

British Standard Copper Products

PRODUCT DESCRIPTION



Patented



The Victaulic copper connection system was developed for joining large diameter copper tubing. In use since 1925 for steel (and other IPS pipe), cast and ductile iron, the grooved piping concept is now available to join British Standard (BS 2871) copper tubing in 54 - 159 mm (2 - 6") sizes, Tables X and Y.

The system uses a proven pressure-responsive synthetic rubber gasket to seal on the outside diameter of the tubing. This means no heat is required and no lead is used. The coupling housing surrounds the gasket gripping into grooves rolled into the tubing. The housing is isolated from the fluid but provides the gripping strength for pressure ratings up to 10 bar (145 psi).

A Vic-Flange® adapter works in a similar manner with a pressure-responsive gasket and flange design which mates to British Standard flanged products. This permits easy adaptation of flanged components.

Compatible copper fittings in 90°, 45° elbow, tee, and reducing configurations are supplied grooved ready for installation.

Standard Victaulic Vic-Easy® roll grooving tools can be used to field or shop roll groove British Standard copper tubing from 54 - 159 mm. The VE26BC allows in place grooving of copper tubing. Tools must be equipped only with Victaulic rolls designed specifically for grooving British Standard copper tubing. **DO NOT use rolls intended for steel or stainless steel pipe, or U.S. copper tubing.**

PERFORMANCE

Style 606-BS British Standard Copper Coupling

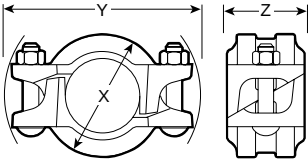
The Victaulic copper connection system has been thoroughly tested on Tables X and Y copper tubing. Victaulic products are routinely tested to failure in unrestrained hydrostatic and flexure tests. Using a nominal 3 to 1 safety factor, these tests provide regular verification of the product working pressures. The ratings in this chart apply with Victaulic Style 606-BS coupling, Style 641-BS Vic-Flange adapter, and roll grooved copper fittings on the indicated types of tubing.

Tubing millimeters/Inches	Table "X"		Table "Y"	
Actual Size	Maximum Joint Working Pressure* Bar/PSI	Maximum Permissible End Load* N/Lbs.	Maximum Joint Working Pressure* Bar/PSI	Maximum Permissible End Load* N/Lbs.
54,0	10	2288	10	2288
2.125	145	514	145	514
66,7	10	3492	10	3492
2.625	145	785	145	785
76,1	10	4561	10	4561
3.000	145	1025	145	1025
108	10	9154	10	9154
4.250	145	2057	145	2057
133	10	13894	–	–
5.236	145	3122	–	–
159	10	19859	–	–
6.260	145	4463	–	–

*Refer to notes on page 7.

DIMENSIONS

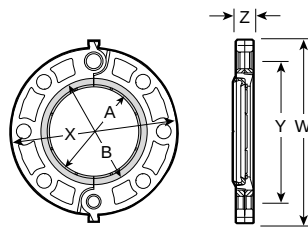
Style 606-BS British Standard Copper Coupling



Tubing millimeters/ Inches	Dimensions millimeters/Inches			Bolt/Nut No. - Size @ millimeters	Pipe End Separation † mm/Inches	Aprx. Weight Each kg/Lbs.
	X	Y	Z			
54,0 2.125	81 3.17	118 4.63	46 1.80	2 - M10 X 50,8 Lg.	0,76 0.03	0,7 1.54
66,7 2.625	93 3.67	130 5.13	46 1.80	2 - M10 X 50,8 Lg.	0,76 0.03	0,9 1.98
76,1 3.000	103 4.05	152 5.97	46 1.80	2 - M12 X 70 Lg.	0,76 0.03	1,1 2.42
108,0 4.250	138 5.44	181 7.14	49 1.94	2 - M12 X 70 Lg.	4,3 0.17	1,7 3.75
133,0 5.236	165 6.50	229 9.01	49 1.94	2 - M16 X 82,5 Lg.	4,6 0.18	2,5 5.51
159,0 6.260	191 7.53	255 10.02	49 1.94	2 - M16 X 82,5 Lg.	4,6 0.18	2,9 6.39

@, † Refer to notes on page 7

Style 641-BS Vic-Flange® Adapters



Note: Gray area of mating face must be free from gouges, undulations or deformities of any type for effective sealing.

