

Victaulic® *Mechanical-T* Bolted Branch Outlets

Styles 422 and E422



1.0 PRODUCT DESCRIPTION

Available Sizes

- 2 x ¾"/DN50 x DN20 through 10 x 2"/DN250 x DN50

Pipe Material

- Types 304/304L and 316/316L Schedule 10S and 40S stainless steel pipe per ASTM A312
- HDPE pipe conforming to ASTM D3035 and ASTM F714

Maximum Working Pressure

- Up to 300 psi/2065 kPa
- For HDPE applications, working pressure dependent on material, wall thickness and size of pipe

WARNING

- FOR ONE-TIME FIELD TEST ONLY, the maximum working pressure may be increased to 1 ½ times the figures shown.

Operating Temperature Range

- Dependent on gasket selection from Section 3.0
- For alternate gasket materials available, reference Victaulic [Publication 05.01](#)

Available Branch End Configurations

- Victaulic® Original Groove System (OGS) – Style 422
- Victaulic® StrengThin™ 100 Groove System (ST-100) – Style E422
- Female National Pipe Thread (FNPT) – Style 422
- Female Threaded ISO 7-Rp – Style 422
- Female Threaded ISO 7-Rc – Style 422

Application

- Provides a reduced size outlet in place of a reducing tee
- Provides a direct branch connection at any location a hole can be cut in a pipe

NOTES

- Not compatible for use on PVC plastic pipe
- Must be installed to keep the main and branch connections at a true 90° angle
- Not approved for use in hot tapping applications
- May be supplied with stainless steel lower housings

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

2.0 CERTIFICATIONS/LISTINGS



- See [Publication 02.06](#): Victaulic Potable Water Approvals ANSI/NSF for potable water approvals, if applicable.
- This product is registered in Canada in accordance with CSA B51, the Canadian Boiler, Pressure Vessel and Pressure Piping Code. Contact Victaulic for registered working pressures, temperatures and confirmation of the applicable CRN by Province or Territory.
- FM Approved for use on 3x2", 4x2", and 4x3" Schedule 10S stainless steel pipe up to a maximum operating pressure of 232 psi/1600 kPa.

3.0 SPECIFICATIONS - MATERIAL

Outlet Housing: Grade CF8M (Type 316 stainless steel) conforming to ASTM A351/A351M

Lower Housing: Ductile Iron conforming to ASTM A536, Grade 65-45-12, Hot Dip Galvanized

☐ **Optional:** Grade CF8M (Type 316 Stainless Steel) conforming to ASTM A351/A351M

Gasket: (specify choice¹)

☐ **Victaulic Grade "E" EPDM**

EPDM (Green stripe color code). Temperature range –30°F to +230°F/ –34°C to +110°C. May be specified 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 +73°F/+23°C and hot +180°F/+82°C potable water service and ANSI/NSF 372. NOT COMPATIBLE FOR PETROLEUM SERVICES.

☐ **Victaulic Grade "T" Nitrile**

Nitrile (Orange stripe color code). Temperature range –20°F to +180°F/–29°C to +82°C. May be specified for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range. Not compatible for hot water services over +150°F/+66°C or for hot dry air over +140°F/+60°C.

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 guideline and for a listing of services which are not compatible.

NOTE

- Additional gasket styles are available. Contact Victaulic for details.

Bolts/Nuts: (specify choice²)

☐ Standard: Carbon steel oval neck track bolts meeting the mechanical property requirements of (imperial) ASTM A449 or (metric) ISO 898-1 Class 9.8 (M10-M16) or Class 8.8 (M20 and greater). Carbon steel hex nuts meeting the mechanical property requirements of (imperial heavy hex nuts) ASTM A563 Grade B or (metric hex nuts) ISO 898-2 Class 10 (M12-M16) or Class 8 (M20 and greater). Track bolts and hex nuts are zinc electroplated per ASTM B633 Fe/Zn5 finish (imperial) Type III or (metric) Type II.

☐ Optional: Stainless steel oval neck track bolts meeting the mechanical property requirements of ASTM A193 Grade B8M, Class 2 (316 stainless steel). Stainless steel heavy hex nuts meeting the mechanical property requirements of ASTM A194 Grade 8M (316 stainless steel), condition CW, with galling reducing coating.

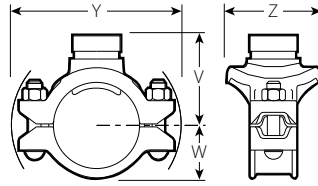
² Optional bolts/nuts are available in imperial size only.

NOTE

- Carbon steel oval neck track bolts are the standard offering for the galvanized ductile iron lower housing option. Stainless steel oval neck track bolts are the standard offering for the stainless steel lower strap option.

