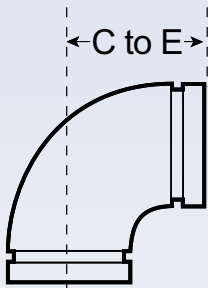


## CTS Copper Fittings

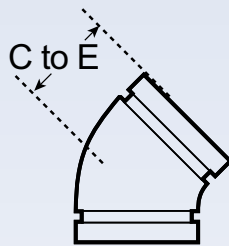
CTS Copper Fittings are produced with groove and cup ends in a variety of fitting configurations. The fittings are constructed to ASTM B75 UNS C12200 with minimum copper content of 99.9%. Fitting pressure ratings match the ratings of the Figure 6400 Coupling.



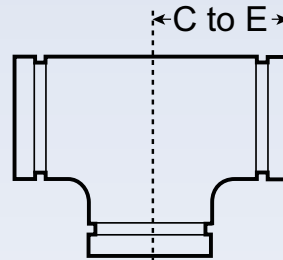
Certified to ANS/NSF 61



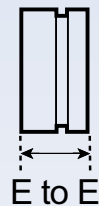
**Fig. 6050**



**Fig. 6051**



**Fig. 6060**

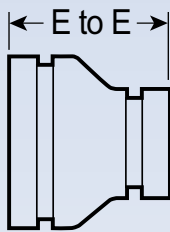


**Fig. 6074**

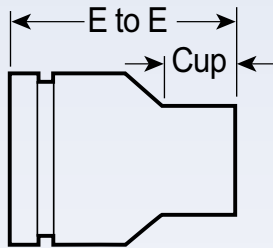
### Dimensions/Weights — Elbows, Tees & Caps

Nominal Size	Copper Tube Diameter	Fig. 6050 90° Elbow		Fig. 6051 45° Elbow		Fig. 6060 Tee		Fig. 6074 Cap	
		C to E	Wt. Ea.	C to E	Wt. Ea.	C to E	Wt. Ea.	E to E	Wt. Ea.
In.	In./mm	In./mm	Lbs./kg	In./mm	Lbs./kg	In./mm	Lbs./kg	In./mm	Lbs./kg
2	2.125 54.0	2.91 74	0.75 0.34	2.19 56	0.61 0.28	2.69 68	1.45 0.66	2.00 51	0.36 0.16
2½	2.625 66.7	3.31 84	1.15 0.52	2.31 59	0.89 0.40	3.20 81	2.37 1.07	2.00 51	0.50 0.23
3	3.125 79.4	3.81 97	1.88 0.85	2.59 66	1.38 0.63	3.52 89	3.38 1.53	2.00 51	0.69 0.31
4	4.125 104.8	4.75 121	4.07 1.85	3.19 81	2.99 1.36	4.25 108	5.77 2.62	2.00 51	1.15 0.52
5	5.125 130.2	5.94 151	6.94 3.15	3.25 83	4.00 1.81	5.94 151	12.84 5.82	2.75 70	1.81 0.82
6	6.125 155.6	6.94 176	11.12 5.04	3.63 92	6.16 2.79	6.94 176	21.00 9.52	3.13 80	2.68 1.22
8	8.125 206.4	7.75 197	21.81 9.89	4.25 108	13.66 6.20	7.75 197	21.81 9.89	— —	— —

