

G-FIRE Grooved Fittings Ductile Iron and Fabricated Steel Ductile

IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

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General Description

GRINNELL G-FIRE Grooved Fittings provide an economical and efficient method of changing direction, adding an outlet, reducing, or capping piping systems. The G-FIRE grooved fittings are available in ductile iron or fabricated steel as indicated.

Note: Figure 510S and 519S fittings are special short radius fittings with smaller center to end dimensions than standard grooved fittings. Depending on the size and coupling used, there may be interferences at the bolt pads that require repositioning of the coupling orientation. The use of flange adapters is not recommended with Figures 510S and 519S fittings. Contact Johnson Controls for details.

NOTICE

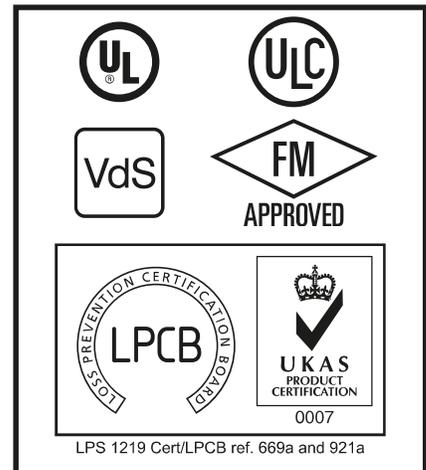
Never remove any piping component nor correct or modify any piping deficiencies without first de-pressurizing and draining the system. Failure to do so may result in serious personal injury, property damage, and/or impaired device performance.

It is the designer's responsibility to select products suitable for the intended service and to ensure that pressure ratings and performance data are not exceeded. Material and gasket selection should be verified to be compatible for the specific application. Always read and understand the installation instructions.

The GRINNELL G-FIRE Grooved Fittings described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the approval agency, in addition to the standards of any other authorities having jurisdiction. Failure to do so may result in serious personal injury or impair the performance of these devices.

Internal fitting coatings serving as protection during storage and transport can become separated after installation and during system operation, potentially causing blockage of strainers or other filtering equipment. If strainers are installed in the piping system the manufacturer recommends they feature a minimum 5/32 in. (4 mm) mesh size and, to prevent blockages, that they are regularly serviced at intervals to be determined by the system designer.

The owner is responsible for maintaining their system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions



Technical Data

Approvals

UL and ULC Listed
FM Approved
VdS Approved
LPCB Certified

Note: LPCB Certification applies to Figures 211, 212, 221, 250, 260, 501, 510, 511, 512, 519, 550, 510S, and 519S.

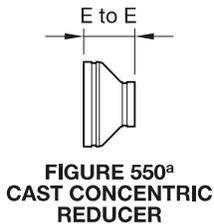
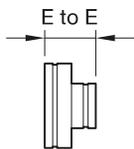
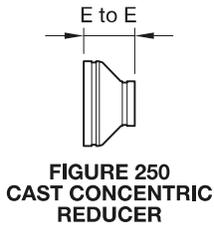
Material

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

Fabricated Steel: Carbon Steel conforming to ASTM A53, ASTM A135, and ASTM A795

Protective Coatings

- Non-lead orange paint (USA)
- RAL red or non-lead paint (EMEA and APAC)
- Hot dipped galvanized conforming to ASTM A153

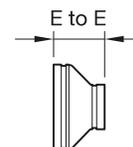


Nominal Pipe Size		Figure 250 Cast		Figure 350 Fabricated		Figure 550 ^(a) Cast	
ANSI Inches (DN)	O.D. Inches (mm)	Nominal E to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal E to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal E to E Inches (mm)	Approx. Weight Lbs. (kg)
1-1/4 x 1 (32 x 25)	1.66 x 1.31 (42,4 x 33,4)	2.50 (63,5)	0.7 (0,3)	—	—	2.50 (63,5)	0.7 (0,3)
1-1/2 x 1 (40 x 25)	1.90 x 1.31 (48,3 x 33,4)	—	—	2.50 (63,5)	0.7 (0,3)	—	—
1-1/2 x 1-1/4 (40 x 32)	1.90 x 1.66 (48,3 x 42,4)	2.50 (63,5)	0.8 (0,3)	—	—	2.50 (63,5)	0.8 (0,3)
2 x 1 (50 x 25)	2.37 x 1.31 (60,3 x 33,4)	—	—	2.50 (63,5)	0.9 (0,4)	—	—
2 x 1-1/4 (50 x 32)	2.37 x 1.66 (60,3 x 42,4)	—	—	—	—	2.50 (63,5)	0.9 (0,4)
2 x 1-1/2 (50 x 40)	2.37 x 1.90 (60,3 x 48,3)	—	—	—	—	2.50 (63,5)	1.0 (0,5)
2-1/2 x 1 (65 x 25)	2.87 x 1.31 (73,0 x 33,4)	—	—	2.50 (63,5)	1.2 (0,5)	—	—
2-1/2 x 1-1/4 (65 x 32)	2.87 x 1.66 (73,0 x 42,4)	2.50 (63,5)	1.4 (0,6)	—	—	2.50 (63,5)	1.4 (0,6)
2-1/2 x 1-1/2 (65 x 40)	2.87 x 1.90 (73,0 x 48,3)	2.50 (63,5)	1.4 (0,6)	—	—	2.50 (63,5)	1.4 (0,6)
2-1/2 x 2 (65 x 50)	2.87 x 2.37 (73,0 x 60,3)	2.50 (63,5)	1.3 (0,6)	—	—	2.50 (63,5)	1.3 (0,6)
76,1mm x 1-1/4 (65 x 32)	3.00 x 1.66 (76,1 x 42,4)	2.50 (63,5)	1.4 (0,6)	—	—	2.50 (63,5)	1.4 (0,6)
76,1mm x 1-1/2 (65 x 40)	3.00 x 1.90 (76,1 x 48,3)	2.50 (63,5)	1.4 (0,6)	—	—	2.50 (63,5)	1.4 (0,6)
76,1mm x 2 (65 x 50)	3.00 x 2.37 (76,1 x 60,3)	2.50 (63,5)	1.5 (0,7)	—	—	2.50 (63,5)	1.5 (0,7)
3 x 1 (80 x 25)	3.50 x 1.31 (88,9 x 33,4)	—	—	2.50 (63,5)	1.3 (0,6)	—	—
3 x 1-1/4 (80 x 32)	3.50 x 1.66 (88,9 x 42,4)	—	—	2.50 (63,5)	1.3 (0,6)	—	—
3 x 1-1/2 (80 x 40)	3.50 x 1.90 (88,9 x 48,3)	2.50 (63,5)	1.8 (0,8)	—	—	2.50 (63,5)	1.8 (0,8)
3 x 2 (80 x 50)	3.50 x 2.37 (88,9 x 60,3)	2.50 (63,5)	1.7 (0,8)	—	—	2.50 (63,5)	1.7 (0,8)
3 x 2-1/2 (80 x 65)	3.50 x 2.87 (88,9 x 70,3)	2.50 (63,5)	1.7 (0,8)	—	—	2.50 (63,5)	1.7 (0,8)
3 x 76,1mm (80 x 65)	3.50 x 3.00 (88,9 x 76,1)	2.50 (63,5)	2.0 (0,9)	—	—	2.50 (63,5)	2.0 (0,9)
4 x 1 (100 x 25)	4.50 x 1.31 (114,3 x 33,4)	—	—	3.00 (76,2)	2.9 (1,1)	—	—
4 x 1-1/4 (100 x 32)	4.50 x 1.66 (114,3 x 42,4)	—	—	3.00 (76,2)	2.2 (1,0)	—	—
4 x 1-1/2 (100 x 40)	4.50 x 1.90 (114,3 x 48,3)	—	—	3.00 (76,2)	2.3 (1,0)	—	—
4 x 2 (100 x 50)	4.50 x 2.37 (114,3 x 60,3)	3.00 (76,2)	2.4 (1,1)	—	—	3.00 (76,2)	2.4 (1,1)
4 x 2-1/2 (100 x 65)	4.50 x 2.87 (114,3 x 73,0)	3.00 (76,2)	2.7 (1,2)	—	—	3.00 (76,2)	2.7 (1,2)

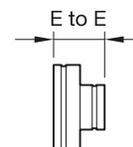
NOTES
 a. Figure 550 is available for the Americas market only.

FIGURE 1 (1 OF 3)
FIGURES 250, 350, AND 550 CONCENTRIC REDUCERS
NOMINAL DIMENSIONS

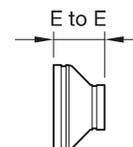
Nominal Pipe Size		Figure 250 Cast		Figure 350 Fabricated		Figure 550 ^(a) Cast	
ANSI Inches (DN)	O.D. Inches (mm)	Nominal E to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal E to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal E to E Inches (mm)	Approx. Weight Lbs. (kg)
4 x 76,1mm (100 x 65)	4.50 x 3.00 (114,3 x 76,1)	3.00 (76,2)	3.2 (1,5)	—	—	3.00 (76,2)	3.2 (1,5)
4 x 3 (100 x 80)	4.50 x 3.50 (114,3 x 88,9)	3.00 (76,2)	2.8 (1,3)	—	—	3.00 (76,2)	2.8 (1,3)
139,7mm x 3 (125 x 80)	5.50 x 3.50 (139,7 x 88,9)	3.50 (88,9)	4.2 (1,9)	—	—	3.50 (88,9)	4.2 (1,9)
139,7mm x 4 (125 x 100)	5.50 x 4.50 (139,7 x 114,3)	3.50 (88,9)	4.4 (2,0)	—	—	3.50 (88,9)	4.4 (2,0)
5 x 2 (125 x 50)	5.56 x 2.37 (141,3 x 60,3)	—	—	3.50 (88,9)	4.6 (2,1)	—	—
5 x 2-1/2 (125 x 65)	5.56 x 2.87 (141,3 x 73,0)	—	—	3.50 (88,9)	4.5 (2,0)	—	—
5 x 3 (125 x 80)	5.56 x 3.50 (141,3 x 88,9)	3.50 (88,9)	4.2 (1,9)	—	—	3.50 (88,9)	4.2 (1,9)
5 x 4 (125 x 100)	5.56 x 4.50 (141,3 x 114,3)	3.50 (88,9)	4.4 (2,0)	—	—	3.50 (88,9)	4.4 (2,0)
165,1mm x 3 (150 x 80)	6.50 x 3.50 (165,1 x 88,9)	4.00 (101,6)	5.5 (2,5)	—	—	4.00 (101,6)	5.5 (2,5)
165,1mm x 4 (150 x 100)	6.50 x 4.50 (165,1 x 114,3)	4.00 (101,6)	6.0 (2,7)	—	—	4.00 (101,6)	6.0 (2,7)
165,1mm x 139,7mm (150 x 125)	6.50 x 5.50 (165,1 x 139,7)	4.00 (101,6)	5.6 (2,5)	—	—	4.00 (101,6)	5.6 (2,5)
6 x 1 (150 x 25)	6.63 x 1.31 (168,3 x 33,7)	4.00 (101,6)	4.7 (2,1)	—	—	4.00 (101,6)	4.7 (2,1)
6 x 1-1/2 (150 x 40)	6.63 x 1.90 (168,3 x 48,3)	4.00 (101,6)	5.0 (2,3)	—	—	4.00 (101,6)	5.0 (2,3)
6 x 2 (150 x 50)	6.63 x 2.37 (168,3 x 60,3)	4.00 (101,6)	5.3 (2,4)	—	—	4.00 (101,6)	5.3 (2,4)
6 x 2-1/2 (150 x 65)	6.63 x 2.87 (168,3 x 73,0)	4.00 (101,6)	5.7 (2,6)	—	—	4.00 (101,6)	5.7 (2,6)
6 x 76,1mm (150 x 65)	6.63 x 3.00 (168,3 x 76,1)	4.00 (101,6)	6.1 (2,7)	—	—	4.00 (101,6)	6.1 (2,7)
6 x 3 (150 x 80)	6.63 x 3.50 (168,3 x 88,9)	4.00 (101,6)	5.8 (2,6)	—	—	4.00 (101,6)	5.8 (2,6)
6 x 108,0mm (150 x 100)	6.63 x 4.25 (168,3 x 108,0)	—	—	4.00 (101,6)	6.0 (2,7)	—	—
6 x 4 (150 x 100)	6.63 x 4.50 (168,3 x 114,3)	4.00 (101,6)	6.0 (2,7)	—	—	4.00 (101,6)	6.0 (2,7)
6 x 139,7mm (150 x 100)	6.63 x 5.50 (168,3 x 139,7)	4.00 (101,6)	6.3 (2,3)	—	—	4.00 (101,6)	6.3 (2,3)
6 x 5 (150 x 125)	6.63 x 5.56 (168,3 x 141,3)	4.00 (101,6)	6.2 (2,8)	—	—	4.00 (101,6)	6.2 (2,8)
216,3mm x 2-1/2 (200 x 65)	8.52 x 2.87 (216,3 x 73,0)	—	—	5.00 (127,0)	12.1 (5,5)	—	—
8 x 3 (200 x 80)	8.63 x 3.50 (219,1 x 88,9)	5.00 (127,0)	11.5 (5,2)	—	—	5.00 (127,0)	11.5 (5,2)
8 x 4 (200 x 100)	8.63 x 4.50 (219,1 x 114,3)	5.00 (127,0)	10.7 (4,9)	—	—	5.00 (127,0)	10.7 (4,9)