4.0 DIMENSIONS

Style 422 Original Groove System (OGS)



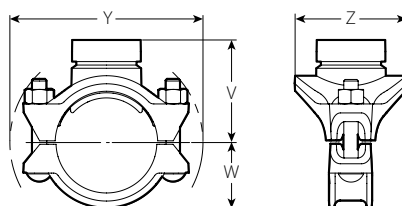
Grooved Outlet

Size			Dimensions								Bolt/Nut		Weight
Nominal Outside Diameter inches DN			Actual Outside Diameter inches mm		Minimum Hole Diameter inches mm	Maximum Hole Diameter inches mm	V Grooved ³ inches mm	W inches mm	Y inches mm	Z inches mm	Qty	Size inches mm	Approx. (Each) Grooved lb kg
3 DN80	x	2 DN50	3.500 88.9	2.375 60.3	2.50 64	2.63 67	3.50 89	2.25 57	6.75 171	3.88 98	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	4.3 2.0
		4 DN100	4.500 114.3	2.375 60.3	2.50 64	2.63 67	4.00 102	2.75 70	8.13 206	3.88 98	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	6.0 2.7
6 DN150	x	3 DN80	6.625 168.3	3.500 88.9	3.50 89	3.63 92	4.13 105	2.75 70	8.13 206	5.13 130	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	7.1 3.2
		2 DN50		2.375 60.3	2.50 64	2.63 67	5.13 130	3.75 95	10.63 270	3.88 98	2	⅝ – 11 × 5 M16 × 2 × 127	8.1 3.7
		3 DN80		3.500 88.9	3.50 89	3.63 92	5.13 130	3.75 95	10.63 270	5.38 137	2	⅝ – 11 × 5 M16 × 2 × 127	9.3 4.2
		4 DN100		4.500 114.3	4.50 114	4.63 117	5.38 137	3.75 95	10.63 270	6.25 159	2	⅝ – 11 × 5 M16 × 2 × 127	10.8 4.9
8 DN200	x	2 DN50	8.625 219.1	2.375 60.3	2.75 70	2.88 73	6.25 159	4.88 124	12.88 327	4.50 114	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	10.7 4.8
		3 DN80	3.500 88.9	3.50 89	3.63 92	6.25 159	4.88 124	12.88 327	5.25 133	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	11.2 5.1	
		4 DN100	4.500 114.3	4.50 114	4.63 117	6.38 162	4.88 124	12.88 327	6.25 159	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	12.3 5.6	

³ Center of run to end of fitting

4.1 DIMENSIONS

Style E422 StrengThin™ 100 Outlet



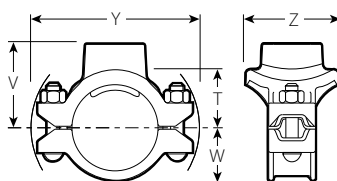
Grooved Outlet

Size				Dimensions						Bolt/Nut		Weight	
Nominal Outside Diameter inches DN		Actual Outside Diameter inches mm		Minimum Hole Diameter inches mm	Maximum Hole Diameter inches mm	V Grooved ³ inches mm	W inches mm	Y inches mm	Z inches mm	Qty	Size inches mm	Approx. (Each) Grooved lb kg	
3 DN80	x	2 DN50	3.500 88.9	2.375 60.3	2.50 64	2.63 67	3.50 89	2.25 57	6.75 171	3.88 98	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	4.3 2.0
4 DN100	x	2 DN50	4.500 114.3	2.375 60.3	2.50 64	2.63 67	4.00 102	2.75 70	8.13 206	3.88 98	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	6.0 2.7
		3 DN80		3.500 88.9	3.50 89	3.63 92	4.13 105	2.75 70	8.13 206	5.13 130	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	7.1 3.2
6 DN150	x	2 DN50	6.625 168.3	2.375 60.3	2.50 64	2.63 67	5.13 130	3.75 95	10.63 270	3.88 98	2	⅝ – 11 × 5 M16 × 2 × 127	8.1 3.7
		3 DN80		3.500 88.9	3.50 89	3.63 92	5.13 130	3.75 95	10.63 270	5.38 137	2	⅝ – 11 × 5 M16 × 2 × 127	9.3 4.2
		4 DN100		4.500 114.3	4.50 114	4.63 117	5.38 137	3.75 95	10.63 270	6.25 159	2	⅝ – 11 × 5 M16 × 2 × 127	10.8 4.9
8 DN200	x	2 DN50	8.625 219.1	2.375 60.3	2.75 70	2.88 73	6.25 159	4.88 124	12.88 327	4.50 114	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	10.7 4.8
		3 DN80		3.500 88.9	3.50 89	3.63 92	6.25 159	4.88 124	12.88 327	5.25 133	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	11.2 5.1
		4 DN100		4.500 114.3	4.50 114	4.63 117	6.38 162	4.88 124	12.88 327	6.25 159	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	12.4 5.6

