

Victaulic® Installation-Ready™ Fittings for Grooved Copper Tubing



Patent Pending

1.0 PRODUCT DESCRIPTION

Available Sizes

- 2 – 3"/50 – 80 mm

Pipe Material

- Types K, L, M and DWV hard drawn copper tubing.

Maximum Working Pressure

- All fittings can accommodate pressures from full vacuum (29.9 in Hg/760 mm Hg) on Types K, L, M and DWV hard drawn copper tubing up to the maximum allowable working pressures (MAWP) shown below:
 - 300 psi/2100 kPa on Types K and L copper systems.
 - 250 psi/1700 kPa on Type M copper systems.
 - 100 psi/700 kPa on Type DWV copper systems.

Fitting Operating Temperature Range

- -30°F to +180°F/-34°C to 82°C

Function

- Exclusively for use with valves, accessories and pipe which feature ends formed with the Victaulic copper tubing grooving dimensions as shown in publication [25.06](#): Victaulic Copper Tubing Roll Groove Specifications to CTS US Standards – ASTM B88 & ASTM B306.

NOTES

- A No. 643 Copper Adapter Nipple (groove x groove) is required to connect two Installation-Ready™ fittings for copper to one another. For more information on the No. 643 Copper Adapter Nipple, reference publication [22.04](#): Victaulic Copper Fittings.
- A Go/No-Go Groove Diameter Cable for Copper Tube is available for checking groove diameters. See publication [24.01](#): Victaulic Pipe Preparation Tools for more information.
- Victaulic Installation-Ready™ fittings for grooved copper tube should not be used with copper tubing to European standards (EN 1057) or to Australian standards (AS 1432).

2.0 CERTIFICATION/LISTINGS

Victaulic Installation-Ready™ fittings for grooved copper tube are UL Classified in accordance with ANSI/NSF 61 for cold +73°F/+23°C and hot +180°F/+82°C potable water service and ANSI/NSF 372.

NOTE

- See publication [22.06](#): Victaulic Potable Water Approvals if applicable.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

| | | | |
|--------------|--|----------|--|
| System No. | | Location | |
| Submitted By | | Date | |

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|--------------|--|-----------|--|
| Spec Section | | Paragraph | |
| Approved | | Date | |

3.0 SPECIFICATIONS - MATERIAL

Fitting Housings: Ductile iron conforming to ASTM A536, Grade 65-45-12.

Housing Coating: Copper colored alkyd enamel.

Liner and Gasket:¹

Polyvinylidene fluoride (PVDF) homopolymer resin classified in accordance with ASTM D3222-05, ASTM D792, ASTM D1238, ASTM D638, and ASTM D3418. EHP (Red and copper stripe color code). May be specified for hot water service within the specified fitting operating temperature range. NOT COMPATIBLE FOR USE WITH PETROLEUM SERVICES.

¹ Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to the latest [Victaulic Seal Selection Guide](#) for specific gasket service guidelines and for a listing of services which are not compatible.

Bolts/Nuts: (specify choice)

Standard: Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449. Carbon steel heavy hex nuts meeting the mechanical property requirements of ASTM A563 Grade B. Track bolts and heavy hex nuts are zinc electroplated per ASTM B633 ZN/FE5, finish Type III (imperial) or Type II (metric).
Optional (Imperial sizes only): Stainless steel oval neck track bolts meeting the mechanical property requirements of ASTM F593, Group 2 (316 stainless steel), condition CW. Stainless steel heavy hex nuts meeting the mechanical property requirements of ASTM F594, Group 2 (316 stainless steel), condition CW, with galling-reducing coating.