## Concentric Reducers



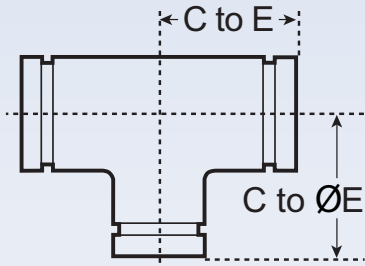
**Fig. 6072**



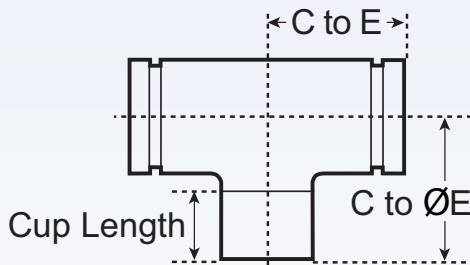
**Fig. 6075**

Dimensions/Weights – Reducers					
Nominal Size	Fig. 6072 Groove x Groove		Fig. 6075 Groove x Cup		
	E to E	Wt. Ea	E to E	Cup Length	Wt Ea.
In.	In./mm	Lbs./kg	In./mm	In./mm	Lbs./kg
2 x 1	–	–	2.70 68.6	0.91 23.1	0.32 0.15
2 x 1 <sup>1</sup> / <sub>4</sub>	–	–	3.00 76.2	0.97 24.6	0.36 0.16
2 x 1 <sup>1</sup> / <sub>2</sub>	–	–	2.94 74.7	1.09 27.7	0.38 0.17
2 <sup>1</sup> / <sub>2</sub> x 1	–	–	3.25 82.6	0.91 23.1	0.53 0.24
2 <sup>1</sup> / <sub>2</sub> x 1 <sup>1</sup> / <sub>4</sub>	–	–	3.52 89.4	0.97 24.6	0.59 0.27
2 <sup>1</sup> / <sub>2</sub> x 1 <sup>1</sup> / <sub>2</sub>	–	–	3.45 87.6	1.09 27.7	0.59 0.27
2 <sup>1</sup> / <sub>2</sub> x 2	3.29 83.6	0.58 0.26	3.30 83.8	1.34 34.0	0.58 0.26
3 x 1 <sup>1</sup> / <sub>2</sub>	–	–	3.68 93.5	1.09 27.7	0.84 0.38
3 x 2	2.50 63.5	0.58 0.26	4.10 104.1	1.34 34.0	0.97 0.44
3 x 2 <sup>1</sup> / <sub>2</sub>	2.50 63.5	0.62 0.28	–	–	–
4 x 2	4.75 120.7	1.71 0.78	4.75 120.7	1.34 34.0	1.76 0.80
4 x 2 <sup>1</sup> / <sub>2</sub>	3.00 76.2	1.12 0.51	–	–	–
4 x 3	3.00 76.2	1.22 0.55	–	–	–
5 x 3	3.88 98.6	2.11 0.96	–	–	–
5 x 4	3.38 85.9	1.97 0.89	–	–	–
6 x 3	4.38 111.3	2.96 1.34	–	–	–
6 x 4	3.88 98.6	2.87 1.30	–	–	–
6 x 5	3.38 85.9	2.78 1.26	–	–	–
8 x 6	5.00 127.0	6.60 2.99	–	–	–

## Reducing Tees



**Fig. 6061**



**Fig. 6064**

### Dimensions/Weights — Reducing Tees

Nominal Size	Fig. 6061			Fig. 6064			
	Groove x Groove x Groove			Groove x Groove x Cup			
	C to E	C to ØE	Wt. Ea	C to E	C to ØE	Cup Length	Wt Ea.
In.	In./mm	In./mm	Lbs./kg	In./mm	In./mm	In./mm	Lbs./kg
2 x 2 x 3/4	—	—	—	2.20	1.98	0.75	0.88
	—	—	—	56	50	19	0.40
2 x 2 x 1	—	—	—	2.33	2.20	0.91	1.03
	—	—	—	59	56	23	0.47
2 x 2 x 1 1/4	—	—	—	2.48	2.35	0.97	1.12
	—	—	—	63	60	25	0.51
2 x 2 x 1 1/2	—	—	—	2.55	2.28	1.09	1.25
	—	—	—	65	58	28	0.57
2 1/2 x 2 1/2 x 3/4	—	—	—	2.27	2.18	0.75	1.25
	—	—	—	58	55	19	0.57
2 1/2 x 2 1/2 x 1	—	—	—	2.40	2.40	0.91	1.38
	—	—	—	61	61	23	0.63
2 1/2 x 2 1/2 x 1 1/4	—	—	—	2.52	2.57	0.97	1.56
	—	—	—	64	65	25	0.71
2 1/2 x 2 1/2 x 1 1/2	—	—	—	2.70	2.68	1.09	1.88
	—	—	—	69	68	28	0.85
2 1/2 x 2 1/2 x 2	3.28	3.38	2.54	—	—	—	—
	83	86	1.15	—	—	—	—
3 x 3 x 3/4	—	—	—	2.45	2.60	0.75	1.88
	—	—	—	62	66	19	0.85
3 x 3 x 1	—	—	—	2.54	2.79	0.91	2.04
	—	—	—	65	71	23	0.93
3 x 3 x 1 1/4	—	—	—	2.63	2.89	0.97	2.13
	—	—	—	67	73	25	0.97
3 x 3 x 1 1/2	—	—	—	2.85	3.00	1.09	2.25
	—	—	—	72	76	28	1.02
3 x 3 x 2	3.00	3.38	2.90	—	—	—	—
	76	86	1.32	—	—	—	—
3 x 3 x 2 1/2	3.25	3.50	3.16	—	—	—	—
	83	89	1.43	—	—	—	—
4 x 4 x 3/4	—	—	—	2.95	3.00	0.75	3.63
	—	—	—	75	76	19	1.65
4 x 4 x 1	—	—	—	3.10	3.22	0.91	3.94
	—	—	—	79	82	23	1.79
4 x 4 x 1 1/4	—	—	—	3.25	3.47	0.97	4.24
	—	—	—	83	88	25	1.92
4 x 4 x 1 1/2	—	—	—	3.35	3.65	1.09	4.47
	—	—	—	85	93	28	2.03
4 x 4 x 2	3.66	4.13	5.14	—	—	—	—
	93	105	2.33	—	—	—	—
4 x 4 x 2 1/2	3.94	4.06	5.36	—	—	—	—
	100	103	2.43	—	—	—	—
4 x 4 x 3	4.19	4.16	5.88	—	—	—	—
	106	106	2.67	—	—	—	—
5 x 5 x 3	3.75	4.63	7.45	—	—	—	—
	95	118	3.38	—	—	—	—
5 x 5 x 4	4.25	4.56	8.13	—	—	—	—
	108	116	3.69	—	—	—	—
6 x 6 x 2 1/2	3.63	5.13	9.42	—	—	—	—
	92	130	4.27	—	—	—	—
6 x 6 x 3	3.69	5.19	10.06	—	—	—	—
	94	132	4.56	—	—	—	—
6 x 6 x 4	4.19	5.13	10.86	—	—	—	—
	106	130	4.93	—	—	—	—
6 x 6 x 5	4.69	5.19	12.73	—	—	—	—
	119	132	5.77	—	—	—	—