Tubing millimeters/Inches	Dimensions millimeters/Inches						Bolt/Nut No. - Size † millimeters	Aprx. Weight Each kg/Lbs.
	Seal Surface		Flange Dimensions					
	A Max.	B Min.	W	X	Y	Z		
Actual Size	A Max.	B Min.	W	X	Y	Z		
54,0 2.125	54,0 2.13	78,0 3.07	175,0 6.89	152,4 6.00	125,0 4.92	19,8 0.78	4 - M16	1,7 3.75
66,7 2.625	67,0 2.64	92,0 3.62	200,0 7.87	177,8 7.00	145,0 5.71	22,4 0.88	4 - M16	2,1 4.63
76,1# 3.000	76,0 2.99	101,0 3.98	215,4 8.48	199,9 7.87	160,0 6.30	21,8 0.86	8 - M16	2,5 5.51
108,0 4.250	108,0 4.25	133,0 5.24	243,0 9.57	220,0 8.66	180,0 7.09	23,8 0.94	8 - M16	3,1 6.84
133,0 5.236	133,0 5.24	160,0 6.30	274,0 10.78	250,0 9.84	210,0 8.27	25,4 1.00	8 - M16	3,9 8.60
159,0 6.260	159,0 6.26	208,0 8.19	307,0 12.09	285,0 11.22	240,0 9.45	26,0 1.02	8 - M16	4,5 9.92

† Total bolts required to be supplied by installer. Bolt sizes for conventional flange-to-flange connection. Longer bolts are required when Vic-Flange adapter is utilized with wafer-type valves.

NOTE: Style 641-BS Vic-Flange adapters for copper tubing provide rigid joints when used on copper tubing roll grooved to Victaulic dimensions and consequently accommodate no linear or angular movement at the joint.

#Specify bolt hole configuration clearly on order. Size 76,1 mm with X = 185 mm; Y = 145 mm and taking 4 - M16 bolts is available.

FLANGE WASHER NOTES:

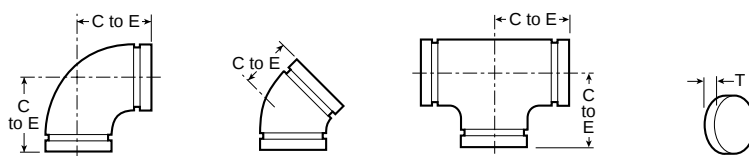
Style 641-BS Vic-Flange adapters require a smooth surface at the mating flange face for effective sealing. Some applications for which the Vic-Flange adapter is otherwise well suited do not provide an adequate mating surface.

Typical applications where a flange washer should be used are:

- When mating to a serrated flange:** a flange gasket should be used adjacent to the serrated flange and then the flange washer is inserted between the Vic-Flange adapter and the flange gasket.
- When mating to a wafer valve:** where typical valves are rubber lined and partially rubber faced (smooth or not), the flange washer is placed between the valve and the Vic-Flange adapter.
- When mating to a rubber faced flange:** the flange washer is placed between the Vic-Flange adapter and the rubber faced flange.
- When mating AWWA cast flanges or IPS flanges to copper tubing size flanges:** the flange washer is placed between two Vic-Flange adapters. If one is not a Vic-Flange adapter (e.g., flanged valve), then a flange gasket must be placed adjacent to that flange and the flange washer inserted between the flange gasket and the Vic-Flange adapter.
- When mating to components** (valves, strainers, etc.) where the component flange face has an insert: follow the same arrangement as in Application 1.