**FIGURE 250
CAST CONCENTRIC
REDUCER**



**FIGURE 350
FABRICATED CONCENTRIC
REDUCER**

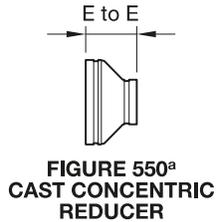
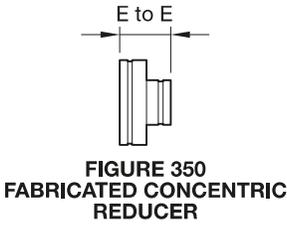
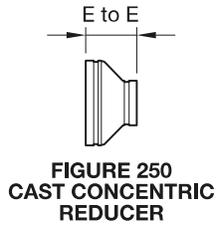


**FIGURE 550^a
CAST CONCENTRIC
REDUCER**

NOTES

a. Figure 550 is available for the Americas market only.

**FIGURE 1 (2 OF 3)
FIGURES 250, 350, AND 550 CONCENTRIC REDUCERS
NOMINAL DIMENSIONS**

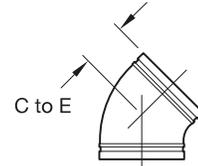


Nominal Pipe Size		Figure 250 Cast		Figure 350 Fabricated		Figure 550 ^(a) Cast	
ANSI Inches (DN)	O.D. Inches (mm)	Nominal E to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal E to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal E to E Inches (mm)	Approx. Weight Lbs. (kg)
8 x 139,7mm (200 x 125)	8.63 x 5.50 (219,1 x 139,7)	5.00 (127,0)	10.0 (4,5)	—	—	5.00 (127,0)	10.0 (4,5)
8 x 5 (200 x 125)	8.63 x 5.56 (219,1 x 141,3)	5.00 (127,0)	10.8 (4,9)	—	—	5.00 (127,0)	10.8 (4,9)
8 x 165,1mm (200 x 150)	8.63 x 6.50 (219,1 x 165,1)	5.00 (127,0)	11.0 (5,0)	—	—	5.00 (127,0)	11.0 (5,0)
8 x 6 (200 x 150)	8.63 x 6.63 (219,1 x 168,3)	5.00 (127,0)	11.3 (5,1)	—	—	5.00 (127,0)	11.3 (5,1)
10 x 4 (250 x 100)	10.75 x 4.50 (273,0 x 114,3)	—	—	6.00 (152,4)	20.5 (9,3)	—	—
10 x 5 (250 x 125)	10.75 x 5.56 (273,0 x 141,3)	—	—	6.00 (152,4)	20.1 (9,1)	—	—
10 x 165,1mm (250 x 150)	10.75 x 6.50 (273,0 x 165,1)	6.00 (152,4)	17.8 (8,0)	—	—	6.00 (152,4)	17.8 (8,0)
10 x 6 (250 x 150)	10.75 x 6.63 (273,0 x 168,3)	6.00 (152,4)	16.3 (7,4)	—	—	6.00 (152,4)	16.3 (7,4)
267,4mm x 216,3mm (250 x 200)	10.52 x 8.52 (267,4 x 216,3)	6.00 (152,4)	17.40 (7,89)	—	—	—	—
10 x 8 (250 x 200)	10.75 x 8.63 (273,0 x 219,1)	6.00 (152,4)	18.3 (8,3)	—	—	6.00 (152,4)	18.3 (8,3)
12 x 4 (300 x 100)	12.75 x 4.50 (323,9 x 114,3)	7.00 (177,8)	22.7 (10,3)	—	—	7.00 (177,8)	22.7 (10,3)
12 x 6 (300 x 150)	12.75 x 6.63 (323,9 x 168,3)	7.00 (177,8)	23.6 (10,7)	—	—	7.00 (177,8)	24.2 (11,0)
318,5mm x 216,3mm (300 x 200)	12.54 x 8.52 (318,5 x 216,3)	7.00 (177,8)	23.12 (10,48)	—	—	—	—
12 x 8 (300 x 200)	12.75 x 8.63 (323,9 x 219,1)	7.00 (177,8)	25.2 (11,4)	—	—	7.00 (177,8)	25.8 (11,7)
318,5mm x 267,4mm (300 x 250)	12.54 x 10.52 (318,5 x 267,4)	7.00 (177,8)	25.42 (11,53)	—	—	—	—
12 x 10 (300 x 250)	12.75 x 10.75 (323,9 x 273,0)	7.00 (177,8)	28.2 (12,8)	7.00 (177,8)	28.2 (12,8)	7.00 (177,8)	28.2 (12,8)

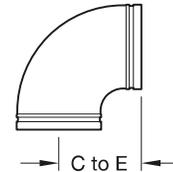
NOTES
 a. Figure 550 is available for the Americas market only.

FIGURE 1 (3 OF 3)
FIGURES 250, 350, AND 550 CONCENTRIC REDUCERS
NOMINAL DIMENSIONS

Nominal Pipe Size		Figure 501 Cast 45° Elbow		Figure 510 Cast 90° Elbow	
ANSI Inches (DN)	O.D. Inches (mm)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)
1 (25)	1.0 (33,7)	1.7 (43,2)	0.6 (0,3)	2.25 (57,2)	0.8 (0,4)
1-1/4 (32)	1.7 (42,4)	1.8 (44,5)	0.8 (0,4)	2.8 (69,9)	1.1 (0,5)
1-1/2 (40)	1.9 (48,3)	1.8 (44,5)	1.0 (0,5)	2.8 (69,9)	1.4 (0,6)
2 (50)	2.4 (60,3)	2.0 (50,8)	1.3 (0,6)	3.3 (82,6)	2.0 (0,9)
2-1/2 (65)	2.9 (73,0)	2.3 (57,2)	2.1 (1,0)	3.8 (95,3)	2.8 (1,3)
76,1mm (65)	3.0 (76,1)	2.3 (57,2)	2.2 (1,0)	3.8 (95,3)	3.0 (1,3)
3 (80)	3.5 (88,9)	2.5 (63,5)	3.4 (1,5)	4.3 (108,0)	4.1 (1,9)
4 (100)	4.5 (114,3)	3.0 (76,2)	5.5 (2,5)	5.0 (127,0)	7.0 (3,2)
139,7mm (125)	5.5 (139,7)	3.3 (82,6)	7.2 (3,3)	5.5 (139,7)	10.3 (4,7)
165,1mm (150)	6.5 (165,1)	3.5 (88,9)	9.2 (4,2)	6.5 (165,1)	13.9 (6,3)
6 (150)	6.6 (168,3)	3.5 (88,9)	11.2 (5,1)	6.5 (165,1)	15.2 (6,9)
8 (200)	8.6 (219,1)	4.25 (108,0)	20.6 (9,3)	7.8 (196,9)	29.6 (13,4)
267,4mm (250)	10.52 (267,4)	—	—	9.00 (228,6)	45.69 (20,72)
10 (250)	10.750 (273,0)	4.75 (120,7)	30.1 (13,7)	9.00 (228,6)	52.0 (23,6)
318,5mm (300)	12.54 (318,5)	—	—	10.00 (254,0)	61.86 (21,86)
12 (300)	12.750 (323,9)	5.25 (133,4)	48.0 (22,0)	10.00 (254,0)	66.4 (30,1)

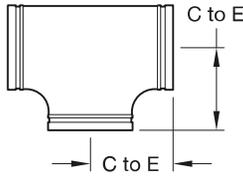


**FIGURE 501
CAST 45° ELBOW**

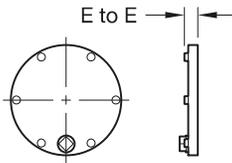


**FIGURE 510
CAST 90° ELBOW**

**FIGURE 2
FIGURES 501 AND 510 ELBOWS
NOMINAL DIMENSIONS**



**FIGURE 519
 CAST TEE**



**FIGURE 260^a
 CAST END CAP**

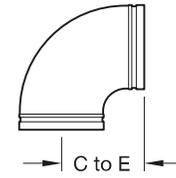
Nominal Pipe Size		Figure 519 Cast Tee		Figure 260 ^(a) Cast End Cap	
ANSI Inches (DN)	O.D. Inches (mm)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal E to E Inches (mm)	Approx. Weight Lbs. (kg)
1 (25)	1.3 (33,4)	2.25 (57,2)	1.1 (0,5)	0.8 (21,1)	0.2 (0,1)
1-1/4 (32)	1.7 (42,4)	2.8 (69,9)	1.7 (0,8)	0.8 (21,1)	0.3 (0,1)
1-1/2 (40)	1.9 (48,3)	2.8 (69,9)	2.1 (1,00)	0.8 (21,1)	0.4 (0,2)
2 (50)	2.4 (60,3)	3.3 (82,6)	2.8 (1,3)	0.9 (23,4)	0.7 (0,3)
2-1/2 (65)	2.9 (73,0)	3.8 (95,3)	4.4 (2,0)	0.9 (23,4)	1.0 (0,5)
76,1mm (65)	3.0 (76,1)	3.8 (95,3)	4.5 (2,0)	0.9 (21,8)	1.3 (0,6)
3 (80)	3.5 (88,9)	4.3 (108,0)	6.5 (3,0)	0.9 (23,4)	1.4 (0,6)
4 (100)	4.5 (114,3)	5.0 (127,0)	9.5 (4,3)	1.0 (25,4)	2.6 (1,2)
139,7mm (125)	5.5 (139,7)	5.5 (139,7)	13.9 (6,3)	0.9 (23,4)	4.7 (2,1)
5 (125)	5.6 (141,3)	5.0 (127,0)	14.2 (6,4)	1.0 (25,4)	5.0 (2,3)
165,1mm (150)	6.5 (165,1)	6.5 (165,1)	19.7 (8,9)	0.9 (23,4)	6.4 (2,9)
6 (150)	6.6 (168,3)	6.5 (165,1)	22.4 (10,2)	1.0 (25,4)	6.2 (2,8)
216,3mm (200)	8.52 (216,3)	—	—	1.06 (27,0)	11.02 (4,99)
8 (200)	8.6 (219,1)	7.8 (196,9)	39.8 (18,1)	1.1 (27,0)	7.1 (3,2)
267,4mm (250)	10.52 (267,4)	9.00 (228,6)	62.58 (28,39)	1.02 (25,78)	19.05 (8,64)
10 (250)	10.8 (273,0)	9.00 (228,6)	64.2 (29,1)	1.0 (25,8)	24.5 (11,1)
318,5mm (300)	12.54 (318,5)	10.00 (254,0)	82.79 (37,55)	1.02 (25,8)	28.82 (13,07)
12 (300)	12.8 (323,9)	10.00 (254,0)	110.0 (49,9)	1.02 (25,8)	31.0 (14,1)

NOTES

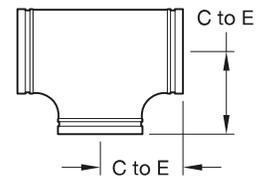
a. Available with tapped plugs. Contact Johnson Controls.