### Figure 6084 Flange Adapter

The Gruvlok® Fig. 6084 Flange Adapter allows for direct connection of Class 125 or Class 150 flanged components to the CTS Copper System. The CTS Copper Flange Adapter (Sizes 2" thru 6") conform to ANSI class 125/150 bolt patterns and is rated at 300 PSIG (20.7 bar). The flange is powder coated with Nylon-11.

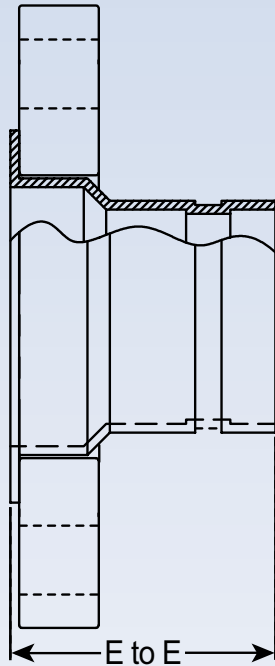
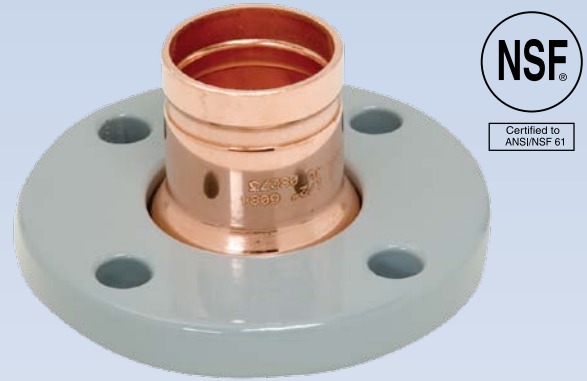


Figure 6084 Flange Adapter			
Nominal Size	Copper Tube Diameter	E to E	Approx. Wt. Ea.
In.	In./mm	In./mm	Lbs./kg
2	2.125 54.0	3.0 76.2	0.85 0.39
2½	2.625 66.7	3.5 88.9	1.34 0.61
3	3.125 79.4	3.5 88.9	1.73 0.78
4	4.125 104.8	3.5 88.9	2.43 1.10
5	5.125 130.2	3.5 88.9	3.27 1.48
6	6.125 155.6	4.0 101.6	4.78 2.17

## Figure 6400 Rigid Coupling

The Figure 6400 Rigid Coupling is specially designed to provide a rigid pipe connection to meet the specific demands of copper tubing installation size 2"-8". Fast and easy swing-over installation of the rugged lightweight housing produces a secure rigid pipe joint. Available with Grade "E" Copper EPDM flush gap style gasket. Gasket has service temperature range of -40°F to +230°F. NSF 61 Certified for cold +86°F (+30°C) and hot +180°F (+82°C) potable water service.



