

Grinnell Grooved Fire Protection Products Grooved Fittings

General Description



See Fire Protection Submittal Sheet for Pressure Rating and Listing/Approval Information

The grooved fittings provide an economical and efficient method of changing direction, adding an outlet, reducing, or capping grooved piping systems. Grooved fittings are available in durable 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 Tyco Fire Products for details.

WARNING

The Fittings described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of this device.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.

Technical Data

Approvals:

UL, FM, ULC, VdS, and LPCB;

Note: See Fire Protection Submittal Sheet for exact Listing / Approval information.

Material:

Cast: Figures: 201, 210, 219, 250, 260, 501, 510, 519, 510DE, 501S, 510S and 519S - Ductile iron conforming to ASTM A-536, Grade 65-45-12

Fabricated Steel: Figures 391, 392, 393, 312, 313, 321, 327, 341 and 350 - Carbon Steel, (Sizes 1 1/4" - 6" are Schedule 40); (Sizes 8" - 12" are Schedule 30), conforming to ASTM A-53 Grade B

Protective Coatings:

- Non-lead orange paint
- Fire brigade red (optional) non-lead paint
- Hot dipped galvanized conforming to ASTM A-153

Ordering Procedure

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

Grinnell Grooved Piping Products, valves, accessories and other products are available throughout the U.S., Canada, and internationally, through a network of distribution centers. You may write directly or call 215-362-0700 for the distributor nearest you.

Care and Maintenance

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in accordance with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions. Any impairment must be immediately corrected. It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service.

Limited Warranty

Products manufactured by Tyco Fire Products are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association (NFPA), and/or the standards of any other Authorities Having Jurisdiction. Materials found by Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

IN NO EVENT SHALL TYCO FIRE PRODUCTS BE LIABLE, IN CONTRACT, TORT, STRICT LIABILITY OR UNDER ANY OTHER LEGAL THEORY, FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LABOR CHARGES, REGARDLESS OF WHETHER TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' LIABILITY EXCEED AN AMOUNT EQUAL TO THE SALES PRICE.

THE FOREGOING WARRANTY IS MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Figures 201, 210, 219, and 260

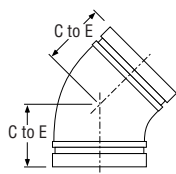


Figure 201

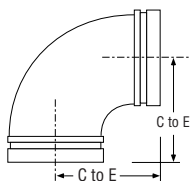


Figure 210

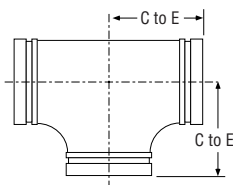


Figure 219

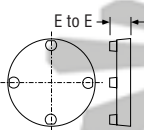


Figure 260

Friction Resistance* (Expressed as Equivalent Straight Pipe)				
Size Inches mm	Elbow		Tee	
	90° Feet Meters	45° Feet Meters	Branch Feet Meters	Run Feet Meters
1 1/4 42.4	1.9 0.6	1.0 0.3	4.8 1.5	1.9 0.6
1 1/2 48.3	2.3 0.7	1.2 0.4	5.8 1.8	2.3 0.7
2 60.3	3.2 1.0	1.6 0.5	8.0 2.5	3.2 1.0
2 1/2 73.0	3.9 1.2	2.0 0.6	9.8 3.0	3.9 1.2
76.1mm	4.1 1.2	2.1 0.6	10.3 3.1	4.1 1.2
3 88.9	4.9 1.5	2.4 0.7	12.2 3.7	4.9 1.5
108.0mm	6.5 2.0	3.3 1.0	16.3 5.0	6.5 2.0
4 114.3	6.5 2.0	3.3 1.0	16.3 5.0	6.5 2.0
133.0mm	8.0 2.4	4.0 1.2	20.0 6.1	8.0 2.4
139.7mm	8.0 2.4	4.1 1.3	20.0 6.1	8.0 2.4
5 141.3	8.2 2.5	4.1 1.3	20.5 6.3	8.2 2.5
159.0mm	9.5 2.9	4.8 1.4	23.8 7.2	9.5 2.9
165.1mm	9.5 2.9	4.8 1.4	23.8 7.2	9.5 2.9
6 168.3	9.9 3.0	5.0 1.5	24.8 7.6	9.9 3.0
216.3mm	13.1 4.0	6.6 2.0	32.8 10.0	13.1 4.0
8 219.1	13.1 4.0	6.6 2.0	32.8 10.0	13.1 4.0
10 273.0	16.5 5.0	8.3 2.5	41.3 12.6	16.5 5.0
12 323.4	19.9 6.1	9.9 3.0	49.7 15.1	19.9 6.1

