prior to adjustment. DO NOT over extend the adjustment barrel. Extend only to the point that free movement stops or damage to internal sealing components may result.

STEP 2 Install Sprinkler Head.

Sprinkler head installation must be in accordance with the approved procedures for Threaded Connections, as outlined in this manual. The Adjustable Sprinkler Head Adapter has multiple wrench flats provided to hold the adjustment barrel while installing the sprinkler head. These same wrench flats must be used to adjust the sprinkler head adapter to its required position.

CAUTION: Never use wrenches, pliers, or any other tool on the threaded portion of the adjustment barrel. DO NOT over extend the adjustment barrel.

STEP 3 Adjust Finished Height.

The maximum range of travel is 1-5/8". Always use multiple wrench flats for making adjustments. Make adjustments slowly if system is pressurized in order to avoid inadvertently over extending adjustment barrel.

CAUTION: Care must be taken not to extend or retract the adjustment barrel excessively, since this may result in damage to the adapter. Adjust only to the point that free movement stops.

For the purpose of hydraulic calculations, the adjustable sprinkler head equivalent length of pipe in feet are as follows: 3/4"x1/2" = 6-ft., 1"x1/2" = 9-ft.

System Flushing Recommendation

Spears® recommends the entire system, including drops, be thoroughly flushed to remove all pipe shavings, dirt and debris left from installation prior to installing any sprinklers and testing. Fill lines slowly and bleed air from the farthest and highest point, then flush with full flow.

System Pre-Acceptance Air Test Provision

Spears® FlameGuard® systems can be tested with Oil Free Air (OFA) at a maximum of 25psi. This is not a substitute for the NFPA hydrostatic test of the system (see System Acceptance Testing), which is still required. This is to help contractors quickly test the system to make sure all components are not leaking.

The following safety concerns must be practiced and followed:

1. Use eye protection and other appropriate safety equipment
2. Use only Oil-Free Air or Nitrogen
3. Use only regulated pressure with a 25 psi over-pressure relief valve

Follow NFPA requirements for System Acceptance Hydrostatic testing.

Warning: Compressed air use in PVC and CPVC plastic systems is potentially hazardous and in most jurisdictions is prohibited for use in transport, storage or distribution of compressed air or gasses. Air is a compressible gas that can store far more energy than water when put under pressure because it can release this energy so rapidly. This potentially explosive nature can result in serious injury. All safety practices above MUST be followed.

System Acceptance Testing (Hydrostatic Pressure Test)

Once an installation is completed and joints are properly cured per the above recommendations, the system should be hydrostatically pressure tested with water at 200 psi (13.8 bar) for 2 hours. See Table II for curing conditions at 200 psi (13.8 bar).

The system should be pressure tested with water at 50 psi (3.4 bar) in excess of maximum pressure when the maximum system pressure is to be maintained in excess of 150 psi (10.3 bar). See Table I for curing conditions at 225 psi (15.5 bar).

Sprinkler systems in one- and two-family dwellings and mobile homes may be pressure tested with water at line pressure, after following Table III curing conditions.

When pressure testing, the sprinkler system shall be slowly filled with water and the air bled from the highest and farthest sprinkler heads before pressure testing is applied. Air must be removed from piping systems (plastic or metal) to prevent it from being locked in the system when pressure is applied. Entrapped air can generate excessive surge pressures that can result in bodily injury and/or property damage, regardless of the piping materials used.

If a leak is found, the fitting must be cut out and discarded. A new section can be installed using couplings or a union. Unions should be used in accessible areas only.

Recommended Cut-in Procedures for System Modification or Repair

Existing system modifications or repairs can be made using Spears® FlameGuard® CPVC Fire Sprinkler Products. In order to maintain full system integrity, the following procedure must be followed when making a system tie-in or repair by cutting into an existing system line. A careful review of all Joining Procedures must be made prior to making a cut-in on an existing system and the Minimum Cut-in Cure Times schedule listed below must be followed. A variety of fitting combinations can be used to tie into an existing system or replace a section between fixed cut-in points. These include using a socket Tee for add-ons or a socket Coupling for repairs in combination with a mechanical joint such as a union, grooved coupling adapter, or flange. Regardless of the components selected, the following must be adhered to:

STEP 1

System modification cut-ins should be made on the smallest diameter pipe section, in close proximity to the area of modification, capable of properly supplying the system change.

STEP 2

Carefully plan and measure prior to cutting into existing system. Be sure to provide adequate space and insure that full insertion into fitting sockets can be made during assembly.

Note: Allowance must be made for making a 1/4-turn twist when inserting the pipe into the fitting during assembly of the tee (or other component), especially on 1-1/2" and larger pipe sizes. This may require assembly of components in combination with the cut-in tee to create a short spool piece for final connection using socket unions, flanges, or grooved coupling adapters.

STEP 3

Review all Installation & Joining procedures prior to commencing cut-in (including square cutting, deburring & beveling, cleaning, dry fit checks).

STEP 4

Depressurize and drain existing line prior to making the cut-in.

STEP 5

Connect to the existing system prior to proceeding with the modification or repair.

STEP 6

All pipe shavings, dirt, debris must be removed from the cut-in system and, water and residual moisture must be removed from all solvent cement areas. Vacuum lines and wipe dry with a clean dry rag. Moisture and dirt will slow the curing and can affect joint strength.

STEP 7

Use only a new can of approved solvent cement when making cut-in connections. Verify cement expiration date on can prior to use.

STEP 8

Cut-ins for modifications or system repairs are often made under less than ideal situations as compared to new installations. As a result, the following specified Minimum Cut-in Cure times must be used.

Minimum Cut-in Cure Times

Ambient Temperature During Cure			
Pipe Size Nominal In.	60° F to 120° F (16° C to 49° C)	40° F to 59° F (4° C to 15° C)	0° F to 39° F (-18° C to 3° C)
3/4" (DN20)	1 hours	4 hours	48 hours
1" (DN25)	1-1/2 hours	4 hours	48 hours
1-1/4" & 1-1/2" (DN32 - DN40)	3 hours	32 hours	10 days
2" (DN50)	8 hours	48 hours	Note 1
2-1/2" & 3" (DN65 - DN80)	24 hours	96 hours	Note 1

Note 1: Solvent cement can be applied at temperatures below 40° F (4° C) in all sizes. For the 2-1/2" & larger, the temperature must be raised to 40° F (4° C) or above and allowed to cure for the recommended times before the system is filled and pressurized. Cement, pipe or fittings brought in from colder outside temperatures must be brought up to room temperature before using the 60° F to 120° F cure schedule.

STEP 9

Following completion and proper cure, inspect for proper alignment and hanger placement prior to pressure testing.

STEP 10 To pressure test the system, slowly fill the system with water and make sure that all air is bled from the farthest and highest point before test pressure is applied. The system **MUST** be pressure tested in accordance with NFPA 13, NFPA 24, or any other applicable NFPA standard requirements. The system must be tested with water. The purpose of the hydrostatic pressure test is to check for leakage, and it may not identify improperly assembled joints. This test **MUST NOT** be considered a substitute for full compliance to these published installation instructions.

It is recommended that the portion of the sprinkler system containing the cut-in tee be isolated for pressure test where possible. The applied test pressure should not exceed 50 psi over the system pressure in order to minimize water damage in the event that a leak occurs.

WARNING: Spears® FlameGuard® CPVC Fire Sprinkler Products must never be used in a system for distribution of compressed air or other gases. Air must be removed from piping systems. Entrapped air can generate excessive surge pressures, regardless of the piping materials used. Failure to follow this warning could result in product failure, property damage and severe personal injury or death.

Engineering Data

Pipe and Fitting Specifications

Spears® FlameGuard® CPVC Sprinkler Pipe is produced in SDR 13.5 dimensions, as specified in ASTM F 442. Engineering data on Material Properties and Expansion & Contraction are provided in this manual for Spears® FlameGuard® CPVC Fire Sprinkler Pipe. Consult other manufacturers for applicable variations

Spears® FlameGuard® CPVC Sprinkler Fittings are produced in Schedule 40 and Schedule 80 dimensions for sizes 3/4" through 1-1/4", and in Schedule 80 for sizes 1-1/2" through 3", in accordance with ASTM F 437, ASTM F 438, and ASTM F 439 as applicable. These products are UL Listed FM/Approved for a rated working pressure of 175 psi (1200kPa) at 150° F (65° C) for sprinkler service and LPCB listed for a rated working pressure of 175 psi (1200kPa) at 120° F (49° C).

CPVC Fire Sprinkler Pipe Dimensions

SDR 13.5 (Ref. ASTM F442)			Weight lbs/ft (kg/m)
Size Nominal inches	Average OD inches (mm)	Average ID inches	
3/4 (DN20)	1.050 (26,7)	0.874 (22,5)	0.168 (0,2)
1 (DN25)	1.315 (33,4)	1.101 (28,2)	0.262 (0,4)
1-1/4 (DN32)	1.660 (42,2)	1.394 (35,6)	0.418 (0,6)
1-1/2 (DN40)	1.900 (48,3)	1.598 (40,7)	0.548 (0,7)
2 (DN50)	2.375 (60,3)	2.003 (50,9)	0.859 (1,2)
2-1/2 (DN65)	2.875 (73,0)	2.423 (61,5)	1.257 (1,2)
3 (DN80)	3.500 (88,9)	2.950 (75,0)	1.867 (1,2)

Hydraulic Design

Hydraulic calculations for the sizing of systems incorporating Spears® FlameGuard® CPVC Fire Sprinkler Products must be calculated using a Hazen-Williams C value of 150. Pipe friction loss calculations must be made according to NFPA Standard 13. The following table shows the allowance for friction loss for fittings, expressed as equivalent length of pipe. For additional information regarding friction loss, contact Spears®.

Allowance for Friction Loss in Fittings

Equivalent Feet (meters) of Pipe

	3/4" 26,7 mm	1" 33,7 mm	1-1/4" 42,4 mm	1-1/2" 48,3 mm	2" 60,3 mm	2-1/2" 73,0 mm	3" 88,9 mm
Tee Run	1 (0,3)	1 (0,3)	1 (0,3)	1 (0,3)	1 (0,3)	2 (0,6)	2 (0,6)
Tee Branch	3 (0,9)	5 (1,5)	6 (1,8)	8 (2,4)	10 (3,1)	12 (3,7)	15 (4,6)
90° Elbow	4 (1,2)	5 (1,5)	6 (1,8)	7 (2,1)	9 (2,7)	12 (3,7)	13 (4,0)
45° Elbow	1 (0,3)	1 (0,3)	2 (0,6)	2 (0,6)	2 (0,6)	3 (0,9)	4 (1,2)
Coupling	1 (0,3)	1 (0,3)	1 (0,3)	1 (0,3)	1 (0,3)	2 (0,6)	2 (0,6)

Hangers & Supports

Since CPVC Fire Sprinkler pipe is rigid, it requires fewer supports than flexible, plastic systems. Spears® recommends use of hangers that are designed and listed for supporting the CPVC Fire Sprinkler pipe. However, some hangers designed for steel pipe may be used if their suitability is clearly established. These hangers must have a minimum 1/2-inch, load-bearing surface, and they must be selected to accommodate the specific pipe size. In addition, they cannot contain rough or sharp edges that contact the pipe, and they must not bind the pipe from axial movement. Vertical runs must be supported so that the weight of the run is not on a fitting or a joint.

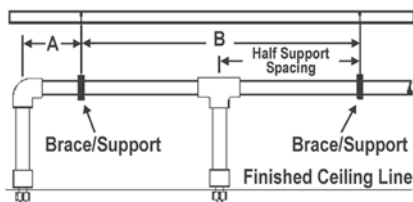
Horizontal runs must be braced so that the stress loads (caused by bending or snaking pipe) will not be placed on a fitting or a joint. Support spacing is shown in the following table. See “Snaking/Deflection of Pipe” in this manual for information regarding bending or snaking CPVC Fire Sprinkler Pipe.

Pipe Size Nominal inches	Maximum Support Spacing feet (meters)	Wt. Water Filled Pipe lbs/ft (kg/m)
3/4 (DN20)	5-1/2 (1,7)	0.427 (0,635)
1 (DN25)	6 (1,8)	0.674 (1,003)
1-1/4 (DN32)	6-1/2 (2,0)	1.078 (1,604)
1-1/2 (DN40)	7 (2,1)	1.412 (2,101)
2 (DN50)	8 (2,4)	2.223 (3,308)
2-1/2 (DN65)	9 (2,7)	3.254 (4,842)
3 (DN80)	10 (3,0)	4.831 (7,189)

NFPA 13D permits “support methods comparable to those required by local plumbing codes.” The above hanger/support requirements must also be followed on NFPA 13D systems.

CAUTION: DO NOT use hanger items such as plumber’s tape or “nail-on” devices. Pipe hanger must comply with NFPA 13, 13D and 13R.

When a sprinkler head activates, a significant reactive force can be exerted on the pipe. With a pendent head, this reactive force can cause the pipe to lift vertically if it is not secured properly, especially if the sprinkler drop is from small diameter pipe. The pipe must be braced against the vertical lift-up with the closest hanger. Refer to the following illustration and Table A & B.



**Table A - Maximum Support Spacing Distance
End Line Sprinkler Head Drop Elbow**

Pipe Size Nominal inches	Line Pressure <100 psi (<689kPa)	Line Pressure >100 psi (>689kPa)
3/4 (DN20)	9 inches (228,6 mm)	6 inches (168,3 mm)
1 (DN25)	12 inches (304,8 mm)	9 inches (228,6 mm)
1-1/4 (DN32)	16 inches (406,4 mm)	12 inches (304,8 mm)
1-1/2 - 3 (DN40 - DN80)	24 inches (610,0 mm)	12 inches (304,8 mm)

Note: Support spacing can be increased by approximately 50% for lower pressures.

**Table B - Maximum Support Spacing Distance
Inline Sprinkler Head Drop Tee**

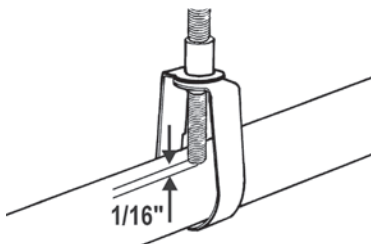
Pipe Size Nominal inches	Line Pressure <100 psi (<689kPa)	Line Pressure >100 psi (>689kPa)
3/4 (DN20)	4 feet (1,22 meters)	3 feet* (0,91 meters)
1 (DN25)	5 feet (1,52 meters)	4 feet* (1,22 meters)
1-1/4 (DN32)	6 feet (1,83 meters)	5 feet* (1,52 meters)
1-1/2 - 3 (DN40 - DN80)	7 feet (2,13 meters)	7 feet (2,13 meters)

Note: *Support spacing can be increased by one foot for lower pressures.

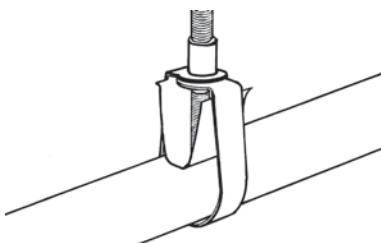
Numerous common methods are used to brace Fire Sprinkler Pipe. A few acceptable methods include: use of a standard band hanger by positioning the threaded support rod to 1/16-inch above the pipe (however, it is important that the rod does not contact the pipe), a wraparound U-hanger, a special escutcheon which prevents upward movement of the sprinkler through the ceiling or band hangers with Surge Restraints to provide surge protection for the system.

Pipe hangers are available that are tested and UL Listed for fire sprinkler service. These hangers comply with NFPA 13 requirements for use with CPVC fire sprinkler piping systems. The following illustrations depict several of these.

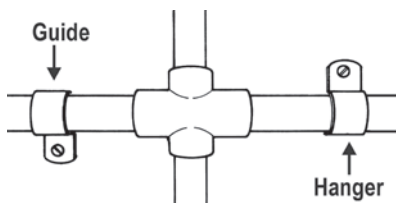
Band Hanger - designed to support CPVC piping systems when used in conjunction with a hanging steel threaded rod that is suspended from a ceiling or other flat, horizontal surface. The threaded rod must be leveled properly before installing the hanger and restraint.



Surge Restraint - when installed with the Band Hanger, as shown below, provides surge protection for the system.

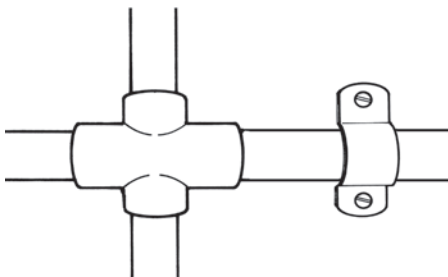


One Hole Wrap-Around Strap - designed to support CPVC piping systems only when the hanger tab is in the vertical position, and the screw-type fastener is in the horizontal position. The one-hole strap can be used as a pipe restrainer when the hanger tab is in the downward position, but it cannot be used as a hanger to hold any weight of the system. In addition, the one-hole strap can be used as a piping system guide when the system lies on top of the beam, and the beam supports the system's weight. The one-hole strap is not intended to support the CPVC piping system from under a ceiling or any other flat, horizontal surface. For this application, install two-hole strap.

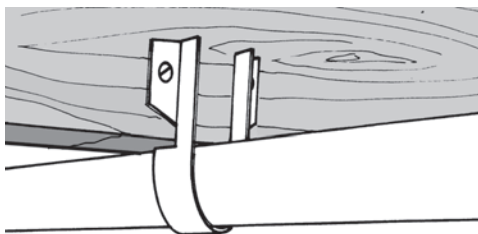


Two-Hole Strap - designed to support CPVC piping systems when attached to a flat, horizontal surface with the screw-type fasteners in the vertical position. In addition, the two-hole strap is designed to support CPVC piping systems when attached to a flat, vertical surface with one mounting tab in the vertical position and the screw-type fasteners in the horizontal position. The two-hole strap can be used as

a piping system guide when the system lies on top of a beam, and the beam supports the system's weight.



Two-Hole 90° Side Mount Strap - designed to support CPVC piping systems when attached to a horizontal beam with the screw-type fasteners in the horizontal position and the pipe hanging below the beam. The fastener's mounting edges are designed to allow the screws to be installed horizontally. This is a benefit when overhead clearance is limited. In addition, the 90° side mount strap can be used in a restrainer fashion when it is attached to the top of a beam, and the system lies on top of the beam.



Riser Supports

Risers must be supported by pipe clamps or by hangers located on the horizontal connection close to the riser. Only Listed hangers and clamps can be used. Vertical lines must be supported at intervals to avoid placing excessive load on a fitting at the lower end. This can be done by using riser clamps or double-bolt pipe clamps listed for this service.

Hangers and supports must not compress, distort, cut, or abrade the piping, and they must allow free movement of the pipe for thermal expansion and contraction. DO NOT use riser clamps that squeeze the pipe and depend on compression of the pipe to support the weight.

Maintain vertical piping in straight alignment with supports at each floor level or 10-foot intervals, whichever is less. CPVC risers in vertical shafts or buildings with ceilings over 25 feet must be aligned straight and supported at each floor level or 10-foot intervals, whichever is less.

Clamps must not exert compressive stresses on the pipe. If possible, the clamps should be located directly below a coupling so that the shoulder of the coupling rests against the clamp. A coupling can be modified to achieve this by cutting a CPVC coupling just above the stop at the socket bottom. Then, cut this piece in half lengthwise to provide two halves that do not contain the stop. Follow the "Solvent

Cement Welding Instructions” to cement the two halves to the pipe at the required location, and make sure that the shoulder of the modified coupling rests on the clamp. Allow the assembly to cure before placing any stress on the joint.

WARNING: CPVC pipe and/or system components must not be used to provide structural support for the system. Care should be used when installing, hanging, or bracing to prevent unnecessary stress loads on the CPVC piping system.

Exposed Installations

For exposed installations that incorporate pendent or sidewall sprinklers, UL Listed support devices for thermoplastic sprinkler piping, or other listed support devices shall be used to mount the piping directly to the ceiling or sidewall.

Earthquake Bracing

Since CPVC fire sprinkler plastic piping is more ductile than metallic sprinkler pipe, it has a greater capacity to withstand earthquake damage. In areas subject to earthquakes, CPVC fire sprinkler systems should be designed and braced in accordance with local codes and NFPA Standard 13.

Trenching

The trench for underground fire service applications should be of adequate width to allow convenient installation, while at the same time being as narrow as possible. Minimum trench widths may be utilized by joining pipe outside of the trench and lowering it into the trench after adequate joint strength has been achieved.

CAUTION - Refer to the set and cure times listed in this manual for solvent cement joints. Failure to follow these cure times before installing piping systems in trenches could result in joint separation. Trench widths have to be wider where pipe is joined in the trench or where thermal expansion and contraction is a factor. Refer to the “Snaking/Deflection of Pipe” section.

Size		Trench Width	Light Traffic Ground Cover	Heavy Traffic Ground Cover
Nominal Diameter inches/mm	Actual Outside Diameter inches/mm	inches	Minimum inches	Minimum inches
3 and under 50 and under	3.500 and under 60.3 and under	8	12 to 18	30 to 36

- Water filled pipe should be buried at least 12 inches below the maximum expected frost line.
- It is recommended that thermoplastic piping be run within a metal or concrete casing when it is installed beneath surfaces that are subject to heavy weight or constant traffic, such as roadways and railroad tracks.

The trench bottom should be continuous, relatively smooth, and free of rocks. Where ledge rock, hardpan, or boulders are encountered, it is necessary to pad the trench bottom using a minimum of four inches of tamped earth or sand beneath the pipe as a cushion and for protection of the pipe from damage.

Sufficient cover must be maintained to keep external stress levels below acceptable design stress. Reliability and safety of service is of major importance in determining minimum cover. Local, state, and national codes may also apply.

Snaking/Deflection of Pipe

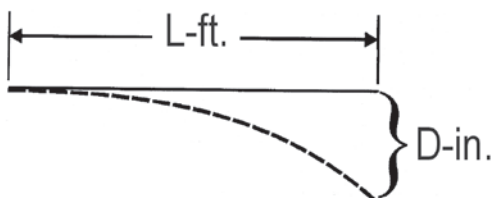
NOTICE –

- After CPVC pipe has been solvent cemented, snake the pipe, according to the following recommendations, beside the trench during its required drying time.
- Be especially careful not to apply any stress that will disturb the undried joint.
- Snaking is necessary to allow for any anticipated thermal contraction that will take place in the newly joined pipeline.

Snaking is particularly necessary on the lengths that have been solvent cemented during the late afternoon or a hot summer's day because their drying time will extend through the cool of the night when thermal contraction of the pipe could stress the joints to the point of pull out. This snaking is especially necessary with pipe that is laid in its trench (necessitating wider trenches than recommended) and is back-filled with cool earth before the joints are thoroughly dry. The following information can be used in determining maximum deflection allowable for various run lengths and pipe sizes.

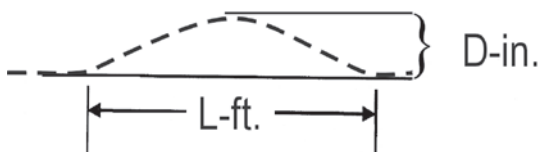
Maximum Bending Deflections in Inches For Given Lengths of CPVC, SDR 13.5 (73° F)

Pipe Size SDR 13.5	Length of Run (L) in Feet													
	2	5	7	10	12	15	17	20	25	30	35	40	45	50
	Pipe Deflection (D) in Inches													
3/4	1.3	7.8	15.4	31.3	45.1	70.5	90.6	124.4	195.9	282.1	383.9	-	-	-
1	1.0	6.3	12.3	25.0	36.0	56.3	72.3	100.1	156.5	225.2	306.6	400.4	-	-
1-1/4	0.8	5.0	9.7	19.8	28.5	44.6	57.3	79.3	123.9	178.4	242.8	317.2	401.4	-
1-1/2	0.7	4.3	8.5	17.3	24.9	39.0	50.1	69.3	108.2	155.9	212.2	277.1	350.7	433.0
2	0.6	3.5	6.8	13.9	20.0	31.2	40.0	55.4	86.6	124.7	169.7	221.7	280.6	346.4
2-1/2	0.5	2.9	5.6	11.4	16.5	25.8	33.1	45.8	71.5	103.0	140.2	183.1	231.8	286.2
3	0.4	2.4	4.6	9.4	13.5	21.2	27.2	37.6	58.8	84.6	115.2	150.4	190.4	235.1



Maximum Snaking Deflections in Inches For Given Lengths of CPVC, SDR 13.5 (73° F)

Pipe Size SDR 13.5	Length of Run (L) in Feet													
	2	5	7	10	12	15	17	20	25	30	35	40	45	50
	Pipe Deflection (D) in Inches													
3/4	0.3	2.0	3.8	7.8	11.3	17.6	22.6	31.3	49.0	70.5	96.0	125.4	158.7	195.9
1	0.3	1.6	3.1	6.3	9.0	14.1	18.1	25.0	39.1	56.3	76.6	100.1	126.7	156.4
1-1/4	0.2	1.2	2.4	5.0	7.1	11.2	14.3	19.8	31.0	44.5	60.7	79.3	100.4	123.9
1-1/2	0.2	1.1	2.1	4.3	6.2	9.7	12.5	17.3	27.1	39.0	53.0	69.3	87.7	108.2
2	0.1	0.9	1.7	3.5	5.0	7.8	10.0	13.9	21.6	31.2	42.4	55.4	70.1	86.6
2-1/2	0.1	0.7	1.4	2.9	4.1	6.4	8.3	11.4	17.9	25.8	35.1	45.8	57.9	71.5
3	0.1	0.6	1.2	2.4	3.4	5.3	6.8	9.4	14.7	21.2	28.8	37.6	47.6	58.8



BACKFILLING

CAUTION - Underground pipe must be thoroughly inspected and tested for leaks prior to backfilling (refer to section on hydrostatic pressure testing). Failure to follow this instruction could result in system failure.

During periods of hot weather, backfilling should only be done early in the morning when the line is fully contracted, and there is no chance of insufficiently dried joints being subjected to contraction stresses.

The pipe should be uniformly and continuously supported over its entire length on a firm, stable material. Blocking should not be used to change pipe grade or to intermittently support pipe across excavated sections.

Pipe is installed in a wide range of sub-soils. These soils must be stable and applied in such a manner to physically shield the pipe from damage. Attention should be given to local pipe laying experience, which may indicate particular pipe bedding problems.

Backfill materials that are free of rocks with a particle size of 1/2-inch or less should be used to surround the pipe with 6 to 8 inches of cover. It should be placed in layers. Each soil layer should be sufficiently

compacted to uniformly develop lateral passive soil forces during the backfill operation. It may be advisable to have the pipe under pressure, 15 to 25 psi, during the backfilling.

Vibratory methods are preferred when compacting sand or gravels. Best results are obtained when the soils are in a nearly saturated condition. Where water-flooding is used, the initial backfill should be sufficient to ensure complete coverage of the pipe. Additional material should not be added until the water flooded backfill is firm enough to walk on. Care should be taken to avoid floating the pipe.

Sand and gravel containing a significant proportion of fine-grained material, such as silt and clay should be compacted by hand or, preferably, by mechanical tamper.

The remainder of the backfill should be spread in uniform layers to fill the trench completely so that there will be no unfilled spaces around rocks or lumps of earth in the backfill. Large or sharp rocks, frozen clods, and other debris, greater than 3 inches in diameter, should be removed. Rolling equipment or heavy tampers should be used only to consolidate the final backfill.

Maintenance shall be in accordance with the Standard for Inspection, Testing and

Maintenance of Water Based Extinguishing Systems, as defined by NFPA 25.

Material Properties

Table I
Modulus of Elasticity & Stress vs. Temperature
For Spears® FlameGuard®™ CPVC Fire Sprinkler Pipe

Property	Temperature ° F							
	73	80	90	100	110	120	140	150
Modulus of Elasticity "E" x 10 ⁵ psi	3.90	3.84	3.78	3.70	3.46	3.21	3.05	2.84
Working Stress "S" psi	1,900	1,785	1,630	1,485	1,345	1,270	950	875

Table II
Physical & Thermal Properties

Property		A-Spears® FlameGuard® CPVC Pipe	ASTM
Specific Gravity	"Sp. Gr."	1.51	D 92
IZOD Impact Strength (ft. lbs/inch of notch)		5.0	D 256A
Modulus of Elasticity, psi	"E"	3.9×10^5	D 638
Ultimate Tensile Strength, psi		8,000	D 638
Compressive Strength, psi		9,000	D 695
Poisson's Ratio		.35 - .38	-
Working Stress @ 73° F, psi		1,900	D 1598
Hazen-Williams "C" Factor		150	-
Coefficient of Linear Expansion in./in. ° F)	"e"	3.2×10^{-5}	D 696
Thermal Conductivity BTU/(hr ° F Win')	"k"	0.95	C 177
Upper Temperature Limit	"° F"	205	-
Flammability		Flame Retardant	
Electrical Conductivity		Non Conductor	

Expansion and Contraction

Spears® FlameGuard® CPVC Fire Sprinkler Products, like all piping materials, expand and contract with changes in temperature. If the coefficient of linear expansion is 3.2×10^{-5} inch/inch ° F. A 25° F change in temperature will cause an expansion of 1 inch for a 100-foot straight length. For most operating and installation conditions, expansion and contraction can be accommodated at changes of direction.

Table III
Thermal Expansion in Inches
For Spears® FlameGuard® CPVC Fire Sprinkler Pipe

Temp. Change ΔT ° F	Length of Run in Feet													
	5	10	15	20	25	30	35	40	45	50	70	90	120	160
	Thermal Expansion ΔL (in.)													
20	0.04	0.08	0.12	0.15	0.19	0.23	0.27	0.31	0.35	0.38	0.54	0.69	0.92	1.23
30	0.06	0.12	0.17	0.23	0.29	0.35	0.40	0.46	0.52	0.58	0.81	1.04	1.38	1.84
40	0.08	0.15	0.23	0.31	0.38	0.46	0.54	0.61	0.69	0.77	1.08	1.38	1.84	2.46
50	0.10	0.19	0.29	0.38	0.48	0.58	0.67	0.77	0.86	0.96	1.34	1.73	2.30	3.07
60	0.12	0.23	0.35	0.46	0.58	0.69	0.81	0.92	1.04	1.15	1.61	2.07	2.76	3.69
70	0.13	0.27	0.40	0.54	0.67	0.81	0.94	1.08	1.21	1.34	1.88	2.42	3.23	4.30
80	0.15	0.31	0.46	0.61	0.77	0.92	1.08	1.23	1.38	1.54	2.15	2.76	3.69	4.92
90	0.17	0.35	0.52	0.69	0.86	1.04	1.21	1.38	1.56	1.73	2.42	3.11	4.15	5.53
100	0.19	0.38	0.58	0.77	0.96	1.15	1.34	1.54	1.73	1.92	2.69	3.46	4.61	6.14

$$\Delta L = 12 e L (\Delta T)$$

$e = 3.2 \times 10^{-5}$ in./in. ° F (Coefficient of Linear Expansion for Spears® FlameGuard® CPVC Fire Sprinkler Pipe) L = Length of Run in Feet

ΔT = Temperature Change in ° F

Example:

How much will a 40 ft. run of 2" Spears® FlameGuard® CPVC Fire Sprinkler Pipe expand if the expected ambient temperature will range from 45° F to 85° F?

$$\Delta L = 12 e L (\Delta T)$$

$$\Delta L = 12 (.000032) \times 40 \times 40$$

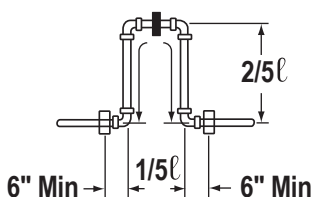
$$\Delta L = .61"$$

Expansion Loop & Offset Configurations

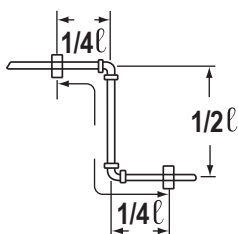
Hangers or guides should only be placed in the loop, offset or change of direction as indicated below. Piping supports should restrict lateral movement and should direct axial movement into the expansion loop.

Expansion Loop and Offset Configurations

Loop



Offset



Change of Direction

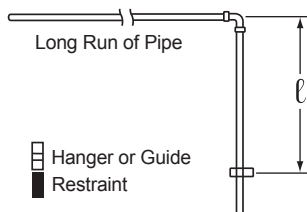


Table IV
Expansion Loop Length in Inches
For Spears® FlameGuard® CPVC Fire Sprinkler Pipe

Nominal Pipe Size	Avg. O.D.	Length of Run in Feet													
		5	10	15	20	25	30	35	40	45	50	70	90	120	160
		Length of Loop (in.) Temperature = 100° F - 30° F, $\Delta T = 70^\circ$ F													
3/4	1.050	7	10	13	15	16	18	19	21	22	23	27	31	36	41
1	1.315	8	11	14	16	18	20	22	23	24	26	30	34	40	46
1-1/4	1.660	9	13	16	18	20	22	24	26	27	29	34	39	45	52
1-1/2	1.900	10	14	17	20	22	24	26	28	29	31	37	41	48	55
2	2.375	11	15	19	22	24	27	29	31	33	35	41	46	54	62
2-1/2	2.875	12	17	21	24	27	30	32	34	36	38	45	51	59	68
3	3.500	13	19	23	27	30	33	35	38	40	42	50	56	65	75

Note: Table IV is based on Stress & Modulus Elasticity at 100° F

$$I = \sqrt{\frac{3ED\Delta L}{2S}}$$

I = Length of Expansion Loop in Inches

E = Modulus of Elasticity (Table I)

D = Average O.D. of Pipe

ΔL = Change in Length of Pipe Due to Change in Temperature (Table III)

S = Working Stress (Table I)

Example: How much expansion can be expected in a 200 ft. run of 2" Spears® FlameGuard® CPVC Fire Sprinkler Pipe and how long should the expansion loop be to compensate for this expansion? (The expected temperature range will be from 40° F to 110° F).

First Find:

ΔT = (Change in Temperature)

ΔT = $T_2 - T_1$

ΔT = 110° F – 40° F

ΔT = 70° F

To Find:

ΔL = (Amount of Expansion in inches from Table III)

ΔL = ΔL of 160 ft. with a ΔT of 70° F + ΔL of 40 ft. with a ΔT of 70° F

ΔL = 4.30" + 1.08"

ΔL = 5.38"

-OR-

ΔL = $12eL(\Delta T)$

e = 3.2×10^{-5} (from Table II)

L = Length of Run in Feet

ΔT = Change in Temperature in ° F

ΔL = $12 \times .000032 \times 200 \times 70$

ΔL = 5.38"

To find the length of the expansion loop or offset in inches:

$$I = \sqrt{\frac{3ED\Delta L}{2S}}$$

I = Length of Expansion Loop in Inches

E = Modulus of Elasticity at 110° F (Table I)

D = Average O.D. of Pipe

ΔL = Change in Length of Pipe Due to Change in Temperature (Table III-A)

S = Working Stress at 110° F (Table I)

$$I = \sqrt{\frac{3ED\Delta L}{2S}}$$

$$I = \sqrt{\frac{3 \times 346,000 \times 2.375 \times 5.38}{2 \times 1345}}$$

$$I = \sqrt{4931}$$

$$I = 70.2"$$

[illegible]

Review – Do's & Don'ts

Do's

- Read the manufacturer's installation instructions.
- Follow recommended safe work practices.
- Make certain that thread sealants, gasket lubricants, or fire stop materials are compatible with CPVC.
- Keep pipe and fittings in original packaging until needed.
- Cover pipe and fittings with an opaque tarp if stored outdoors.
- Follow proper handling procedures.
- Use tools specifically designed for use with plastic pipe and fittings.
- Use the proper solvent cement and follow application instructions.
- Use a drop cloth to protect interior finishes.
- Cut the pipe ends square.
- Deburr and bevel the pipe end with a chamfering tool.
- Rotate the pipe 1/4 turn when bottoming pipe in fitting socket.
- Avoid puddling of cement in fittings and pipe.
- Make certain no solvent cement is on sprinkler head and adapter threads.
- Make certain that solvent cement does not run and plug the sprinkler head orifice.
- Follow the manufacturer's recommended cure times prior to pressure testing.
- Fill lines slowly and bleed the air from the system prior to flushing and pressure testing.
- Support sprinkler head properly to prevent lift up of the head through the ceiling when activated.
- Keep threaded rod within 1/16" of the pipe or use a surge arrestor.
- Install Spears® FlameGuard® CPVC Fire Sprinkler Products in wet systems only.
- Use only factory mixed glycerin and water solutions for freeze protection.
- Allow for movement due to expansion and contraction.
- Renew your Spears® FlameGuard® CPVC Fire Sprinkler Products installation training every two years.

Don'ts

- Do not use edible oils such as Crisco as a gasket lubricant.
- Do not use petroleum or solvent-based sealants, lubricants, or fire stop materials.
- Do not install tape, insulated wire or cable in direct contact with CPVC.
- Do not use any glycol-based solutions as an anti-freeze.
- Do not mix glycerin and water solutions in contaminated containers, only factory pre-mixed glycerin is permitted.
- Do not use solvent cement that exceeds its shelf life or has become discolored or jellied.
- Do not allow solvent cement to plug the sprinkler head orifice.
- Do not connect rigid metal couplers to CPVC grooved adapters.
- Do not thread, groove, or drill CPVC pipe.
- Do not use solvent cement near sources of heat, open flame, or when smoking.
- Do not perform System Acceptance Testing with air.
- Do not pressure test until recommended cure times are met.
- Do not use ratchet cutters below 50° F.
- Do not use CPVC pipe that has been stored outdoors, unprotected and is faded in color.
- Do not allow threaded rod to come in contact with the pipe.
- Do not install Spears® FlameGuard® CPVC Fire Sprinkler Products in cold weather without allowing for expansion.

GHS LABEL:

Signal Word: Danger	WHMIS CLASSIFICATION: CLASS B, DIVISION 2
Hazard Statements	Precautionary Statements
H225: Highly flammable liquid and vapor	P210: Keep away from heat/sparks/open flames/hot surfaces - No smoking
H319: Causes serious eye irritation	P261: Avoid breathing dust/fume/gas/mist/vapors/spray
H332: Harmful if inhaled	P280: Wear protective gloves/protective clothing/eye protection/face protection
H335: May cause respiratory irritation	P337+P313: Get medical advice/attention
H336: May cause drowsiness or dizziness	P337+P313: Get medical advice/attention
H351: Suspected of causing cancer	P403+P233: Store in a well-ventilated place. keep container tightly closed
EUH019: May form explosive peroxides	P501: Dispose of contents/container in accordance with local regulation

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

	CAS#	EINECS #	REACH NUMBER	CONCENTRATION % by Weight
Tetrahydrofuran (THF)	109-99-9	203-726-8	05-2116297729-22-0000	30 - 60
Methyl Ethyl Ketone (MEK)	78-93-3	201-159-0	05-2116297728-24-0000	2 - 25
Cyclohexanone	108-94-1	203-631-1	05-2116297718-25-0000	5 - 15
Acetone	67-64-1	200-662-2	05-2116297713-35-0000	1 - 5

All of the constituents of this adhesive product are listed on the TSCA inventory of chemical substances maintained by the US EPA, or are exempt from that listing.

* Indicates this chemical is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (40CFR372).

indicates that this chemical is found on Proposition 65's List of chemicals known to the State of California to cause cancer or reproductive toxicity.

SECTION 4 - FIRST AID MEASURES

Contact with eyes: Flush eyes immediately with plenty of water for 15 minutes and seek medical advice immediately.

Skin contact: Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water. If irritation develops, seek medical advice.

Inhalation: Remove to fresh air. If breathing is stopped, give artificial respiration. If breathing is difficult, give oxygen. Seek medical advice.

Ingestion: Rinse mouth with water. Give 1 or 2 glasses of water or milk to dilute. Do not induce vomiting. Seek medical advice immediately.

Likely Routes of Exposure: Inhalation, Eye and Skin Contact

Acute symptoms and effects:

Inhalation: Severe overexposure may result in nausea, dizziness, headache. Can cause drowsiness, irritation of eyes and nasal passages.

Eye Contact: Vapors slightly uncomfortable. Overexposure may result in severe eye injury with corneal or conjunctival inflammation on contact with the liquid.

Skin Contact: Liquid contact may remove natural skin oils resulting in skin irritation. Dermatitis may occur with prolonged contact.

Ingestion: May cause nausea, vomiting, diarrhea and mental sluggishness.

Chronic (long-term) effects: Category 2 Carcinogen

SECTION 5 - FIREFIGHTING MEASURES

Suitable Extinguishing Media: Dry chemical powder, carbon dioxide gas, foam, Halon, water fog.

Unsuitable Extinguishing Media: Water spray or stream

Exposure Hazards: Inhalation and dermal contact.

Combustion Products: Oxides of carbon, hydrogen chloride and smoke.

Protection for Firefighters: Self-contained breathing apparatus or full-face positive pressure airline masks

	HMIS	NFPA	0-Minimal
Health	2	2	1-Slight
Flammability	3	3	2-Moderate
Reactivity	0	0	3-Serious
PPE	B		4-Severe

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions:

Keep away from heat, sparks and open flame

Provide sufficient ventilation, use explosion-proof exhaust ventilation equipment or wear suitable respiratory

protective equipment.

Prevent contact with skin or eyes (see section 8).

Environmental Precautions:

Prevent product or liquids contaminated with product from entering sewers, drains, soil or open water course.

Methods for Cleaning up:

Clean up with sand or other inert absorbent material. Transfer to a closable steel vessel.

Materials not to be used for clean up: Aluminum or plastic containers.

SECTION 7 - HANDLING AND STORAGE

Handling: Avoid breathing of vapor, avoid contact with eyes, skin and clothing

Keep away from ignition sources, use only electrically grounded handling equipment and ensure adequate ventilation/fume exhaust hoods.

Do not eat, drink or smoke while handling.

Storage: Store in ventilated room or shade below 33 °C (90 °F) and away from direct sunlight.

Keep away from ignition sources and incompatible materials: caustics, ammonia, inorganic acids, chlorinated compounds, strong oxidizers and isocyanates.

Follow all precautionary information on container label, product bulletins and solvent cementing literature.

SECTION 8 - PRECAUTIONS TO CONTROL EXPOSURE / PERSONAL PROTECTION

EXPOSURE LIMITS

Component	ACGIH TLV	ACGIH STEL	OSHA PEL	OSHA STEL
Tetrahydrofuran (THF)	50 ppm	100 ppm	200 ppm	N/E
Methyl Ethyl Ketone (MEK)	200 ppm	300 ppm	200 ppm	N/E
Cyclohexanone	20 ppm	50 ppm	50 ppm	N/E
Acetone	500 ppm	750 ppm	1000 ppm	N/E

Component	OSHA PEL-Ceiling	CAL/OSHA PEL	CAL/OSHA Ceiling	CAL/OSHA STEL
Tetrahydrofuran (THF)	N/E	200 ppm	N/E	250 ppm
Methyl Ethyl Ketone (MEK)	N/E	200 ppm	N/E	300 ppm
Cyclohexanone	N/E	25 ppm	N/E	N/E
Acetone	N/E	500 ppm	3000 ppm	750 ppm

Engineering Controls: Use local exhaust as needed.

Monitoring: Maintain breathing zone airborne concentrations below exposure limits.

Personal Protective Equipment (PPE):

Eye Protection: Avoid contact with eyes, wear splash-proof chemical goggles, face shield, safety glasses (spectacles) with brow guards and side shields, etc. as may be appropriate for the exposure.

Skin Protection:

Prevent contact with the skin as much as possible. Butyl rubber gloves should be used for frequent immersion. Use of solvent-resistant gloves or solvent-resistant barrier cream should provide adequate protection when normal adhesive application practices and procedures are used for making structural bonds.

Respiratory Protection: Prevent inhalation of the solvents. Use in a well-ventilated room. Open doors and/or windows to ensure airflow and air changes. Use local exhaust ventilation to remove airborne contaminants from employee breathing zone and to keep contaminants below levels listed above. With normal use, the Exposure Limit Value will not usually be reached. When limits approach, use respiratory protection equipment

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Red, heavy syrupy liquid

Odor: Ether-Like **Odor Threshold:** 0.88 ppm (Cyclohexanone)

pH: Not Applicable

Melting/Freezing Point: -108.5 °C (-163.3 °F) Based on first melting component: THF

Boiling Point: 66 °C (151 °F) Based on first boiling component: THF

Boiling Range: 66°C (151°F) to 156°C (313°F)

Flash Point: -20 °C (-4 °F) TCC based on THF

Specific Gravity: 0.857 ± 0.01 @ 23°C ± 2° (73°F ± 3.6°)

Solubility: Solvent portion soluble in water. Resin portion separates out.

Partition Coefficient n-octanol/water: Not Available

Auto-ignition Temperature: 321 °C (610 °F) based on THF

Decomposition Temperature: Not Applicable

VOC Content: When applied as directed, per SCAQMD Rule 1168, Test Method 316A, VOC content is: < 490 g/l.

Evaporation Rate: > 1.0 (BUAC = 1)

Flammability: Category 2

Flammability Limits: LEL: 1.1% based on Cyclohexanone

UEL: 11.8% based on THF

Vapor Pressure: 129 mm Hg @ 20 °C (68 °F) based on THF

Vapor Density: >2.0 (Air = 1)

Other Data: Viscosity: Heavy bodied

SECTION 10 - STABILITY AND REACTIVITY

Stability: Stable

Hazardous decomposition products: None in normal use. When forced to burn, this product gives off oxides of carbon, hydrogen chloride and smoke.

Conditions to avoid: Keep away from heat, sparks, open flame and other ignition sources.