³ Center of run to end of fitting

4.2 DIMENSIONS

Style 422 Threaded



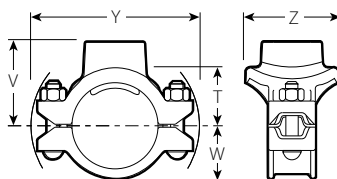
Threaded Outlet

Size				Dimensions							Bolt/Nut		Weight	
Nominal Outside Diameter inches DN		Actual Outside Diameter inches mm		Minimum Hole Diameter inches mm	Maximum Hole Diameter inches mm	T ⁴ inches mm	V Threads ³ inches mm	W inches mm	Y inches mm	Z inches mm	Qty	Size inches mm	Approx. (Each) Thread lb kg	
2 DN50	x ¾ DN20	2.375 60.3	1.050 26.9	1.50 38	1.63 41	2.00 51	2.50 64	1.63 41	5.63 143	2.75 70	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	3.0 1.4	
				1.50 38	1.63 41	1.88 48	2.50 64	1.63 41	5.63 143	2.75 70	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	2.9 1.3	
	2 ½ DN20	x ¾ DN20	2.875 73.0	1.050 26.9	1.50 38	1.63 41	2.13 54	2.75 70	1.88 48	5.88 149	2.75 70	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	3.2 1.5
1.50 38					1.63 41	2.13 54	2.75 70	1.88 48	5.88 149	2.75 70	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	2.9 1.3	
1.75 44					1.88 48	2.25 57	3.00 76	1.88 48	6.13 156	3.00 76	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	4.0 1.8	
2.00 51					2.13 54	2.25 57	3.00 76	1.88 48	6.13 156	3.00 76	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	4.0 1.8	
1.900 48.3					2.00 51	2.13 54	2.25 57	1.88 48	6.13 156	3.00 76	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	4.0 1.8	
DN65	x ¾ DN20	76.1	1.050 26.9	1.50 38	1.63 41	2.25 57	2.88 73	1.88 48	5.88 149	2.75 70	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	3.2 1.4	
				1.50 38	1.63 41	2.25 57	2.88 73	1.88 48	5.88 149	2.75 70	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	3.1 1.4	
				1.50 38	1.63 41	2.25 57	2.88 73	1.88 48	5.88 149	2.75 70	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	3.1 1.4	
3 DN80	x ¾ DN20	3.500 88.9	1.050 26.9	1.50 38	1.63 41	3.00 76	3.50 89	2.75 70	6.38 162	2.75 70	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	3.6 1.6	
				1.50 38	1.63 41	2.88 73	3.50 89	2.75 70	6.38 162	2.75 70	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	3.5 1.6	
				2.00 51	2.13 54	2.75 70	3.50 89	2.75 70	6.38 162	3.88 98	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	4.8 2.2	
				2.375 60.3	2.50 64	2.63 67	2.75 70	3.50 89	2.75 70	6.75 171	3.88 98	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	5.0 2.3
				2.375 60.3	2.50 64	2.63 67	2.75 70	3.50 89	2.75 70	6.75 171	3.88 98	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	5.0 2.3
4 DN100	x ¾ DN20	4.500 114.3	1.050 26.9	1.50 38	1.63 41	3.00 76	3.50 89	2.75 70	8.13 206	2.75 70	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	5.3 2.4	
				1.50 38	1.63 41	2.88 73	3.50 89	2.75 70	8.13 206	2.75 70	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	5.3 2.4	
				2.00 51	2.13 54	3.25 83	4.00 102	2.75 70	8.13 206	3.25 83	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	5.6 2.5	
				2.375 60.3	2.50 64	2.63 67	3.25 83	4.00 102	2.75 70	8.13 206	3.88 98	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	6.6 3.0
				2.375 60.3	2.50 64	2.63 67	3.25 83	4.00 102	2.75 70	8.13 206	3.88 98	2	½ – 13 × 3 ¼ M12 × 1.75 × 82.6	6.6 3.0
DN125	x ¾ DN20	139.7	1.050 26.9	1.50 38	1.63 41	4.00 102	4.50 114	3.25 83	8.63 219	3.25 83	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	5.4 2.4	
				1.50 38	1.63 41	3.88 98	4.50 114	3.25 83	8.63 219	3.25 83	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	5.3 2.4	
				1.50 38	1.63 41	3.88 98	4.50 114	3.25 83	8.63 219	3.25 83	2	½ – 13 × 2 ¾ M12 × 1.75 × 69.9	5.3 2.4	
6 DN150	x ¾ DN20	6.625 168.3	1.050 26.9	2.00 51	2.13 54	4.50 114	5.13 130	3.75 95	10.63 270	3.25 83	2	⅝ – 11 × 5 M16 × 2 × 127	9.4 4.3	
				2.00 51	2.13 54	4.50 114	5.13 130	3.75 95	10.63 270	3.25 83	2	⅝ – 11 × 5 M16 × 2 × 127	9.2 4.2	
				2.00 51	2.13 54	4.38 111	5.13 130	3.75 95	10.63 270	3.25 83	2	⅝ – 11 × 5 M16 × 2 × 127	8.6 3.9	
				2.375 60.3	2.50 64	2.63 67	4.38 111	5.13 130	3.75 95	10.63 270	3.88 98	2	⅝ – 11 × 5 M16 × 2 × 127	9.2 4.2
				2.375 60.3	2.50 64	2.63 67	4.38 111	5.13 130	3.75 95	10.63 270	3.88 98	2	⅝ – 11 × 5 M16 × 2 × 127	9.2 4.2

