

## Exhibit A

7- 8" gruvlok galv. 7788 flange

4- 8" gruvlok galv 7050 90

2- 8" gruvlok galv. 7051 45

2- 4" gruvlok galv. 7788 flange

27- 8" gruvlok galv. 7401E coupling

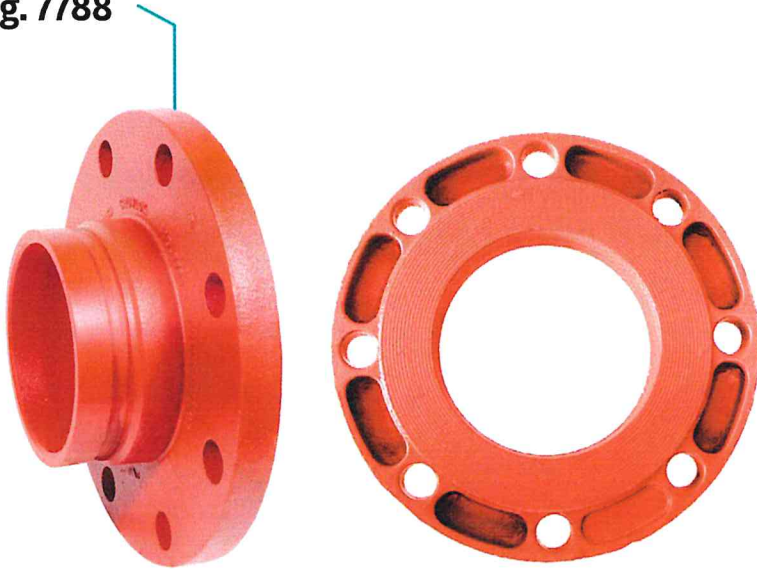
5- 8" x 2" gruvlok galv. 7045E female clamp tee

2- 8" x 8" x 4" gruvlok galv. 7061 Reducing tee

2- 2X1/2 CLASS 150 THRD GALVANIZED MALLEABLE IRON HEX BUSHING IMPORT

2- 4" gruvlok galv. 7401E galv. coupling

## Gruvlok Flange Adapter Fig. 7788



### Material Specifications

#### Housing

Ductile Iron conforming to ASTM A536, Grade 65-45-12

#### Coatings

- Rust inhibiting paint - Color: Orange (standard), Red (optional)
- Hot Dipped Zinc Galvanized (optional)
- Other Colors Available (IE: RAL3000 and RAL9000)

For other Coating requirements contact an ASC Engineered Solutions™ Representative for more information.

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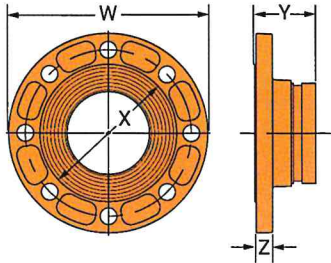
The Gruvlok Fig. 7788 Flange Adapter allows for direct connection of Class 125 or Class 150 flanged components to a grooved piping system. The Gruvlok Flange Adapter provides an alternative method of connecting to flanged components than the traditional Fig. 7012 Gruvlok Flange. The Gruvlok Flange Adapter provides a raised serrated face flange connection with a shorter overall length than Anvil's Fig. 7084 Flange x Groove Nipple.



PROJECT INFORMATION	APPROVAL STAMP
Project: C3 BACKFLOW PROJECT	<input type="checkbox"/> Approved
Address:	<input type="checkbox"/> Approved as noted
Contractor:	<input type="checkbox"/> Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1: Need Quantity of 7	
Notes 2: Needs to be Galvanized	



## Gruvlok Flange Adapter Fig. 7788



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Nominal Size	O.D.	Max. Working Pressure	Coupling Dimensions				Qty.	Size	Coupling Bolts		Specified Torque		Approx. Wt. Ea.
			W	X	Y	Z			Bolt Circle Diameter	Bolt Hole Diameter	Min.	Max.	
In./DN(mm)	In./mm	PSI/bar	In./mm	In./mm	In./mm	In./mm	PN(10) (16)	In. (ISO)/mm	In./mm	In./mm	Fl.-Lbs/N-m	Lbs./kg	
2 50	2.375 60.3	300 20.7	6 152.4	3 <sup>5</sup> / <sub>8</sub> 91.9	2 <sup>1</sup> / <sub>2</sub> 63.5	1 <sup>1</sup> / <sub>16</sub> 17.5	4	5/8 x 2 <sup>3</sup> / <sub>4</sub> M16 x 70	4 <sup>3</sup> / <sub>4</sub> 120.7	3/4 19.1	110 149	140 190	4.39 2.0
2 <sup>1</sup> / <sub>2</sub> 65	2.875 73.0	300 20.7	7 177.8	4 <sup>1</sup> / <sub>8</sub> 104.6	2 <sup>1</sup> / <sub>2</sub> 63.5	3/4 19.1	4	5/8 x 2 <sup>3</sup> / <sub>4</sub> M16 x 70	5 <sup>1</sup> / <sub>2</sub> 139.7	3/4 19.1	110 149	140 190	6.17 2.8
3 80	3.500 88.9	300 20.7	7 <sup>1</sup> / <sub>2</sub> 190.5	5 127.0	2 <sup>1</sup> / <sub>2</sub> 63.5	3/4 19.1	4	5/8 x 2 <sup>3</sup> / <sub>4</sub> M16 x 70	6 152.4	3/4 19.1	110 149	140 190	7.19 3.3
4 100	4.500 114.3	300 20.7	9 228.6	6 <sup>3</sup> / <sub>16</sub> 157.2	2 <sup>3</sup> / <sub>4</sub> 69.9	3/4 19.1	8	5/8 x 2 <sup>3</sup> / <sub>4</sub> M16 x 70	7 <sup>1</sup> / <sub>2</sub> 190.5	3/4 19.1	110 149	140 190	10.68 4.9
5 125	5.563 141.3	300 20.7	10 254.0	7 <sup>5</sup> / <sub>16</sub> 185.7	2 <sup>3</sup> / <sub>4</sub> 69.9	7/8 22.1	8	3/4 x 2 <sup>7</sup> / <sub>8</sub> —	8 <sup>1</sup> / <sub>2</sub> 215.9	7/8 22.2	220 298	250 339	13.99 6.4
6 150	6.625 168.3	300 20.7	11 279.4	8 <sup>1</sup> / <sub>2</sub> 215.9	2 <sup>3</sup> / <sub>4</sub> 69.9	7/8 22.1	8	3/4 x 3 <sup>1</sup> / <sub>8</sub> M20 x 80	9 <sup>1</sup> / <sub>2</sub> 241.1	7/8 22.2	220 298	250 339	16.47 7.5
8* 200	8.625 219.1	300 20.7	13 <sup>1</sup> / <sub>2</sub> 342.9	10 <sup>5</sup> / <sub>8</sub> 269.7	3 76.2	6 <sup>1</sup> / <sub>64</sub> 24.1	8	3/4 x 3 <sup>1</sup> / <sub>4</sub> M20 x 80	11 <sup>3</sup> / <sub>4</sub> 298.5	7/8 22.2	220 298	250 339	24.79 11.3
10* 250	10.750 273.1	300 20.7	16 406.4	12 <sup>3</sup> / <sub>4</sub> 323.9	3 <sup>3</sup> / <sub>8</sub> 85.7	1 25.4	12	7/8 x 3 <sup>1</sup> / <sub>2</sub> M20 x 90	14 <sup>1</sup> / <sub>4</sub> 362.0	1 25.4	320 439	400 542	36.75 16.7
12* 300	12.750 323.9	300 20.7	19 482.6	15 381.0	3 <sup>1</sup> / <sub>2</sub> 88.9	1 <sup>13</sup> / <sub>64</sub> 30.5	12	7/8 x 3 <sup>3</sup> / <sub>4</sub> —	17 431.8	1 25.4	320 439	400 542	56.31 25.6

**Note:**

\*8", 10" and 12" Flange Adapters have a machined raise face. 2" through 6" Flange Adapters have a cast raised face.



asc-e:

Building connections that





# GRUVLOK FITTINGS



**FIG. 7050**

90° Elbow\*

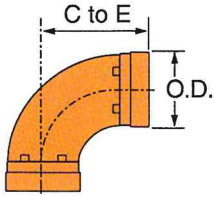


FIGURE 7050 90° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	Lbs./Kg
1	1.315	2 1/4 C	0.6
25	33.4	57	0.3
1 1/4	1.660	2 1/4 C	1.0
32	42.2	70	0.5
1 1/2	1.900	2 1/4 C	1.2
40	48.3	70	0.5
2	2.375	3 1/4 C	1.7
50	60.3	83	0.8
2 1/2	2.875	3 1/4 C	2.6
65	73.0	95	1.2
3 O.D.	2.996	4 C	3.6
76.1	76.1	102	1.6
3	3.500	4 1/4 C	4.0
80	88.9	108	1.8
3 1/2	4.000	4 1/2 C	5.5
90	101.6	114	2.5
4 1/4 O.D.	4.250	4 1/2 C	7.7
108.0	108.0	121	3.5
4	4.500	5 C	7.7
100	114.3	127	3.5
5 1/4 O.D.	5.236	5 1/4 C	10.4
133.0	133.0	133	4.7
5 1/2 O.D.	5.500	5 1/4 C	10.9
139.7	139.7	133	4.9
5	5.563	5 1/2 C	11.1
125	141.3	140	5.0
6 1/4 O.D.	6.259	6 C	15.2
159.0	159.0	152	6.9
6 1/2 O.D.	6.500	6 1/2 C	17.4
165.1	165.1	165	7.9
6	6.625	6 1/2 C	16.5
150	168.3	165	7.5
8	8.625	7 1/4 C	30.6
200	219.1	197	13.9
10	10.750	9 C	53.5
250	273.1	229	24.3
12	12.750	10 C	82
300	323.9	254	37.2
14	14.000	21	169.0
350	355.6	533	76.7
16	16.000	24	222.0
400	406.4	610	100.7
18	18.000	27	280.0
450	457.2	686	127.0
20	20.000	30	344.0
500	508.0	762	156.0
24	24.000	36	490.0
600	609.6	914	222.3

**FIG. 7051**

45° Elbow\*

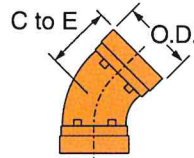


FIGURE 7051 45° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	Lbs./Kg
1	1.315	1 3/4 C	0.5
25	33.4	44	0.2
1 1/4	1.660	1 3/4 C	0.7
32	42.2	44	0.3
1 1/2	1.900	1 3/4 C	0.9
40	48.3	44	0.4
2	2.375	2 C	1.5
50	60.3	51	0.7
2 1/2	2.875	2 1/4 C	1.9
65	73.0	57	0.9
3 O.D.	2.996	2 1/4 C	2.2
76.1	76.1	64	1.0
3	3.500	2 1/2 C	3.3
80	88.9	64	1.5
3 1/2	4.000	2 3/4 C	4.3
90	101.6	70	2.0
4 1/4 O.D.	4.250	2 3/4 C	4.4
108.0	108.0	83	2.0
4	4.500	3 C	5.4
100	114.3	76	2.4
5 1/4 O.D.	5.236	3 1/4 C	7.3
133.0	133.0	83	3.3
5 1/2 O.D.	5.500	3 1/4 C	7.8
139.7	139.7	83	3.5
5	5.563	3 1/2 C	9.0
125	141.3	83	4.1
6 1/4 O.D.	6.259	3 3/4 C	10.1
159.0	159.0	89	4.6
6 1/2 O.D.	6.500	3 3/4 C	11.1
165.1	165.1	89	5.0
6	6.625	3 1/2 C	11.2
150	168.3	89	5.1
8	8.625	4 1/4 C	19.8
200	219.1	108	9.0
10	10.750	4 3/4 C	34.3
250	273.1	121	15.6
12	12.750	5 1/4 C	50.0
300	323.9	133	22.7
14	14.000	8 3/4	92.0
350	355.6	222	41.7
16	16.000	10	117.0
400	406.4	254	53.1
18	18.000	11 1/4	146.0
450	457.2	286	66.2
20	20.000	12 1/2	179.0
500	508.0	317	81.2
24	24.000	15	255.0
600	609.6	381	115.7

**FIG. 7052**

22 1/2° Elbow

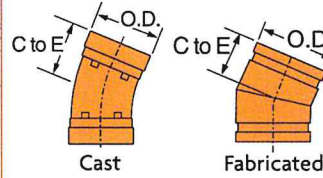


FIGURE 7052 22 1/2° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	Lbs./Kg
1	1.315	3 1/4	0.5
25	33.4	83	0.2
1 1/4	1.660	1 1/4	0.7
32	42.2	44	0.3
1 1/2	1.900	1 1/4	0.8
40	48.3	44	0.4
2	2.375	1 7/8 C	1.5
50	60.3	48	0.7
2 1/2	2.875	2	1.9
65	73.0	51	0.9
3	3.500	2 1/4 C	3.2
80	88.9	57	1.5
3 1/2	4.000	2 1/2	4.0
90	101.6	64	1.8
4	4.500	2 5/8 C	5.3
100	114.3	67	2.4
5	5.563	2 3/4	7.2
125	141.3	73	3.3
6	6.625	3 1/8 C	8.2
150	168.3	79	3.7
8	8.625	3 3/8 C	17.8
200	219.1	98	8.1
10	10.750	4 1/8	30.0
250	273.1	111	13.6
12	12.750	4 3/8	40.4
300	323.9	124	18.3
14	14.000	5	46.0
350	355.6	127	20.9
16	16.000	5	52.2
400	406.4	127	23.7
18	18.000	5 1/2	65.0
450	457.2	140	29.5
20	20.000	6	80.0
500	508.0	152	36.3
24	24.000	7	112.0
600	609.6	178	50.8

Need quantity of 4  
Need to be Galvanized

**FIG. 7053**

11 1/4° Elbow

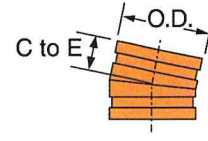


FIGURE 7053 11 1/4° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	Lbs./Kg
1	1.315	1 1/8	0.3
25	33.4	35	0.1
1 1/4	1.660	1 1/8	0.5
32	42.2	35	0.2
1 1/2	1.900	1 1/8	0.7
40	48.3	35	0.3
2	2.375	1 1/8	0.9
50	60.3	35	0.4
2 1/2	2.875	1 1/2	1.5
65	73.0	38	0.7
3	3.500	1 1/2	2.0
80	88.9	38	0.9
3 1/2	4.000	1 3/4	2.8
90	101.6	44	1.3
4	4.500	1 3/4	3.3
100	114.3	44	1.5
5	5.563	2	5.0
125	141.3	51	2.3
6	6.625	2	6.5
150	168.3	51	2.9
8	8.625	2	10.0
200	219.1	51	4.5
10	10.750	2 1/8	14.5
250	273.1	54	6.6
12	12.750	2 1/4	18.7
300	323.9	57	8.5
14	14.000	3 1/2	32.1
350	355.6	89	14.6
16	16.000	4	42.0
400	406.4	102	19.1
18	18.000	4 1/2	53.2
450	457.2	114	24.1
20	20.000	5	65.7
500	508.0	127	29.8
24	24.000	6	96.0
600	609.6	152	43.5

C - Cast malleable or ductile iron, all others are fabricated steel.