Incompatible Materials: Oxidizers, strong acids and bases, amines, ammonia

SECTION 11 - TOXICOLOGICAL INFORMATION

Toxicity:	LD50	LC50
Tetrahydrofuran (THF)	Oral: 2842 mg/kg (rat)	Inhalation 3 hrs. 21,000 mg/m3 (rat)
Methyl Ethyl Ketone (MEK)	Oral: 2737 mg/kg (rat), Dermal: 6480 mg/kg (rabbit)	Inhalation 8 hrs. 23,500 mg/m3 (rat)
Cyclohexanone	Oral 1535 mg/kg (rat), Dermal: 948 mg/kg (rabbit)	Inhalation 4 hrs. 8,000 PPM (rat)
Acetone	Oral: 5800 mg/kg (rat)	Inhalation 50,100 mg/m3 (rat)

Toxicity: Target Organs

Tetrahydrofuran (THF) STOT SE3

Methyl Ethyl Ketone (MEK) STOT SE3

Cyclohexanone

Acetone STOT SE3

Reproductive Effects Teratogenicity

Not Establish Not Established

Mutagenicity

Not Established

Embryotoxicity Sensitization to Product

Not Established Not Established

Synergistic Products

Not Established

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity: None Known

Mobility: In normal use, emission of volatile organic compounds (VOC's) to the air takes place, typically at a rate of < 490g/l.

Degradability: Biodegradable

Bioaccumulation: Minimal to none

SECTION 13 - WASTE DISPOSAL CONSIDERATIONS

Follow local and national regulations. Consult disposal expert

SECTION 14 - TRANSPORT INFORMATION

Proper Shipping Name: Adhesives

Hazard Class: 3

Secondary Risk: None

Identification Number: UN 1133

Packing Group: PG II

Label Required: Class 3 Flammable Liquid

Marine Pollutant: NO

EXCEPTION for Ground Shipping

DOT Limited Quantity: Up to 1L per inner packaging, 30 kg gross weight per package.

Consumer Commodity: Depending on packaging, these quantities may qualify under DOT as "ORM-D"

TDG INFORMATION

TDG CLASS: FLAMMABLE LIQUID 3

SHIPPING NAME: ADHESIVES

UN NUMBER/PACKING GROUP: UN 1133, PG II

SECTION 15 - REGULATORY INFORMATION

Precautionary Label Information: Highly Flammable, Irritant

Symbols: F, Xi

Risk Phrases: R11: Highly flammable; R36/37: Irritating to eyes and respiratory system; R66: Repeated exposure may cause skin dryness or cracking; R67: Vapors may cause drowsiness and dizziness

Safety Phrases: S2: Keep out of the reach of children; S9: Keep container in a well-ventilated place; S16: Keep away from sources of ignition - No smoking; S25: Avoid contact with eyes; S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice; S33: Take precautionary measures against static discharges.

Ingredient Listings: USA TSCA, Europe EINECS, Canada DSL, Australia AICS, Korea ECL/TCCL, Japan MITI (ENCS)

SECTION 16 - OTHER INFORMATION

Specification Information:

Department issuing data sheet: Environmental Health & Safety

All ingredients are compliant with the requirements of the European Directive on RoHS (Restriction of Hazardous Substances).

E-mail address: EHSInfo@SpearsMfg.net

Training necessary: Yes, training in practices and procedures contained in product literature.

Reissue date / reason for reissue: 09/01/15 / Updated GHS Standard Format

Intended Use of Product: Solvent Cement for CPVC Plastic Pipe

This product is intended for use by skilled individuals at their own risk. The information contained herein is based on data considered accurate based on current state of knowledge and experience.

However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.

This image shows a full page of blank, lined paper. It features approximately 28 evenly spaced horizontal grey lines across its entire width, providing a template for writing or drawing. The margins are consistent on all sides.



TorqueSafe™ Gasket Sealed Head Adapter

No Thread Sealant to be Used
Hand Tight + 10 to 25 ft-lbs Torque to
Rotate for Sprinkler Head Alignment

QuickTorque™ & SoftTorque™

Gasket Sealed Head Adapter
No Thread Sealant to be Used
Finger Tight + 1-Turn, Up to
1-Additional Turn to Align Head



For Other Thread Connections:

1. Use a compatible paste sealant. Spears® recommends [BLUE 75™](#), tested for compatibility with CPVC products.
2. Apply sealant to male threads.
3. Install Sprinkler Heads or make metal pipe transitions, tighten as follows:



Adapter for
Metal Pipe
Transition



Hand tight
+1.5 to 2
Turns

SR Plastic
Thread



Min. 5 ft-lbs
Max. 10 ft-lbs
Torque

Metal
Thread



Min. 15 ft-lbs
Max. 20 ft-lbs
Torque

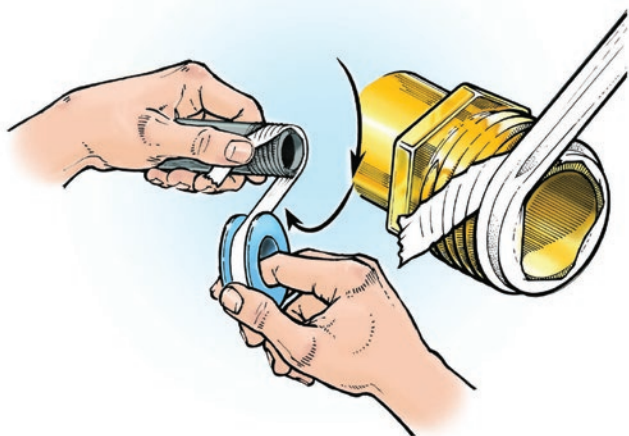
If You Feel You MUST Use Tape Sealant . . .

... DO IT CORRECTLY!

Failure to follow instructions can result in thread breaks from too much tape, difficult assembly from not enough, or leaks due to exposed starting threads.

DO NOT USE TAPE & PASTE!

- DO NOT USE with Gasket Sealed Head Adapters
- USE a TFE tape with a min. thickness of 3.5 mil.
- Cover male starting threads to prevent seizing.



- Wrap tape in direction of threads.
 - For Regular Head Adapters, use 2 to 3 wraps. Tighten to specified torque (see front cover).
 - For Female Adapter Transitions to metal pipe, use ONLY 5 to 5-1/2 wraps.
- Joint Assembly — tighten 1-2 turns beyond finger tight. DO NOT back up. DO NOT over tighten!

SPEARS® MANUFACTURING COMPANY
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PO Box 9203, Sylmar, CA 91392
(818) 364-1611
www.spearsmfg.com



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CPVC STRAPS



FUNCTION: Designed to support CPVC pipe horizontally from the side or bottom of beam. Fig. 070 can only be used as a guide on top of beam or on vertical piping. Fig. 070 also acts as a restrainer to prevent the thrust of a sprinkler head during activation when mounted on top of structure. Fig. 070 may be installed onto wood using supplied fasteners or into, minimum 20 gauge, steel using two 1/4" X 1" tek type screws. Features flared edges to protect piping as it slides through the installed fitting and retaining dimples to allow for easy installation onto pipe.

SIZE: 3/4" Through 2" CPVC pipe

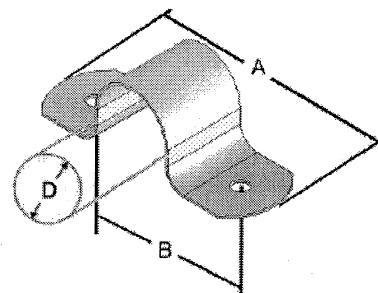
FINISH: Pre-galvanized

MATERIAL: Carbon Steel

APPROVALS: Underwriters Laboratories listed for US and Canada

ORDERING: Specify pipe size and model number.

Fig. 070
CPVC TWO-HOLE
PIPE STRAP



Pipe Size	A	B	D Nominal	Material Size	Box Qty.	Max Spacing	Appx. Wt. Per 100 (lbs.)
3/4	3 1/16	2 3/16	1.050	20 ga. X 1 1/8"	100	5'-6"	7.50
1	3 3/8	2 1/2	1.315	20 ga. X 1 1/8"	100	6'-0"	8.20
1 1/4	3 3/4	2 1/8	1.660	20 ga. X 1 1/8"	100	6'-6"	9.40
1 1/2	4 1/8	3 1/4	1.900	20 ga. X 1 1/8"	100	7'-0"	10.40
2	4 3/8	3 1/2	2.375	20 ga. X 1 1/8"	100	8'-0"	11.90

CPVC STRAPS



FUNCTION: Designed to support CPVC pipe horizontally from the side of a beam. Fig. 075 must be installed with the mounting tab oriented over top of piping on the side of a beam as illustrated below. Fig. 075 can only be used as a guide on top of beam or on vertical piping. Fig. 075 may be installed onto wood using supplied fasteners or into, minimum 20 gauge, steel using one 1/4" X 1" tek type screw. Features flared edges to protect piping as it slides through the installed fitting.

SIZE: 3/4" Through 2" CPVC pipe

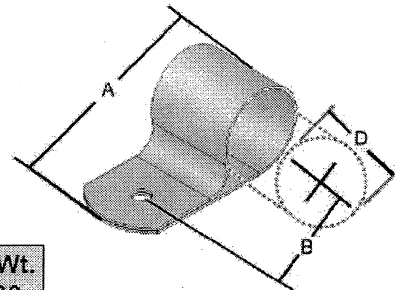
FINISH: Pre-galvanized

MATERIAL: Carbon Steel

APPROVALS: Underwriters Laboratories listed for US and Canada

ORDERING: Specify pipe size and model number.

**Fig. 075
CPVC ONE-HOLE
WRAP AROUND**



Pipe Size	A	B	D Nominal	Material Size	Box Qty.	Max Spacing	Appx. Wt. Per 100 (lbs.)
3/4	2 3/8	1 3/8	1.050	20 ga. X 1 1/8"	100	5'-6"	8.70
1	2 5/8	1 7/16	1.315	20 ga. X 1 1/8"	100	6'-0"	9.40
1 1/4	2 7/8	1 9/16	1.660	20 ga. X 1 1/8"	100	6'-6"	11.00
1 1/2	3 1/16	1 5/8	1.900	20 ga. X 1 1/8"	100	7'-0"	11.90
2	3 7/16	1 13/16	2.375	20 ga. X 1 1/8"	100	8'-0"	14.10

CPVC STRAPS



FUNCTION: Designed to support CPVC pipe horizontally from the side or bottom of beam, or composite wood joists with a minimum of 3/8" web thickness. Fig. 076 can only be used as a guide on top of beam or on vertical piping. Fig. 076 may be installed onto wood using supplied fasteners or into, minimum 18 gauge, steel using two 1/4" X 1" tek type screws. Features flared edges to protect piping as it slides through the installed fitting.

SIZE: 3/4" Through 2" CPVC pipe

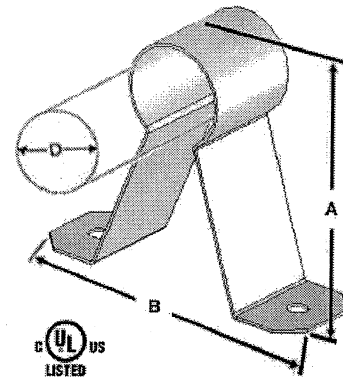
FINISH: Pre-galvanized

MATERIAL: Carbon Steel

APPROVALS: Underwriters Laboratories listed for US and Canada

ORDERING: Specify pipe size and model number.

Fig. 076
CPVC TWO-HOLE
STAND OFF STRAP



Pipe Size	A	B	D	Material Size	Box Qty.	Max Spacing	Appx. Wt. Per 100 (lbs.)
3/4	2 9/16	4 1/4	1.050	20 ga. X 1 1/8"	100	5'-6"	12.10
1	2 13/16	4 1/2	1.315	20 ga. X 1 1/8"	100	6'-0"	12.80
1 1/4	3 3/16	4 5/8	1.660	20 ga. X 1 1/8"	100	6'-6"	14.10
1 1/2	3 1/16	5	1.990	20 ga. X 1 1/8"	100	7'-0"	15.20
2	3 7/8	5	2.375	20 ga. X 1 1/8"	100	8'-0"	16.40

CPVC STRAPS



FUNCTION: Designed to support CPVC pipe horizontally from the side or bottom of beam. Fig. 077 can only be used as a guide on top of beam or on vertical piping. Fig. 077 also acts as a restrainer to prevent the thrust of a sprinkler head during activation when mounted on top of structure. Fig. 077 may be installed onto wood using supplied fasteners or into, minimum 20 gauge, steel using two 1/4" X 1" tek type screws. Features flared edges to protect piping and retaining dimples to allow for easy installation onto pipe.

SIZE: 3/4" Through 2" CPVC pipe

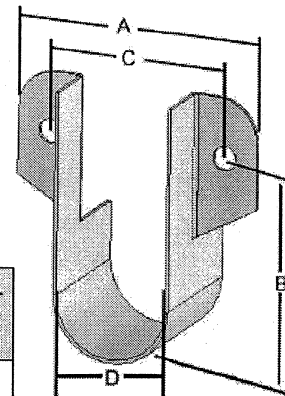
FINISH: Pre-galvanized

MATERIAL: Carbon Steel

APPROVALS: Underwriters Laboratories listed for US and Canada

ORDERING: Specify pipe size and model number.

Fig. 077
CPVC TWO-HOLE
SIDE MOUNT STRAP



Pipe Size	A	B	C	D	Material Size	Box Qty.	Max Spacing	Appx. Wt. Per 100 (lbs.)
3/4	2 5/16	1 7/8	1 11/16	1.050	20 ga. X 1 1/8"	100	5'-6"	8.50
1	2 9/16	2 3/16	1 15/16	1.315	20 ga. X 1 1/8"	100	6'-0"	9.40
1 1/4	2 15/16	2 1/2	2 5/16	1.660	20 ga. X 1 1/8"	100	6'-6"	10.40
1 1/2	3 1/4	2 13/16	2 5/8	1.990	20 ga. X 1 1/8"	100	7'-0"	11.30
2	3 5/8	3 1/4	3	2.375	20 ga. X 1 1/8"	100	8'-0"	13.20

ADJUSTABLE SWIVEL RING HANGERS



FUNCTION: Designed for the suspension of non-insulated stationary pipe lines. The knurled insert nut that allows a vertical adjustment after installation, is tapped to NFPA reduced rod size standards. Fig. 141F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.

APPROVALS: Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), for use with standard steel pipe sizes $\frac{3}{4}$ " (20mm) to 8" (200MM) and CPVC pipe sizes $\frac{3}{4}$ " (20mm) to 4" (100MM). Factory Mutual Approved for sizes $\frac{3}{4}$ " (20mm) to 8" (200MM). Complies with Federal Specifications A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 10).

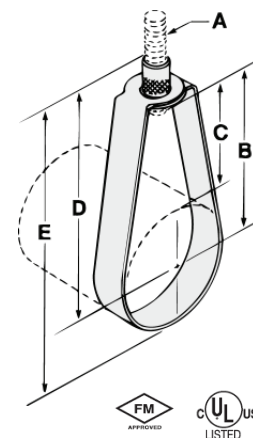
ORDERING: Specify pipe size and figure number.

		Rod Size			Adj.						Max. Rec. Load		Wt. Per Inch	
Pipe Size			B		C		D		E	lbs.	Kn	lbs.	kg	
1/2	(15)	3/8	1 7/8	(47.63)	1 7/16	(36.51)	2 3/4	(69.85)	3 1/16	(77.79)	300	(1.33)	.10	(.05)
3/4	(20)	3/8	1 11/16	(42.86)	1 1/8	(28.58)	2 1/2	(63.50)	3 1/16	(77.79)	300	(1.33)	.10	(.05)
1	(25)	3/8	1 5/8	(41.28)	1	(25.40)	2 1/2	(63.50)	3 3/16	(80.96)	300	(1.33)	.10	(.05)
1 1/4	(32)	3/8	1 15/16	(49.21)	1 1/16	(26.99)	2 13/16	(71.44)	3 9/16	(90.49)	300	(1.33)	.11	(.05)
1 1/2	(40)	3/8	2 1/8	(53.98)	1 1/16	(26.99)	3 1/8	(79.38)	3 7/8	(98.43)	300	(1.33)	.11	(.05)
2	(50)	3/8	2 7/16	(61.91)	1 1/8	(28.58)	3 5/16	(84.14)	4 3/8	(111.13)	300	(1.33)	.14	(.06)
2 1/2	(65)	3/8	3 1/16	(77.79)	1 5/8	(41.28)	3 15/16	(100.01)	5 3/8	(136.53)	525	(2.34)	.19	(.09)
3	(80)	3/8	3 11/16	(93.66)	1 7/8	(47.63)	4 9/16	(115.89)	6 5/16	(160.34)	525	(2.34)	.23	(.10)
3 1/2	(90)	3/8	3 3/4	(95.25)	1 7/8	(47.63)	4 5/8	(117.48)	6 5/8	(168.28)	525	(2.34)	.25	(.11)
4	(100)	3/8	4 3/16	(106.36)	1 7/8	(47.63)	5 1/16	(128.59)	7 5/16	(185.74)	650	(2.89)	.30	(.14)
5	(125)	1/2	4 5/8	(117.48)	1 5/8	(41.28)	5 5/8	(142.88)	8 3/8	(212.73)	1000	(4.45)	.50	(.23)
6	(150)	1/2	5 5/8	(142.88)	2 1/4	(57.15)	6 1/2	(165.10)	9 13/16	(249.24)	1000	(4.45)	.58	(.26)
8	(200)	1/2	6 13/16	(173.04)	2 7/16	(61.91)	7 15/16	(201.61)	12 1/4	(311.15)	1000	(4.45)	.90	(.41)

Note: If ordering Fig. 141F felt lined hangers for pipe sizes of $\frac{3}{16}$ " (90mm) or under, order the next largest size to allow for the thickness of the felt lining.

Fig. 141 & 141F NFPA SWIVEL RING HANGER

Fig. 141 PRE-GALVANIZED
Fig. 141F PRE-GALVANIZED
WITH FELT LINING



MATERIAL: Low carbon steel

FUNCTION: Designed for the suspension of non-insulated stationary pipe lines. The knurled insert nut, allows for vertical adjustment after installation. Fig. 151F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.

APPROVALS: Underwriters' Laboratories Listed in the U.S. (UL) and Factory Mutual Approved for all sizes. Complies with Federal Specification A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 10).

ORDERING: Specify pipe size and figure number. **MATERIAL:** Low carbon steel

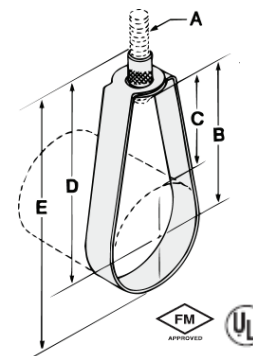
Pipe Size		Rod Size	B		Adj. C		D		E		Max. Rec. Load		Wt. Per Inch	
											lbs.	Kn	lbs.	kg
2½	(65)	½	2¾	(69.85)	1¼	(31.75)	3⅛	(93.66)	5⅛	(130.18)	600	(2.67)	.33	(.15)
3	(80)	½	3⅛	(79.38)	1⅛	(28.58)	4	(101.60)	5⅞	(149.23)	600	(2.67)	.35	(.16)
3½	(90)	½	3⅝	(92.08)	1½	(38.10)	4⅝	(109.54)	6⅝	(168.28)	600	(2.67)	.37	(.17)
4	(100)	⅝	3⅞	(98.43)	1¼	(31.75)	4⅝	(125.41)	7⅛	(180.98)	1000	(4.45)	.48	(.22)
5	(125)	⅝	3⅞	(85.73)	1⅜	(34.93)	5⅝	(142.88)	8½	(215.90)	1000	(4.45)	.57	(.26)
6	(150)	¾	5⅝	(134.94)	2	(50.80)	6⅛	(169.86)	10⅛	(257.18)	1250	(5.56)	1.06	(.48)
8	(200)	¾	6⅝	(176.21)	2⅝	(66.68)	8⅝	(211.14)	12⅞	(327.03)	1250	(5.56)	1.32	(.60)

Note: If ordering Fig. 151F felt lined hangers for pipe sizes of $\frac{3}{16}$ " (90mm) or under, order the next largest size to allow for the thickness of the felt lining.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

Fig. 151 & 151F SWIVEL RING HANGER

Fig. 151 PRE-GALVANIZED
Fig. 151F PRE-GALVANIZED
WITH FELT LINING





THREADED ACCESSORIES

Fig. 20 & 21 CONTINUOUS THREADED ROD

FUNCTION: Useful in applications where stud lengths cannot be predetermined.

MATERIAL: Low carbon steel

ORDERING: Specify rod size, length and figure number.

Fig. 20* PLAIN

Fig. 21 ELECTRO-GALVANIZED



*Available in stainless steel. To order, specify 304 or 316 and add suffix SS to figure number.
Price on request.

Rod Size	Packaging Feet Per Bundle						Max. Rec. Load				Wt. Per Foot	
							650°F (343°C)		750°F (399°C)			
	6ft.	(1.83)	10ft.	(3.05)	12ft.	(3.66)	lbs.	kN	lbs.	kN	lbs.	kg
1/4 -20	300	(91.44)	500	(152.4)	600	(182.88)	240	(1.07)	210	(.93)	.12	(.05)
3/8 -16	150	(45.72)	250	(76.2)	240	(73.15)	730	(3.25)	540	(2.40)	.29	(.13)
1/2 -13	72	(21.95)	120	(36.58)	144	(43.90)	1350	(6.01)	1010	(4.49)	.54	(.25)
5/8 -11	48	(14.63)	80	(24.38)	96	(29.26)	1810	(8.05)	1610	(7.16)	.83	(.38)
3/4 -10	30	(9.14)	50	(15.24)	60	(18.29)	2710	(12.05)	2420	(10.76)	1.25	(.57)
7/8 -9	24	(7.32)	40	(12.19)	48	(14.63)	3770	(16.77)	3360	(14.95)	1.65	(.75)
1-8	12	(3.66)	20	(6.10)	24	(7.32)	4960	(22.06)	4420	(19.66)	2.25	(1.02)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

RISER CLAMPS



FUNCTION: Designed for supporting and stabilizing vertical pipe runs. The PVC coating on Fig. 553 protects the pipe from the metal surface of the clamp. This product is not intended for use with hanger rods. Clamp is designed for standard iron pipe O.D. and must be considered when sizing other types of piping.

APPROVALS: Underwriters' Laboratories Listed in the U.S. (UL) and Factory Mutual Approved for sizes 3/4" (20mm) to 8" (200mm) only. Complies with Federal Specifications A-A-1192A (Type 8) and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 8).

MATERIAL: Low carbon steel

ORDERING: Specify pipe size and figure number.

Fig. 550, 551 & 553 RISER CLAMP

Fig. 550* PLAIN

Fig. 551 ELECTRO-GALVANIZED

Fig. 553 PLAIN WITH PVC
COATING

*Available in stainless steel.

To order, specify 304 or 316 and add suffix SS to figure number.

Price on request.

Pipe Size		B		C		Bolt Size	Max. Rec. Load		Wt. Each	
							lbs.	kN	lbs.	kg
1/2	(15)	9	(228.60)	2 1/2	(63.50)	3/8 x 1 1/4	220	(0.98)	1.05	(.48)
3/4	(20)	8 7/8	(225.43)	2 3/8	(60.33)	3/8 x 1 1/4	220	(0.98)	1.05	(.48)
1	(25)	8 3/4	(222.25)	2 1/4	(57.15)	3/8 x 1 1/4	220	(0.98)	1.05	(.48)
1 1/4	(32)	9 1/4	(234.95)	2 3/4	(69.85)	3/8 x 1 1/4	250	(1.11)	1.10	(.50)
1 1/2	(40)	10	(254.00)	3 1/2	(88.90)	3/8 x 1 1/4	250	(1.11)	1.17	(.53)
2	(50)	10 1/4	(260.35)	3 3/4	(95.25)	3/8 x 1 1/4	300	(1.33)	1.20	(.54)
2 1/2	(65)	11 1/8	(282.58)	4 5/8	(117.48)	3/8 x 1 1/2	400	(1.78)	1.89	(.86)
3	(80)	11 3/4	(298.45)	5 1/4	(133.35)	3/8 x 1 1/2	500	(2.22)	1.99	(.90)
3 1/2	(90)	12 1/2	(317.50)	6	(152.40)	3/8 x 1 1/2	600	(2.67)	2.17	(.98)
4	(100)	13	(330.20)	6 1/2	(165.10)	1/2 x 1 3/4	750	(3.34)	2.21	(1.00)
5	(125)	14 1/4	(361.95)	7 3/4	(196.85)	1/2 x 1 3/4	1500	(6.67)	3.24	(1.47)
6	(150)	15 3/8	(390.53)	8 7/8	(225.43)	1/2 x 1 3/4	1600	(7.12)	3.89	(1.76)
8	(200)	18 1/2	(469.90)	12	(304.80)	5/8 x 2	2500	(11.12)	7.60	(3.45)
10	(250)	20 1/2	(520.70)	14	(355.60)	5/8 x 2	2500	(11.12)	11.10	(5.03)
12	(300)	22 1/2	(571.50)	16	(406.40)	5/8 x 2 1/2	2700	(12.01)	16.50	(7.48)
14	(350)	25 1/8	(638.18)	18 5/8	(473.08)	5/8 x 3	2700	(12.01)	17.70	(8.03)
16	(400)	26 1/4	(666.75)	20 3/4	(527.05)	3/4 x 3 1/2	2900	(12.90)	30.40	(13.79)
18	(450)	27 7/8	(708.03)	22 3/8	(568.33)	3/4 x 3 1/2	2900	(12.90)	33.30	(15.10)
20	(500)	30	(762.00)	24 1/2	(622.30)	3/4 x 3 1/2	2900	(12.90)	36.30	(16.47)
24	(600)	35	(889.00)	29 1/2	(749.30)	7/8 x 3 1/2	2900	(12.90)	48.68	(22.08)
30	(750)	42 3/8	(1076.33)	35 3/8	(898.52)	7/8 x 3 1/2	2900	(12.90)	60.16	(27.29)

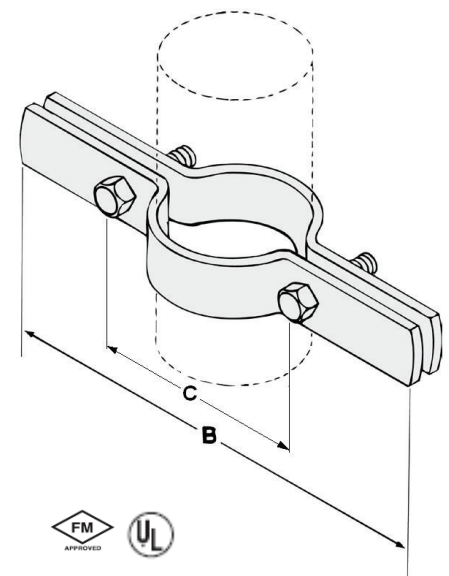


Fig. 553 only available up to 8" (200) pipe size.

Installation practice for Model 550 Riser Clamps

When possible the clamp should be placed under a coupling, hub or welded lugs on steel pipe. Bolt torques should be per industry standards.

Recommended Torque For Pipe Clamp Hardware						
Bolt Size	1/4"-20	5/16"-18	3/8"-16	1/2"-13	5/8"-11	3/4"-10 & Larger
ft/lbs	6	11	19	50	65	75
N/m	(8)	(15)	(26)	(68)	(88)	(102)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.



Model G Swing Check Valves

2½" (65 mm), 76 mm
3" (80 mm), 4" (100 mm),
6" (150 mm), 165 mm & 8" (200 mm)

Features

1. Grooved end connections.
2. Compact, lightweight design.
3. Non-slamming, spring loaded clapper to minimize water hammer.
4. Approved for horizontal and vertical installation.
5. Streamlined body design provides very low friction loss.

General

Reliable Model G Swing Check Valves are multiple purpose valves performing regular check valve duties with very low friction loss. All four sizes are approved for use in fire protection systems. Typical applications include connections between public water supplies and private fire systems, at the discharge from fire pumps, at gravity tank connections and at fire department pumper connections.

All Model G Check Valves are provided with a ½" NPT (R½) supply side connection (Item 12, Fig.2).

Grooved end connections provide fast and easy installation using listed or approved mechanical grooved couplings. Rigid style grooved couplings can be used for positive clamping to resist flexural and torsional loads.



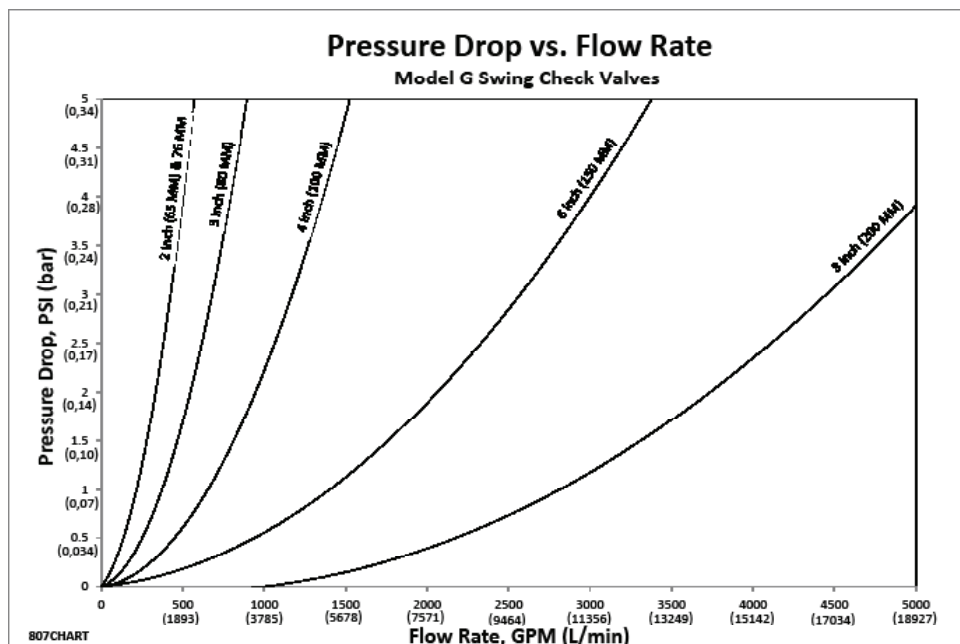
Figure 1

Valve Description

1. Rated working pressure 250 psi (17,25 bar).
2. Factory hydrostatic test pressure 500 psi (34,5 bar).
3. Friction loss, expressed in equivalent length of Sch. 40 pipe with C = 120 (based on Hazen and Williams formula):
 2½" (65 mm) & 76 mm - 7 ft (2.13 m)
 3" (80 mm) - 7 ft (2.13 m)
 4" (100 mm) - 10 ft (3.05 m)
 6" (150 mm) & 165 mm - 16 ft (4.88 m)
 8" (200 mm) - 15.9 ft (4.85 m)
4. Standard grooved end dimensions per ANSI/AWWA C606.

Technical Data

Valve Size	Face-to-Face Dimensions	Shipping weight
2½" (65 mm) & 76 mm	7.12" (181 mm)	9 lbs. (4kg)
3" (80 mm)	7.62" (193 mm)	11 lbs. (5kg)
4" (100 mm)	8.44" (214 mm)	17 lbs. (7.7kg)
6" (150 mm) & 165 mm	10.25" (260 mm)	38 lbs. (17.25kg)
8" (200 mm)	12.5" (318 mm)	63 lbs. (28.58kg)



Note: Model G Check Valves may be damaged by excessively turbulent water flow. Model G Check Valves should be installed a reasonable distance from pipe transitions, such as pumps, elbows, expanders, reducers, or similar devices. Typical piping practices suggest a minimum distance of five times the pipe diameter for general use.

Approvals

1. Listed by Underwriters Laboratories, Inc.
2. Underwriters' Laboratories certified for Canada.
3. Approved by Factory Mutual Research Corp.*
4. NYC MEA 258-93-E

* FM Approved as both a "Single" check valve and as an "Anti-Water Hammer" check valve.

Refer to figure 2.

Item No.	Part Name	Material	Qty.	Part Number						
				2½" (65 mm)	76 mm	3" (80 mm)	4" (100 mm)	6" (150 mm)	165 mm	8" (200 mm)
1*	Valve Body	Gray Iron, ASTM-A48 Class 30A	1	91005012	91005011	91005013	91005014	91005016	91006015	91005008
2*	Seat	Bronze C83600 or C93200, ASTM-B505	1	96020200	96020200	96020300	96020400	96020600	96020600	96020800
3	Clapper	Stainless Steel 304, ASTM-A240	1	91816112	91816112	91816113	91816114	91816116	91816116	91816118
4	Facing Seal **	EPDM Rubber	1	95520200	95520200	95520300	95520400	95520600	95520600	95520800
5	Clamping Ring	Stainless Steel 304, ASTM-A240	1	95290300	95290300	95290300	95290400	95290600	95290600	95290800
6	Gasket **	EPDM Rubber	1	93720604	93720604	93720604	93720604	93720604	93720604	93720804
7	Spring	Stainless Steel 302, ASTM-A313	1	96400300	96400300	96400300	96400400	96400600	96400600	96400800
8	Hinge Pin	Stainless Steel 303, ASTM-A582	1	95000280	95000280	95000300	95006824	95000600	95000600	95000800
9	Bolt	Stainless Steel 304, ASTM-F593	1	91090600	91090600	91090600	91090600	91090600	91090600	91090800
10	Locknut **	Stainless Steel 303, ASTM-F594	1	94913816	94913816	94913816	94913816	94913816	94913816	94913816
11	Plug, ¼" NPT	Steel	1	95201800	95201800	95201800	95201800	95201800	95201800	95201800
12	Plug, ½" NPT	Steel	1	98604402	98604402	98604402	98604402	98604402	98604402	98604402
13	Shoulder Eye	Steel	1	N/A	N/A	N/A	N/A	N/A	N/A	98020016
**	Replacement Seal Kit		1	6888040025	6888040025	6888040030	6888040040	6888040060	6888040060	6888040080

* Not field replaceable.

Valve Disassembly

1. Close the main water supply valve and drain the system.
2. Remove the check valve from the piping system.
3. Inspect the Seat (2) for any cuts, scrapes and dents. Replace the valve if any damage is found.
4. To replace the Facing Seal (4), remove the Clapper (3), unscrew the Locknut (10) and remove the Retention Bolt (9).

Valve Reassembly

1. Thoroughly clean the Clapper (3). Insert the Retention Bolt (9) with a new Gasket (6).
2. Place the new Facing Seal (4) and the Clamping Ring (5) against the Clapper (3). Tighten the new Locknut (10) to 21 in.-lbs. (2.37 N•m) torque in 2½" (65 mm), 76 mm & 3" (80 mm) sizes and to 52 in.-lbs. (5.87 N•m) in 4" (100 mm), 6" (150 mm), 165 mm & 8" (200 mm) sizes.
3. Insert the clapper assembly into the valve through the downstream opening. Reinsert the Hinge Pin (8) while holding the coils of the properly oriented Spring (7) in place. Install the hinge pin Plug (11).
4. Reinstall the check valve in the system.
5. Place the system back in service.

Ordering Information

Specify:

1. Model G Check Valve.
2. Size.

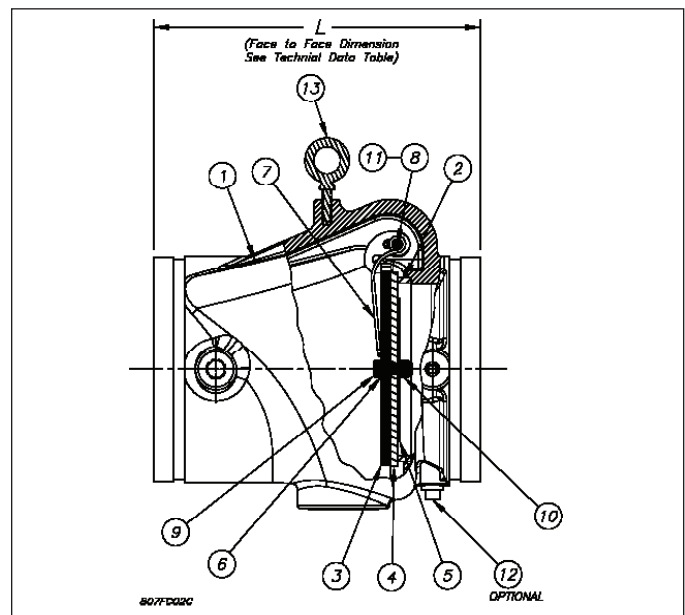


Figure 2

Maintenance and Installation

Swing Check Valves and associated equipment should periodically be given a thorough inspection and test. NFPA 25 provides minimum maintenance requirements. Check valves should be inspected and operated at least annually. Parts should be replaced as required.

When Model G Swing Check Valves are installed vertically, the direction of the flow arrow must point upward. For horizontal installations, the hinge pin must be located at the top.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Products manufactured and distributed by Reliable have been protecting life and property for over 90 years.

Manufactured by

Reliable®

Reliable Automatic Sprinkler Co., Inc.

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Model REL-CV Swing Check Valve

200 psi (13.8 bar)

Product Description

Reliable Model REL-CV swing check valves have a rated working pressure of 200 psi (13.8 bar) and feature a brass valve body with FNPT end connections.

Installation

The Reliable swing check valves shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. Verify compatibility of the valve materials with the water supply and the environment where the valve will be installed prior to installation.

WARNING: Model REL-BL ball valves contain lead and are not for use in systems carrying water intended for human consumption.

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable swing check valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the valve for corrosion, damage, and wear as required and replace as necessary. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.



Model REL-CV Swing Check Valve

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Reliable Model REL-CV Swing Check Valve Valve Size

- 3/8" (10 mm)
- 1/2" (15 mm)
- 3/4" (20 mm)
- 1" (25 mm)
- 1-1/4" (32 mm)
- 1-1/2" (40 mm)
- 2" (50 mm)

Model REL-CV Swing Check Valves

Technical Specifications

Pressure Rating:

200 psi (13.8 bar)

Material Specifications

Body: C37700 Brass Alloy

Bonnet: C37700 Brass Alloy

Check Plate: C37700 Brass Alloy

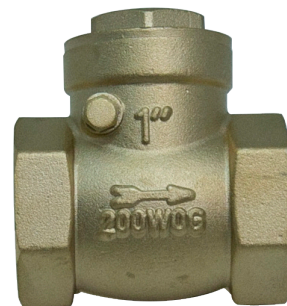
Hinge Pin: 304 Stainless Steel

Plug: C37700 Forged Brass Alloy

Seal Ring: NBR/Nitrile/Buna-N Rubber

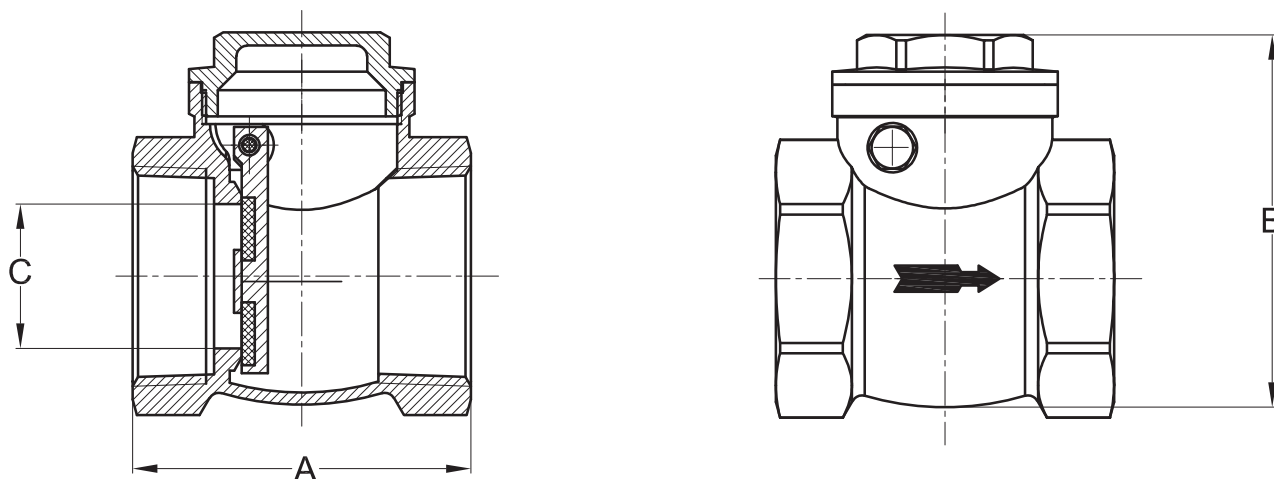
End Connections

Female NPT



Model REL-CV Swing Check Valve Dimensions

Figure 1



Dimensions in. (mm)

Table A

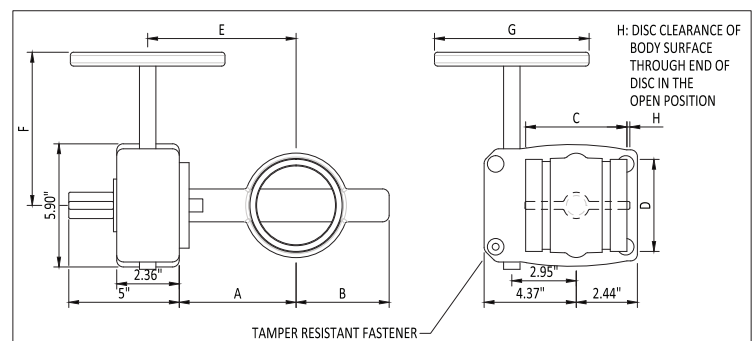
Valve Size	A	B	C
3/8 (10)	1-13/16 (46)	1-3/4 (44)	1/2 (13)
1/2 (15)	1-13/16 (46)	1-7/8 (48)	1/2 (13)
3/4 (19)	2-1/8 (54)	2-1/16 (52)	5/8 (16)
1 (25)	2-3/8 (61)	2-9/16 (66)	7/8 (23)
1-1/4 (32)	2-9/16 (65)	2-13/16 (71)	1-1/16 (28)
1-1/2 (40)	2-13/16 (72)	3-1/16 (78)	1-1/4 (32)
2 (50)	3-1/4 (82)	3-11/16 (93)	1-5/8 (42)

- High quality fire protection control Butterfly Valves in Grooved End connections.
- These valves are UL, ULC listed and FM approved and are available in sizes from 2½" up to 8".
- They are supplied from stock with factory installed UL listed double tamper switch for indoor and outdoor use.

Grooved End 2 ½" - 8" (65mm up to 200mm)

Working Pressure and Temperature	
Working Pressure	300 psi (21.4 bars)
Max. Test Pressure	600 psi (42.8 bars)
Max. Working Temperature	250°F (120°C)

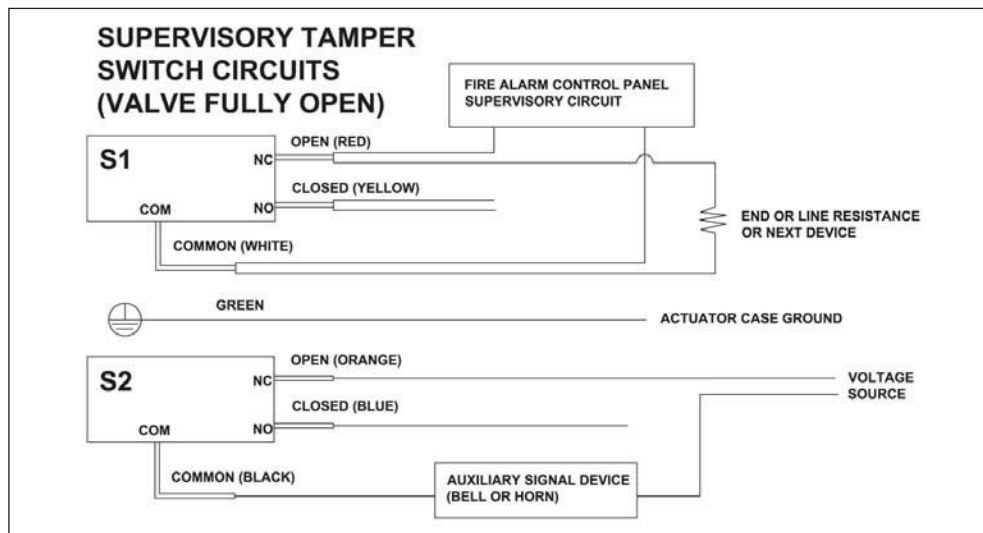
Materials List	
Components	Material
Body	ASTM A-536 Nylon-11 Coated
Disc	ASTM A-536 EPDM Encapsulated
Upper & Lower Stems	AISI 420-SS
Housing	ASTM A-536
Hand Wheel	ASTM A-536
Flag Indicator	ASTM A-536
Shear Pin	ASTM A-510
Segment Gear	ASTM B-148 or B-584
Housing Gasket	EPDM Grade E
O-Rings (All)	EPDM Grade E



Size	A	B	C	D	E	F	G	H
2 ½"	4.13 (105)	3.30 (85)	3.80 (96.4)	2.87 (73.0)	5.31 (135)	5.04 (128)	5.04 (128)	----
3"	4.41 (112)	3.60 (92)	3.80 (96.4)	3.50 (88.9)	5.59 (142)	5.04 (128)	5.04 (128)	----
4"	5.71 (145)	4.30 (108)	4.54 (115.4)	4.50 (114.3)	6.89 (175)	5.04 (128)	5.04 (128)	----
6"	7.05 (179)	5.71 (145)	5.21 (132.4)	6.63 (168.3)	8.23 (209)	8.66 (220)	8.66 (220)	0.28 (7.10)
8"	8.03 (204)	6.70 (170)	5.80 (147.4)	8.63 (219.1)	9.21 (234)	8.66 (220)	8.66 (220)	0.95 (24.2)



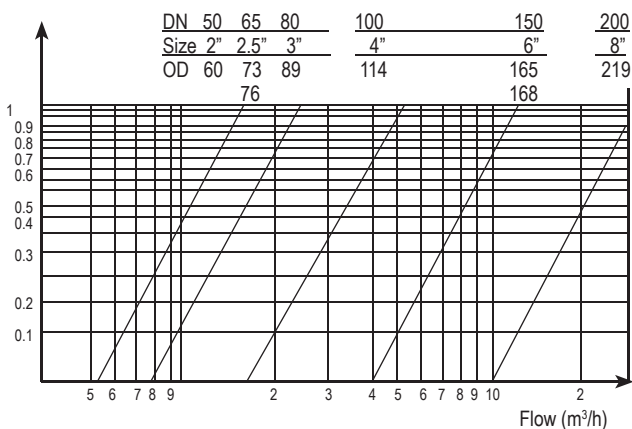
Wiring Diagram



Test Data: BUTTERFLY VALVE

GROOVED END

Flow Characteristics



Flow Coefficient: Kv

Kv=M³/hour across valve at same standard condition (20°C, 1bar)

DW (mm)	Size (in)	OD	30*	40*	50*	60*	70*	80*	90*
65	2 1/2"	73	12	27.4	53.1	96	138	156	163
65	2 1/2"	76	12	27.4	53.1	96	138	156	163
80	3"	89	18.9	39.4	78.9	144	210	243	249
100	4"	114	30	65.1	129	226	377	488	514
150	6"	165	84	184	369	634	964	1196	1286
150	6"	168	84	184	369	634	964	1196	1286
200	8"	219	165	339	677	1230	2002	2850	3129

$$CV = \frac{Q}{Kv} \quad KV = \frac{Q}{31.6} \sqrt{\frac{\rho_1}{\Delta P}} \quad Q = 31.6 KV \sqrt{\frac{\Delta P}{\rho_1}}$$

Q = flow in m³/h ΔP = pressure loss in bar ρ1 = density in Kg/m³

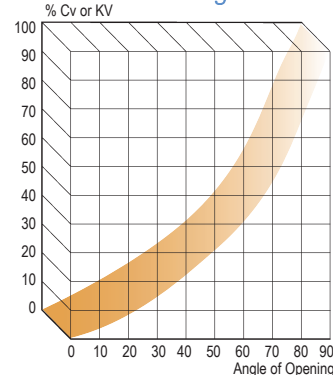
Size	Part #	Weight
2 1/2"	7M99002653	19.84
3"	7M99002654	21.6
4"	7M99002655	24.25
6"	7M99002656	38.36
8"	7M99002657	50.26

Flow Coefficients

The flow coefficient KV is the flow of water through the valve in m³/h, at an average temperature of 20°C, which produces a pressure loss of 1 bar. The relation between Cv and KV is:

$$Cv = \frac{Q}{Kv}$$

Cv VS Disc Angle





RBV Series Bronze Butterfly Valves

Product Description

The Reliable Model RBV series bronze butterfly valves are indicating control valves for fire protection systems. Model RBVT valves have ANSI B1.20.1 NPT threaded end connections and are available in 1" (25 mm), 1-1/4" (32mm), 1-1/2" (38mm), 2" (51mm), and 2-1/2" (65mm) nominal sizes. The Model RBVG valves have ANSI/AWWA C606 grooved end connections and are available in 1-1/4" (32mm), 1-1/2" (38mm), 2" (51mm), and 2-1/2" (65mm) nominal sizes. The valves are listed for 300 psi (20.7 bar) working pressure.