For reducing tees and branches, use the value that is corresponding to the branch size. Example: for 8" x 8" x 2" tee, the branch value 2" is 8.0 feet.

* Friction resistance for all elbows and tees except Figures 510S and 519S.

Nominal Size	Figure 201 45° Elbow		Figure 210 90° Elbow		Figure 219 Tee		Figure 260† End Cap	
	C to E Inches mm	Appx. Wt. Lbs. Kg.	C to E Inches mm	Appx. Wt. Lbs. Kg.	C to E Inches mm	Appx. Wt. Lbs. Kg.	E to E Inches mm	Appx. Wt. Lbs. Kg.
1 1/4"	1.75 44.5	0.9 0.4	2.75 69.9	1.0 0.5	2.75 69.9	1.4 0.6	0.88 22.4	0.4 0.2
1 1/2"	1.75 44.5	1.1 0.5	2.75 69.9	1.2 0.5	2.75 69.9	1.8 0.8	0.88 22.4	0.6 0.3
2"	2.00 50.8	1.8 0.8	3.25 82.6	2.0 0.9	3.25 82.6	2.7 1.2	0.88 22.4	0.9 0.4
2 1/2"	2.25 57.2	2.2 1.0	3.75 95.3	3.0 1.4	3.75 95.3	5.8 2.6	0.88 22.4	0.9 0.4
76.1mm	2.25 57.2	2.2 1.0	3.75 95.3	3.0 1.4	3.75 95.3	5.8 2.6	0.94 23.9	1.1 0.5
3"	2.50 63.5	3.5 1.6	4.25 108.0	4.5 2.0	4.25 108.0	7.0 3.2	0.88 22.4	1.1 0.5
108.0mm	2.88 73.0	5.5 2.5	4.75 120.7	8.5 3.9	4.75 120.7	11.5 5.2	-	-
4"	3.00 76.2	5.2 2.4	5.00 127.0	8.5 3.9	5.00 127.0	11.8 5.4	1.00 25.4	2.6 1.2
133.0mm	3.25 82.6	7.7 3.5	5.25 133.4	11.3 5.1	5.25 133.4	10.6 4.8	-	-
139.7mm	3.25 82.6	7.7 3.5	5.50 139.7	11.3 5.1	5.50 139.7	15.3 6.9	0.92 23.4	4.7 2.1
5"	3.25 82.6	8.5 3.9	5.50 139.7	13.5 6.1	5.50 139.7	17.0 7.7	1.00 25.4	5.0 2.3
159.0mm	3.50 88.9	12.0 5.4	6.00 152.4	14.6 6.6	6.00 152.4	13.9 6.3	-	-
165.1mm	3.50 88.9	12.0 5.4	6.50 165.1	18.5 8.4	6.50 165.1	26.0 11.8	1.00 25.4	7.5 3.4
6"	3.50 88.9	12.0 5.4	6.50 165.1	18.5 8.4	6.50 165.1	26.0 11.8	1.00 25.4	7.5 3.4
216.3mm	4.25 108.0	23.0 10.4	7.75 196.9	36.5 16.6	7.75 196.9	45.0 20.4	-	-
8"	4.25 108.0	23.0 10.4	7.75 196.9	36.5 16.6	7.75 196.9	45.0 20.4	1.19 30.2	12.8 5.8
10"	4.75 120.7	31.0 14.1	9.00 228.6	60.0 27.2	9.00 228.6	72.1 32.7	1.25 31.8	20.0 9.1
12"	5.25 133.4	40.0 18.1	10.00 254.0	67.0 30.4	10.00 254.0	92.5 42.0	1.25 31.8	36.0 16.3

† - Available with tapped plugs, contact Tyco Fire & Building Products.