\* 14"-24" Standard Radius 90° & 45° Elbows are 1 1/2".

Center to end dimensions and weights may differ from those shown in chart, contact a Gruvlok Representative for more information.

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For Listings/Approval Details and Limitations, visit our website @ [www.anvilintl.com](http://www.anvilintl.com) or contact an Anvil/AnvilStar Sales Representative.







# GRUVLOK FITTINGS FOR GROOVED-END PIPE

Gruvlok fittings are available through 24" nominal pipe size in a variety of styles. Use the Fitting Size Table to convert nominal pipe size to corresponding pipe O.D.

These fittings are designed to provide minimum pressure drop and uniform strength.

Depending on styles and size, Gruvlok fittings are provided in various materials including malleable iron, ductile iron, forged steel or fabricated steel.

Pressure ratings of Gruvlok standard fittings conform to those of Fig. 7001 Gruvlok coupling.

Not for use in copper systems.



## FLOW DATA – FRICTIONAL RESISTANCE (EXPRESSED AS EQUIVALENT STRAIGHT PIPE)

Nom. Size	O.D.	Pipe Wall Thickness	Elbow		Tee	
			90°	45°	Branch	Run
In./DN(mm)	In./mm	In./mm	Ft./m	Ft./m	Ft./m	Ft./m
1 25	1.315 33.4	0.133 3.4	1.7 0.5	0.9 0.3	4.4 1.3	1.7 0.5
1½ 32	1.660 42.2	0.140 3.6	2.3 0.7	1.2 0.4	5.8 1.8	2.3 0.7
1½ 40	1.900 48.3	0.145 3.7	2.7 0.8	1.3 0.4	6.7 2.0	2.7 0.8
2 50	2.375 60.3	0.154 3.9	3.4 1.0	1.7 0.5	8.6 2.6	3.4 1.0
2½ 65	2.875 73.0	0.203 5.2	4.1 1.2	2.1 0.6	10.3 3.1	4.1 1.2
3 O.D. 76.1	2.996 76.1	0.197 5.0	4.3 1.3	2.2 0.7	10.8 3.3	4.3 1.3
3 80	3.500 88.9	0.216 5.5	5.1 1.6	2.6 0.8	12.8 3.9	5.1 1.6
4½ O.D. 108.0	4.250 108.0	0.220 5.6	6.4 2.0	3.2 1.0	16.1 4.9	6.4 2.0
4 100	4.500 114.3	0.237 6.0	6.7 2.0	3.4 1.0	16.8 5.1	6.7 2.0
5¼ O.D. 133.0	5.236 133.0	0.248 6.3	8.0 2.4	4.0 1.2	20.1 6.1	8.0 2.4
5½ O.D. 139.7	5.500 139.7	0.248 6.3	8.3 2.5	4.2 1.3	20.9 6.4	8.3 2.5
5 125	5.563 141.3	0.258 6.6	8.4 2.6	4.2 1.3	21.0 6.4	8.4 2.6
6¼ O.D. 159.0	6.259 159.0	0.280 7.1	9.7 3.0	4.9 1.5	24.3 7.4	9.7 3.0
6½ O.D. 165.1	6.500 165.1	0.280 7.1	10.0 3.0	5.0 1.5	24.9 7.6	10.0 3.0
6 150	6.625 168.3	0.280 7.1	10.1 3.1	5.1 1.6	25.3 7.7	10.1 3.1
8 200	8.625 219.1	0.322 8.2	13.3 4.1	6.7 2.0	33.3 10.1	13.3 4.1
10 250	10.750 273.1	0.365 9.3	16.7 5.1	8.4 2.6	41.8 12.7	16.7 5.1
12 300	12.750 323.9	0.375 9.5	20.0 6.1	10.0 3.0	50.0 15.2	20.0 6.1
14 350	14.000 355.6	0.375 9.5	22.2 6.8	17.7 5.4	64.2 19.6	22.9 7.0
16 400	16.000 406.4	0.375 9.5	25.5 7.8	20.4 6.2	73.9 22.5	26.4 8.0
18 450	18.000 457.2	0.375 9.5	28.9 8.8	23.1 7.0	87.2 26.6	31.1 9.5
20 500	20.000 508.0	0.375 9.5	32.2 9.8	25.7 7.8	97.3 29.7	34.8 10.6
24 600	24.000 609.6	0.375 9.5	38.9 11.9	31.1 9.5	113.0 34.4	40.4 12.3

For the reducing tee and branches, use the value that is corresponding to the branch size. For example: for 6" x 6" x 3" tee, the branch value of 3" is 12.8 ft (3.9).

## MATERIAL SPECIFICATIONS

### CAST FITTINGS:

Ductile iron conforming to ASTM A 536  
Malleable iron conforming to ASTM A 47

### FABRICATED FITTINGS:

1-6" Carbon steel, Schedule 40, conforming to ASTM A 53, Grade B  
8-12" Carbon steel, Schedule 30, conforming to ASTM A 53, Grade B  
14-24" Carbon steel, 0.375 wall, conforming to ASTM A 53, Grade B

### COATINGS:

Rust inhibiting paint Color: ORANGE (standard)  
Hot Dipped Zinc Galvanized conforming to ASTM A 153 (optional)  
Other Colors Available (IE: RAL3000 and RAL9000)

## FITTING SIZE

Nominal Size	O.D.	Nominal Size	O.D.
1 25	1.315 33.4	5 140	5.563 141.3
1½ 32	1.660 42.4	6¼ O.D. 159.0	6.259 159.0
1½ 40	1.900 48.3	6½ O.D. 165.1	6.500 165.1
2 50	2.375 60.3	6 150	6.625 168.3
2½ 65	2.875 73.0	8 200	8.625 219.1
3 O.D. 76.1	2.996 76.1	10 250	10.750 273.0
3 80	3.500 88.9	12 300	12.750 323.9
3½ 65	4.000 101.6	14 350	14.000 355.6
4½ O.D. 108.0	4.250 108.0	16 400	16.000 406.4
4 100	4.500 114.3	18 450	18.000 457.2
5¼ O.D. 133.0	5.236 133.0	20 500	20.000 508.0
5½ O.D. 139.7	5.500 139.7	24 600	24.000 609.6

The Fitting Size Chart is used to determine the O.D. of the pipe that the fittings is to be used with. Gruvlok Fittings are identified by either the Nominal size in inches or the Pipe O.D. in/mm.





# GRUVLOK FITTINGS



**FIG. 7050**

90° Elbow\*

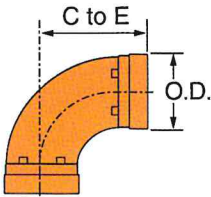


FIGURE 7050 90° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	Lbs./Kg
1	1.315	2¼ C	0.6
25	33.4	57	0.3
1¼	1.660	2½ C	1.0
32	42.2	70	0.5
1½	1.900	2¾ C	1.2
40	48.3	70	0.5
2	2.375	3¼ C	1.7
50	60.3	83	0.8
2½	2.875	3½ C	2.6
65	73.0	95	1.2
3 O.D.	2.996	4 C	3.6
76.1	76.1	102	1.6
3	3.500	4¼ C	4.0
80	88.9	108	1.8
3½	4.000	4½ C	5.5
90	101.6	114	2.5
4¼ O.D.	4.250	4¾ C	7.7
108.0	108.0	121	3.5
4	4.500	5 C	7.7
100	114.3	127	3.5
5¼ O.D.	5.236	5¼ C	10.4
133.0	133.0	133	4.7
5½ O.D.	5.500	5½ C	10.9
139.7	139.7	133	4.9
5	5.563	5½ C	11.1
125	141.3	140	5.0
6¼ O.D.	6.259	6 C	15.2
159.0	159.0	152	6.9
6½ O.D.	6.500	6½ C	17.4
165.1	165.1	165	7.9
6	6.625	6½ C	16.5
150	168.3	165	7.5
8	8.625	7¾ C	30.6
200	219.1	197	13.9
10	10.750	9 C	53.5
250	273.1	229	24.3
12	12.750	10 C	82
300	323.9	254	37.2
14	14.000	21	169.0
350	355.6	533	76.7
16	16.000	24	222.0
400	406.4	610	100.7
18	18.000	27	280.0
450	457.2	686	127.0
20	20.000	30	344.0
500	508.0	762	156.0
24	24.000	36	490.0
600	609.6	914	222.3

**FIG. 7051**

45° Elbow\*

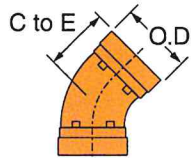


FIGURE 7051 45° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	Lbs./Kg
1	1.315	1¾ C	0.5
25	33.4	44	0.2
1¼	1.660	1¾ C	0.7
32	42.2	44	0.3
1½	1.900	1¾ C	0.9
40	48.3	44	0.4
2	2.375	2 C	1.5
50	60.3	51	0.7
2½	2.875	2¼ C	1.9
65	73.0	57	0.9
3 O.D.	2.996	2½ C	2.2
76.1	76.1	64	1.0
3	3.500	2½ C	3.3
80	88.9	64	1.5
3½	4.000	2¾ C	4.3
90	101.6	70	2.0
4¼ O.D.	4.250	2¾ C	4.4
108.0	108.0	83	2.0
4	4.500	3 C	5.4
100	114.3	76	2.4
5¼ O.D.	5.236	3¼ C	7.3
133.0	133.0	83	3.3
5½ O.D.	5.500	3¼ C	7.8
139.7	139.7	83	3.5
5	5.563	3¼ C	9.0
125	141.3	83	4.1
6¼ O.D.	6.259	3½ C	10.1
159.0	159.0	89	4.6
6½ O.D.	6.500	3½ C	11.1
165.1	165.1	89	5.0
6	6.625	3½ C	11.2
150	168.3	89	5.1
8	8.625	4¼ C	19.8
200	219.1	108	9.0
10	10.750	4¾ C	34.3
250	273.1	121	15.6
12	12.750	5¼ C	50.0
300	323.9	133	22.7
14	14.000	8¾	92.0
350	355.6	222	41.7
16	16.000	10	117.0
400	406.4	254	53.1
18	18.000	11¼	146.0
450	457.2	286	66.2
20	20.000	12½	179.0
500	508.0	317	81.2
24	24.000	15	255.0
600	609.6	381	115.7

**FIG. 7052**

22 ½° Elbow

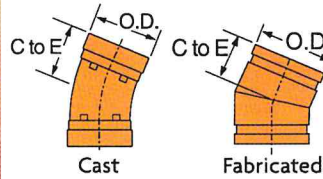


FIGURE 7052 22½° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	Lbs./Kg
1	1.315	3¼	0.5
25	33.4	83	0.2
1¼	1.660	1¾	0.7
32	42.2	44	0.3
1½	1.900	1¾	0.8
40	48.3	44	0.4
2	2.375	1¾ C	1.5
50	60.3	48	0.7
2½	2.875	2	1.9
65	73.0	51	0.9
3	3.500	2¼ C	3.2
80	88.9	57	1.5
3½	4.000	2½	4.0
90	101.6	64	1.8
4	4.500	2¾ C	5.3
100	114.3	67	2.4
5	5.563	2¾	7.2
125	141.3	73	3.3
6	6.625	3¼ C	8.2
150	168.3	79	3.7
8	8.625	3¾ C	17.8
200	219.1	98	8.1
10	10.750	4¾	30.0
250	273.1	111	13.6
12	12.750	4¾	40.4
300	323.9	124	18.3
14	14.000	5	46.0
350	355.6	127	20.9
16	16.000	5	52.2
400	406.4	127	23.7
18	18.000	5½	65.0
450	457.2	140	29.5
20	20.000	6	80.0
500	508.0	152	36.3
24	24.000	7	112.0
600	609.6	178	50.8

**FIG. 7053**

11 ¼° Elbow

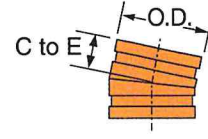


FIGURE 7053 11¼° ELBOW*			
Nominal Size	O.D.	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	Lbs./Kg
1	1.315	1¾	0.3
25	33.4	35	0.1
1¼	1.660	1¾	0.5
32	42.2	35	0.2
1½	1.900	1¾	0.7
40	48.3	35	0.3
2	2.375	1¾	0.9
50	60.3	35	0.4
2½	2.875	1½	1.5
65	73.0	38	0.7
3	3.500	1½	2.0
80	88.9	38	0.9
3½	4.000	1¾	2.8
90	101.6	44	1.3
4	4.500	1¾	3.3
100	114.3	44	1.5
5	5.563	2	5.0
125	141.3	51	2.3
6	6.625	2	6.5
150	168.3	51	2.9
8	8.625	2	10.0
200	219.1	51	4.5
10	10.750	2½	14.5
250	273.1	54	6.6
12	12.750	2¼	18.7
300	323.9	57	8.5
14	14.000	3½	32.1
350	355.6	89	14.6
16	16.000	4	42.0
400	406.4	102	19.1
18	18.000	4½	53.2
450	457.2	114	24.1
20	20.000	5	65.7
500	508.0	127	29.8
24	24.000	6	96.0
600	609.6	152	43.5

Need quantity of 2  
Needs to be Galvanized

C - Cast malleable or ductile iron, all others are fabricated steel.

