

# GRUVLOK® CTS COPPER SYSTEM



The Gruvlok® CTS Copper System offers an installer of large diameter copper tubing an alternative to the conventional soldering and brazing.

This new grooved copper system is faster and easier to install. Temperature and weather conditions are no longer a factor when planning installations. There is no sweating or brazing as this system requires only a wrench for assembly on grooved end pipe.

The copper system is “flame-free”. Essentially you save time and enjoy a very reliable system that is both versatile and economical. Safety is a factor as there is no fire hazard, especially in a retrofit installation. The ease of assembly is a great benefit in new construction and ease of disassembly is ideal for renovation, retrofit or expansion.

## BENEFITS

- Fast and easy to assemble.
- No flame, no sweat
- Each joint has a union.
- Provides rigidity
- Easily roll grooved
- Proven joint reliability
- Accepted and approved.
- Economical and reliable

- Introduction
- Couplings
- Outlets
- Fittings
- Valves & Accessories
- High Pressure
- CTS Copper System
- Di-Electric Nipples
- Plain-End Fittings
- HDPE Couplings
- Sock-It® Fittings
- Stainless Steel Method
- Stainless Steel G-Press System
- Roll Groovers
- Installation & Assembly
- Special Coatings
- Design Services
- Technical Data
- Master Format 3 Part Specs.
- Pictorial Index

# FIG. 64

## CTS SlideLOK® Ready for Installation Coupling

The CTS SlideLOK coupling is a ready for installation coupling designed to reduce installation time. The slide action allows for a smooth trouble free installation. The patented gasket provides four separate sealing surfaces for added protection. The engineered predictive gap is a quick and easy indication of proper assembly.

The CTS SlideLOK is designed to be used with copper tube sizes 2" - 8" and produces a secure, rigid joint connection.

The CTS SlideLOK coupling allows for a maximum working pressure of 300 psi for Type K or L. Contact an Anvil Representative for other copper tube pressure ratings.



SlideLOK Pressure Responsive Gasket



Patent D680629, D680630, D696751

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

### MATERIAL SPECIFICATIONS

**BOLTS:**

SAE J429, Grade 5, Zinc Electroplated

**HEAVY HEX NUTS:**

ASTM A563, Grade A, Zinc Electroplated

**HOUSING:**

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

**COATINGS:**

Rust inhibiting paint Color: COPPER (standard)  
Hot Dipped Zinc Galvanized (optional)

**GASKETS:**

Properties as designated in accordance with ASTM D 2000

**Grade "EP" EPDM (Copper color code)**

-40°F to 250°F (Service Temperature Range)(-40°C to 121°C)  
Recommended for water service, diluted acids, alkalis solutions, oil-free air and many other chemical services.  
NOT FOR USE IN PETROLEUM APPLICATIONS.

**GASKET TYPE:**

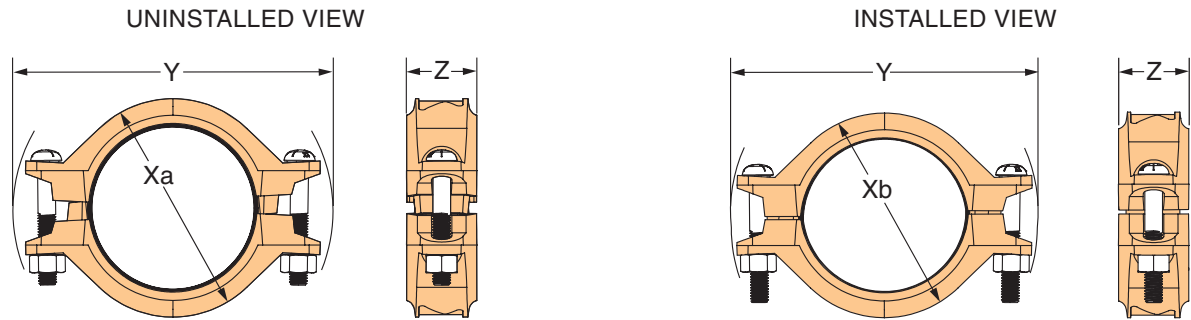
SlideLOK (2" - 8")

**LUBRICATION:**

Standard  
Gruvlok Xtreme™

**FIG. 64**

**CTS SlideLOK® Ready for Installation Coupling**



**FIGURE 64 CTS SLIDELOK COUPLING**

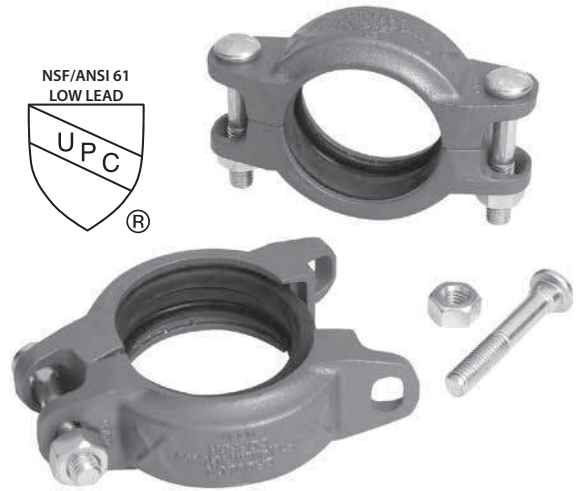
Nominal Size	O.D.	Max. Working Pressure	Max. End Load	Range of Pipe End Separation	Coupling Dimensions				Coupling Bolts		Approx. Wt. Ea.
					Xa	Xb	Y	Z	Qty.	Size	
In./DN(mm)	In./mm	PSI/bar	Lbs./kN	In./mm	In./mm	In./mm	In./mm	In./mm		In./mm	Lbs./kg
2 50	2.125 54.0	300 20.7	1,064 4.73	0-0.08 0-2.0	3½ 89	3¼ 83	5½ 140	1⅝ 49	2	½ x 2¾ M12 X 70	2.4 1.1
2½ 65	2.625 66.7	300 20.7	1,624 7.22	0-0.08 0-2.0	4 102	3¾ 95	6 152	1⅝ 49	2	½ x 2¾ M12 X 70	2.6 1.2
3 80	3.125 79.4	300 20.7	2,301 10.24	0-0.08 0-2.0	4⅝ 117	4¼ 108	6¼ 171	1⅝ 49	2	½ x 3½ M12 X 89	3.5 1.6
4 100	4.125 104.8	300 20.7	4,009 17.83	0-0.13 0-3.3	5½ 140	5⅝ 130	8 203	2 51	2	½ x 3½ M12 X 89	4.0 1.8
5 125	5.125 130.2	300 20.7	6,189 27.53	0-0.13 0-3.3	6⅝ 168	6¼ 159	9¼ 235	2 51	2	⅝ x 3½ M16 X 89	5.0 2.3
6 150	6.125 155.6	300 20.7	8,839 39.32	0-0.13 0-3.3	7¼ 197	7¼ 184	10¼ 260	2 51	2	⅝ x 3½ M16 X 89	5.8 2.6
8 200	8.125 206.4	300 20.7	15,555 69.19	0.07-0.13 0-3.3	9¼ 248	9¼ 235	12¼ 311	2 51	2	⅝ x 4¼ M16 X 110	8.0 3.6

For additional details see "Coupling Data Chart Notes" on page 19. See Installation & Assembly directions on pages 241-242.