**FIGURE 3
 FIGURES 519 TEE AND FIGURE 260 END CAP
 NOMINAL DIMENSIONS**

Nominal Pipe Size		Figure 510S 90° Elbow		Figure 519S Tee	
ANSI Inches (DN)	O.D. Inches (mm)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)
2 (50)	2.4 (60,3)	2.8 (69,9)	1.5 (0,7)	2.8 (69,9)	2.6 (1,2)
2-1/2 (65)	2.9 (73,0)	3.0 (76,2)	2.1 (1,0)	3.0 (76,2)	4.4 (2,0)
76,1mm (65)	3.0 (76,1)	3.0 (76,2)	2.3 (1,0)	3.0 (76,2)	3.1 (1,4)
3 (80)	3.5 (88,9)	3.4 (85,9)	3.0 (1,4)	3.8 (85,9)	6.5 (3,0)
4 (100)	4.5 (114,3)	4.0 (101,6)	5.0 (2,3)	4.0 (101,6)	10.7 (4,9)
139,7mm (125)	5.5 (139,7)	4.9 (124,0)	8.7 (3,9)	4.9 (124,0)	10.9 (5,0)
5 (125)	5.6 (141,3)	4.8 (123,0)	9.4 (4,3)	4.8 (123,0)	11.6 (5,3)
165,1mm (150)	6.5 (165,1)	5.5 (139,7)	11.4 (5,2)	5.5 (139,7)	14.8 (6,7)
6 (150)	6.6 (168,3)	5.5 (139,7)	12.1 (5,5)	5.5 (139,7)	15.0 (6,8)
8 (200)	8.6 (219,1)	6.9 (174,8)	22.2 (10,1)	6.9 (174,8)	39.8 (18,1)

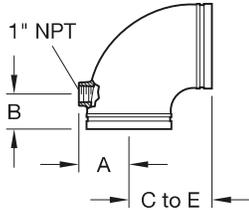


**FIGURE 510S
90° ELBOW
SHORT PATTERN**



**FIGURE 519S
TEE
SHORT PATTERN**

**FIGURE 4
FIGURES 510S ELBOW AND FIGURE 519S TEE
NOMINAL DIMENSIONS**

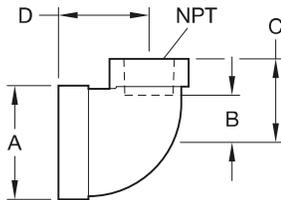


Nominal Pipe Size		Figure 510DE ^(a) 90° Drain Elbow			
ANSI Inches (DN)	O.D. Inches (mm)	Nominal C to E Inches (mm)	Nominal A Inches (mm)	Nominal B Inches (mm)	Approx. Weight Lbs. (kg)
2 (50)	2.4 (60,3)	3.8 (95,3)	2.0 (50,8)	2.8 (69,9)	3.1 (1,4)
2-1/2 (65)	2.9 (73,0)	3.8 (95,3)	2.0 (50,8)	2.8 (69,9)	2.2 (1,0)
3 (80)	3.5 (88,9)	4.3 (108,0)	2.3 (59,4)	2.8 (69,9)	6.0 (2,7)
4 (100)	4.5 (114,3)	5.0 (127,0)	2.9 (72,4)	2.8 (69,9)	8.6 (3,9)
6 (150)	6.6 (168,3)	6.5 (165,1)	3.9 (99,6)	2.8 (69,9)	18.0 (8,2)
8 (200)	8.6 (219,1)	7.8 (196,9)	5.00 (125,7)	2.8 (69,9)	31.0 (14,1)

NOTES

a. Figure 510DE not available for the EMEA market.

FIGURE 5
FIGURE 510DE 90° DRAIN ELBOW
NOMINAL DIMENSIONS



Nominal Pipe Size		Dimensions- Inches (mm)				Approx. Weight Lbs. (kg)
ANSI Inches (DN)	Outlet NPT ⁽¹⁾	A O.D.	B Takeout	C	D	
1-1/2 (40)	1/2	1.9 (48,3)	1.3 (31,8)	1.8 (44,5)	1.9 (48,0)	0.8 (0,4)
	3/4		1.3 (31,8)	1.8 (44,5)	1.9 (48,0)	0.8 (0,4)
	1		1.4 (34,8)	2.0 (50,8)	2.0 (51,3)	0.9 (0,4)
2 (50)	1/2	2.4 (60,3)	1.3 (31,8)	1.8 (44,5)	1.9 (48,0)	0.9 (0,4)
	3/4		1.3 (31,8)	1.8 (44,5)	1.9 (48,0)	0.8 (0,4)
	1		1.4 (34,8)	2.0 (50,8)	2.0 (51,3)	1.1 (0,5)
2-1/2 (65)	1/2	2.9 (73,0)	1.5 (37,3)	2.0 (50,0)	1.9 (48,0)	1.8 (0,8)
	3/4		1.5 (37,3)	2.0 (50,0)	1.9 (48,0)	1.1 (0,5)
	1		1.4 (34,8)	2.0 (50,8)	2.0 (51,3)	1.1 (0,5)

NOTES

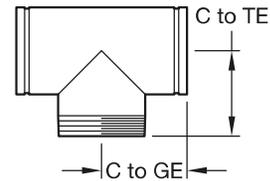
a. ISO threaded outlets are available upon request.

b. ADACAP not available for the EMEA market.

c. Rated pressure 300 psi (20,7 bar).

FIGURE 6
ADACAP
NOMINAL DIMENSIONS

Nominal Pipe Size		Figure 320 Fabricated Thread Tee		
ANSI Inches (DN)	O.D. Inches (mm)	Nominal C to GE Inches (mm)	Nominal C to TE Inches (mm)	Approx. Weight Lbs. (kg)
1 (25)	1.31 (33,4)	2.25 (57,2)	2.25 (57,2)	1.3 (0,6)
1-1/4 (32)	1.66 (42,4)	2.75 (69,9)	2.75 (69,9)	1.5 (0,7)
1-1/2 (40)	1.90 (48,3)	2.75 (69,9)	2.75 (69,9)	1.9 (0,9)
2 (50)	2.37 (60,3)	3.25 (82,6)	4.25 (108,0)	3.2 (1,5)
2-1/2 (65)	2.87 (73,0)	3.75 (95,3)	3.75 (95,3)	4.0 (1,8)
76,1mm (65)	3.00 (76,1)	3.75 (95,3)	3.75 (95,3)	4.5 (2,0)
3 (80)	3.50 (88,9)	4.25 (108,0)	6.00 (152,4)	6.0 (2,7)
4 (100)	4.50 (114,3)	5.00 (127,0)	7.25 (184,2)	11.0 (5,0)
139,7mm (125)	5.50 (139,7)	5.50 (139,7)	5.50 (139,7)	21.0 (9,5)
5 (125)	5.56 (141,3)	5.50 (139,7)	5.50 (139,7)	23.0 (10,5)
165,1mm (150)	6.50 (165,1)	6.50 (165,1)	6.50 (165,1)	25 (11,3)
6 (150)	6.63 (168,3)	6.50 (165,1)	6.50 (165,1)	28.0 (12,7)
8 (200)	8.63 (219,1)	7.75 (196,9)	7.75 (196,9)	38.7 (17,6)
10 (250)	10.75 (273,0)	9.00 (228,6)	9.00 (228,6)	72.1 (32,8)
12 (300)	12.75 (323,9)	10.00 (254,0)	10.00 (254,0)	92.5 (42,0)



NOTES

a. Figure 320 not available for the EMEA market.

FIGURE 7
FIGURE 320 FABRICATED GROOVE X GROOVE X MALE THREAD TEES (SEGMENT WELDED)
NOMINAL DIMENSIONS

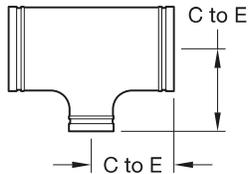


FIGURE 221
CAST TEE REDUCING
GROOVED
(SEGMENT WELDED)

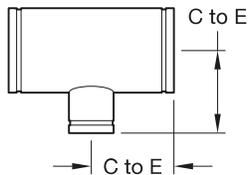
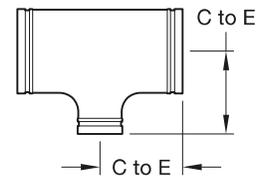


FIGURE 321
FABRICATED TEE REDUCING
GROOVED
(SEGMENT WELDED)

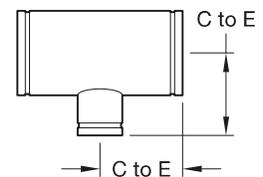
Nominal Pipe Size		Figure 221 Cast Reducing Tee		Figure 321 Fabricated Reducing Tee	
ANSI Inches (DN)	O.D. Inches (mm)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)
1-1/4 x 1-1/4 x 1 (32 x 32 x 25)	1.66 x 1.66 x 1.31 (42,4 x 42,4 x 33,4)	—	—	2.75 (69,9)	1.3 (0,6)
1-1/2 x 1-1/2 x 1 (40 x 40 x 25)	1.90 x 1.90 x 1.31 (48,3 x 48,3 x 33,4)	—	—	2.75 (69,9)	1.4 (0,6)
1-1/2 x 1-1/2 x 1-1/4 (40 x 40 x 32)	1.90 x 1.90 x 1.66 (48,3 x 48,3 x 42,4)	—	—	2.75 (69,9)	1.5 (0,7)
2 x 2 x 1 (50 x 50 x 25)	2.37 x 2.37 x 1.32 (60,3 x 60,3 x 33,4)	—	—	3.25 (82,6)	1.6 (0,7)
2 x 2 x 1-1/2 (50 x 50 x 40)	2.37 x 2.37 x 1.90 (60,3 x 60,3 x 48,3)	3.25 (82,6)	2.7 (1,2)	3.25 (82,6)	2.0 (0,9)
2-1/2 x 2-1/2 x 1 (65 x 65 x 25)	2.87 x 2.87 x 1.32 (73,0 x 73,0 x 33,4)	—	—	3.75 (95,3)	2.3 (1,1)
2-1/2 x 2-1/2 x 1-1/4 (65 x 65 x 32)	2.87 x 2.87 x 1.66 (73,0 x 73,0 x 42,4)	—	—	3.75 (95,3)	4.2 (1,9)
2-1/2 x 2-1/2 x 1-1/2 (65 x 65 x 40)	2.87 x 2.87 x 1.90 (73,0 x 73,0 x 48,3)	—	—	3.75 (95,3)	4.2 (1,9)
2-1/2 x 2-1/2 x 2 (65 x 65 x 50)	2.87 x 2.87 x 2.37 (73,0 x 73,0 x 60,3)	3.75 (95,3)	4.2 (1,9)	3.75 (95,3)	4.5 (2,0)
76,1mm x 76,1mm x 1 (65 x 65 x 25)	3.00 x 3.00 x 1.32 (76,1 x 76,1 x 33,4)	—	—	3.75 (95,3)	2.4 (1,1)
76,1mm x 76,1mm x 1-1/4 (65 x 65 x 32)	3.00 x 3.00 x 1.66 (76,1 x 76,1 x 42,4)	—	—	3.75 (95,3)	4.3 (2,0)
76,1mm x 76,1mm x 1-1/2 (65 x 65 x 40)	3.00 x 3.00 x 1.90 (76,1 x 76,1 x 48,3)	3.75 (95,3)	4.5 (2,0)	3.75 (95,3)	4.2 (1,9)
76,1mm x 76,1mm x 2 (65 x 65 x 50)	3.00 x 3.00 x 2.37 (76,1 x 76,1 x 60,3)	3.75 (95,3)	4.3 (2,0)	3.75 (95,3)	4.6 (2,1)
3 x 3 x 1 (80 x 80 x 25)	3.50 x 3.50 x 1.32 (88,9 x 88,9 x 33,4)	4.25 (108,0)	5.6 (2,5)	4.25 (108,0)	6.0 (2,7)
3 x 3 x 1-1/4 (80 x 80 x 32)	3.50 x 3.50 x 1.66 (88,9 x 88,9 x 42,4)	—	—	4.25 (108,0)	6.1 (2,8)
3 x 3 x 1-1/2 (80 x 80 x 40)	3.50 x 3.50 x 1.90 (88,9 x 88,9 x 48,3)	4.25 (108,0)	5.9 (2,7)	4.25 (108,0)	6.2 (2,8)
3 x 3 x 2 (80 x 80 x 50)	3.50 x 3.50 x 2.37 (88,9 x 88,9 x 60,3)	4.25 (108,0)	6.0 (2,7)	4.25 (108,0)	6.4 (2,9)
3 x 3 x 2-1/2 (80 x 80 x 65)	3.50 x 3.50 x 2.87 (88,9 x 88,9 x 73,0)	4.25 (108,0)	6.2 (2,8)	4.25 (108,0)	6.5 (2,9)
3 x 3 x 76,1mm (80 x 80 x 65)	3.50 x 3.50 x 3.00 (88,9 x 88,9 x 76,1)	4.25 (108,0)	6.0 (2,7)	4.25 (108,0)	6.7 (3,0)
4 x 4 x 1 (100 x 100 x 25)	4.50 x 4.50 x 1.32 (114,3 x 114,3 x 33,4)	—	—	5.00 (127,0)	8.0 (3,7)
4 x 4 x 1-1/4 (100 x 100 x 32)	4.50 x 4.50 x 1.66 (114,3 x 114,3 x 42,4)	—	—	5.00 (127,0)	9.8 (4,4)
4 x 4 x 1-1/2 (100 x 100 x 40)	4.50 x 4.50 x 1.90 (114,3 x 114,3 x 48,3)	—	—	5.00 (127,0)	9.9 (4,5)
4 x 4 x 2 (100 x 100 x 50)	4.50 x 4.50 x 2.37 (114,3 x 114,3 x 60,3)	5.00 (127,0)	9.1 (4,1)	5.00 (127,0)	11.0 (5,0)
4 x 4 x 2-1/2 (100 x 100 x 65)	4.50 x 4.50 x 2.88 (114,3 x 114,3 x 73,0)	5.00 (127,0)	9.5 (4,3)	5.00 (127,0)	11.2 (5,1)
4 x 4 x 76,1mm (125 x 125 x 65)	4.50 x 4.50 x 3.00 (114,3 x 114,3 x 76,1)	5.00 (127,0)	9.5 (4,3)	5.00 (127,0)	11.4 (5,2)