\* 14"-24" Standard Radius 90° & 45° Elbows are 1 ½".

Center to end dimensions and weights may differ from those shown in chart, contact a Gruklok Representative for more information.

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For Listings/Approval Details and Limitations, visit our website @ www.anvilintl.com or contact an Anvil/AnvilStar Sales Representative.





# GRUVLOK FITTINGS FOR GROOVED-END PIPE

Gruvlok fittings are available through 24" nominal pipe size in a variety of styles. Use the Fitting Size Table to convert nominal pipe size to corresponding pipe O.D.

These fittings are designed to provide minimum pressure drop and uniform strength.

Depending on styles and size, Gruvlok fittings are provided in various materials including malleable iron, ductile iron, forged steel or fabricated steel.

Pressure ratings of Gruvlok standard fittings conform to those of Fig. 7001 Gruvlok coupling.

Not for use in copper systems.



## FLOW DATA – FRICTIONAL RESISTANCE (EXPRESSED AS EQUIVALENT STRAIGHT PIPE)

Nom. Size	O.D.	Pipe Wall Thickness	Elbow		Tee	
			90°	45°	Branch	Run
In./DN(mm)	In./mm	In./mm	Ft./m	Ft./m	Ft./m	Ft./m
1 25	1.315 33.4	0.133 3.4	1.7 0.5	0.9 0.3	4.4 1.3	1.7 0.5
1¼ 32	1.660 42.2	0.140 3.6	2.3 0.7	1.2 0.4	5.8 1.8	2.3 0.7
1½ 40	1.900 48.3	0.145 3.7	2.7 0.8	1.3 0.4	6.7 2.0	2.7 0.8
2 50	2.375 60.3	0.154 3.9	3.4 1.0	1.7 0.5	8.6 2.6	3.4 1.0
2½ 65	2.875 73.0	0.203 5.2	4.1 1.2	2.1 0.6	10.3 3.1	4.1 1.2
3 O.D. 76.1	2.996 76.1	0.197 5.0	4.3 1.3	2.2 0.7	10.8 3.3	4.3 1.3
3 80	3.500 88.9	0.216 5.5	5.1 1.6	2.6 0.8	12.8 3.9	5.1 1.6
4¼ O.D. 108.0	4.250 108.0	0.220 5.6	6.4 2.0	3.2 1.0	16.1 4.9	6.4 2.0
4 100	4.500 114.3	0.237 6.0	6.7 2.0	3.4 1.0	16.8 5.1	6.7 2.0
5¼ O.D. 133.0	5.236 133.0	0.248 6.3	8.0 2.4	4.0 1.2	20.1 6.1	8.0 2.4
5½ O.D. 139.7	5.500 139.7	0.248 6.3	8.3 2.5	4.2 1.3	20.9 6.4	8.3 2.5
5 125	5.563 141.3	0.258 6.6	8.4 2.6	4.2 1.3	21.0 6.4	8.4 2.6
6¼ O.D. 159.0	6.259 159.0	0.280 7.1	9.7 3.0	4.9 1.5	24.3 7.4	9.7 3.0
6½ O.D. 165.1	6.500 165.1	0.280 7.1	10.0 3.0	5.0 1.5	24.9 7.6	10.0 3.0
6 150	6.625 168.3	0.280 7.1	10.1 3.1	5.1 1.6	25.3 7.7	10.1 3.1
8 200	8.625 219.1	0.322 8.2	13.3 4.1	6.7 2.0	33.3 10.1	13.3 4.1
10 250	10.750 273.1	0.365 9.3	16.7 5.1	8.4 2.6	41.8 12.7	16.7 5.1
12 300	12.750 323.9	0.375 9.5	20.0 6.1	10.0 3.0	50.0 15.2	20.0 6.1
14 350	14.000 355.6	0.375 9.5	22.2 6.8	17.7 5.4	64.2 19.6	22.9 7.0
16 400	16.000 406.4	0.375 9.5	25.5 7.8	20.4 6.2	73.9 22.5	26.4 8.0
18 450	18.000 457.2	0.375 9.5	28.9 8.8	23.1 7.0	87.2 26.6	31.1 9.5
20 500	20.000 508.0	0.375 9.5	32.2 9.8	25.7 7.8	97.3 29.7	34.8 10.6
24 600	24.000 609.6	0.375 9.5	38.9 11.9	31.1 9.5	113.0 34.4	40.4 12.3

For the reducing tee and branches, use the value that is corresponding to the branch size. For example: for 6" x 6" x 3" tee, the branch value of 3" is 12.8 ft (3.9).

## MATERIAL SPECIFICATIONS

### CAST FITTINGS:

Ductile iron conforming to ASTM A 536  
Malleable iron conforming to ASTM A 47

### FABRICATED FITTINGS:

1-6" Carbon steel, Schedule 40, conforming to ASTM A 53, Grade B  
8-12" Carbon steel, Schedule 30, conforming to ASTM A 53, Grade B  
14-24" Carbon steel, 0.375 wall, conforming to ASTM A 53, Grade B

### COATINGS:

Rust inhibiting paint Color: ORANGE (standard)  
**Hot Dipped Zinc Galvanized conforming to ASTM A 153 (optional)**  
Other Colors Available (IE: RAL3000 and RAL9000)

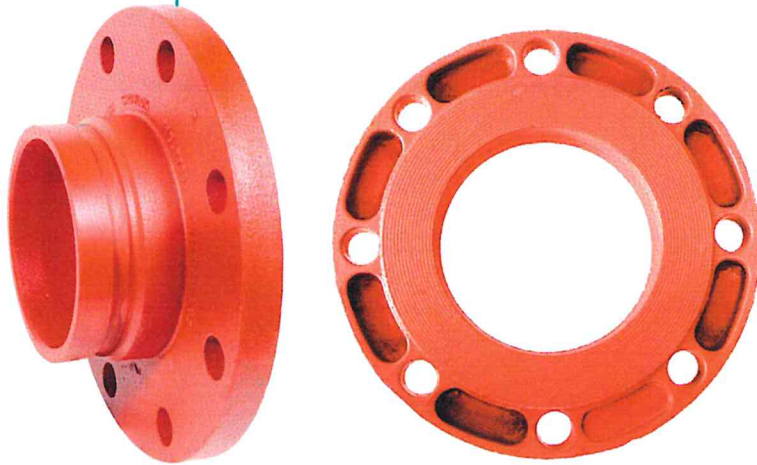
## FITTING SIZE

Nominal Size	O.D.	Nominal Size	O.D.
1 25	1.315 33.4	5 140	5.563 141.3
1¼ 32	1.660 42.4	6¼ O.D. 159.0	6.259 159.0
1½ 40	1.900 48.3	6½ O.D. 165.1	6.500 165.1
2 50	2.375 60.3	6 150	6.625 168.3
2½ 65	2.875 73.0	8 200	8.625 219.1
3 O.D. 76.1	2.996 76.1	10 250	10.750 273.0
3 80	3.500 88.9	12 300	12.750 323.9
3½ 65	4.000 101.6	14 350	14.000 355.6
4¼ O.D. 108.0	4.250 108.0	16 400	16.000 406.4
4 100	4.500 114.3	18 450	18.000 457.2
5¼ O.D. 133.0	5.236 133.0	20 500	20.000 508.0
5½ O.D. 139.7	5.500 139.7	24 600	24.000 609.6

The Fitting Size Chart is used to determine the O.D. of the pipe that the fittings is to be used with. Gruvlok Fittings are identified by either the Nominal size in inches or the Pipe O.D. in/mm.



## Gruvlok Flange Adapter Fig. 7788



### Material Specifications

**Housing**

Ductile Iron conforming to ASTM A536, Grade 65-45-12

**Coatings**

- Rust inhibiting paint – Color: Orange (standard), Red (optional)
- Hot Dipped Zinc Galvanized (optional)
- Other Colors Available (IE: RAL3000 and RAL9000)

For other Coating requirements contact an ASC Engineered Solutions™ Representative for more information.

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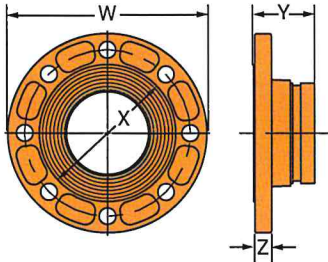
The Gruvlok Fig. 7788 Flange Adapter allows for direct connection of Class 125 or Class 150 flanged components to a grooved piping system. The Gruvlok Flange Adapter provides an alternative method of connecting to flanged components than the traditional Fig. 7012 Gruvlok Flange. The Gruvlok Flange Adapter provides a raised serrated face flange connection with a shorter overall length than Anvil's Fig. 7084 Flange x Groove Nipple.



PROJECT INFORMATION	APPROVAL STAMP
Project: C3 BACKFLOW PROJECT	<input type="checkbox"/> Approved
Address:	<input type="checkbox"/> Approved as noted
Contractor:	<input type="checkbox"/> Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1: Need Quantity of 2	
Notes 2: Needs to be Galvanized	



## Gruvlok Flange Adapter Fig. 7788



1182198

Nominal Size	O.D.	Max. Working Pressure	Coupling Dimensions				Qty.	Size	Coupling Bolts		Specified Torque		Approx. Wt. Ea.
			W	X	Y	Z			Bolt Circle Diameter	Bolt Hole Diameter	Min.	Max.	
In./DN(mm)	In./mm	PSI/bar	In./mm	In./mm	In./mm	In./mm	PN(10) (16)	In. (ISO)/mm	In./mm	In./mm	Ft.-Lbs/N-m		Lbs./kg
2 50	2.375 60.3	300 20.7	6 152.4	3 <sup>5</sup> / <sub>8</sub> 91.9	2 <sup>1</sup> / <sub>2</sub> 63.5	1 <sup>1</sup> / <sub>16</sub> 17.5	4	5 <sup>5</sup> / <sub>8</sub> X 2 <sup>3</sup> / <sub>4</sub> M16 x 70	4 <sup>3</sup> / <sub>4</sub> 120.7	3 <sup>4</sup> / <sub>4</sub> 19.1	110 149	140 190	4.39 2.0
2 <sup>1</sup> / <sub>2</sub> 65	2.875 73.0	300 20.7	7 177.8	4 <sup>1</sup> / <sub>8</sub> 104.6	2 <sup>1</sup> / <sub>2</sub> 63.5	3 <sup>4</sup> / <sub>4</sub> 19.1	4	5 <sup>5</sup> / <sub>8</sub> X 2 <sup>3</sup> / <sub>4</sub> M16 x 70	5 <sup>1</sup> / <sub>2</sub> 139.7	3 <sup>4</sup> / <sub>4</sub> 19.1	110 149	140 190	6.17 2.8
3 80	3.500 88.9	300 20.7	7 <sup>1</sup> / <sub>2</sub> 190.5	5 127.0	2 <sup>1</sup> / <sub>2</sub> 63.5	3 <sup>4</sup> / <sub>4</sub> 19.1	4	5 <sup>5</sup> / <sub>8</sub> X 2 <sup>3</sup> / <sub>4</sub> M16 x 70	6 152.4	3 <sup>4</sup> / <sub>4</sub> 19.1	110 149	140 190	7.19 3.3
<b>4</b> 100	<b>4.500</b> 114.3	<b>300</b> 20.7	<b>9</b> 228.6	<b>6<sup>3</sup>/<sub>16</sub></b> 157.2	<b>2<sup>3</sup>/<sub>4</sub></b> 69.9	<b>3<sup>4</sup>/<sub>4</sub></b> 19.1	<b>8</b>	<b>5<sup>5</sup>/<sub>8</sub> X 2<sup>3</sup>/<sub>4</sub></b> M16 x 70	<b>7<sup>1</sup>/<sub>2</sub></b> 190.5	<b>3<sup>4</sup>/<sub>4</sub></b> 19.1	<b>110</b> 149	<b>140</b> 190	<b>10.68</b> 4.9
5 125	5.563 141.3	300 20.7	10 254.0	7 <sup>5</sup> / <sub>16</sub> 185.7	2 <sup>3</sup> / <sub>4</sub> 69.9	7 <sup>8</sup> / <sub>8</sub> 22.1	8	3 <sup>4</sup> / <sub>4</sub> X 2 <sup>7</sup> / <sub>8</sub> —	8 <sup>1</sup> / <sub>2</sub> 215.9	7 <sup>8</sup> / <sub>8</sub> 22.2	220 298	250 339	13.99 6.4
6 150	6.625 168.3	300 20.7	11 279.4	8 <sup>1</sup> / <sub>2</sub> 215.9	2 <sup>3</sup> / <sub>4</sub> 69.9	7 <sup>8</sup> / <sub>8</sub> 22.1	8	3 <sup>4</sup> / <sub>4</sub> X 3 <sup>1</sup> / <sub>8</sub> M20 x 80	9 <sup>1</sup> / <sub>2</sub> 241.1	7 <sup>8</sup> / <sub>8</sub> 22.2	220 298	250 339	16.47 7.5
8* 200	8.625 219.1	300 20.7	13 <sup>1</sup> / <sub>2</sub> 342.9	10 <sup>5</sup> / <sub>8</sub> 269.7	3 76.2	6 <sup>1</sup> / <sub>64</sub> 24.1	8	3 <sup>4</sup> / <sub>4</sub> X 3 <sup>1</sup> / <sub>4</sub> M20 x 80	11 <sup>3</sup> / <sub>4</sub> 298.5	7 <sup>8</sup> / <sub>8</sub> 22.2	220 298	250 339	24.79 11.3
10* 250	10.750 273.1	300 20.7	16 406.4	12 <sup>3</sup> / <sub>4</sub> 323.9	3 <sup>3</sup> / <sub>8</sub> 85.7	1 25.4	12	7 <sup>8</sup> / <sub>8</sub> X 3 <sup>1</sup> / <sub>2</sub> M20 x 90	14 <sup>1</sup> / <sub>4</sub> 362.0	1 25.4	320 439	400 542	36.75 16.7
12* 300	12.750 323.9	300 20.7	19 482.6	15 381.0	3 <sup>1</sup> / <sub>2</sub> 88.9	1 <sup>13</sup> / <sub>64</sub> 30.5	12	7 <sup>8</sup> / <sub>8</sub> X 3 <sup>3</sup> / <sub>4</sub> —	17 431.8	1 25.4	320 439	400 542	56.31 25.6

**Note:**

\*8", 10" and 12" Flange Adapters have a machined raise face. 2" through 6" Flange Adapters have a cast raised face.



asc-e:

Building connections that





**FIG. 7401****Rigidlok® Coupling**

The Fig. 7401 Rigidlok Coupling from Gruvlok provides a rigid, locked in pipe connection. Rigidity is attained simply; it is designed in.