# FIG. 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 "EP" Copper EPDM flush gap style gasket. Gasket has service temperature range of -40°F to +250°F.



### MATERIAL SPECIFICATIONS

**HOUSING:**

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

**COATINGS:**

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

**BOLTS:**

SAE J429, Grade 5, Zinc Electroplated

**HEAVY HEX NUTS:**

ASTM A563, Grade A, Zinc Electroplated

**GASKETS:**

Grade "EP" EPDM Flush Gap Gasket (Copper Color Code)  
Service Temperature Range: -40°F to +250°F (-40°C to +121°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.

**LUBRICATION:**

Standard  
Gruvlok Xtreme™

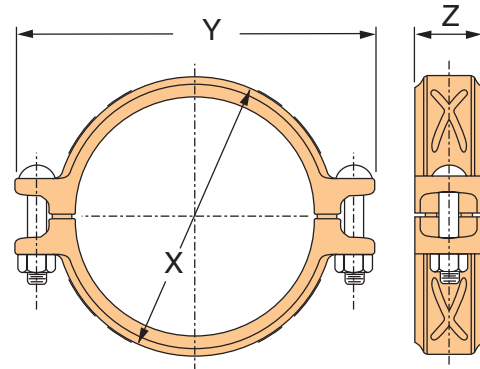


FIGURE 6400 RIGID COUPLING

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 - 0.08 0 - 2.0	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 - 0.08 0 - 2.0	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 - 0.08 0 - 2.0	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 - 0.13 0 - 2.4	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 - 0.13 0 - 2.4	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 - 0.13 0 - 2.4	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 - 0.13 0 - 2.4	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.  
See Installation & Assembly directions on page 243.

# FIG. 616

## Reducing Coupling for Joining Copper Tubing Systems



Figure 616 Reducing Coupling is for Joining Copper Tubing Systems. The Gruvlok Figure 616 Reducing Coupling allows a direct reduction between two different CTS copper tubing sizes and eliminates the need for a concentric reducer and couplings.

The epoxy coated ductile iron coupling housings help to eliminate galvanic local cell and stray current problems, and a specially designed rubber gasket prevents the smaller tube from telescoping into the larger tube during vertical installation.

### MATERIAL SPECIFICATIONS

**ANSI BOLTS/NUTS:**

Carbon steel oval neck bolts and nuts are heat-treated and conform to the physical properties of ASTM A 183 Grade 2 and SAE J429 Grade 5 with a minimum tensile strength of 110,000 psi (7584 bar).

Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 183 Grade 2 and SAE J995 Grade 5. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.

**METRIC BOLTS/NUTS:**

Carbon steel oval neck track head bolts (Gold color coded) are heat treated and conform to the physical properties of ASTM F 568 M with a minimum tensile strength of 760 MPa.

Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 563 M Class 9. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.

**STAINLESS STEEL BOLTS & NUTS:**

Stainless steel bolts and nuts are available upon request.

**HOUSING:**

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

**COATINGS:**

Copper – Acrylic Enamel

**GASKETS: Materials**

Properties as designated in accordance with ASTM D 2000

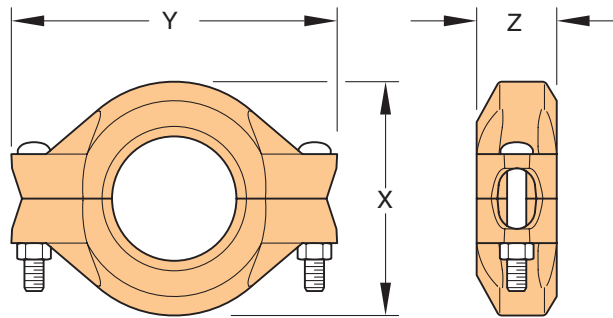
Tri-Seal Grade “EN” EPDM (Copper color code)

NSF61 Approved for potable water systems up to 180°F (82°C).  
NOT FOR USE IN PETROLEUM APPLICATIONS.

- Introduction
- Couplings
- Outlets
- Fittings
- Valves & Accessories
- High Pressure
- CTS Copper System
- Di-Electric Nipples
- Plain-End Fittings
- HDPE Couplings
- Socket® Fittings
- Stainless Steel Method
- Stainless Steel G-Press System
- Roll Groovers
- Installation & Assembly
- Special Coatings
- Design Services
- Technical Data
- Master Format 3 Part Specs.
- Pictorial Index

# FIG. 616

## Reducing Coupling for Joining Copper Tubing Systems



**FIGURE 616 REDUCING COUPLING**

Nominal Size	O.D.	Max. Working Pressure (CWP*)	Max.* Gap	Deflection from $\bar{C}$		Coupling Dimensions			Coupling Bolt Size	Approx. Wt. Ea.
				Per Coupling	of Pipe	X	Y	Z		
<i>In./DN(mm)</i>	<i>In./mm</i>	<i>PSI/bar</i>	<i>In./mm</i>	<i>Degrees(-Minutes')</i>	<i>In./ft-mm/m</i>	<i>In./mm</i>	<i>In./mm</i>	<i>In./mm</i>	<i>In./mm</i>	<i>Lbs./kg</i>
2½ x 2 <i>65 x 50</i>	2.625 x 2.125 <i>66.7 x 54.0</i>	300 <i>20</i>	0.06 <i>1.6</i>	1° - 22'	0.29 <i>24.0</i>	3.70 <i>94</i>	5.55 <i>141</i>	1.77 <i>45</i>	½ x 3	2.9 <i>1.3</i>
3 x 2 <i>80 x 50</i>	3.125 x 2.125 <i>79.4 x 54.0</i>	300 <i>20</i>	0.06 <i>1.6</i>	1° - 09'	0.24 <i>20.0</i>	4.21 <i>107</i>	5.98 <i>152</i>	1.77 <i>45</i>	½ x 3	3.3 <i>1.5</i>
3 x 2½ <i>80 x 65</i>	3.125 x 2.625 <i>79.4 x 66.7</i>	300 <i>20</i>	0.06 <i>1.6</i>	1° - 09'	0.24 <i>20.0</i>	4.21 <i>107</i>	5.98 <i>152</i>	1.77 <i>45</i>	½ x 3	3.0 <i>1.4</i>
4 x 2½ <i>100 x 65</i>	4.125 x 2.625 <i>104.8 x 66.7</i>	300 <i>20</i>	0.06 <i>1.6</i>	0° - 53'	0.18 <i>15.0</i>	5.20 <i>132</i>	7.20 <i>183</i>	1.77 <i>45</i>	½ x 3	4.2 <i>1.9</i>
4 x 3 <i>100 x 68</i>	4.125 x 3.125 <i>104.8 x 79.4</i>	300 <i>20</i>	0.06 <i>1.6</i>	0° - 53'	0.18 <i>15.0</i>	5.20 <i>132</i>	7.20 <i>183</i>	1.77 <i>45</i>	½ x 3	4.0 <i>1.8</i>
5 x 4 <i>125 x 100</i>	5.125 x 4.125 <i>130.7 x 104.8</i>	200 <i>14</i>	0.06 <i>1.6</i>	0° - 42'	0.15 <i>12.0</i>	6.30 <i>160</i>	8.82 <i>224</i>	1.77 <i>45</i>	⅝ x 3¼	5.5 <i>2.5</i>
6 x 4 <i>150 x 100</i>	6.125 x 4.125 <i>155.6 x 104.8</i>	200 <i>14</i>	0.06 <i>1.6</i>	0° - 36'	0.13 <i>10.3</i>	7.28 <i>185</i>	9.88 <i>251</i>	1.77 <i>45</i>	⅝ x 3¼	7.3 <i>3.3</i>