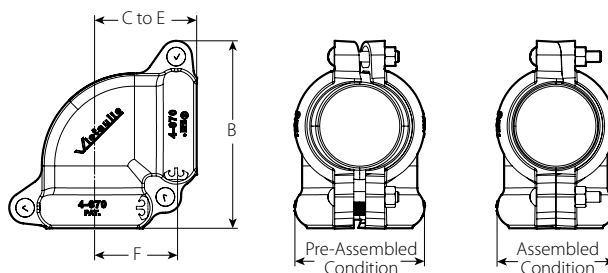
Bolt Retainers: Celcon M270

DISCONTINUED PRODUCT

4.0 DIMENSIONS

Elbows

No. 670 90° Elbow



| Size | | Pipe End Separation ² | Bolt/Nut | | | No. 670 90° Elbow | | | | | Weight | |
|----------------|-----------------------------------|----------------------------------|----------|-------------|---|-------------------|---------------------|------------------|-------------|-------------------------|---------------------|--------------------------|
| Nominal inches | Actual Outside Diameter inches mm | Allowable inches mm | Qty. | Size inches | | | F Takeout inches mm | C to E inches mm | B inches mm | Pre-Assembled inches mm | Assembled inches mm | Approximate (Each) lb kg |
| 2 | 2.125 54.0 | 0.16 4.0 | 3 | 3/8 | x | 2 | 2.13 54 | 3.13 80 | 5.75 146 | 3.75 95 | 3.38 86 | 3.6 1.6 |
| 2½ | 2.625 66.7 | 0.16 4.0 | 3 | 3/8 | x | 2 | 2.63 67 | 3.68 94 | 6.63 168 | 4.38 111 | 3.88 98 | 4.7 2.1 |
| 3 | 3.125 79.4 | 0.16 4.0 | 3 | ½ | x | 3 | 3.14 80 | 4.13 105 | 7.25 194 | 5.13 130 | 4.63 118 | 10.7 4.9 |

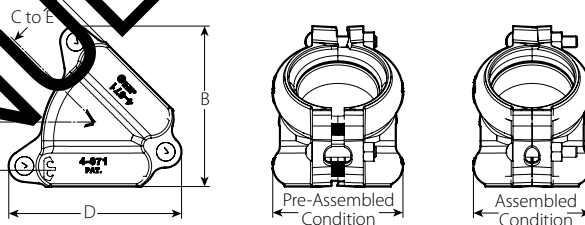
² The allowable pipe separation dimension shown is for system layout purposes only. Installation-Ready™ fittings for copper tube are considered rigid connections and will not accommodate expansion or contraction of the piping system.

NOTE

- Dimension values are rounded up to the nearest 1/32" (3.175 mm).

4.1 DIMENSIONS

No. 671 45° Elbow



| Size | | Pipe End Separation ² | Bolt/Nut | | No. 671 45° Elbow | | | | | | Weight |
|----------------|-----------------------------------|----------------------------------|----------|-------------|---------------------|------------------|-------------|-------------|-------------------------|---------------------|--------------------------|
| Nominal inches | Actual Outside Diameter inches mm | Allowable inches mm | Qty. | Size inches | F Takeout inches mm | C to E inches mm | B inches mm | D inches mm | Pre-Assembled inches mm | Assembled inches mm | Approximate (Each) lb kg |
| 2 | 2.125 54.0 | 0.16 4.0 | 3 | 3/8 x 2 | 1.38 35 | 2.38 60 | 5.63 143 | 5.38 137 | 3.75 95 | 3.38 86 | 3.3 1.5 |
| 2½ | 2.625 66.7 | 0.16 4.0 | 3 | 3/8 x 2 | 1.63 41 | 2.63 67 | 6.00 152 | 5.88 149 | 4.38 111 | 3.88 98 | 4.0 1.8 |
| 3 | 3.125 79.4 | 0.16 4.0 | 3 | ½ x 3 | 1.89 48 | 2.88 73 | 7.25 184 | 6.88 175 | 5.13 130 | 4.63 118 | 8.3 3.8 |

² The allowable pipe separation dimension shown is for system layout purposes only. Installation-Ready™ fittings for copper tube are considered rigid connections and will not accommodate expansion or contraction of the piping system.