The Fig. 7401 Rigidlok coupling is based on a technologically advanced housing design that conforms to and grips the pipe. With the Fig. 7401 there emerges a new generation of rigid couplings.

Coupling installation is fast and easy, remove only one nut and swing the housing over the gasket and into the grooves. The exclusive Guidelok® feature automatically separates the grooved pipe ends and guides the coupling into position as the bolts are tightened. Precisely sized and oriented tines in the housing key section firmly grip the pipe. The combination of these designed in features produce a secure, rigid pipe joint connection.

This coupling is an ideal connector for service and applications that require a rigid connection.

The Fig. 7401 Rigidlok Coupling is designed for use with roll grooved or cut grooved standard weight and roll grooved lightweight pipe, as well as with grooved-end fittings and valves.



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The Rigidlok Coupling maintains a rigid connection with support and hanging in conformance with applicable ANSI B31.1 Power Piping Code, ANSI B31.9 Building Service Pipe Code as well as NFPA 13 sprinkler systems.

The Fig. 7401 Rigidlok Coupling allows for working pressure ratings to 750 psi (51.7 bar) when used on standard wall roll or cut grooved pipe.

**MATERIAL SPECIFICATIONS****ANSI BOLTS & HEAVY HEX NUTS:**

Heat treated, oval neck track head bolts conforming to ASTM A 183 Grade 2 with a minimum tensile strength of 110,000 psi and heavy hex nuts of carbon steel conforming to ASTM A 563 Grade A or Grade B, or J995 Grade 2. Bolts and nuts are provided zinc electroplated as standard.

**METRIC BOLTS & HEAVY HEX NUTS:**

Heat treated, zinc electroplated oval-neck track head bolts made of carbon steel with mechanical properties per ISO 898-1 Class 8.8. Hex nuts are zinc electroplated followed by a yellow chromate dip.

**STAINLESS STEEL BOLTS & NUTS:**

Stainless steel bolts and nuts are also available. Contact a Gruvlok Representative for more information.

**HOUSING:**

Ductile Iron conforming to ASTM A 536, Grade 65-45-12

**COATINGS:**

Rust inhibiting paint Color: ORANGE (standard)

Hot Dipped Zinc Galvanized (optional)

Other Colors Available (IE: RAL3000 and RAL9000)

For other Coating requirements contact a Gruvlok Representative.

**GASKETS: Materials**

Properties as designated in accordance with ASTM D 2000

**Grade "E" EPDM (Green color code) NSF 61 Certified**  
-40°F to 230°F (Service Temperature Range)(-40°C to 110°C)

Recommended for water service, diluted acids, alkalies solutions, oil-free air and many chemical services.

NOT FOR USE IN PETROLEUM APPLICATIONS.

**Grade "T" Nitrile (Orange color code)**

-20°F to 180°F (Service Temperature Range)(-29°C to 82°C)

Recommended for petroleum applications. air with oil vapors and vegetable and mineral oils.

NOT FOR USE IN HOT WATER OR HOT AIR

**Grade "O" Fluoro-Elastomer (Blue color code)**

-20°F to 300°F (Service Temperature Range)(-29°C to 149°C)

Recommended for high temperature resistance to oxidizing acids, petroleum oils, hydraulic fluids, halogenated hydrocarbons and lubricants.

**Grade "L" Silicone (Red color code)**

-40°F to 350°F (Service Temperature Range)(-40°C to 177°C)

Recommended for dry, hot air and some high temperature chemical services.

**GASKET TYPE:**

Standard C Style

Flush Gap (1 1/2" - 14")

**LUBRICATION:**

Standard Gruvlok

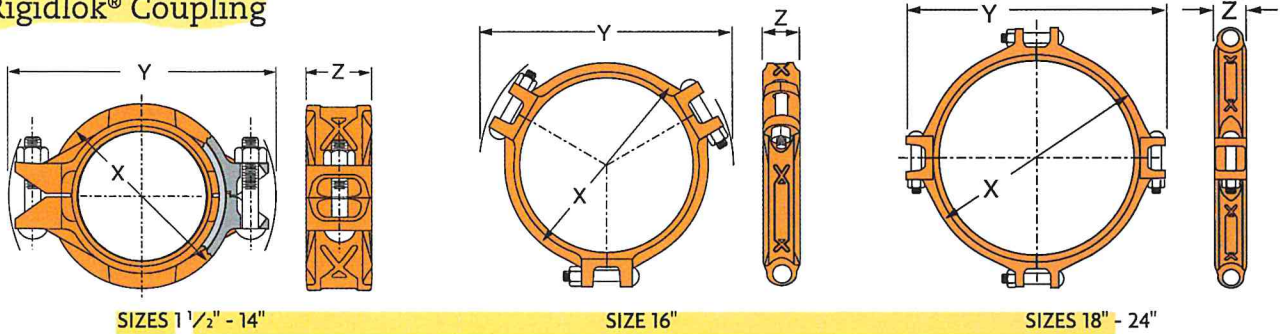
Gruvlok Xtreme™ (Do Not use with Grade "L")





# COUPLINGS FOR GROOVED-END PIPE

**FIG. 7401**  
Rigidlok® Coupling



SIZES 1 1/2" - 14"

SIZE 16"

SIZES 18" - 24"

**FIGURE 7401 RIDGIDLOK COUPLING**

Nominal Size	O.D.	Max. Working Pressure	Max. End Load	Range of Pipe End Separation	Coupling Dimensions			Qty.	Coupling Bolts*		Specified Torque §		Approx. Wt. Ea.
					X	Y	Z		Size	Min.	Max.		
In./DN(mm)	In./mm	PSI/bar	Lbs./kN	In./mm	In./mm	In./mm	In./mm	In./mm	Ft.-Lbs/N-M		Lbs./kN		
1 1/2 40	1.900 48.3	750 51.7	2,126 9.46	0-3/4 0-3.2	3 76	5 1/2 130	1 1/2 48	2	3/8 x 2 1/4 M10 x 57	30 40	45 60	1.8 0.8	
2 50	2.375 60.3	750 51.7	3,323 14.78	0-3/4 0-3.2	3 1/2 89	5 1/2 143	1 1/2 48	2	3/8 x 2 1/2 M10 x 63	30 40	45 60	2.4 1.1	
2 1/2 65	2.875 73.0	750 51.7	4,869 21.66	0-3/4 0-3.2	4 102	6 1/2 156	1 1/2 48	2	3/8 x 2 1/2 M10 x 63	30 40	45 60	2.9 1.3	
3 O.D. 76.1	2.996 76.1	750 51.7	5,207 23.52	0-3/4 0-3.2	4 1/4 105	6 1/2 156	1 1/2 48	2	1/2 x 3 M12 x 76	80 110	100 150	3.4 1.5	
3 80	3.500 88.9	750 51.7	7,216 32.10	0-3/4 0-3.2	4 3/4 121	7 1/4 184	1 1/2 48	2	1/2 x 3 M12 x 76	80 110	100 150	3.6 1.6	
4 100	4.500 114.3	750 51.7	11,928 53.06	0-3/4 0-6.4	5 1/2 149	8 1/2 213	2 1/2 54	2	1/2 x 3 M12 x 76	80 110	100 150	5.0 2.3	
5 1/4 O.D. 139.7	5.500 139.7	750 51.7	17,819 79.26	0-3/4 0-6.4	7 178	9 1/4 248	2 1/2 54	2	5/8 x 3 1/2 M16 x 85	100 135	130 175	6.9 3.1	
5 125	5.563 141.3	750 51.7	18,229 81.09	0-3/4 0-6.4	7 178	10 254	2 1/2 54	2	5/8 x 3 1/2 M16 x 85	100 135	130 175	6.9 3.1	
6 1/2 O.D. 165.1	6.500 165.1	750 51.7	24,887 110.70	0-3/4 0-6.4	8 203	11 279	2 1/2 54	2	5/8 x 3 1/2 M16 x 85	100 135	130 175	7.6 3.4	
6 150	6.625 168.3	750 51.7	25,854 115.00	0-3/4 0-6.4	8 1/2 206	11 1/2 283	2 1/2 54	2	5/8 x 3 1/2 M16 x 85	100 135	130 175	7.9 3.6	
8 200	8.625 219.1	600 41.4	35,056 155.94	0-3/4 0-6.4	10 1/2 267	14 1/2 359	2 5/8 67	2	3/4 x 4 1/2 M20 x 110	130 175	180 245	15.9 7.2	
10 250	10.750 273.1	500 34.5	45,381 201.87	0-3/4 0-6.4	12 1/2 327	17 1/2 445	2 5/8 67	2	1 x 6 M24 x 150	200 270	250 340	25.6 11.6	
12 300	12.750 323.9	400 27.6	51,070 227.17	0-3/4 0-6.4	15 381	19 1/2 495	2 5/8 67	2	7/8 x 6 M22 x 150	180 245	220 300	30.5 13.8	
14 350	14.000 355.6	300 20.7	46,181 205.43	0-3/4 0-6.4	16 1/4 413	19 3/4 502	3 76	2	7/8 x 5 1/2 M22 x 140	180 245	220 300	36.1 16.4	
16 400	16.000 406.4	300 20.7	60,319 268.31	0-3/4 0-6.4	18 1/2 460	22 1/4 565	3 76	3	7/8 x 5 1/2 M22 x 140	180 245	220 300	42.0 19.1	
18 450	18.000 457.2	300 20.7	76,341 339.58	0-3/4 0-6.4	20 1/2 521	24 3/4 619	3 1/2 79	4	1 x 4 M24 x 100	200 270	250 340	51.6 23.4	
20 500	20.000 508.0	300 20.7	94,248 419.23	0-3/4 0-6.4	23 581	26 3/4 683	3 1/2 79	4	1 x 4 M24 x 100	200 270	250 340	68.3 31.0	
24 600	24.000 609.6	250 17.2	113,097 503.08	0-3/4 0-6.4	27 1/2 689	30 3/4 784	3 1/2 79	4	1 x 4 M24 x 100	200 270	250 340	89.3 40.5	

\* Available in ANSI or metric bolt sizes only as indicated.  
 For additional details see "Coupling Data Chart Notes" from page 15.  
 Not for use in copper systems.  
 § - For additional Bolt Torque information, see page 178.  
 See Installation & Assembly directions on page 147.

**Need quantity of 27  
Needs to be Galvanized**



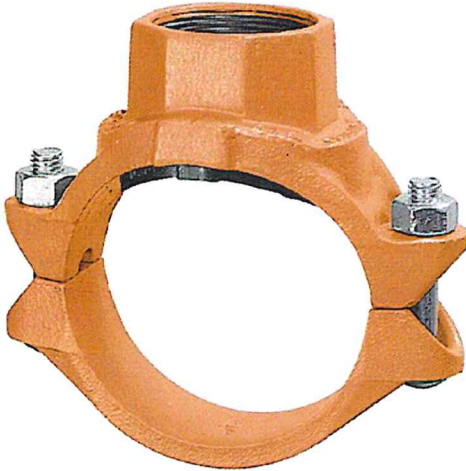
- Introduction
- Couplings
- Outlets
- High Pressure Process Fittings
- Advanced Copper Method
- DI-LOK® Nipples
- Plain-End Fittings
- HDPE Couplings
- SOOK-IT® Fittings
- Stainless Steel Method
- Roll Groovers
- Installation & Assembly
- Special Coatings
- Design Services
- Technical Data
- Master Format Part Specs.



## BRANCH OUTLETS



**FIG. 7045**  
Clamp-T, FPT Branch




  
 For Listings/Approval Details and Limitations,  
 visit our website @ [www.anvilintl.com](http://www.anvilintl.com)  
 or contact an Anvil/AnvilStar Sales Representative.

The Gruzlok Clamp-T provides a quick and easy outlet at any location along the pipe. A hole drilled or cut in the pipe to receive the locating collar of the Clamp-T is all that is required. The full, smooth outlet area provides for optimum flow characteristics.

The Clamp-T housing is specially engineered to conform to the pipe O.D. and the Clamp-T gasket providing a leak tight reliable seal in both positive pressure and vacuum conditions. The maximum working pressure for all sizes is 500 PSI (34.5 bar) when assembled on standard wall steel pipe.