Figures 501, 510, 519 and 510DE

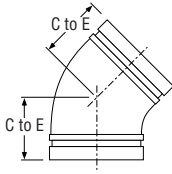


Figure 501

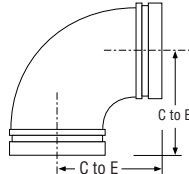


Figure 510

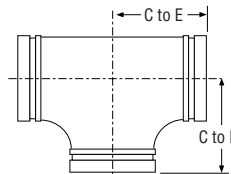


Figure 519

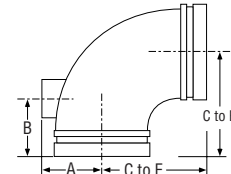


Figure 510DE

Nominal Size	Figure 501 45° Elbow		Figure 510 90° Elbow		Figure 519 Tee		Figure 510DE 90° Drain Elbow			
	C to E Inches mm	Appx. Wt. Lbs. Kg.	C to E Inches mm	Appx. Wt. Lbs. Kg.	C to E Inches mm	Appx. Wt. Lbs. Kg.	C to E Inches mm	A Inches mm	B Inches mm	Appx. Wt. Lbs. Kg.
1 1/4"	1.75 44.5	0.9 0.4	2.75 69.9	1.0 0.5	2.75 69.9	1.4 0.6	-	-	-	-
1 1/2"	1.75 44.5	1.1 0.5	2.75 69.9	1.2 0.5	2.75 69.9	1.8 0.8	-	-	-	-
2"	2.00 50.8	1.8 0.8	3.25 82.6	2.0 0.9	3.25 82.6	2.7 1.2	-	-	-	-
2 1/2"	2.25 57.2	2.2 1.0	3.75 95.3	3.0 1.4	3.75 95.3	5.8 2.6	3.75 95.3	2.00 50.8	2.75 69.9	2.7 1.2
3"	2.50 63.5	3.5 1.6	4.25 108.0	4.5 2.0	4.25 108.0	7.0 3.2	4.25 108.0	2.34 59.4	2.75 69.9	3.7 1.7
4"	3.00 76.2	5.2 2.4	5.00 127.0	8.5 3.9	5.00 127.0	11.8 5.4	5.00 127.0	2.85 72.4	2.75 69.9	7.0 3.2
5"	3.25 82.6	8.5 3.9	5.50 139.7	13.5 6.1	5.50 139.7	17.0 7.7	5.50 139.7	3.38 85.9	2.75 69.9	13.0 5.9
6"	3.50 88.9	12.0 5.4	6.50 165.1	18.5 8.4	6.50 165.1	26.0 11.8	6.50 165.1	3.92 99.6	2.75 69.9	13.4 6.1
8"	4.25 108.0	23.0 10.4	7.75 196.9	36.5 16.6	7.75 196.9	45.0 20.4	7.75 196.9	4.95 125.7	2.75 69.9	26.3 11.9