FIGURE 8 (1 OF 3)
FIGURES 221 AND 321 REDUCING TEES
NOMINAL DIMENSIONS

Nominal Pipe Size		Figure 221 Cast Reducing Tee		Figure 321 Fabricated Reducing Tee	
ANSI Inches (DN)	O.D. Inches (mm)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)
4 x 4 x 3 (100 x 100 x 80)	4.50 x 4.50 x 3.50 (114,3 x 114,3 x 88,9)	5,00 (127,0)	9.7 (4,4)	5,00 (127,0)	11.6 (5,3)
139,7mm x 139,7mm x 3 (125 x 125 x 80)	5.50 x 5.50 x 3.50 (139,7 x 139,7 x 88,9)	5,50 (139,7)	12.7 (5,8)	5,50 (139,7)	12.2 (5,5)
139,7mm x 139,7mm x 4 (125 x 125 x 100)	5.50 x 5.50 x 4.50 (139,7 x 139,7 x 114,3)	5,50 (139,7)	13.4 (6,1)	5,50 (139,7)	12.5 (5,7)
5 x 5 x 1 (125 x 125 x 25)	5.56 x 5.56 x 1.31 (141,3 x 141,3 x 33,4)	—	—	5,50 (139,7)	13.0 (5,9)
5 x 5 x 1-1/2 (125 x 125 x 40)	5.56 x 5.56 x 1.90 (141,3 x 141,3 x 48,3)	—	—	5,50 (139,7)	13.4 (6,1)
5 x 5 x 2 (125 x 125 x 50)	5.56 x 5.56 x 2.37 (141,3 x 141,3 x 60,3)	—	—	5,50 (139,7)	14.1 (6,4)
5 x 5 x 2-1/2 (125 x 125 x 65)	5.56 x 5.56 x 2.87 (141,3 x 141,3 x 73,0)	5,50 (139,7)	18.0 (8,2)	5,50 (139,7)	14.8 (6,7)
5 x 5 x 76,1mm (125 x 125 x 65)	5.56 x 5.56 x 3.00 (141,3 x 141,3 x 76,1)	—	—	5,50 (139,7)	15.3 (6,9)
5 x 5 x 3 (125 x 125 x 80)	5.56 x 5.56 x 3.50 (141,3 x 141,3 x 88,9)	5,50 (139,7)	14.0 (6,4)	5,50 (139,7)	16.0 (7,3)
5 x 5 x 4 (125 x 125 x 100)	5.56 x 5.56 x 4.50 (141,3 x 141,3 x 114,3)	5,50 (139,7)	13.9 (6,3)	5,50 (139,7)	16.4 (7,4)
165,1mm x 165,1mm x 3 (150 x 150 x 80)	6.50 x 6.50 x 3.50 (165,1 x 165,1 x 88,9)	6,50 (165,1)	18.0 8,2	6,50 (165,1)	22.0 (10,0)
165,1mm x 165,1mm x 4 (150 x 150 x 100)	6.50 x 6.50 x 4.50 (165,1 x 165,1 x 114,3)	6,50 (165,1)	19.5 8,9	6,50 (165,1)	22.6 (10,3)
165,1mm x 165,1mm x 5 (150 x 150 x 125)	6.50 x 6.50 x 5.50 (165,1 x 165,1 x 139,7)	—	—	6,50 (165,1)	23.2 (10,5)
165,1mm x 165,1mm x 139,7mm (150 x 150 x 125)	6.50 x 6.50 x 5.50 (165,1 x 165,1 x 141,3)	—	—	6,50 (165,1)	22.9 (10,4)
6 x 6 x 1 (150 x 150 x 25)	6.63 x 6.63 x 1.31 (168,3 x 168,3 x 33,4)	—	—	6,50 (165,1)	22.8 (10,3)
6 x 6 x 1-1/2 (150 x 150 x 40)	6.63 x 6.63 x 1.90 (168,3 x 168,3 x 48,3)	—	—	6,50 (165,1)	22.9 (10,4)
6 x 6 x 2 (150 x 150 x 50)	6.63 x 6.63 x 2.37 (168,3 x 168,3 x 60,3)	6,50 (165,1)	19.4 (8,8)	6,50 (165,1)	23.0 (10,4)
6 x 6 x 2-1/2 (150 x 150 x 65)	6.63 x 6.63 x 2.87 (168,3 x 168,3 x 73,0)	6,50 (165,1)	21.2 (9,8)	6,50 (165,1)	23.4 (10,6)
6 x 6 x 76,1mm (150 x 150 x 65)	6.63 x 6.63 x 3.00 (168,3 x 168,3 x 76,1)	6,50 (165,1)	21.2 9,8	6,50 (165,1)	23.5 (10,7)
6 x 6 x 3 (150 x 150 x 80)	6.63 x 6.63 x 3.50 (168,3 x 168,3 x 88,9)	6,50 (165,1)	21.0 (9,5)	6,50 (165,1)	23.7 (10,7)
6 x 6 x 4 (150 x 150 x 100)	6.63 x 6.63 x 4.50 (168,3 x 168,3 x 114,3)	6,50 (165,1)	21.8 (9,9)	6,50 (165,1)	23.9 (10,8)
6 x 6 x 139,7mm (150 x 150 x 125)	6.63 x 6.63 x 5.50 (168,3 x 168,3 x 139,7)	6,50 (165,1)	23.0 10,4	6,50 (165,1)	24.0 (10,9)
6 x 6 x 5 (150 x 150 x 125)	6.63 x 6.63 x 5.56 (168,3 x 168,3 x 141,3)	—	—	6,50 (165,1)	27.0 12,2
8 x 8 x 1-1/2 (200 x 200 x 40)	8.63 x 8.63 x 1.90 (219,1 x 219,1 x 48,3)	—	—	7,75 (196,9)	36.0 (16,3)
8 x 8 x 2 (200 x 200 x 50)	8.63 x 8.63 x 2.375 (219,1 x 219,1 x 60,3)	—	—	7,75 (196,9)	36.2 (16,4)



**FIGURE 221
CAST TEE REDUCING
GROOVED
(SEGMENT WELDED)**



**FIGURE 321
FABRICATED TEE REDUCING
GROOVED
(SEGMENT WELDED)**

**FIGURE 8 (2 OF 3)
FIGURES 221 AND 321 REDUCING TEES
NOMINAL DIMENSIONS**

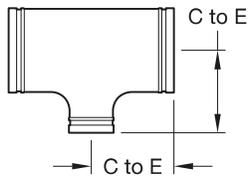


FIGURE 221
CAST TEE REDUCING
GROOVED
(SEGMENT WELDED)

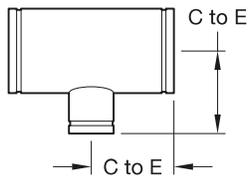


FIGURE 321
FABRICATED TEE REDUCING
GROOVED
(SEGMENT WELDED)