DIMENSIONS

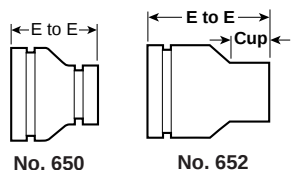
British Standard Copper Fittings



Tubing millimeters/ Inches	No. 610 90° Elbow		No. 611 45° Elbow		No. 620 Tee		No. 660 Cap	
Actual Size	C to E mm/in.	Aprx. Wgt. Ea. kg/Lbs.	C to E mm/in.	Aprx. Wgt. Ea. kg/Lbs.	C to E mm/in.	Aprx. Wgt. Ea. kg/Lbs.	Thickness T mm/in.	Aprx. Wgt. Ea. kg/Lbs.
54,0 2.125	73,9 2.91	0,4 0.9	55,6 2.19	0,4 0.9	68,3 2.69	0,5 1.1	24,4 0.96	0,5 1.0
66,7 2.625	84,1 3.31	0,6 1.3	58,7 2.31	0,5 1.1	81,4 3.20	0,8 1.8	24,4 0.96	0,6 1.3
76,1 3.000	96,8 3.81	1,0 c 2.1	65,9 2.59	0,7 1.6	89,3 3.52	1,5 3.3	24,4 0.96	0,6 1.3
108,0 4.250	120,7 4.75	1,8 c 4.0	81,0 3.19	1,5 c 3.4	108,0 4.25	2,8 6.1	24,4 0.96	1,1 2.4
133,0 5.236	150,9 5.94	6,3 c 14.0	82,6 3.25	4,7 c 10.5	150,9 5.94	9,9 22.0	24,4 0.96	1,6 3.5
159,0 6.260	176,3 6.94	9,0 c 20.0	92,1 3.63	5,9 c 13.0	176,3 6.94	13,1 29.0	24,4 0.96	1,9 4.2

c = Bronze casting; all others, drawn copper

No. 650 & No. 652 Copper Concentric Reducer



SIZE Actual O.D. mm/inches		No. 650 Grooved X Grooved		No. 652 Grooved X Cup		
		End to End mm/inches	Aprx. Weight Each kg/Lbs.	End to End mm/inches	Cup mm/inches	Aprx. Weight Each kg/Lbs.
54,0 2.125	X 42,4 X 1.67	— —	— —	77 3.03	27 1.06	0,2 0.4
66,7 2.626	X 42,4 X 1.67	— —	— —	88 3.45	27 1.06	0,3 0.7
76,1 3.000	X 54,0 X 2.125	99 3.90	0,4 0.9	— —	— —	— —
	X 66,7 X 2.626	80 3.13	0,5 c 1.1	— —	— —	— —
108,0 4.252	X 66,7 X 2.626	92 3.62	0,9 c 2.0	— —	— —	— —
	X 76,1 X 3.000	86 3.39	0,9 c 2.0	— —	— —	— —
133,0 5.236	X 76,1 X 3.000	99 3.90	2,9 6.4	— —	— —	— —
	X 108,0 X 4.252	86 3.39	2,9 6.4	— —	— —	— —
159,0 6.260	X 108,0 X 4.252	99 3.90	2,9 6.4	— —	— —	— —
	X 133,0 X 5.236	86 3.39	3,0 6.6	— —	— —	— —