The Gruzlok Clamp-T provides for a branch or cross connection in light wall or standard wall steel pipe.

The Fig. 7045 Clamp-T female pipe thread branch is available with NPT or ISO 7/1 connection and the Fig. 7046 Clamp-T has grooved-end branch connection.

Clamp-T cross connections are available in various sizes allowing greater versatility in piping design.

NOTE: Variable End Configurations are Possible —  
 Thd x Thd and Gr. x Thd.  
 Sizes — 2" x 1/2" through 8" x 4"

#### CLAMP-T FLOW DATA (FRICTIONAL RESISTANCE)

Branch Size Inches	Fig. 7045 Threaded Branch	
	C.V. Value	Equiv. Pipe Length Feet
DN/mm	Meters	
1/2	22	1.0
15	-	0.3
3/4	25	2.0
20	-	0.6
1	44	2.0
25	-	0.6
1 1/4	76	2.5
32	-	0.8
1 1/2	89	4.0
40	-	1.2
2	164	3.5
50	-	1.1
2 1/2	152	12.5
65	-	3.8
3	318	8.5
80	-	2.6
4	536	8.0
100	-	2.4

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## MATERIAL SPECIFICATIONS

### ANSI BOLTS & HEAVY HEX NUTS:

Heat treated, oval neck track head bolts conforming to ASTM A 183 Grade 2 with a minimum tensile strength of 110,000 psi and heavy hex nuts of carbon steel conforming to ASTM A 563 Grade A or Grade B, or J995 Grade 2. Bolts and nuts are provided zinc electroplated as standard.

### METRIC BOLTS & HEAVY HEX NUTS:

Heat treated, zinc electroplated oval-neck track head bolts made of carbon steel with mechanical properties per ISO 898-1 Class 8.8. Hex nuts are zinc electroplated followed by a yellow chromate dip.

### U-BOLT:

Cold drawn steel and zinc plated.

### STAINLESS STEEL BOLTS & NUTS:

Stainless steel bolts and nuts are also available. Contact a Gruzlok Representative for more information.

### HOUSING:

Ductile Iron conforming to ASTM A 536, Grade 65-45-12 or Malleable Iron conforming to ASTM A 47, Grade 32510.

### COATINGS:

Rust inhibiting paint Color: ORANGE (standard)

Hot Dipped Zinc Galvanized (optional)

Other Colors Available (IE: RAL3000 and RAL9000)

For other Coating requirements Contact a Gruzlok Representative for more information.

### GASKETS: Materials

Properties as designated in accordance with ASTM D 2000

#### Grade "E" EPDM (Green color code)

-40°F to 230°F (Service Temperature Range)(-40°C to 110°C)

Recommended for water service, diluted acids, alkalis solutions, oil-free air and many chemical services.

NOT FOR USE IN PETROLEUM APPLICATIONS.

#### Grade "T" Nitrile (Orange color code)

-20°F to 180°F (Service Temperature Range)(-29°C to 82°C)

Recommended for petroleum applications. air with oil vapors and vegetable and mineral oils.

NOT FOR USE IN HOT WATER OR HOT AIR.

### LUBRICATION:

Standard Gruzlok

Gruzlok Xtreme™ (Do Not use with Grade "L")

# BRANCH OUTLETS



**FIG. 7045**  
Clamp-T, FPT Branch

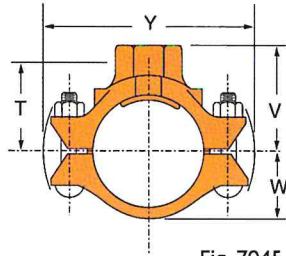


Fig. 7045

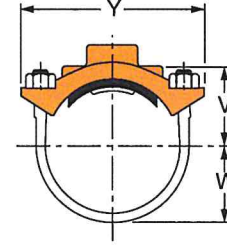
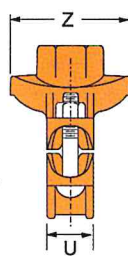
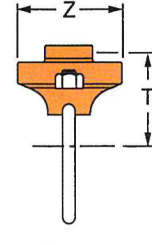


Fig. 7045 (U-Bolt)



**FIGURE 7045-FPT BRANCH (CONTINUED FROM PREVIOUS PAGE)**

Nominal Size	O.D.	Hole Dimensions		▼ Max. Working Pressure	Clamp-T Dimensions						Bolt Size	Specified Torque §		Approx. Wt. Each
		Min. Diameter	Max. Diameter		T	U	V Threaded	W	Y	Z		Min.	Max.	
<i>ln./DN(mm)</i>	<i>ln./mm</i>	<i>ln./mm</i>	<i>ln./mm</i>	<i>PSI/bar</i>	<i>ln./mm</i>	<i>ln./mm</i>	<i>ln./mm</i>	<i>ln./mm</i>	<i>ln./mm</i>	<i>ln./mm</i>	<i>ln./mm</i>	<i>Ft.-Lbs/N-m</i>		<i>Lbs./Kg</i>
5 x 1¼ <i>125 x 32</i>	5.563 x 1.660 <i>141.3 x 42.4</i>	2 <i>51</i>	2½ <i>54</i>	500 <i>34.5</i>	3¼ <i>94</i>	1½ <i>48</i>	4¾ <i>111</i>	¾ <i>83</i>	9½ <i>232</i>	3¼ <i>95</i>	¾ x 3¼ <i>-</i>	100	130	5.4 <i>2.4</i>
5 x 1½ <i>125 x 40</i>	5.563 x 1.900 <i>141.3 x 48.3</i>	2 <i>51</i>	2½ <i>54</i>	500 <i>34.5</i>	3¼ <i>94</i>	1½ <i>48</i>	4¾ <i>111</i>	¾ <i>83</i>	9½ <i>232</i>	3¼ <i>95</i>	¾ x 3¼ <i>-</i>	100	130	5.5 <i>2.5</i>
5 x 2 <i>125 x 50</i>	5.563 x 2.375 <i>141.3 x 60.3</i>	2½ <i>64</i>	2¾ <i>67</i>	500 <i>34.5</i>	3¼ <i>97</i>	1½ <i>48</i>	4½ <i>114</i>	¾ <i>83</i>	9½ <i>232</i>	4¼ <i>105</i>	¾ x 3¼ <i>-</i>	100	130	5.7 <i>2.6</i>
5 x 2½ <i>125 x 65</i>	5.563 x 2.875 <i>141.3 x 73.0</i>	2¾ <i>70</i>	2¾ <i>73</i>	500 <i>34.5</i>	3¼ <i>97</i>	1½ <i>48</i>	4¾ <i>121</i>	¾ <i>83</i>	9½ <i>232</i>	4¼ <i>111</i>	¾ x 3¼ <i>-</i>	100	130	7.0 <i>3.2</i>
5 x 3 O.D. <i>125 x 80</i>	5.563 x 2.996 <i>141.3 x 76.1</i>	2¾ <i>70</i>	2¾ <i>73</i>	500 <i>34.5</i>	¾ <i>95</i>	1½ <i>48</i>	4¾ <i>121</i>	¾ <i>83</i>	9½ <i>232</i>	4¼ <i>111</i>	¾ x 4½ <i>-</i>	130	180	7.0 <i>3.2</i>
5 x 3 <i>125 x 80</i>	5.563 x 3.500 <i>141.3 x 88.9</i>	3½ <i>89</i>	3¾ <i>92</i>	500 <i>34.5</i>	4 <i>102</i>	1½ <i>48</i>	5 <i>127</i>	¾ <i>83</i>	9½ <i>232</i>	5¼ <i>133</i>	¾ x 3¼ <i>-</i>	100	130	8.7 <i>3.9</i>
6 x 1¼ <i>150 x 32</i>	6.625 x 1.660 <i>168.3 x 42.4</i>	2 <i>51</i>	2½ <i>54</i>	500 <i>34.5</i>	4¼ <i>106</i>	2 <i>51</i>	4½ <i>124</i>	¾ <i>98</i>	10½ <i>257</i>	3¼ <i>95</i>	¾ x 4¼ <i>-</i>	100	130	7.8 <i>3.5</i>
6 x 1½ <i>150 x 40</i>	6.625 x 1.900 <i>168.3 x 48.3</i>	2 <i>51</i>	2½ <i>54</i>	500 <i>34.5</i>	4¼ <i>106</i>	2 <i>51</i>	4½ <i>124</i>	¾ <i>98</i>	10½ <i>257</i>	3¼ <i>95</i>	¾ x 4¼ <i>-</i>	100	130	7.8 <i>3.5</i>
6 x 2 <i>150 x 50</i>	6.625 x 2.375 <i>168.3 x 60.3</i>	2½ <i>64</i>	2¾ <i>67</i>	500 <i>34.5</i>	4¼ <i>106</i>	2 <i>51</i>	4½ <i>124</i>	¾ <i>98</i>	10½ <i>257</i>	4¼ <i>105</i>	¾ x 4¼ <i>-</i>	100	130	7.8 <i>3.5</i>
6 x 2½ <i>150 x 65</i>	6.625 x 2.875 <i>168.3 x 73.0</i>	2¾ <i>70</i>	2¾ <i>73</i>	500 <i>34.5</i>	4¼ <i>106</i>	2 <i>51</i>	5½ <i>130</i>	¾ <i>98</i>	10½ <i>257</i>	4¼ <i>111</i>	¾ x 4¼ <i>-</i>	100	130	8.4 <i>3.8</i>
6 x 3 O.D. <i>150 x 80</i>	6.625 x 2.996 <i>168.3 x 76.1</i>	2¾ <i>70</i>	2¾ <i>73</i>	500 <i>34.5</i>	4¼ <i>105</i>	2 <i>51</i>	5½ <i>130</i>	¾ <i>98</i>	10½ <i>257</i>	4¼ <i>111</i>	¾ x 4¼ <i>-</i>	100	130	8.4 <i>3.8</i>
6 x 3 <i>150 x 80</i>	6.625 x 3.500 <i>168.3 x 88.9</i>	3½ <i>89</i>	3¾ <i>92</i>	500 <i>34.5</i>	4¼ <i>111</i>	2 <i>51</i>	5½ <i>137</i>	¾ <i>98</i>	10½ <i>257</i>	5¼ <i>133</i>	¾ x 4¼ <i>-</i>	100	130	9.6 <i>4.4</i>
6 x 4 <i>150 x 100</i>	6.625 x 4.500 <i>168.3 x 114.3</i>	4½ <i>114</i>	4¾ <i>117</i>	500 <i>34.5</i>	4¼ <i>111</i>	2 <i>51</i>	5½ <i>140</i>	¾ <i>98</i>	10½ <i>257</i>	6½ <i>165</i>	¾ x 4¼ <i>-</i>	100	130	10.5 <i>4.8</i>
8 x 2 <i>200 x 50</i>	8.625 x 2.750 <i>219.1 x 70.0</i>	2½ <i>64</i>	2¾ <i>67</i>	500 <i>34.5</i>	5¼ <i>132</i>	2¼ <i>57</i>	5½ <i>149</i>	5 <i>127</i>	12¼ <i>324</i>	4¼ <i>105</i>	¾ x 4¼ <i>-</i>	130	180	11.3 <i>5.1</i>
8 x 2½ <i>200 x 65</i>	8.625 x 2.875 <i>219.1 x 73.0</i>	2¾ <i>70</i>	2¾ <i>73</i>	500 <i>34.5</i>	5¼ <i>134</i>	2¼ <i>57</i>	6¼ <i>159</i>	5 <i>127</i>	12¼ <i>324</i>	4¼ <i>111</i>	¾ x 4½ <i>-</i>	130	180	11.1 <i>5.0</i>
8 x 3 O.D. <i>200 x 80</i>	8.625 x 2.996 <i>219.1 x 76.1</i>	2¾ <i>70</i>	2¾ <i>73</i>	500 <i>34.5</i>	5¼ <i>133</i>	2¼ <i>57</i>	6¼ <i>159</i>	5 <i>127</i>	12¼ <i>324</i>	4¼ <i>111</i>	¾ x 4½ <i>-</i>	130	180	11.1 <i>5.0</i>
8 x 3 <i>200 x 80</i>	8.625 x 3.500 <i>219.1 x 88.9</i>	3½ <i>89</i>	3¾ <i>92</i>	500 <i>34.5</i>	5¼ <i>137</i>	2¼ <i>57</i>	6½ <i>162</i>	5 <i>127</i>	12¼ <i>324</i>	5¼ <i>133</i>	¾ x 4½ <i>-</i>	130	180	13.0 <i>5.9</i>
8 x 4 <i>200 x 100</i>	8.625 x 4.500 <i>219.1 x 114.3</i>	4½ <i>114</i>	4¾ <i>117</i>	500 <i>34.5</i>	5¼ <i>137</i>	2¼ <i>57</i>	6½ <i>165</i>	5 <i>127</i>	12¼ <i>324</i>	6½ <i>165</i>	¾ x 4½ <i>-</i>	130	180	16.2 <i>7.3</i>

NOTE: 2½", 5" and 6" Nom. Run pipe size Clamp-T may be used on 3" O.D., 5½" O.D. and 6½" O.D. pipe

▼ Based on use with standard wall pipe.

Not for use in copper systems.

§ - For additional Bolt Torque Information, see page 178.

(Additional smaller sizes on previous page.)

See Installation & Assembly directions on page 156.

**Need quantity of 5**  
**Need to be Galvanized**

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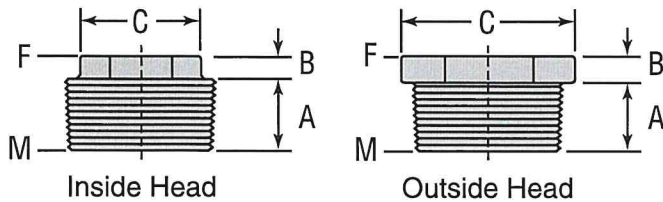
# MALLEABLE IRON THREADED FITTINGS



## Class 150 (Standard)

### FIG. 3383

#### Hex Bushing




  
 For Listings/Approval Details and Limitations, visit our website at [www.anvilint.com](http://www.anvilint.com) or contact an Anvil® Sales Representative.