### Material Specifications

**Housing:**

Ductile iron conforming to ASTM A-536, Grade 65-54-12

**Coatings:**

Rust inhibiting enamel paint — Color: Copper  
For other coating requirements contact your Anvil Representative.

**ANSI Bolts and Heavy Hex Nuts:**

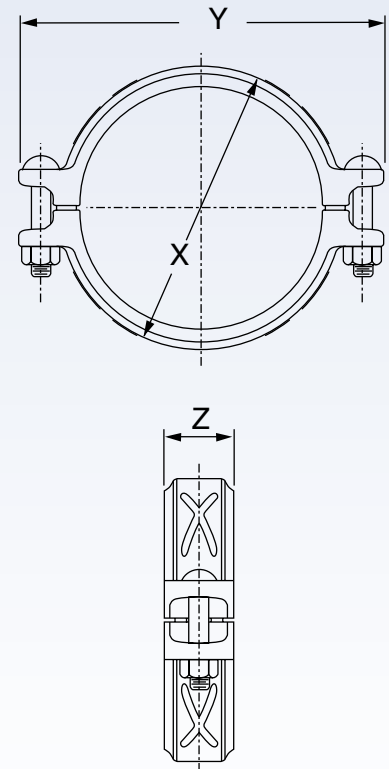
Heat treated carbon steel oval neck bolts conforming to the physical properties of ASTM A 183 with a minimum tensile strength of 110,000 PSI. Bolts and nuts are provided zinc electroplated as standard.

**Gaskets:**

Grade "E" EPDM Flush Gap Gasket (Copper Color Code)  
Service Temperature Range: -40°F to +230°F (-40°C to +110°C)  
Recommended for water service, diluted acids, alkaline solutions, oil-free air and many chemical services.  
**NOT FOR USE IN PETROLEUM APPLICATIONS.**

NSF 61 Certified for cold +86°F (+30°C) and hot +180°F (+82°C) potable water service.

Figure 6400 Rigid Coupling										
Nominal Size	Copper Tube Diameter	Max Wk. Pressure	Max End Load	Range of Pipe End Separation	Coupling Dimensions			Coupling Bolts		Approx. Wt. Ea.
					X	Y	Z	Qty.	Size	
In.	In./mm	PSI/bar	Lbs./kN	In./mm	In./mm				In./mm	Lbs./Kg
2	2.125 54.0	300 20.7	1063 4.73	0 - 0.16 0 - 3.2	3.00 76	5.00 127	1.68 43	2	3/8 x 2 1/4	1.53 0.69
2 1/2	2.625 66.7	300 20.7	1623 7.22	0 - 0.16 0 - 3.2	3.50 89	5.50 140	1.68 43	2	3/8 x 2 1/4	1.78 0.81
3	3.125 79.4	300 20.7	2300 10.23	0 - 0.16 0 - 3.2	4.18 106	6.28 159	1.68 43	2	1/2 x 3	2.76 1.25
4	4.125 104.8	300 20.7	4007 17.82	0 - 0.17 0 - 4.2	5.20 132	7.50 191	1.70 43	2	1/2 x 3	3.27 1.48
5	5.125 130.2	300 20.7	6186 27.51	0 - 0.17 0 - 4.2	6.20 157	9.10 231	1.80 46	2	5/8 x 3 1/4	4.71 2.14
6	6.125 155.6	300 20.7	8835 39.30	0 - 0.17 0 - 4.2	7.20 183	10.20 259	1.80 46	2	5/8 x 3 1/4	5.24 2.38
8	8.125 206.4	300 20.7	15547 69.15	0 - 0.17 0 - 4.2	9.32 237	12.40 315	2.00 51	2	5/8 x 3 1/4	7.67 3.48



Pressure ratings and end loads are based on use with ASTM B88 Type K or L tubing.  
For pressure ratings on Type M and DWV, contact your Anvil Representative.

## Butterfly Valve

The lever handle bronze body butterfly valve is designed for use with grooved copper tubing (CTS), fittings and couplings. This valve features a 10 position lever handle, bronze body and EPDM rubber encapsulated dual-seal disc. Both bronze valve body and the EPDM rubber disc obtained certification to ANSI/NSF 61 for use in potable water systems, and is rated to 300 PSI (20 bar).