c = Bronze casting; all others, drawn copper

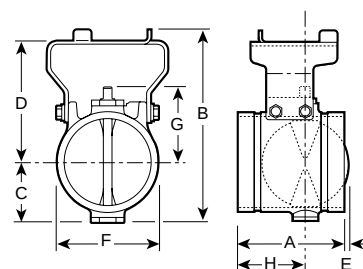
No. 625 Reducing Tee

No. 625 Grooved X Grooved							
SIZE Actual O.D. mm/inches		C to E mm/inches	Aprx. Wgt. Each kg/Lbs.	SIZE Actual O.D. mm/inches		C to E mm/inches	Aprx. Wgt. Each kg/Lbs.
76,1 3.000	X 54,0 X 2.125	76,2 3.00	1,0 c 2.2	133,0 5.236	X 76,1 X 3.000	108,0 4.25	2,5 5.5
	X 66,7 X 2.626	82,6 3.25	1,1 c 2.4		X 108,0 X 4.252	108,0 4.25	4,0 8.8
108,0 4.252	X 66,7 X 2.626	100,1 3.94	2,6 c 5.7	159,0 6.260	X 108,0 X 4.252	106,4 4.19	4,4 9.7
	X 76,1 X 3.000	106,4 4.19	2,8 c 6.2		X 133,0 X 5.236	119,1 4.69	5,1 11.2

c = Bronze casting; all others, drawn copper

DIMENSIONS

Series 608-BS British Standard Butterfly Valve

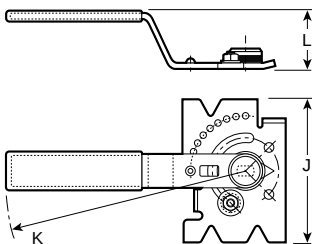


65 - 80 (typical)

Tubing mm/Inches	Dimensions - mm/Inches								Aprx. Wgt. Ea. w/o Oper. kg/Lbs.
Actual Size	End to End A	Overall Height B	C	D	E	F	G	H	
66,7 2.625	96 3.77	121 4.77	42,93 1.69	75,18 2.96	— —	63,5 2.5	55,1 2.17	59 2.31	1,9 c 4.1
76,1 3.000	96 3.77	137 5.39	50,80 2.00	83,1 3.27	2 0.08	76,2 3.00	63,0 2.48	59 2.31	2,2 c 4.8

c = Bronze casting

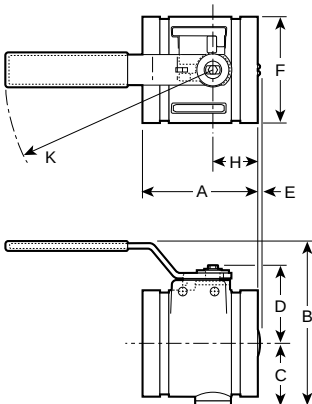
Lever Lock/Infinitely Variable Handle



Tubing mm/Inches	Dimensions - mm/Inches			Aprx. Wgt. Ea. w/o Oper. kg/Lbs.
Actual Size	J	K	L	
66,7 2.625	107 4.20	180 7.08	43 1.70	0,7 1.5
76,1 3.000	107 4.20	180 7.08	43 1.70	0,7 1.5

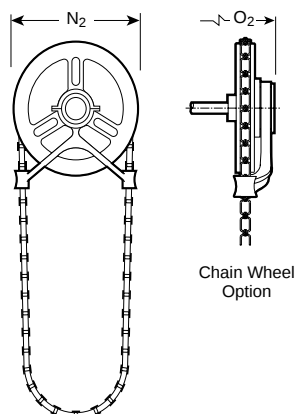
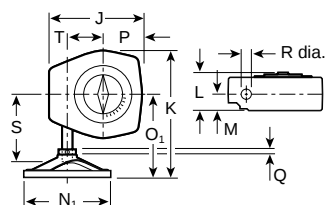
NOTE: Handles come complete with hardware for both lever lock and infinitely variable handle plus memory stop.