843321

FIGURE 3383 - HEX BUSHING						
Nominal Size		Dimensions			Approx. Wt. Each	Hex
Male (M)	Female (F)	A	B	C		
In. (mm)	In. (mm)	In. (mm)	In. (mm)	In. (mm)	Lbs. (kg)	
3/4	1/2	0.63	0.22	1.15	0.11	Outside
	20	16.00	5.59	29.21	0.05	
1	1/8	0.75	0.30	1.12	0.18	Inside
	6	19.05	7.62	28.45	0.08	
	1/4	0.75	0.30	1.12	0.21	Inside
	8	19.05	7.62	28.45	0.10	
	3/8	0.75	0.30	1.12	0.20	Inside
	10	19.05	7.62	28.45	0.09	
1	1/2	0.75	0.25	1.42	0.22	Outside
	15	19.05	6.35	36.07	0.10	
3/4	1/2	0.75	0.25	1.42	0.18	Outside
	20	19.05	6.35	36.07	0.08	
1 1/4	1/4	0.80	0.34	1.12	0.30	Inside
	8	20.32	8.64	28.45	0.14	
	3/8	0.80	0.34	1.12	0.28	Inside
	10	20.32	8.64	28.45	0.13	
	1/2	0.80	0.34	1.34	0.32	Inside
15	20.32	8.64	34.04	0.15		
	3/4	0.80	0.28	1.76	0.37	Outside
20	20.32	7.11	44.70	0.17		
	1	0.80	0.28	1.76	0.30	Outside
25	20.32	7.11	44.70	0.14		
	1/4	0.83	0.37	1.12	0.38	Inside
8	21.08	9.40	28.45	0.17		
	3/8	0.83	0.37	1.12	0.38	Inside
10	21.08	9.40	28.45	0.17		
	1/2	0.83	0.37	1.34	0.40	Inside
15	21.08	9.40	34.04	0.18		

### MATERIAL SPECIFICATIONS

Dimensions: Fittings: ASME B16.3  
 Unions: ASME B16.39  
 Bushings/Plugs: ASME B16.14  
 Material: ASTM A-197  
 Finish: Black or Hot Dip Galvanized per ASTM A153 Class A  
 Threads\*: NPT per ASME B1.20.1  
 Pressure Ratings: Fittings: ASME B16.3  
 Unions: ASME B16.39  
 Bushings/Plugs: ASME B16.14

Pressure Testing: All malleable iron fittings are tested for through wall porosity using an air under water process.

Agency Approvals: All malleable iron fittings and unions are UL/ULC Listed and FM Approved.

\* British Standard threading per BS 21 available upon request.

PROJECT INFORMATION	APPROVAL STAMP
Project: C3 BACKFLOW PROJECT	<input type="checkbox"/> Approved
Address:	<input type="checkbox"/> Approved as noted
Contractor:	<input type="checkbox"/> Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1: Need Quantity of 3	
Notes 2: Needs to be Galvanized	





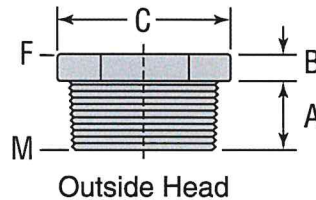
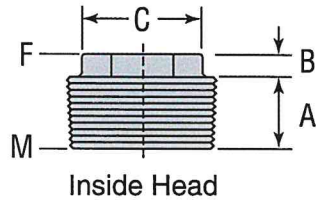
# MALLEABLE IRON THREADED FITTINGS



## Class 150 (Standard)

### FIG. 3383

#### Hex Bushing



843321

FIGURE 3383 - HEX BUSHING						
Nominal Size		Dimensions			Approx. Wt. Each	Hex
Male (M)	Female (F)	A	B	C		
In. (mm)	In. (mm)	In. (mm)	In. (mm)	In. (mm)	Lbs. (kg)	
1½ 40	¾	0.83	0.37	1.63	0.45	Inside
	20	21.08	9.40	41.40	0.20	
	1	0.83	0.31	2.00	0.46	Outside
25	21.08	7.87	50.80	0.21		
1¼	0.83	0.31	2.00	0.31	0.14	Outside
32	21.08	7.87	50.80			
2 50	¼	0.88	0.41	1.12	0.54	Inside
	8	22.35	10.41	28.45	0.24	
	½	0.88	0.41	1.34	0.56	Inside
	15	22.35	10.41	34.04	0.25	
	¾	0.88	0.41	1.63	0.61	Inside
	20	22.35	10.41	41.40	0.28	
	1	0.88	0.41	1.95	0.65	Inside
25	22.35	10.41	49.53	0.29		
1¼	0.88	0.34	2.48	0.80	0.36	Outside
32	22.35	8.64	62.99			
1½	0.88	0.34	2.48	0.66	0.30	Outside
40	22.35	8.64	62.99			
2½ 65	¾	1.07	0.44	1.63	0.98	Inside
	20	27.18	11.18	41.40	0.44	
	1	1.07	0.44	1.95	1.04	Inside
	25	27.18	11.18	49.53	0.47	
	1¼	1.07	0.44	2.39	1.10	Inside
	32	27.18	11.18	60.71	0.50	
1½	1.07	0.44	2.68	1.38	0.63	Outside
40	27.18	11.18	68.07			
2	1.07	0.37	2.98	0.97	0.44	Outside
50	27.18	9.40	75.69			

FIGURE 3383 - HEX BUSHING						
Nominal Size		Dimensions			Approx. Wt. Each	Hex
Male	Female (F)	A	B	C		
In. (mm)	In. (mm)	In. (mm)	In. (mm)	In. (mm)	Lbs. (kg)	
3 80	1	1.13	0.48	1.95	1.48	Inside
	25	28.70	12.19	49.53	0.67	
	1¼	1.13	0.48	2.39	1.57	Inside
	32	28.70	12.19	60.71	0.71	
	1½	1.13	0.48	2.68	1.62	Inside
	40	28.70	12.19	68.07	0.73	
2	2	1.13	0.48	3.28	2.10	Outside
	50	28.70	12.19	83.31	0.95	
	2½	1.13	0.40	3.86	1.84	Outside
65	28.70	10.16	98.04	0.83		
3½	3	1.18	0.43	4.62	2.10	Outside
90	80	29.97	10.92	117.35	0.95	
4 100	¾	1.22	0.67	1.63	2.48	Inside
	20	30.99	17.02	41.40	1.12	
	1	1.22	0.60	1.95	2.60	Inside
	25	30.99	15.24	49.53	1.18	
	1¼	1.22	0.60	2.39	2.74	Inside
	32	30.99	15.24	60.71	1.24	
	1½	1.22	0.60	2.68	2.81	Inside
	40	30.99	15.24	68.07	1.27	
	2	1.22	0.60	3.28	2.91	Inside
50	30.99	15.24	83.31	1.32		
2½	1.22	0.60	3.86	2.98	Inside	
65	30.99	15.24	98.04	1.35		
3	1.22	0.50	4.62	2.93	Outside	
80	30.99	12.70	117.35	1.33		





# GRUVLOK FITTINGS



**FIG. 7063**

Tee w/ Threaded Branch

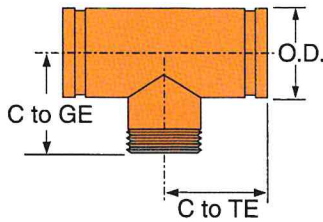


FIGURE 7063 TEE WITH THREADED BRANCH				
Nominal Size	O.D.	C to GE	C to TE	Approx. Wt. Ea.
In./DN(mm)	In./mm	In./mm	In./mm	Lbs./Kg
1	1.315	2 1/4	2 1/4	0.9
25	33.4	57	57	0.4
1 1/4	1.660	2 3/4	2 3/4	1.4
32	42.2	70	70	0.6
1 1/2	1.900	2 3/4	2 3/4	1.7
40	48.3	70	70	0.8
2	2.375	3 1/4	4 1/4	2.9
50	60.3	83	108	1.3
2 1/2	2.875	3 3/4	3 3/4	4.7
65	73.0	95	95	2.1
3	3.500	4 1/4	6	8.1
80	88.9	108	152	3.7
3 1/2	4.000	4 1/2	4 1/2	8.8
90	101.6	114	114	4.0
4	4.500	5	7 1/4	13.5
100	114.3	127	184	6.1
5	5.563	5 1/2	5 1/2	16.7
125	140	140	140	7.6
6	6.625	6 1/2	6 1/2	25.6
150	168.3	165	165	11.6
8	8.625	7 3/4	7 3/4	45.0
200	219.1	197	197	20.4
10	10.750	9	9	73.0
250	273.1	229	229	33.1
12	12.750	10	10	98.0
300	323.9	254	254	44.5

**FIG. 7061**

Reducing Tee Standard

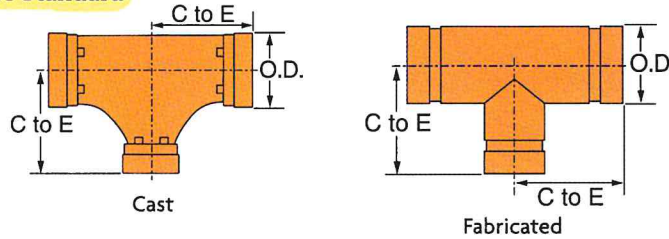


FIGURE 7061 STANDARD REDUCING TEE								
Nominal Size	Center to End	Approx. Wt. Ea.	Nominal Size	Center to End	Approx. Wt. Ea.	Nominal Size	Center to End	Approx. Wt. Ea.
In./DN(mm)	In./mm	Lbs./Kg	In./DN(mm)	In./mm	Lbs./Kg	In./DN(mm)	In./mm	Lbs./Kg
1 1/4 x 1 1/4 x 1	2 3/4	1.5	6 x 6 x 2 1/2	6 1/2 C	26.5	14 x 14 x 8	11	103
32 x 32 x 25	70	0.7	150 x 150 x 65	165	12.0	350 x 350 x 200	279	46.7
40 x 40 x 25	70	0.8	6 x 6 x 3	6 1/2 C	26.5	14 x 14 x 10	11	104
40 x 40 x 32	70	0.8	150 x 150 x 80	165	12.0	350 x 350 x 250	279	47.2
1 1/2 x 1 1/2 x 1 1/4	2 3/4	1.8	6 x 6 x 4	6 1/2 C	26.5	14 x 14 x 12	11	105
40 x 40 x 32	70	0.8	150 x 150 x 100	165	12.0	350 x 350 x 300	279	47.6
2 x 2 x 1	3 1/4 C	2.6	6 x 6 x 5	6 1/2 C	28.0	16 x 16 x 4	12	126
50 x 50 x 25	83	1.2	150 x 150 x 125	165	12.7	400 x 400 x 100	305	57.2
2 x 2 x 1 1/4	3 3/4	1.7	8 x 8 x 1 1/2	7 3/4	33.0	16 x 16 x 6	12	127
50 x 50 x 32	83	0.8	200 x 200 x 40	197	15.0	400 x 400 x 150	305	57.6
2 x 2 x 1 1/2	3 3/4 C	2.7	8 x 8 x 2	7 3/4	32.7	16 x 16 x 8	12	128
50 x 50 x 40	83	1.2	200 x 200 x 50	197	14.8	400 x 400 x 200	305	58.1
2 1/2 x 2 1/2 x 1	3 3/4	4.1	8 x 8 x 2 1/2	7 3/4	33.0	16 x 16 x 10	12	129
65 x 65 x 25	95	1.9	200 x 200 x 65	197	15.0	400 x 400 x 250	305	58.5
2 1/2 x 2 1/2 x 1 1/4	3 3/4	4.2	8 x 8 x 3	7 3/4	33.5	16 x 16 x 12	12	130
65 x 65 x 32	95	1.9	200 x 200 x 80	197	15.2	400 x 400 x 300	305	59.0
2 1/2 x 2 1/2 x 1 1/2	3 3/4	4.3	8 x 8 x 4	7 3/4 C	50.0	16 x 16 x 14	12	132
65 x 65 x 40	95	2.0	200 x 200 x 100	197	22.7	400 x 400 x 350	305	59.9
2 1/2 x 2 1/2 x 2	3 3/4	4.4	8 x 8 x 5	7 3/4	34.7	18 x 18 x 4	15 1/2	188
65 x 65 x 50	95	2.0	200 x 200 x 125	197	15.7	450 x 450 x 100	394	85.3
3 x 3 x 1	4 1/4 C	7.0	8 x 8 x 6	7 3/4 C	54.0	18 x 18 x 6	15 1/2	190
80 x 80 x 25	108	3.2	200 x 200 x 150	197	24.5	450 x 450 x 150	394	86.2
3 x 3 x 1 1/4	4 1/4	5.8	10 x 10 x 1 1/2	9	52.0	18 x 18 x 8	15 1/2	192
80 x 80 x 32	108	2.6	250 x 250 x 40	229	23.6	450 x 450 x 200	394	87.1
3 x 3 x 1 1/2	4 1/4	5.9	10 x 10 x 2	9	52.2	18 x 18 x 10	15 1/2	194
80 x 80 x 40	108	2.7	250 x 250 x 50	229	23.7	450 x 450 x 250	394	88.0
3 x 3 x 2	4 1/4 C	5.5	10 x 10 x 2 1/2	9	52.6	18 x 18 x 12	15 1/2	196
80 x 80 x 50	108	2.5	250 x 250 x 65	229	23.9	450 x 450 x 300	394	88.9
3 x 3 x 2 1/2	4 1/4	6.3	10 x 10 x 3	9	53.0	18 x 18 x 14	15 1/2	201
80 x 80 x 65	108	2.9	250 x 250 x 80	229	24.0	450 x 450 x 350	394	91.2
4 x 4 x 1	5	7.0	10 x 10 x 4	9	53.6	18 x 18 x 16	15 1/2	203
100 x 100 x 25	95	3.2	250 x 250 x 100	229	24.3	450 x 450 x 400	394	92.1
4 x 4 x 1 1/4	5	9.6	10 x 10 x 5	9	54.2	20 x 20 x 6	17 1/4	240
100 x 100 x 32	127	4.4	250 x 250 x 125	229	24.6	500 x 500 x 150	438	108.9
4 x 4 x 1 1/2	5	10.2	10 x 10 x 6	9	55.0	20 x 20 x 8	17 1/4	242
100 x 100 x 40	127	4.6	250 x 250 x 150	229	24.9	500 x 500 x 200	438	109.8
4 x 4 x 2	5 C	10.2	10 x 10 x 8	9	64.7	20 x 20 x 10	17 1/4	244
100 x 100 x 50	127	4.6	250 x 250 x 200	229	29.3	500 x 500 x 250	438	110.7
4 x 4 x 2 1/2	5 C	11.2	12 x 12 x 1	10	77.0	20 x 20 x 12	17 1/4	246
100 x 100 x 65	127	5.1	300 x 300 x 25	254	34.9	500 x 500 x 300	438	111.6
4 x 4 x 3	5 C	11.4	12 x 12 x 2	10	80.0	20 x 20 x 14	17 1/4	248
100 x 100 x 80	127	5.2	300 x 300 x 50	254	36.3	500 x 500 x 350	438	112.5
5 x 5 x 1	5 1/2	13.6	12 x 12 x 2 1/2	10	78.0	20 x 20 x 16	17 1/4	250
125 x 125 x 25	140	6.2	300 x 300 x 65	254	35.4	500 x 500 x 400	438	113.4
5 x 5 x 1 1/2	5 1/2	13.8	12 x 12 x 3	10	74.6	20 x 20 x 18	17 1/4	252
125 x 125 x 40	140	6.3	300 x 300 x 80	254	33.8	500 x 500 x 450	438	114.3
5 x 5 x 2	5 1/2	14	12 x 12 x 4	10	75.1	24 x 24 x 8	20	327
125 x 125 x 50	140	6.4	300 x 300 x 100	254	34.1	600 x 600 x 200	508	148.3
5 x 5 x 2 1/2	5 1/2	14.3	12 x 12 x 5	10	75.6	24 x 24 x 10	20	330
125 x 125 x 65	140	6.5	300 x 300 x 125	254	34.3	600 x 600 x 250	508	149.7
5 x 5 x 3	5 1/2	14.6	12 x 12 x 6	10	76.2	24 x 24 x 12	20	334
125 x 125 x 80	140	6.6	300 x 300 x 150	254	34.6	600 x 600 x 300	508	151.5
5 x 5 x 4	5 1/2 C	17.9	12 x 12 x 8	10	76.3	24 x 24 x 14	20	340
125 x 125 x 100	140	8.1	300 x 300 x 200	254	34.6	600 x 600 x 350	508	154.2
6 x 6 x 1	6 1/2	20.5	12 x 12 x 10	10	77.6	24 x 24 x 16	20	342
150 x 150 x 25	165	9.3	300 x 300 x 250	254	35.2	600 x 600 x 400	508	155.1
6 x 6 x 1 1/2	6 1/2	21.0	14 x 14 x 4	11	100.0	24 x 24 x 18	20	345
150 x 150 x 40	165	9.5	350 x 350 x 100	279	45.4	600 x 600 x 450	508	156.5
6 x 6 x 2	6 1/2 C	26.4	14 x 14 x 6	11	101	24 x 24 x 20	20	347
150 x 150 x 50	165	12.0	350 x 350 x 150	279	45.8	600 x 600 x 500	508	157.4