**NOTE:**

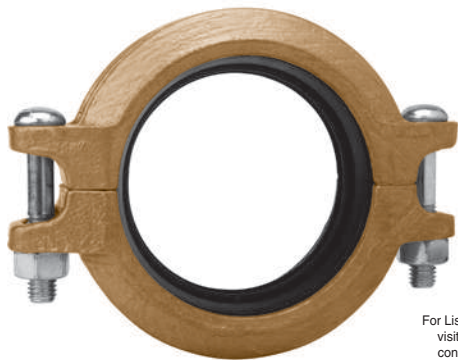
\*The maximum cold water pressure for general piping services tested to ASTM F1476 and/or AWWA C606 methods. Figures listed are based on roll-grooved Type K-ASTM B-88 copper tubing. For more information on other types, contact an Anvil Sales Representative. Couplings with rubber gaskets are likely to function as an insulator. Where electrical continuity is required, Gruvlok Continuity Clip will restore electrical continuity to the system. The continuity clip satisfies IEE Wiring Regulations.

For additional details see "Coupling Data Chart Notes" on page 19. See Installation & Assembly directions on page 244.



# FIG. 617

## Transition Coupling for Joining IPS to Copper Tubing Systems



UPC NSF Certified to NSF/ANSI 61-G  
 For Listings/Approval Details and Limitations, visit our website at [www.anvilintl.com](http://www.anvilintl.com) or contact an Anvil® Sales Representative.

The Gruvlok Figure 617 Transition Coupling provides for a direct connection between grooved end IPS steel pipe, fittings or valves, and grooved end CTS copper tubing eliminating the need for a dielectric waterway transition fitting and couplings. The coupling is comprised of two ductile iron housings, a specially designed pressure responsive rubber transition gasket, and track bolts and nuts. The rubber gasket isolates the fluid from the coupling housings and the epoxy coated housings help to eliminate galvanic local cell and stray current problems.

### MATERIAL SPECIFICATIONS

#### ANSI BOLTS/NUTS:

Carbon steel oval neck bolts and nuts are heat-treated and conform to the physical properties of ASTM A 183 Grade 2 and SAE J429 Grade 5 with a minimum tensile strength of 110,000 psi (7584 bar).

Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 183 Grade 2 and SAE J995 Grade 5. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.

#### METRIC BOLTS/NUTS:

Carbon steel oval neck track head bolts (Gold color coded) are heat treated and conform to the physical properties of ASTM F 568 M with a minimum tensile strength of 760 MPa.

Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 563 M Class 9. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.

#### STAINLESS STEEL BOLTS & NUTS:

Stainless steel bolts and nuts are available upon request.

#### HOUSING:

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

#### COATINGS:

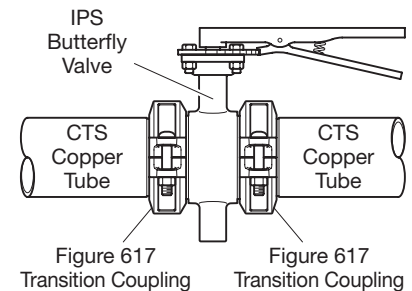
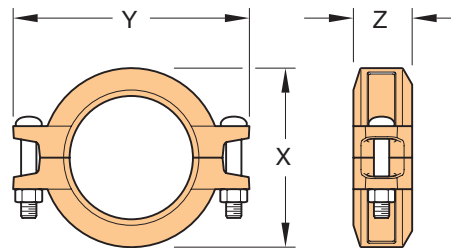
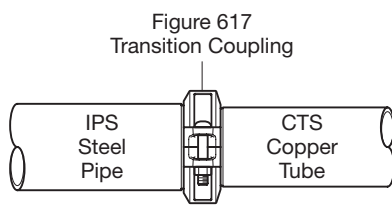
Copper – Acrylic Enamel

#### GASKETS: Materials

Properties as designated in accordance with ASTM D 2000

#### Tri-Seal Grade “EN” EPDM (Copper color code)

NSF61 Approved for potable water systems up to 180°F (82°C).  
 NOT FOR USE IN PETROLEUM APPLICATIONS.



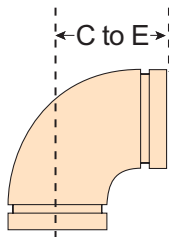
**FIGURE 617 TRANSITION COUPLING**

Nominal Size	O.D. IPS x CTS	Max. Working Pressure (CWP)	Axial Displacement	Deflection from $\perp$		Coupling Dimensions			Coupling Bolt Size	Approx. Wt. Ea.
				Per Coupling	Degrees(°)-Minutes(')	X	Y	Z		
In./DN(mm)	In./mm	PSI/bar	In./mm		In./mm	In./mm	In./mm	In./mm	Lbs./kg	
2	2.375 x 2.125	300	0 - 0.06	1° - 31'	3.31	5.08	1.89	1/2 x 2 1/8	2.0	
50	60.3 x 54.0	20	0 - 1.6		84	129	48		0.9	
2 1/2	2.875 x 2.625	300	0 - 0.06	1° - 15'	3.90	5.59	1.89	3/8 x 2 1/8	2.2	
65	73.0 x 66.7	20	0 - 1.6		99	142	48		1.0	
3	3.500 x 3.125	300	0 - 0.06	1° - 02'	4.57	6.65	1.89	1/2 x 3	3.0	
80	88.9 x 79.4	20	0 - 1.6		116	169	48		1.4	
4	4.500 x 4.125	300	0 - 0.06	1° - 36'	7.76	7.76	2.05	1/2 x 3	4.2	
100	114.3 x 104.8	20	0 - 1.6		197	197	52		1.9	

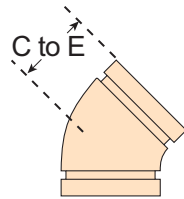
For additional details see "Coupling Data Chart Notes" on page 19. See Installation & Assembly directions on page 245.