Two Position Handle



Tubing mm/Inches	Dimensions - mm/Inches								Aprx. Wgt. Ea. kg/Lbs.
Actual Size	E - E A	Overall Hgt. B	C	D	E	F	H	K	
66,7 2.625	96 3.77	120 4.71	43 1.69	59 2.31	— —	64 2.50	37 1.46	173 6.83	1,2 2.6
76,1 3.000	96 3.77	135 5.33	51 2.00	70 2.74	2 0.08	76 3.00	37 1.46	173 6.83	1,5 3.3

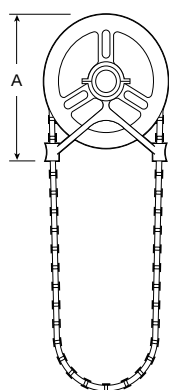
Gear Operator



Tubing mm/Inches	Dimensions mm/Inches													No. Turns to Close	Aprx. Wgt. Ea. kg Lbs.
Actual Size	J	K	L	M	Handwheel		Chain Wheel		P	Q	R	S	T		
					N ₁	O ₁	N ₂	O ₂							
66,7 2.625	107 4.23	152 5.99	55 2.15	54 2.12	79 3.12	98 3.87	100 4.00	148 5.84	48 1.90	— —	— —	— —	42 1.66	10	1,2 2.6
76,1 3.000	107 4.23	152 5.99	55 2.15	54 2.12	79 3.12	98 3.87	100 4.00	148 5.84	48 1.90	— —	— —	— —	42 1.66	10	1,2 2.6

ACCESSORIES

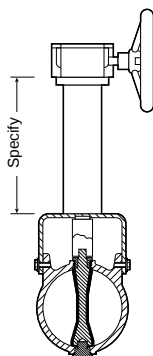
Chain Wheel



Tubing mm/Inches	Dimensions – mm/Inches			Aprx. Weight Each kg Lbs.
	Sprocket Size	Handwheel Size (Dia.)	A	
66,7 2.625	0	102 4.00	118 4.63	1,6 3.5
76,1 3.000	0	102 4.00	118 4.63	1,6 3.5

Always specify length of chain required.

Stem Extensions



Stem extensions are used for remote operations of the valve. Lever, gear or power actuators can be attached to the top of the extension. All extension components are carbon steel (stainless steel also available). Specify extension length per drawing and identify valve by figure number to which the extension will be attached.

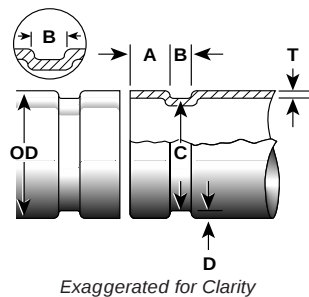
Drive Hub Extension Insulation



Series 608-BS valves with bracket-mounted handles, operators or actuators are available with factory-installed (removable) blown urethane insulation around the drive hub extension. This option provides a fully internally-insulated bracket over the drive hub leaving only normal external areas to be insulated.

GROOVE SPECIFICATIONS

British Standard Copper



1	2		3	4	5	6	7
Nominal Size mm	Actual Outside Dia. mm/Inches		Dimensions mm/Inches				
	Min.	Max.	Gasket Seat "A" ± 0.8 ±0.03	Groove Width "B" +0.8/-0 +0.03/- 0	Groove Diameter "C" + 0/-0.5 +0/- 0.02	Groove Depth "D" Ref. Only	Max. Allow. Flare Diameter
54	53,99 2.126	54,07 2.129	15,87 0.625	7,6 0.300	51,53 2.029	1,25 0.049	56,39 2.220
66,7	66,60 2.622	66,75 2.628	15,87 0.625	7,6 0.300	64,14 2.525	1,27 0.050	69,09 2.720
76,1	76,15 2.998	76,30 3.004	15,87 0.625	7,6 0.300	73,53 2.895	1,35 0.053	78,61 3.095
108	108,00 4.252	108,25 4.262	15,87 0.625	7,6 0.300	104,93 4.131	1,60 0.063	110,54 4.352
133	133,25 5.246	133,50 5.256	15,87 0.625	7,6 0.300	129,67 5.105	1,85 0.073	135,79 5.346
159	159,25 6.270	159,50 6.280	15,87 0.625	7,6 0.300	155,68 6.129	1,85 0.073	161,80 6.370

COLUMN 1 - Nominal BS-2871 drawn copper tubing size as indicated in the chart heading.