Need quantity of 2  
Need to be Galvanized



C - Cast malleable or ductile iron, all others are fabricated steel.

Center to end dimensions and weights may differ from those shown in chart, contact a Gruvlok Representative for more information. See Fitting Size chart on page 47 for O.D.

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# GRUVLOK FITTINGS FOR GROOVED-END PIPE

Gruvlok fittings are available through 24" nominal pipe size in a variety of styles. Use the Fitting Size Table to convert nominal pipe size to corresponding pipe O.D.

These fittings are designed to provide minimum pressure drop and uniform strength.

Depending on styles and size, Gruvlok fittings are provided in various materials including malleable iron, ductile iron, forged steel or fabricated steel.

Pressure ratings of Gruvlok standard fittings conform to those of Fig. 7001 Gruvlok coupling.

Not for use in copper systems.



FLOW DATA – FRICTIONAL RESISTANCE (EXPRESSED AS EQUIVALENT STRAIGHT PIPE)						
Nom. Size	O.D.	Pipe Wall Thickness	Elbow		Tee	
			90°	45°	Branch	Run
In./DN(mm)	In./mm	In./mm	ft./m	ft./m	ft./m	ft./m
1 25	1.315 33.4	0.133 3.4	1.7 0.5	0.9 0.3	4.4 1.3	1.7 0.5
1¼ 32	1.660 42.2	0.140 3.6	2.3 0.7	1.2 0.4	5.8 1.8	2.3 0.7
1½ 40	1.900 48.3	0.145 3.7	2.7 0.8	1.3 0.4	6.7 2.0	2.7 0.8
2 50	2.375 60.3	0.154 3.9	3.4 1.0	1.7 0.5	8.6 2.6	3.4 1.0
2½ 65	2.875 73.0	0.203 5.2	4.1 1.2	2.1 0.6	10.3 3.1	4.1 1.2
3 O.D. 76.1	2.996 76.1	0.197 5.0	4.3 1.3	2.2 0.7	10.8 3.3	4.3 1.3
3 80	3.500 88.9	0.216 5.5	5.1 1.6	2.6 0.8	12.8 3.9	5.1 1.6
4¼ O.D. 108.0	4.250 108.0	0.220 5.6	6.4 2.0	3.2 1.0	16.1 4.9	6.4 2.0
4 100	4.500 114.3	0.237 6.0	6.7 2.0	3.4 1.0	16.8 5.1	6.7 2.0
5¼ O.D. 133.0	5.236 133.0	0.248 6.3	8.0 2.4	4.0 1.2	20.1 6.1	8.0 2.4
5½ O.D. 139.7	5.500 139.7	0.248 6.3	8.3 2.5	4.2 1.3	20.9 6.4	8.3 2.5
5 125	5.563 141.3	0.258 6.6	8.4 2.6	4.2 1.3	21.0 6.4	8.4 2.6
6¼ O.D. 159.0	6.259 159.0	0.280 7.1	9.7 3.0	4.9 1.5	24.3 7.4	9.7 3.0
6½ O.D. 165.1	6.500 165.1	0.280 7.1	10.0 3.0	5.0 1.5	24.9 7.6	10.0 3.0
6 150	6.625 168.3	0.280 7.1	10.1 3.1	5.1 1.6	25.3 7.7	10.1 3.1
8 200	8.625 219.1	0.322 8.2	13.3 4.1	6.7 2.0	33.3 10.1	13.3 4.1
10 250	10.750 273.1	0.365 9.3	16.7 5.1	8.4 2.6	41.8 12.7	16.7 5.1
12 300	12.750 323.9	0.375 9.5	20.0 6.1	10.0 3.0	50.0 15.2	20.0 6.1
14 350	14.000 355.6	0.375 9.5	22.2 6.8	11.7 5.4	64.2 19.6	22.9 7.0
16 400	16.000 406.4	0.375 9.5	25.5 7.8	12.4 6.2	73.9 22.5	26.4 8.0
18 450	18.000 457.2	0.375 9.5	28.9 8.8	13.1 7.0	87.2 26.6	31.1 9.5
20 500	20.000 508.0	0.375 9.5	32.2 9.8	13.7 7.8	97.3 29.7	34.8 10.6
24 600	24.000 609.6	0.375 9.5	38.9 11.9	17.1 9.5	113.0 34.4	40.4 12.3

For the reducing tee and branches, use the value that is corresponding to the branch size. For example: for 6" x 6" x 3" tee, the branch value of 3" is 12.8 ft (3.9).

## MATERIAL SPECIFICATIONS

### CAST FITTINGS:

Ductile iron conforming to ASTM A 536  
Malleable iron conforming to ASTM A 47

### FABRICATED FITTINGS:

1-6" Carbon steel, Schedule 40, conforming to ASTM A 53, Grade B  
8-12" Carbon steel, Schedule 30, conforming to ASTM A 53, Grade B  
14-24" Carbon steel, 0.375 wall, conforming to ASTM A 53, Grade B

### COATINGS:

Rust inhibiting paint Color: ORANGE (standard)  
Hot Dipped Zinc Galvanized conforming to ASTM A 153 (optional)  
Other Colors Available (IE: RAL3000 and RAL9000)

FITTING SIZE			
Nominal Size	O.D.	Nominal Size	O.D.
In./DN(mm)	In./mm	In./DN(mm)	In./mm
1 25	1.315 33.4	5 140	5.563 141.3
1¼ 32	1.660 42.4	6¼ O.D. 159.0	6.259 159.0
1½ 40	1.900 48.3	6½ O.D. 165.1	6.500 165.1
2 50	2.375 60.3	6 150	6.625 168.3
2½ 65	2.875 73.0	8 200	8.625 219.1
3 O.D. 76.1	2.996 76.1	10 250	10.750 273.0
3 80	3.500 88.9	12 300	12.750 323.9
3½ 65	4.000 101.6	14 350	14.000 355.6
4¼ O.D. 108.0	4.250 108.0	16 400	16.000 406.4
4 100	4.500 114.3	18 450	18.000 457.2
5¼ O.D. 133.0	5.236 133.0	20 500	20.000 508.0
5½ O.D. 139.7	5.500 139.7	24 600	24.000 609.6

The Fitting Size Chart is used to determine the O.D. of the pipe that the fittings is to be used with. Gruvlok Fittings are identified by either the Nominal size in inches or the Pipe O.D. in/mm.





# COUPLINGS FOR GROOVED-END PIPE



## FIG. 7401

### Rigidlok® Coupling

The Fig. 7401 Rigidlok Coupling from Gruvlok provides a rigid, locked in pipe connection. Rigidity is attained simply; it is designed in.

The Fig. 7401 Rigidlok coupling is based on a technologically advanced housing design that conforms to and grips the pipe. With the Fig. 7401 there emerges a new generation of rigid couplings.

Coupling installation is fast and easy, remove only one nut and swing the housing over the gasket and into the grooves. The exclusive Guidelok® feature automatically separates the grooved pipe ends and guides the coupling into position as the bolts are tightened. Precisely sized and oriented tines in the housing key section firmly grip the pipe. The combination of these designed in features produce a secure, rigid pipe joint connection.

This coupling is an ideal connector for service and applications that require a rigid connection.

The Fig. 7401 Rigidlok Coupling is designed for use with roll grooved or cut grooved standard weight and roll grooved lightweight pipe, as well as with grooved-end fittings and valves.



   
For Listings/Approval Details and Limitations,  
visit our website @ [www.anvilintl.com](http://www.anvilintl.com)  
or contact an Anvil/AnvilStar Sales Representative.

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The Rigidlok Coupling maintains a rigid connection with support and hanging in conformance with applicable ANSI B31.1 Power Piping Code, ANSI B31.9 Building Service Pipe Code as well as NFPA 13 sprinkler systems.

The Fig. 7401 Rigidlok Coupling allows for working pressure ratings to 750 psi (51.7 bar) when used on standard wall roll or cut grooved pipe.

## MATERIAL SPECIFICATIONS

### ANSI BOLTS & HEAVY HEX NUTS:

Heat treated, oval neck track head bolts conforming to ASTM A 183 Grade 2 with a minimum tensile strength of 110,000 psi and heavy hex nuts of carbon steel conforming to ASTM A 563 Grade A or Grade B, or J995 Grade 2. Bolts and nuts are provided zinc electroplated as standard.

### METRIC BOLTS & HEAVY HEX NUTS:

Heat treated, zinc electroplated oval-neck track head bolts made of carbon steel with mechanical properties per ISO 898-1 Class 8.8. Hex nuts are zinc electroplated followed by a yellow chromate dip.

### STAINLESS STEEL BOLTS & NUTS:

Stainless steel bolts and nuts are also available. Contact a Gruvlok Representative for more information.

### HOUSING:

Ductile Iron conforming to ASTM A 536, Grade 65-45-12

### COATINGS:

Rust inhibiting paint Color: ORANGE (standard)

Hot Dipped Zinc Galvanized (optional)

Other Colors Available (IE: RAL3000 and RAL9000)

For other Coating requirements contact a Gruvlok Representative.

### GASKETS: Materials

Properties as designated in accordance with ASTM D 2000

Grade "E" EPDM (Green color code) NSF 61 Certified  
-20°F to 230°F (Service Temperature Range)(-40°C to 110°C)

Recommended for water service, diluted acids, alkalies solutions, oil-free air and many chemical services.

NOT FOR USE IN PETROLEUM APPLICATIONS.

Grade "T" Nitrile (Orange color code)

-20°F to 180°F (Service Temperature Range)(-29°C to 82°C)

Recommended for petroleum applications. air with oil vapors and vegetable and mineral oils.

NOT FOR USE IN HOT WATER OR HOT AIR

Grade "O" Fluoro-Elastomer (Blue color code)

-20°F to 300°F (Service Temperature Range)(-29°C to 149°C)

Recommended for high temperature resistance to oxidizing acids, petroleum oils, hydraulic fluids, halogenated hydrocarbons and lubricants.