The valves have an integral 10 Amp pre-wired supervisory tamper switch assembly for indoor and outdoor use. The tamper switch signals movement of the valve seal from the full open position.

Installation

Model RBV series butterfly valves must be installed in accordance with NFPA 13, NFPA 72, FM Global Property Loss Prevention Data Sheets, and the requirements of any authorities having jurisdiction. Failure to follow installation instructions may void the warranty and listing of the valve. Verify compatibility of the valve materials with the water supply and the environment where the valve will be installed prior to installation.

The valve can be installed in any orientation on a piping system with standard ASME B1.20.1 NPT threaded (Model BFVT) or ANSI/AWWA C606 grooved (Model BFVG) connections. Install Model BFVT valves by applying PTFE-based thread sealant to the male pipe threads and tightening the threaded connection using a wrench on only the hexagonal wrench-flats of the valve. Over-tightening threaded connections may damage the valve body resulting in leakage. Attached Model BFVG valve using UL Listed or FM Approved grooved couplings.

The integral tamper switch assembly consistent of two switches. Switch 1 has dual leads on the terminals and is used for connection of the supervisory circuit of a listed fire alarm control panel.



Threaded end



Grooved end

Switch 2 has a single lead and is used for connection of the auxiliary equipment. A 14 ga. green wire is connected to the gearbox housing as a ground connection. All unused wires need to be capped with wire nuts and tucked into a junction box. All electrical connections must be in accordance with NFPA 72 and the requirements of any authorities having jurisdiction.

End Configuration Options

Table A

Model	End Connections	Sizes in (mm)	Approvals
RBVT	Threaded	1" (25)	UL Listed, FM Approved
		1-1/4" (32), 1-1/2" (38), 2" (51), 2-1/2" (65)	cULus Listed, FM Approved
RBVG	Grooved	1-1/4" (32), 1-1/2" (38), 2" (51), 2-1/2" (65)	cULus Listed, FM Approved

Model RBVT Bronze Butterfly Valve - Threaded End

Technical Specifications

Pressure Rating:
300 psi (20.7 bar)

End Connections

ANSI B1.20.1 NPT Threads

Material Specifications

Body: Bronze ASTM 584 C83600

Disc: SS304 Sheet Stamping

Handwheel: Ductile Iron ASTM A536

Seat: ASTM D2000 Viton

Indicator: Powder Metal FD0205 95HT

Housing: Forged Brass JIS C3771 (Ref. ASTM C37700)

Cover: Forged Brass JIS C3771 (Ref. ASTM C37700)

Listings and Approvals

UL Listed - All Sizes

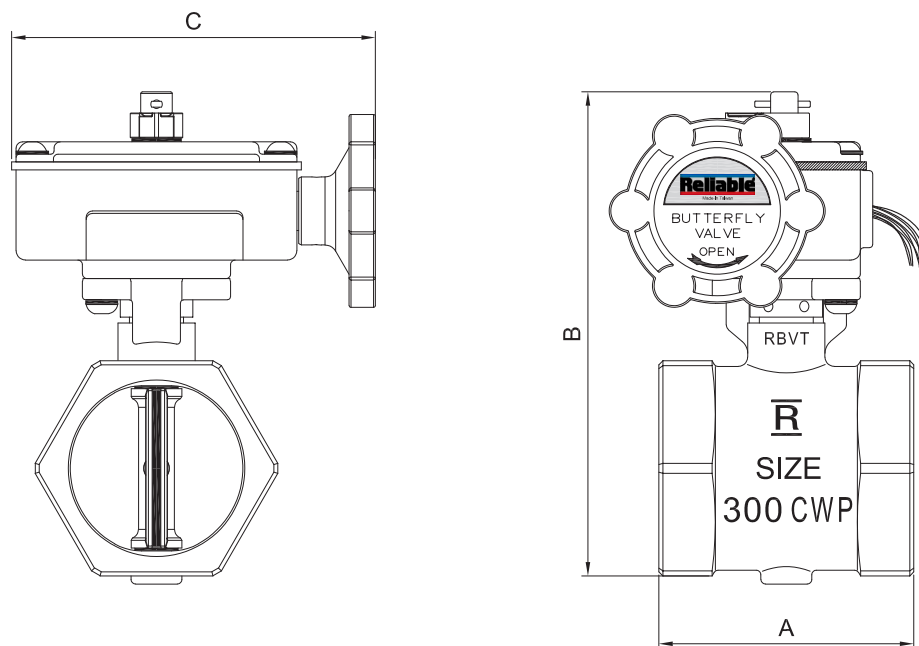
cULus Listed - 1-1/4" (32mm), 1-1/2" (38mm), 2" (51mm), 2-1/2" (65mm)

FM Approved - All Sizes



Model RBVT Bronze Butterfly Valve - Threaded Components and Dimensions

Figure 1



Model RBVT Bronze Butterfly Valve - Threaded Dimensions - in. (mm)

Table B

Valve Size	A	B	C
1"	2-1/8 (54)	4-15/16 (125)	4-5/8 (118)
1-1/4"	2-5/8 (67)	5-1/8 (130)	4-5/8 (118)
1-1/2"	2-7/8 (73)	5-5/8 (142)	4-5/8 (118)
2"	3-1/4 (83)	6-1/8 (156)	4-5/8 (118)
2-1/2"	4-1/2 (114)	6-5/8 (167)	4-5/8 (118)

Model RBVG Bronze Butterfly Valve - Grooved End

Technical Specifications

Pressure Rating:
300 psi (20.7 bar)

End Connections

ANSI/AWWA C606 grooves

Material Specifications

Body: Bronze ASTM 584 C83600

Disc: SS304 Sheet Stamping

Handwheel: Ductile Iron ASTM A536

Seat: ASTM D2000 Viton

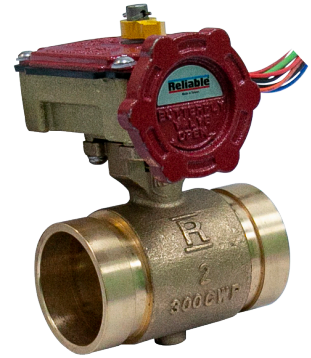
Indicator: Powder Metal FD0205 95HT

Housing: Forged Brass JIS C3771 (Ref. ASTM C37700)

Cover: Forged Brass JIS C3771 (Ref. ASTM C37700)

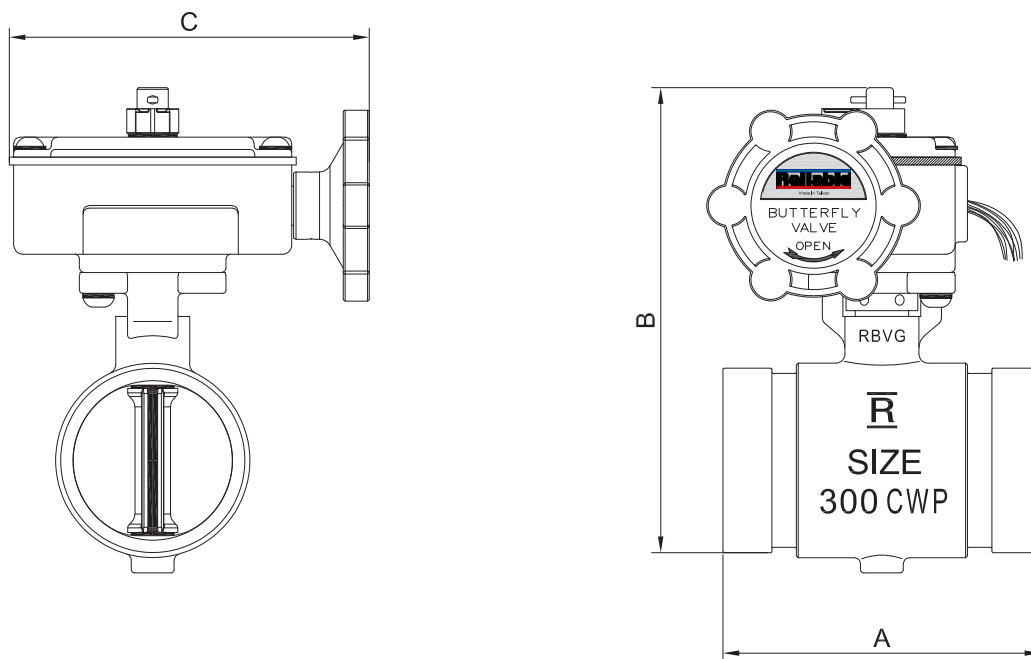
Listings and Approvals

cULus Listed
FM Approved



Model RBVG Bronze Butterfly Valve - Grooved Components and Dimensions

Figure 2



Model RBVG Bronze Butterfly Valve - Grooved Dimensions - in. (mm)

Table C

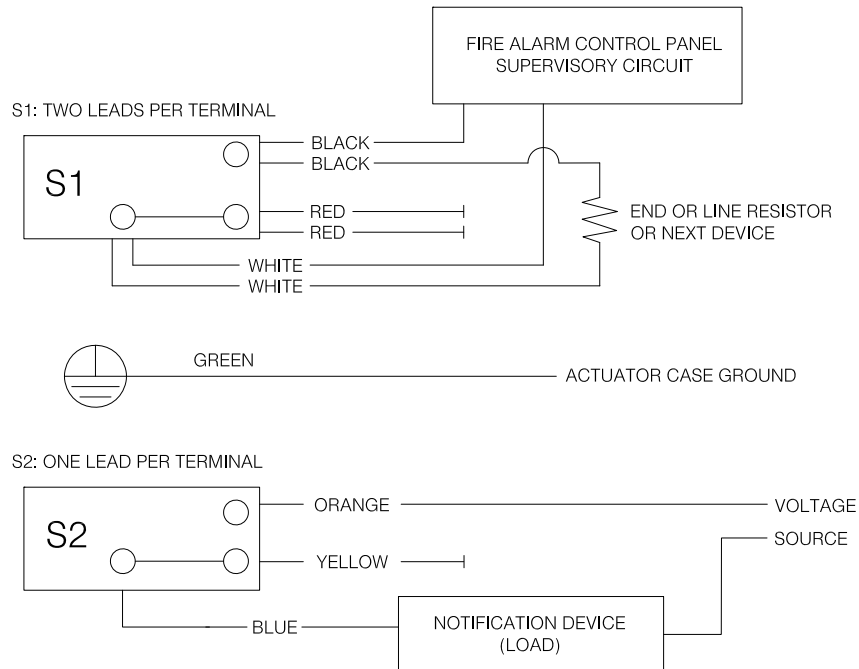
Valve Size	A	B	C
1-1/4"	3-7/8 (98)	5-3/16 (132)	4-5/8 (118)
1-1/2"	4 (102)	5-1/2 (139)	4-5/8 (118)
2"	4-1/8 (104)	6-1/16 (154)	4-5/8 (118)
2-1/2"	4-1/2 (114)	6-9/16 (167)	4-5/8 (118)

Switch conditions shown to indicate valve in fully open position.

Dual Leads Soldered to Switch Tabs

Figure 3

Supervised Normally Open Valve



Notes:

1. Green wire is provided as ground for the switch housing.
2. Switch rating: 10.1 Amps-125/250VAC-60Hz
3. Actual switch application rating: 10 Amps/115 VAC-60Hz, 0.5 Amps/28 VDC
4. Cap unused leads with wire nuts and tuck into a junction box (not provided).

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable Bronze Butterfly valves and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements.

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Valve Model

- RBVT (threaded)
- RBVG (grooved)

Valve Size

- 1" (25mm) (RBVT only)
- 1-1/4" (32mm)
- 1-1/2" (38mm)
- 2" (51mm)
- 2-1/2" (65mm)

ANGLE VALVES 300LB. RATED



Fire Department Valves
FEMALE X MALE

STANDARD EQUIPMENT: Female
NPT inlet and male hose thread
outlet cast brass valve with wheel
handle.

Fire Hose Rack Assembly Valves
DOUBLE FEMALE

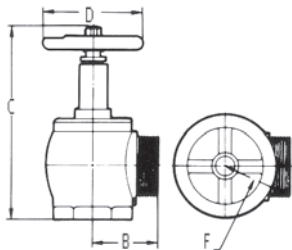
STANDARD EQUIPMENT: Female
NPT inlet and outlet cast brass valve
with wheel handle



Figure No. 5020-5025

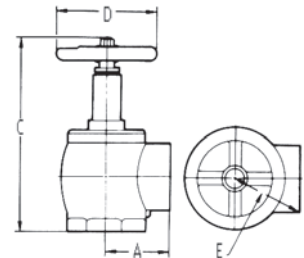
Figure No. 5010-5015

**SPECIFY
THREAD**



OPTIONAL FINISHES:
PB- Polished Brass
RC- Rough Chrome Plated
PC- Polished Chrome Plated
U/L LISTED
NY BSA/MEA APPROVED

Figure No.	5010 5020	5015 5025
Size	1 1/2"	2 1/2"
A	2 11/64	3 3/16
B	2 7/32	3 3/16
C-Closed	6 5/8	9 1/4
C-Open	7 21/22	11
D	3 3/4	5
E	2 7/16	3 19/32
F	2 13/16	3 19/32
U/L Listed	Yes	Yes
FM Approved	Yes	Yes
NYC Approved	Yes	Yes
	2 13/16	3 19/32



ANGLE VALVES 300LB. RATED



Fire Department Valves
FEMALE X MALE

STANDARD EQUIPMENT: Female
NPT inlet and male hose thread
outlet cast brass valve with wheel
handle.

Fire Hose Rack Assembly Valves
DOUBLE FEMALE

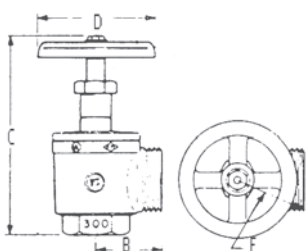
STANDARD EQUIPMENT: Female
NPT inlet and outlet cast brass valve
with wheel handle



Figure No. 5040-5045

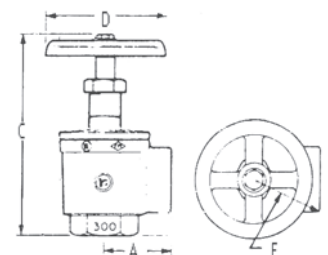
Figure No. 5030-5035

**SPECIFY
THREAD**



OPTIONAL FINISHES:
PB- Polished Brass
RC- Rough Chrome Plated
PC- Polished Chrome Plated
U/L LISTED
NY BSA/MEA APPROVED

Figure No.	5030 5040	5035 5045
Size	1 1/2"	2 1/2"
A	2 9/64	3 5/32
B	2 17/64	3 3/16
C-Closed	6 1/2	8 3/4
C-Open	7 11/16	10 9/16
D	4 1/64	5 1/8
E	2 7/10	3 1/2
F	2 3/8	3 3/8
U/L Listed	Yes	Yes



PRESSURE RELIEF VALVE

For use on all closed systems to prevent damage in the event of a malfunction due to some foreign object or matter becoming lodged in an automatic regulating or control valve. Featuring a pop-type relief action for maximum performance.



Figure No. 5660

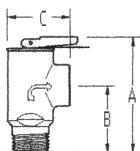


Figure No.	Press. Set (PSI)	Dimensional Data (Inches)				
		Inlet	Outlet	A	B	C
5660	15-175	3/4	3/4	3	3	1
5661	175	1/2	1/2	1 3/4	1	15/16

3/4 Available with 3/4 Male or 3/4 female inlet with 3/4" Female Outlet

THREE WAY GAUGE VALVE

For use with Sprinkler System gauges.



Figure No. 5662

Standard Equipment:
1/4" valve NPT Bronze three way globe valve with handwheel. Female inlets. 175 PSI.

Figure No. 5662 Size 1/4

GLOBE VALVES RISING STEM

For use with Sprinkler System gauges.



Figure No. 5663-5670

Standard Equipment:
Bronze with teflon seat. 125 WSP.

Figure No.	Size
5663	1/4
5664	3/8
5665	1/2
5666	3/4
5667	1
5668	1 1/4
5669	1 1/2
5670	2

OPTIONAL FINISHES:
RC - Rough Chrome Plated

CAPS AND CHAINS

Used to cover and protect male outlet threads on valves and hydrants. Prevents entry of foreign matter.

CAST BRASS WITH CHAIN

Fig. No. With Pin Lugs	Fig. No. With Rocker Lugs	Size
5709	5710	1 1/2
5713	5714	2 1/2
5715	5716	3
5717	5718	4



Figure No. 5709-5713

OPTIONAL FINISHES:

PB - Polished Brass
RC - Rough Chrome Plated
PC - Polished Chrome Plated

SPECIFY THREAD

CAST HARDCOATED ALUMINUM CAP WITH CHAIN

Fig. No. 5720 Size 2 1/2

NY BSA/MEA Approved

PLASTIC CAP WITH CHAIN

Fig. No. 5721 Size 1 1/2
5722 Size 2 1/2
5723 Size 3

VALVE ESCUTCHEONS



Used to trim pipe into cabinet.

Figure No.	Size	Material
5730	1 1/2	Stamped Steel Cadmium Plated
5735	2 1/2	Stamped Steel Cadmium Plated

Figure No.	Size	Material
5750	1 1/2	Cast Brass
5755	2 1/2	Cast Brass

OPTIONAL FINISHES:

PB-- Polished brass
RC-- Rough Chrome Plated
PC-- Polished Chrome Plated

**SPECIFY FIGURE NO
SIZE-FINISH**

DOUBLE MALE



Figure No. 7201 - Cast Brass

Sizes: 1 1/2" X 1 1/2" 4" X 4"
 2 1/2" X 1 1/2" 4 1/2" X 4"
 2 1/2" X 2" 4 1/2" X 4 1/2"
 2 1/2" X 2 1/2" 5" X 5"
 3" X 2 1/2" 6" X 4 1/2"
 6" X 6"

HEX ADAPTERS DOUBLE FEMALE



Figure No. 7215 - Cast Brass

Sizes: 1 1/2" X 1 1/2"
 2 1/2" X 2 1/2"

FEMALE X MALE



Figure No. 7220 - Cast Brass

Sizes: 1 1/2" X 1 1/2" 3" X 2 1/2"
 2 1/2" X 1 1/2" 4" X 4"
 2 1/2" X 2" 4 1/2" X 4"
 2 1/2" X 2 1/2" 6" X 4 1/2"
 6" X 6"

ADAPTERS PINLUG OR ROCKERLUG

DOUBLE MALE



Figure No. 7230 - Cast Brass

Sizes: 1 1/2" X 1 1/2"
 2 1/2" X 2 1/2"

DOUBLE FEMALE SWIVEL



Figure No. 7235 - Cast Brass

Sizes: 1 1/2" X 1 1/2"
 2 1/2" X 2 1/2"

FEMALE X MALE



Figure No. 7245

Sizes: 2 1/2" X 3/4" 2 1/2" X 2"
 2 1/2" X 1" 3" X 2 1/2"
 2 1/2" X 1 1/2"

FEMALE X MALE INCREASER PINLUG OR ROCKERLUG



Figure No. 7255 - Cast Brass

Sizes: 1 1/2" X 2 1/2"
 2" X 2 1/2"
 2 1/2" X 3"

MALE X MALE ADAPTER NO LUGS



Figure No. 7260 - Cast Brass

Sizes: 2 1/2" X 2 1/2"
 3" X 2 1/2"

FEMALE X MALE BUSHING

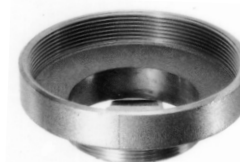


Figure No. 7280 - Cast Brass

Sizes: 6" Female NPT X 4" Male NPT
 8" Female NPT X 6" Male NPT

NEW YORK CITY FLOW TEST NIPPLE MALE X MALE



Figure No. 7285

Sizes: 3" X 2 1/2"
 (2" INTERNAL THREAD)

STORZ X STORZ LIGHTWEIGHT ADAPTER



Figure No. 7290 - Aluminum

Sizes: 4" X 6"
 5" X 6"

STORZ X THREADED ADAPTER



Figure No. 7295 - Aluminum

Sizes: 3" X 2 1/2" 5" X 5"
 2 1/2" X 2 1/2" 4" X 4" 6" X 6"

OPTIONAL FINISHES PB- POLISHED BRASS RC- ROUGH CHROME PC- POLISHED CHROME

OTHER SIZES AVAILABLE UPON REQUEST



Storz Connections
rated at 250 psi

Product Description

Reliable Storz Connections provide a quick connection of large diameter hose by Fire Service Professionals to fire sprinkler or standpipe systems. Conforms with NFPA 1963 requirements. Constructed with forged aluminum.

Installation

The Reliable Storz Connections and Storz accessories shall be installed in accordance with NFPA 13, “Standard for the Installation of Sprinkler Systems,” as well as the requirements of any authorities having jurisdiction. Verify compatibility of the Reliable Storz connection materials with the water supply and the environment where the valve will be installed prior to installation.

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable Storz Connections and Storz accessories shall periodically be given a thorough inspection and test. NFPA 25, “Inspection, Testing and Maintenance of Water Based Fire Protection Systems,” provides minimum maintenance requirements.

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Reliable Storz Connection
4" Storz x 4" FNPT
5" Storz x 4" FNPT
4" Storz x 4" FNPT w/ Cap
5" Storz x 4" FNPT w/ Cap
4" Storz x 4" FNPT w/ 30° Elbow
5" Storz x 4" FNPT w/ 30° Elbow
4" Storz x 4" FNPT w/ 30° Elbow & Cap
5" Storz x 4" FNPT w/ 30° Elbow & Cap
4" Storz Cap & Chain
5" Storz Cap & Chain
Storz Wall Connection Plate



Storz Connection with Cap



Storz Connection with 30° Elbow and Cap



Storz Connection Wall Plate

Storz Connections

Inlet: 4" or 5" Storz connection

Outlet: 4" FNPT Threads

Configuration: Straight or 30° Elbow

Maximum Working Pressure: 250 psi

Accessories:

Cap and chain

Wall connection plate

Material Specifications

Body: Forged 6061 T-6 Aluminum Alloy

Finish: Powder Coated

Seal: Metal Face

Wall Plate: 6061 Aluminum Alloy Red Painted

Chain: Q235A Steel Alloy Black Painted

Bushing: 6061 Aluminum Alloy Silver grey powder coated outside

Screen: Type 304 Stainless Steel

Lock Mechanism: Type 304 Stainless Steel

Spring: Type 302 Stainless Steel

Screw: Type 304 Stainless Steel

Lock, quick disconnect: 6061 Aluminum Alloy Silver grey powder coated outside

Gasket: NBR nitrile rubber (A60+-5)

Cap: 6061 Aluminum Alloy Silver grey powder coated outside

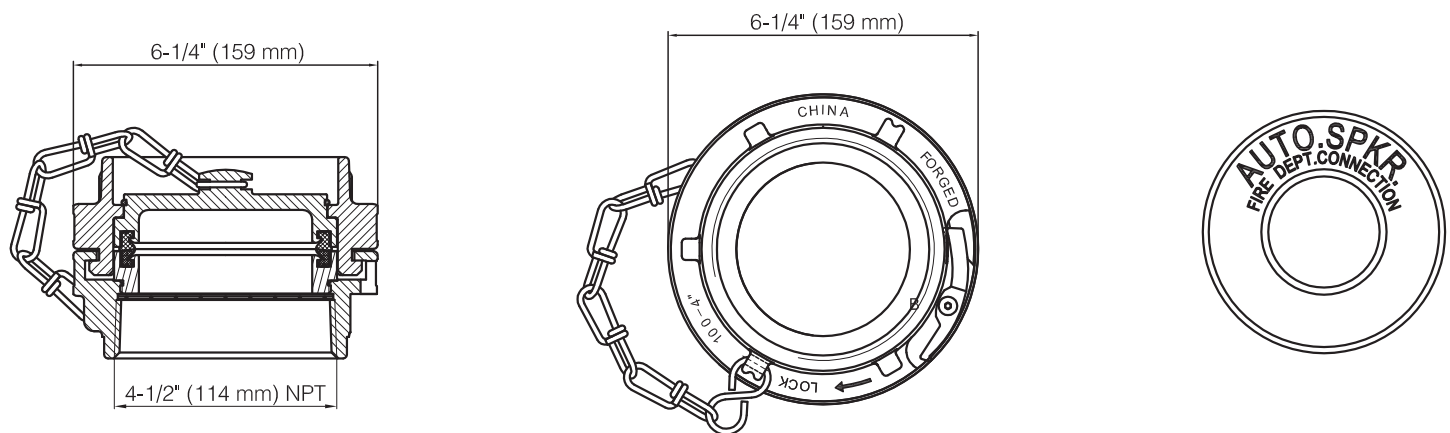
Retaining Ring: Type Type 304 Stainless Steel

Adapter, quick disconnect: 6061 Aluminum Alloy Silver grey powder coated outside



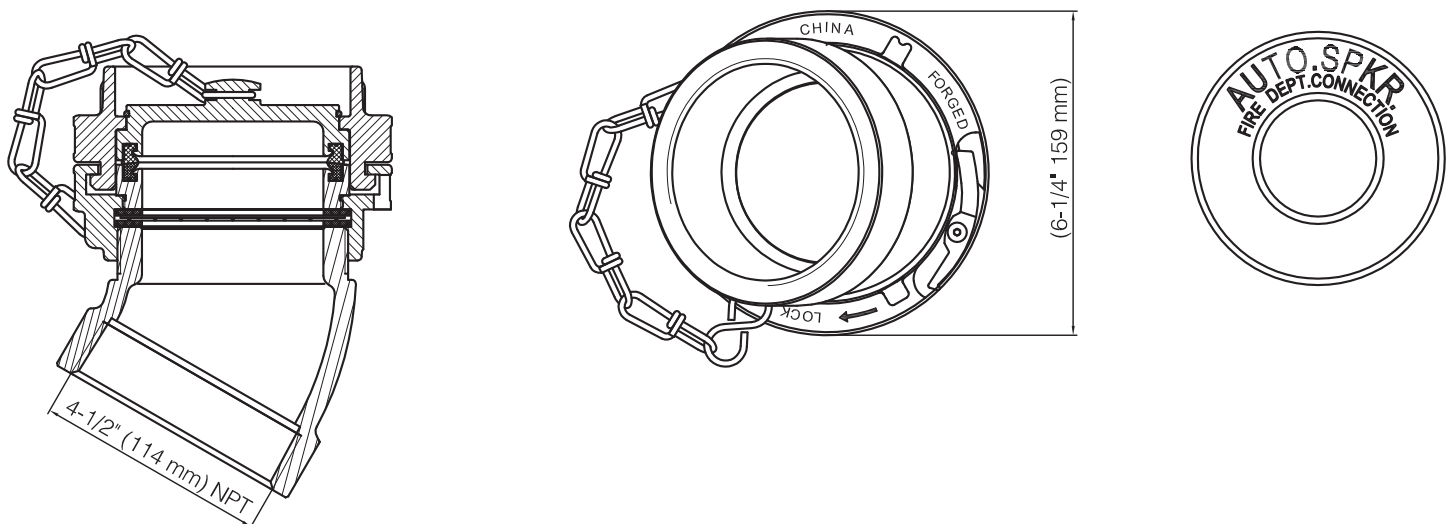
Storz with Wall Plate, Cap and Chain Specification and Dimensions

Figure 1



Storz with 30° Elbow, Wall Plate, Cap and Chain Specification and Dimensions

Figure 2





Model CR Commercial Riser Riser Manifold for Commercial Applications

Available Sizes/Pressure Ratings:

1½"(40mm) and 2"(50mm) Threaded - 250 psi (17.2 bar) Working Pressure

2"(50mm), 2½"(65mm), & 3"(80mm) Grooved - 300 psi (20.7 bar) Working Pressure

4"(100mm), 6"(150mm), & 8"(200mm) Grooved - 300 psi (20.7 bar) Working Pressure

Features

1. Cast stainless steel body construction for threaded manifolds.
2. Painted, cast ductile iron body construction for grooved manifolds.
3. Brass and galvanized Trim.
4. Factory assembled and pressure tested.
5. Available with Test and Drain Valves in various orifice sizes. Grooved end Test and Drain valves are available as MTO.
6. Optional Pressure Relief Valve Kit available for all sizes.
7. Same take-out dimensions for the 1½"(40mm) and 2"(50mm) threaded sizes.
8. Same end-to-end dimensions for the 2"(50mm) through 8"(200mm) grooved sizes.
9. Approved for installation in horizontal or vertical positions.
10. Built in drain port allows hydrostatic testing without draining the system.
11. ¼" three-way valve allows for easy testing and replacing of pressure gauge.
12. Dedicated cULus Listed, ULC Listed and FM Approved Waterflow Detector assures optimum sensitivity. See Table 3 for triggering flow rates.

Product Description

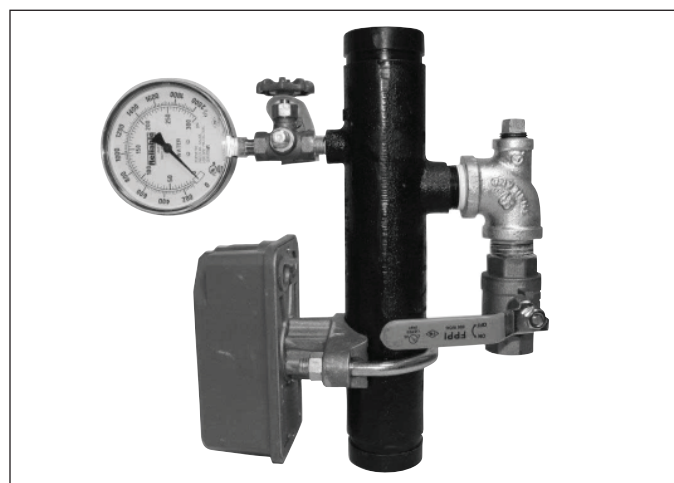
The Model CR Commercial Riser comes factory assembled with the necessary accessories for a cost effective, yet complete riser assembly. These assemblies are UL Listed, ULC Listed and FM Approved as a unit.

Cast-on lettering on the manifold identifies manifold pipe size, flow direction, gauge and drain outlets, and UL Listing and FM Approval markings.

The Model CR Commercial Riser is available in four configurations (see Figures 1 and 2):

- **Basic Trim**

Commercial riser manifold assembly includes a cULus Listed pressure gauge, a ¼" three-way valve, a drain (ball) valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @



24 VDC. See Table 3 for triggering flow rates.

- **Basic Trim with Pressure Relief Kit**

Commercial riser manifold assembly includes a cULus Listed pressure gauge, a ¼" three-way valve, a drain (ball) valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @ 24 VDC. See Table 3 for triggering flow rates. The non-adj (2) unstable Pressure Relief Kit will maintain system pressures below 175 psi (12.1 bar).

- **Basic Trim with Test and Drain Valves**

Commercial riser manifold assembly includes a cULus Listed pressure gauge, a ¼" three-way valve, a Test and Drain Valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @ 24 VDC. See Table 3 for triggering flow rates. The available test orifice size inside the Test and Drain Valve are

(Choose one):

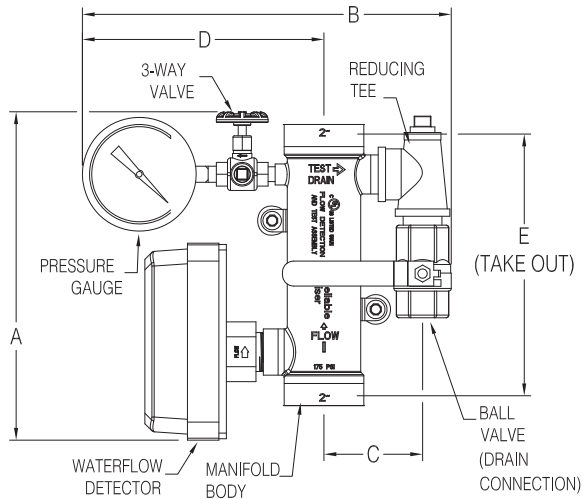
- ⅜" (K-2.8) ⁽¹⁾
- 7/16" (K-4.2)
- 1/2" (K-5.6)
- 17/32" (K-8.0)
- 5/8" (K-11.2) ⁽³⁾
- 3/4" (K-14.0) ⁽³⁾
- 15/16" (K-16.8) ^{(2) (3)}
- 15/64" (K-22.4) ^{(2) (3)}
- 19/64" (K-25.2) ^{(2) (3)}

⁽¹⁾ Not available for 4", 6" and 8" risers.

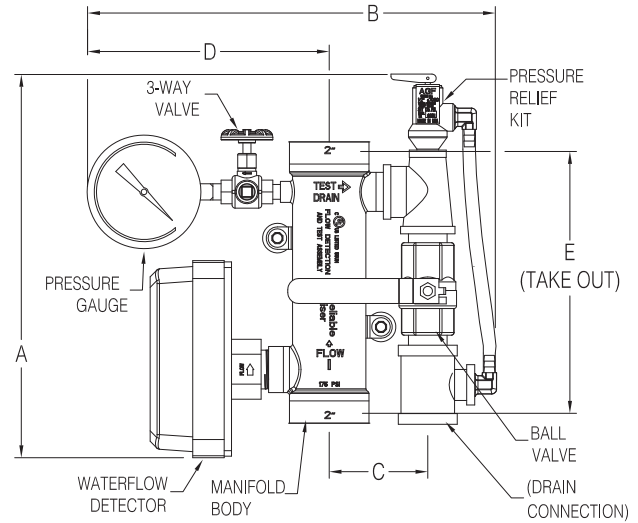
⁽²⁾ Not available for 1½" to 3" risers.

⁽³⁾ Not available for 1½" to 2" threaded & 2" grooved risers.

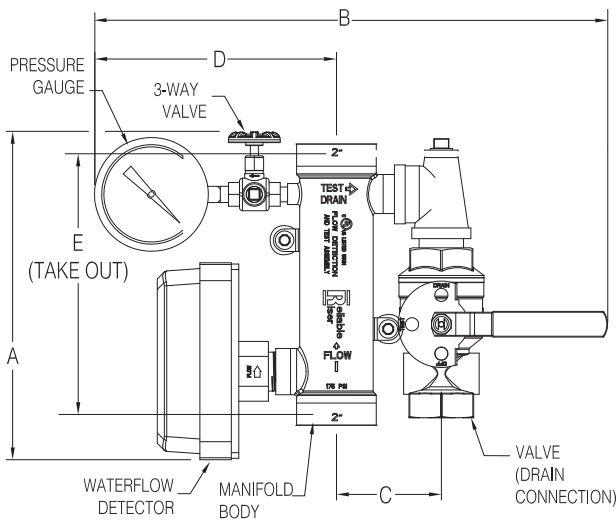
THREADED ENDS ASSEMBLIES (1-1/2"(40MM) & 2"(50MM) ONLY)



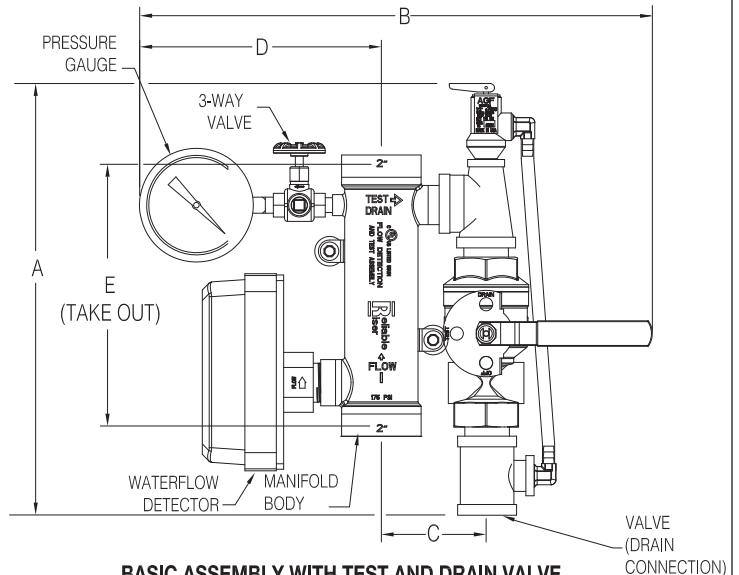
**BASIC ASSEMBLY (2" (50MM) VERSION SHOWN)
SEE TABLE 1.**



**BASIC ASSEMBLY WITH PRESSURE RELIEF KIT
(2" (50MM) VERSION SHOWN) SEE TABLE 1.**



**BASIC ASSEMBLY WITH TEST AND DRAIN VALVE
(2" (50MM) VERSION SHOWN) SEE TABLE 2.
(TEST AND DRAIN SHOWN IN "OFF" POSITION)**



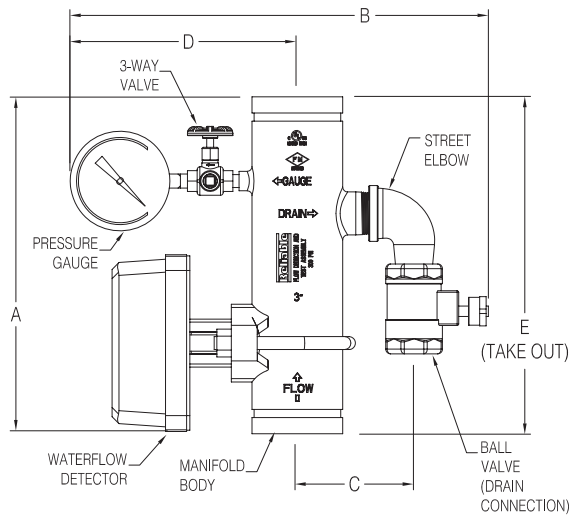
**BASIC ASSEMBLY WITH TEST AND DRAIN VALVE
& PRESSURE RELIEF KIT
(2" (50MM) VERSION SHOWN) SEE TABLE 2.
(TEST AND DRAIN SHOWN IN "OFF" POSITION)**

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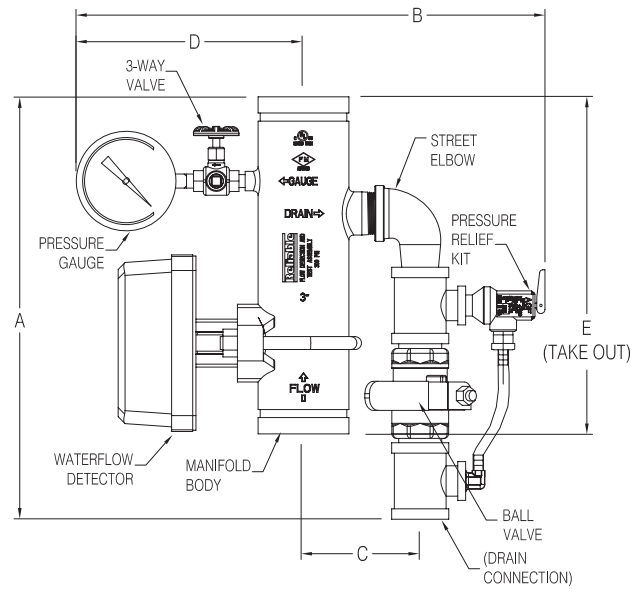
Fig. 1

Note: 1 1/4" Grooved end Test and Drain valves are available in various orifice size as Made To Order (MTO).

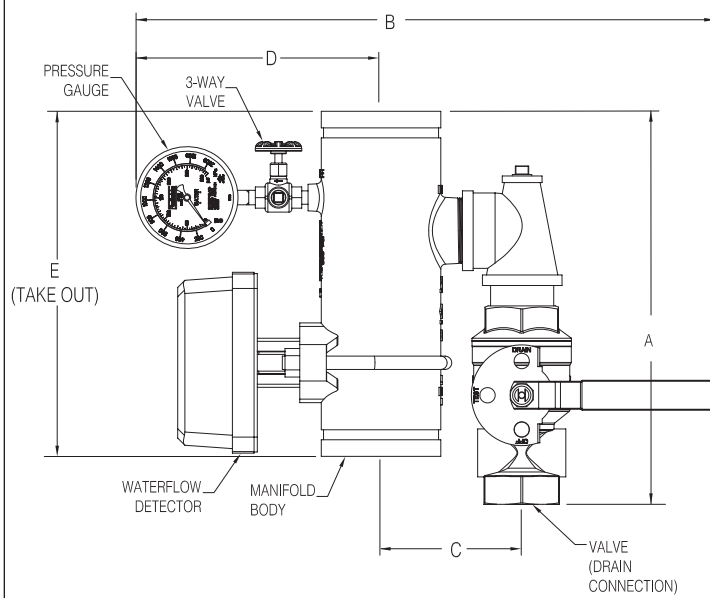
GROOVED ENDS ASSEMBLIES (2"(50MM), 2-1/2"(65MM), 3"(80MM), 4"(100MM), 6"(150MM), & 8" (200MM))



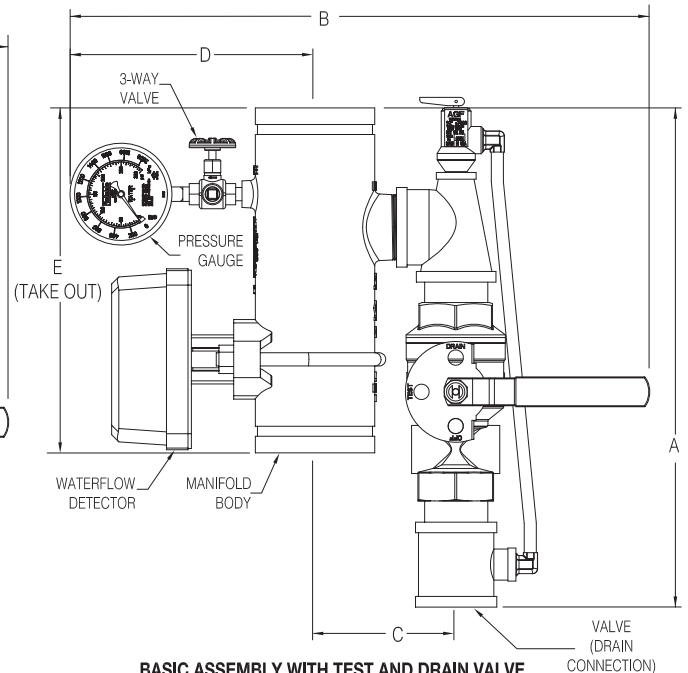
BASIC ASSEMBLY (3" (80MM) VERSION SHOWN)
(SEE TABLE 1.)



BASIC ASSEMBLY WITH PRESSURE RELIEF KIT
(3" (80MM) VERSION SHOWN) (SEE TABLE 1.)



BASIC ASSEMBLY WITH TEST AND DRAIN VALVE
(4" (100MM) VERSION SHOWN) (SEE TABLE 2.)
(TEST AND DRAIN SHOWN IN "OFF" POSITION)



BASIC ASSEMBLY WITH TEST AND DRAIN VALVE
& PRESSURE RELIEF KIT
(4" (100MM) VERSION SHOWN) (SEE TABLE 2.)
(TEST AND DRAIN SHOWN IN "OFF" POSITION)

617FG02B

Fig. 2

Note: 1 1/4" Grooved end Test and Drain valves are available in various orifice size as Made To Order (MTO).