Nominal Pipe Size		Figure 221 Cast Reducing Tee		Figure 321 Fabricated Reducing Tee	
ANSI Inches (DN)	O.D. Inches (mm)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)
8 x 8 x 2-1/2 (200 x 200 x 65)	8.63 x 8.63 x 2.88 (219,1 x 219,1 x 73,0)	—	—	7.75 (196,9)	36.4 (16,5)
216mm x 216mm x 165,1mm (200 x 200 x 150)	8.52 x 8.52 x 6.50 (216,3 x 216,3 x 165,1)	—	—	7.75 (196,9)	37.9 (17,2)
8 x 8 x 76,1mm (200 x 200 x 65)	8.63 x 8.63 x 3.00 (216,1 x 219,1 x 76,1)	—	—	7.75 (196,9)	36.4 (16,5)
8 x 8 x 3 (200 x 200 x 80)	8.63 x 8.63 x 3.50 (219,1 x 219,1 x 88,9)	—	—	7.75 (196,9)	36.5 (16,6)
8 x 8 x 4 (200 x 200 x 100)	8.63 x 8.63 x 4.50 (219,1 x 219,1 x 114,1)	7.75 (196,9)	37.2 (16,9)	7.75 (196,9)	36.4 (16,5)
8 x 8 x 139,7mm (200 x 200 x 125)	8.63 x 8.63 x 5.56 (219,1 x 219,1 x 139,7)	7.75 (196,9)	37.7 (17,1)	7.75 (196,9)	36.7 (16,6)
8 x 8 x 5 (200 x 200 x 125)	8.63 x 8.63 x 5.50 (219,1 x 219,1 x 141,3)	—	—	7.75 (196,9)	36.8 (16,7)
8 x 8 x 165,1mm (200 x 200 x 150)	8.63 x 8.63 x 6.50 (219,1 x 219,1 x 165,1)	7.75 (196,9)	37.7 (17,1)	7.75 (196,9)	39.0 (17,7)
10 x 10 x 1-1/2 (250 x 250 x 40)	10.75 x 10.75 x 1.90 (273,0 x 273,0 x 48,3)	—	—	9.00 (228,6)	57.0 (25,8)
10 x 10 x 2 (250 x 250 x 50)	10.75 x 10.75 x 2.37 (273,0 x 273,0 x 60,3)	—	—	9.00 (228,6)	57.1 (25,9)
10 x 10 x 2-1/2 (250 x 250 x 65)	10.75 x 10.75 x 2.87 (273,0 x 273,0 x 73,0)	—	—	9.00 (228,6)	57.3 (26,0)
10 x 10 x 3 (250 x 250 x 80)	10.75 x 10.75 x 3.50 (273,0 x 273,0 x 88,9)	—	—	9.00 (228,6)	57.4 (26,0)
10 x 10 x 4 (250 x 250 x 100)	10.75 x 10.75 x 4.50 (273,0 x 273,0 x 114,3)	—	—	9.00 (228,6)	57.8 (26,2)
10 x 10 x 5 (250 x 250 x 125)	10.75 x 10.75 x 5.56 (273,0 x 273,0 x 141,3)	—	—	9.00 (228,6)	58.0 (26,3)
10 x 10 x 6 (250 x 250 x 150)	10.75 x 10.75 x 6.63 (273,0 x 273,0 x 168,3)	—	—	9.00 (228,6)	62.0 (28,1)
10 x 10 x 8 (250 x 250 x 200)	10.75 x 10.75 x 8.63 (273,0 x 273,0 x 219,1)	—	—	9.00 (228,6)	63.0 (28,6)
12 x 12 x 1 (300 x 300 x 25)	12.75 x 12.75 x 1.31 (323,9 x 323,9 x 33,4)	—	—	10.00 (254,0)	64.0 (29,0)
12 x 12 x 2 (300 x 300 x 50)	12.75 x 12.75 x 2.37 (323,9 x 323,9 x 60,3)	—	—	10.00 (254,0)	69.5 (31,5)
12 x 12 x 2-1/2 (300 x 300 x 65)	12.75 x 12.75 x 2.87 (323,9 x 323,9 x 73,0)	—	—	10.00 (254,0)	75.6 (34,3)
12 x 12 x 3 (300 x 300 x 80)	12.75 x 12.75 x 3.50 (323,9 x 323,9 x 88,9)	—	—	10.00 (254,0)	80.2 (36,4)
12 x 12 x 4 (300 x 300 x 100)	12.75 x 12.75 x 4.50 (323,9 x 323,9 x 114,3)	—	—	10.00 (254,0)	80.5 (36,5)
12 x 12 x 5 (300 x 300 x 125)	12.75 x 12.75 x 5.56 (323,9 x 323,9 x 141,3)	—	—	10.00 (254,0)	80.7 (36,6)
12 x 12 x 6 (300 x 300 x 150)	12.75 x 12.75 x 6.63 (323,9 x 323,9 x 168,3)	—	—	10.00 (254,0)	80.9 (36,7)
12 x 12 x 165,1mm (300 x 300 x 150)	12.75 x 12.75 x 6.50 (323,9 x 323,9 x 165,1)	—	—	10.00 (254,0)	79.9 (36,2)
12 x 12 x 8 (300 x 300 x 200)	12.75 x 12.75 x 8.63 (323,9 x 323,9 x 219,1)	—	—	10.00 (254,0)	76.3 (34,6)
12 x 12 x 10 (300 x 300 x 250)	12.75 x 12.75 x 10.75 (323,9 x 323,9 x 273,0)	—	—	10.00 (254,0)	77.6 (35,2)

FIGURE 8 (3 OF 3)
FIGURES 221 AND 321 REDUCING TEES
NOMINAL DIMENSIONS

Nominal Pipe Size		Figure 327(a)		Figure 341(a)			Figure 342(a)		
ANSI Inches (DN)	O.D. Inches (mm)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal E to E Inches (mm)	Mating Flange Bolt Qty.	Approx. Weight Lbs. (kg)	Nominal E to E Inches (mm)	Mating Flange Bolt Qty.	Approx. Weight Lbs. (kg)
1 (25)	1.31 (33,4)	2.25 (57,2)	2.2 (1,0)	3.00 (76,2)	4	2.3 (1,0)	3.00 (76,2)	4	4.0 (1,8)
1-1/4 (32)	1.66 (42,4)	2.75 (69,9)	2.2 (1,0)	4.00 (101,6)	4	2.8 (1,3)	4.00 (101,6)	4	4.6 (2,1)
1-1/2 (40)	1.90 (48,3)	2.75 (69,9)	2.5 (1,1)	4.00 (101,6)	4	3.2 (1,5)	4.00 (101,6)	4	7.1 (3,2)
2 (50)	2.37 (60,3)	3.25 (82,6) ^b	3.7 (1,7) ^b	4.00 (101,6)	4	5.2 (2,4)	4.00 (101,6)	8	8.2 (3,7)
2-1/2 (65)	2.87 (73,0)	3.75 (95,3) ^b	5.8 (2,6) ^b	4.00 (101,6)	4	8.0 (3,6)	4.00 (101,6)	8	11.9 (5,4)
76,1mm (65)	3.00 (76,1)	3.75 (95,3)	6.0 (2,7)	4.00 (101,6)	4	8.8 (4,0)	4.00 (101,6)	8	12.5 (5,7)
3 (80)	3.50 (88,9)	4.25 (108,0)	8.6 (3,9)	4.00 (101,6)	4	10.2 (4,6)	4.00 (101,6)	8	15.5 (7,0)
4 (100)	4.50 (114,3)	5.00 (127,0) ^b	20.7 (9,4) ^b	6.00 (152,4)	8	17.2 (7,8)	6.00 (152,4)	8	28.0 (12,7)
139,7mm (125)	5.50 (139,7)	5.50 (139,7)	18.3 (8,3)	6.00 (152,4)	8	18.5 (8,4)	6.00 (152,4)	8	32.5 (14,7)
5 (125)	5.56 (141,3)	5.50 (139,7)	18.5 (8,4)	6.00 (152,4)	8	21.4 (9,7)	6.00 (152,4)	8	37.0 (16,8)
165,1mm (150)	6.50 (165,1)	6.50 (165,1)	26.2 (11,9)	6.00 (152,4)	8	22.0 (10,0)	6.00 (152,4)	12	42.5 (19,3)
6 (150)	6.63 (168,3)	6.50 (165,1)	27.3 (12,4)	6.00 (152,4)	8	26.0 (11,8)	6.00 (152,4)	12	48.0 (21,8)
216,3mm (200)	8.52 (216,3)	7.75 (196,9)	44.0 (20,0)	6.00 (152,4)	8	34.5 (15,6)	6.00 (152,4)	12	72.5 (32,9)
8 (200)	8.63 (219,1)	7.75 (196,9)	48.0 (21,7)	6.00 (152,4)	8	38.4 (17,4)	6.00 (152,4)	12	79.0 (35,8)
10 (250)	10.75 (273,0)	9.00 (228,6)	75.0 (34,0)	8.00 (203,2)	12	65.0 (29,5)	8.00 (203,2)	16	122.0 (55,3)
12 (300)	12.75 (323,9)	10.00 (254,0)	95.8 (43,4)	8.00 (203,2)	12	91.0 (41,3)	8.00 (203,2)	16	183.0 (83,0)

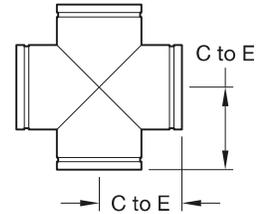


FIGURE 327^a
FABRICATED CROSS
GROOVED
(SEGMENT WELDED)

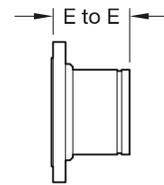


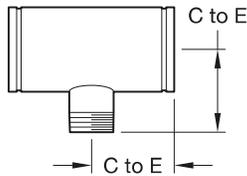
FIGURE 341^a
FABRICATED
FLANGE ADAPTER
ANSI CLASS 150 LBS.
GROOVED

FIGURE 342^a
FABRICATED
FLANGE ADAPTER
ANSI CLASS 300 LBS.
GROOVED

NOTES

- a. Figure 327, Figure 341, and Figure 342 are not available for the EMEA market.
b. Figure 227

FIGURE 9
FIGURE 327 CROSS AND FIGURE 341 AND FIGURE 342 FLANGE ADAPTERS
NOMINAL DIMENSIONS

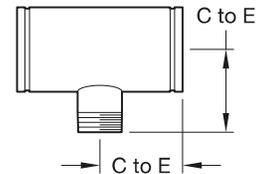


Nominal Pipe Size		Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)
ANSI Inches (DN)	O.D. Inches (mm)		
2 x 2 x 3/4 (50 x 50 x 20)	2.37 x 2.37 x 1.05 (60,3 x 60,3 x 26,7)	3.25 (82,6)	2.0 (0,9)
2 x 2 x 1 (50 x 50 x 25)	2.37 x 2.37 x 1.31 (60,3 x 60,3 x 33,4)	3.25 (82,6)	2.2 (1,0)
2 x 2 x 1-1/4 (50 x 50 x 32)	2.37 x 2.37 x 1.66 (60,3 x 60,3 x 42,4)	3.25 (82,6)	2.3 (1,0)
2 x 2 x 1-1/2 (50 x 50 x 40)	2.37 x 2.37 x 1.90 (60,3 x 60,3 x 48,3)	3.25 (82,6)	1.4 (1,1)
2-1/2 x 2-1/2 x 1 (65 x 65 x 25)	2.875 x 2.875 x 1.315 (73,0 x 73,0 x 33,4)	3.75 (95,3)	3.6 (1,6)
2-1/2 x 2-1/2 x 1-1/4 (65 x 65 x 32)	2.875 x 2.875 x 1.660 (73,0 x 73,0 x 42,4)	3.75 (95,3)	3.8 (1,7)
2-1/2 x 2-1/2 x 1-1/2 (65 x 65 x 40)	2.875 x 2.875 x 1.900 (73,0 x 73,0 x 48,3)	3.75 (95,3)	4.0 (1,8)
2-1/2 x 2-1/2 x 2 (65 x 65 x 50)	2.875 x 2.875 x 2.375 (73,0 x 73,0 x 60,3)	3.75 (95,3)	4.2 (1,9)
76,1mm x 76,1mm x 1 (65 x 65 x 25)	3.00 x 3.00 x 1.31 (76,1 x 76,1 x 33,4)	3.75 (95,3)	3.8 (1,7)
76,1mm x 76,1mm x 1-1/4 (65 x 65 x 32)	3.00 x 3.00 x 1.66 (76,1 x 76,1 x 42,4)	3.75 (95,3)	4.0 (1,8)
76,1mm x 76,1mm x 1-1/2 (65 x 65 x 40)	3.00 x 3.00 x 1.90 (76,1 x 76,1 x 48,3)	3.75 (95,3)	4.2 (1,9)
3 x 3 x 3/4 (80 x 80 x 20)	3.50 x 3.50 x 1.05 (88,9 x 88,9 x 26,7)	4.25 (108,0)	5.2 (2,4)
3 x 3 x 1 (80 x 80 x 25)	3.50 x 3.50 x 1.31 (88,9 x 88,9 x 33,4)	4.25 (108,0)	5.7 (2,6)
3 x 3 x 1-1/2 (80 x 80 x 40)	3.50 x 3.50 x 1.90 (88,9 x 88,9 x 48,3)	4.25 (108,0)	5.8 (2,6)
3 x 3 x 2 (80 x 80 x 50)	3.50 x 3.50 x 2.37 (88,9 x 88,9 x 60,3)	4.25 (108,0)	5.9 (2,7)
3 x 3 x 2-1/2 (80 x 80 x 65)	3.50 x 3.50 x 2.87 (88,9 x 88,9 x 73,0)	4.25 (108,0)	6.3 (2,9)
3 x 3 x 76,1mm (80 x 80 x 65)	3.50 x 3.50 x 3.00 (88,9 x 88,9 x 76,1)	4.25 (108,0)	6.5 (2,9)
4 x 4 x 3/4 (100 x 100 x 20)	4.50 x 4.50 x 1.05 (114,3 x 114,3 x 26,7)	3.75 (95,3)	6.4 (2,9)
4 x 4 x 1 (100 x 100 x 25)	4.50 x 4.50 x 1.31 (114,3 x 114,3 x 33,4)	5.00 (127,0)	6.9 (3,1)
4 x 4 x 1-1/4 (100 x 100 x 32)	4.50 x 4.50 x 1.66 (114,3 x 114,3 x 42,4)	5.00 (127,0)	7.6 (3,4)
4 x 4 x 1-1/2 (100 x 100 x 40)	4.50 x 4.50 x 1.90 (114,3 x 114,3 x 48,3)	5.00 (127,0)	8.3 (3,8)
4 x 4 x 2 (100 x 100 x 50)	4.50 x 4.50 x 2.37 (114,3 x 114,3 x 60,3)	5.00 (127,0)	9.6 (4,4)
4 x 4 x 2-1/2 (100 x 100 x 65)	4.500 x 4.500 x 2.875 (114,3 x 114,3 x 73,0)	5.00 (127,0)	10.0 (4,5)
4 x 4 x 76,1mm (100 x 100 x 65)	4.500 x 4.500 x 3.00 (114,3 x 114,3 x 76,1)	5.00 (127,0)	10.5 (4,8)

NOTES
a. Figure 323 not available for the EMEA market.

