Victaulic® Standard Product for Copper Tubing (CTS)

22.01

Approvals/Listings

SBCC NYBSA

See Victaulic publication 10.01 for more details.

See Victaulic submittal publication 02.06 for potable water approvals if applicable.

Product Description

The Victaulic copper connection system was developed for joining sizes 2 – 8"/50 – 200mm copper tubing. 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 300 psi/2065 kPa, depending on the wall thickness and diameter of copper tubing.

A Vic-Flange® adapter works in a similar manner with a pressure-responsive gasket and flange design which mates to ANSI Class 125 or 150 flanged products. This permits easy adapting of flanged components.

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

Victaulic Vic-Easy® roll grooving tools VE272SFS, VE270FSD, VE268, VE416FSD, and VE414MC can be used to roll groove Types K, L, M and DWV copper tubing from 2 – 8"/54.0 – 206.4 mm. The Vic-Easy VE226C can be used for 2 – 6"/50 – 150 mm copper tubing. The VE26C allows in-place manual grooving of 2 – 6"/50 – 150 mm copper tubing. Tools must be equipped only with Victaulic rolls designed specifically for grooving copper tube (color coded copper).

Testing

The normally thin wall and high ductility of copper piping make a grooved mechanical connection the simplest means for joining tubing. Recognizing that this roll groove would alter the flow pattern, Victaulic Company of America contracted with the LaQue Center for Corrosion Technology, Inc. (LaQue Center) to conduct a series of tests to evaluate what effect, if any, this protrusion might have on the flow stream pattern and, consequently, the historically low corrosion rate of copper piping in potable water systems.

Conclusions

In review of these tests, the aggressive 60-day exposure in natural seawater revealed that effects of the increased turbulence caused by the introduction of roll grooves for the Victaulic piping method were no more than those caused by the tees and elbows in the system, which are the same as for sweated piping systems. Results of the six-month potable water test, while not being anywhere near the expected life of an actual copper piping system, demonstrated that the roll grooves had no adverse effects on the formation and retention of a protective corrosion product film. Based upon these test results, the Victaulic piping system should perform equally with a sweated piping system under the same conditions. See publication 22.07.

Job/Owner

System No.	
Location	

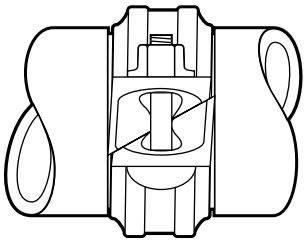
Contractor

Submitted By	
Date	

Engineer

Spec Section	
Paragraph	
Approved	
Date	

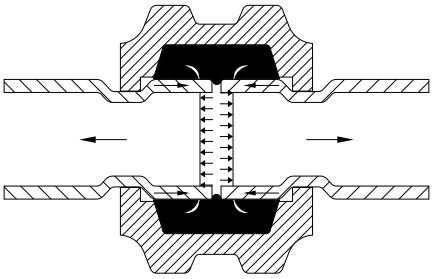
22.01 1551 Rev D Updated 03/2015



Exaggerated for clarity

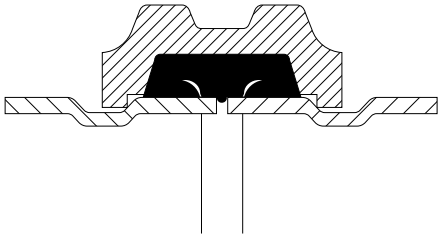
Provides rigidity

Patented angle-pad design adjusts to standard tubing tolerances. Provides positive clamping on the tubing to resist flexural and torsional loads. Assures rigidity for ease of hanging.



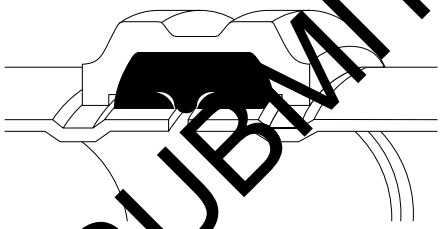
Proven joint reliability

Full circumferential engagement of housing into groove provides end load strength. Tested in field installations and by independent services.



Easily roll grooved

Victaulic tools permit easy grooving of hard drawn copper tubing in Types K, L, M and DWV, using specifically designated copper roll sets on various Victaulic Vic-Easy roll grooving tools. Fits standard power drives and tools.



Accepted and approved

The Victaulic grooved system is accepted under national, state and local plumbing codes. Accepted by BOCA, IAPMO, SBCCI, UL and others. Tested to industry standards and beyond.

• See Victaulic submittal publication 02.06 for potable water approvals if applicable.

Performance

The Victaulic copper connection system has been thoroughly tested on Types K, L, M and DWV drawn 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 below apply with Victaulic couplings Style 607, Vic-Flange adapter Style 641, Series 608N butterfly valve, Victaulic Installation-Ready™ fittings for copper and roll grooved copper fittings on the indicated Types of tubing.