Figures 501S, 510S and 519S

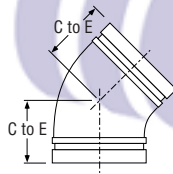


Figure 501S

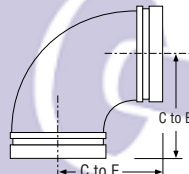


Figure 510S*

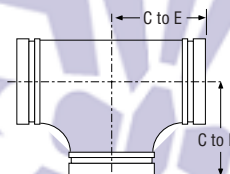


Figure 519S*

Friction Resistance 501S, 510S & 519S (Expressed as Equivalent Straight Pipe)				
Size Inches mm	Elbow		Tee	
	90° Feet Meters	45° Feet Meters	Branch Feet Meters	Run Feet Meters
2 60.3	3.2 1.0	1.6 0.5	8.0 2.5	3.2 1.0
2 1/2 73.0	3.9 1.2	2.0 0.6	9.8 3.0	3.9 1.2
76.1mm	4.1 1.2	2.1 0.6	10.3 3.1	4.1 1.2
3 88.9	4.9 1.5	2.4 0.7	12.2 3.7	4.9 1.5
4 114.3	6.5 2.0	3.3 1.0	16.3 5.0	6.5 2.0
139.7mm	8.0 2.4	4.1 1.3	20.0 6.1	8.0 2.4
5 141.3	8.2 2.5	4.1 1.3	20.5 6.3	8.2 2.5
165.1mm	9.5 2.9	4.8 1.4	23.8 7.2	9.5 2.9
6 168.3	9.9 3.0	5.0 1.5	24.8 7.6	9.9 3.0
8 219.1	13.1 4.0	6.6 2.0	32.8 10.0	13.1 4.0

Nominal Size	Figure 501S 45° Elbow		Figure 510S 90° Elbow		Figure 519S Tee	
	C to E Inches mm	Appx. Wt. Lbs. Kg.	C to E Inches mm	Appx. Wt. Lbs. Kg.	C to E Inches mm	Appx. Wt. Lbs. Kg.
2"	2.00 50.8	1.8 0.8	2.75 69.9	1.5 0.7	2.75 69.9	2.1 1.0
2 1/2"	2.25 57.2	2.2 1.0	3.00 76.2	2.2 1.0	3.00 76.2	3.0 1.4
76.1mm	2.25 57.2	2.2 1.0	3.00 76.2	2.3 1.0	3.00 76.2	3.1 1.4
3"	2.50 63.5	3.5 1.6	3.38 85.9	3.0 1.3	3.38 85.9	4.1 1.9
4"	3.00 76.2	5.2 2.4	4.00 101.6	5.6 2.6	4.00 101.6	7.7 3.5
139.7mm	3.25 82.6	7.7 3.5	4.88 124.0	8.6 3.9	4.88 124.0	12.0 5.4
5"	3.25 82.6	8.5 3.9	4.88 124.0	8.8 3.9	4.88 124.0	12.0 5.4
165.1mm	3.50 88.9	12.0 5.4	5.50 139.7	11.00 5.0	5.50 139.7	15.0 6.8
6"	3.50 88.9	12.0 5.4	5.50 139.7	11.2 5.1	5.50 139.7	15.2 6.9
8"	4.25 108.0	23.0 10.4	6.88 174.8	23.4 10.6	6.88 174.8	31.2 14.2

* 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 which requires repositioning of the coupling orientation. The use of flange adapters is not recommended with Figures 510S and 519S fittings. Contact Tyco Fire Products for details.

Figures 250 and 350

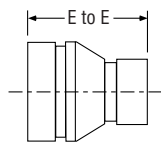


Figure 250
Cast

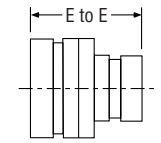


Figure 350
Fabricated
Sizes 3" to 6"

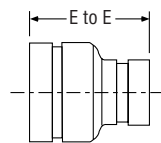
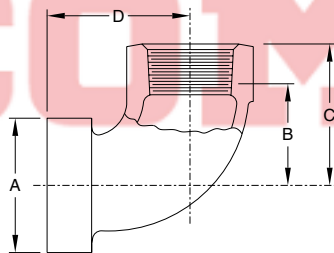


Figure 350
Fabricated
Sizes 8" to 12"