FIGURE 10 (1 OF 3)
FIGURE 323 FABRICATED GROOVE X GROOVE X MALE THREAD REDUCING TEES (SEGMENT WELDED)
NOMINAL DIMENSIONS

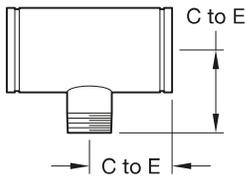
Nominal Pipe Size		Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)
ANSI Inches (DN)	O.D. Inches (mm)		
4 x 4 x 3 (100 x 100 x 80)	4.50 x 4.50 x 3.50 (114,3 x 114,3 x 88,9)	5.00 (127,0)	10,3 (4,7)
5 x 5 x 2 (125 x 125 x 50)	5.56 x 5.56 x 2.37 (141,3 x 141,3 x 60,3)	5.50 (139,7)	14,0 (6,4)
5 x 5 x 2-1/2 (125 x 125 x 65)	5.56 x 5.56 x 2.87 (141,3 x 141,3 x 73,0)	5.50 (139,7)	14,3 (6,5)
5 x 5 x 76,1mm (125 x 125 x 65)	5.56 x 5.56 x 3.00 (141,3 x 141,3 x 76,1)	5.50 (139,7)	14,5 (6,6)
5 x 5 x 3 (125 x 125 x 80)	5.56 x 5.56 x 3.50 (141,3 x 141,3 x 88,9)	5.50 (139,7)	14,6 (6,6)
5 x 5 x 4 (125 x 125 x 100)	5.56 x 5.56 x 4.50 (141,3 x 141,3 x 114,3)	5.50 (139,7)	15,1 (6,8)
165,1mm x 165,1mm x 2 (150 x 150 x 50)	6.50 x 6.50 x 2.37 (165,1 x 165,1 x 60,3)	6.50 (165,1)	9,5 (4,3)
165,1mm x 165,1mm x 2-1/2 (150 x 150 x 65)	6.50 x 6.50 x 2.875 (165,1 x 165,1 x 73,0)	6.50 (165,1)	9,7 (4,4)
165,1mm x 165,1mm x 76,1mm (150 x 150 x 65)	6.50 x 6.50 x 3.00 (165,1 x 165,1 x 76,1)	6.50 (165,1)	9,7 (4,4)
165,1mm x 165,1mm x 3 (150 x 150 x 80)	6.50 x 6.50 x 3.50 (165,1 x 165,1 x 88,9)	6.50 (165,1)	9,8 (4,4)
165,1mm x 165,1mm x 4 (150 x 150 x 100)	6.50 x 6.50 x 4.50 (165,1 x 165,1 x 114,3)	6.50 (165,1)	10,0 (4,5)
165,1mm x 165,1mm x 5 (150 x 150 x 125)	6.50 x 6.50 x 5.563 (165,1 x 165,1 x 141,3)	6.50 (165,1)	10,2 (4,6)
6 x 6 x 1-1/2 (150 x 150 x 40)	6.625 x 6.625 x 1.90 (168,3 x 168,3 x 48,3)	6.50 (165,1)	19,0 (8,6)
6 x 6 x 2 (150 x 150 x 50)	6.625 x 6.625 x 2.375 (168,3 x 168,3 x 60,3)	6.50 (165,1)	21,3 (9,7)
6 x 6 x 2-1/2 (150 x 150 x 65)	6.625 x 6.625 x 2.875 (168,3 x 168,3 x 73,0)	6.50 (165,1)	21,7 (9,8)
6 x 6 x 76,1mm (150 x 150 x 65)	6.625 x 6.625 x 3.00 (168,3 x 168,3 x 76,1)	6.50 (165,1)	14,5 (6,6)
6 x 6 x 3 (150 x 150 x 80)	6.625 x 6.625 x 3.500 (168,3 x 168,3 x 88,9)	6.50 (165,1)	22,0 (10,0)
6 x 6 x 4 (150 x 150 x 100)	6.625 x 6.625 x 4.500 (168,3 x 168,3 x 114,3)	6.50 (165,1)	22,5 (10,2)
6 x 6 x 5 (150 x 150 x 125)	6.625 x 6.625 x 5.563 (168,3 x 168,3 x 141,3)	6.50 (165,1)	23,1 10,5
8 x 8 x 2 (200 x 200 x 50)	8.63 x 8.63 x 2.37 (219,1 x 219,1 x 60,3)	7.75 (196,9)	32,7 (14,8)
8 x 8 x 3 (200 x 200 x 80)	8.63 x 8.63 x 3.50 (219,1 x 219,1 x 88,9)	7.75 (196,9)	33,5 (15,2)
8 x 8 x 4 (200 x 200 x 100)	8.63 x 8.63 x 4.50 (219,1 x 219,1 x 114,1)	7.75 (196,9)	34,5 (15,6)
8 x 8 x 5 (200 x 200 x 125)	8.63 x 8.63 x 5.56 (219,1 x 219,1 x 141,3)	7.75 (196,9)	34,7 (15,7)



NOTES

a. Figure 323 not available for the EMEA market.

**FIGURE 10 (2 OF 3)
FIGURE 323 FABRICATED GROOVE X GROOVE X MALE THREAD REDUCING TEES (SEGMENT WELDED)
NOMINAL DIMENSIONS**



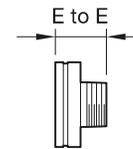
Nominal Pipe Size		Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)
ANSI Inches (DN)	O.D. Inches (mm)		
8 x 8 x 165,1mm (200 x 200 x 150)	8.63 x 8.63 x 6.50 (219,1 x 219,1 x 165,1)	7.75 (196,9)	35.0 (15,9)
8 x 8 x 6 (200 x 200 x 150)	8.63 x 8.63 x 6.63 (219,1 x 219,1 x 168,3)	7.75 (196,9)	35.6 (16,1)
10 x 10 x 2 (250 x 250 x 50)	10.75 x 10.75 x 2.37 (273,0 x 273,0 x 60,3)	9.00 (228,6)	52.2 (23,7)
10 x 10 x 3 (250 x 250 x 80)	10.75 x 10.75 x 3.50 (273,0 x 273,0 x 88,9)	9.00 (228,6)	53.0 (24,0)
10 x 10 x 4 (250 x 250 x 100)	10.75 x 10.75 x 4.50 (273,0 x 273,0 x 114,3)	9.00 (228,6)	53.6 (24,3)
10 x 10 x 5 (250 x 250 x 125)	10.75 x 10.75 x 5.56 (273,0 x 273,0 x 141,3)	9.00 (228,6)	54.2 (24,6)
10 x 10 x 165,1mm (250 x 250 x 150)	10.75 x 10.75 x 6.50 (273,0 x 273,0 x 165,1)	9.00 (228,6)	55.5 (25,2)
10 x 10 x 6 (250 x 250 x 150)	10.75 x 10.75 x 6.63 (273,0 x 273,0 x 168,3)	9.00 (228,6)	54.9 (24,9)
10 x 10 x 8 (250 x 250 x 200)	10.75 x 10.75 x 8.63 (273,0 x 273,0 x 219,1)	9.00 (228,6)	55.3 (25,1)
12 x 12 x 3 (300 x 300 x 80)	12.75 x 12.75 x 3.50 (323,9 x 323,9 x 88,9)	10.00 (254,0)	74.6 (33,8)
12 x 12 x 4 (300 x 300 x 100)	12.75 x 12.75 x 4.50 (323,9 x 323,9 x 141,3)	10.00 (254,0)	75.1 (34,1)
12 x 12 x 5 (300 x 300 x 125)	12.75 x 12.75 x 5.563 (323,9 x 323,9 x 114,3)	10.00 (254,0)	75.6 (34,3)
12 x 12 x 165,1mm (300 x 300 x 150)	12.75 x 12.75 x 6.50 (323,9 x 323,9 x 165,1)	10.00 (254,0)	76.2 (34,6)
12 x 12 x 6 (300 x 300 x 150)	12.75 x 12.75 x 6.625 (323,9 x 323,9 x 168,3)	10.00 (254,0)	76.2 (34,6)
12 x 12 x 8 (300 x 300 x 200)	12.750 x 12.750 x 8.625 (323,9 x 323,9 x 219,1)	10.00 (254,0)	76.3 (34,6)
12 x 12 x 10 (300 x 300 x 250)	12.750 x 12.750 x 10.750 (323,9 x 323,9 x 273,0)	10.00 (254,0)	77.6 (35,2)

NOTES

a. Figure 323 not available for the EMEA market.

FIGURE 10 (3 OF 3)
FIGURE 323 FABRICATED GROOVE X GROOVE X MALE THREAD REDUCING TEES (SEGMENT WELDED)
NOMINAL DIMENSIONS

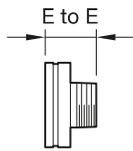
Nominal Pipe Size		E to E Inches (mm)	Approx. Weight Lbs. (kg)
ANSI Inches (DN)	Pipe O.D. Inches (mm)		
1-1/2 x 1 (40 x 25)	1.90 x 1.31 (48,3 x 33,7)	2.50 (63,5)	0.6 (0,3)
2 x 3/4 (50 x 20)	2.37 x 1.05 (60,3 x 26,7)	2.50 (63,5)	1.0 (0,5)
2 x 1 (50 x 25)	2.37 x 1.31 (60,3 x 33,4)	2.50 (63,5)	0.8 (0,4)
2 x 1-1/4 (50 x 32)	2.37 x 1.66 (60,3 x 42,4)	2.50 (63,5)	0.8 (0,4)
2 x 1-1/2 (50 x 40)	2.37 x 1.90 (60,3 x 48,3)	2.50 (63,5)	0.8 (0,4)
2-1/2 x 1 (65 x 25)	2.87 x 1.31 (73,0 x 33,4)	2.50 (63,5)	0.9 (0,4)
2-1/2 x 1-1/4 (65 x 32)	2.87 x 1.66 (73,0 x 42,4)	2.50 (63,5)	1.0 (0,5)
2-1/2 x 1-1/2 (65 x 40)	2.87 x 1.90 (73,0 x 48,3)	2.50 (63,5)	1.3 (0,6)
2-1/2 x 2 (65 x 50)	2.87 x 2.37 (73,0 x 60,3)	2.50 (63,5)	1.2 (0,5)
76,1mm x 1-1/4 (65 x 32)	3.00 x 1.66 (76,1 x 42,4)	2.50 (63,5)	1.0 (0,5)
76,1mm x 1-1/2 (65 x 40)	3.00 x 1.90 (76,1 x 48,3)	2.50 (63,5)	1.1 (0,5)
76,1mm x 2 (65 x 50)	3.00 x 2.37 (76,1 x 60,3)	2.50 (63,5)	1.2 (0,5)
3 x 3/4 (80 x 20)	3.50 x 1.05 (88,9 x 26,7)	2.50 (63,5)	1.1 (0,5)
3 x 1 (80 x 25)	3.50 x 1.31 (88,9 x 33,4)	2.50 (63,5)	1.3 (0,6)
3 x 1-1/4 (80 x 32)	3.50 x 1.66 (88,9 x 42,4)	2.5 (63,5)	1.3 (0,6)
3 x 1-1/2 (80 x 40)	3.50 x 1.90 (88,9 x 48,3)	2.50 (63,5)	1.3 (0,6)
3 x 2 (80 x 50)	3.50 x 2.37 (88,9 x 60,3)	2.50 (63,5)	1.3 (0,6)
3 x 2-1/2 (80 x 65)	3.50 x 2.87 (88,9 x 73,0)	2.50 (63,5)	1.5 (0,7)
3 x 76,1mm (80 x 65)	3.50 x 3,00 (88,9 x 76,1)	2.50 (63,5)	1.5 (0,7)
4 x 1 (100 x 25)	4.50 x 1.31 (114,3 x 33,4)	3.00 (76,2)	1.8 (0,8)
4 x 1-1/4 (100 x 32)	4.50 x 1.66 (114,3 x 42,4)	3.00 (76,2)	2.0 (0,9)
4 x 1-1/2 (100 x 40)	4.50 x 1.90 (114,3 x 48,3)	3.00 (76,2)	2.3 (1,0)
4 x 2 (100 x 50)	4.50 x 2.37 (114,3 x 60,3)	3.00 (76,2)	2.3 (1,0)
4 x 2-1/2 (100 x 65)	4.50 x 2.87 (114,3 x 73,0)	3.00 (76,2)	2.3 (1,0)



NOTES

a. Figure 372 not available for the EMEA market.