Table 1		Dimensions & Weights											
		Basic Assembly							Basic Assembly with Pressure Relief Kit				
	Manifold Pipe Size in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)
Threaded Ends (See Fig. 1)	1½ (40)	11 (279)	11½ (292)	3 (76)	7¾ (197)	8¼ (210)	8.3 (3.8)	13½ (343)	12¾ (324)	3 (76)	7¾ (197)	8¼ (210)	10.4 (4.7)
	2 (50)	11 (279)	12¼ (311)	3¼ (83)	8 (203)	8¼ (210)	9.1 (4.1)	13½ (343)	13½ (343)	3¼ (83)	8 (203)	8¼ (210)	11.2 (5.1)
Grooved Ends (See Fig. 2)	2 (50)	12¾ (324)	16 (406)	5¼ (133)	8 (203)	13 (330)	10.7 (4.9)	16¾ (425)	17¾ (451)	5¼ (133)	8 (203)	13 (330)	13.3 (6.0)
	2½ (65)	12¾ (324)	16½ (419)	5½ (140)	8¼ (210)	13 (330)	12.9 (5.9)	16¾ (425)	18¼ (464)	5½ (140)	8¼ (210)	13 (330)	16.7 (7.6)
	3 (80)	12¾ (324)	17 (432)	5¾ (146)	8½ (216)	13 (330)	17.6 (8.0)	16¾ (425)	18¾ (476)	5¾ (146)	8½ (216)	13 (330)	18.3 (8.3)
	4 (100)	12½ (318)	19 (483)	6¼ (159)	9 (229)	13 (330)	21.3 (9.7)	16¾ (425)	19½ (495)	7 (168)	9 (229)	13 (330)	26.7 (12)
	6 (150)	12½ (318)	20 (508)	6¼ (159)	10 (254)	13 (330)	26.3 (12)	16¾ (425)	20½ (521)	7 (178)	10 (254)	13 (330)	31.8 (14.4)
	8 (200)	12½ (318)	22 (559)	4¼ (184)	11 (280)	13 (330)	31.0 (14.1)	16¾ (425)	22½ (572)	8 (203)	11 (280)	13 (330)	36.5 (16.6)

Table 2		Dimensions & Weights											
		Basic Assembly with Test and Drain Valve						Basic Assembly with Test and Drain Valve & Pressure Relief Kit					
	Manifold Pipe Size in (mm)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)	A in (mm)	B in (mm)	C in (mm)	D in (mm)	E in (mm)	Weight lbs (kg)
Threaded Ends (See Fig. 1)	1½ (40)	11 (279)	16 (406)	3 (76)	7¾ (197)	8¼ (210)	10.0 (4.5)	14¾ (375)	16 (406)	3 (76)	7¾ (197)	8¼ (210)	10.8 (4.9)
	2 (50)	11 (279)	16½ (419)	3¼ (83)	8 (203)	8¼ (210)	10.8 (4.9)	14¾ (375)	16½ (419)	3¼ (83)	8 (203)	8¼ (210)	11.6 (5.3)
Grooved Ends (See Fig. 2)	2 (50)	12¾ (324)	18½ (470)	5¼ (133)	8 (203)	13 (330)	10.7 (4.9)	15¼ (387)	18½ (470)	5¼ (133)	8 (203)	13 (330)	13.3 (6.0)
	2½ (65)	12¾ (324)	19 (475)	5½ (140)	8¼ (210)	13 (330)	12.9 (5.9)	15¼ (387)	19 (475)	5½ (140)	8¼ (210)	13 (330)	16.1 (7.3)
	3 (80)	12¾ (324)	19¾ (502)	5¾ (146)	8½ (216)	13 (330)	17.6 (8.0)	15¼ (387)	19¾ (502)	5¾ (146)	8½ (216)	13 (330)	17.0 (7.7)
	4 (100)	14 (356)	23 (584)	6¾ (172)	9 (229)	13 (330)	25.8 (11.6)	18¼ (464)	23 (584)	6¾ (172)	9 (229)	13 (330)	26 (11.8)
	6 (150)	14 (356)	25½ (648)	8 (203)	10 (254)	13 (330)	30 (13.6)	18¼ (464)	25½ (648)	8 (203)	10 (254)	13 (330)	31 (14.1)
	8 (200)	14¼ (362)	27 (686)	9 (229)	11 (280)	13 (330)	35.3 (16)	18¼ (470)	27 (686)	9 (229)	11 (280)	13 (330)	36.3 (16.5)

- **Basic Trim with Test and Drain Valve & Pressure Relief Kit**
Commercial riser manifold assembly includes a cULus Listed pressure gauge, a 1/4" three-way valve, a Test and Drain Valve, and a dedicated waterflow detector containing two sets of SPDT (Form C) contacts, having an electrical rating of 10A @ 125/250 VAC/2.5 A @ 24 VDC. See Table 3 for triggering flow rates. The non-adjustable Pressure Relief Kit will maintain system pressures below 175 psi (12.1 bar). The available test orifice size inside the Test and Drain Valve are

(Choose one):

- 3/8" (K-2.8)⁽¹⁾
- 7/16" (K-4.2)
- 1/2" (K-5.6)
- 17/32" (K-8.0)
- 5/8" (K-11.2)⁽³⁾
- 3/4" (K-14.0)⁽³⁾
- 15/16" (K-16.8)^{(2) (3)}
- 15/64" (K-22.4)^{(2) (3)}
- 19/64" (K-25.2)^{(2) (3)}

⁽¹⁾ Not available for 4", 6" and 8" risers.

⁽²⁾ Not available for 1 1/2" to 3" risers.

⁽³⁾ Not available for 1 1/2" to 2" threaded & 2" grooved risers.

Installation

1. Attach the pressure gauge as shown in Figures 1-4.
2. Install the manifold with the flow arrow pointing towards the SYSTEM side using threaded fittings or grooved pipe couplings.
3. Connect the appropriately sized drain line.
4. Ensure that the drain valve is in the CLOSED position.
5. Place the sprinkler system in service.
6. Installation must comply with NFPA 13, Section 8.16.4.2

Caution:

Automatic sprinkler systems having non-fire protection connection (permitting continual water flow) require dielectric fittings, according to NFPA 13 sect. 4-6, when dissimilar metal piping materials are joined.

Note:

Use a non-hardening pipe joint compound, or teflon tape. Follow the manufacturer's instructions when using grooved pipe couplings.

Listings and Approvals

1. Listed by Underwriters' Laboratories Inc. and ULC Listed.
2. Factory Mutual Approved.
3. NYC MEA 258-93-E

Engineering Specification

[Model CR Commercial Riser Assembly] shall be [UL Listed][ULC Listed] [Factory Mutual (FM) Approved] for horizontal or vertical installation as a one-piece, fabricated assembled unit. The [Model CR Commercial Riser Assembly] shall consist of a (choose one):

- 1 1/2" (40 mm) cast, non-welded stainless steel body with threaded end connections
- 2" (50 mm) cast, non-welded, stainless steel body with threaded end connections
- 2" (50 mm) cast, non-welded, ductile iron body with grooved end connections
- 2 1/2" (65 mm) cast, non-welded, ductile iron body with grooved end connections
- 3" (80 mm) cast, non-welded, ductile iron body with grooved end connections
- 4" (100 mm) cast, non-welded, ductile iron body with grooved end connections
- 6" (150 mm) cast, non-welded, ductile iron body with grooved end connections
- 8" (200 mm) cast, non-welded, ductile iron body with grooved end connections

having all brass and galvanized trim. The manifold piping shall clearly identify the manifold's pipe size, flow direction, UL Listing/ ULC Listing/ FM Approval, drain, and gauge outlets. A built-in drain port shall be available to permit hydrostatic testing without draining the system. This drain port shall be sized per the following:

- 1" (25mm) for 1 1/2" (40mm) and 2" (50mm) sizes.
- 1 1/4" (32 mm) for 2 1/2" (65mm), and 3" (80mm) sizes.
- 2" (50mm) for 4" (100mm), 6" (150mm) and 8" (200mm) sizes.

Take-out dimensions shall be the same for the 1 1/2" (40mm) and 2" (50mm) threaded sizes. End-to-end dimensions shall be the same for the 2" (50mm) through 3" (80mm) grooved sizes. Assembly shall have a working pressure rating of [250 psi (17.2 bar) (for 1 1/2" (40mm) and 2" (50mm) threaded manifold assemblies)] [300 psi (20.7 bar) (for 2" through 3" grooved manifold assemblies)].

End-to-end dimensions shall be the same for the 4" (100mm) through 8" (200mm) grooved sizes. Assembly shall have a working pressure rating of [300 psi (20.7 bar) (for 4" (100mm) through 8" (200mm) grooved manifold assemblies)].

Table 3

Manifold Sizes	Triggering Flow Rate - GPM (LPM)
1 1/2" (40mm), 2" (50mm), 2 1/2" (65mm) & 3" (80mm)	4 (15) to 10 (38)
4" (100mm), 6" (150mm), & 8" (200mm)	4 (15) to 10 (38)

Ordering Information:

Model CR Commercial Riser Assembly Part Number Code Key

1.5NT 1.5MT 2NT 2MT 2G 2.5G 3G 4G 6G 8G	B T28 (K-2.8)⁽¹⁾ T42 (K-4.2) T56 (K-5.6) T80 (K-8.0) T112 (K-11.2)⁽³⁾ T140 (K-14.0)⁽³⁾ T168 (K-16.8)^{(2) (3)} T224 (K-22.4)^{(2) (3)} T252 (K-25.2)^{(2) (3)}	0 1 2 3
<p>1.5NT = 1½" (40 mm) NPT Threaded Ends Assembly</p> <p>1.5MT = 1½" (40 mm) Metric Threaded Ends Assembly</p> <p>2NT = 2" (50 mm) NPT Threaded Ends Assembly</p> <p>2MT = 2" (50 mm) Metric Threaded Ends Assembly</p> <p>2G = 2" (50 mm) Grooved Ends Assembly</p> <p>2.5G = 2½" (65 mm) Grooved Ends Assembly</p> <p>3G = 3" (80 mm) Grooved Ends Assembly</p> <p>4G = 4" (100 mm) Grooved Ends Assembly</p> <p>6G = 6" (150mm) Grooved Ends Assembly</p> <p>8G = 8" (200 mm) Grooved Ends Assembly</p>	<p>B = Basic Assembly</p> <p>T28 = W / K-2.8 Test & Drain Valve</p> <p>T42 = W / K-4.2 Test & Drain Valve</p> <p>T56 = W / K-5.6 Test & Drain Valve</p> <p>T80 = W / K-8.0 Test & Drain Valve</p> <p>T112 = W / K-11.2 Test & Drain Valve⁽³⁾</p> <p>T140 = W / K-14.0 Test & Drain Valve⁽³⁾</p> <p>T168 = W / K-16.8 Test & Drain Valve^{(2) (3)}</p> <p>T224 = W / K-22.4 Test & Drain Valve^{(2) (3)}</p> <p>T252 = W / K-25.2 Test & Drain Valve^{(2) (3)}</p> <p>⁽¹⁾ Not available for 4", 6" and 8" risers.</p> <p>⁽²⁾ Not available for 1½" to 3" risers.</p> <p>⁽³⁾ Not available for 1½" to 2" threaded & 2" grooved risers.</p> <p>For Grooved end Test and Drain valves (See note 3)</p>	<p>0 = Assembly without Pressure Relief Kit Water Detector - cULus & FM</p> <p>1 = Assembly with Pressure Relief Kit Water Detector - cULus & FM</p> <p>2 = Assembly without Pressure Relief Kit Water Detector - ULC</p> <p>3 = Assembly with Pressure Relief Kit Water Detector - ULC</p>

Example #1: 1.5NT – B – 1

(1½" (40mm) Model CR Commercial Riser Assembly with NPT female inlet and outlet threads, basic trim with installed Pressure Relief Kit).

Example #2: 3G – T56 – 0

(3"(80mm) Model CR Commercial Riser Assembly with grooved ends, basic trim with Test and Drain Valve having a 5.6 K factor, without a Pressure Relief Kit)

Example #3: 6G – T80 – 0

(6"(150mm) Model CR Commercial Riser Assembly with grooved ends, basic trim with Test and Drain Valve having a 8.0 K factor, without a Pressure Relief Kit)

Notes:

1. All Model CR Commercial Riser Assemblies come with a 300 psi (20.7 bar) UL Listed and FM Approved pressure gauge for 175 psi (12.1 bar) applications. If the Model CR Commercial Riser Assembly is to be installed in a 300 psi (20.7 bar) application, please purchase a 600 psi (41.4 bar) (P/N 98248005) pressure gauge. This gauge may or may not be UL Listed and/or FM Approved at the time of purchase.
2. If required, Pressure Relief Kits may also be installed in the field. Please contact Reliable's Customer Service Department for details.
3. 1¼" and 2" Grooved end Test and Drain valves are available in various orifice size K factor as MTO. Please contact Reliable Service Department for details.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Products manufactured and distributed by Reliable have been protecting life and property for almost 100 years.

Manufactured by



Reliable Automatic Sprinkler Co., Inc.

(800) 431-1588

(800) 848-6051

(914) 829-2042

www.reliablesprinkler.com

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Sales Fax

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P/N 9999970349



Model F1Res Series Glass Bulb Residential Sprinklers

cULus Listed

Features

- cULus Listed Residential Sprinklers
- Available in pendent and horizontal sidewall orientations
- Decorative finishes available, including recessed escutcheons and conical concealed cover plates

Product Description

Model F1Res Series sprinklers are residential sprinklers with a 3 mm glass bulb operating element. A variety of K-Factors as well as recessed and conical concealed options are available as detailed in this Bulletin.

The F1Res Series sprinklers are specially engineered for fast thermal response to meet the requirements of UL 1626. They are intended for installation in accordance with NFPA 13, 13R, and 13D.

Application

The Model F1Res Series sprinklers cULus Listed Residential sprinklers are intended for use in accordance with NFPA 13, NFPA 13R, or NFPA 13D. The Model F1Res residential sprinklers are cULus Listed for use in residential occupancies and residential portions of any occupancy, where permitted by NFPA 13, NFPA 13R, or NFPA 13D. For NFPA 13R and NFPA 13D applications, the design flow and pressure shall not be less than the minimum flow and pressure specified in the Listed Design Criteria tables in this Bulletin. For NFPA 13 applications,

Important Note: Model D wrench and Model GFR2 wrench are no longer compatible with this product. Model W2 (non-recessed) and Model W4 (recessed, concealed) are required.




the design density shall be a minimum of 0.1 gpm/sf (4.1 mm/min), but in no case shall the flow and pressure be less than the minimum flow and pressure specified in the Listed Design Criteria tables in this bulletin. Model F1Res Series sprinklers are listed for use in wet systems only.

Residential Sprinkler Summary

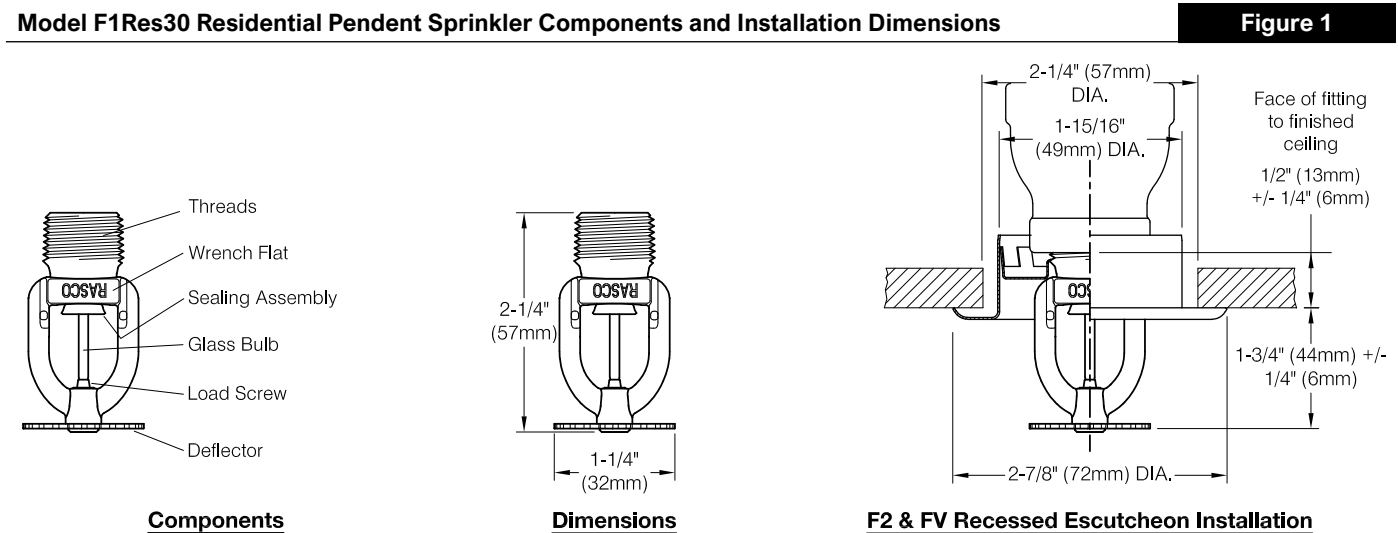
Table A

Sprinkler Model	Sprinkler Identification Number (SIN)	Orientation	K-Factor gpm/psi ^{1/2} (lpm/bar ^{1/2})	Thread Size NPT or ISO7-1	Installation Options	Max. Coverage Area ft ² x ft (m x m)
F1Res30	R3511	Pendent	3.0 (43)	1/2	Pendent or Recessed	16 x 16 (4.9 x 4.9)
F1Res49	R3516	Pendent	4.9 (71)	1/2	Pendent or Recessed	20 x 20 (6.1 x 6.1)
F1Res58	R3513	Pendent	5.8 (84)	1/2	Pendent or Recessed	20 x 20 (6.1 x 6.1)
F1Res76	R7618	Pendent	7.6 (109)	3/4	Pendent or Recessed	20 x 20 (6.1 x 6.1)
F1Res30 CCP	R3511	Pendent	3.0 (43)	1/2	Conical Concealed	14 x 14 (4.3 x 4.3)
F1Res49 CCP	R3516	Pendent	4.9 (71)	1/2	Conical Concealed	20 x 20 (6.1 x 6.1)
F1Res58 CCP	R3513	Pendent	5.8 (84)	1/2	Conical Concealed	20 x 20 (6.1 x 6.1)
F1Res76 CCP	R7618	Pendent	7.6 (109)	3/4	Conical Concealed	20 x 20 (6.1 x 6.1)
F1Res44 HSW	R3531	Horizontal Sidewall	4.4 (63)	1/2	Recessed	16 x 20 (4.9 x 6.1)
F1Res44 SWC	R3531	Horizontal Sidewall	4.4 (63)	1/2	Conical Concealed	16 x 20 (4.9 x 6.1)
F1Res58 HSW	R3533	Horizontal Sidewall	5.8 (84)	1/2	Recessed	16 x 20 (4.9 x 6.1)
F1Res 58 HSWX	RA3533	Horizontal Sidewall	5.8 (84)	1/2	Recessed	14 x 26 (4.3 x 7.9)

Note: Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).

Model F1Res30 Residential Pendant Sprinkler & Models F2 & FV Escutcheon		SIN R3511
Technical Specifications Style: Pendant and Recessed Pendant Threads: 1/2" NPT or ISO7-1R1/2 Nominal K-Factor: 3.0 (43 metric) Max. Working Pressure: 175 psi (12 bar)	Finishes (See Table N) Sensitivity Fast-response Temperature Ratings 155°F (68°C) 175°F (79°C) Recessed Escutcheons F2 Recessed FV Recessed* Sprinkler Wrenches Model W2 Model W4 (Recessed)	
Material Specifications Thermal Sensor: 3 mm glass bulb Sprinkler Frame: Brass Alloy Button: Copper Alloy Sealing Assembly: Nickel Alloy with PTFE Load Screw: Bronze Alloy Deflector: Bronze Alloy		

***Note:** Model FV escutcheons are not for use in positively pressurized ceiling plenums.



Model F1Res30 Residential Pendant Sprinkler Hydraulic Design Criteria			Table B
Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft.(m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	8 (30)	7.0 (0.48)	1 to 4 inches (25 to 100 mm)
14 x 14 (4.3 x 4.3)	10 (38)	11.0 (0.76)	
15 x 15 (4.6 x 4.6)	12 (45)	16.0 (1.1)	
16 x 16 (4.9 x 4.9)	13 (49)	18.8 (1.3)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Technical Specifications

Style: Pendant and Recessed Pendant
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 4.9 (71 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass-bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

175°F (79°C)

Recessed Escutcheons

F1 Recessed

F2 Recessed

FV Recessed*

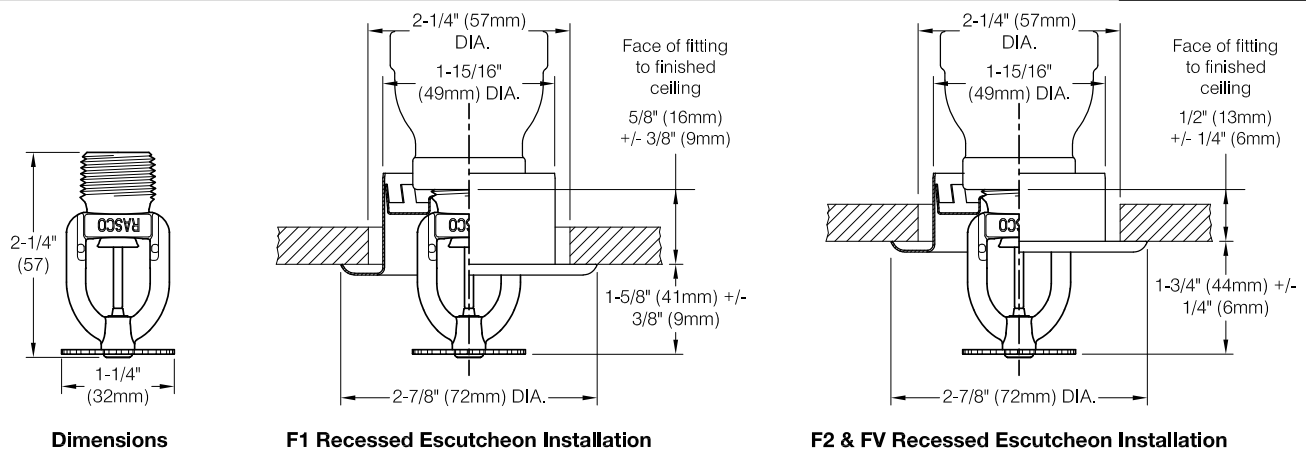
Sprinkler Wrenches

Model W2

Model W4 (Recessed)



***Note:** Model FV escutcheons are not for use in positively pressurized ceiling plenums.

Model F1Res49 Residential Pendant Sprinkler Components and Installation Dimensions
Figure 2

Model F1Res49 Residential Pendant Sprinkler Hydraulic Design Criteria
Table C

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	13 (49)	7.0 (0.48)	1 to 4 inches (25 to 100 mm)
14 x 14 (4.3 x 4.3)	13 (49)	7.0 (0.48)	
16 x 16 (4.9 x 4.9)	13 (49)	7.0 (0.48)	
18 x 18 (5.5 x 5.5)	17 (64)	12.0 (0.83)	
20 x 20 (6.1 x 6.1)	20 (76)	16.7 (1.15)	
12 x 12 (3.7 x 3.7)	15 (57)	9.4 (0.65)	4 to 8 inches (100 to 200 mm)
14 x 14 (4.3 x 4.3)	16 (61)	10.7 (0.74)	
16 x 16 (4.9 x 4.9)	17 (64)	12.0 (0.83)	
18 x 18 (5.5 x 5.5)	19 (72)	15.0 (1.03)	
20 x 20 (6.1 x 6.1)	22 (83)	20.2 (1.39)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Technical Specifications

Style: Pendent and Recessed Pendent
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.8 (84 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

175°F (79°C)

Recessed Escutcheons

F1 Recessed

F2 Recessed

FV Recessed*

Sprinkler Wrenches

Model W2

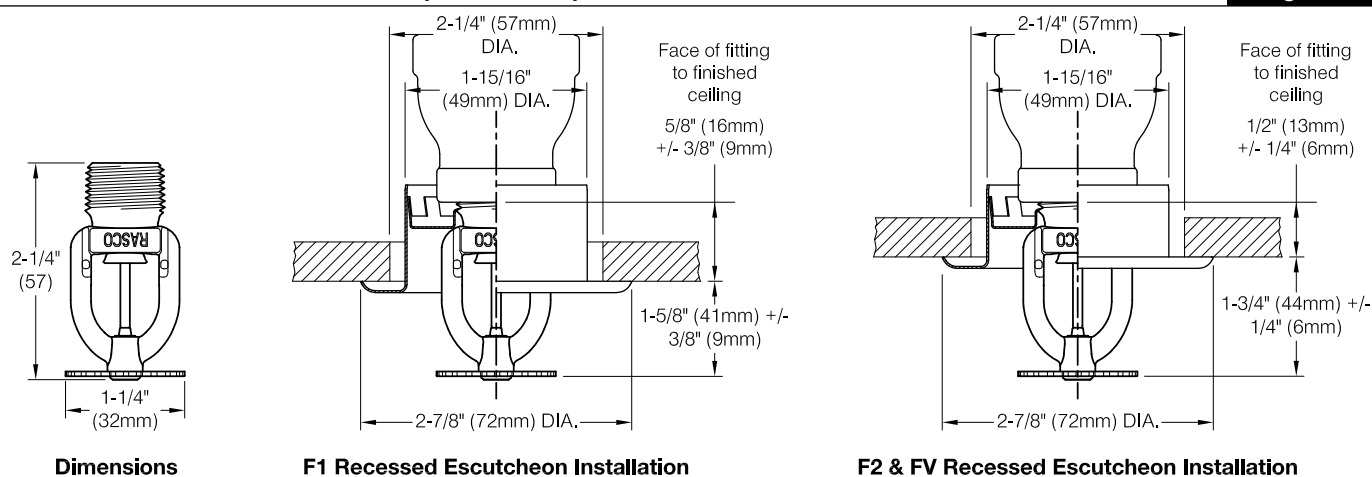
Model W4 (Recessed)



***Note:** Model FV escutcheons are not for use in positively pressurized ceiling plenums.

Model F1Res58 Residential Pendent Sprinkler Components and Installation Dimensions

Figure 3



Model F1Res58 Residential Pendent Sprinkler Hydraulic Design Criteria

Table D

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
16 x 16 (4.9 x 4.9)	16 (61)	7.6 (0.52)	1 to 4 inches (25 to 100 mm)
18 x 18 (5.5 x 5.5)	19 (72)	10.8 (0.75)	
20 x 20 (6.1 x 6.1)	22 (83)	14.4 (1.0)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Technical Specifications

Style: Pendant and Recessed Pendant
Threads: 3/4" NPT or ISO7-1R3/4
Nominal K-Factor: 7.6 (109 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

175°F (79°C)

Recessed Escutcheons

F1 Recessed

F2 Recessed

FV Recessed*

Sprinkler Wrenches

Model W2

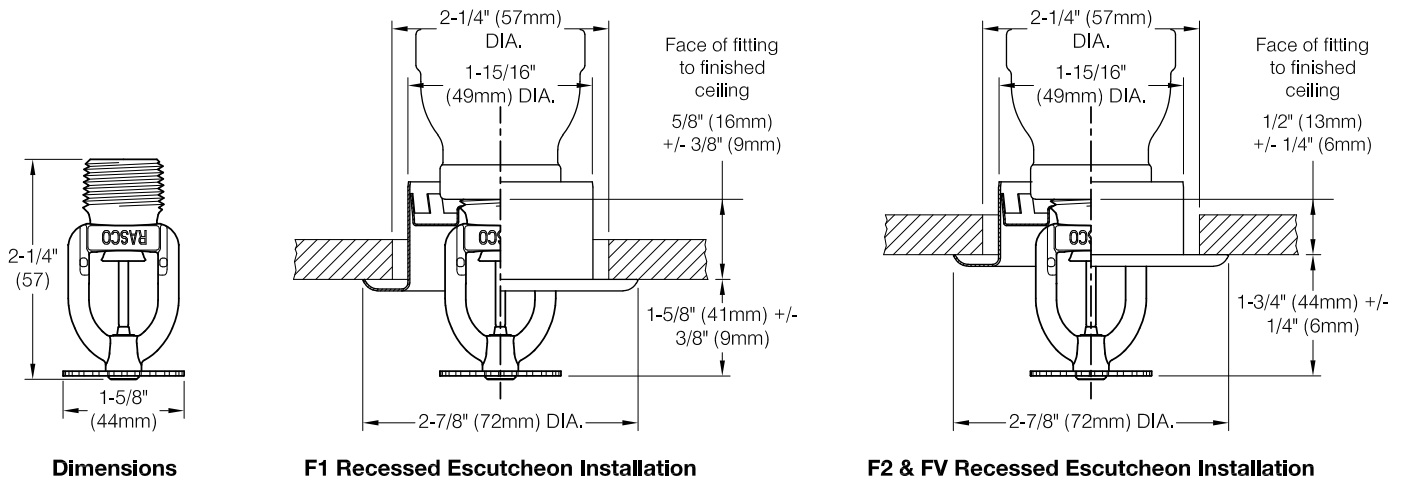
Model W4 (Recessed)



***Note:** Model FV escutcheons are not for use in positively pressurized ceiling plenums.

Model F1Res76 Residential Pendant Sprinkler Components and Installation Dimensions

Figure 4



Model F1Res76 Residential Pendant Sprinkler Hydraulic Design Criteria

Table E

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
18 x 18 (5.5 x 5.5)	21 (80)	7.6 (0.52)	1 to 4 inches (25 to 100 mm)
20 x 20 (6.1 x 6.1)	23 (87)	9.2 (0.63)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Model F1Res30 CCP Conical Concealed Pendant & Model FP Recessed Escutcheon Pendant Sprinkler

SIN R3511

Technical Specifications

Style: Conical Concealed Pendant and Recessed Pendant
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 3.0 (43 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)*

FP Recessed*

Sprinkler Wrenches

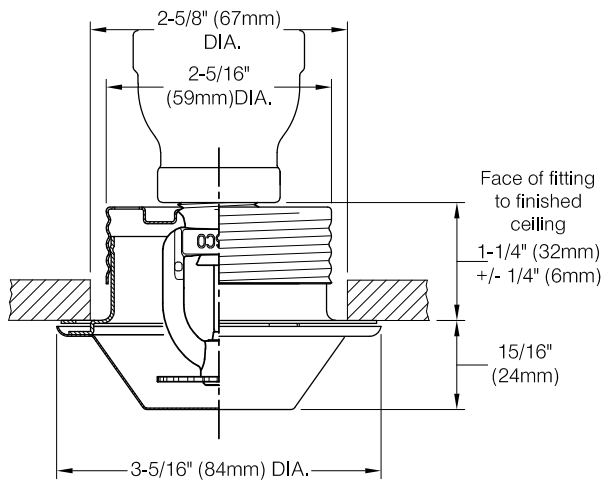
Model W4



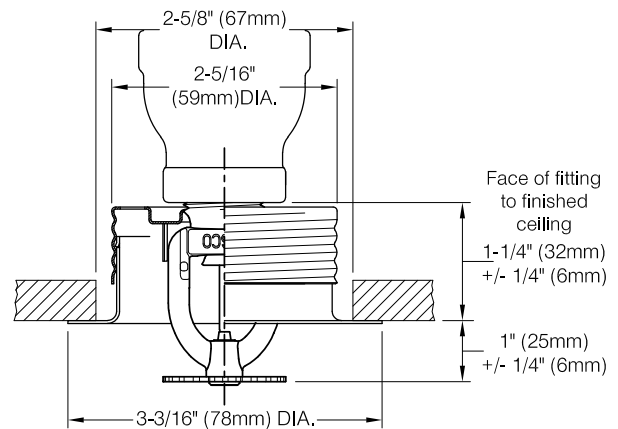
***Note:** Model FP escutcheons and CCP cover plates are not listed for use in positively pressurized ceiling plenums.

Model F1Res30 CCP and FP Recessed Pendant Sprinkler Installation Dimensions

Figure 5



CCP Recessed Escutcheon Installation



FP Recessed Escutcheon Installation

Model F1Res30 CCP Pendant & FP Recessed Pendant Sprinkler Hydraulic Design Criteria

Table F

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	8 (30)	7.0 (0.48)	1/2 to 1 inch (13 to 25 mm)
14 x 14 (4.3 x 4.3)	11 (38)	13.4 (0.92)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.

Technical Specifications

Style: Conical Concealed Pendent and Recessed Pendent
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 4.9 (71 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)*
 FP Recessed*

Sprinkler Wrenches

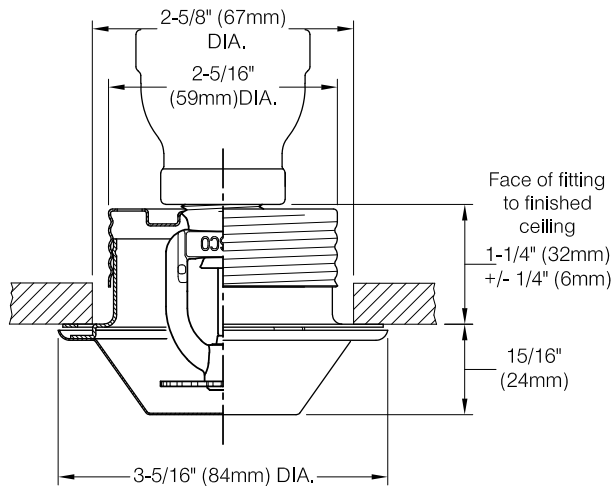
Model W4



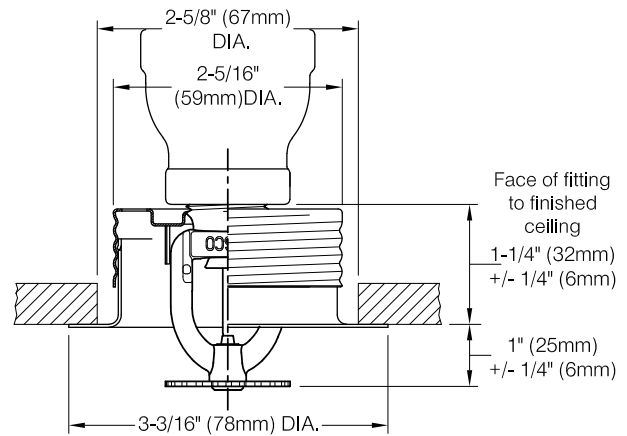
***Note:** Model FP escutcheons and CCP cover plates are not for use in positively pressurized ceiling plenums.

Model F1Res49 CCP & FP Recessed Pendent Sprinkler Installation Dimensions

Figure 6



CCP Recessed Escutcheon Installation



FP Recessed Escutcheon Installation

Model F1Res49 CCP Pendent and FP Recessed Pendent Hydraulic Design Criteria

Table G

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
14 x 14 (4.3 x 4.3)	13 (49)	7.0 (0.48)	1/2 to 1 inch (13 to 25 mm)
16 x 16 (4.9 x 4.9)	14 (53)	8.2 (0.57)	
18 x 18 (5.5 x 5.5)	18 (68)	13.5 (0.93)	
20 x 20 (6.1 x 6.1)	20 (76)	16.7 (1.15)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.

Technical Specifications

Style: Conical Concealed Pendent and Recessed Pendent
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.8 (84 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)*
 FP Recessed*

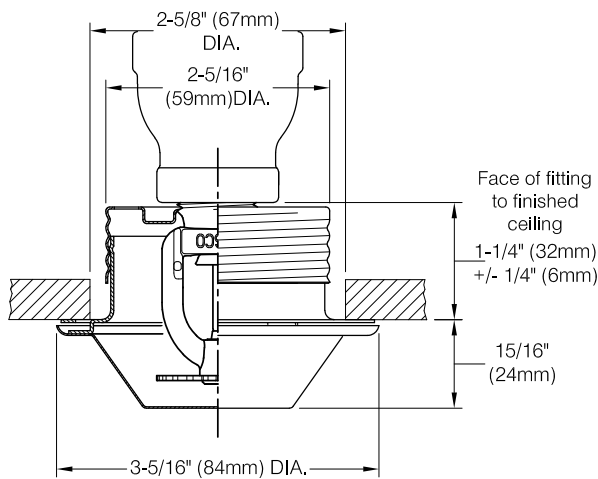
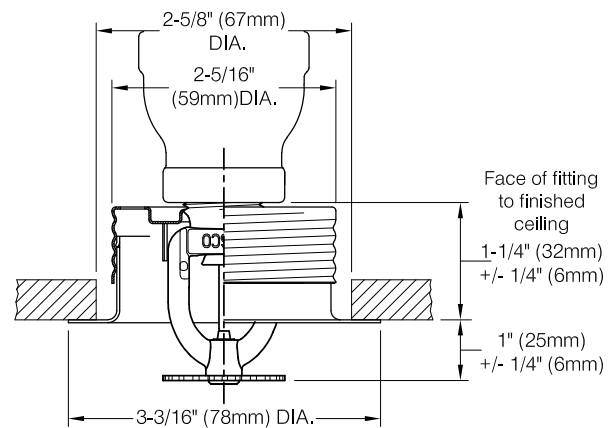
Sprinkler Wrenches

Model W4



***Note:** Model FP escutcheons and CCP cover plates are not for use in positively pressurized ceiling plenums.

Model F1Res58 CCP and FP Recessed Pendent Sprinkler Installation Dimensions

Figure 7

CCP Recessed Escutcheon Installation

FP Recessed Escutcheon Installation

Model F1Res58 CCP Pendent & FP Recessed Pendent Hydraulic Design Criteria

Table H

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
16 x 16 (4.9 x 4.9)	16 (61)	7.6 (0.52)	1/2 to 1 inch (13 to 25 mm)
18 x 18 (5.5 x 5.5)	19 (72)	10.8 (0.75)	
20 x 20 (6.1 x 6.1)	22 (83)	14.4 (1.0)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.

Technical Specifications

Style: Conical Concealed Pendent and Recessed Pendent
Threads: 3/4" NPT or ISO7-1R3/4
Nominal K-Factor: 7.6 (109 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)*
 FP Recessed*

Sprinkler Wrenches

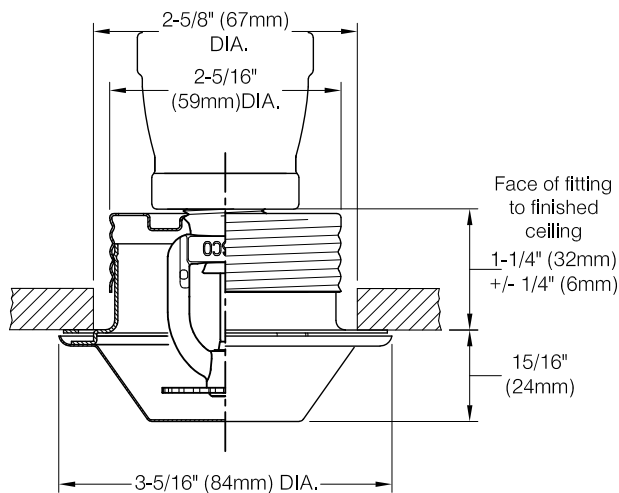
Model W4



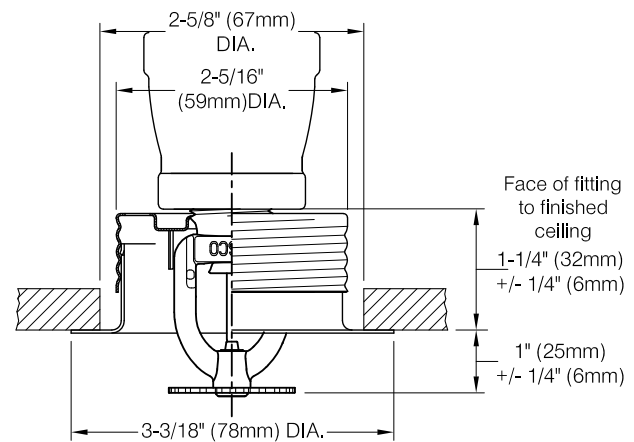
***Note:** Model FP escutcheons and CCP cover plates are not for use in positively pressurized ceiling plenums.

Model F1Res76 CCP and FP Recessed Pendent Sprinkler Installation Dimensions

Figure 8



CCP Recessed Escutcheon Installation



FP Recessed Escutcheon Installation

Model F1Res76 CCP Pendent & FP Recessed Pendent Hydraulic Design Criteria

Table I

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
16 x 16 (4.9 x 4.9)	21 (80)	7.6 (0.52)	1/2 to 1 inch (13 to 25 mm)
18 x 18 (5.5 x 5.5)	22 (83)	8.4 (0.58)	
20 x 20 (6.1 x 6.1)	25 (95)	10.8 (0.75)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.

Technical Specifications

Style: Sidewall and Recessed Sidewall

Threads: 1/2" NPT or ISO7-1R1/2

Nominal K-Factor: 4.4 (63 metric)

Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb

Sprinkler Frame: Brass Alloy

Button: Copper Alloy

Sealing Assembly: Nickel Alloy with PTFE

Load Screw: Bronze Alloy

Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

175°F (79°C)

Recessed Escutcheons

F2 Recessed

FV Recessed

Sprinkler Wrenches

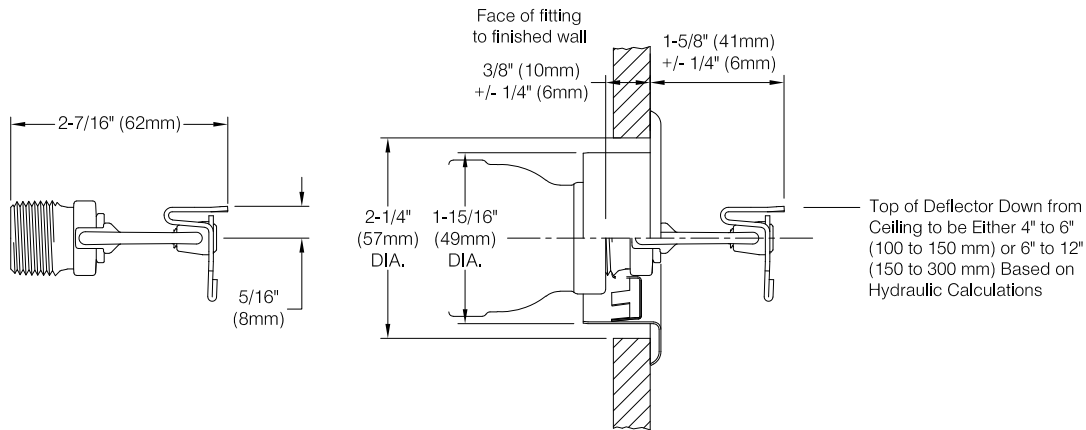
Model W2

Model W4 (Recessed)



Model F1Res44 Horizontal Sidewall Sprinkler Installation Dimensions

Figure 9



Dimensions

F2 & FV Recessed Escutcheon Installation

Model F1Res44 Horizontal Sidewall Sprinkler Hydraulic Design Criteria

Table J

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	12 (45)	7.5 (0.52)	4 to 6 inches (100 to 150 mm)
14 x 14 (4.3 x 4.3)	14 (53)	10.2 (0.70)	
15 x 15 (4.6 x 4.6)	15 (57)	11.6 (0.80)	
16 x 16 (4.9 x 4.9)	16 (61)	13.3 (0.92)	
16 x 18 (4.9 x 5.5)	18 (68)	16.8 (1.16)	
16 x 20 (4.9 x 6.1)	23 (87)	27.4 (1.89)	
18 x 18 (5.5 x 5.5)	19 (72)	18.7 (1.29)	
12 x 12 (3.7 x 3.7)	14 (53)	10.2 (0.7)	6 to 12 inches (150 to 300 mm)
14 x 14 (4.3 x 4.3)	16 (61)	13.2 (0.91)	
15 x 15 (4.6 x 4.6)	16 (61)	13.2 (0.91)	
16 x 16 (4.9 x 4.9)	17 (64)	15.0 (1.03)	
16 x 18 (4.9 x 5.5)	20 (76)	20.7 (1.43)	
16 x 20 (4.9 x 6.1)	23 (87)	27.4 (1.89)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Model F1Res44 SWC Conical Concealed Horizontal Sidewall Sprinkler

SIN R3531

Technical Specifications

Style: Conical Concealed Sidewall
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 4.4 (63 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass-bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

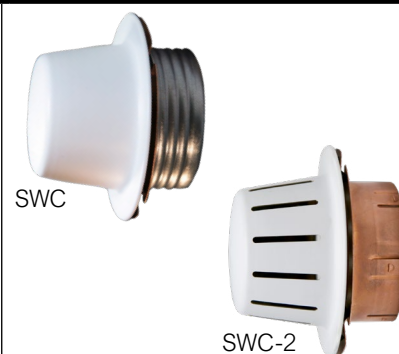
155°F (68°C)
175°F (79°C) ⁽¹⁾

Cover Plates

SWC Conical Concealed Plate⁽²⁾
SWC-2 (Slotted) Conical Concealed Plate⁽³⁾

Sprinkler Wrenches

Model W4



Note:

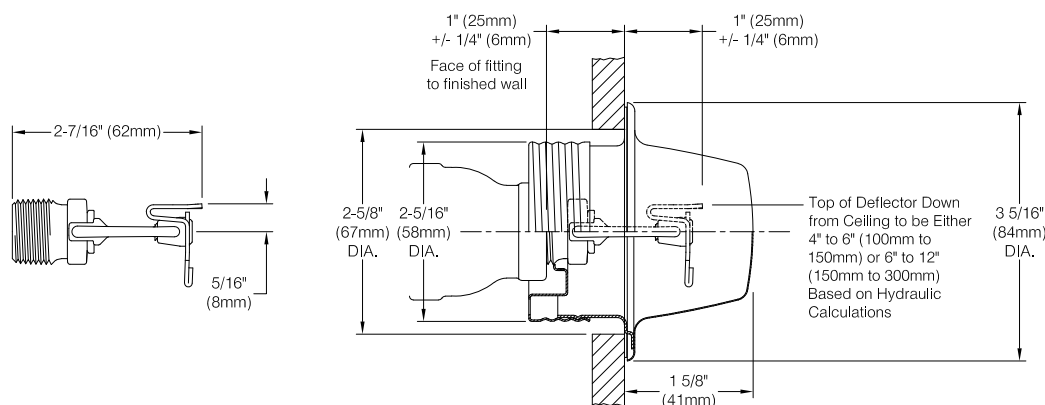
⁽¹⁾ Not for installation where the maximum ceiling temperature exceeds 100°F due to cover plate temperature rating.