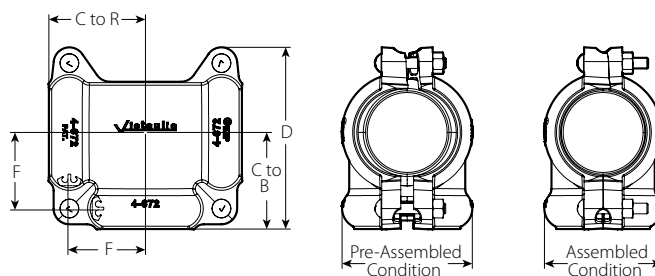
NOTE

- Dimension values are rounded up to the nearest 1/32" (3.175 mm).

4.2 DIMENSIONS

Tee

No. 672 Tee



| Size | | Pipe End Separation ² | Bolt/Nut | | No. 672 Tee | | | | | | Weight |
|----------------|-----------------------------------|----------------------------------|----------|-------------|---------------------|------------------|------------------|-------------|-------------------------|---------------------|--------------------------|
| Nominal inches | Actual Outside Diameter inches mm | Allowable inches mm | Qty. | Size inches | F Takeout inches mm | C to B inches mm | C to R inches mm | D inches mm | Pre-Assembled inches mm | Assembled inches mm | Approximate (Each) lb kg |
| 2 | 2.125 54.0 | 0.16 4.0 | 4 | 3/8 x 2 | 2.25 57 | 3.25 83 | 3.25 83 | 6.00 152 | 3.35 85 | 3.38 86 | 5.0 2.3 |
| 2½ | 2.625 66.7 | 0.16 4.0 | 4 | 3/8 x 2 | 2.63 67 | 3.63 92 | 3.63 92 | 6.75 172 | 3.38 86 | 3.88 98 | 6.4 2.9 |
| 3 | 3.125 79.4 | 0.16 4.0 | 4 | ½ x 3 | 3.14 80 | 4.13 105 | 4.13 105 | 7.88 200 | 5.13 130 | 4.63 118 | 14.3 6.5 |

² The allowable pipe separation dimension shown is for system layout purposes only. Installation-Ready™ fittings for copper tube are considered rigid connections and will not accommodate expansion or contraction of the piping system.

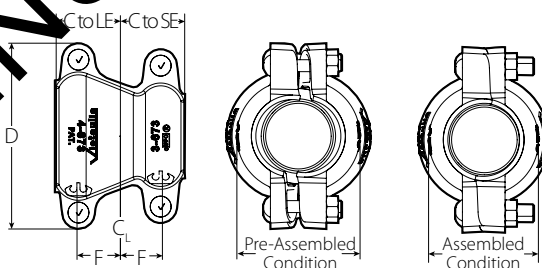
NOTE

- Dimension values are rounded up to the nearest 1/8" / 3.175 mm.

4.3 DIMENSIONS

Concentric Reducer

No. 673 Concentric Reducer



| Size | | Pipe End Separation ² | Bolt/Nut | | No. 673 Concentric Reducer | | | | | Weight |
|-------------------|-----------------------------------|----------------------------------|----------|----------------|----------------------------|---------------------------|-------------|-------------------------|---------------------|--------------------------|
| Nominal inches | Actual Outside Diameter inches mm | Allowable inches mm | Qty. | Size inches mm | F Takeout inches mm | C to LE C to SE inches mm | D inches mm | Pre-Assembled inches mm | Assembled inches mm | Approximate (Each) lb kg |
| 2½ x 2 65 x 50 | | 0.16 4.0 | 4 | 3/8 x 2 | 1.75 44 | 2.69 68 | 6.25 159 | 4.00 102 | 3.50 89 | 5.3 2.4 |
| 3 x 2 75 x 50 | | 0.16 4.0 | 4 | ½ x 3 | 2.06 54 | 3.00 76 | 7.25 184 | 4.00 102 | 3.50 89 | 8.7 3.9 |
| 2½ x 2 65 x 50 | | 0.16 4.0 | 4 | ½ x 3 | 1.80 48 | 2.69 68 | 7.25 184 | 4.50 114 | 4.00 102 | 8.1 3.7 |

² The allowable pipe separation dimension shown is for system layout purposes only. Installation-Ready™ fittings for copper tube are considered rigid connections and will not accommodate expansion or contraction of the piping system.