COLUMN 2 - Outside diameter: The outside diameter of roll grooved tubing shall not vary more than the tolerance listed. The maximum allowable tolerance from square cut ends is 0,8 mm (0.030") for 50 - 80 mm; 1,1 mm (0.045") for 100 - 150 mm, measured from true square line.

COLUMN 3 - Gasket seat: The tubing surface shall be free from indentations, roll marks, and projections from the end of the tubing to the groove, to provide a leak-tight seat for the gasket. All loose scale, dirt, chips and grease must be removed.

COLUMN 4 - Groove width: Bottom of groove to be free of loose dirt, chips and scale that may interfere with proper coupling assembly.

COLUMN 5 - Groove outside diameter: The groove must be uniform depth for the entire tubing circumference. Groove must be maintained within the "C" diameter tolerance listed.

COLUMN 6 - Groove depth: For reference only. Groove must conform to the groove diameter "C" listed.

COLUMN 7 - Maximum allowable end flare diameter: Measured at the most extreme tubing end diameter.

MATERIAL SPECIFICATIONS

COUPLING

Body: Ductile iron conforming to ASTM A-536, grade 65-45-12. Ductile iron conforming to ASTM A-395, grade 65-45-15, is available upon special request.

Housing Coating: Copper colored alkyd enamel

Gasket (and Disc Coating) (Specify choice on order):

- **Grade “E” EPDM**
EPDM (Green color code). Temperature range –34°C to +110°C (–30°F to +230°F). Recommended for cold and hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL classified in accordance with ANSI/NSF 61 for cold +30°C (+86°F) and hot +82°C (+180°F) potable water service. NOT RECOMMENDED FOR PETROLEUM SERVICES.
- **Grade “T” nitrile**
Nitrile (Orange color code). Temperature range –29°C to +82°C (–20°F to +180°F). Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range. Not recommended for hot water services over +66°C (+150°F) or for hot dry air over +60°C (+140°F).

*Services listed are General Service Recommendations only. It should be noted that there are services for which these gaskets are not recommended. Reference should always be made to the latest Victaulic Gasket Selection Guide for specific gasket service recommendations and for a listing of services which are not recommended.

FITTINGS:

Copper per ASTM B-75 alloy C12200, or B-152 alloy C11000 or bronze casting per ASTM B-584 alloy C83600 (85-5-5-5).

BUTTERFLY VALVE

Body: Bronze per CDA-836 (85-5-5-5).

Disc: Ductile iron to ASTM A-536

Disc Coating (Specify choice): Refer to Gasket under coupling data.

Drive Hub Adapter: Steel, black enamel coated

Upper Bearing/Lower Trunnion Seals: Same as Disc Coating

Trim: (Upper Bearing/Lower Trunnion) Bronze alloy

Operator Bracket: Steel, black enamel coated

Bracket Bolts/Washers: Steel, zinc plated

Operator (specify choice)

- **Two-position detent manual handle:** Steel, black enamel coated
- **Manual lever lock/ininitely variable handle with memory stop:** Steel, black enamel coated
- **Manual gear operator with handwheel:**
 - **Optional:** Memory Stop
 - **Optional:** Chain wheel

Electric actuator §

Pneumatic actuator §

NOTES

* Working Pressure and End Load are total, from all internal and external loads, based on British Standard copper tubing of the table indicated, standard roll grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

† For field installation only. Style 606-BS is essentially rigid and does not accommodate expansion or contraction.

§ Sizing of actuator is dependent upon service. Contact Victaulic for details.

@ Number of bolts required equals number of housing segments.

WARNING: Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.

This product shall be manufactured by Victaulic Company. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.