⁽²⁾ 135°F SWC Conical Concealed Plate for 155°F (68°C) sprinklers

⁽³⁾ 135°F SWC-2 (Slotted) Conical Concealed Plate for 175°F (79°C) sprinklers

Model F1Res44 SWC Conical Concealed Horizontal Sidewall Sprinkler and Installation Dimensions

Figure 10



Dimensions

SWC & SWC-2 Concealed Cover Plate Installation

Model F1Res44 SWC Conical Concealed Horizontal Sidewall Sprinkler Hydraulic Design Criteria

Table K

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾					
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Ordinary Temperature Rating 155°F (68°C)		Intermediate Temperature Rating 175°F (79°C)		Deflector to Ceiling Distance
	Flow gpm (l/min)	Pressure psi (bar)	Flow gpm (l/min)	Pressure psi (bar)	
12 x 12 (3.7 x 3.7)	13 (49)	8.7 (0.60)	14 (53)	10.2 (0.7)	4 to 6 inches (100 to 150 mm)
14 x 14 (4.3 x 4.3)	14 (53)	10.2 (0.7)	14 (53)	10.2 (0.7)	
15 x 15 (4.6 x 4.6)	16 (61)	13.2 (0.91)	--	--	
16 x 16 (4.9 x 4.9)	17 (64)	15.0 (1.03)	--	--	
16 x 18 (5.5 x 5.5)	19 (72)	18.7 (1.31)	--	--	
16 x 20 (4.9 x 6.1)	23 (87)	27.4 (1.89)	--	--	6 to 12 inches (150 to 300 mm)
12 x 12 (3.7 x 3.7)	14 (53)	10.2 (0.7)	--	--	
14 x 14 (4.3 x 4.3)	15 (57)	11.7 (0.81)	--	--	
15 x 15 (4.6 x 4.6)	17 (64)	15.0 (1.03)	--	--	
16 x 16 (4.9 x 4.9)	18 (68)	16.8 (1.16)	--	--	
16 x 18 (4.9 x 5.5)	20 (76)	20.7 (1.43)	--	--	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Technical Specifications

Style: Sidewall and Recessed Sidewall
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.8 (84 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

175°F (79°C)

Recessed Escutcheons

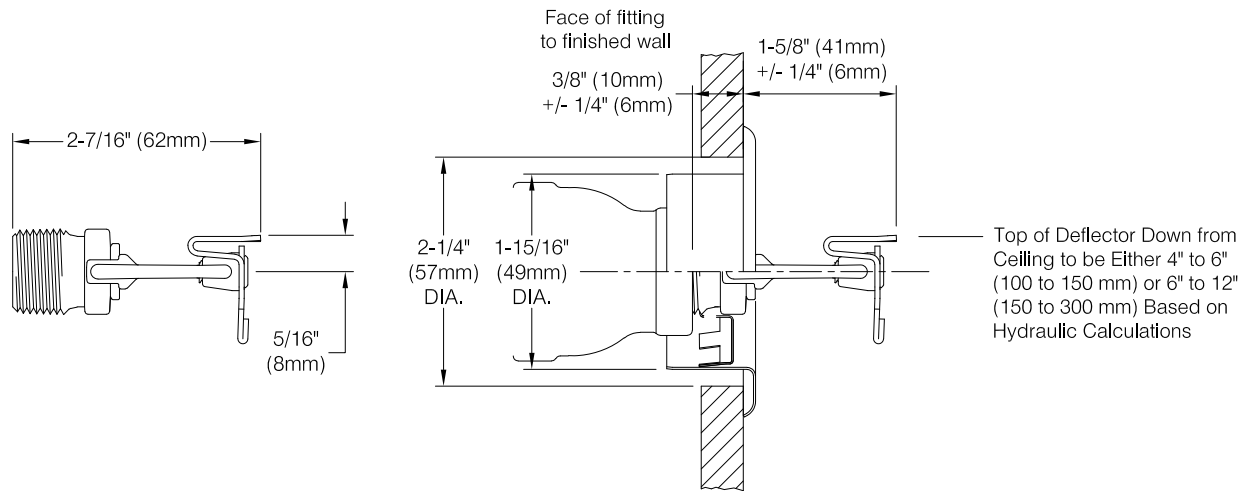
F2 Recessed

FV Recessed

Sprinkler Wrenches

Model W2

Model W4 (Recessed)

**Model F1Res58 Residential Horizontal Sidewall Sprinkler Installation Dimensions****Figure 11****Dimensions****F2 & FV Recessed Escutcheon Installation****Model F1Res58 Horizontal Sidewall Sprinkler Hydraulic Design Criteria****Table L**

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	16 (61)	7.6 (0.52)	4 to 6 inches (100 to 150 mm)
14 x 14 (4.3 x 4.3)	18 (68)	9.7 (0.66)	
15 x 15 (4.6 x 4.6)	19 (72)	10.7 (0.74)	
16 x 16 (4.9 x 4.9)	21 (80)	13.2 (0.91)	
16 x 18 (4.9 x 5.5)	25 (95)	18.6 (1.28)	
16 x 20 (4.9 x 6.1)	29 (110)	25.0 (1.72)	
12 x 12 (3.7 x 3.7)	22 (83)	14.4 (1.0)	6 to 12 inches (150 to 300 mm)
14 x 14 (4.3 x 4.3)	22 (83)	14.4 (1.0)	
15 x 15 (4.6 x 4.6)	24 (91)	17.1 (1.18)	
16 x 16 (4.9 x 4.9)	26 (98)	20.1 (1.39)	
16 x 18 (4.9 x 5.5)	31 (117)	28.6 (1.97)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).

Technical Specifications

Style: Sidewall and Recessed Sidewall
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.8 (84 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

175°F (79°C)

Recessed Escutcheons

F2 Recessed

FV Recessed

Sprinkler Wrenches

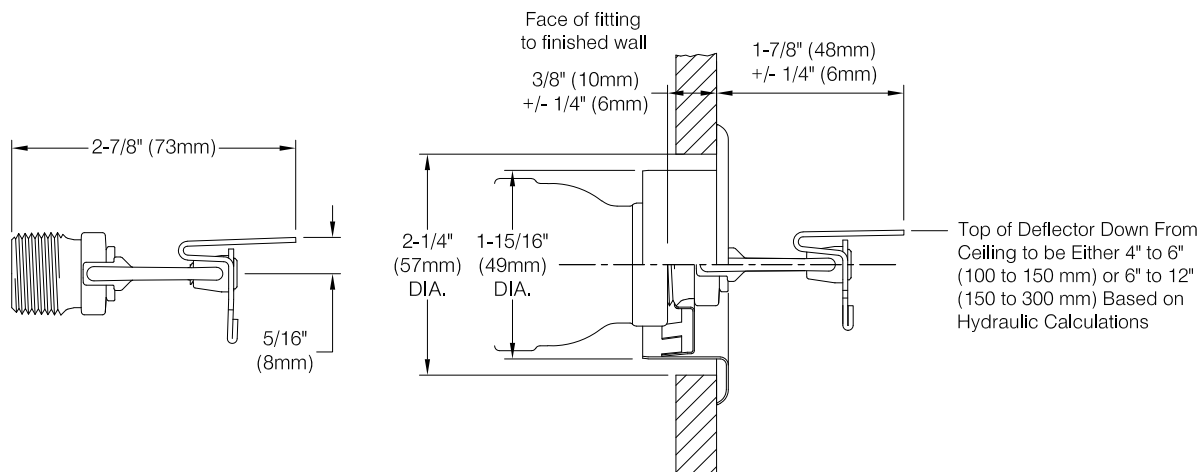
Model W2

Model W4 (Recessed)



Model F1Res58 HSWX Residential Horizontal Sidewall Sprinkler Installation Dimensions

Figure 12



Dimensions

F2 & FV Recessed Escutcheon Installation

Model F1Res58 HSWX Horizontal Sidewall Sprinkler Hydraulic Design Criteria

Table M

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
18 x 20 (5.5 x 6.1)	30 (114)	26.8 (1.85)	4 to 6 inches (100 to 150 mm)
20 x 20 (6.1 x 6.1)	30 (114)	26.8 (1.85)	
16 x 22 (4.9 x 6.7)	33 (125)	32.4 (2.23)	
16 x 24 (4.9 x 7.3)	38 (144)	42.9 (2.96)	
14 x 26 (4.3 x 7.9)	42 (160)	52.4 (3.63)	
18 x 20 (5.5 x 6.1)	35 (133)	36.4 (2.51)	6 to 12 inches (150 to 300 mm)
16 x 22 (4.9 x 6.7)	38 (144)	42.9 (2.96)	
16 x 24 (4.9 x 7.3)	42 (160)	52.4 (3.61)	
14 x 26 (4.3 x 7.9)	46 (174)	62.9 (4.34)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).

Finishes

Table N

Standard Finishes			Special Application Finishes		
Sprinkler ⁽¹⁾	F1, F2, FV, FP ⁽³⁾ , Escutcheons	CCP, SWC (Conical) Cover Plates ⁽¹⁾	Sprinkler ⁽¹⁾	F1, F2, FV, FP ⁽³⁾ , Escutcheons	CCP, SWC (Conical) Cover Plates ⁽¹⁾
Bronze	Brass	--	Bright Brass	Bright Brass	Bright Brass
Chrome Plated	Chrome Plated	Chrome Plated	Satin Chrome	Satin Chrome	Satin Chrome
White Polyester ⁽²⁾	White Polyester	White Paint	Black Polyester ⁽²⁾	Black Polyester	Black Paint
--	--	--	Custom Color Polyester	Custom Color Polyester	Custom Color Paint
--	--	--	Electroless Nickel PTFE ⁽²⁾	--	--

Notes:

(1) Paint or any other coating applied over the factory finish will void all approvals and warranties.

(2) cULus Listed Corrosion Resistant.

(3) The Model FP escutcheon assembly consists of an unfinished galvanized cup with a finished escutcheon ring.

Installation

Models F1Res sprinklers are to be installed as shown in this bulletin. Model F1, F2, FV, and FP recessed escutcheons are the only recessed escutcheons to be used with Model F1Res sprinklers. Not all F1Res sprinklers may be used with all recessed escutcheons offered. Confirm listing of escutcheon type for use with individual sprinklers. Use of any other recessed escutcheon will void all approvals and warranties.

For installing Model F1Res sprinklers, use only the Model W2 sprinkler Wrench; for installing Models F1Res Recessed Pendent, Sidewall, Conical Concealed Pendent (CCP), and Sidewall Concealed (SWC and SWC-2) sprinklers use only the Model W4 sprinkler wrench. Use of wrenches other than those specified may damage these sprinklers.

Installation of F1Res sprinklers in a wall or ceiling will require a hole diameter of 2-1/4" (57 mm) for F1 or F2 recessed escutcheons; or 2-5/8" (67 mm) for FP recessed escutcheons, CCP, SWC, and SWC-2 cover plates.

Install F1Res HSW sprinklers with a ceiling to deflector distance that complies with the hydraulic design criteria tables in this bulletin. The flow arrow on deflector must point away from near wall and "Top" marking must face the ceiling.

A "leak tight" sprinkler joint can be obtained with the following torque:

- 1/2" NPT and ISO7-1R1/2: 8-18 ft-lbs (11 – 24 N-m)
- 3/4" NPT and ISO7-1R3/4: 14-20 ft-lbs (19 – 27 N-m)

Do not tighten sprinklers over maximum recommended torque. This may cause leakage or impairment of the sprinklers. Do not install any glass bulb sprinklers where the bulb is cracked or there is a loss of liquid from the bulb.

Glass bulb sprinklers have orange bulb protectors to minimize bulb damage during shipping, handling and installation. Remove this protection at the time the sprinkler system is placed in service. Removal of the protectors before this time may leave the bulb vulnerable to damage. RASCO wrenches are designed to install sprinklers when protectors are in place. Remove protectors by undoing the clasp by hand. Do not use tools to remove the protectors.



Model W2



Model W4

Model W4 Wrench Installation Example

Figure 13



The Model W4 wrench includes two sets of jaws. One set of jaws is equivalent to a Model GFR2 wrench and the other set of jaws is equivalent to a Model W1 wrench. Use the smallest of the two sets of jaws that will fit on the sprinkler's wrench flats. The Model W4 wrench is used in conjunction with the installer's nominal 1/2" square drive ratchet and nominal 5" (125mm) long extension (not provided) as shown in Figure 13.

Maintenance

Reliable Model F1Res Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, 13, 13D, and 13R, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). Properly installed CCP, SWC, and SWC-2 cover plates will have an air gap that is required for proper operation, do not seal the gap or paint the cover plates.

Replace any sprinkler which has been damaged, where cracks are observed in the glass bulb, or when liquid has been lost from the glass bulb.

A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Listings & Approvals

Listed by Underwriters Laboratories Inc. and UL Certified for Canada (cULus)

Guarantee

For Reliable Automatic Sprinkler Company guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Patents

For patents applicable to products contained in this technical bulletin, please visit www.r-s.co

Ordering Information

Specify the following when ordering:

Sprinkler

- Model (See Table A)
- Temperature Rating
- Threads (NPT or ISO7-1)
- Finish (See Table N)

Escutcheon or Cover Plate

- Model
- Finish (See Table N)

Sprinkler Wrench

- Model W2 (Pendent and HSW)
- W4 (Recessed and Concealed)

Note: Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).



F1FR56 Series Quick Response Sprinklers

K-factor 5.6 (80)

Features

- Standard coverage quick-response sprinklers
- Upright, pendent, horizontal sidewall, and vertical sidewall defectors
- Low profile, compact design
- Available in a wide variety of finishes

Product Description

Reliable Model F1FR56 series sprinklers are quick-response standard spray automatic fire sprinklers utilizing a sensitive 3.0 mm glass bulb thermal element.

Pendent and horizontal sidewall sprinklers may be installed exposed or surface mounted using escutcheons such as the Reliable Models B, C, or HB (reference Technical Bulletin 204). When installed recessed or concealed, the Model F1FR56 series sprinklers are specifically listed with and may only be installed with listed Reliable escutcheons and cover plates. Refer to the technical information on the following pages for specific listings for recessed and concealed installations and refer to Figures 5 and 6 for dimensional information.

When fitted with an approved water shield, these sprinklers may be considered intermediate sprinklers for use in racks, below grated walkways, and other areas where intermediate level sprinklers are required.

Table A provides a summary of the approvals and availability of specific Model F1FR series sprinkler configurations. Additional technical information for each sprinkler model is provided on the following pages.



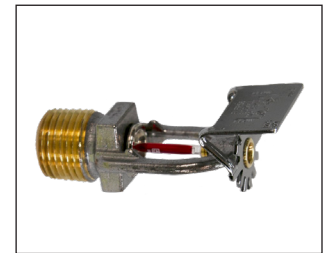
Model F1FR56 Pendent



Model F1FR56 Upright



Model F1FR56 Vertical Sidewall

Model F1FR56
Horizontal Sidewall

Note: Not all versions of the product are shown.

Note: This bulletin may contain information on New and Legacy sprinklers that reflects a dimensional change only. Sprinkler Identification Number (SIN), application, performance, and listings/approval are not otherwise affected. Sprinklers with New frames will include the suffix "N" in the order.

F1FR Series Sprinklers Summary

Table A

Sprinkler Model	K-Factor gpm/psi ^{1/2} (lpm/bar ^{1/2})	Orientation	Listings & Approvals	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
F1FR56	5.6 (80)	Upright Intermediate Upright	cULus, FM, LPCB, VdS, EC, WM, UKCA	175 (12) 250 (17) (cULus only)	RA1425
		Pendent	cULus, FM, LPCB, VdS, EC, WM, UKCA	175 (12) 250 (17) (cULus only)	RA1414
		Concealed Pendent	cULus, VdS, EC, WM, UKCA	175 (12) 250 (17) (cULus only)	RA1414
		Horizontal Sidewall	cULus, FM	175 (12) 250 (17) (cULus only)	RA1435
		Vertical Sidewall	cULus, FM, LPCB, UKCA	175 (12)	RA1485

Model F1FR56 Upright Sprinkler

SIN RA1425

Technical Specifications

Style: Upright, Intermediate Upright

Threads: 1/2" NPT or ISO 7-R1/2

Nominal K-Factor: 5.6 (80 metric)

Max. Working Pressure:

175 psi (12 bar)

250 psi (17 bar) (cULus only)

Material Specifications

Thermal Sensor: 3 mm Glass Bulb

Sprinkler Frame: Brass Alloy

Cap: Bronze Alloy

Sealing Washer: Nickel with PTFE

Load Screw: Copper Alloy

Deflector: Brass Alloy

Sprinkler Finishes

(See Table B)

Sensitivity

Quick response

Temperature Ratings

135°F (57°C)

155°F (68°C)

175°F (79°C)

200°F (93°C)

286°F (141°C)

Guards & Shields (New Frames)

Factory Water Shield (cULus, FM)

F-1 Guard (cULus, FM)

F-3 Guard with Shield (cULus, FM)

Guards and Shields (Legacy Frames)

Factory Water Shield

C-1 Guard (FM)

C-3 Guard with Shield (cULus, FM)

D-1 Guard (cULus)

D-3 Guard with Shield (cULus)

Sprinkler Wrench

Model W2

Model J (New frame with guard installed)

Model JD (Legacy frame with guard installed)

Listings and Approvals

cULus Listed

FM Approved

LPCB

VdS

EC

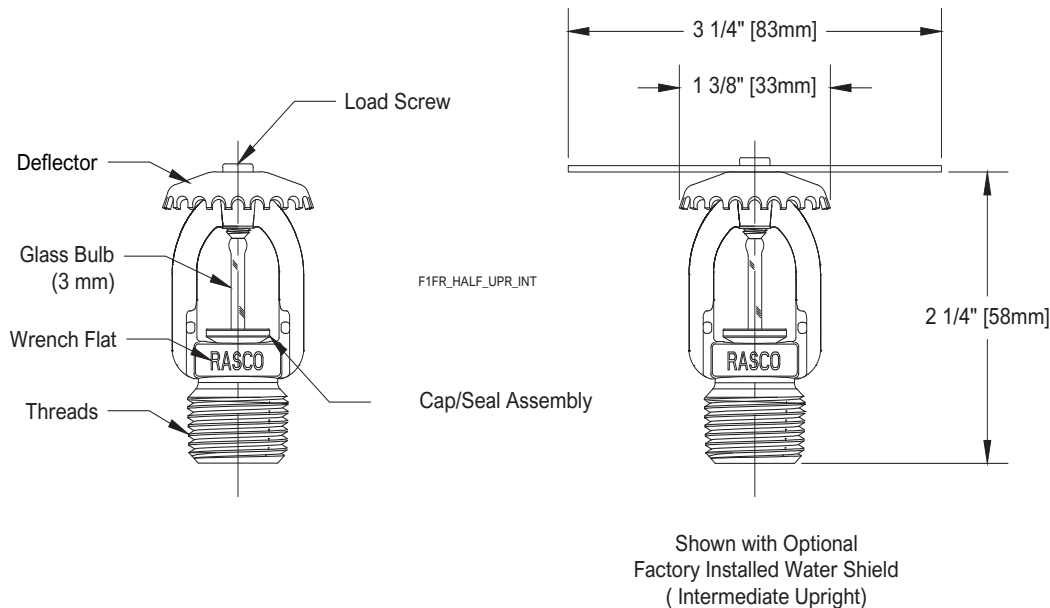
WM

UKCA: 0832-UKCA-CPR-S5045



Model F1FR56 Upright Sprinkler Components and Dimensions

Figure 1



Technical Specifications**Style:**

Pendent
Recessed Pendent
Concealed Pendent

Threads: 1/2" NPT or ISO 7-R1/2

Nominal K-Factor: 5.6 (80 metric)

Max. Working Pressure:

175 psi (12 bar)
250 psi (17 bar) (cULus only)

Material Specifications

Thermal Sensor: 3 mm Glass Bulb

Sprinkler Frame: Brass Alloy

Cap: Bronze Alloy

Sealing Washer: Nickel with PTFE

Load Screw: Copper Alloy

Deflector: Brass Alloy

Sprinkler Finishes

(See Table B)

Sensitivity

Quick response

Temperature Ratings⁽¹⁾

135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)

Recessed Escutcheons

Model F1 (cULus, LPCB, VdS, CE, WM)
Model F2 (cULus, FM, LPCB, VdS, CE, WM)
Model FP (cULus, VdS, CE, WM)

Cover Plate

Model CCP (cULus, VdS⁽²⁾, CE⁽²⁾)

Guards & Shields (New Frames)⁽³⁾

F-1 Guard (FM)
F-5 Guard/Shield Kit (FM)
F-7 Guard (cULus)
F-8 Guard/Shield Kit (cULus)
S-1 Shield (cULus, FM)

Guards & Shields (Legacy Frames)⁽³⁾

C-1 Guard (FM)
C-5 Guard/Shield Kit (FM)
D-1 Guard (cULus, FM)
D-4 Guard/Shield Kit (FM)
D-5 Guard/Shield Kit (cULus, FM)
S-1 Shield (cULus, FM)

Sprinkler Wrenches

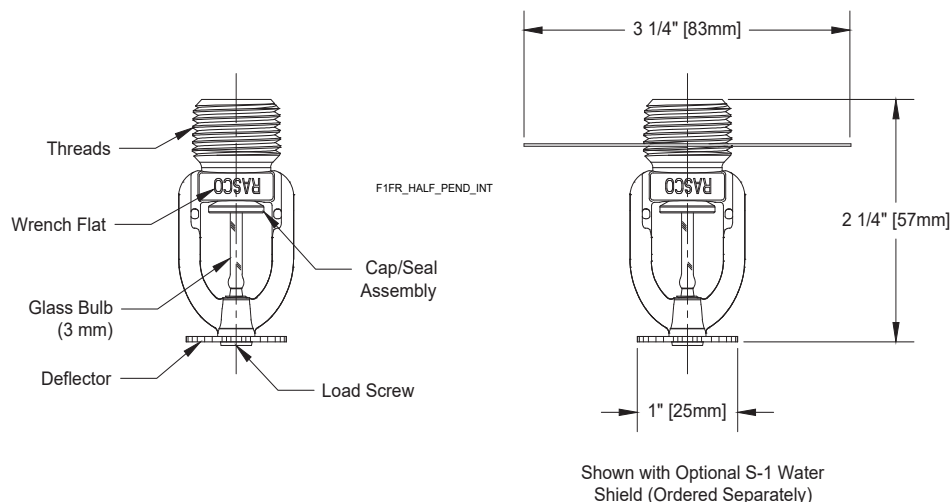
Model W2 (pendent)
Model W4 (recessed or concealed)
Model J (New frame with guard installed)
Model JD (Legacy frame with guard installed)

Listings and Approvals⁽⁴⁾

cULus Listed
FM Approved
LPCB
VdS
EC
WM
UKCA: 0832-UKCA-CPR-S5045,
0831-UKCA-CPR-5072 (CCP)

**Notes:**

1. 286°F (141°C) temperature rated sprinkler not listed for recessed or concealed use.
2. VdS and CE approval for CCP concealed use is for 155°C (68°C) sprinkler ONLY.
3. Not suitable for recessed or concealed installations.
4. When used surface mounted or exposed. See Recessed Escutcheon and Cover Plate section for specific approvals when installed recessed or concealed.

Model F1FR56 Pendent Sprinkler Components and Dimensions**Figure 2**

Note: Please refer to Figure 8 for recessed and concealed installation.

Technical Specifications**Style:**

Horizontal Sidewall
Recessed Horizontal Sidewall

Threads: 1/2" NPT or ISO 7-R1/2**Nominal K-Factor:** 5.6 (80 metric)**Max. Working Pressure:**

175 psi (12 bar)
250 psi (17 bar) (cULus only)

Material Specifications**Thermal Sensor:** 3 mm Glass Bulb**Sprinkler Frame:** Brass Alloy**Cap:** Bronze Alloy**Sealing Washer:** Nickel with PTFE**Load Screw:** Copper Alloy**Deflector:** Brass Alloy**Sprinkler Finishes**

(See Table B)

Sensitivity

Quick response

Temperature Ratings ⁽¹⁾

135°F (57°C)

155°F (68°C)

175°F (79°C)

200°F (93°C)

286°F (141°C)

Recessed Escutcheons⁽²⁾

Model F1 (cULus)

Model F2 (cULus, FM)

Model FP (cULus)

Guards & Shields (New Frames)⁽³⁾

F-4 Guard (FM)

F-7 Guard (cULus)

Guards & Shields (Legacy Frames)⁽³⁾

C1 Guard (FM)

D1 Guard (cULus)

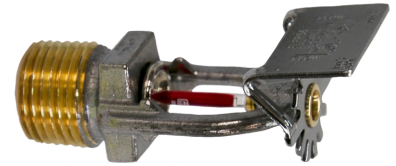
Sprinkler Wrenches

Model W2 (non-recessed)

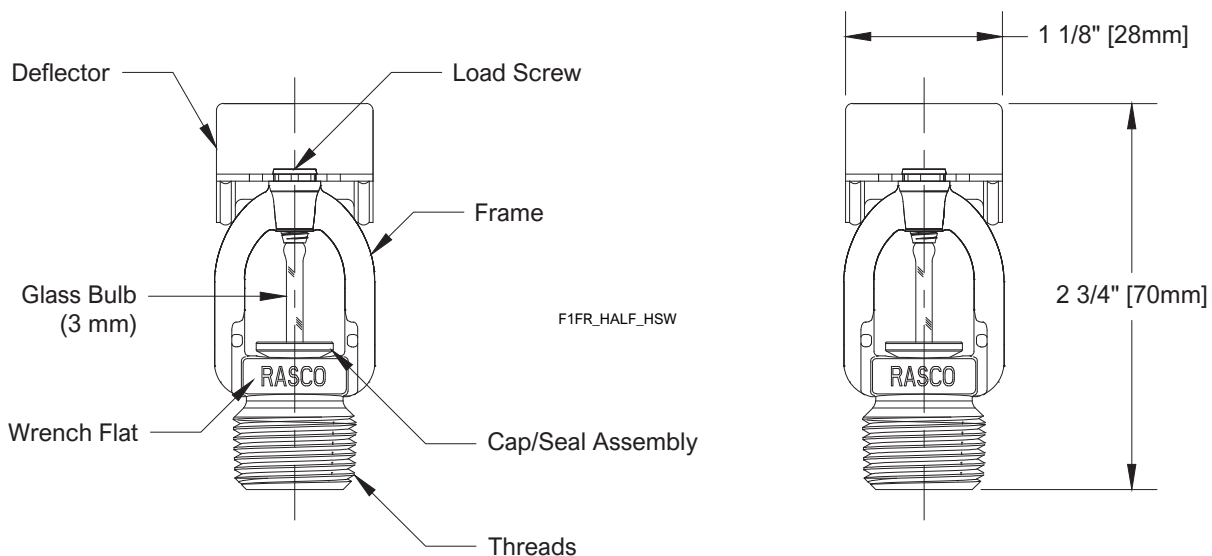
Model W4 (recessed)

Model J (New frame with guard installed)

Model JD (Legacy frame with guard installed)

Listings and ApprovalscULus Listed⁽⁴⁾FM Approved⁽⁵⁾**Notes:**

1. 286°F (141°C) temperature rated sprinkler not listed for recessed use.
2. FM approved recessed installation when used with Model F2 escutcheon ONLY.
3. Not suitable for recessed horizontal sidewall installations.
4. cULus Listed for Light and Ordinary Hazard when installed exposed or surface mounted. Listed for Light Hazard ONLY when installed recessed.
5. FM Approved for Light Hazard ONLY.

Model F1FR56 Horizontal Sidewall Sprinkler Components and Dimensions**Figure 3****Note:** Please refer to Figure 9 for recessed installation.

Technical Specifications

Style:

Upright Vertical Sidewall
Pendent Vertical Sidewall

Threads: 1/2" NPT or ISO 7-R1/2

Nominal K-Factor: 5.6 (80 metric)

Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm Glass Bulb

Sprinkler Frame: Brass Alloy

Cap: Bronze Alloy

Sealing Washer: Nickel with PTFE

Load Screw: Copper Alloy

Deflector: Brass Alloy

Sprinkler Finishes

(See Table B)

Sensitivity

Quick response

Temperature Ratings

135°F (57°C)

155°F (68°C)

175°F (79°C)

200°F (93°C)

286°F (141°C)

Guards & Shields (New Frames)

F-2 Guard (FM)

Guards & Shields (Legacy Frames)

C1 Guard (FM)

Sprinkler Wrenches

Model W2

Model J (New frame with guard installed)

Model JD (Legacy frame with guard installed)

Listings and Approvals⁽¹⁾

cULus Listed

FM Approved

LPCB⁽²⁾

UKCA: 0832-UKCA-CPR-S5045

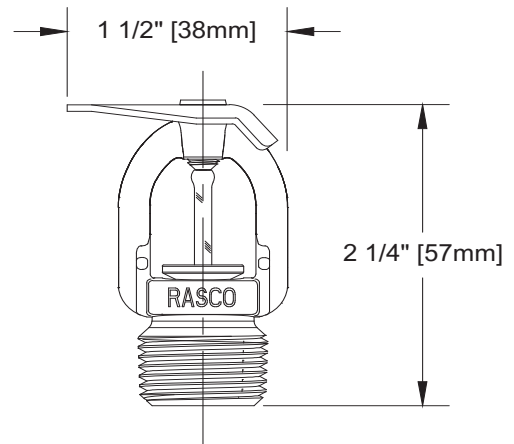
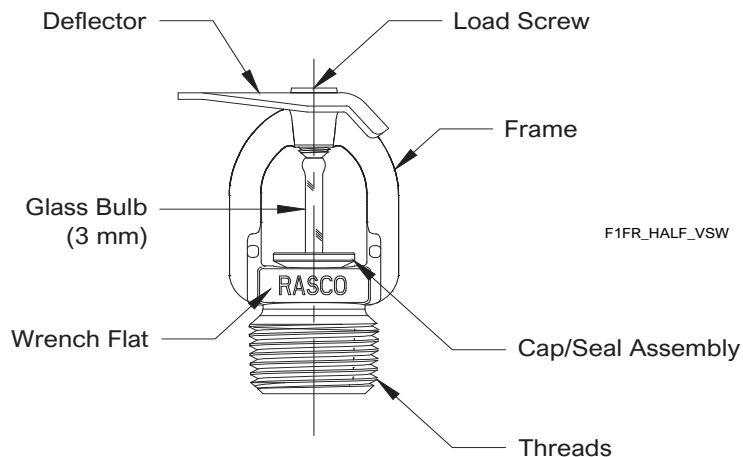


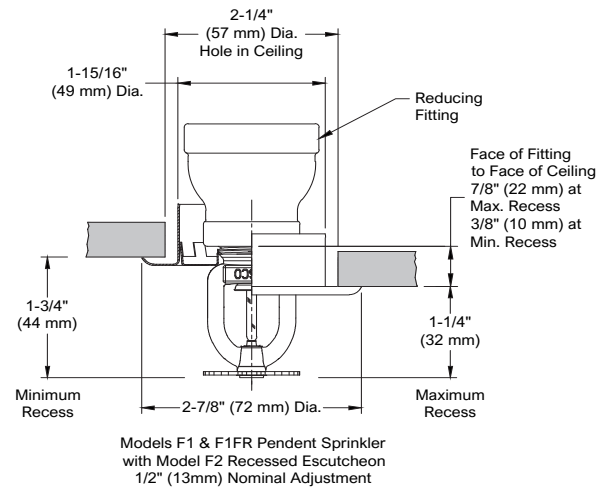
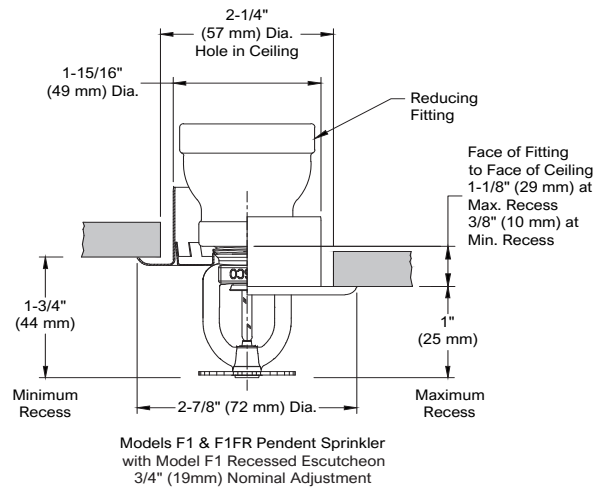
Notes:

1. Listed and approved for Light Hazard ONLY.
2. LPCB approved for use in pendent position ONLY.

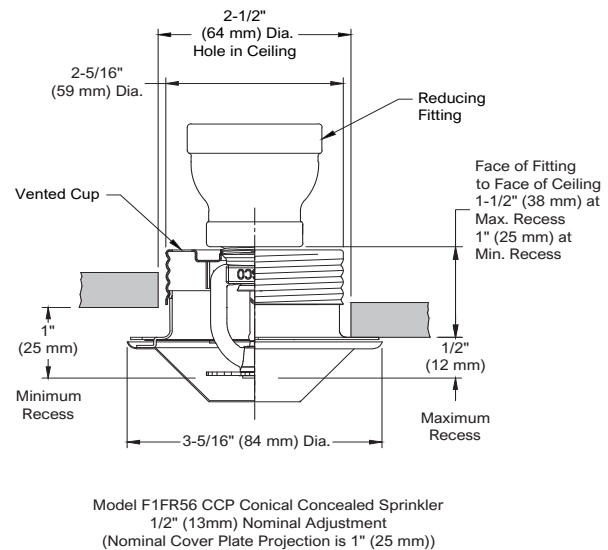
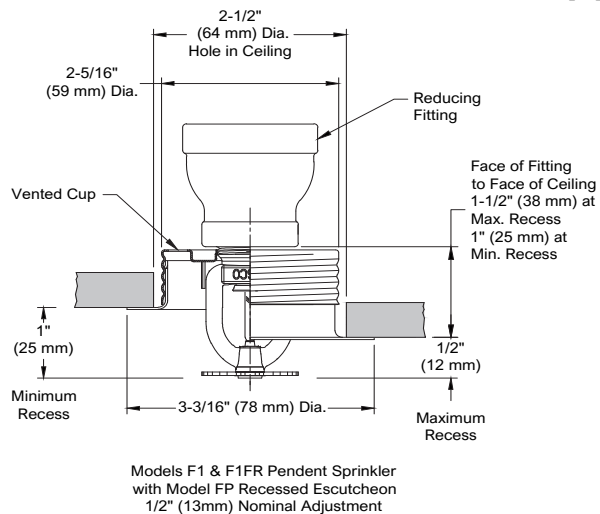
Model F1FR56 Vertical Sprinkler Components and Dimensions

Figure 4





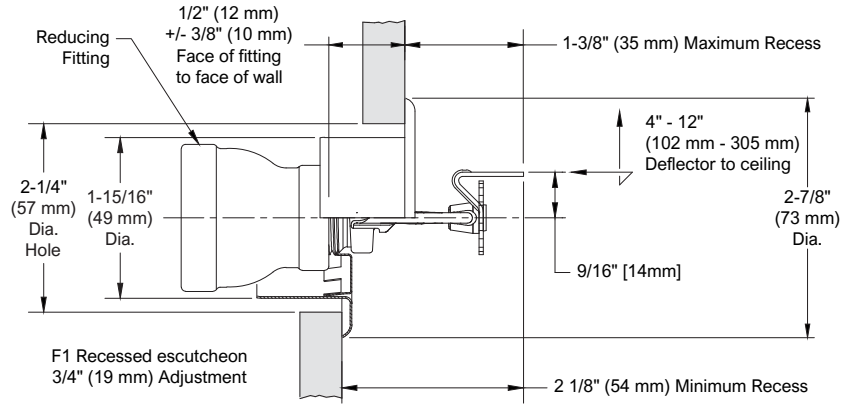
F1_REC_PEND_CCP



Note: Model FP recessed assemblies may not be used where the pressure in the space above the ceiling is positive with respect to the protected area. Ensure that the openings in the Model FP cup are unobstructed following installation.

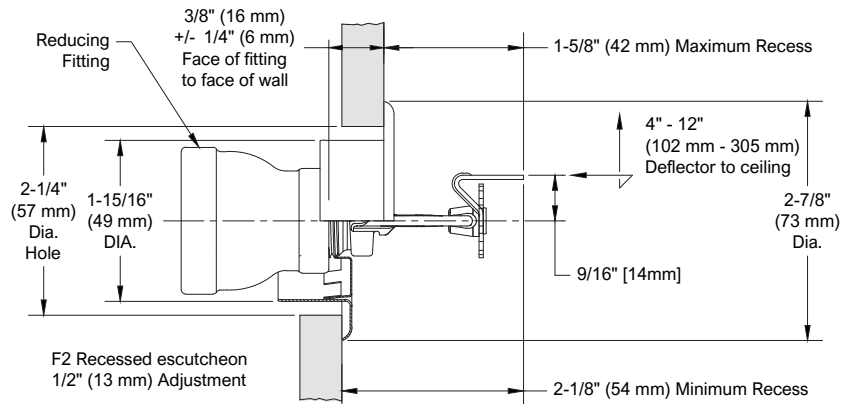
Note: Model CCP concealed assemblies may not be used where the pressure in the space above the ceiling is positive with respect to the protected area. Ensure that the openings in the Model CCP cup are unobstructed following installation.



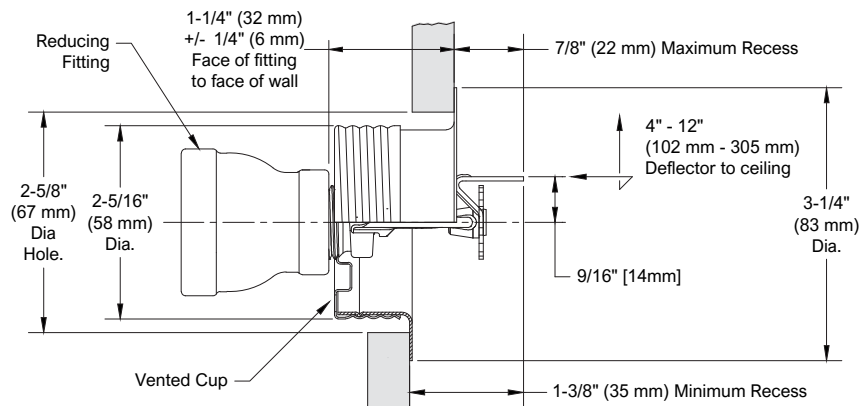


Model F1FR Horizontal Sidewall Sprinkler
with Model F1 Recessed Escutcheon
3/4" (19mm) Nominal Adjustment

F1FR_REC_HSW



Model F1FR Horizontal Sidewall Sprinkler
with Model F2 Recessed Escutcheon
1/2" (13mm) Nominal Adjustment



Model F1FR Horizontal Sidewall Sprinkler
with Model FP Recessed Escutcheon
1/2" (13mm) Nominal Adjustment

Note: Model FP recessed assemblies may not be used where the pressure in the space behind the sprinkler is positive with respect to the space in the protected area. Ensure that the openings in the Model FP cup are unobstructed following installation.

Wrenches



Model W2 (upright, pendent)



Model J (New frame with guard installed)
Model JD (Legacy frame with guard installed, similar but with zinc finish)



Model W4
(recessed, concealed pendent)

Finishes⁽¹⁾

Table B

Standard Finishes			Special Application Finishes		
Sprinkler	F1, F2 and FP ⁽²⁾ Escutcheons	CCP Cover Plate ⁽²⁾	Sprinkler	F1, F2 and FP ⁽²⁾ Escutcheons	CCP Cover Plate ⁽²⁾
Bronze	Brass	Chrome	Electroless Nickel PTFE ⁽³⁾⁽⁴⁾	Bright Brass	Bright Brass
Chrome	Chrome	White Paint	Bright Brass ⁽⁵⁾	Satin Chrome	Satin Chrome
White Polyester ⁽³⁾	White Polyester		Satin Chrome	Custom Color Polyester	Custom Color Paint
			Custom Color Polyester ⁽³⁾		

Notes:

1. Paint or any other coating applied over the factory finish will void all approvals and warranties.
2. Model FP escutcheons and Model CCP sprinklers utilize a galvanized steel cup with a finished trim ring or cover plate.
3. cULus Listed as corrosion resistant.
4. FM Approved as corrosion resistant.
5. For 200°F (93°C) maximum temperature rated sprinklers only.

Installation

Model F1FR Series sprinklers must be installed in accordance with NFPA13 and the requirements of all applicable authorities having jurisdiction. Model F1FR Series sprinklers must be installed with the Reliable sprinkler installation wrench identified in this Bulletin. Any other wrench may damage the sprinkler. The Models W2 and W4 wrenches have two sets of jaws. Use the smallest set of jaws that fit on the wrench flats of the sprinkler. A leak tight sprinkler joint can be obtained with a torque of 8 to 18 lb-ft (11 to 24 N-m). Do not tighten sprinklers over the maximum recommended installation torque. Exceeding the maximum recommended installation torque may cause leakage or impairment of the sprinkler.

Glass bulb sprinklers have orange bulb protectors or protective caps to minimize bulb damage during shipping, handling and installation. Reliable sprinkler installation wrenches are designed to install sprinklers with bulb protectors in place. Remove the bulb protector at the time when the sprinkler system is placed in service for fire protection. Removal of the bulb protector before this time may leave the bulb vulnerable to damage. Remove bulb protectors by undoing the clasp by hand. Do not use tools to remove bulb protectors.

Maintenance

Reliable Model F1FR series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Model

- F1FR56

Deflector/Orientation

- Upright
- Intermediate Upright
- Pendent
- CCP Concealed Pendent
- Horizontal Sidewall
- Vertical Sidewall

Temperature Rating

- See sprinkler technical specifications

Sprinkler Finish

- See Table B

Recessed Escutcheon⁽¹⁾⁽²⁾

- F1
- F2
- FP

Escutcheon Finish

- See Table B

CCP Cover Plate Temperature Rating

- 135°F (57°C) [For use with 135°F (57°C) and 155°F (68°C) sprinklers.]
- 165°F (74°C) [For use with 175°F (79°C) and 200°F (93°C) sprinklers.]

CCP Cover Plate Finish

- See Table B

Sprinkler Wrench

- Model W2
- Model W4 (recessed, concealed)
- Model J (New frame with guard installed)
- Model JD (Legacy frame with guard installed)

Notes:

1. 286°F (141°C) sprinklers are not listed to be used recessed or concealed.
2. For FM, recessed sprinklers must use the Model F2 escutcheon.

VicFlex™ Style VS1 Dry Sprinkler

Models V3505, V3506, V3509, V3510, V3517, V3518



1.0 PRODUCT DESCRIPTION

Style

- Pendent, Concealed Pendent, Horizontal Sidewall

K Factor

- 5.6/8.1 S.I.
For system design purposes, no equivalent length calculations are required.

Sprinkler Length

- 38"/965 mm, 50"/1270 mm, 58"/1475 mm

Nominal Orifice Size

- ½"/13 mm

Maximum Working Pressure

- 175 psi/1200 kPa

Factory Hydrostatic Test

- 100% @ 500 psi/3450 kPa

Minimum Operating Pressure

- 7 psi/48 kPa

Connections

- To branch line (inlet) via 1"/25 mm NPT or 1" BSPT

Minimum Bend Radius:

- **UL:** 2"/51 mm
- **FM:** 7"/178 mm

Maximum Number of 90° Bends:

- **UL:** 4
- **FM:** 2 bends for 38", 3 bends for 50", 4 bends for 58"

Hazard Classifications

- Light and Ordinary Hazard

NOTE

- The VS1 is classified as a dry sprinkler and has no equivalent length.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

2.0 CERTIFICATION/LISTINGS



Approvals/Listings	Model								
	V3505	V3505	V3506	V3506	V3509	V3509	V3510	V3517	V3518
Orifice Size (inches)	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Orifice Size (mm)	13	13	13	13	13	13	13	13	13
Nominal K Factor Imperial	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Nominal K Factor S.I.	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
Response	Standard	Standard	Quick	Quick	Standard	Standard	Quick	Standard	Quick ¹
Deflector Type	Pendent	Recessed	Pendent	Recessed	Hor. SW	Rec. Hor. SW	Hor. SW, Recessed Hor. Sidewall	Conc. Pend.	Conc. Pend. w/Clean room gasket
Approved Temperature Ratings	F°/C°								
FM	135/57	135/57	135/57	135/57	135/57	135/57	135/57	–	135/57
	155/68	155/68	155/68	155/68	155/68	155/68	155/68	–	155/68
	175/79	175/79	175/79	175/79	175/79	175/79	175/79	–	175/79
	200/93	200/93	200/93	200/93	200/93	200/93	200/93	–	200/93
	286/141	–	–	–	286/141	–	–	–	–
UL	135/57	135/57	135/57	135/57	135/57	135/57	135/57	135/57	135/57
	155/68	155/68	155/68	155/68	155/68	155/68	155/68	155/68	155/68
	175/79	175/79	175/79	175/79	175/79	175/79	175/79	175/79	175/79
	200/93	200/93	200/93	200/93	200/93	200/93	200/93	200/93	200/93
	286/141	286/141	286/141	286/141	286/141	–	286/141	–	–

¹ Model V3518 is a Standard Response FM sprinkler.