Nominal Size	Type "K" ASTM B-88			Type "L" ASTM B-88			Type "M" ASTM B-88			DWV ASTM B-306		
Tubing inches mm	Wall Thickness inches mm	Max. Joint. Work. Press. psi kPa	Max. Permis. End Load Lbs. N	Wall Thickness inches mm	Max. Joint. Work. Press. psi kPa	Max. Permis. End Load Lbs. N	Wall Thickness inches mm	Max. Joint. Work. Press. psi kPa	Max. Permis. End Load Lbs. N	Wall Thickness inches mm	Max. Joint. Work. Press. psi kPa	Max. Permis. End Load Lbs. N
2 54.0	0.083 2.1	300 2065	1065 4737	0.070 1.8	300 2065	1065 4737	0.058 1.5	250 1725	890 3959	0.042 1.1	[illegible]	354 1575
2½ 66.7	0.095 2.4	300 2065	1625 7228	0.080 2.0	300 2065	1625 7228	0.065 1.7	250 1725	1350 6005	–	–	–
3 79.4	0.109 2.8	300 2065	2300 10231	0.090 2.3	300 2065	2300 10231	0.072 1.8	250 1725	1415 6294	0.045 1.1	100 690	765 3403
4 104.8	0.134 3.4	300 2065	4005 17815	0.110 2.8	300 2065	4005 17815	0.095 2.4	250 1725	3341 14857	0.058 1.5	100 690	1335 5938
5 130.2	0.160 4.1	300 2065	6190 27534	0.125 3.2	300 2065	6190 27534	0.109 2.8	200 1379	[illegible] 18319	0.072 1.8	100 690	2060 9163
6 155.6	0.192 4.9	300 2065	8840 39322	0.140 3.6	300 2065	8840 39322	0.122 3.1	200 1375	5890 26200	0.083 2.1	100 690	2945 13100
8 206.4	0.271 6.9	300 2065	15550 69170	0.200 5.1	300 2065	15550 69170	0.170 4.3	200 137[illegible]	10370 46128	0.109 2.8	100 690	5180 23042

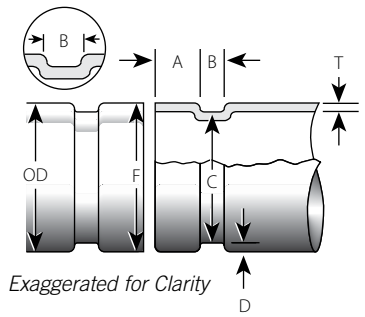
NOTE: Working Pressure and End Load are total, from all internal and external loads, based on the indicated Type of hard drawn copper tubing, standard roll grooved in accordance with Victaulic specifications.

⚠ WARNING

- **FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.**
- **Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.**

Roll Groove Specifications

The groove is achieved by the upper male roll being pressed, with manual or hydraulic force, into tubing which rotates on a lower female roll. Use only roll sets for copper tubing. Tubing grooves must be within tolerances listed below to assure proper coupling assembly.



Exaggerated for Clarity

Nominal Size	Pipe Outside Diameter		Dimensions					
Tubing [1]	Basic [2]	Tolerance [2]	Gasket Seat A [3] 0.03 0.76	Groove Width B [4] +0.03/-0.00 +0.76/-0.00	Groove Dia. C [5] +0.000/-0.020 +0.00/-0.50	Groove Depth (ref.) D [6]	Min. Allow. Wall Thick. T [7]	Max. Allow. Flare Diameter F [8]
inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm
2 54.0	2.125 54.0	0.002 0.05	0.610 15.5	0.300 7.6	2.029 51.5	0.047 1.2	DWV	2.174 55.2
2½ 66.7	2.625 66.7	0.002 0.05	0.610 15.5	0.300 7.6	2.525 64.1	0.050 1.2	0.065 1.700	2.674 67.9
3 79.4	3.125 79.4	0.002 0.05	0.610 15.5	0.300 7.6	3.025 76.8	0.050 1.2	DWV	3.174 80.6
4 104.8	4.125 104.8	0.002 0.05	0.610 15.5	0.300 7.6	4.015 102.1	0.053 1.4	DWV	4.174 106.0
5 130.2	5.125 130.2	0.002 0.05	0.610 15.5	0.300 7.6	4.999 127.0	0.053 1.4	DWV	5.220 132.6
6 155.6	6.125 155.6	0.002 0.05	0.610 15.5	0.300 7.6	5.999 152.3	0.063 1.6	DWV	6.220 158.0
8 206.4	8.125 206.4	0.002/-0.004 0.05/-0.10	0.610 15.5	0.300 7.6	7.959 202.2	0.083 2.1	DWV	8.220 208.0

1 Nominal ASTM B-88 drawn copper tubing size.

2 Outside diameter: the outside diameter and tolerances of roll grooved tubing shall be in accordance with ASTM B-88 for drawn tubing as shown here. The maximum allowable tolerance from square cut ends is 0.030" for 2 – 3"/50 – 80 mm; 0.045" (1.14 mm) for 4 – 8"/100 – 200 mm, measured from true square line.

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 seal for the gasket. All loose scale, dirt, chips and grease must be removed.

4 Grooving width: bottom of groove to be free of loose dirt, chips, and scale that may interfere with proper coupling assembly.

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.

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

7 ASTM B-306 drain waste and vent (DWV) is minimum wall thickness copper tubing which may be roll grooved.

8 Maximum allowable end flare diameter. Measured at the most extreme tubing end diameter.

⚠ CAUTION

- **DO NOT use grooving rolls intended for steel, stainless steel, aluminum, or PVC pipe when preparing copper tubing for use with Victaulic copper connection system products.**

Failure to follow this instruction could cause joint leakage, resulting in property damage.

User Responsibility for Product Selection and Suitability
Each user has 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, 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 hanbook 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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