# GTS COPPER FITTINGS

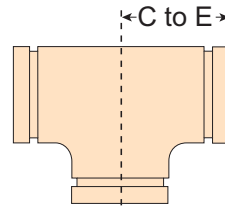
CTS Copper Fittings are produced with groove and cup ends in a variety of fitting configurations. The fittings are constructed to ASTM B75 UNS C12200 with a minimum copper content of 99.9%. Fitting pressure ratings match the ratings of the Figure 6400 Coupling.



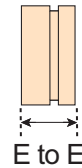
**FIG. 6050**



**FIG. 6051**



**FIG. 6060**



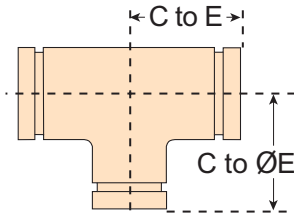
**FIG. 6074**

**DIMENSIONS/WEIGHTS — ELBOWS, TEES & CAPS**

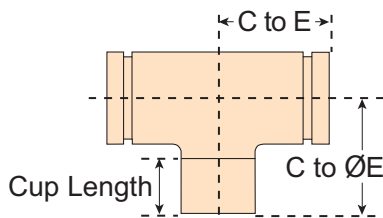
Nominal Size	Copper Tube Diameter	Fig. 6050 90° Elbow		Fig. 6051 45° Elbow		Fig. 6060 Tee		Fig. 6074 Cap	
		C to E	Wt. Ea.	C to E	Wt. Ea.	C to E	Wt. Ea.	E to E	Wt. Ea.
<i>In.</i>	<i>In./mm</i>	<i>In./mm</i>	<i>Lbs./kg</i>	<i>In./mm</i>	<i>Lbs./kg</i>	<i>In./mm</i>	<i>Lbs./kg</i>	<i>In./mm</i>	<i>Lbs./kg</i>
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	— —	— —



# REDUCING TEES



**FIG. 6061**

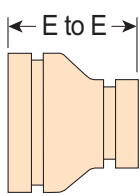


**FIG. 6064**

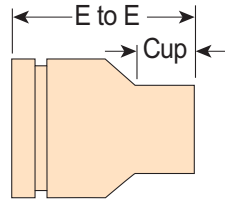
**DIMENSIONS/WEIGHTS – REDUCING TEES**

Nominal Size	Fig. 6061 Groove x Groove x Groove			Fig. 6064 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 ¾	–	–	–	2.20 56	1.98 50	0.75 19	0.88 0.40
2 x 2 x 1	–	–	–	2.33 59	2.20 56	0.91 23	1.03 0.47
2 x 2 x 1¼	–	–	–	2.48 63	2.35 60	0.97 25	1.12 0.51
2 x 2 x 1½	–	–	–	2.55 65	2.28 58	1.09 28	1.25 0.57
2½ x 2½ x ¾	–	–	–	2.27 58	2.18 55	0.75 19	1.25 0.57
2½ x 2½ x 1	–	–	–	2.40 61	2.40 61	0.91 23	1.38 0.63
2½ x 2½ x 1¼	–	–	–	2.52 64	2.57 65	0.97 25	1.56 0.71
2½ x 2½ x 1½	–	–	–	2.70 69	2.68 68	1.09 28	1.88 0.85
2½ x 2½ x 2	3.28 83	3.38 86	2.54 1.15	–	–	–	–
3 x 3 x ¾	–	–	–	2.45 62	2.60 66	0.75 19	1.88 0.85
3 x 3 x 1	–	–	–	2.54 65	2.79 71	0.91 23	2.04 0.93
3 x 3 x 1¼	–	–	–	2.63 67	2.89 73	0.97 25	2.13 0.97
3 x 3 x 1½	–	–	–	2.85 72	3.00 76	1.09 28	2.25 1.02
3 x 3 x 2	3.00 76	3.38 86	2.90 1.32	–	–	–	–
3 x 3 x 2½	3.25 83	3.50 89	3.16 1.43	–	–	–	–
4 x 4 x ¾	–	–	–	2.95 75	3.00 76	0.75 19	3.63 1.65
4 x 4 x 1	–	–	–	3.10 79	3.22 82	0.91 23	3.94 1.79
4 x 4 x 1¼	–	–	–	3.25 83	3.47 88	0.97 25	4.24 1.92
4 x 4 x 1½	–	–	–	3.35 85	3.65 93	1.09 28	4.47 2.03
4 x 4 x 2	3.66 93	4.13 105	5.14 2.33	–	–	–	–
4 x 4 x 2½	3.94 100	4.06 103	5.36 2.43	–	–	–	–
4 x 4 x 3	4.19 106	4.16 106	5.88 2.67	–	–	–	–
5 x 5 x 3	3.75 95	4.63 118	7.45 3.38	–	–	–	–
5 x 5 x 4	4.25 108	4.56 116	8.13 3.69	–	–	–	–
6 x 6 x 2½	3.63 92	5.13 130	9.42 4.27	–	–	–	–
6 x 6 x 3	3.69 94	5.19 132	10.06 4.56	–	–	–	–
6 x 6 x 4	4.19 106	5.13 130	10.86 4.93	–	–	–	–
6 x 6 x 5	4.69 119	5.19 132	12.73 5.77	–	–	–	–

# CONCENTRIC REDUCERS



**FIG. 6072**



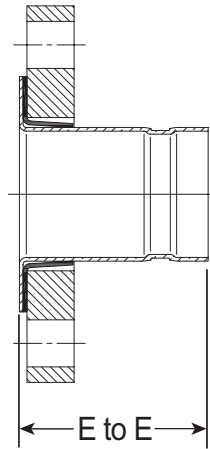
**FIG. 6075**

### 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.
<i>In.</i>	<i>In./mm</i>	<i>Lbs./kg</i>	<i>In./mm</i>	<i>In./mm</i>	<i>Lbs./kg</i>
2 x 1	—	—	2.70 68.6	0.91 23.1	0.32 0.15
2 x 1¼	—	—	3.00 76.2	0.97 24.6	0.36 0.16
2 x 1½	—	—	2.94 74.7	1.09 27.7	0.38 0.17
2½ x 1	—	—	3.25 82.6	0.91 23.1	0.53 0.24
2½ x 1¼	—	—	3.52 89.4	0.97 24.6	0.59 0.27
2½ x 1½	—	—	3.45 87.6	1.09 27.7	0.59 0.27
2½ x 2	3.29 83.6	0.58 0.26	3.30 83.8	1.34 34.0	0.58 0.26
3 x 1½	—	—	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 2½	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 2½	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	—	—	—

# FIG. 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") conforms to ANSI class 125/150 bolt patterns and is rated at 300 PSIG (20.7 bar). The flange adapter is a dielectric union, utilizing the epoxy coating as a suitable replacement for flange dielectric insulation kits.