Figures 250 and 350 Concentric Reducer - Groove x Groove								
Nominal Size Inches	E to E Inches mm	Appx. Wt. Lbs. Kg.	Nominal Size Inches	E to E Inches mm	Appx. Wt. Lbs. Kg.	Nominal Size Inches	E to E Inches mm	Appx. Wt. Lbs. Kg.
*2 x 1¼	2.50 63.5	1.0 0.5	*139.7mm x 3	3.50 88.9	4.2 1.9	*6 x 5	4.00 101.6	5.8 2.6
*2 x 1½	2.50 63.5	1.3 0.6	*139.7mm x 4	3.50 88.9	4.4 2.0	8 x 2	5.00 127.0	12.2 5.5
*2½ x 2	2.50 63.5	1.2 0.5	5 x 1½	3.50 88.9	4.6 2.1	8 x 2½	5.00 127.0	12.1 5.5
*76.1mm x 1½	2.50 63.5	1.5 0.7	5 x 2	3.50 88.9	4.6 2.1	8 x 3	5.00 127.0	12.0 5.5
*76.1mm x 2	2.50 63.5	1.6 0.8	5 x 2½	3.50 88.9	4.5 2.0	8 x 4	5.00 127.0	11.9 5.4
3 x 1¼	2.50 63.5	1.3 0.6	5 x 3	3.50 88.9	4.4 2.0	8 x 5	5.00 127.0	11.3 5.1
3 x 1½	2.50 63.5	1.3 0.6	*5 x 4	3.50 88.9	4.5 2.0	8 x 6	5.00 127.0	10.8 4.9
*3 x 2	2.50 63.5	1.3 0.6	*165.1mm x 3	4.00 101.6	5.5 2.5	10 x 4	6.00 152.4	21.9 10.0
*3 x 2½	3.00 76.2	1.5 0.7	*165.1mm x 4	4.00 101.6	6.0 2.7	10 x 5	6.00 152.4	21.6 9.8
*3 x 76.1mm	3.00 76.2	2.0 0.9	*165.1mm x 139.7mm	4.00 101.6	5.6 2.5	10 x 6	6.00 152.4	21.1 9.6
4 x 1¼	3.00 76.2	2.2 1.0	*6 x 2	4.00 101.6	6.0 2.7	10 x 8	6.00 152.4	19.5 8.9
4 x 1½	3.00 76.2	2.3 1.0	6 x 2½	4.00 101.6	6.0 2.7	12 x 4	7.00 177.8	28.0 12.7
*4 x 2	3.00 76.2	2.3 1.0	*6 x 76.1mm	4.00 101.6	6.0 2.7	12 x 6	7.00 177.8	30.0 13.6
*4 x 2½	3.00 76.2	2.3 1.0	6 x 3	4.00 101.6	6.0 2.7	12 x 8	7.00 177.8	28.0 12.7
*4 x 76.1mm	3.00 76.2	3.2 1.5	*6 x 4	4.00 101.6	5.9 2.7	12 x 10	7.00 177.8	33.0 15.0
4 x 3	3.00 76.2	2.6 1.2	*6 x 139.7mm	4.00 101.6	6.3 2.9			

Note: Sizes marked with an asterisk (*) are only available in Figure 250 Cast.
 Sizes without an asterisk are only available in Figure 350 Fabricated.

ADA CAP®



Pipe		Nominal Dimensions				Net Wt. Lbs. Kg.
Size Inches	Outlet NPT* Inches	O.D.	Takeout	Center to End		
		A Inches <i>mm</i>	B Inches <i>mm</i>	C Inches <i>mm</i>	D Inches <i>mm</i>	
1½	½	1.900 48.3	1.25 31.8	1.75 44.5	1.89 48.0	0.77 0.3
	¾		1.25 31.8	1.75 44.5	1.89 48.0	0.77 0.3
	1		1.37 34.8	2.00 50.8	2.02 51.3	0.88 0.4
2	½	2.375 60.3	1.25 31.8	1.75 44.5	1.89 48.0	0.92 0.4
	¾		1.25 31.8	1.75 44.5	1.89 48.0	0.92 0.4
	1		1.37 34.8	2.00 50.8	2.02 51.3	1.06 0.5
2½	½	2.875 73.0	1.47 37.3	1.97 50.0	1.89 48.0	1.28 0.6
	¾		1.47 37.3	1.97 50.0	1.89 48.0	1.28 0.6
	1		1.37 34.8	2.00 50.8	2.02 51.3	1.50 0.7

* ISO-7 threaded outlets are available upon request.