3.0 MATERIAL SPECIFICATIONS

Deflector: Brass

Bulb: Glass with glycerin solution

Bulb Nominal Diameter:

Quick Response: 3.0 mm

Standard Response: 5.0 mm

Split Spacers: Stainless steel

Load Screw: Brass

Pip Cap: Stainless steel

Spring Seal Assembly: PTFE tape coated beryllium nickel and stainless steel

Frame: Brass

Flexible Hose: Stainless steel

Collar/Weld Fitting: Stainless steel

Gasket Seal: Victaulic EPDM

Isolation Ring: Nylon

Hose Fittings: Carbon steel, zinc-plated

Inlet Fitting: Brass

Outer Tube: Stainless steel

Concealed Cup: Carbon steel, zinc-plated

Brackets: Carbon steel, zinc-plated

3.1 ACCESSORIES SPECIFICATIONS

Sprinkler Finishes:

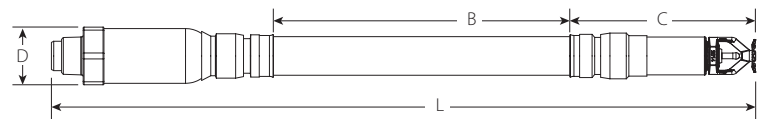
Standard: VC-250

White painted RAL 9010

4.0 DIMENSIONS

Product Details and Optional Components

Style VS1 Dry Sprinkler

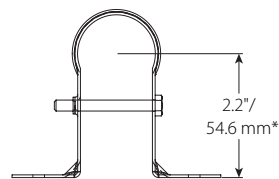
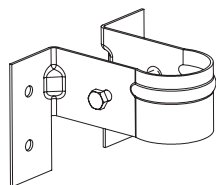


Sprinkler Length inches mm	Overall Length (pendent) L inches mm	Live Length B inches mm	Outlet End Length C inches mm	Maximum OD D inches mm
38 965	39.2 995	25.1 638	6.5 165	2.2 56
50 1270	51.2 1300	37.1 943	6.5 165	2.2 56
58 1475	59.2 1505	45.1 1145	6.5 165	2.2 56

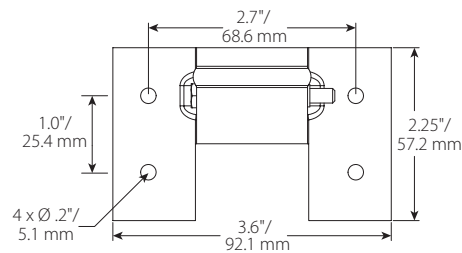
NOTE

- Add ½" to Overall Length and Outlet End Length for increased length of sidewall deflector

Style VB1 Bracket



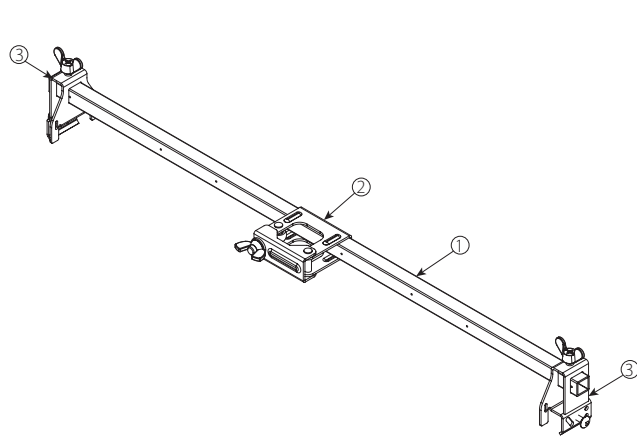
*Note: Theoretical center point of sprinkler in bracket.



4.0 DIMENSIONS (CONTINUED)

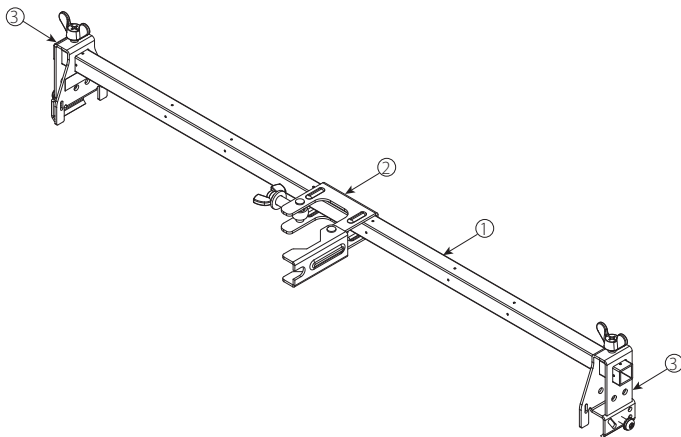
Style VB2 Bracket
Recessed Pendent, Suspended Ceilings

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Patented 1-Bee Center Bracket
3	End Bracket



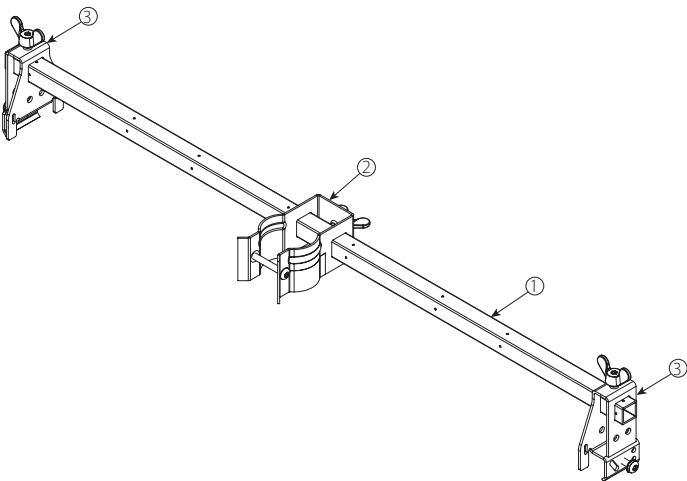
Style VB3 Bracket
Concealed Pendent, Suspended Ceilings

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Patented 1-Bee Center Bracket
3	End Bracket



Style VB4 Bracket
Sleeve and Skirt Pendent, Suspended Ceilings

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Center Bracket
3	End Bracket



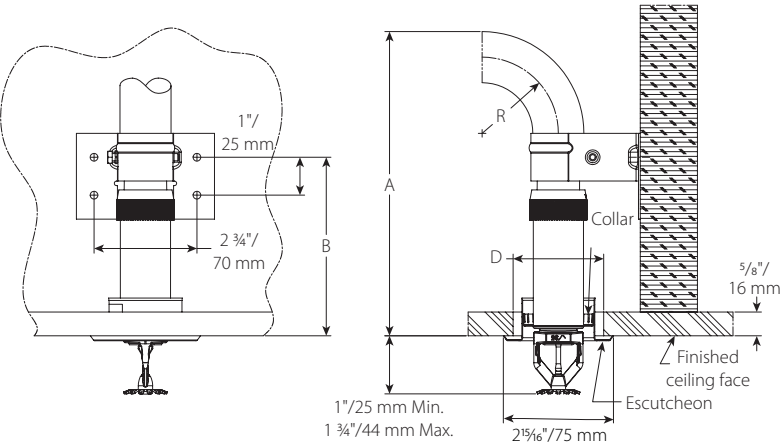
4.1 DIMENSIONS

Sprinkler Finishes: Dimensions and Mounting Conditions

NOTE

- Drawings are shown with 5/8" finished ceiling thickness. Adjustments to "B" and "C" dimensions will be required if finished ceiling thickness deviate from drawing.

Recessed Pendent:



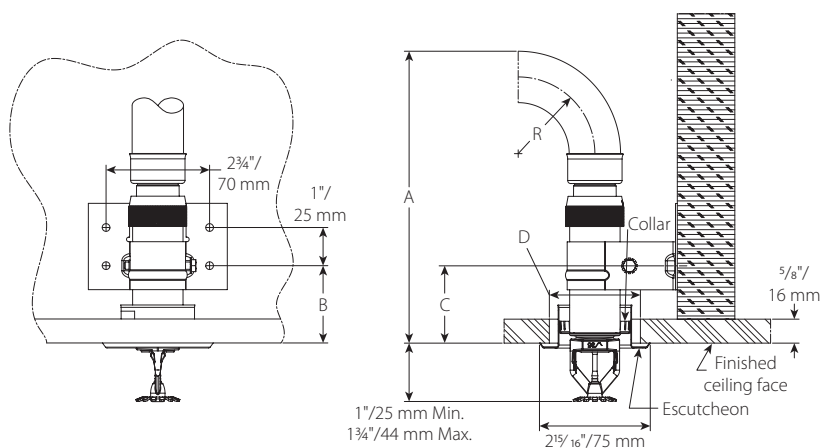
Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	7 5/8 193	12 5/8 320
"B" Mounting Screw Hole Location	4 3/4 119	
Ceiling Hole Diameter "D"	2 – 2 3/8 50 – 60	

NOTE

- Dimensions are shown with 3/4" escutcheon at middle of height adjustment range.

4.2 DIMENSIONS

Recessed Pendant Alternative Bracket Location



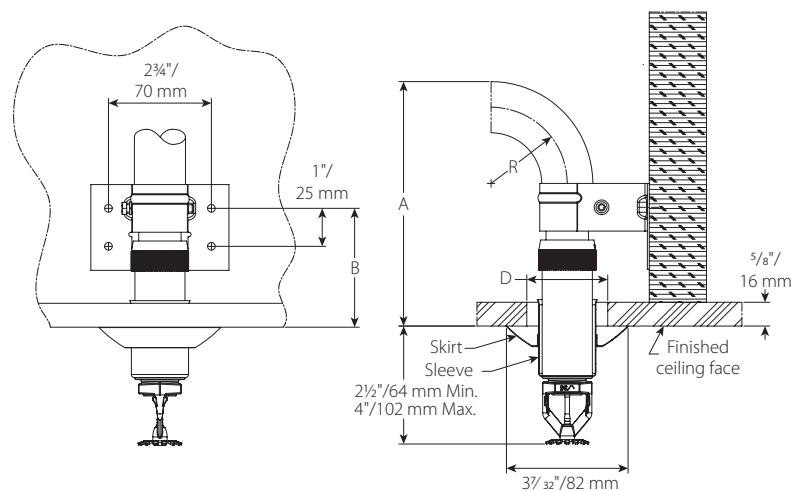
Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	7 5/8 193	12 5/8 320
"B" Mounting Screw Hole Location	2 50	
Ceiling Hole Diameter "D"	2 – 2 3/8 50 – 60	

NOTE

- Dimensions are shown with 3/4" escutcheon at middle of height adjustment range.

4.3 DIMENSIONS

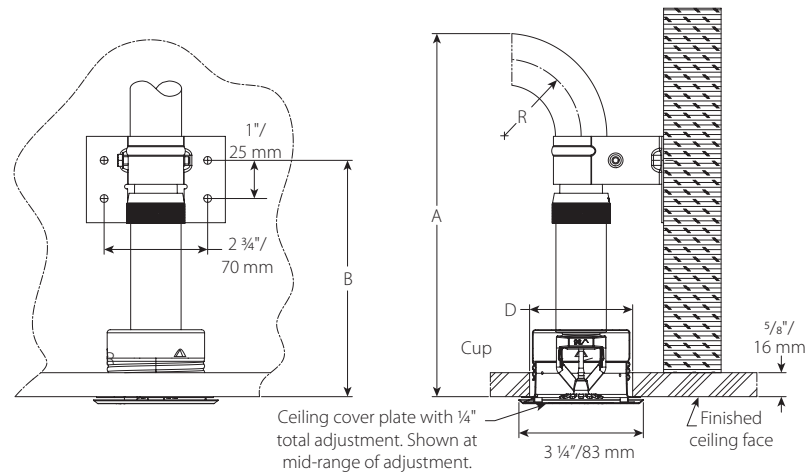
Sleeve and Skirt Pendent



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	6 1/2 163	11 1/2 290
"B" Mounting Screw Hole Location	3 1/8 79	
Ceiling Hole Diameter "D"	1 3/4 – 2 1/8 44 – 54	

4.4 DIMENSIONS

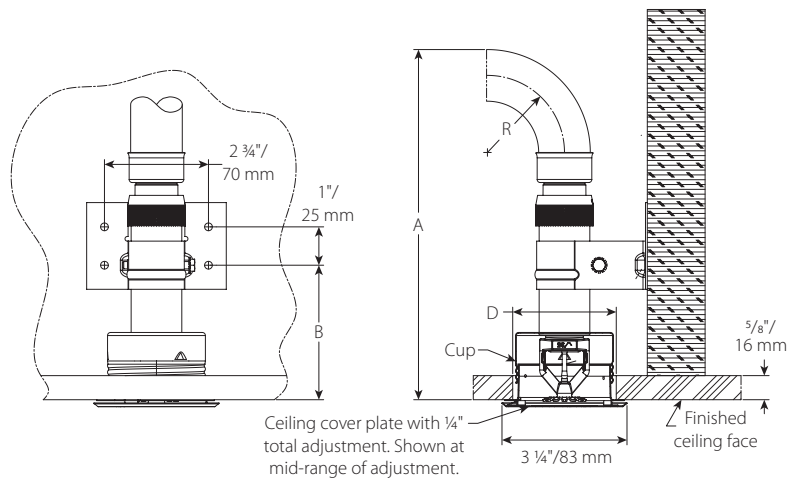
Concealed Pendent



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	9 1/2 241	14 1/2 369
"B" Mounting Screw Hole Location	6 1/4 157	
Ceiling Hole Diameter "D"	2 5/8 – 2 3/4 67 – 70	

4.5 DIMENSIONS

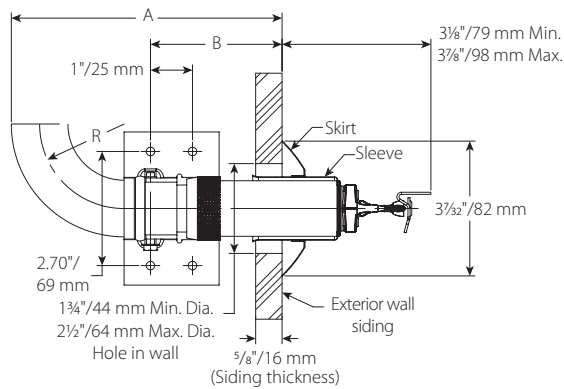
Concealed Pendent Alternative Bracket Location



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	9 1/8 231	14 1/8 358
"B" Mounting Screw Hole Location	3 1/2 89	
Ceiling Hole Diameter "D"	2 5/8 – 2 3/4 67 – 70	

4.6 DIMENSIONS

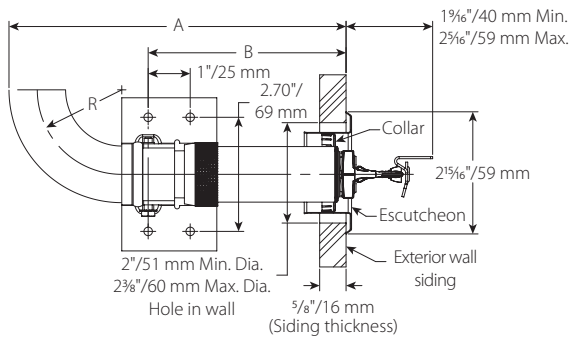
Sleeve and Skirt Sidewall



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	6 1/2 163	11 1/2 290
"B" Mounting Screw Hole Location	3 1/8 79	
Ceiling Hole Diameter "D"	1 3/4 – 2 1/8 44 – 54	

4.7 DIMENSIONS

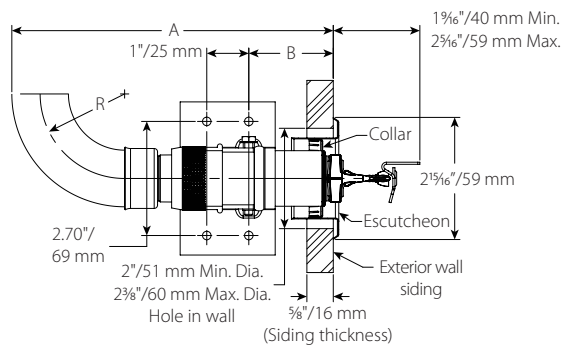
Recessed Sidewall



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	8 203	13 330
"B" Mounting Screw Hole Location	4 3/4 119	
Ceiling Hole Diameter "D"	2 – 2 3/8 51 – 60	

4.8 DIMENSIONS

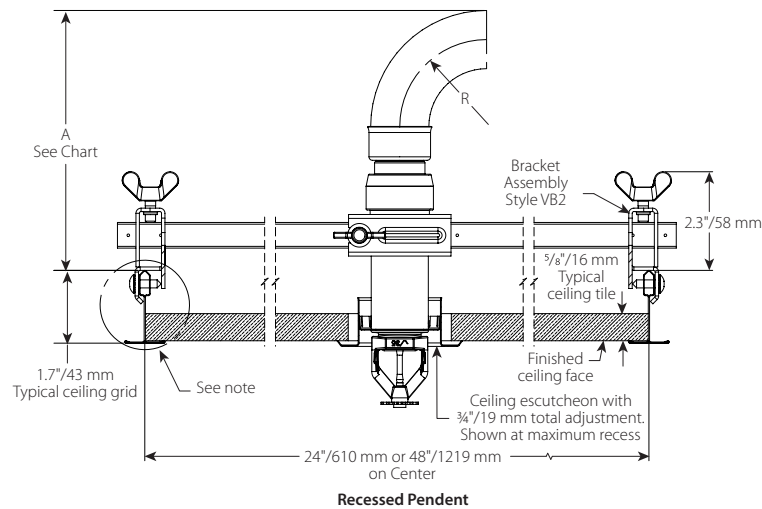
Recessed Sidewall Alternative Bracket Location



Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2 50	7 175
"A" Minimum Required Installation Space	8 203	13 330
"B" Mounting Screw Hole Location	2 51	
Ceiling Hole Diameter "D"	2 – 2 3/8 51 – 60	

4.9 DIMENSIONS

VB2 Recessed Pendant



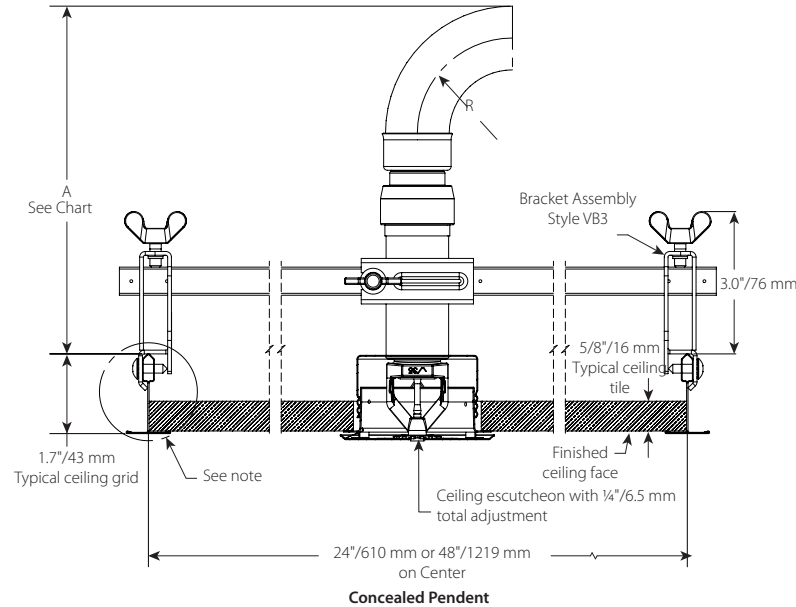
Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2	7
	50	175
"A" Minimum Required Installation Space	6 1/2	11 1/2
	163	290

NOTE

- Victaulic *VicFlex* Style VB2 Bracket assemblies shall be used only with Style VS1 recessed pendant sprinklers.

4.10 DIMENSIONS

VB3 Concealed Pendant



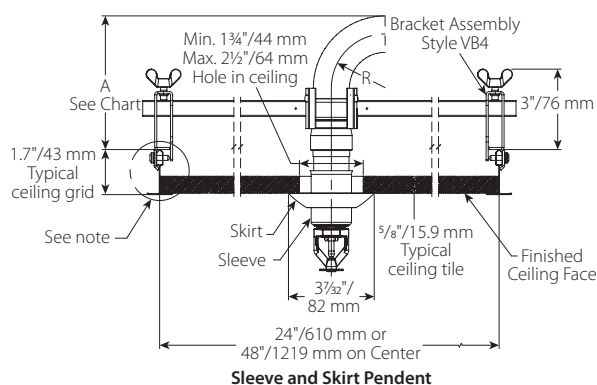
Clearance Chart		
Dimension	inches mm	
"R" Minimum Bend Radius	2	7
	50	175
"A" Minimum Required Installation Space	7 3/8	12 3/8
	193	320

NOTE

- Victaulic *VicFlex* Style VB3 Bracket assemblies shall be used only with Style VS1 concealed pendant sprinklers.

4.11 DIMENSIONS

VB4 Sleeve and Skirt Pendant



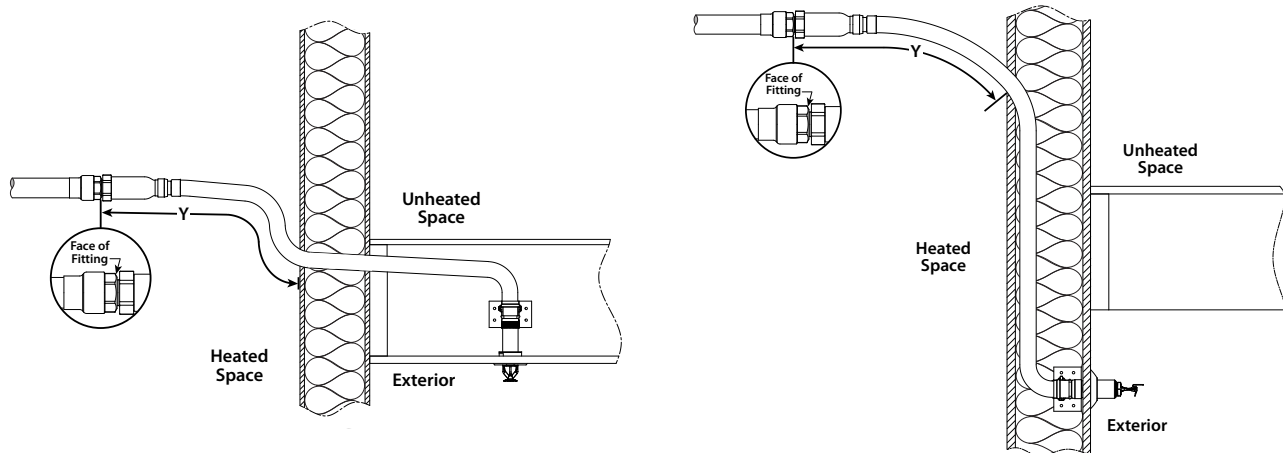
Clearance Chart		
Bend Radius		
	inches mm	inches mm
"R" Minimum Bend Radius	2 51	7 178
"A" Minimum Required Installation Space	5 127	10 254

NOTE

- Victaulic *VicFlex* Style VB2 Bracket assemblies shall be used only with Style VS1 recessed pendent sprinklers.

5.0 PERFORMANCE

Freeze Protection



Ambient Temperature Exposed to Discharge End of Sprinkler °F °C	Exposed Minimum Barrel Length "Y"		
	inches mm		
	40°F/4°C	50°F/10°C	60°F/16°C
40	0	0	0
4	0	0	0
30	0	0	0
-1	0	0	0
20	4	0	0
-7	100	0	0
10	8	1	0
-12	200	25	0
0	12	3	0
-18	300	75	0
-10	14	4	1
-23	350	100	25
-20	14	6	3
-29	350	150	75
-30	16	8	4
-34	400	200	100
-40	18	8	4
-40	450	200	100
-50	20	10	6
-46	500	250	150
-60	20	10	6
-51	500	250	150

NOTE

- Exposed minimum barrel lengths are inclusive up to 30-mph/48-kph wind velocities.

Maximum Allowable Number of Bends

Sprinkler Length inches mm	Maximum Allowable Number of 90° Bends at 2"/51mm Bend Radius for UL Listing	Maximum Allowable Number of 90° Bends at 7"/178mm Bend Radius for FM Approval
38 965	4	2
50 1270	4	3
58 1475	4	4

6.0 NOTIFICATIONS

WARNING



- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Wear safety glasses, hardhat, and foot protection.

- These products shall be used only in fire protection systems that are designed and installed in accordance with current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards, or equivalent standards, and in accordance with applicable building and fire codes. These standards and codes contain important information regarding protection of systems from freezing temperatures, corrosion, mechanical damage, etc.
- The installer shall understand the use of this product and why it was specified for the particular application.
- The installer shall understand common industry safety standards and potential consequences of improper product installation.

WARNING

- It is the responsibility of the system designer to verify suitability of 300-series stainless steel flexible hose for use with the intended fluid media within the piping system and external environments.
- The effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on 300-series stainless steel flexible hose must be evaluated by the material specifier to confirm system life will be acceptable for the intended service.
- It is the responsibility of the owner of a building or their authorized agent to provide the sprinkler system installer with any knowledge that the water supply might be contaminated with or conducive to the development of microbiologically influenced corrosion (MIC), including as required by NFPA 13. Failure to identify adverse water quality issues may affect the VicFlex product and void the manufacturer's warranty.

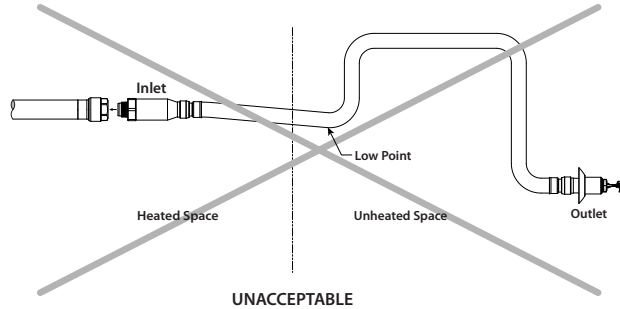
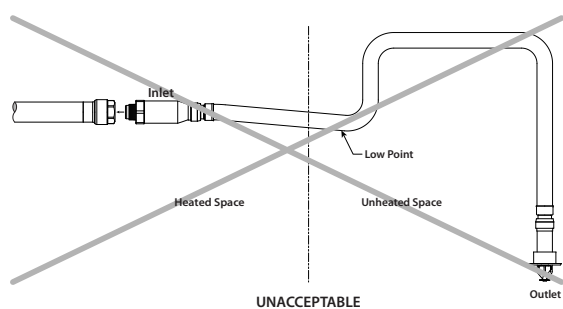
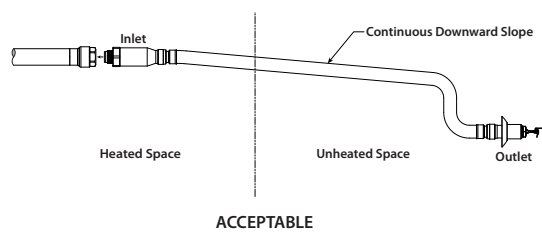
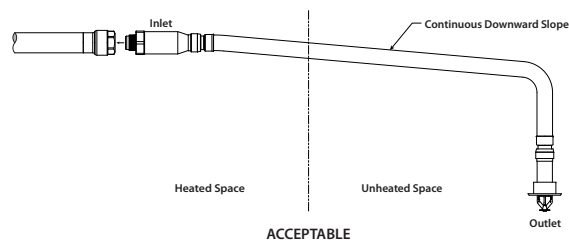
Failure to follow these instructions could cause product failure, resulting in serious personal injury and/or property damage.

DO NOT paint, coat, or firestop the outlet/inlet portion of the Style VS1 Dry Sprinkler. Braided hose and fitting portions of the Style VS1 Dry Sprinkler may be painted or coated, provided that the paint or coating is compatible with stainless steel material. This includes penetration through firestop-filled annular space of a firewall. The firestop material in direct contact with the flexible braided hose will not impede functionality of the Style VS1 Dry Sprinkler, provided that the components are installed in accordance with Victaulic's installation instructions.

6.0 NOTIFICATIONS (CONTINUED)

Important Installation Notes:

1. Shall be installed only in accordance with NFPA 13 Standard for the the Installation of Sprinkler Systems and applicable FM Data Sheets.
2. Install and tighten swivel hex nut at inlet of sprinkler fitting only.
3. Do not remove deflector or inlet end of sprinkler.



6.0 NOTIFICATIONS (CONTINUED)

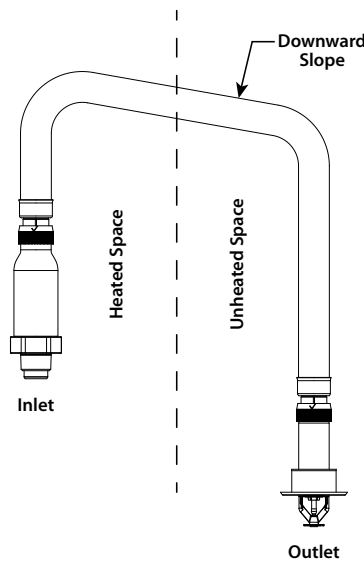
FOR DRY SYSTEMS ONLY:

- The Style VS1 Dry Sprinkler's inlet shall be installed only into the outlet of a fitting (excluding elbows) or welded outlet that meets the dimensional requirements of ANSI B16.3 and ANSI B16.4, Class 125 and Class 150. Use a sample fitting to confirm proper engagement and to verify that there is no interference between the sprinkler and the fitting.

Style VS1 Dry Sprinklers in an unheated space shall be installed with a continuous downward slope along its entire length from the branch line fitting to the sprinkler. No localized low points shall be present along the length of the Style VS1 Dry Sprinkler.

Style VS1 Dry Sprinklers in an unheated space are not permitted to be installed into the top of the branch line piping. Style VS1 Dry Sprinklers shall be installed into the side or from the bottom of the branch line piping.

In a heated space, if a portion of the Style VS1 Dry Sprinkler is installed from the top of a branch line and then extends into an unheated space, it shall be installed with a continuous downward slope along the entire length from the inside wall to the outlet of the sprinkler. No localized low points shall be present along the length of the sprinkler in the unheated space. Refer to the drawing below.



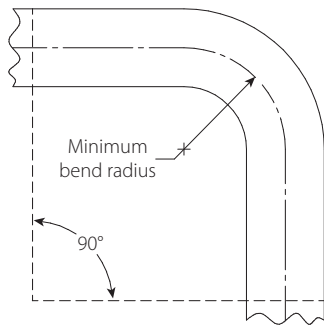
FOR WET SYSTEMS ONLY:

- DO NOT** install Victaulic® VicFlex™ Style VS1 Dry Sprinklers into any threaded elbow, threaded-by-thread coupling, or fitting that interferes with thread penetration. The inlet of the Victaulic® VicFlex™ Style VS1 Dry Sprinkler **SHALL NOT** bottom out in the fitting. Use a sample fitting to confirm proper engagement.
- To ensure unobstructed flow during operation, the Victaulic® VicFlex™ Style VS1 Dry Sprinkler shall be installed into a fitting that will prevent water and debris from accumulating at the dry sprinkler's inlet.
- Verify that the exposed minimum barrel length in the heated space is measured and maintained in accordance with the table on page 1.

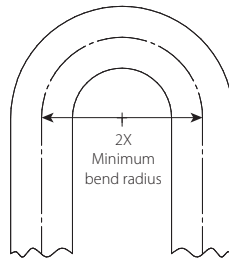
In a heated space, if a portion of the Style VS1 Dry Sprinkler extends into an unheated space, it shall be installed with a continuous downward slope along the entire length from the inside wall to the outlet end of the dry sprinkler. No localized low points shall be present along the length of the sprinkler in the unheated space. Refer to the drawing above.

7.0 REFERENCE MATERIALS

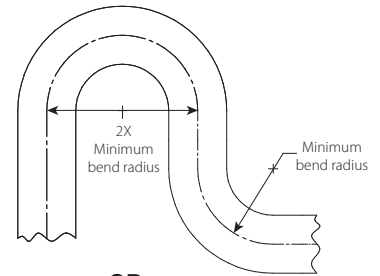
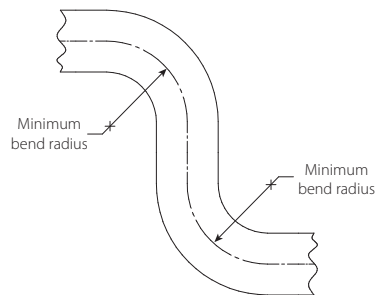
ONE BEND



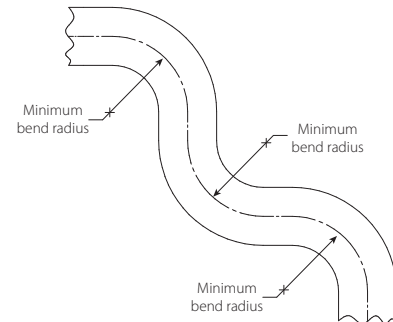
TWO BENDS



OR



OR



NOTE

For out-of-plane (three-dimensional) bends, care must be taken to avoid imparting torsional stress on the sprinkler.

7.0 REFERENCE MATERIALS

Bill To:

Company Name

Address

State/Province

Phone No.

Fax No.

Zip Code/Postal Code

Email

Ship To:

Order No.

Date

Company Name

Address

State/Province

Zip Code/Postal Code

Tag

Quantity (as specified below): If units of different size, type or other option are required, please attach additional form(s) with their specification(s) separately.

VicFlex™ Dry Sprinkler Model VS1

A

-

3F

-

-

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-

-

4

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-

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Class	Style	Thread	Deflector Style	Temperature	Response	K Factor	Finish	Recessed Escutcheon Material	Size Code	Size Inches	Escutcheon Style †
A	3F = V35	3 = 1" NPT 8 = 25 mm BSP	B = Pendent C = Horizontal Sidewall P - Concealed	A = 135°F/57°C C = 155°F/68°C E = 175°F/79°C F = 200°F/93°C J = 286°F/141°C	Q = Quick S = Std.	4 = K5.6	4 = White N = VC-250 ‡	W = White Stainless Steel X = Stainless Steel 0 = Concealed	380 = 38" 500 = 50" 580 = 58"	12 = Recessed 13 = Sleeve and Skirt 15 = Concealed	

‡ VC-250 sprinkler finish sold standard on the VicFlex Dry Sprinkler Model VS1.

7.0 REFERENCE MATERIALS (CONTINUED)

[29.01: Victaulic Terms and Conditions of Sale](#)
[I-VICFLEX.VS1: Victaulic® VicFlex™ Style VS1 Dry Sprinkler Installation Instructions](#)

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

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Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at www.victaulic.com.

Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

Trademarks

Victaulic and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.

Reliable®

Model AAV Automatic Air Vent

cULus Listed,
FM Approved

Features

- Stainless Steel Construction
- 175 psi (12 bar) and 300 psi (20.7 bar) option

Product Description

The Reliable Model AAV Automatic Air Vent is designed to reduce the amount of trapped air in a wet pipe fire sprinkler system. Reducing the amount of air in the system reduces internal corrosion of piping by limiting the supply of oxygen and can also reduce the incidence of false alarms. The Model AAV is designed to automatically vent air from a high point in the system as the piping is filled and will automatically close when water reaches the vent. Air that subsequently migrates to the Model AAV will also be vented. The Model AAV is provided with a ½" NPT inlet for connection to the system, and a ½" NPT outlet connection for routing to drain (if desired).

Installation

The Model AAV shall be installed in accordance with the requirements of NFPA 13 and any applicable local codes or standards. The recommended location is near a high point of the wet pipe system. The Model AAV must be installed in the upright, vertical position on top of the pipe, in a location that does not obstruct the distribution pattern of any fire sprinkler. If desired, a ball valve (not included) may be installed in line with the device to facilitate inspection and servicing. Immediately after filling the wet pipe system, inspect the Model AAV for leaks and proper operation.

Maintenance

The owner is responsible for maintaining all parts of the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a system component out of service may eliminate the fire protection that is provided by the fire protection system.

The Reliable Model AAV Automatic Air Vent shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing, and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. System components shall be tested, operated, cleaned and inspected at least annually and parts replaced as required.

Listings and Approvals

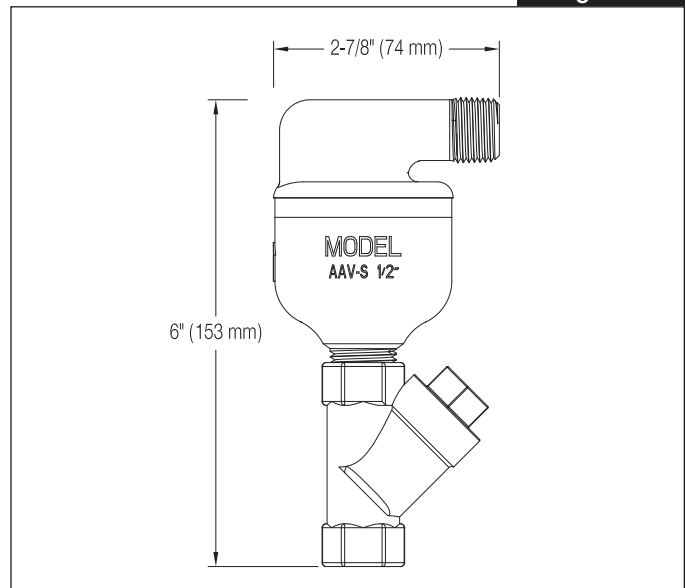
- UL Listed to Subject 2573, Automatic Air Release Valves and Air/Vacuum Valves for Fire Protection Service
- FM Approved to Approval Standard for Air Release Valves, Class 1344



Model AAV Automatic Air Vent

Dimensions

Figure 1



Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Model AAV Automatic Air Vent

- 175 psi (12 bar)
- 300 psi (20.7 bar)

Reliable®

Spare Sprinkler Cabinets

Features

- Red enamel finish
- Constructed of lightweight steel
- Mounting holes provided
- Five models available

Product Description

Reliable Spare Sprinkler Cabinets are designed to meet the requirements of NFPA 13 and NFPA 13R that state: "A supply of at least six spare sprinklers shall be maintained on the premises so that any sprinklers that have operated or been damaged in any way can be promptly replaced." These lightweight steel, red enamel finished cabinets are quickly mounted using the holes provided.

Table 1

Part Number	Capacity	Max. Sprinkler Thread Size (inches)	Size of Cabinet inches (mm)		
			Width	Depth	Height
6803200000	12	1	16-3/4 (425)	4 (101)	14-1/4 (361)
6999991473	3	3/4	7-3/8 (187)	2-3/8 (60)	5-1/4 (133)
6999991470	6	3/4	14-1/4 (361)	2-3/8 (60)	5-1/4 (133)
6999991472	6	1	14-1/4 (361)	3-1/8 (79)	6-1/2 (165)
6999991471	12	3/4	14-1/4 (361)	4 (101)	5-1/4 (133)
6990015802	24	3/4	14-1/4 (361)	4 (101)	8-7/16 (214)
6990015201	36	3/4	12-5/16 (313)	4 (101)	11-3/4 (298)

Installation

Location must be coordinated with, and installation made in accordance with, the requirements of NFPA 13 or NFPA 13R, and all authorities having jurisdiction.

Guarantee

For Reliable Automatic Sprinkler, Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify:

- Part Number



Note: Not all versions of the product are shown.



Specifications subject to change without notice.

Ordering Information			
Nominal Pipe Size		Model	Part Number
2"	DN50	VSR-2	1144402
2 1/2"	DN65	VSR-2 1/2	1144425
3"	DN80	VSR-3	1144403
3 1/2"	-	VSR-3 1/2	1144435
4"	DN100	VSR-4	1144404
5"	-	VSR-5	1144405
6"	DN150	VSR-6	1144406
8"	DN200	VSR-8	1144408

Optional: Cover Tamper Switch Kit, stock no. 0090148

Replaceable Components: Retard/Switch Assembly, stock no. 1029030

UL, CUL and CSFM Listed, FM Approved, LPCB Approved, For CE Marked (EN12259-5) / VdS Approved model use VSR-EU

Service Pressure: 450 PSI (31 BAR) - UL

Flow Sensitivity Range for Signal:

4-10 GPM (15-38 LPM) - UL

Maximum Surge: 18 FPS (5.5 m/s)

Contact Ratings: Two sets of SPDT (Form C)
10.0 Amps at 125/250VAC
2.0 Amps at 30VDC Resistive
10 mAmps min. at 24VDC

Conduit Entrances: Two knockouts provided for 1/2" conduit.
Individual switch compartments suitable for dissimilar voltages.

Environmental Specifications:

- NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL
- Non-corrosive sleeve factory installed in saddle.

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

CAUTION

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

Important: This document contains important information on the installation and operation of the VSR waterflow switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

General Information

The Model VSR is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed for use on a steel pipe; schedules 5 through 40, sizes 2" - 6" and is UL Listed and FM Approved for use on steel pipe; schedules 10 through 40, sizes 2" thru 8" (50 mm thru 200 mm). LPC approved sizes are 2" thru 8" (50 mm thru 200 mm). See Ordering Information chart.

The VSR may also be used as a sectional waterflow detector on large systems. The VSR contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 GPM (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

The VSR switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

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Installation (see Fig. 1)

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they shall be installed on the top side of the pipe where they will be accessible. The device should not be installed within 6" (15 cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain.

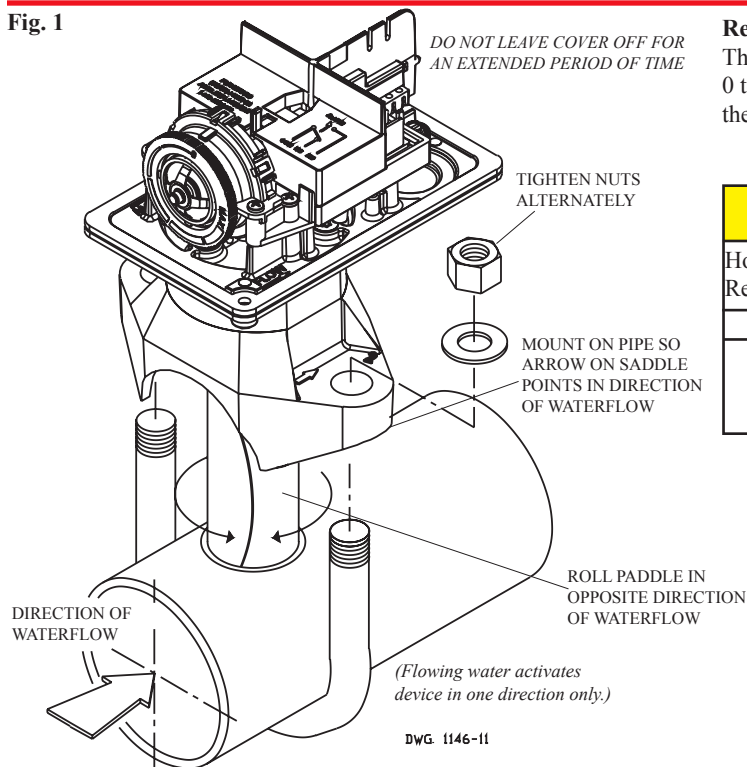
NOTE: Do not leave cover off for an extended period of time.

Drain the system and drill a hole in the pipe using a hole saw in a slow speed drill (see Fig. 1). Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole. Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Take care not to damage the non-corrosive bushing in the saddle. The bushing should fit inside the hole in the pipe. Install the saddle strap and tighten nuts alternately to required torque (see the chart in Fig. 1). The vane must not rub the inside of the pipe or bind in any way.

CAUTION

Do not trim the paddle. Failure to follow these instructions may prevent the device from operating and will void the warranty. Do not obstruct or otherwise prevent the trip stem of the flow switch from moving when water flows as this could damage the flow switch and prevent an alarm. If an alarm is not desired, a qualified technician should disable the alarm system.

Fig. 1

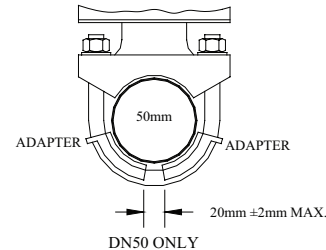


Retard Adjustment

The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms

CAUTION

Hole must be drilled perpendicular to the pipe and vertically centered. Refer to the Compatible Pipe/Installation Requirements chart for size.



USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

DWG# 1146-1F

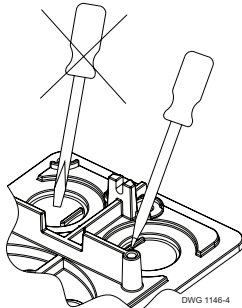
Compatible Pipe/ Installation Requirements

Model	Nominal Pipe Size		Nominal Pipe O.D.		Pipe Wall Thickness										Hole Size		U-Bolt Nuts Torque			
					Lightwall		Schedule 10 (UL)		Schedule 40 (UL)		BS-1387 (LPC)		DN (VDS)							
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	ft-lb	n-m		
VSR-2	2	DN50	2.375	60.3	.065	1.651	0.109	2.77	0.154	3.91	0.142	3.6	0.091	2.3	1.25 ± .125/- .062	33.0 ± 2.0	20	27		
VSR-2 1/2	2.5	-	2.875	73.0	.084	2.134	0.120	3.05	0.203	5.16	-	-	-	-						
VSR-2 1/2	-	DN65	3.000	76.1	-	-	-	-	-	-	0.142	3.6	0.102	2.6						
VSR-3	3	DN80	3.500	88.9	.083	2.108	0.120	3.05	0.216	5.49	0.157	4.0	0.114	2.9	2.00 ± .125	50.8 ± 2.0			20	27
VSR-3 1/2	3.5	-	4.000	101.6	-	-	0.120	3.05	0.226	5.74	-	-	-	-						
VSR-4	4	DN100	4.500	114.3	.084	2.134	0.120	3.05	0.237	6.02	0.177	4.5	0.126	3.2						
VSR-5	5	-	5.563	141.3	-	-	0.134	3.40	0.258	6.55	-	-	-	-						
VSR-6	6	DN150	6.625	168.3	.115	2.921	0.134	3.40	0.280	7.11	0.197	5.0	0.157	4.0						
VSR-8	8	DN200	8.625	219.1	-	-	0.148	3.76	0.322	8.18	0.248	6.3	0.177	4.5						

NOTE: For copper or plastic pipe use Model VSR-CF.

Fig. 2

To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



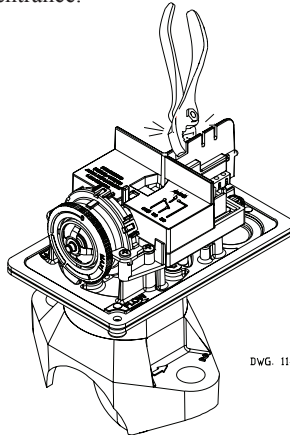
DWG. 1146-4

NOTICE

Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

Fig. 3

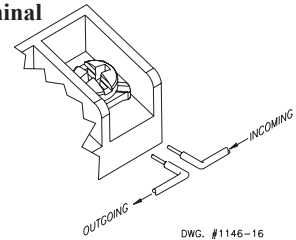
Break out thin section of cover when wiring both switches from one conduit entrance.