### Material Specifications

#### Valve Body:

Bronze to ASTM B584 C90500 (88-10-0-2) certified to ANSI/NSF 61 for use in cold +86°F (+30°C) and hot +180°F (+82°C) potable water system.

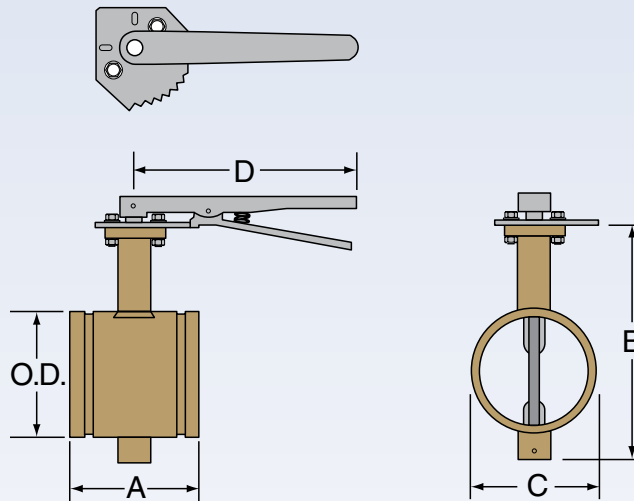
#### Disc:

Ductile iron to ASTM A536 Gr. 65-45-12 encapsulated with EPDM.  
 Grade "E" EPDM: Service temperature range: -40°F to +230°F (-40°C to +110°C).  
 Recommended for water service, diluted acids, alkaline solutions, and oil-free air.

*Not recommended for use in petroleum applications.*

#### Upper & Lower Shafts:

Stainless Steel Type 416 of ASTM A582.



Dimensions/Weights — Butterfly Valve

Nominal Size	Copper Tube Diameter	Dimensions				Weight
		A	B	C	D	
In.	In./mm	In./mm	In./mm	In./mm	In./mm	Lbs./kg
2½	2.625 66.7	3.77 96	6.23 158	2.76 70	10.8 274	5.90 2.68
3	3.125 79.4	3.77 96	6.74 171	3.13 80	10.8 274	6.60 2.99
4	4.125 104.8	4.63 118	8.60 218	4.10 104	10.8 274	11.00 4.99
5	5.125 130.2	5.27 134	10.22 260	5.10 130	10.8 274	17.60 7.98
6	6.125 155.6	5.27 134	11.10 282	6.12 155	10.8 274	21.60 9.80



## The 6400 Rigid Coupling is a snap.

### Installation & Assembly

The Fig. 6400 Coupling from Gruvlok is specially designed to provide a rigid pipe connection to meet the specific demands of copper tubing installation. Fast and easy swing-over installation of the rugged lightweight housing produces a secure, rigid pipe joint. Available with the EPDM flush gap style gasket as the standard gasket.

#### Step 1 – Lube Gasket.

Check the gasket to be sure it is compatible for the intended service. Apply a thin coating of Gruvlok® Xtreme Lubricant to the entire surface, both internal and external, of the gasket. Be careful that foreign particles do not adhere to the lubricated surfaces.

#### Step 2 – Install Gasket.

Slip the gasket over one tube, making sure the gasket lip does not overhang the tube end.

#### Step 3 – Alignment.

After aligning the two tube ends together, pull the gasket into position, centering it between the grooves on each tube. The gasket should not extend into the groove on either tube or between the tube ends.

#### Step 4 – Assemble Housings.

Remove one nut and bolt and loosen the other nut. Place one housing over the gasket, making sure the housing keys fit into the tube grooves. Swing the other housing over the gasket and into the grooves on both tubes, making sure the tongue and recess of each housing is properly mated. Re-insert the bolt and run-up both nuts finger tight.

#### Step 5 – Tighten Nuts.

Securely tighten nuts alternately and equally to the specified bolt torque, keeping the gaps at the bolt pads evenly spaced. Assembly is complete. Visually inspect the pipe joint to assure the coupling keys are fully engaged in the pipe grooves. The bolt pads are to have equal gaps on each side of the coupling.