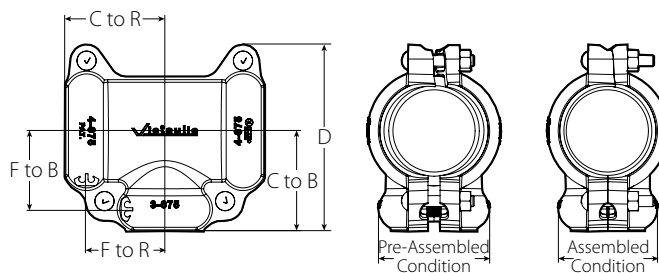
NOTE

- Dimension values are rounded up to the nearest 1/8" / 3.175 mm.

4.4 DIMENSIONS

Reducing Tee

No. 675 Reducing Tee



| Size | | | | Pipe End Separation ² | Bolt/Nut | | | | No. 675 Reducing Tee | | | | | | | Weight |
|-------------------------|---|-------------|---|----------------------------------|-------------|----------------------|---------|-----------------------------------|-----------------------------------|------------------------|------------------------|-------------------|-----------------------------------|---------------------------|-----------------------------------|--------|
| Nominal inches mm | | | | Allowable inches mm | Qty. | Size inches mm | | F to R Takeout inches mm | F to B Takeout inches mm | C to R inches mm | C to B inches mm | D inches mm | Pre- Assembled inches mm | Assembled inches mm | Approximate (Each) lb kg | |
| 2 1/2 65 | x | 2 1/2 65 | x | 2 50 | 0.16 4.0 | 4 | 3/8 x 2 | 2.51 64 | 3.13 79 | 3.38 86 | 4.00 102 | 7.13 181 | 4.00 102 | 3.50 89 | 7.8 3.5 | |
| 3 75 | x | 3 75 | x | 2 50 | 0.16 4.0 | 4 | 1/2 x 3 | 2.89 73 | 3.38 86 | 3.75 92 | 4.25 108 | 7.75 197 | 4.00 102 | 3.50 89 | 12.5 5.7 | |
| | | | | 2 1/2 65 | 0.16 4.0 | 4 | 1/2 x 3 | 2.89 73 | 3.38 86 | 3.75 92 | 4.25 108 | 7.75 197 | 4.63 118 | 4.00 102 | 12.6 5.7 | |

² The allowable pipe separation dimension shown is for system layout purposes only. Installation-Ready™ fittings for copper tube are considered rigid connections and will not accommodate expansion or contraction of the piping system.

NOTE

- Dimension values are rounded up to the nearest ⅛"/3.175 mm.

5.0 PERFORMANCE

The Victaulic copper connection system has been thoroughly tested on Types K, L, M and DWV hard drawn copper tubing (CTS) conforming to ASTM B88 and ASTM B306 (DWV). Performance ratings below also apply to the Victaulic Series 608N Butterfly Valve, Victaulic Style 641 *Vic-Flange*™ Adapter, and Victaulic Installation-Ready™ fittings connected to the indicated Types of copper tubing.