FIGURE 11 (1 OF 2)
FIGURE 372 FABRICATED CONCENTRIC REDUCER GROOVE X MALE THREAD (MPT)
NOMINAL DIMENSIONS

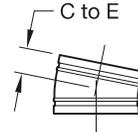


Nominal Pipe Size		E to E Inches (mm)	Approx. Weight Lbs. (kg)
ANSI Inches (DN)	Pipe O.D. Inches (mm)		
4 x 3 (100 x 80)	4.50 x 3.50 (114,3 x 88,9)	3.00 (76,2)	2.6 (1,2)
5 x 4 (125 x 100)	5.56 x 4.50 (141,3 x 114,3)	3.50 (88,9)	4.5 (2,0)
165,1mm x 1 (150 x 25)	6.50 x 1.31 (165,1 x 33,4)	4.00 (101,6)	1.2 (0,5)
165,1mm x 2 (150 x 50)	6.50 x 2.37 (165,1 x 60,3)	4.00 (101,6)	5.5 (2,5)
165,1mm x 76,1mm (150 x 65)	6.50 x 3.00 (165,1 x 76,1)	4.00 (101,6)	5.7 (2,6)
165,1mm x 3 (150 x 50)	6.50 x 3.50 (165,1 x 88,9)	4.00 (101,6)	5.8 (2,6)
165,1mm x 4 (150 x 50)	6.50 x 4.50 (165,1 x 114,3)	4.00 (101,6)	5.8 (2,6)
165,1mm x 5 (150 x 50)	6.50 x 5.563 (165,1 x 141,3)	4.00 (101,6)	5.8 (2,6)
6 x 1 (150 x 25)	6.63 x 1.31 (168,3 x 33,4)	4.00 (101,6)	5.2 (2,4)
6 x 2 (150 x 50)	6.63 x 2.37 (168,3 x 60,3)	4.00 (101,6)	5.4 (2,4)
6 x 2-1/2 (150 x 65)	6.63 x 2.87 (168,3 x 73,0)	4.00 (101,6)	5.6 (2,5)
6 x 76,1mm (150 x 65)	6.63 x 3.00 (168,3 x 76,1)	4.00 (101,6)	5.8 (2,6)
6 x 3 (150 x 80)	6.63 x 3.50 (168,3 x 88,9)	4.00 (101,6)	6.0 (2,7)
6 x 4 (150 x 100)	6.63 x 4.50 (168,3 x 114,3)	4.00 (101,6)	6.2 (2,8)
6 x 5 (150 x 125)	6.63 x 5.56 (168,3 x 141,3)	4.00 (101,6)	6.7 (3,0)

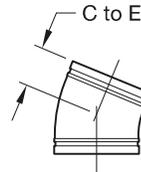
NOTES
a. Figure 372 not available for the EMEA market.

FIGURE 11 (2 OF 2)
FIGURE 372 FABRICATED CONCENTRIC REDUCER GROOVE X MALE THREAD (MPT)
NOMINAL DIMENSIONS

Nominal Pipe Size		Figures 211, 311, & 511		Figures 212, 312, & 512	
ANSI Inches (DN)	O.D. Inches (mm)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)	Nominal C to E Inches (mm)	Approx. Weight Lbs. (kg)
1-1/4 (32)	1.660 (42,4)	1.38 (35,1)	0.4 (0,2)	1.75 (44,5)	0.4 (0,2)
1-1/2 (40)	1.900 (48,3)	1.38 (35,1)	0.5 (0,2)	1.75 (44,5)	0.5 (0,2)
2 (50)	2.375 (60,3)	1.38 (35,1)	0.6 (0,3)	1.88 (47,8)	0.6 (0,3)
2-1/2 ^a (65) ^b	2.875 (73,0)	1.50 (38,1)	1.1 (0,5)	2.00 (50,8)	0.7 (0,3)
76,1mm (65)	3.000 (76,1)	1.50 (38,1)	1.1 (0,5)	2.00 (50,8)	1.2 (0,5)
3 (80)	3.500 (88,9)	1.50 (38,1)	1.2 (0,5)	2.25 (57,2)	1.4 (0,6)
4 (100)	4.500 (114,3)	1.75 (44,5)	2.2 (1,0)	2.63 (66,8)	2.4 (1,1)
139,7mm (125)	5.500 (139,7)	2.00 (50,8)	2.3 (1,0)	2.88 (73,2)	2.5 (1,1)
5 (125)	5.563 (141,3)	2.00 (50,8)	3.3 (1,5)	2.88 (73,2)	4.1 (1,9)
165,1mm (150)	6.500 (165,1)	2.00 (50,8)	3.5 (1,6)	3.13 (79,5)	4.3 (2,0)
6 (150)	6.625 (168,3)	2.00 (50,8)	4.6 (2,1)	3.13 (79,5)	5.6 (2,5)
8 (200)	8.625 (219,1)	2.00 (50,8)	8.7 (3,9)	3.88 (98,6)	11.1 (5,0)
10 (250)	10.750 (273,0)	2.13 (54,1)	9.1 (4,1)	4.38 (111,3)	14.0 (6,4)
12 (300)	12.750 (323,9)	2.25 (57,2)	16.7 (7,6)	4.88 (124,0)	22.0 (10,0)



**FIGURES 211, 311, & 511
FABRICATED 11¼° ELBOW
(SEGMENT WELDED)**



**FIGURES 212, 312, & 512
FABRICATED 22½° ELBOW
(SEGMENT WELDED)**

NOTES

- a. Nominal Pipe Size 2-1/2 in. no longer Figure 311.
- b. Nominal Pipe Size 2-1/2 in. no longer Figure 312.

**FIGURE 12
FIGURES 211, 311, AND 511 FABRICATED ELBOWS AND FIGURES 212, 312, AND 512 FABRICATED ELBOWS
NOMINAL DIMENSIONS**

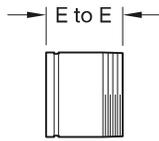


FIGURE 391^a
FABRICATED
ADAPTER NIPPLE
GROOVE X MALE THREAD
(MA)

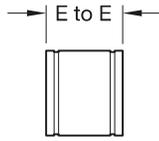


FIGURE 392^a
FABRICATED
ADAPTER NIPPLE
GROOVE X GROOVE

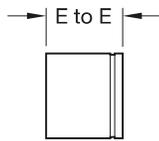


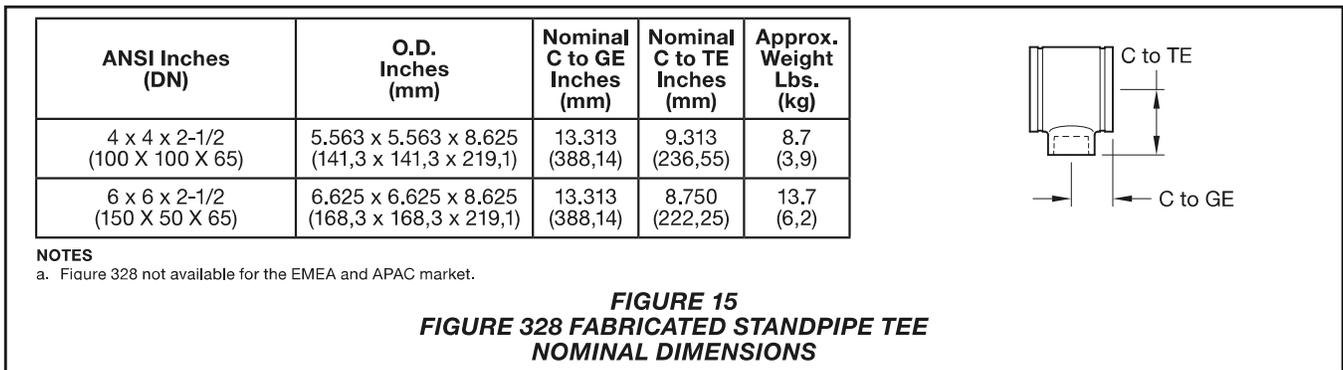
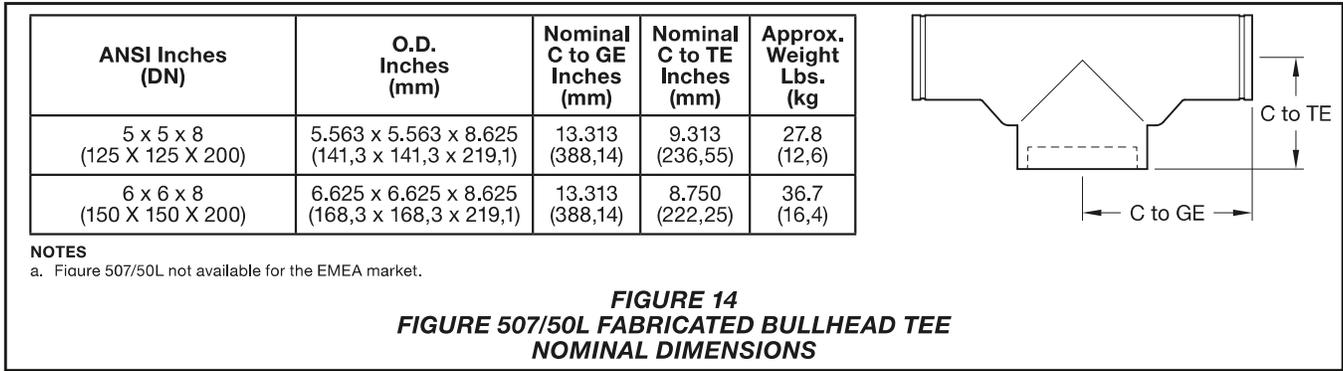
FIGURE 393^a
FABRICATED
ADAPTER NIPPLE
GROOVE X PLAIN

Nominal Pipe Size		Figures 391, 392 & 393 ^a	
ANSI Inches (DN)	O.D. Inches (mm)	Nominal E to E Inches (mm)	Approx. Weight Lbs. (kg)
1-1/4 (32)	1.660 (42,4)	4.00 (101,6)	0.8 (0,4)
1-1/2 (40)	1.900 (48,3)	4.00 (101,6)	0.9 (0,4)
2 ^b (50)	2.375 (60,3)	4.00 (101,6)	1.2 (0,5)
2-1/2 ^b (65)	2.875 (73,0)	4.00 (101,6)	1.9 (0,9)
76,1mm (65)	3.000 (76,1)	4.00 (101,6)	1.9 (0,9)
3 (80)	3.500 (88,9)	4.00 (101,6)	2.5 (1,1)
4 (100)	4.500 (114,3)	6.00 (154,4)	5.5 (2,5)
139,7mm (125)	5.500 (139,7)	6.00 (154,4)	5.6 (2,5)
5 (125)	5.563 (141,3)	6.00 (154,4)	7.4 (3,4)
165,1mm (150)	6.500 (165,1)	6.00 (154,4)	7.6 (3,4)
6 (150)	6.625 (168,3)	6.00 (154,4)	9.5 (4,3)
8 (200)	8.625 (219,1)	6.00 (154,4)	14.2 (6,4)
10 (250)	10.750 (273,0)	8.00 (203,2)	27.0 (12,2)
12 (300)	12.750 (323,9)	8.00 (203,2)	33.0 (15,0)

NOTES

- a. Figure 391, Figure 392, and Figure 393 are not available for the EMEA market.
- b. Figure 391 2 in. x 4 in. (DN50 x DN100) and 2-1/2 in. x 4 in. (DN65 x DN100) are cast.