DWG. 1146-13

Fig. 4

Switch Terminal Connections Clamping Plate Terminal



DWG. #1146-16

WARNING

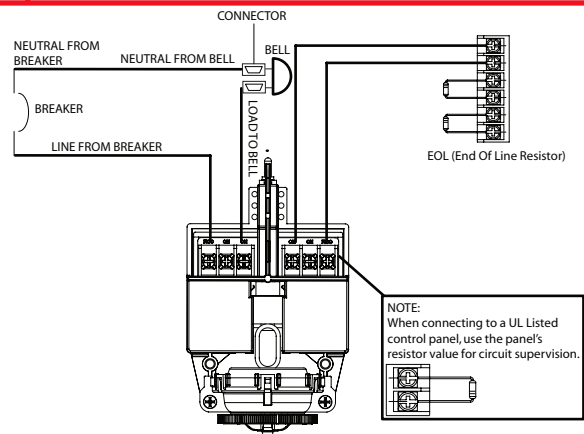
An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life.

Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

Fig. 5 Typical Electrical Connections

Notes:

1. The Model VSR has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 4).



NOTE:
When connecting to a UL Listed control panel, use the panel's resistor value for circuit supervision.

Testing

The frequency of inspection and testing for the Model VSR and its associated protective monitoring system shall be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

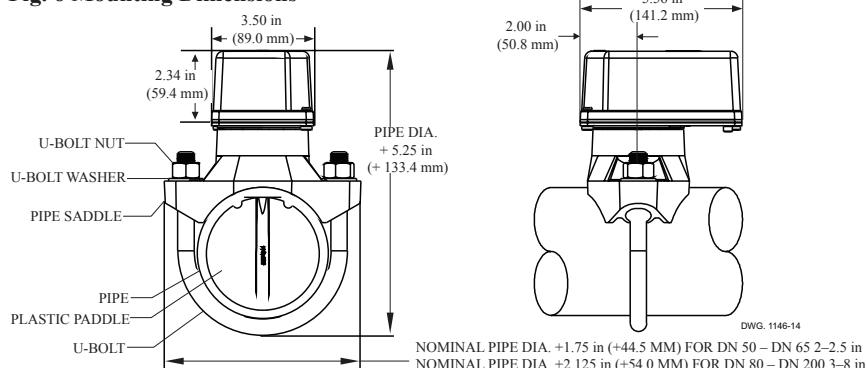
If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR is not recommended or advisable.

A minimum flow of 10 GPM (38 LPM) is required to activate this device.

NOTICE

Advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

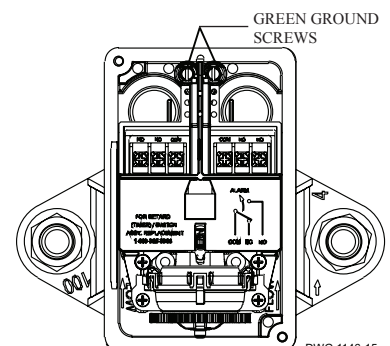
Fig. 6 Mounting Dimensions



DWG. 1146-14

NOMINAL PIPE DIA. +1.75 in (+44.5 MM) FOR DN 50 - DN 65 2-2.5 in
NOMINAL PIPE DIA. +2.125 in (+54.0 MM) FOR DN 80 - DN 200 3-8 in

Fig. 7



DWG. 1146-15

Maintenance

Inspect detectors monthly. If leaks are found, replace the detector. The VSR waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030 (see Fig. 8). There is no maintenance required, only periodic testing and inspection.

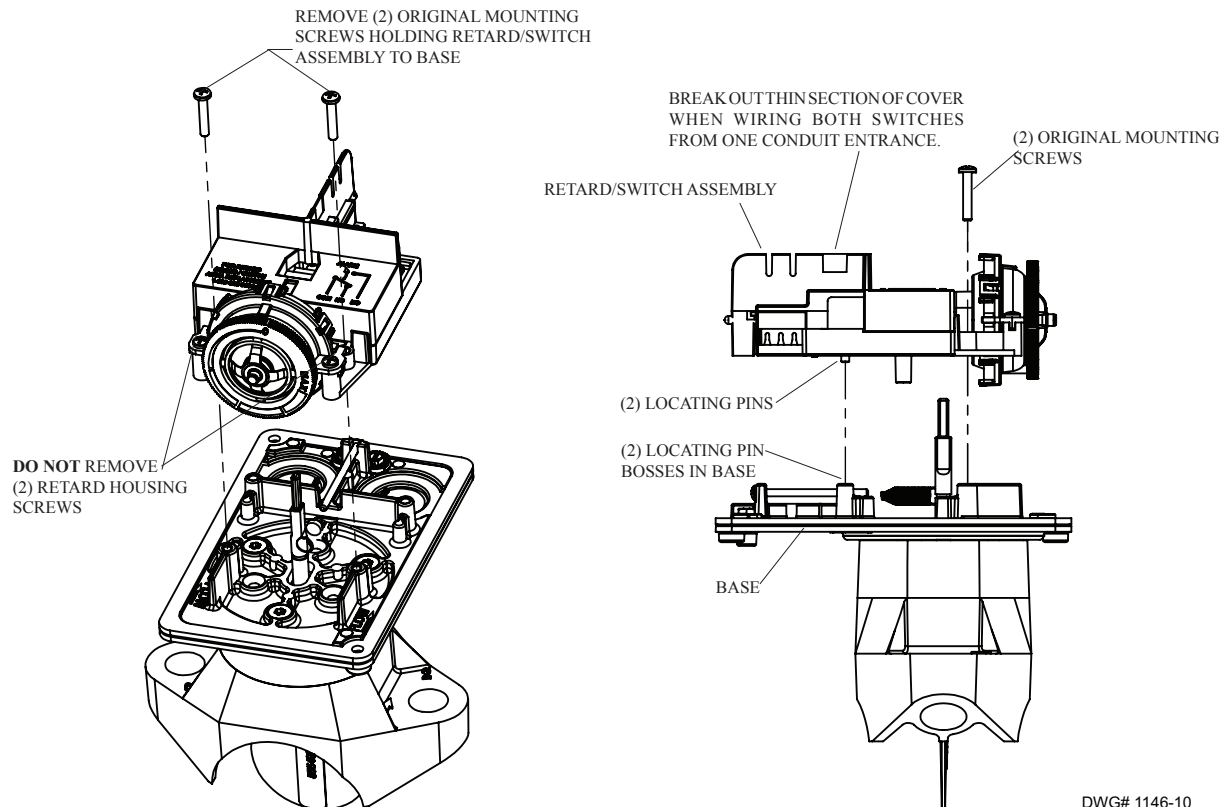
Retard/Switch Assembly Replacement (See Fig. 8)

NOTICE

The Retard/Switch Assembly is field-replaceable without draining the system or removing the waterflow switch from the pipe.

1. Make sure the fire alarm zone or circuit connected to the waterflow switch is bypassed or otherwise taken out of service.
2. Disconnect the power source for local bell (if applicable).
3. Identify and remove all wires from the waterflow switch.
4. Remove the (2) mounting screws holding retard/switch assembly to the base. **Do not** remove the (2) retard housing screws.
5. Remove the retard assembly by lifting it straight up over the tripstem.
6. Install the new retard assembly. Make sure the locating pins on the retard/switch assembly fit into the locating pin bosses on the base.
7. Re-install the (2) original mounting screws.
8. Reconnect all wires. Perform a flow test and place the system back in service.

Fig. 8



Removal of Waterflow Switch

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Loosen nuts and remove U-bolts.
- Gently lift the saddle far enough to get your fingers under it. With your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector saddle.
- Lift detector clear of pipe.



EPS10-1 and EPS10-2 Alarm Pressure Switches

System Sensor EPS10 Series switches are designed for use in wet, dry, deluge, and pre-action automatic sprinkler systems to indicate a discharge from a sprinkler.



Features

- Sensitivity adjustment wheel, no special tools required
- Reinforced diaphragm resists pressure spikes
- Two conduit entrances
- Both one- and two-switch models available

The EPS10-1 has a single SPDT switch while the EPS10-2 model contains two SPDT switches. The EPS10 Series features field adjustable pressure sensitivity to provide an alarm response between 4 and 20 psi. It is factory set to respond at 4 – 8 psi on rising or falling pressure. The pressure adjustment wheel requires no special tools and does not affect switch synchronization on the EPS10-2. The EPS10 Series switches are NEMA 4 rated.

Agency Listings



Specifications, EPS10-1 and EPS10-2

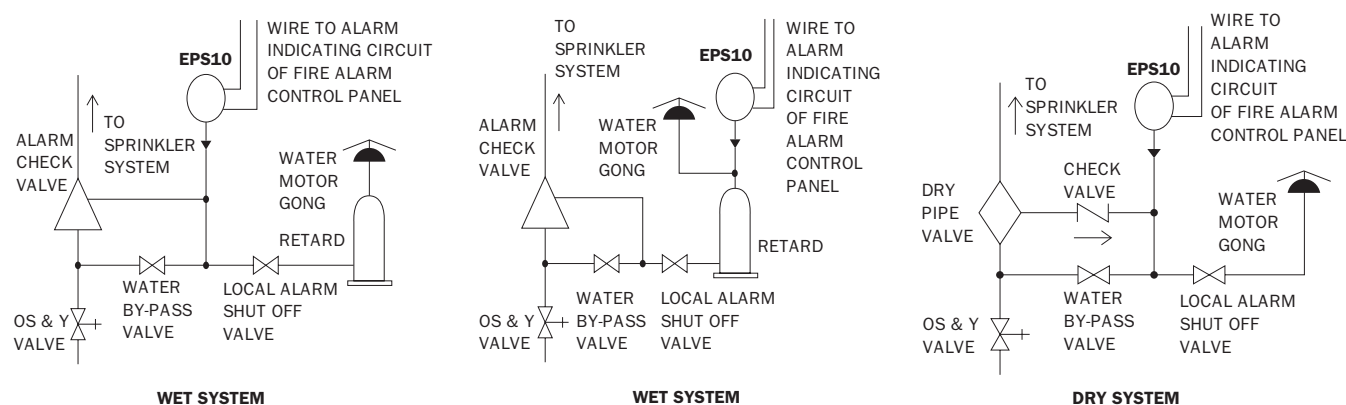
Architectural/Engineering Specifications EPS10-1 (SPDT), EPS10-2 (2/SPDT)

Model shall be an EPS10-1 or EPS10-2 pressure type waterflow switch as manufactured by System Sensor of St. Charles, IL. They shall be installed on the sprinkler system with connection as shown on the drawings and/or as specified herein. Pressure switches shall be of the bellows-activated type. Switches shall have a maximum service pressure rating of 300 psi and shall be factory adjusted to operate at a pressure of 4 – 8 psi. There shall be one (1) or two (2) SPDT contacts rated at 10.0 Amp @ 125/250 VAC and 2.5 Amp @ 6/12/24 VDC. The contractor shall furnish and install, where indicated on the plans, pressure switches according to appropriate NFPA standards. Switches shall be provided with a ½" NPT male pressure connection to be connected to the alarm check valve of a "wet" sprinkler system, into the intermediate chamber of a "dry" system, or to a pre-action or deluge valve. They shall be activated by any flow of water equal to or in excess of the discharge from one sprinkler head. Switches shall provide 1 knockout type and 1 open hole for ½" conduit fitting attachment and a ground screw provision for electrical grounding. The switch enclosure shall be weatherproof and carry a UL 4x/NEMA 4 rating when used with proper electrical fittings and conduit. The cover shall incorporate tamper-resistant screws. The unit shall be listed by Underwriters Laboratories, Inc. and approved by Factory Mutual.

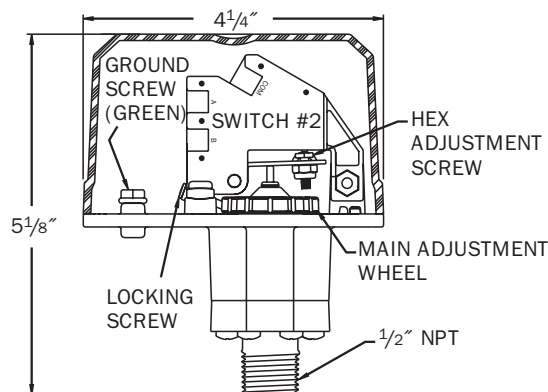
Specifications, EPS10-1 and EPS10-2 (continued)

Physical/Operating Specifications			
Maximum Operating Pressure	300 psi	Operating Temperature Range	Indoor or outdoor use: -40°F to 160°F (-40°C to 71°C)
Maximum Adjustment Pressure Range	4 to 20 psi	Cover Tamper Switch	UL Models: Optional P/N 546-8000 ULC Models: Factory Installed
Differential	Approximately 3 psi throughout range	Enclosure	Rated UL 4x, NEMA 4 for indoor or outdoor use
Factory Setting	Operates at rising pressure 4 to 8 psi	Shipping Weight	1.2 lbs. (.54 Kg)
Switch Contact Ratings	EPS10-1: One set SPDT (Form C) EPS10-2: Two sets SPDT (Form C) 10.0 A, ½ HP @ 125/250 VAC 2.5 A @ 6/12/24 VDC	Service Use	Automatic Sprinkler: NFPA 13 One or Two Family Dwelling: NFPA 13D Residential Occupancies up to 4 Stories: NFPA 13R National Fire Alarm Code: NFPA 72
Pressure Connection	½" NPT male glass reinforced nylon	Warranty	3 years
Dimensions	5.12" H × 3.325" W × 4.250" L (13.0 cm × 8.4 cm × 10.8 cm)		

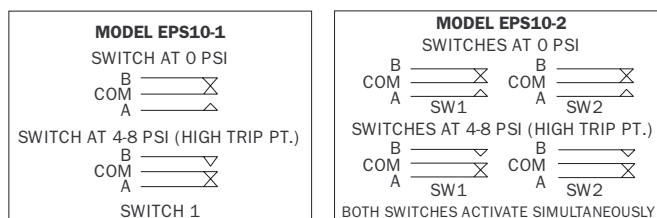
Typical Sprinkler Applications



Pressure Switch Basic Dimensions



Electrical Connections



Ordering Information

Part No.	Description
EPS10-1	Alarm Waterflow Pressure Switch, One SPDT, 4-20 PSI
EPS10-2	Alarm Waterflow Pressure Switch, Two SPDT, 4-20 PSI
EPSA10-1	ULC/Canadian Version
EPSA10-2	ULC/Canadian Version
Replacement Parts	
S07-66-02	Replacement Tamper Screws for Cover of EPS
WFDW	Replacement Tamper Proof Wrench for Cover of EPS
546-8000	Cover Tamper Switch for EPS Series



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WFD51702 • 12/14



EPS40-1 and EPS40-2 Supervisory Pressure Switches

System Sensor EPS40 Series switches are designed for use in dry pipe systems or pressure tanks and water pressure supplies of automatic water control valves.



Features

- Sensitivity adjustment wheel, no special tools required
- Reinforced diaphragm resists pressure spikes
- Two conduit entrances
- Both one- and two-switch models available

Agency Listings



The EPS40-1 has a single SPDT switch while the EPS40-2 model contains two SPDT switches. The EPS40 Series features field adjustable pressure sensitivity to provide an alarm response between 10 and 100 psi. All models are factory set for use in a nominal 40 psi system. The EPS40-1 is factory set to respond at 30 psi at decreasing pressure while the EPS40-2 is factory set to respond at 50 psi on rising pressure and 30 psi at decreasing pressure. The pressure adjustment wheel requires no special tools and does not affect switch synchronization on the EPS40-2. The EPS40-1 and EPS40-2 supervisory pressure switches are NEMA 4 rated.

Specifications, EPS40-1 and EPS40-2

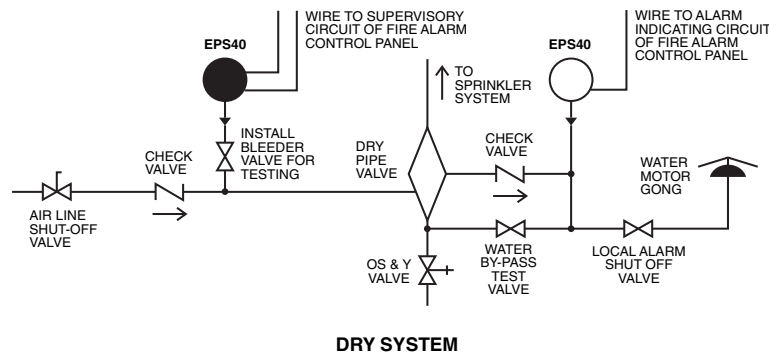
Architectural/Engineering Specifications EPS40-1 (SPDT), EPS40-2 (2/SPDT)

Model shall be an EPS40-1 or EPS40-2 pressure type waterflow switch as manufactured by System Sensor of St. Charles, IL. They shall be installed on the sprinkler system with connection as shown on the drawings and/or as specified herein. Pressure switches shall be of the bellows-activated type. Switches shall have a maximum service pressure rating of 300 psi and shall be adjustable from 10 – 100 psi. There shall be one (1) or two (2) SPDT contacts rated at 10.0 Amp @ 125/250 VAC and 2.5 Amp @ 6/12/24 VDC. The contractor shall furnish and install, where indicated on the plans, pressure switches according to appropriate NFPA standards. Switches shall be provided with a 1/2" NPT male pressure connection to be connected into the air supply line on the system side of any shut-off valve. Switches shall provide 1 knockout type and 1 open hole for 1/2" conduit fitting attachment and a ground screw provision for electrical grounding. The switch enclosure shall be weatherproof and carry a UL 4x/NEMA 4 rating when used with proper electrical fittings and conduit. The cover shall incorporate tamper-resistant screws. The unit shall be listed by Underwriters Laboratories, Inc., the California State Fire Marshal, MEA, CSFM, LPCB, VdS and approved by Factory Mutual.

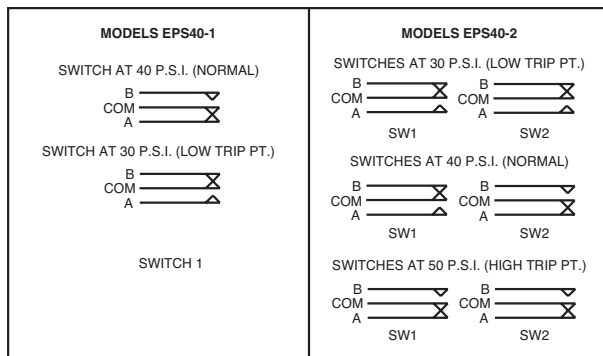
Specifications, EPS40-1 and EPS40-2 (continued)

Physical/Operating Specifications			
Maximum Operating Pressure	300 psi	Operating Temperature Range	Indoor or outdoor use: -40°F to 160°F (-40°C to 71°C)
Maximum Adjustment Pressure Range	10 to 100 psi	Cover Tamper Switch	UL Models: Optional P/N 546-8000 ULC Models: Factory Installed
Differential	Approximately 3 psi @ 10 psi, 6 psi @ 100 psi	Enclosure	Rated UL 4x, NEMA 4 for indoor or outdoor use
Factory Setting	EPS40-1 operates at decreasing pressure at 30 psi EPS40-2 operates at increasing pressure at 50 psi and decreasing pressure at 30 psi	Shipping Weight	1.2 lbs. (.54 Kg)
Switch Contact Ratings	EPS10-1: One set SPDT (Form C) EPS10-2: Two sets SPDT (Form C) 10.0 A, ½ HP @ 125/250 VAC 2.5 A @ 6/12/24 VDC	Service Use	Automatic Sprinkler: NFPA 13 One or Two Family Dwelling: NFPA 13D Residential Occupancies up to 4 Stories: NFPA 13R National Fire Alarm Code: NFPA 72
Pressure Connection	½" NPT male	Warranty	3 years
Dimensions	5.12" H x 3.325" W x 4.250" L (13.0 cm x 8.4 cm x 10.8 cm)		

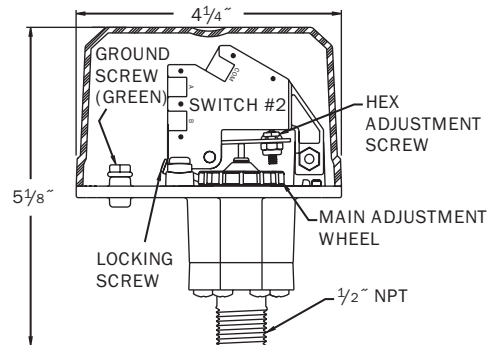
Typical Sprinkler Applications



Electrical Connections



Pressure Switch Basic Dimensions



Ordering Information

Part No.	Description
EPS40-1	Low Pressure Supervisory Switch, One SPDT, 10-100 PSI
EPS40-2	High/Low Pressure Supervisory Switch, Two SPDT, 10-100 PSI
EPSA40-1	Low Pressure Supervisory Switch, One SPDT, 10-100 PSI (ULC Model)
EPSA40-2	High/Low Pressure Supervisory Switch, Two SPDT, 10-100 PSI (ULC Model)
Replacement Parts	
S07-66-XX	Replacement Tamper Screws for Cover of EPS
WFDW	Replacement Tamper Proof Wrench for Cover of EPS
546-8000	Cover Tamper Switch for EPS Series



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for current product information, including the latest version of this data sheet.
WFDS51801 • 5/14



OSY2 Supervisory Switch

The System Sensor OSY2 is used to monitor the open position of an Outside Screw and Yoke (OS&Y) type gate valve.



Features

- NEMA 3R-rated enclosure
- User-friendly mounting bracket fits newer valve yokes
- Single side conduit entry does not require right angle fittings
- Adjustable length actuator eliminates the need for cutting the shaft
- Accommodates up to 12 AWG wire
- Three position switch monitors vandal and valve close signals
- Two SPDT contacts are enclosed in a durable terminal block for added strength
- 100 percent synchronization activates both alarm panel and local bell simultaneously

Robust Construction. The OSY2 consists of a rugged housing, intended for indoor and outdoor use. When installed with the actuator in the vertical position, the OSY2 is NEMA 3R rated per UL.

Application Flexibility. The OSY2 features a user-friendly mounting bracket and adjustable shaft to permit mounting to most OS&Y valves, ranging in size from 1" to 12". Its right angle design and wide bracket span provides maximum clearance for valve components, to accommodate troublesome valves. Removing the OSY2's gate valve bracket allows the unit to monitor side-bracket-style pressure reducing valves.

Simplified Operation. Installation is made easier with the OSY2's single side conduit entrance. By providing a direct conduit pathway to the electrical source, right angle fittings are not required. Installation is further simplified by the OSY2's adjustable length actuator, which eliminates the need for cutting the shaft.

Reliable Performance. The OSY2 is equipped with tamper-resistant cover screws to prevent unauthorized entry. Inside, two sets of SPDT (Form C) synchronized switches are enclosed in a durable terminal block to assure reliable performance.

Agency Listings



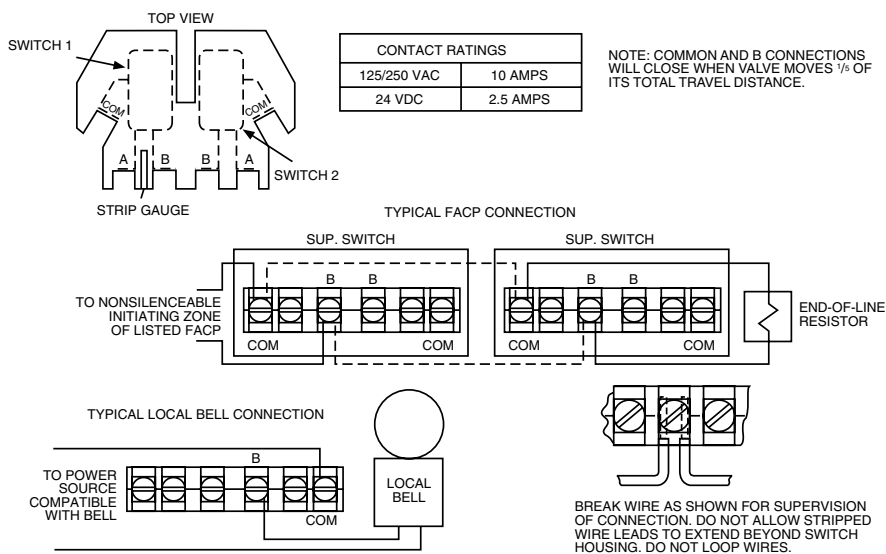
OSY2 Specifications

Architectural/Engineering Specifications

Model shall be model number OSY2 supervisory switch as manufactured by System Sensor. OSY2 shall be installed on each valve as designated on the drawings and/or as specified herein. Switches shall be mounted so as not to interfere with the normal operation of the valve and shall be adjusted to operate within two revolutions of the valve control or when the stem has moved no more than one-fifth of the distance from its normal position. The mechanism shall be contained in a weatherproof die cast metal housing that provides a side entrance for 1/2" conduit and incorporates the necessary facilities for attachment to the valve. A grounding provision is provided. The switch assembly shall include two switches each with a rated capacity of 10 Amp @ 125/250VAC and 2.5 Amp @ 24VDC. The cover shall contain tamper-resistant screws for which a security wrench will be provided with each switch. The OSY2 shall be Underwriters Laboratories listed for indoor or outdoor use. The OSY2 shall be Factory Mutual, CSFM, and MEA approved.

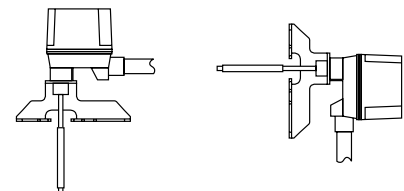
Physical Specifications		Operating Specifications	
Overall Switch Dimensions	5 3/4"H x 3 1/2"W x 3 1/4"D (14.6cm x 8.9cm x 8.2cm)	Contact Ratings	Two sets of SPDT (Form C) 10.0 A @ 125/250VAC; 2.5 @ 6/12/24VDC
Shipping Weight	2.8 lbs. (1.3 kg)	Enclosure Rating	UL indoor/outdoor NEMA 3R when mounted with the actuator vertical
Operating Temperature Range	32°F to 120°F (0°C to 49°C) NOTE: The OSY2 will operate from -40°F to 120°F (-40°C to 49°C); however UL does not test control valve supervisory switches below 32°F (0°C).	Cover Tamper Switch	Standard with ULC model Optional for UL model, part no. 546-7000
Maximum Stem Extension	2 5/8" (6.7cm)	Service Use	Automatic Sprinkler: NFPA 13 One or Two Family Dwelling: NFPA 13D Residential Occupancies up to 4 stories: NFPA 13R National Fire Alarm code: NFPA 72
Bracket Span	1/4"H x 6 3/4"W x 1"D (5.7cm x 17.1cm x 2.5cm)	Warranty	3 years
Conduit Entrances	One single side open for 1/2" conduit	U.S. Patent Nos.	5,478,038; 5,213,205

Electrical Connections for OSY2



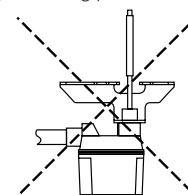
OSY2 Mounting

The following are examples of acceptable mounting positions:



Actuator Vertical (Down) Actuator Horizontal

The following mounting position is not acceptable:



Actuator Vertical (Pointing Up)

Ordering Information

Part No.	Description		
OSY2	Outside Screw and Yoke valve supervisory switch		
OSY2A	Outside Screw and Yoke valve supervisory switch (ULC model)		
Accessories			
OSYRK	Replacement hardware kit (wrenches, screw pack and J-hooks)	WFDW	Replacement tamper-proof wrench for cover
546-7000	Cover tamper switch kit	HEXW	Replacement hex wrench
S07-66-XX	Tamper screws for cover		



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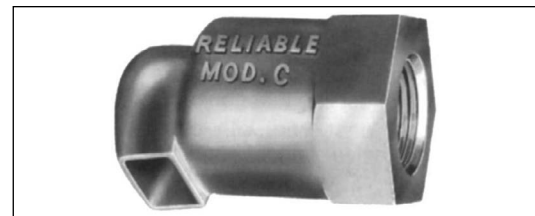
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A05-0196-010 • 1/09 • #1960



Ball Drip
Sight Drain
Drum Drip
Control Valve Seal
Fill Cup
Inspectors Test Connections
Pressure Gauges

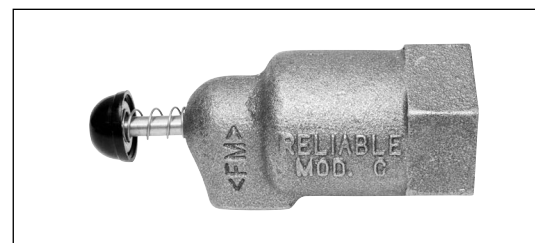
Model C — Automatic Ball Drip

An automatic drain valve horizontally installed at the low point in the fire department connection piping of automatic sprinkler systems. Water pressure from a fire department pumper automatically closes this valve. It automatically re-opens when pressure ceases, permitting this piping to drain and thereby preventing freezing. Made of bronze and available with $\frac{3}{4}$ " (R $\frac{3}{4}$) or $\frac{1}{2}$ " NPT (R $\frac{1}{2}$) female inlet connection. FM approved. Length: $2\frac{9}{16}$ ". Maximum working pressure: 175psi (12bar).



Model C - Mechanical Ball Drip Valve

The Model C Mechanical Ball Drip Valve is a listed trim component used in the alarm line of Reliable Model A & D dry valves, Model DDX deluge and DDX preaction valves. The mechanical ball drip valve is designed to close upon activation of the dry or deluge valve when sufficient flow is present in the alarm line. In the normal or open position the mechanical ball drip allows for the relieving of pressure in the alarm chamber of the valve. After valve activation, push in the plunger of the mechanical ball drip valve to manually release the water pressure and to drain the alarm line of the valve. Made of bronze and available with $\frac{1}{2}$ " NPT (R $\frac{1}{2}$) female inlet connection. FM approved. Length: $3\frac{1}{2}$ ". Maximum working pressure: 175 psi (12 bar).



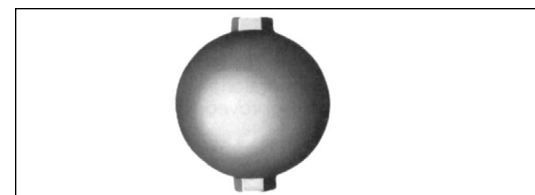
Model C — 2" (50 mm) Sight Drain

Designed for installation in drain lines of sprinkler systems that connect with closed drains. Made of cast iron with clear plastic tube. Has 2" NPT (50mm) female pipe connection. Length: 6" (152mm).



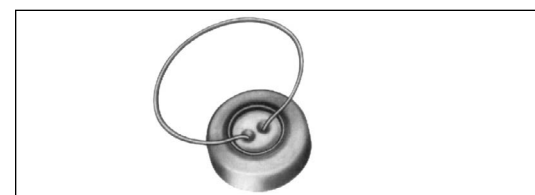
Model B — Drum Drip

Permits draining the low points of dry pipe systems without tripping the system. Made of cast iron with $\frac{3}{4}$ " NPT (R $\frac{3}{4}$) female pipe connection at each end. Diameter: $6\frac{1}{2}$ " (165mm). Length: $7\frac{3}{4}$ " (197mm).



Model A — Control Valve Seal

Made of tin-plated steel. Two piece, snap type construction. Outer piece holes are sized for use with standard sealing wire (wire not included). Diameter: $\frac{7}{8}$ " (22mm).



Model A — Fill Cup

Made of cast iron. Available with $\frac{1}{2}$ " or $\frac{3}{4}$ " NPT (R $\frac{1}{2}$ or R $\frac{3}{4}$) female pipe connection. Cup Diameter: $3\frac{3}{4}$ " (95mm). Length: $2\frac{1}{4}$ " (57mm).



Inspectors Test Connections

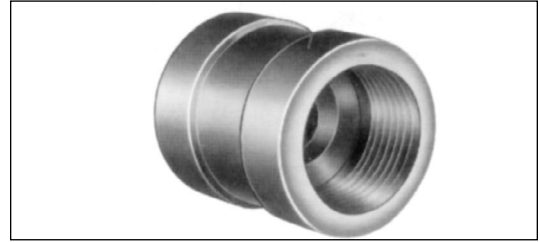
Installed in the test line of sprinkler systems to test alarms by simulating the flow of water through a sprinkler.

- **Model A — Blind Test Connection**

Designed for installation in test lines of sprinkler systems that connect to open drains. Made of bronze with 1" NPT female pipe connections. Orifice gives flow equivalent to one nominal 1/2" (15mm) orifice sprinkler.

Length: 1 7/8" (48mm).

Maximum working pressure: 175psi (12bar).

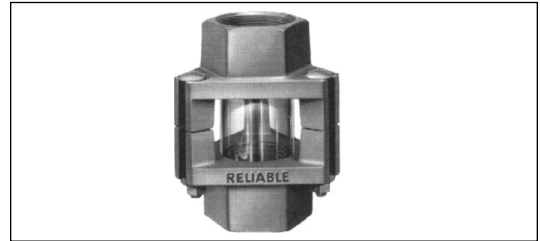


- **Model B — Sight Test Connection**

Designed for installation on the drain side of the test valve in a test line that connects to a closed drain.

Made of cast iron with clear tube. Smooth bore non-corrosive orifice gives flow equivalent to one nominal 1/2" (15mm) orifice sprinkler. Has 1" NPT pipe connections.

Length: 5 1/16" (129mm).



- **Model UA — Water Pressure Gauge**

Range 0 to 300psi in 5psi increments, and 0 to 2000 kPa in 50kPa increments. 1/4" NPT (R 1/4) male pipe connection. Case: 3 3/4" diameter (95mm). Height: 4 3/4" (121mm). Also available (not shown) with a range of 0 to 600psi (4000kPa) with 10psi (100kPa) increments.

Accuracy: ANSI B40.1 Grade B (3–2–3%)

Underwriters Laboratories Listed, UL file EX26795

Factory Mutual Approved



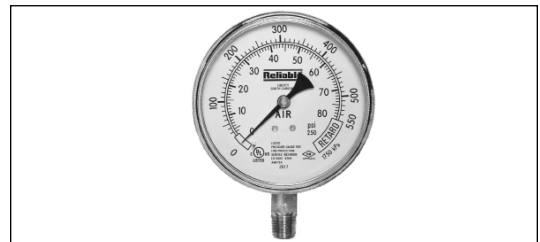
- **Model UA — Air Pressure Gauge**

Range 0 to 80psi in 1psi increments, and 0 to 550kPa in 10kPa increments. Retard to 250psi and 1750kPa. 1/4" NPT (R 1/4) male pipe connection. Case: 3 3/4" diameter (95mm). Height: 4 3/4" (121mm).

Accuracy: ANSI B40.1 Grade B (3–2–3%)

Underwriters Laboratories Listed, UL file EX26795

Factory Mutual Approved



- **Low Air Pressure Diaphragm Gauge**

Range 0 to 60 oz. in 1 oz. increments, and 1/4" NPT (R 1/4) male pipe connection. Case: 1/2" diameter (63.5mm). Height: 3 1/2" (88.9mm).



The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Products manufactured and distributed by Reliable have been protecting life and property for almost 100 years.

Manufactured by

Reliable®

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P/N 9999970037



Model TD Test and Drain Valve

300 psi (20.7 bar) pressure rated

cULus Listed, FM Approved

Product Description

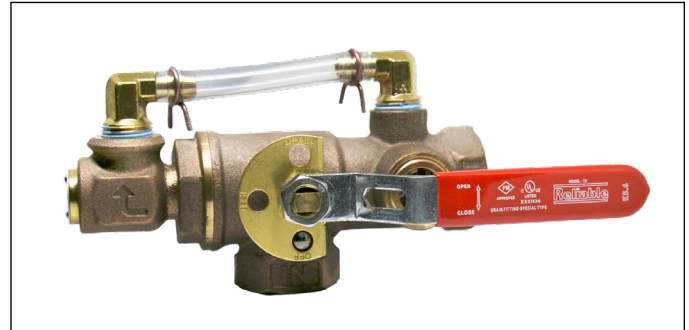
The Reliable Model TD Test and Drain Valve is a single-handle, tri-position ball valve allowing both testing of the waterflow alarm and draining of a wet-pipe fire protection system. The valves are cULus Listed and FM Approved. The Model TD Valve has a pressure rating of 300 psi (20.7 bar), and is factory tested at 600 psi (41.1 bar).

Model TD Test and Drain Valves have a restricted orifice with the available K-factors listed in Table A. Nominal valve sizes are 1", 1-1/4", and 2" with either NPT or ISO7-1 female threaded connections. 1-1/4" and 2" versions are also available with ANSI/AWWA C606 grooved inlet connections. Table C identifies the materials used in the Model TD valve.

The Model TD valve is available with an optional relief valve kit. The relief valve kit includes a Reliable Model A relief valve along with a hose and all fittings needed to connect the relief valve to the Model TD valve. The Model A relief valve is UL Listed and FM Approved for use on fire protection systems. The Model A relief valve is available with a nominal pressure rating of 175 psi (12 bar), 185 psi (13 bar), 210 psi (14 bar), 260 psi (18 bar), or 310 psi (21 bar). See Reliable Technical Bulletin 257 for additional information on the Model A relief valve. An optional locking handle kit is available for use with customer supplied padlocks.

Installation

Connect the "IN" port of the Model TD valve to the wet-pipe sprinkler system. Connect the "OUT" port to a properly sized drain. The optional relief valve kit is installed as shown in the photographs in this bulletin after removing the plugs in the cap and body of the Model TD valve. The relief valve is commonly installed after hydrostatic testing.



Model TD Test & Drain Valve 1" with optional relief valve kit; threaded inlet



Model TD Test & Drain Valve 2" with optional relief valve kit; grooved inlet

Operation

To run a test, rotate the handle counter-clockwise until the "Test" position is aligned with the ball detent. Note that rotating the valve to the "test" position is intended to operate the sprinkler system's waterflow alarm. To drain, rotate the handle further until the "Drain" position is aligned with the ball detent. Return the handle to the "Off" position when all testing and draining functions have been completed.

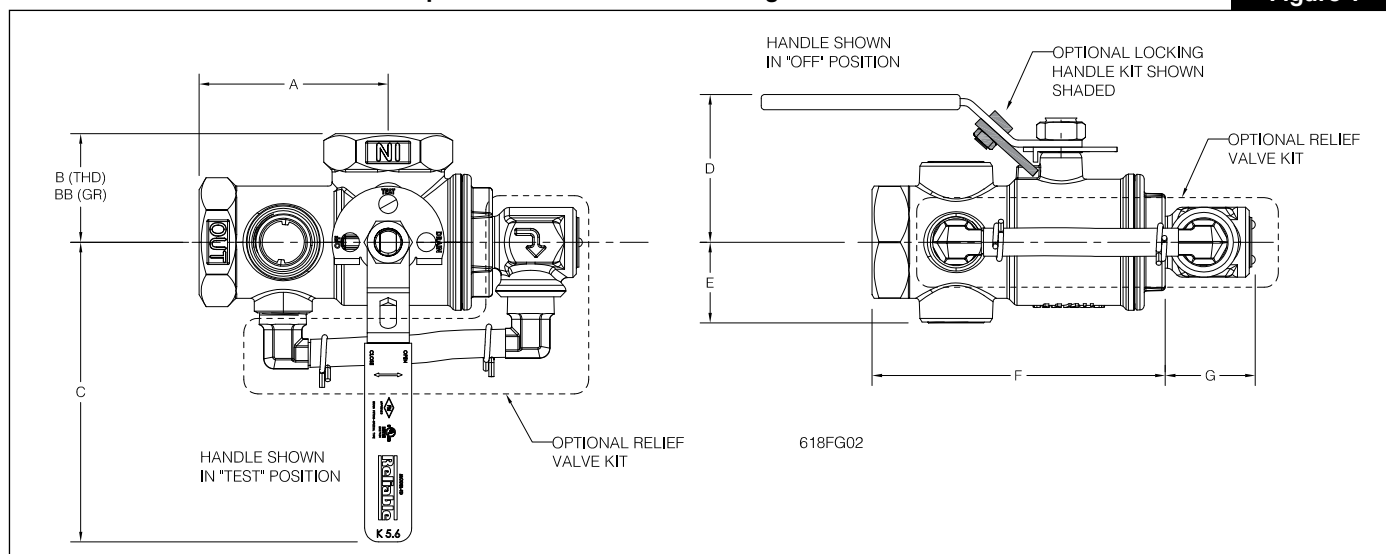
Table A

Nominal Valve Size	Available K-factors* gpm/psi ^{1/2} (L/min/bar ^{1/2})	Inlet Connection	Outlet Connection
1"	2.8 (40), 4.2 (60), 5.6 (80)	NPT, ISO7-1 Threaded	NPT, ISO7-1 Threaded
1 1/4"	2.8 (40), 4.2 (60), 5.6 (80), 8.0 (115), 11.2 (160)	NPT, ISO7-1 Threaded	
2"	2.8 (40), 4.2 (60), 5.6 (80), 8.0 (115), 11.2 (160), 16.8 (240)	C606 Grooved	

***Note:** Valve K-factor must be equal to or less than the K-factor of the smallest K-factor sprinkler installed on the sprinkler system. For sprinkler systems where the smallest K-factor sprinkler on the system is greater than the largest available valve K-factor, use any valve K-factor that will provide a min. flow of 10 gpm (38 lpm) as required to operate a UL Listed Waterflow Switch.

Model TD Test and Drain Valve with optional relief valve kit & locking handle kit

Figure 1



Component Dimensions (refer to Figure 1)

Table B

Valve Size	A	B	BB	C	D	E	F	G
Model TD Test and Drain 1" Valve	3-3/8" (86mm)	1-11/16" (43mm)	N/A	5-1/2" (140mm)	2-9/16" (65mm)	1-7/16" (37mm)	5-1/4" (133mm)	1-3/4" (44mm)
Model TD Test and Drain 1-1/4" Valve	3-3/8" (86mm)	1-15/16" (49mm)	2-5/16" (59mm)	5-1/2" (140mm)	2-5/8" (67mm)	1-7/16" (37mm)	5-1/4" (133mm)	1-3/4" (44mm)
Model TD Test and Drain 2" Valve	4-1/16" (103mm)	2-7/8" (73mm)	2-7/8" (73mm)	7-5/8" (194mm)	3-1/2" (89mm)	1-15/16" (49mm)	6-3/4" (171mm)	1-3/4" (44mm)

Materials

Table C

Component	Material
Body	Brass alloy
Stem seal	Nitrile
End cap seal	Nitrile
Stem washer	PTFE
Nest	PTFE
Stem	Brass alloy
Ball	Chrome plated brass alloy
End cap	Brass alloy
Spring detent	Stainless steel
Ball detent	Stainless steel
Plate washer	Delrin
Function plate	Brass alloy
Handle	Plated carbon steel
Nut, handle	Stainless steel
Sight glass seal	EPDM
Sight glass	Glass
Sight glass gasket	PTFE
Sight glass retainer	Brass alloy
Pipe plug	Brass alloy

Maintenance

Reliable Model TD valve should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Model TD Test and Drain Valve

Valve Size (1", 1-1/4", 2")

K-factor (See Table A)

Inlet/Outlet Connection (Thd x Thd [all sizes], Gr x Thd [1-1/4" & 2" sizes only])

Threads (NPT, ISO7-1)

Optional Accessories:

Relief Valve Kit [175 psi (12 bar), 185 psi (13 bar), 210 psi (14 bar), 260 psi (18 bar), or 310 psi (21 bar)]

Locking Handle Kit

1" & 1-1/4" Valve size P/N 6990021646

2" Valve size P/N 6990021647



Model A Relief Valve

UL Listed, FM Approved

Product Description

The Model A relief valve is UL Listed and FM Approved as a fire protection system pressure relief valve for installation in accordance with NFPA 13 and FM Property Loss Prevention Data Sheets. The Model A relief valve is available factory-set at the following nominal operating pressures: 175 psi (12 bar), 185 psi (13 bar), 210 psi (14 bar), 260 psi (18 bar), or 310 psi (21 bar).

Application

The Model A relief valve is intended for use to relieve excess pressure in fire protection systems due to thermal expansion and is also intended for installation downstream of pressure reducing valves. The Model A relief valve is UL Listed and FM Approved to operate between 95% and 105% of the nominal operating pressure. Select a relief valve with a nominal operating pressure up to 10 psi (0.7 bar) in excess of the maximum system pressure to avoid operation under normal system pressures.

Installation

The Model A relief valve must be installed in accordance with NFPA 13, NFPA 20, and FM Property Loss Prevention Data Sheets as well as the requirements of any authorities having jurisdiction. PTFE-based thread seal tape should be applied to the male pipe threads of the Model A relief valve; the Model A relief valve should then be installed in a 1/2-inch NPT or ISO 7-1 R1/2 threaded outlet or fitting on the sprinkler system. Tighten the Model A relief valve using a smooth jaw wrench applied to the flat sides of the relief valve. Recommended installation torque is 8 to 18 lb-ft (11 to 24 n-m). The 1/2-inch NPT or ISO 7-1 R1/2 outlet from the Model A relief valve should be piped to a location where high pressure water flow will not cause injury or damage.

Note: In most cases where system components are rated to 175 psi (12 bar), a 185 psi (13 bar) relief valve is recommended. Do not use 175 psi (12 bar) relief valves where the system pressure is expected to exceed 165 psi (11.4 bar).

Maintenance

Model A relief valve must be maintained in accordance with the requirements of NFPA 25.