Figures 391, 392, 393, 312 and 313

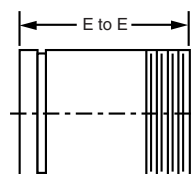


Figure 391

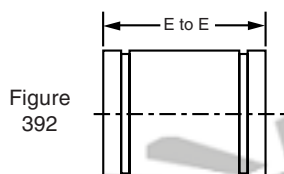


Figure 392

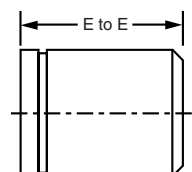


Figure 393

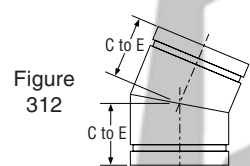


Figure 312

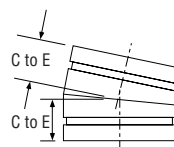


Figure 313

Nominal Size	Figures 391, 392 and 393 Adapter Nipples		Figure 312 22 1/2° Elbow		Figure 313 1 1/4° Elbow	
	E to E Inches mm	Appx. Wt. Lbs. Kg.	C to E Inches mm	Appx. Wt. Lbs. Kg.	C to E Inches mm	Appx. Wt. Lbs. Kg.
1 1/4"	4.00 101.6	0.8 0.4	1.75 44.5	0.4 0.2	1.38 35.1	0.4 0.2
1 1/2"	4.00 101.6	0.9 0.4	1.75 44.5	0.5 0.2	1.38 35.1	0.5 0.2
2"	4.00 101.6	1.2 0.5	1.88 47.8	0.6 0.3	1.38 35.1	0.6 0.3
2 1/2"	4.00 101.6	1.9 0.9	2.00 50.8	0.7 0.3	1.50 38.1	1.1 0.5
3"	4.00 101.6	2.5 1.1	2.25 57.2	1.4 0.6	1.50 38.1	1.2 0.5
4"	6.00 152.4	5.5 2.5	2.63 66.8	2.4 1.1	1.75 44.5	2.2 1.0
5"	6.00 152.4	7.4 3.4	2.88 73.2	4.1 1.9	2.00 50.8	3.3 1.5
6"	6.00 152.4	9.5 4.3	3.13 79.5	5.6 2.5	2.00 50.8	4.6 2.1
8"	6.00 152.4	14.2 6.4	3.88 98.6	11.1 5.0	2.00 50.8	8.7 3.9
10"	8.00 203.2	27.0 12.2	4.38 11.3	14.0 6.4	2.13 54.1	9.1 4.1
12"	8.00 203.2	33.0 15.0	4.88 124.0	22.0 10.0	2.25 57.2	16.7 7.6