| Size | | Type "K" ASTM B88 | | | Type "L" ASTM B88 | | | |
|---------------------|-------------------|---------------------------------|---|---|-------------------|---------------------------------|---|---|
| Nominal inches | Wall Thickness | Wall Thickness Tolerances | Maximum Joint Working Pressure ³ | Maximum Permis. End Load ³ | Wall Thickness | Wall Thickness Tolerances | Maximum Joint Working Pressure ³ | Maximum Permis. End Load ³ |
| Actual Tubing mm | inches mm | inches mm | psi kPa | lb N | inches mm | inches mm | psi kPa | lb N |
| 2 | 0.083 | ± 0.008 | 300 | 1065 | 0.070 | ± 0.007 | 300 | 1065 |
| 54.0 | 2.1 | ± 0.20 | 2065 | 4740 | 1.8 | ± 0.18 | 2065 | 4740 |
| 2½ | 0.095 | ± 0.010 | 300 | 1625 | 0.080 | ± 0.008 | 300 | 1625 |
| 66.7 | 2.4 | ± 0.25 | 2065 | 7230 | 2.0 | ± 0.20 | 2065 | 7230 |
| 3 | 0.109 | ± 0.011 | 300 | 2300 | 0.090 | ± 0.009 | 300 | 2300 |
| 79.4 | 2.8 | ± 0.28 | 2065 | 10235 | 2.3 | ± 0.23 | 2065 | 10235 |

| Size | | Type "M" ASTM B88 | | | Type "DWV" - ASTM B306 | | | |
|---------------------|-------------------|---------------------------------|---|---|------------------------|---------------------------------|---|---|
| Nominal inches | Wall Thickness | Wall Thickness Tolerances | Maximum Joint Working Pressure ³ | Maximum Permis. End Load ³ | Wall Thickness | Wall Thickness Tolerances | Maximum Joint Working Pressure ³ | Maximum Permis. End Load ³ |
| Actual Tubing mm | inches mm | inches mm | psi kPa | lb N | inches mm | inches mm | psi kPa | lb N |
| 2 | 0.058 | ± 0.006 | 250 | 890 | 0.042 | — | 100 | 355 |
| 54.0 | 1.5 | ± 0.15 | 1725 | 3960 | 1.1 | — | 690 | 1580 |
| 2½ | 0.065 | ± 0.006 | 250 | 1350 | — | — | — | — |
| 66.7 | 1.7 | ± 0.15 | 1725 | 6010 | — | — | — | — |
| 3 | 0.072 | ± 0.007 | 250 | 1415 | 0.045 | ± 0.004 | 100 | 765 |
| 79.4 | 1.8 | ± 0.187 | 1725 | 6300 | 1.1 | ± 0.10 | 690 | 3405 |

³ Working Pressure and End Load are total, from all internal and external loads, based on hard drawn copper tubing of the weight indicated or DWV tube, and 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 figure shown.

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

6.0 NOTIFICATIONS

CAUTION

- DO NOT use grooving roll sets intended for steel, stainless steel, aluminum or PVC pipe.

7.0 REFERENCE MATERIALS

[05.01: Victaulic Seal Selection Guide: Elastometric Seal Construction](#)

[22.01: Victaulic Copper Connection Systems for Copper Tubing \(CTS\)](#)

[22.04: Victaulic Copper Fittings](#)

[24.01: Victaulic Pipe Preparation Tools](#)

[25.06: Victaulic Copper Tubing Roll Groove Specifications](#)

[I-600: Victaulic Field Assembly and Installation Instruction Handbook for Copper Products](#)

[I-670/671: Victaulic No. 670 \(90 Degree Elbow\) and No. 671 \(45 Degree Elbow\) Installation-Ready™ Fittings for Copper Tubing Installation Instructions](#)

[I-672/675: Victaulic No. 672 \(Straight Tee\) and No. 675 \(Reducing Tee\) Installation-Ready™ Fittings for Copper Tubing Installation Instructions](#)

[I-673: Victaulic No. 673 \(Concentric Reducer\) Installation-Ready™ Fittings for Copper Tubing Installation Instructions](#)

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

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Note

This product shall be manufactured by Victaulic or to Victaulic specifications. 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.

Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at www.victaulic.com.

Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

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