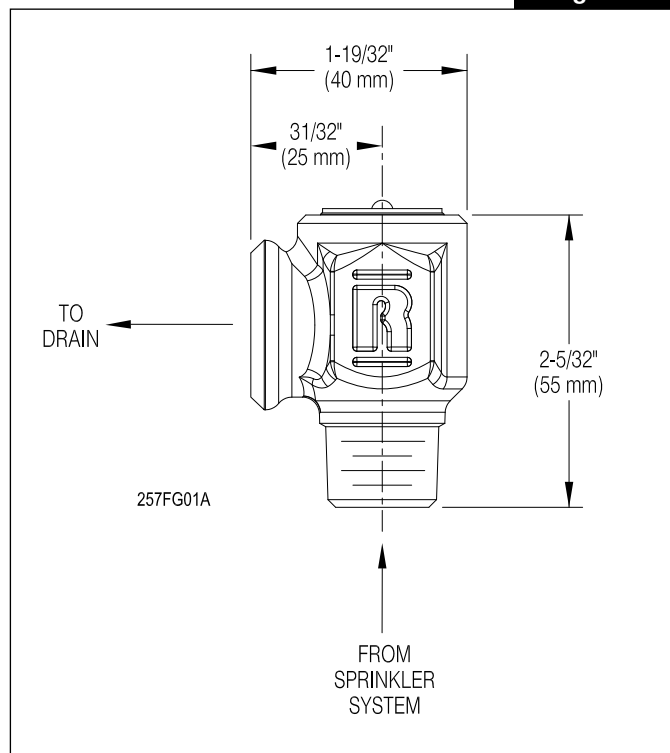
Listings and Approvals

UL Listed to ANSI/UL1478A Pressure Relief Valves for Sprinkler Systems

FM Approved to Approval Standard for Trim Water Pressure Relief Valves, Class No. 1359



Model A Relief Valve Ports and Dimensions **Figure 1**



Ordering Information

Specify:

Model A Relief Valve Nominal Operating Pressure

- 175 psi (12 bar)
- 185 psi (13 bar)
- 210 psi (14 bar)
- 260 psi (18 bar)
- 310 psi (21 bar)

Threads

- 1/2" NPT
- ISO 7-1 R1/2



Model REL-GV Globe Valve

300 psi (20.7 bar)

Product Description

Reliable Model REL-GV globe valves have a rated working pressure of 300 psi (20.7 bar) and feature a brass valve body with FNPT end connections.

Installation

The Reliable globe valves shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. Verify compatibility of the valve materials with the water supply and the environment where the valve will be installed prior to installation.

WARNING: Model REL-GV globe valves contain lead and are not for use in systems carrying water intended for human consumption.

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable globe valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the valve for corrosion, damage, and wear as required and replace as necessary. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.



Model REL-GV Globe Valve

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Reliable Model REL-GV Globe Valve Valve Size

- 3/8" (10 mm)
- 1/2" (15 mm)
- 3/4" (20 mm)
- 1" (25 mm)
- 1-1/4" (32 mm)
- 1-1/2" (40 mm)
- 2" (50 mm)

Model REL-GV Globe Valves

Technical Specifications

Pressure Rating:

300 psi (20.7 bar)

Material Specifications

Body: C37700 Brass Alloy

Bonnet: C37700 Brass Alloy

Seat: C37700 Brass Alloy

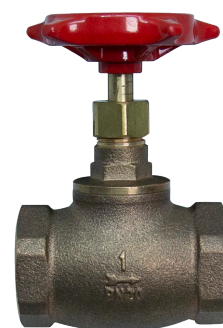
Stem: C37700 Brass Alloy

Stem Packing: PTFE

Seat Seal: EPDM Rubber

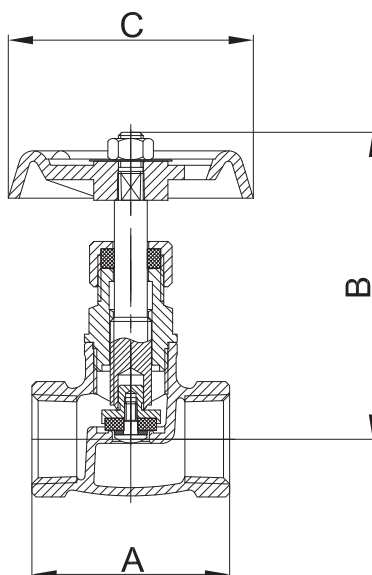
End Connections

Female NPT



Model REL-GV Globe Valve Dimensions

Figure 1



Dimensions in. (mm)

Table A

Valve Size	A	B	C
1/2 (15)	1-7/8 (48)	2-15/16 (75)	2-3/8 (60)
3/4 (19)	2-1/16 (53)	2-15/16 (75)	2-3/8 (60)
1 (25)	2-1/2 (63)	3-3/16 (80)	2-9/16 (65)
1-1/4 (32)	3 (77)	3-5/8 (92)	2-9/16 (65)
1-1/2 (40)	3-9/16 (84)	4-1/2 (114)	3-1/8 (80)
2 (50)	3-7/8 (99)	5-1/8 (130)	3-15/16 (100)



Model REL-AGV Angle Globe Valve

300 psi (20.7 bar)

Product Description

Reliable Model REL-AGV angle globe valves have a rated working pressure of 300 psi (20.7 bar) and feature a brass valve body with FNPT end connections.

Installation

The Reliable angle globe valves shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. Verify compatibility of the valve materials with the water supply and the environment where the valve will be installed prior to installation.

WARNING: Model REL-AGV angle globe valves contain lead and are not for use in systems carrying water intended for human consumption.

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable angle globe valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the valve for corrosion, damage, and wear as required and replace as necessary. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.



Model REL-AGV Angle Globe Valve

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Reliable Model REL-AGV Angle Globe Valve Valve Size

- 1/2" (15 mm)
- 3/4" (20 mm)
- 1" (25 mm)
- 1-1/4" (32 mm)
- 1-1/2" (40 mm)
- 2" (50 mm)

Model REL-AGV Globe Valves

Technical Specifications

Pressure Rating:

200 psi (13.8 bar)

Material Specifications

Body: C37700 Brass Alloy

Bonnet: C37700 Brass Alloy

Seat: C37700 Brass Alloy

Stem: C37700 Brass Alloy

Stem Packing: PTFE

Seat Seal: EPDM Rubber

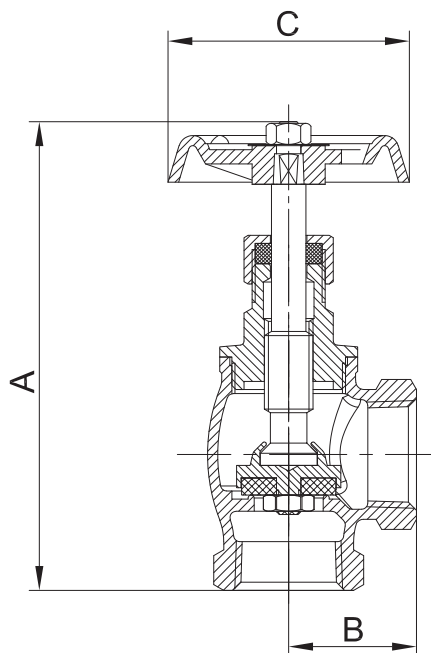
End Connections

Female NPT



Model REL-AGV Angle Globe Valve Dimensions

Figure 1



Dimensions in. (mm)

Table A

Valve Size	A	B	C
1/2 (15)	3-5/16 (84)	1-1/16 (27)	2-3/8 (60)
3/4 (19)	4-9/16 (116)	1-1/4 (32)	2-3/8 (60)
1 (25)	5-1/8 (131)	1-9/16 (40)	2-9/16 (65)
1-1/4 (32)	5-5/8 (142)	1-3/4 (46)	2-9/16 (65)
1-1/2 (40)	6-1/2 (165)	2 (50)	3-1/8 (80)
2 (50)	7-15/16 (202)	2-7/16 (61)	3-15/16 (100)



Model REL-BL Full Port Ball Valves

Product Description

Reliable Model REL-BL full port ball valves are cULus Listed and FM Approved as trim and drain valves for fire protection systems. Table A indicates the rated working pressures. The valves feature a forged brass valve body with FNPT end connections.

Installation

The Reliable Full Port Ball Valve shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. Verify compatibility of the Full Port Ball Valve materials with the water supply and the environment where the valve will be installed prior to installation.

WARNING: Model REL-BL ball valves contain lead and are not for use in systems carrying water intended for human consumption.

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a control valve out of service will eliminate the fire protection that is provided by the fire protection system.

The Reliable Full Port Ball Valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the valve for corrosion, damage, and wear as required and replace as necessary. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.



Model REL-BL Full Port Ball

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Reliable Model REL-BL Full Port Ball Valve Valve Size

- 1/4" (8 mm)
- 1/2" (15 mm)
- 3/4" (20 mm)
- 1" (25 mm)
- 1-1/4" (32 mm)
- 1-1/2" (40 mm)
- 2" (50 mm)

Table A

Valve Size	Pressure Rating	Approvals
1/4" (8 mm)	600 psi (41.4 bar)	cULus Listed
1/2" (15 mm)	600 psi (41.4 bar)	cULus Listed
	300 psi (20.7 bar)	FM Approved
3/4" (20 mm)	600 psi (41.4 bar)	cULus Listed
	300 psi (20.7 bar)	FM Approved
1" (25 mm)	600 psi (41.4 bar)	cULus Listed
	300 psi (20.7 bar)	FM Approved
1-1/4" (32 mm)	600 psi (41.4 bar)	cULus Listed
	300 psi (20.7 bar)	FM Approved
1-1/2" (40 mm)	600 psi (41.4 bar)	cULus Listed
	300 psi (20.7 bar)	FM Approved
2" (50 mm)	300 psi (20.7 bar)	cULus Listed, FM Approved

Model REL-BL Full Port Ball Valves

Technical Specifications

Pressure Rating:

See Table A

Material Specifications

Body: C37700 Brass Alloy

Bonnet: C37700 Brass Alloy

Seat: PTFE

Ball: C37700 Brass Alloy

Stem: HPb59-1 Brass Alloy

Packing: PTFE

Gland: C37700 Brass Alloy

Handle: Q235A Steel Alloy

Nut: Q235A Steel Alloy

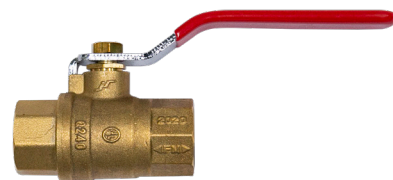
End Connections

Female NPT

Listings and Approvals

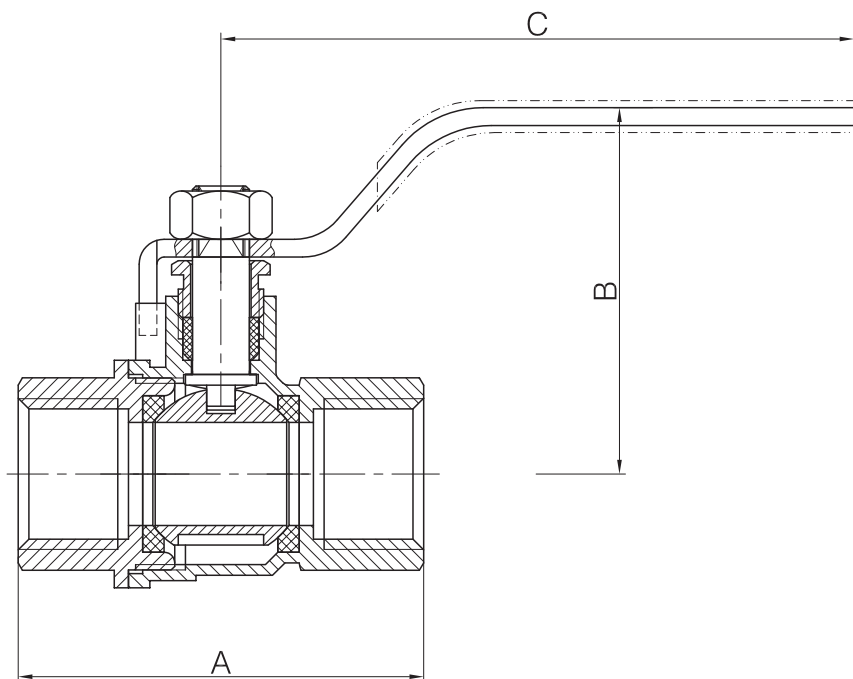
cULus Listed (1/4" - 2")

FM Approved (1/2" - 2")



Model REL-BL Full Port Ball Valve Dimensions

Figure 1



Dimensions in. (mm)

Table B

Valve Size	A	B	C
1/4" (8 mm)	1-3/4" (44)	1-13/16" (46)	3-1/2" (89)
1/2" (15 mm)	2-1/4" (57)	2" (51.5)	3-1/2" (89)
3/4" (20 mm)	2-1/2" (63)	2-3/8" (61)	4-1/8" (104)
1" (25 mm)	3" (75.5)	2-1/2" (63.5)	4-5/8" (117.5)
1-1/4" (32 mm)	3-7/16" (86.5)	2-13/16" (71)	4-5/8" (117.5)
1-1/2" (40 mm)	3-11/16" (94.2)	3-3/4" (94.5)	5-11/16" (145)
2" (50 mm)	4-1/4" (108)	4" (102)	5-11/16" (145)



SERIES LCI INTUMESCENT SEALANT

APPLICATIONS

SpecSeal® LCI Sealant has a broad application base designed to seal a wide variety of common penetrations in light commercial and grouped residential construction. Penetrant types include insulated and non-insulated metallic pipes and tubes, non-metallic pipes and tubes, and common electrical service and power distribution, telephone, data, and TV cabling. This product is also used in conjunction with other SpecSeal® Products such as SpecSeal® Firestop Collars and Wrap Strips to protect larger plastic pipes.

See Table A for a summary application list.



PRODUCT DESCRIPTION

SpecSeal® LCI Sealant is a versatile and economical intumescent product intended for firestopping a wide array of applications in small commercial or grouped residential construction and other structures with similar applications. SpecSeal® LCI Sealant is available in a single grade that has excellent caulking properties as well as high build properties on vertical or overhead surfaces. This single grade may be caulked (standard cartridge or bulk loaded), knifed or troweled. In addition, SpecSeal® LCI Sealant does not contain PCB's or asbestos.

SpecSeal® LCI Sealant is storage stable (when stored according to the manufacturer's recommendations), and will not separate or shrink when dried. SpecSeal® Series LCI Sealant will adhere to all common construction and penetrant materials and contains no solvents that might adversely effect plastic pipes or cable jackets.

FEATURES

- **Economical:** High performance without the high price!
- **Highly Intumescent:** Expands up to 8 times.
- **Excellent Smoke Seal**
- **Water Resistant:** Will not re-emulsify when dry.
- **Water-Based** for easy installation, cleanup, and disposal.
- **Acoustically Tested:** Reduces noise transmission
- **Safe...**Low VOC's, No Solvents, Non-Halogenated
- **Paintable**

PERFORMANCE

SpecSeal® LCI Sealant is the basis for systems that meet the exacting criteria of ASTM E814 (UL1479) and ASTM E1966 (UL2079) as well as to the time-temperature requirements of ASTM E119 (UL263). LCI provides up to a 2-hour fire rating for typical service penetrations through concrete or wood floors, concrete or masonry walls, as well as gypsum board walls (3-hour for metallic pipe, conduit and tubing). SpecSeal® LCI Sealant meets Class A finish requirements for Flame Spread and Smoke Development when tested in accordance with ASTM E84 (UL723). SpecSeal® LCI Sealant is also acoustically tested, demonstrating excellent sound attenuation properties.

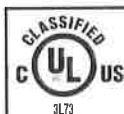


SYSTEM COMPATIBLE

PHYSICAL PROPERTIES

Properties	Series LCI
Color	Red
Odor	Mild Latex
Density	9.0 lb/gal (1.08 kg/L)
pH	9.0
In Service Temperature	≤ 130°F (54°C)
Flame Spread	0*
Smoke Developed	5*
STC Rating (ASTM E90/ASTM C919)	62
VOC Content (EPA Method 24/ASTM D3960)	0.29 lbs/gal (35.0 g/L)
Shelf Life	2 yrs
Volume Expansion	10X Free Expansion
Storage Temp.	≤ 130°F (54°C)

* Tested to ASTM E84 (UL723) at 14% surface coverage (modified test for sealants and caulks)



FILL, VOID OR CAVITY MATERIALS FOR USE IN JOINT SYSTEMS AND THROUGH-PENETRATION FIRESTOP SYSTEMS. SEE UL DIRECTORY OF PRODUCTS CERTIFIED FOR CANADA AND UL FIRE RESISTANCE DIRECTORY.



SPECIFICATIONS

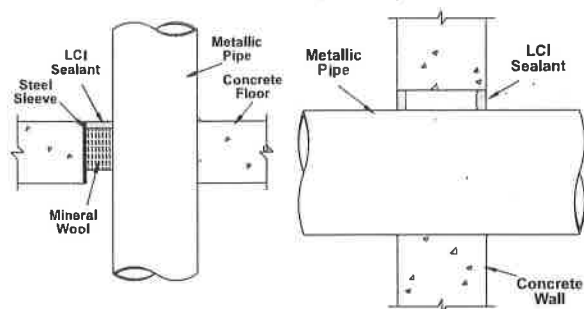
The firestopping sealant shall be a water-resistant, intumescent latex sealant. The sealant when exposed to high heat or flame shall exhibit a free expansion of up to 8 times its original volume. The firestopping sealant shall contain no water soluble nor hygroscopic ingredients and shall be acoustically tested. The sealant shall be UL Classified and/or FM approved and tested to the requirements of ASTM E814 (UL1479) and shall meet Class A finish requirements when tested in accordance with ASTM E84 (UL723).

SPECIFIED DIVISIONS

DIV. 7	07840	Through-Penetration Firestopping
DIV. 13	13900	Special Construction Fire Suppression & Supervisory Systems
DIV. 15	15250	Mechanical Insulation - Fire Protection
DIV. 16	16050	Basic Electrical Materials & Methods



Fig 1: METALLIC PIPES - Concrete/Masonry Floors & Walls

**UL System No. C-AJ-1353**

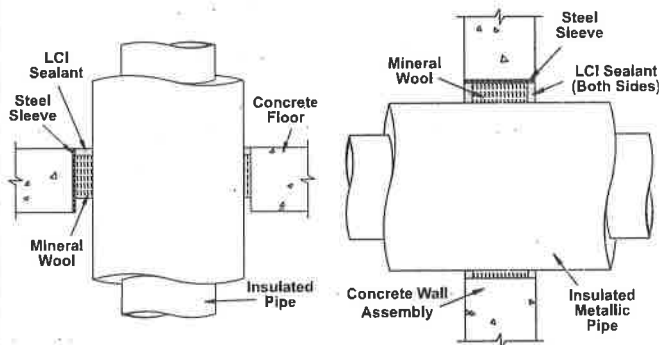
F Rating: 3 Hr • T Rating: 0 Hr
 Steel or Iron Pipe: <12", Copper Pipe: <4"
 Annulus: 0" to 2"
 Sealant Depth: 1/4"

Forming Material: Nom 4 pcf mineral wool (2 1/4" Depth)

UL System No. W-J-1098

F Rating: 2 Hr • T Rating: 1/4, 3/4 & 1 Hr
 Steel or Iron Pipe: <8", Copper Pipe: <4"
 Annulus: 0" to 2"
 Sealant Depth: 5/8"

Fig 2: INSULATED METALLIC PIPES - Concrete/Masonry Floors & Walls

**UL System No. C-AJ-5138**

F Rating: 2 Hr • T Rating: 3/4 or 1 Hr
 Steel or Iron Pipe: 6", Copper Pipe: 4"
 Pipe Covering: Max. 2" fiber glass or mineral wool pipe insulation.
 Annulus: 1/4" to 1-5/8" • Sealant: 1/2"
 Forming: Nom. 4 pcf mineral wool (3" depth)

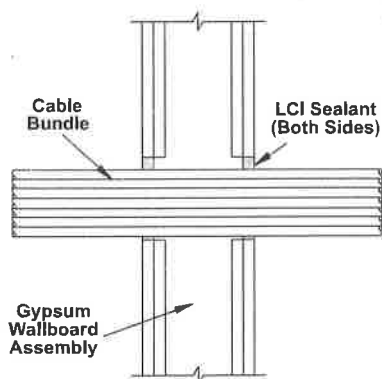
SEALANT REQUIREMENTS IN CUBIC INCHES PER 1/4 INCH OF INSTALLED DEPTH*

Pipe Size		Diameter of Opening (In.)											
Trade Size	Pipe O.D.	1.5	2.0	3.0	4.0	5.0	6.0	7.0	8.0	10	12	14	26
0.5"	0.840	0.3	0.6	1.6	3.0	4.8	6.9	9.5	12.4	19.5	28.1	38.3	132.6
1"	1.315	0.1	0.4	1.4	2.8	4.6	6.7	9.3	12.2	19.3	27.9	38.1	132.4
1.5"	1.900			1.1	2.4	4.2	6.4	8.9	11.9	18.9	27.6	37.8	132.0
2"	2.375			0.7	2.0	3.8	6.0	8.5	11.5	18.5	27.2	37.4	131.6
2.5"	2.875			0.1	1.5	3.3	5.4	8.0	10.9	18.0	26.7	36.9	131.1
3"	3.500				0.7	2.5	4.7	7.2	10.2	17.2	25.9	36.1	130.3
3.5"	4.000					1.8	3.9	6.5	9.4	16.5	25.1	35.3	129.6
4"	4.500					0.8	3.0	5.6	8.5	15.6	24.2	34.4	128.7
6"	6.625							1.1	4.0	11.1	19.7	29.9	124.2
8"	8.625									4.9	13.6	23.8	118.0
10"	10.750										5.6	15.8	110.0
12"	12.750											6.6	100.8
24"	24.000												19.6

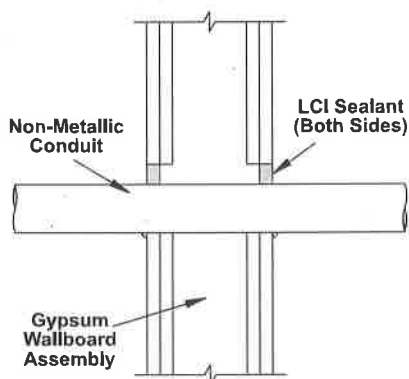
*Different Sealant Depth?
 1/2" Multiply by 2
 5/8" Multiply by 2.5
 1" Multiply by 4
 1-1/4" Multiply by 5

IMPORTANT NOTE: This table is for estimation purposes only. Consult UL Fire Resistance Directory or STI Product & Application Guide for specific installation requirements and limitations
 Metric Estimation Table available upon request.

Fig. 3: ELECTRICAL, DATA OR COMMUNICATIONS - Gypsum Walls

**UL System No. W-L-3169**

F Rating: 1, 2 Hr • T Rating: 1/4 and 3/4
 Up to 4-1/2" cable bundle
 Annulus: 0" to 1/2" • Sealant: 5/8"

**UL System No. W-L-2241**

F Rating: 1, 2 Hr • T Rating: 0, 1/4, 1, 1-3/4
 <2" Rigid PVC or ENMT, CPVC, ABS
 Annulus: 0-1" • Sealant 5/8"

TABLE A: APPLICATIONS**TESTED AND CLASSIFIED FOR FIRE RESISTANCE**

- **Metallic Pipes** including steel, iron, or copper pipe and tubing.
- **Nonmetallic Pipes, Conduits & Tubing** including PVC, CPVC, ABS, and PEX.
- **Electrical & Electronic Cabling** including service entrance, power distribution, computer, telephone, and television.
- **Metal Ductwork** including HVAC, bath and dryer vents.
- **Insulated Pipes** including heating, cooling, and condensation applications.
- **Complete Wood Floor firestopping package** for electrical, plumbing, HVAC, telephone, and television.

INSTALLATION INSTRUCTIONS

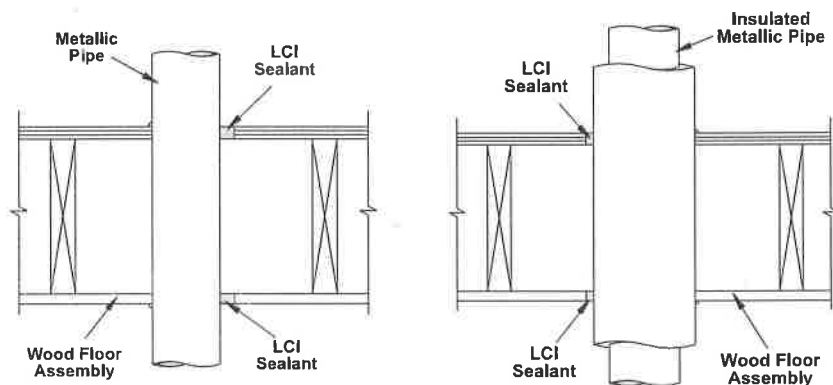
GENERAL: Areas to be protected must be clean and free of oil, loose dirt, rust or scale. Installation temperatures must be between 35°F (2°C) and 100°F (38°C). Allow product to dry a minimum of 24 hours before exposure to moisture.

SYSTEM SELECTION: Selection of an appropriate firestop system design is critical to the fire protection process. Space limitations preclude highly detailed information pertaining to individual application systems. Please consult the Product & Application Guide as well as the UL® Fire Resistance Directory for additional information.

FORMING: Some installations may require forming as either an integral part of the system or as an option to facilitate installation. In systems where forming is required, mineral wool batts with a minimum nominal density of 4 PCF (64 kg/m³) are generally required. Cut forming material oversize to allow for tight packing. Position forming material to allow for the proper depth of fill material.

FILL MATERIAL: SpecSeal® LCI Sealant may be installed by caulking using a standard caulking gun or from bulk containers using a bulk loading caulk gun, or by manually troweling using a mason's trowel or putty knife. If the sealant tends to pull back from a surface, clean the surface with a damp rag or sponge and reapply. Work sealant into all areas exercising care to eliminate voids or seams. The surface of the sealant can be smoothed using a putty knife dipped in water. Adding water to the sealant itself is not recommended. Sealant (when dry) may be painted using most non-solvent based paints.

Fig. 4: BARE & INSULATED METALLIC PIPES - Wood Floor Assemblies



UL System No. F-C-1074
F Rating: 1 & 2 Hr • T Rating: ¼, ½ and 1 Hr
Steel, Iron or Copper: 4" • Chase wall optional.
Annulus: 0" to 1" • Sealant: 5/8" bottom, ¾" top

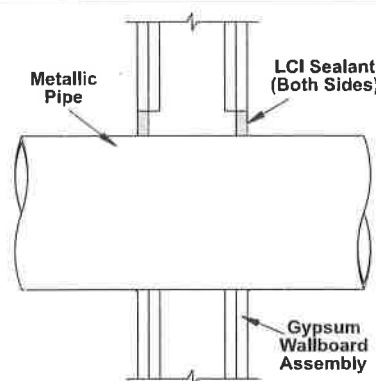
UL System No. F-C-5043
F Rating: 1 & 2 Hr • T Rating: ¾ and 1 Hr
Steel, Iron or Copper: 4"
Pipe covering: 1" Fiber Glass, Mineral fiber
or AB/PVC • Chase wall optional.
Annulus: 0" to 1" • Sealant: 5/8" bottom, ¾" top.

In gypsum wallboard penetrations, apply a minimum cove bead of 1/4" (6 mm) at the interface of the penetrant with both exterior wall surfaces.

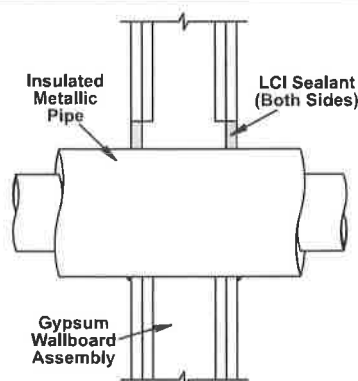
SMOKE SEALING: In some applications including firestop collars, SpecSeal® LCI Sealant is recommended as a smoke seal. It is suggested in these applications that the sealant be applied to both sides of walls. In floor applications, a sealing bead is suggested top and bottom.

LIMITATIONS: SpecSeal® LCI Sealant is water-based and cures through the evaporation of water. Low temperatures as well as high humidity may retard drying. Non-porous or impermeable backing materials, plates, or coatings may retard the drying process. Do not paint or seal in any way that prevents contact with air until sealant has dried through completely. This product has been designed to be safe with plastics and has been used extensively and successfully with a variety of different types of plastic pipes, tubes, and plastic cable insulations. Variations in these materials however, make it impossible to guarantee compatibility. STI strongly recommends that the user consult with the manufacturer of the pipe, tubing, or cable in question regarding any known sensitivities or potential restrictions before applying this product.

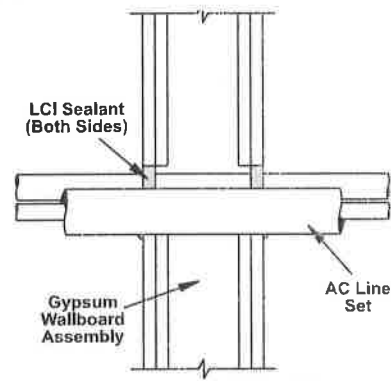
Fig. 5: BARE & INSULATED METALLIC PIPES - Gypsum Walls



UL System No. W-L-1222
F Rating: 1, 2 Hr • T Rating: ¼, ¾, 1 Hr
Steel or Iron pipe: 8", Copper pipe: 4"
Annulus: 0" to 2" • Sealant: 5/8"



UL System Nos. W-L-5121, W-L-5122
F Rating: 1, 2 Hr • T Rating: 1 Hr & 1/4 Hr
Steel or Iron pipe: 6", Copper pipe: 4"
Pipe covering: Max. 2" fiber glass,
¾" AB/PVC or 2" mineral fiber
Annulus: 0" to 1-1/2" • Sealant: 5/8"



UL System No. W-L-8025
F Rating: 1, 2 Hr • T Rating: ¼ Hr
AC Line Set: Two copper tubes,
one with ¾" AB/PVC and thermostat wire
Annulus: 0" to 1" • Sealant: 5/8"



MAINTENANCE

No maintenance is normally required, however a periodic inspection of rated barriers is recommended to make sure that any new openings, modifications of previously installed firestops, or areas exhibiting physical damage, have been properly sealed or repaired. Subsequent sealing or repairs should be accomplished using SpecSeal® products per the original approved design.

RETROFIT: When adding or removing penetrants, care should be taken to minimize damage to the seal. Reseal using SpecSeal® products per the approved design. **NOTE:** New penetrants of a different nature than the original design may require a totally new firestop design or extensive modifications to the existing design. Reseal all openings as per the requirements of the modified design.

TECHNICAL SERVICE

Specified Technologies Inc. provides toll free technical support to assist in product selection and appropriate installation design. UL Systems, Material Safety Data Sheets and other technical information is available through the Technical Library at www.stifiirestop.com.

PRECAUTIONARY INFORMATION

Consult Material Safety Data Sheet for additional information on the safe handling and disposal of this material.

AVAILABILITY

SpecSeal® Series LCI Sealant is available from authorized STI distributors. Consult factory or website for the names and locations of the nearest sales representatives or distributors.

ORDERING INFORMATION

CAT. NO.	DESCRIPTION	
LCI300	Sealant 10.1 oz Tube	18.2 Cu In (300 ml)
LCI305	Sealant 5 Gal Pail	1,155 Cu In (19.0 Liters)
LCI320	Sealant 20 oz Sausage	36 Cu in. (592 ml)
LCI329	Sealant 29 oz Quart Tube	52 Cu in. (858 ml)



Additional SpecSeal Products...

Series SSS Sealant

The industry's most versatile sealant provides the firestopping solutions for a wide range of combustible and noncombustible applications. Water-based intumescent sealant expands up to 8X!

Intumescent Wrap Strips

Three grades of intumescent wrap strips provide an unmatched combination of flexibility, economy, and expansion (up to 30X). Systems for plastic pipes including FR Polypropylene up to 8" trade size!

SSC & LCC Firestop Collars

Easy to install, economical protection for ABS and PVC pipes (both solid and foam core) as well as CPVC, PVDF, and FRPP. LCC Collars are available up to 4" and SSC Collars are available up to 6" trade size.

Firestop Mortar

Lightweight, versatile and economical! The best choice for large or complex installations.

SSP Firestop Putty

Available both in bar form and in pads, putty provides easy retrofit for through-penetrations and economical protection for electrical boxes.

Pensil® Silicones

Sealants and foam for through-penetrations and construction joints. Unexcelled aging characteristics and flexibility.

Elastomeric Joint Seals

New economical products for sealing construction joints. Choose caulk or spray applied products tested to UL2079.

CITY OF NEW YORK MEA 211-01-M

IMPORTANT NOTICE: All statements, technical information, and recommendations contained herein are based upon testing believed to be reliable, but the accuracy and completeness thereof is not guaranteed.

WARRANTY

Specified Technologies Inc. manufactures its goods in a manner to be free of defects. Should any defect occur in its goods (within one year), Specified Technologies Inc., upon prompt notification, will at its option, exchange or repair the goods or refund the purchase price.

LIMITATIONS AND EXCLUSIONS:

THIS WARRANTY IS IN LIEU OF ALL OTHER REPRESENTATIONS EXPRESSED OR IMPLIED (INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR USE) AND UNDER NO CIRCUMSTANCES SHALL SPECIFIED TECHNOLOGIES INC. BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL PROPERTY DAMAGE OR LOSSES. PRIOR TO USE, THE USER SHALL DETERMINE THE SUITABILITY OF THE PRODUCT FOR ITS INTENDED USE, AND THE USER ASSUMES ALL RISKS AND LIABILITY FOR SUBSEQUENT USE. No statement or recommendation not contained herein shall have any force or effect unless in an agreement signed by officers of seller and manufacturer.



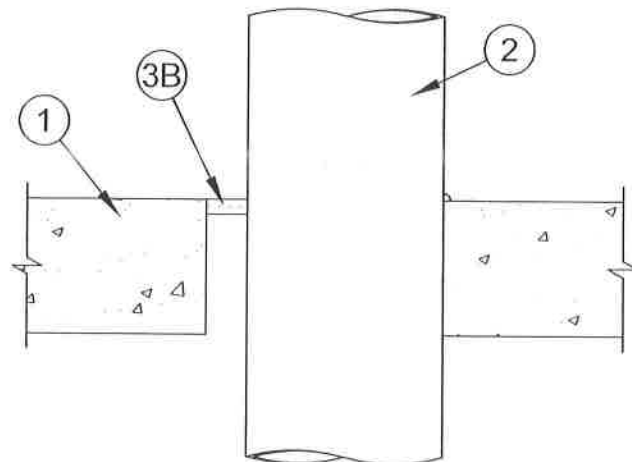
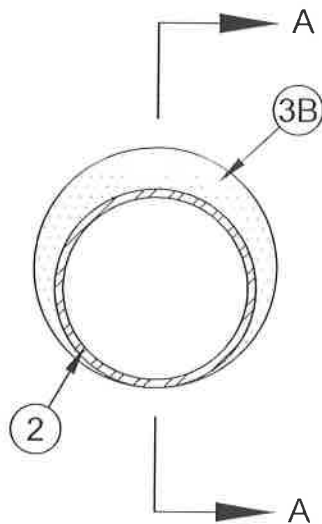
Specified Technologies, Inc.

200 Evans Way • Somerville, NJ 08876 | Toll Free: 800-992-1180 • F: 908.526.9623





ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 3 Hr	F Rating - 3 Hr
T Rating - 0 Hr	FT Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 3 Hr
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Rating - 0 Hr
	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - Less Than 1 CFM/sq ft



Section A-A

- 1. Floor or Wall Assembly** - Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 32 in.

See **Concrete Block** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

- 2. Through Penetrants** - One metallic pipe, conduit or tubing to be centered within the firestop system. The annular space shall range from min 0 in. (point contact) to max 2 in. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
 - A. Steel Pipe** - Nom 30 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.
 - B. Iron Pipe** - Nom 30 in. diam (or smaller) cast or ductile iron pipe.
 - C. Conduit** - Nom 4 in. diam (or smaller) electrical metallic tubing or nom 6 in. diam (or smaller) rigid galv steel conduit.
 - D. Copper Tubing** - Nom 6 in. diam (or smaller) Type M (or heavier) copper tubing.
 - E. Copper Pipe** - Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.
- 3. Firestop System** - The firestop system shall consist of the following:
 - A. Packing Material** - (Optional, Not Shown) - Mineral wool batt insulation, polyethylene backer rod or glass fiber batt insulation friction fitted into annular space. Packing material to be recessed from top surface of floor or both surfaces of wall as required to accommodate the required thickness of fill material.
 - B. Fill, Void or Cavity Material* - Caulk** - Min 1/2 in. thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall. At point contact location, apply min 1/4 in. diam bead of sealant at the pipe/concrete interface on the top surface of the floor or both surfaces of wall.

SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.(such



Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

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Created or Revised: January 23, 2014

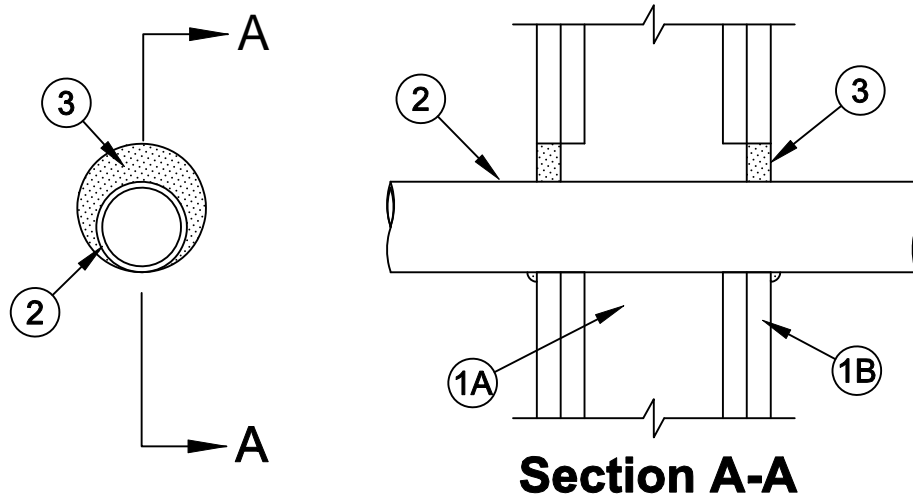
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C-AJ-1080
PAGE 1 OF 1

System No. W-L-2241

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 0, 1/4, 1 and 1-3/4 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft



1. **Wall Assembly** - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

- A. **Studs** - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced max 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
- B. **Gypsum Board*** - Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Diam of opening to be 1 in. to 1-1/8 in. (25 to 29 mm) larger than outside diam of pipe.

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. When Item 2G or 2H is used, the hourly F Rating is 1 hr.

2. **Through Penetrant** - One nonmetallic pipe, conduit or tube to be installed eccentrically or concentrically within the firestop system. Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
- A. **Polyvinyl Chloride (PVC) Pipe** - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
- B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 2 in. (51 mm) diam (or smaller) SDR 13.5 or Schedule 80 CPVC pipe for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
- C. **Rigid Nonmetallic Conduit+** - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70). Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
- D. **Electrical Nonmetallic Tubing+** - Nom 2 in. (51 mm) diam (or smaller) PVC tubing installed in accordance with Article 331 of the National Electrical Code (NFPA 70). Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).
- E. **Cross Linked Polyethylene (PEX) Tubing** - Nom 1 in. (25 mm) diam (or smaller) SDR9 PEX tubing for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).



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W-L-2241
PAGE 1 OF 2

F. **Acrylonitrile Butadiene Styrene (ABS) pipe** - Nom 1-1/2 in. (38 mm) diam (or smaller) Schedule 40 solid-core or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. Annular space shall be min 1/4 in. (6 mm) to max 3/4 in. (19 mm).

G. **Polyvinyl Chloride (PVC) Pipe** - Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).

H. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 3 in. (76 mm) diam (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) piping systems. Annular space shall be min 0 in. (0 mm, point contact) to max 1 in. (25 mm).

When Item 2A or 2B is used, the T Rating is 1/4 hr. When Item 2C, 2D, or 2E is used, the T Rating is 1 hr and 1-3/4 hr for 1 hr and 2 hr fire rated walls, respectively. When Item 2F, 2G, or 2H is used, T Rating is 0 hr.

3. **Fill, Void or Cavity Material* - Sealant** - Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at nonmetallic pipe/gypsum board interface on both surfaces of wall.

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant or Type WF300 Firestop Caulk (for wood studs only)

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.



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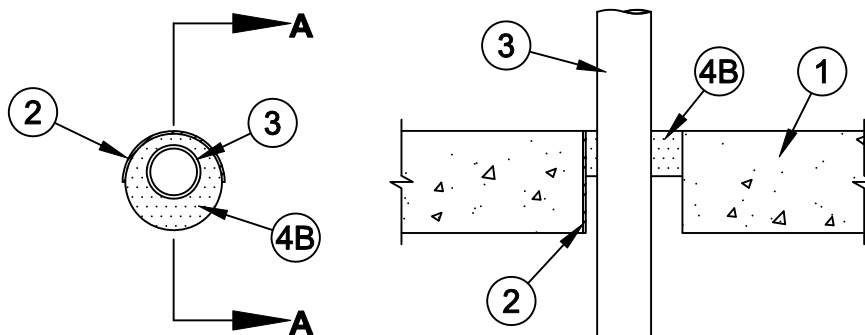
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W-L-2241
PAGE 2 OF 2

System No. C-AJ-2290

F Rating - 2 Hr
T Rating - 0 Hr



Section A-A

1. **Floor or Wall Assembly** - Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete floor. Floor may also be constructed of any min 6 in. (152 mm) thick hollow-core **Precast Concrete Units***. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 4 in. (102 mm).
See **Concrete Blocks** (CAZT) or **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Steel Sleeve** - (Optional) - Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe cast or grouted into floor or wall assembly, flush with floor or wall surfaces.
3. **Through Penetrant** - One nonmetallic pipe, conduit or tube to be installed eccentrically or concentrically within the firestop system. The annular space between the pipe, conduit or tube and the periphery of the opening shall be nom 1/2 in. (13 mm) to max 1-1/8 in. (29 mm). Pipe, conduit or tube to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of nonmetallic pipes, conduits and tubes may be used:
 - A. **Polyvinyl Chloride (PVC) Pipe** - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 polyvinyl chloride (PVC) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
 - B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** - Nom 2 in. (51 mm) diam (or smaller) SDR13.5 chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.
 - C. **Rigid Nonmetallic Conduit+** - Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).
 - D. **Electrical Nonmetallic Tubing+** - Nom 2 in. (51 mm) diam (or smaller) PVC tubing installed in accordance with Article 331 of the National Electrical Code (NFPA 70).
 - E. **Optical Fiber Raceway (OFR)+** - Nom 2 in. (51 mm) diam (or smaller) optical fiber raceway formed from either polyvinylidene fluoride (PVDF) or polyvinyl chloride (PVC). Raceway to be installed in accordance with Article 770 of the National Electrical Code (NFPA 70). Multiple 62.5/48 micron fiber optical cables with PE or PVC jacket to be installed within each raceway.
4. **Firestop System** - The firestop system shall consist of the following:
 - A. **Packing Material** - (Optional, Not Shown) - Polyethylene backer rod, mineral wool batt insulation or glass fiber batt insulation friction fit into opening as a permanent form to facilitate installation of fill material (Item 4B).
 - B. **Fill, Void or Cavity Material* - Sealant** - Min 2 in. (51 mm) thickness of fill material installed within annulus, flush with top surface of floor or both surfaces of wall assembly. In floors constructed of precast hollow core units, fill material installed to min 1 in. (25 mm) depth, flush with each surface of the floor.

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

+Bearing the UL Listing Mark



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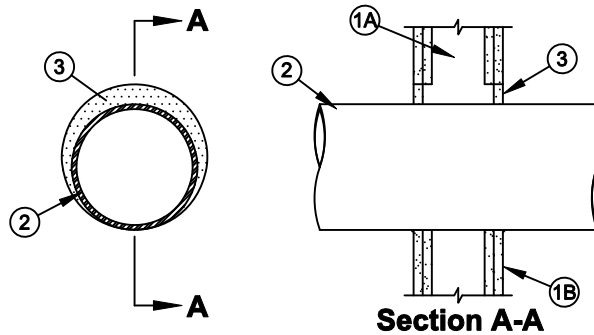
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C-AJ-2290
PAGE 1 OF 1

System No. W-L-1222

F Ratings - 1 and 2 Hr (See Item 1)
T Ratings - 1/4, 3/4 and 1 Hr (See Item 2)



1. **Wall Assembly** - The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
 - A. **Studs** - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-1/2 in. (89 mm) wide and spaced max 24 in. (610 mm) OC.
 - B. **Gypsum Board*** - Thickness, type, number of layers and fasteners as specified in the individual Wall and Partition Design. Max diam of opening is 10-5/8 in. (270 mm).

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Through Penetrant** - One metallic pipe, conduit or tube to be installed eccentrically or concentrically within the firestop system. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. The annular space between the pipe, conduit or tube and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Pipe, conduit or tube to be rigidly supported on both sides of the wall assembly. The following types and sizes of metallic pipes, conduits and tubes may be used:
 - A. **Steel Pipe** - Nom 8 in. (203 mm) diam (or smaller) Schedule 5 (or heavier) steel pipe.
 - B. **Iron Pipe** - Nom 8 in. (203 mm) diam (or smaller) cast or ductile iron pipe.
 - C. **Conduit** - Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit, nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or nom 4 in. (102 mm) diam (or smaller) flexible steel conduit.
 - D. **Copper Pipe** - Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
 - E. **Copper Tube** - Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tube.

Type of Penetrant	Max Diam	T Rating
Steel or iron pipe, steel conduit or EMT	2 in. (51 mm)	1 hr
Steel or iron pipe, steel conduit or EMT	8 in. (203 mm)	3/4 hr
Copper pipe or tube	4 in. (102 mm)	1/4 hr

- 2A. **Through Penetrating Product* - Flexible Metal Piping** - As an alternate to Item 2, one nom 1-1/4 in. (32 mm) diam (or smaller) steel flexible metal pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between the pipe and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm). Pipe to be rigidly supported on both sides of the wall assembly.

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3. **Fill, Void or Cavity Material* - Sealant** - Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At point contact location, min 1/4 in. (6 mm) diam bead of fill material applied at metallic pipe/gypsum board interface on both surfaces of wall.

SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.



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W-L-1222
PAGE 1 OF 1