Figures 327 and 341

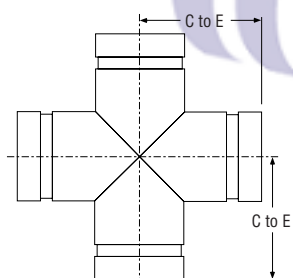


Figure 327

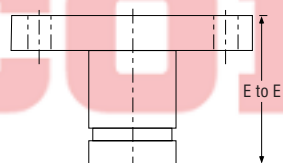


Figure 341

Nominal Size	Figure 327 Cross		Figure 341 150 lbs. Flange Adapter	
	C to E Inches mm	Appx. Wt. Lbs. kg.	E to E Inches mm	Appx. Wt. Lbs. kg.
1 1/4"	2.75 69.6	2.0 0.9	4.00 101.6	2.8 1.3
1 1/2"	2.75 69.9	2.2 2.0	4.00 101.6	3.2 1.5
2"	3.25 82.6	2.7 1.2	4.0 101.6	5.2 2.4
2 1/2"	3.75 95.3	5.0 2.3	4.00 101.6	8.0 3.6
3"	4.25 108.0	7.1 3.2	4.00 101.6	10.2 4.6
4"	5.00 127.0	11.9 5.4	6.00 152.4	17.2 7.8
5"	5.50 139.7	17.1 7.8	6.00 152.4	21.4 9.7
6"	6.50 165.1	27.5 12.5	6.00 152.4	26.0 11.8
8"	7.75 196.9	47.0 21.3	6.00 152.4	38.4 17.4
10"	9.00 228.6	68.0 30.8	8.00 203.2	65.0 29.5
12"	10.00 254.0	107.0 48.5	8.00 203.2	91.0 41.3

Figure 321

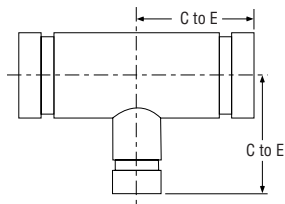


Figure 321

Figure 321 Reducing Tee					
Nominal Size Inches	C to E Inches <i>mm</i>	Appx. Wt. Lbs. <i>Kg.</i>	Nominal Size Inches	C to E Inches <i>mm</i>	Appx. Wt. Lbs. <i>Kg.</i>
1½ x 1½ x ¼	3.25 82.6	2.0 0.9	6 x 6 x 4	6.50 165.1	26.6 12.1
2 x 2 x 1½	3.25 82.6	2.7 1.2	6 x 6 x 5	6.50 165.1	27.0 12.2
2½ x 2½ x 1¼	3.75 95.3	4.2 1.9	8 x 8 x 2	7.75 196.9	36.2 16.4
2½ x 2½ x 1½	3.75 95.3	4.2 1.9	8 x 8 x 3	7.75 196.9	36.5 16.6
2½ x 2½ x 2	3.75 95.3	4.3 2.0	8 x 8 x 4	7.75 196.9	36.6 16.6
3 x 3 x 1½	4.25 108.0	5.3 2.4	8 x 8 x 5	7.75 196.9	36.8 16.7
3 x 3 x 2	4.25 108.0	5.5 2.5	8 x 8 x 6	7.75 196.9	37.0 16.8
3 x 3 x 2½	4.25 108.0	5.8 2.6	10 x 10 x 2	9.00 228.6	57.1 25.9
4 x 4 x 1¼	5.00 127.0	9.8 4.4	10 x 10 x 3	9.00 228.6	57.4 26.0
4 x 4 x 1½	5.00 127.0	9.9 4.5	10 x 10 x 4	9.00 228.6	57.6 26.1
4 x 4 x 2	5.00 127.0	10.1 4.6	10 x 10 x 5	9.00 228.6	57.8 26.2
4 x 4 x 2½	5.00 127.0	10.3 4.7	10 x 10 x 6	9.00 228.6	58.0 26.3
4 x 4 x 3	5.00 127.0	10.5 4.8	10 x 10 x 8	9.00 228.6	58.4 26.5
5 x 5 x 2	5.50 139.7	14.5 6.6	12 x 12 x 3	10.00 254.0	80.2 36.4
5 x 5 x 2½	5.50 139.7	14.8 6.7	12 x 12 x 4	10.00 254.0	80.5 36.5
5 x 5 x 3	5.50 139.7	15.2 6.9	12 x 12 x 5	10.00 254.0	80.7 36.6
5 x 5 x 4	5.50 139.7	15.8 7.2	12 x 12 x 6	10.00 254.0	80.9 36.7
6 x 6 x 2	6.50 165.1	26.5 11.9	12 x 12 x 8	10.00 254.0	91.4 41.5
6 x 6 x 2½	6.50 165.1	26.5 12.0	12 x 12 x 10	10.00 254.0	91.8 41.6
6 x 6 x 3	6.50 165.1	26.5 12.0			

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