### FIGURE 6084 FLANGE ADAPTER

Nominal Size	Copper Tube Diameter	E to E	Approx. Wt. Ea.
<i>In.</i>	<i>In./mm</i>	<i>In./mm</i>	<i>Lbs./kg</i>
2	2.125 54.0	2.63 66.8	0.85 0.39
2½	2.625 66.7	2.00 50.8	1.34 0.61
3	3.125 79.4	2.44 62.0	1.73 0.78
4	4.125 104.8	2.88 73.2	2.43 1.10
5	5.125 130.2	3.94 100.1	3.27 1.48
6	6.125 155.6	4.31 109.5	4.78 2.17

# GTS FITTINGS



For additional listings or approvals, visit our website at [www.anvilintl.com](http://www.anvilintl.com)

Gruvlok Full-Flow Grooved Fittings for Copper Piping Systems provide an economical and efficient method of changing direction. These copper fittings are available in sizes 2" to 8" (50 - 200mm).

Cast fittings in 90° and 45° elbows, tees, caps, concentric reducers, and reducing tees are cast with a copper alloy conforming to CDA C89833. Cast fittings are stronger and more durable than wrought copper fittings and are less susceptible to damage in transit or during installation. Reducing fittings are available with Groove x Groove or Groove x Cup End configurations.

Fittings are standard radius, full flow, designed for installation with Gruvlok Copper System products.

## MATERIAL SPECIFICATIONS

### CAST COPPER ALLOY FITTINGS:

Copper Alloy conforming to CDA C89833 or C83470; UL Classified in accordance with ANSI / NSF-61 and bears the UL Water Quality Mark.

### WROUGHT COPPER FITTINGS:

(For Figure 652 Groove by Copper Fittings Only)  
ASTM B 75 C12200; wall thickness per ASTM B 88 Type L.

### MAXIMUM WORKING PRESSURE

Fittings are rated at the pressure rating of the Gruvlok Coupling or Adapter in use.

- Introduction
- Couplings
- Outlets
- Fittings
- Valves & Accessories
- High Pressure
- CTS Copper System
- Di-Electric Nipples
- Plain-End Fittings
- HDPE Couplings
- Sock-It® Fittings
- Stainless Steel Method
- Stainless Steel G-Press System
- Roll Groovers
- Installation & Assembly
- Special Coatings
- Design Services
- Technical Data
- Master Format 3 Part Specs.
- Pictorial Index

### FIG. 610

90° CTS Elbow

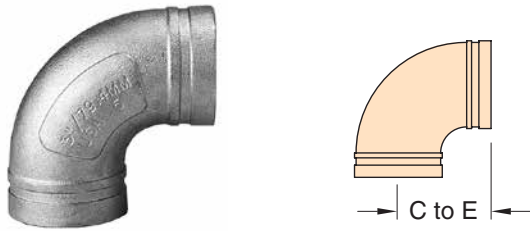


FIGURE 610 90° CTS ELBOW			
Nominal Size	Copper Tubing O.D.	Center to End	Approx. Wt. Ea.
<i>In./DN(mm)</i>	<i>In./mm</i>	<i>In./mm</i>	<i>Lbs./Kg</i>
2	2.125	2.91	1.9
50	54.0	73.9	0.9
2½	2.625	3.31	2.7
65	66.7	84.1	1.2
3	3.125	3.81	3.6
80	79.4	96.8	1.6
4	4.125	4.75	7.1
100	104.8	120.7	3.2
5	5.125	5.94	11.9
125	130.2	150.9	5.4
6	6.125	6.94	16.7
150	155.6	176.7	7.6
8	8.125	7.75	25.3
200	206.4	196.9	11.5

### FIG. 601

45° CTS Elbow

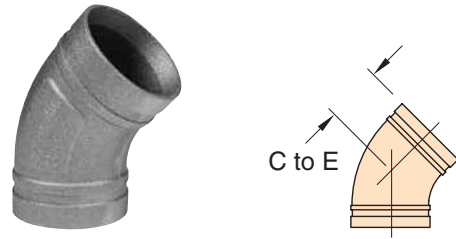


FIGURE 601 45° CTS ELBOW			
Nominal Size	Copper Tubing O.D.	Center to End	Approx. Wt. Ea.
<i>In./DN(mm)</i>	<i>In./mm</i>	<i>In./mm</i>	<i>Lbs./Kg</i>
2	2.125	2.19	1.6
50	54.0	55.6	0.7
2½	2.625	2.31	2.1
65	66.7	58.7	1.0
3	3.125	2.59	2.7
80	79.4	65.8	1.2
4	4.125	3.19	5.5
100	104.8	81.0	2.5
5	5.125	3.25	7.7
125	130.2	82.6	3.5
6	6.125	3.5	10.1
150	155.6	88.9	4.6
8	8.125	4.25	16.6
200	206.4	108.0	7.5

### FIG. 619

CTS Tee

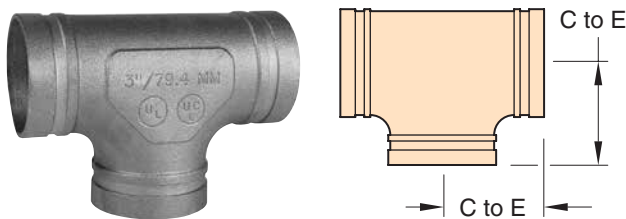


FIGURE 619 CTS TEE			
Nominal Size	Copper Tubing O.D.	Center to End	Approx. Wt. Ea.
<i>In./DN(mm)</i>	<i>In./mm</i>	<i>In./mm</i>	<i>Lbs./Kg</i>
2	2.125	2.69	2.5
50	54.0	68.3	1.1
2½	2.625	3.20	3.8
65	66.7	81.3	1.7
3	3.125	3.52	4.7
80	79.4	89.4	2.1
4	4.125	4.25	9.0
100	104.8	108.0	4.1
5	5.125	5.94	17.7
125	130.2	150.9	8.0
6	6.125	6.94	24.8
150	155.6	176.3	11.3
8	8.125	7.75	46.2
200	206.4	196.9	21.0