Grade "L" Silicone (Red color code)

-40°F to 350°F (Service Temperature Range)(-40°C to 177°C)

Recommended for dry, hot air and some high temperature chemical services.

### GASKET TYPE:

Standard C Style

Flush Gap (1 1/2" - 14")

### LUBRICATION:

Standard Gruvlok

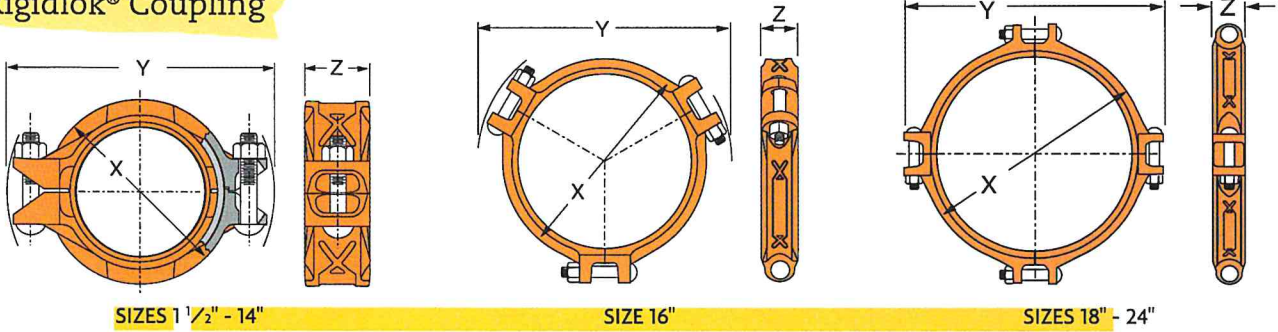
Gruvlok Xtreme™ (Do Not use with Grade "L")





# COUPLINGS FOR GROOVED-END PIPE

**FIG. 7401**  
Rigidlok® Coupling



SIZES 1 1/2" - 14"

SIZE 16"

SIZES 18" - 24"

**FIGURE 7401 RIDGIDLOK COUPLING**

Nominal Size	O.D.	Max. Working Pressure	Max. End Load	Range of Pipe End Separation	Coupling Dimensions			Qty.	Coupling Bolts*		Specified Torque §		Approx. Wt. Ea.
					X	Y	Z		Size	Min.	Max.		
In./DN(mm)	In./mm	PSI/bar	Lbs./kN	In./mm	In./mm	In./mm	In./mm	In./mm	Ft.-Lbs/N-M		Lbs./kN		
1 1/2 40	1.900 48.3	750 51.7	2,126 9.46	0-1/8 0-3.2	3 76	5 1/2 130	1 1/2 48	2	3/8 x 2 1/4 M10 x 57	30 40	45 60	1.8 0.8	
2 50	2.375 60.3	750 51.7	3,323 14.78	0-1/8 0-3.2	3 1/2 89	5 1/2 143	1 1/2 48	2	3/8 x 2 1/2 M10 x 63	30 40	45 60	2.4 1.1	
2 1/2 65	2.875 73.0	750 51.7	4,869 21.66	0-1/8 0-3.2	4 102	6 1/2 156	1 1/2 48	2	3/8 x 2 1/2 M10 x 63	30 40	45 60	2.9 1.3	
3 O.D. 76.1	2.996 76.1	750 51.7	5,207 23.52	0-1/8 0-3.2	4 1/4 105	6 1/2 156	1 1/2 48	2	1/2 x 3 M12 x 76	80 110	100 150	3.4 1.5	
3 80	3.500 88.9	750 51.7	7,216 32.10	0-1/8 0-3.2	4 3/4 121	7 1/4 184	1 1/2 48	2	1/2 x 3 M12 x 76	80 110	100 150	3.6 1.6	
4 100	4.500 114.3	750 51.7	11,928 53.06	0-1/4 0-6.4	5 1/2 149	8 3/4 213	2 1/2 54	2	1/2 x 3 M12 x 76	80 110	100 150	5.0 2.3	
5 1/2 O.D. 139.7	5.500 139.7	750 51.7	17,819 79.26	0-1/4 0-6.4	7 178	9 1/4 248	2 1/2 54	2	5/8 x 3 1/2 M16 x 85	100 135	130 175	6.9 3.1	
5 125	5.563 141.3	750 51.7	18,229 81.09	0-1/4 0-6.4	7 178	10 254	2 1/2 54	2	5/8 x 3 1/2 M16 x 85	100 135	130 175	6.9 3.1	
6 1/2 O.D. 165.1	6.500 165.1	750 51.7	24,887 110.70	0-1/4 0-6.4	8 203	11 279	2 1/2 54	2	5/8 x 3 1/2 M16 x 85	100 135	130 175	7.6 3.4	
6 150	6.625 168.3	750 51.7	25,854 115.00	0-1/4 0-6.4	8 1/2 206	11 1/2 283	2 1/2 54	2	5/8 x 3 1/2 M16 x 85	100 135	130 175	7.9 3.6	
8 200	8.625 219.1	600 41.4	35,056 155.94	0-1/4 0-6.4	10 1/2 267	14 1/2 359	2 5/8 67	2	3/4 x 4 1/2 M20 x 110	130 175	180 245	15.9 7.2	
10 250	10.750 273.1	500 34.5	45,381 201.87	0-1/4 0-6.4	12 1/2 327	17 1/2 445	2 5/8 67	2	1 x 6 M24 x 150	200 270	250 340	25.6 11.6	
12 300	12.750 323.9	400 27.6	51,070 227.17	0-1/4 0-6.4	15 381	19 1/2 495	2 5/8 67	2	7/8 x 6 M22 x 150	180 245	220 300	30.5 13.8	
14 350	14.000 355.6	300 20.7	46,181 205.43	0-1/4 0-6.4	16 1/4 413	19 3/4 502	3 76	2	7/8 x 5 1/2 M22 x 140	180 245	220 300	36.1 16.4	
16 400	16.000 406.4	300 20.7	60,319 268.31	0-1/4 0-6.4	18 1/2 460	22 1/4 565	3 76	3	7/8 x 5 1/2 M22 x 140	180 245	220 300	42.0 19.1	
18 450	18.000 457.2	300 20.7	76,341 339.58	0-1/4 0-6.4	20 1/2 521	24 3/4 619	3 1/2 79	4	1 x 4 M24 x 100	200 270	250 340	51.6 23.4	
20 500	20.000 508.0	300 20.7	94,248 419.23	0-1/4 0-6.4	23 581	26 3/4 683	3 1/2 79	4	1 x 4 M24 x 100	200 270	250 340	68.3 31.0	
24 600	24.000 609.6	250 17.2	113,097 503.08	0-1/4 0-6.4	27 1/2 689	30 3/4 784	3 1/2 79	4	1 x 4 M24 x 100	200 270	250 340	89.3 40.5	

\* Available in ANSI or metric bolt sizes only as indicated.  
 For additional details see "Coupling Data Chart Notes" from page 15.  
 Not for use in copper systems.  
 § - For additional Bolt Torque information, see page 178.  
 See Installation & Assembly directions on page 147.

**Need Quantity of 2  
Need to be Galvanized**



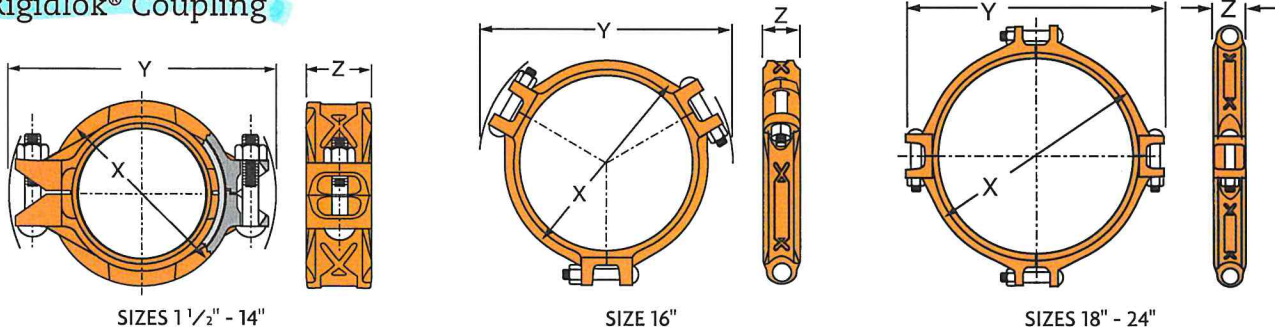
- Introduction
- Couplings
- Outlets
- Fittings
- High Pressure
- Advanced Copper Method
- DI-LOK® Nipples
- Plain-End Fittings
- HDPE Couplings
- Soak-It® Fittings
- Stainless Steel Method
- Roll Groovers
- Installation & Assembly
- Special Coatings
- Design Services
- Technical Data
- Master Format Part Specs.





# COUPLINGS FOR GROOVED-END PIPE

**FIG. 7401**  
Rigidlok® Coupling



**FIGURE 7401 RIDGIDLOK COUPLING**

Nominal Size	O.D.	Max. Working Pressure	Max. End Load	Range of Pipe End Separation	Coupling Dimensions			Qty.	Coupling Bolts*		Specified Torque §		Approx. Wt. Ea.
					X	Y	Z		Size	Min.	Max.		
In./DN(mm)	In./mm	PSI/bar	Lbs./kN	In./mm	In./mm	In./mm	In./mm	In./mm	Ft.-Lbs./N-M		Lbs./kN		
1½	1.900	750	2,126	0-¼	3	5½	1½	2	¾ x 2¼	30	45	1.8	
40	48.3	51.7	9.46	0-3.2	76	130	48		M10 x 57	40	60	0.8	
2	2.375	750	3,323	0-¼	3½	5½	1½	2	¾ x 2½	30	45	2.4	
50	60.3	51.7	14.78	0-3.2	89	143	48		M10 x 63	40	60	1.1	
2½	2.875	750	4,869	0-¼	4	6½	1½	2	¾ x 2½	30	45	2.9	
65	73.0	51.7	21.66	0-3.2	102	156	48		M10 x 63	40	60	1.3	
3 O.D.	2.996	750	5,207	0-¼	4½	6½	1½	2	½ x 3	80	100	3.4	
76.1	76.1	51.7	23.52	0-3.2	105	156	48		M12 x 76	110	150	1.5	
3	3.500	750	7,216	0-¼	4¾	7¼	1½	2	½ x 3	80	100	3.6	
80	88.9	51.7	32.10	0-3.2	121	184	48		M12 x 76	110	150	1.6	
4	4.500	750	11,928	0-¼	5½	8½	2½	2	½ x 3	80	100	5.0	
100	114.3	51.7	53.06	0-6.4	149	213	54		M12 x 76	110	150	2.3	
5½ O.D.	5.500	750	17,819	0-¼	7	9¼	2½	2	½ x 3½	100	130	6.9	
139.7	139.7	51.7	79.26	0-6.4	178	248	54		M16 x 85	135	175	3.1	
5	5.563	750	18,229	0-¼	7	10	2½	2	½ x 3½	100	130	6.9	
125	141.3	51.7	81.09	0-6.4	178	254	54		M16 x 85	135	175	3.1	
6½ O.D.	6.500	750	24,887	0-¼	8	11	2½	2	½ x 3½	100	130	7.6	
165.1	165.1	51.7	110.70	0-6.4	203	279	54		M16 x 85	135	175	3.4	
6	6.625	750	25,854	0-¼	8½	11½	2½	2	¾ x 3½	100	130	7.9	
150	168.3	51.7	115.00	0-6.4	206	283	54		M16 x 85	135	175	3.6	
8	8.625	600	35,056	0-¼	10½	14½	2½	2	¾ x 4½	130	180	15.9	
200	219.1	41.4	155.94	0-6.4	267	359	67		M20 x 110	175	245	7.2	
10	10.750	500	45,381	0-¼	12½	17½	2½	2	1 x 6	200	250	25.6	
250	273.1	34.5	201.87	0-6.4	327	445	67		M24 x 150	270	340	11.6	
12	12.750	400	51,070	0-¼	15	19½	2½	2	7/8 x 6	180	220	30.5	
300	323.9	27.6	227.17	0-6.4	381	495	67		M22 x 150	245	300	13.8	
14	14.000	300	46,181	0-¼	16¼	19¾	3	2	7/8 x 5½	180	220	36.1	
350	355.6	20.7	205.43	0-6.4	413	502	76		M22 x 140	245	300	16.4	
16	16.000	300	60,319	0-¼	18½	22¼	3	3	7/8 x 5½	180	220	42.0	
400	406.4	20.7	268.31	0-6.4	460	565	76		M22 x 140	245	300	19.1	
18	18.000	300	76,341	0-¼	20½	24¾	3½	4	1 x 4	200	250	51.6	
450	457.2	20.7	339.58	0-6.4	521	619	79		M24 x 100	270	340	23.4	
20	20.000	300	94,248	0-¼	23	26¾	3½	4	1 x 4	200	250	68.3	
500	508.0	20.7	419.23	0-6.4	581	683	79		M24 x 100	270	340	31.0	
24	24.000	250	113,097	0-¼	27½	30¾	3½	4	1 x 4	200	250	89.3	
600	609.6	17.2	503.08	0-6.4	689	784	79		M24 x 100	270	340	40.5	

\* Available in ANSI or metric bolt sizes only as indicated.  
 For additional details see "Coupling Data Chart Notes" from page 15.  
 Not for use in copper systems.  
 § - For additional Bolt Torque information, see page 178.  
 See Installation & Assembly directions on page 147.

Introduction  
Couplings  
Outlets  
High Pressure  
7/8" & 1" Fittings  
Accessories  
Advanced  
Copper Method  
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& Assembly  
Special  
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Design  
Services  
Technical  
Data  
Laser Format  
Part Specs.