FIGURE 13
FIGURES 391, 392, AND 393 FABRICATED ADAPTER NIPPLES
NOMINAL DIMENSIONS



Friction Resistance					
Nominal Pipe Size		Elbows 90° Feet (m)	Elbows 45° Feet (m)	Tee⁽¹⁾ Branch Feet (m)	Tee Run Feet (m)
ANSI Inches (DN)	O.D. Inches (mm)				
1 (25)	1.31 (33,4)	1.3 (0,4)	0.8 (0,3)	3.7 (1,1)	1.3 (0,6)
1-1/4 (32)	1.7 (42,4)	1.9 (0,6)	1.0 (0,3)	4.8 (1,5)	1.9 (0,6)
1-1/2 (40)	1.9 (48,3)	2.3 (0,7)	1.2 (0,4)	5.8 (1,8)	2.3 (0,7)
2 (50)	2.4 (60,3)	3.2 (1,0)	1.6 (0,5)	8.0 (2,5)	3.2 (1,0)
2-1/2 (65)	2.9 (73,0)	3.9 (1,2)	2.0 (0,6)	9.8 (3,0)	3.9 (1,2)
– (65)	3.0 (76,1)	4.1 (1,2)	2.1 (0,6)	10.3 (3,1)	4.1 (1,2)
3 (80)	3.5 (88,9)	4.9 (1,5)	2.4 (0,7)	12.2 (3,7)	4.9 (1,5)
4 (100)	4.5 (114,3)	6.5 (2,0)	3.3 (1,0)	16.3 (5,0)	6.5 (2,0)
– (125)	5.5 (139,7)	8.0 (2,4)	4.1 (1,3)	20.0 (6,1)	8.0 (2,4)
5 (125)	5.6 (141,3)	8.2 (2,5)	4.1 (1,3)	20.5 (6,3)	8.2 (2,5)
– (150)	6.5 (165,1)	9.5 (2,9)	4.8 (1,4)	23.8 (7,2)	9.5 (2,9)
6 (150)	6.6 (168,3)	9.9 (3,0)	5.0 (1,5)	24.8 (7,6)	9.9 (3,0)
8 (200)	8.6 (219,1)	13.1 (4,0)	6.6 (2,0)	32.8 (10,0)	13.1 (4,0)
10 (250)	10.8 (273,0)	16.5 (5,0)	8.3 (2,5)	41.3 (12,6)	16.5 (5,0)
12 (300)	12.8 (323,9)	19.9 (6,1)	9.9 (3,0)	49.7 (15,1)	19.9 (6,1)

NOTES

a. For the reducing tee branches, use the value that is corresponding to the branch size.

Example:

For 8 in. x 8 in. x 2 in. tee, the branch value of 2 in. is 8.0 feet.

For sizes not listed interpolate from the values shown.

TABLE A
FRICITION RESISTANCE FOR
FIGURES 501, 510, 510DE AND 519
(EXPRESSED AS EQUIVALENT STRAIGHT PIPE)

Friction Resistance					
Nominal Pipe Size		Elbows 90° Feet (m)	Elbows 45° Feet (m)	Tee* Branch Feet (m)	Tee Run Feet (m)
ANSI Inches (DN)	O.D. Inches (mm)				
2 (50)	2.4 (60,3)	3.5 (1,1)	1.6 (0,5)	8.0 (2,4)	3.2 (1,0)
2-1/2 (65)	2.9 (73,0)	4.3 (1,3)	2.0 (0,6)	9.8 (3,0)	3.9 (1,2)
– (65)	3.0 (76,1)	4.3 (1,3)	2.1 (0,6)	10.3 (3,1)	4.1 (1,2)
3 (80)	3.5 (88,9)	5.0 (1,5)	2.4 (0,7)	12.2 (3,7)	4.9 (1,5)
4 (100)	4.5 (114,3)	6.7 (2,0)	3.3 (1,0)	16.3 (5,0)	6.5 (2,0)
– (125)	5.5 (139,7)	8.3 (2,5)	4.1 (1,2)	20.0 (6,1)	8.0 (2,4)
5 (125)	5.6 (141,3)	8.5 (2,5)	4.3 (1,3)	21.5 (6,5)	8.6 (2,6)
– (150)	6.5 (165,1)	9.6 (2,9)	4.8 (1,5)	23.8 (7,3)	9.5 (2,9)
6 (150)	6.6 (168,3)	10.0 (3,0)	5.0 (1,5)	24.8 (7,6)	9.9 (3,0)
8 (200)	8.6 (219,1)	13.1 (4,0)	6.6 (2,0)	32.8 (10,0)	13.0 (4,0)

TABLE B
FRICITION RESISTANCE FOR FIGURES 510S AND 519S
(EXPRESSED AS EQUIVALENT LENGTH OF STRAIGHT SCHEDULE 40 STEEL PIPE)

Nominal Pipe Size		Figure 501 Cast 45° Elbow psi bar				Figure 510 Cast 90° Elbow psi bar				Figure 519 Cast Tee psi bar			
Ansi Inches (DN)	O.D. Inches mm	UL	FM	VdS	LPCB	UL	FM	VdS	LPCB	UL	FM	VdS	LPCB
1 (25)	1.31 (33,4)	—	—	—	—	—	—	—	—	—	—	—	—
1-1/4 (32)	1.66 (42,4)	—	—	—	—	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	—	365 (25,2)	232 (16,0)	290 (20,0)
1-1/2 (40)	1.90 (48,3)	—	—	—	—	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	—	365 (25,2)	232 (16,0)	290 (20,0)
2 (50)	2.37 (60,3)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)
2-1/2 (65)	2.87 (73,0)	365 (25,2)	365 (25,2)	—	—	365 (25,2)	365 (25,2)	—	—	365 (25,2)	365 (25,2)	—	—
76,1mm (65)	3.00 (76,1)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)
3 (80)	3.50 (88,9)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)
4 (100)	4.50 (114,3)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)
139,7mm (125)	5.50 (139,7)	365 (25,2)	365 (25,2)	232 (16,0)	—	365 (25,2)	365 (25,2)	232 (16,0)	—	365 (25,2)	365 (25,2)	232 (16,0)	—
5 (125)	5.56 (141,3)	—	365 (25,2)	—	—	—	365 (25,2)	—	—	—	365 (25,2)	—	—
165,1mm (150)	6.50 (165,1)	365 (25,2)	365 (25,2)	—	290 (20,0)	365 (25,2)	365 (25,2)	—	290 (20,0)	365 (25,2)	365 (25,2)	—	290 (20,0)
6 (150)	6.63 (168,3)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)
8 (200)	8.63 (219,1)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)
10 (250) ^a	10.75 (273,0)	450 (31,0)	—	232 (16,0)	290 (20,0)	450 (31,0)	—	232 (16,0)	290 (20,0)	450 (31,0)	—	232 (16,0)	290 (20,0)
12 (300) ^a	12.75 (323,9)	450 (31,0)	—	232 (16,0)	290 (20,0)	450 (31,0)	—	232 (16,0)	290 (20,0)	450 (31,0)	—	232 (16,0)	290 (20,0)

NOTES
a. Marked as Grinnell.

TABLE C
FIGURE 501 AND FIGURE 510 CAST ELBOWS, AND 519 CAST TEE
LISTED/APPROVED PRESSURE RATING

Nominal Pipe Size		Figure 260 Cast End Cap psi bar				Figure 510S Cast 90° Elbow psi bar				Figure 519S Cast Tee psi bar			
Ansi Inches (DN)	O.D. Inches (mm)	UL	FM	VdS	LPCB	UL	FM	VdS	LPCB	UL	FM	VdS	LPCB
1 (25)	1.31 (33,4)	500 (34,5)	—	—	—	—	—	—	—	—	—	—	—
1-1/4 (32)	1.66 (42,4)	500 (34,5)	500 (34,5)	—	—	—	—	—	—	—	—	—	—
1-1/2 (40)	1.90 (48,3)	500 (34,5)	500 (34,5)	—	—	—	—	—	—	—	—	—	—
2 (50)	2.37 (60,3)	500 (34,5)	500 (34,5)	—	—	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)
2-1/2 (65)	2.87 (73,0)	500 (34,5)	500 (34,5)	—	—	365 (25,2)	365 (25,2)	—	—	365 (25,2)	365 (25,2)	—	—
76,1mm (65)	3.00 (76,1)	500 (34,5)	500 (34,5)	—	—	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	—	290 (20,0)
3 (80)	3.50 (88,9)	500 (34,5)	500 (34,5)	—	—	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)
4 (100)	4.50 (114,3)	500 (34,5)	500 (34,5)	—	—	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)
139,7mm (125)	5.50 (139,7)	500 (34,5)	500 (34,5)	—	—	365 (25,2)	365 (25,2)	232 (16,0)	—	365 (25,2)	365 (25,2)	232 (16,0)	—
5 (125)	5.56 (141,3)	500 (34,5)	500 (34,5)	—	—	—	365 (25,2)	—	—	—	365 (25,2)	—	—
165,1mm (150)	6.50 (165,1)	500 (34,5)	500 (34,5)	—	—	365 (25,2)	365 (25,2)	—	—	365 (25,2)	365 (25,2)	—	—
6 (150)	6.63 (168,3)	500 (34,5)	500 (34,5)	—	—	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)
8 (200)	8.63 (219,1)	500 (34,5)	500 (34,5)	—	—	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)	365 (25,2)	365 (25,2)	232 (16,0)	290 (20,0)
10 (250)	10.75 (273,0)	500 (34,5)	500 (34,5)	—	—	—	—	—	—	—	—	—	—
12 (300)	12.75 (323,9)	500 (34,5)	500 (34,5)	—	—	—	—	—	—	—	—	—	—

TABLE D
FIGURE 260 CAST END CAP, FIGURE 510S CAST ELBOW, AND FIGURE 519S CAST TEE
LISTED/APPROVED PRESSURE RATING

Nominal Pipe Size	ADACAP psi bar			
	UL	FM	VdS	LPCB
1-1/2 x 1/2 (40)	300 (20,7)	300 (20,7)	—	—
1-1/2 x 3/4 (40)	300 (20,7)	300 (20,7)	—	—
1-1/2 x 1 (40)	300 (20,7)	300 (20,7)	—	—
2 x 1/2 (50)	300 (20,7)	300 (20,7)	—	—
2 x 3/4 (50)	300 (20,7)	300 (20,7)	—	—
2 x 1 (50)	300 (20,7)	300 (20,7)	—	—
2-1/2 x 1/2 (65)	300 (20,7)	300 (20,7)	—	—
2-1/2 x 3/4 (65)	300 (20,7)	300 (20,7)	—	—
2-1/2 x 1 (65)	300 (20,7)	300 (20,7)	—	—

TABLE E
ADACAP
LISTED/APPROVED PRESSURE RATING

Care and Maintenance

The following inspection procedure must be performed as indicated, in addition to any specific requirements of the NFPA. Any impairments must be immediately corrected.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection system from the proper authorities and notify all personnel who may be affected by this decision.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION, for example, NFPA 25, in addition to the standards of any authority having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

After placing a fire protection system in service, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

GRINNELL Products are available globally through a network of distribution centers. For the nearest distributor, visit www.grinnell.com.

When placing an order, indicate the full product name. Specify the quantity, figure number, wall thickness, and size.