### FIG. 660

CTS Cap

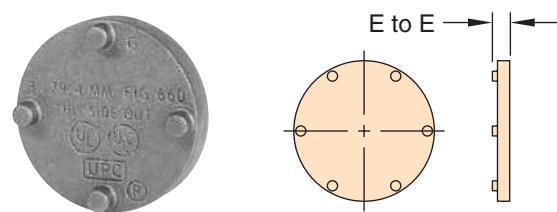


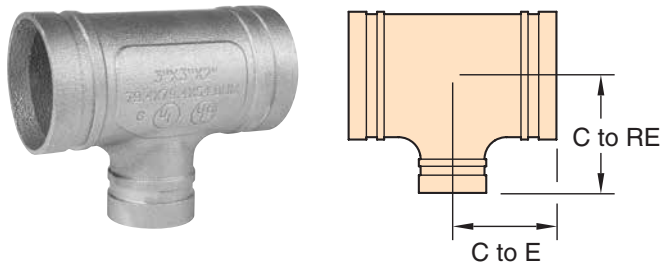
FIGURE 660 CTS CAP			
Nominal Size	Copper Tubing O.D.	End to End	Approx. Wt. Ea.
<i>In./DN(mm)</i>	<i>In./mm</i>	<i>In./mm</i>	<i>Lbs./Kg</i>
2	2.125	0.92	0.6
50	54.0	23.4	0.3
2½	2.625	0.92	1.0
65	66.7	23.4	0.4
3	3.125	0.92	1.3
80	79.4	23.4	0.6
4	4.125	0.92	2.2
100	104.8	23.4	1.0
5	5.125	0.92	5.8
125	130.2	23.4	2.6
6	6.125	0.92	8.1
150	155.6	23.4	3.7
8	8.125	1.03	14.1
200	206.4	26.2	6.4

**Notes:**

For information on larger sizes, contact an Anvil Sales Representative.  
See page 177 for CTS Fitting Specifications.

**FIG. 621**

CTS Reducing Tee



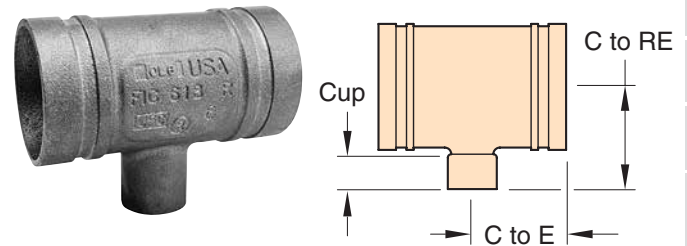
**FIGURE 621 CTS REDUCING TEE**

Nominal Size	Copper Tubing O.D.	C to E	C to RE	Approx. Wt. Ea.
<i>In./DN(mm)</i>	<i>In./mm</i>	<i>In./mm</i>	<i>In./mm</i>	<i>Lbs./Kg</i>
2½ x 2½ x 2 65 x 65 x 50	2.625 x 2.625 x 2.125 66.7 x 66.7 x 54.0	3.28 83.3	3.38 85.9	3.5 1.6
3 x 3 x 2 80 x 80 x 50	3.125 x 3.125 x 2.125 79.4 x 79.4 x 54.0	3.00 76.2	3.38 85.9	3.8 1.7
3 x 3 x 2½ 80 x 80 x 65	3.125 x 3.125 x 2.625 79.4 x 79.4 x 66.7	3.25 82.6	3.5 88.9	4.3 2.0
4 x 4 x 2 100 x 100 x 50	4.125 x 4.125 x 2.125 104.8 x 104.8 x 54.0	3.66 93.0	4.13 104.9	6.9 3.2
4 x 4 x 2½ 100 x 100 x 65	4.125 x 4.125 x 2.625 104.8 x 104.8 x 66.7	3.94 100.1	4.06 103.1	7.5 3.4
4 x 4 x 3 100 x 100 x 80	4.125 x 4.125 x 3.125 104.8 x 104.8 x 79.4	4.19 106.4	4.16 105.7	8.7 4.0
5 x 5 x 3 125 x 125 x 80	5.125 x 5.125 x 3.125 130.2 x 130.2 x 79.4	3.75 95.3	4.63 117.6	10.0 4.5
5 x 5 x 4 125 x 125 x 100	5.125 x 5.125 x 4.125 130.2 x 130.2 x 104.8	4.25 108.0	4.56 115.8	11.4 5.2
6 x 6 x 2½ 150 x 150 x 65	6.125 x 6.125 x 2.625 155.6 x 155.6 x 66.7	3.63 92.2	5.13 130.3	11.5 5.2
6 x 6 x 3 150 x 150 x 80	6.125 x 6.125 x 3.125 155.6 x 155.6 x 79.4	3.69 93.7	5.19 131.8	11.9 5.4
6 x 6 x 4 150 x 150 x 100	6.125 x 6.125 x 4.125 155.6 x 155.6 x 104.8	4.19 106.4	5.13 130.3	13.7 6.2
6 x 6 x 5 150 x 150 x 125	6.125 x 6.125 x 5.125 155.6 x 155.6 x 130.2	4.69 119.1	5.19 131.8	15.9 7.2

Dimensional information in this chart is for cast fittings.

**FIG. 618**

CTS Reducing Tee (Groove x Groove x Cup)