**NOTE:** Copper is a soft material, and in some cases, the bolt pads may come close to metal-to-metal contact.

#### STEP 1 – Check and lubricate gasket



#### STEP 2 – Gasket Installation



#### STEP 3 – Alignment



#### STEP 4 – Assemble Housings



**CAUTION:** Uneven tightening may cause the gasket to pinch. The gasket should not be visible between segments after the bolts are tightened. Proper torquing of coupling bolts is required to obtain specified performance. **Over torquing the bolts may result in damage to the bolt and/or casting which could result in pipe joint separation.** Under torquing the bolts may result in lower pressure retention capabilities, lower bend load capabilities, joint leakage and pipe joint separation.

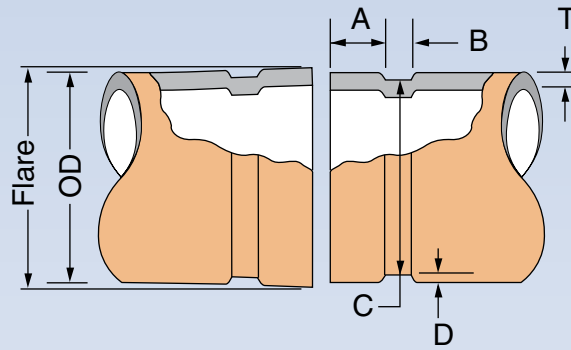
#### STEP 5 – Tighten Nuts



Specified Bolt Torque		
Bolt Size	Wrench Size	Specified Bolt Torque*
In.	In.	Ft.-Lbs
3/8	1 1/16	30-45
1/2	7/8	30-45
5/8	1 1/16	60-90

\* Non-lubricated bolt torques.

## Roll Groove Specifications



Gruvlok CTS Copper System – Roll Groove Specifications

-1- Nominal Size	-2- Tubing Outside Diameter			-3- Gasket Seat "A" +/- 0.03 in. +/- 0.76mm	-4- Groove Width "B" +0.03/-0.00 in. +0.76/-0.00mm	-5- Groove Diameter "C"		-6- Nominal Groove Depth "D"	-7- Min. Wall "T"	-8- Max. Flare Diam.
	Actual	Tolerance				Actual	Tolerance +0.000			
		+ ln./mm	- ln./mm							
2	2.125 54.0	0.002 0.05	0.002 0.05	0.610 15.5	0.300 7.6	2.029 51.54	-0.020 -0.51	0.048 1.2	0.058 1.6	2.220 56.4
2½	2.625 66.7	0.002 0.05	0.002 0.05	0.610 15.5	0.300 7.6	2.525 64.14	-0.020 -0.51	0.050 1.3	0.065 1.7	2.720 69.1
3	3.125 79.4	0.002 0.05	0.002 0.05	0.610 15.5	0.300 7.6	3.025 76.84	-0.020 -0.51	0.050 1.3	DWV	3.220 81.8
4	4.125 104.8	0.002 0.05	0.002 0.05	0.610 15.5	0.300 7.6	4.019 102.08	-0.020 -0.51	0.053 1.3	DWV	4.220 107.2
5	5.125 130.2	0.002 0.05	0.002 0.05	0.610 15.5	0.300 7.6	4.999 126.97	-0.020 -0.51	0.053 1.3	DWV	5.220 132.6
6	6.125 155.6	0.002 0.05	0.002 0.05	0.610 15.5	0.300 7.6	5.999 152.37	-0.020 -0.51	0.063 1.6	DWV	6.220 158.0
8	8.125 206.4	0.002 0.05	0.004 0.10	0.610 15.5	0.300 7.6	7.959 202.16	-0.020 -0.51	0.083 2.1	DWV	8.220 208.8

**Column 1:** Nominal tubing size ASTM B88

**Column 2:** Outside diameter of copper tubing per ASTM B88. Allowable tolerance from square cut ends is 0.030"/0.76mm for sizes 2"-3"; 0.045"/1.14mm for sizes 4-8"

**Column 3:** Gasket seat must be free from scores, roll marks, indentations, grease and dirt which may interfere with gasket sealing.

**Column 4:** Groove width is to be free from chips, dirt, etc. which may interfere with proper coupling assembly.

**Column 5:** Groove diameter must be of uniform depth for the entire circumference of the tubing. See column 6.

**Column 6:** Groove depth is for reference only; the groove diameter must conform to column 5.

**Column 7:** DWV (Drain, Waste and Vent Piping) per ASTM B306.

**Column 8:** Maximum flare diameter is the OD at the most extreme tubing diameter.