**FIGURE 618 CTS REDUCING TEE**

Nominal Size	Copper Tubing O.D.	C to E	C to RE	Cup	Approx. Wt. Ea.
<i>In./DN(mm)</i>	<i>In./mm</i>	<i>In./mm</i>	<i>In./mm</i>	<i>In./mm</i>	<i>Lbs./Kg</i>
2 x 2 x ¾ 50 x 50 x 20	2.125 x 2.125 x 0.825 54.0 x 54.0 x 21.0	2.20 55.9	2.04 51.8	0.75 19.0	1.6 0.7
2 x 2 x 1 50 x 50 x 25	2.125 x 2.125 x 1.125 54.0 x 54.0 x 25.4	2.33 59.1	2.26 57.4	0.91 23.1	1.8 0.8
2 x 2 x 1¼ 50 x 50 x 32	2.125 x 2.125 x 1.375 54.0 x 54.0 x 34.9	2.48 63.0	2.41 61.2	0.97 24.6	2.0 0.9
2 x 2 x 1½ 50 x 50 x 40	2.125 x 2.125 x 1.625 54.0 x 54.0 x 38.1	2.55 64.7	2.34 59.4	1.09 27.7	2.0 0.9
2½ x 2½ x ¾ 65 x 65 x 20	2.625 x 2.625 x 0.875 66.7 x 66.7 x 21.0	2.27 57.7	2.24 57.0	0.75 19.0	2.2 1.0
2½ x 2½ x 1 65 x 65 x 25	2.625 x 2.625 x 1.125 66.7 x 66.7 x 25.4	2.40 61.0	2.46 62.5	0.91 23.1	2.3 1.0
2½ x 2½ x 1¼ 65 x 65 x 32	2.625 x 2.625 x 1.375 66.7 x 66.7 x 34.9	2.52 64.0	2.63 66.8	0.97 24.6	2.5 1.1
2½ x 2½ x 1½ 65 x 65 x 40	2.625 x 2.625 x 1.625 66.7 x 66.7 x 38.1	2.70 68.6	2.74 69.6	1.09 27.7	2.7 1.2
3 x 3 x ¾ 80 x 80 x 20	3.125 x 3.125 x 0.875 79.4 x 79.4 x 21.0	2.45 62.2	2.64 67.1	0.75 19.0	2.9 1.3
3 x 3 x 1 80 x 80 x 25	3.125 x 3.125 x 1.125 79.4 x 79.4 x 25.4	2.54 64.5	2.85 72.4	0.91 23.1	3.0 1.4
3 x 3 x 1¼ 80 x 80 x 32	3.125 x 3.125 x 1.375 79.4 x 79.4 x 34.9	2.63 66.8	2.95 74.9	0.97 24.6	3.1 1.4
3 x 3 x 1½ 80 x 80 x 40	3.125 x 3.125 x 1.625 79.4 x 79.4 x 38.1	2.85 72.4	3.06 77.7	1.09 27.7	3.4 1.5
4 x 4 x ¾ 100 x 100 x 20	4.125 x 4.125 x 0.875 104.8 x 104.8 x 21.0	2.95 74.9	3.06 77.7	0.75 19.0	5.2 2.4
4 x 4 x 1 100 x 100 x 25	4.125 x 4.125 x 1.125 104.8 x 104.8 x 25.4	3.10 78.7	3.28 83.3	0.91 23.1	5.5 2.6
4 x 4 x 1¼ 100 x 100 x 32	4.125 x 4.125 x 1.375 104.8 x 104.8 x 34.9	3.25 82.5	3.53 89.7	0.97 24.6	5.7 2.6
4 x 4 x 1½ 100 x 100 x 40	4.125 x 4.125 x 1.625 104.8 x 104.8 x 38.1	3.35 85.1	3.71 94.2	1.09 27.7	6.1 2.8

**Notes:**

For information on larger sizes, contact an Anvil Sales Representative.  
See page 177 for CTS Fitting Specifications.

### FIG. 650

CTS Concentric Reducer



FIGURE 650 CTS CONCENTRIC REDUCER			
Nominal Size	Copper Tubing O.D.	End to End	Approx. Wt. Ea.
<i>In./DN(mm)</i>	<i>In./mm</i>	<i>In./mm</i>	<i>Lbs./Kg</i>
2½ x 2 65 x 50	2.625 x 2.125 66.7 x 54.0	3.29 83.6	1.4 0.6
3 x 2 80 x 50	3.125 x 2.125 79.4 x 54.0	2.50 63.5	1.4 0.6
3 x 2½ 80 x 65	3.125 x 2.625 79.4 x 66.7	2.50 63.5	1.4 0.6
4 x 2 100 x 50	4.125 x 2.125 104.8 x 54.0	4.75 120.7	3.0 1.4
4 x 2½ 100 x 65	4.125 x 2.625 104.8 x 66.7	3.00 76.2	2.3 1.1
4 x 3 100 x 80	4.125 x 3.125 104.8 x 79.4	3.00 76.2	2.3 1.1
5 x 3 125 x 80	5.125 x 3.125 130.2 x 79.4	3.88 98.6	3.7 1.7
5 x 4 125 x 100	5.125 x 4.125 130.2 x 104.8	3.38 85.9	3.7 1.7
6 x 3 150 x 80	6.125 x 3.125 155.6 x 79.4	4.38 111.3	5.1 2.3
6 x 4 150 x 100	6.125 x 4.125 155.6 x 104.8	3.88 98.6	5.2 2.4
6 x 5 150 x 125	6.125 x 5.125 155.6 x 130.2	3.38 85.9	4.8 2.2
8 x 6 200 x 150	8.125 x 6.125 206.4 x 155.6	5.00 127.0	9.7 4.4

### FIG. 652

CTS Concentric Reducer (Groove x Cup)



FIGURE 652 CTS CONCENTRIC REDUCER				
Nominal Size	Copper Tubing O.D.	End to End	Cup	Approx. Wt. Ea.
<i>In./DN(mm)</i>	<i>In./mm</i>	<i>In./mm</i>		<i>Lbs./Kg</i>
2 x 1 50 x 25	2.125 x 1.125 54.0 x 25.4	2.70 68.6	0.91 23.1	0.5 0.2
2 x 1¼ 50 x 32	2.125 x 1.375 54.0 x 34.9	3.00 76.2	0.97 24.6	0.4 0.2
2 x 1½ 50 x 40	2.125 x 1.625 54.0 x 38.1	2.94 74.7	1.09 27.7	0.4 0.2
2½ x 1 65 x 25	2.625 x 1.125 66.7 x 25.4	3.25 82.6	0.91 23.1	0.5 0.2
2½ x 1¼ 65 x 32	2.625 x 1.375 66.7 x 34.9	3.52 89.4	0.97 24.6	0.6 0.3
2½ x 1½ 65 x 40	2.625 x 1.625 66.7 x 38.1	3.45 87.6	1.09 27.7	0.6 0.3
2½ x 2 65 x 50	2.625 x 2.125 66.7 x 54.0	3.38 85.9	1.34 34.0	0.6 0.3
3 x 1½ 80 x 40	3.125 x 1.625 79.4 x 38.1	3.68 93.5	1.09 27.7	0.7 0.3
3 x 2 80 x 50	3.125 x 2.125 79.4 x 54.0	4.10 104.1	1.34 34.0	1.0 0.5
4 x 2 100 x 50	4.125 x 2.125 104.8 x 54.0	4.75 120.7	1.34 34.0	1.4 0.6

**Notes:**

For information on larger sizes, contact an Anvil Sales Representative.  
See page 177 for CTS Fitting Specifications.



# SERIES 6700

## CTS Copper 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 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.

### MATERIAL SPECIFICATIONS

**VALVE BODY:**

ASTM B584 C89836; Bronze, Low Lead

**DISC:**

ASTM A536 Gr. 65-45-12; Ductile Iron

**DISC ENCAPSULATION:**

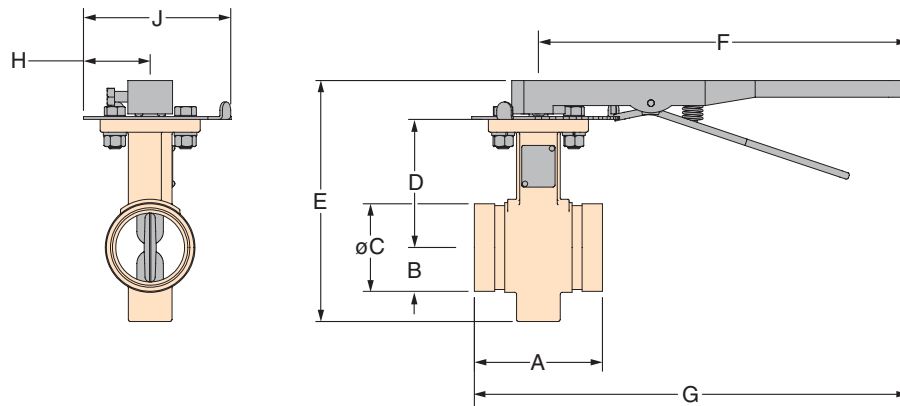
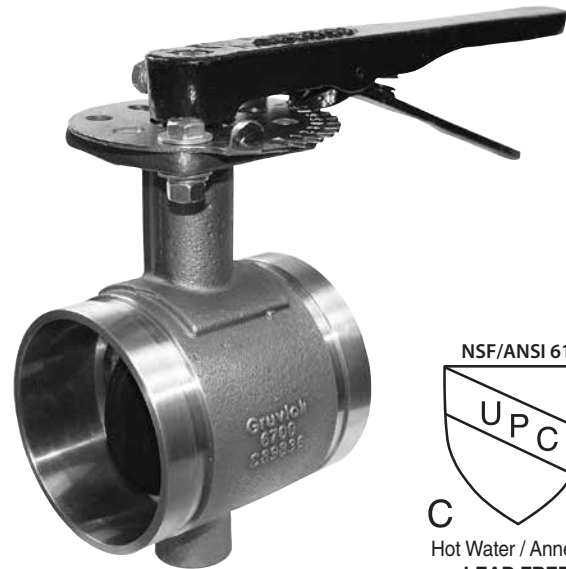
Grade "EP" EPDM Rubber: Service temperature range: -40°F to +250°F (-40°C to +121°C). Recommended for water service, diluted acids, alkaline solutions, and oil-free air.  
 NOT RECOMMENDED FOR USE IN PETROLEUM APPLICATIONS.

**UPPER & LOWER SHAFTS:**

Stainless Steel Type 17-4PH; ASTM A564

**CERTIFICATIONS:**

ANSI/NSF61 for use in Cold +86F(+30C) and Hot +180F(+82C) potable water systems. Annex G. UPC.



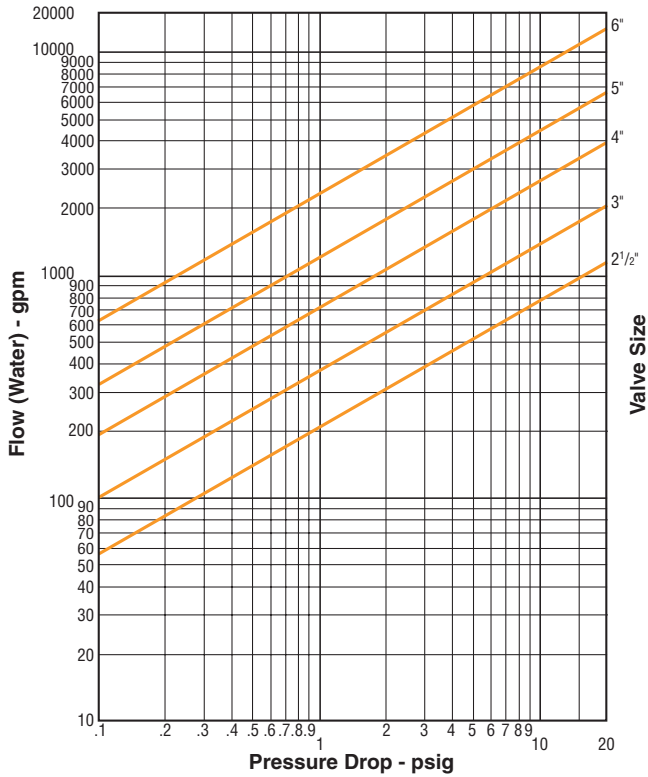
**SERIES 6700 CTS COPPER BUTTERFLY VALVE DIMENSIONS**

Nominal Size	Copper Tube Diameter	Dimensions									Weight
		A	B	C	D	E	F	G	H	J	
In.	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	Lbs./kg
2½	2.625 66.7	3.77 95.8	2.22 56.4	2.63 66.7	3.83 97.3	7.20 182.5	10.50 266.7	12.39 314.6	2.00 50.8	4.43 112.5	4 1.8
3	3.125 79.4	3.77 95.8	2.60 65.9	3.13 79.4	4.08 130.5	7.84 198.2	10.50 266.7	12.39 314.6	2.00 50.8	4.43 112.5	5 2.3
4	4.125 104.8	4.63 117.6	3.10 78.7	4.13 104.9	4.72 119.9	8.97 227.8	10.50 266.7	12.81 325.5	2.00 50.8	4.43 112.5	8 3.8
5	5.125 130.2	5.88 149.4	3.85 97.8	5.13 130.2	5.22 132.6	10.27 260.9	10.50 266.7	13.44 341.4	2.00 50.8	4.43 112.5	14 6.4
6	6.125 155.6	5.88 149.4	4.36 110.8	6.13 155.6	5.75 146.2	11.31 287.3	10.50 266.7	13.44 341.4	2.00 50.8	4.43 112.5	18 8.1

- Introduction
- Couplings
- Outlets
- Fittings
- Valves & Pressure Accessories
- High Pressure
- CTS Copper System
- D-Electric Nipples
- Plain-End Fittings
- HDPE Couplings
- Sock-It® Fittings
- Stainless Steel Method
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# SERIES 6700

## CTS Copper Butterfly Valve



Values for flow of water at +60°F (+16°C)

$$C_v = \frac{Q}{\sqrt{\Delta P}}$$

Where:  $C_v$  = Flow coefficient

$Q$  = Flow (GPM)

$\Delta P$  = Pressure drop (psi)

GRUVLOK CTS COPPER BUTTERFLY VALVE SERIES 6700 (ORDERING INFORMATION)							
Sample Part Number	4"	A	N	67	2	1 -	3
4" AN6721-3 →	Size	Body Style	Body Type	Series	Disc Coating	Operator	Shaft
	2 1/2" - 6"	A	Bronze	6700	2 - EPDM (Grade EP)	1 - 10 Pos. Handlever	3 - Stainless Steel Type 17-4PH