³ Center of run to end of fitting⁴ Center of run to engaged pipe end, female threaded outlet only (dimensions approximate)

4.2 DIMENSIONS (CONTINUED)

Style 422 Threaded



Threaded Outlet

Size			Dimensions							Bolt/Nut		Weight	
Nominal Outside Diameter inches DN	Actual Outside Diameter inches mm		Minimum Hole Diameter inches mm	Maximum Hole Diameter inches mm	T ⁴ inches mm	V Threads ³ inches mm	W inches mm	Y inches mm	Z inches mm	Qty	Size inches mm	Approx. (Each) Thread lb kg	
8 DN200	x 219.1	¾ DN20	1.050 26.9	2.75 70	2.88 73	5.63 143	6.25 159	4.88 124	12.88 327	4.50 114	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	13.4 6.1
		1 DN25	1.315 33.7	2.75 70	2.88 73	5.50 140	6.25 159	4.88 124	12.88 327	4.50 114	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	13.3 6.0
		1 ½ DN40	1.900 48.3	2.75 70	2.88 73	5.50 140	6.25 159	4.88 124	12.88 327	4.50 114	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	12.7 5.7
		2 DN50	2.375 60.3	2.75 70	2.88 73	5.50 140	6.25 159	4.88 124	12.88 327	4.50 114	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	11.8 5.4
		10 DN250	x 273.0	¾ DN20	1.050 26.9	2.75 70	2.88 73	6.75 171	7.25 184	6.00 152	14.88 378	4.50 114	2
10 DN250	x 273.0	1 DN25	1.315 33.7	2.75 70	2.88 73	6.63 168	7.25 184	6.00 152	14.88 378	4.50 114	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	16.9 7.7
		1 ½ DN40	1.900 48.3	2.75 70	2.88 73	6.50 165	7.25 184	6.00 152	14.88 378	4.50 114	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	16.3 7.4
		2 DN50	2.375 60.3	2.75 70	2.88 73	6.50 165	7.25 184	6.00 152	14.88 378	4.50 114	2	¾ – 10 × 4 ¼ M20 × 2.5 × 108	15.5 7.0

³ Center of run to end of fitting

⁴ Center of run to engaged pipe end, female threaded outlet only (dimensions approximate)

5.0 PERFORMANCE

Flow Data

Flow test data has shown that the total head loss between points ① and ② for the Style 422 and E422 fittings can best be expressed in terms of the pressure difference across the inlet and branch. The pressure difference can be obtained from the relationship below.

C_v/K_v values for flow of water at +60°F/+16°C are shown in the table.

Formulas for C_v values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

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

Where:

Q = Flow (GPM)

ΔP = Pressure Drop (psi)

C_v = Flow Coefficient

Formulas for K_v values:

$$\Delta P = \frac{Q^2}{K_v^2}$$

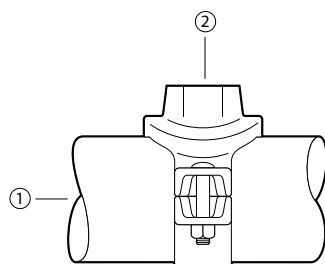
$$Q = K_v \times \sqrt{\Delta P}$$

Where:

Q = Flow (m³/hr)

ΔP = Pressure Drop (Bar)

K_v = Flow Coefficient



Exaggerated for clarity

Outlet Size		Flow Data – Frictional Resistance		Flow Characteristics	
Nominal	Actual Outside Diameter	Equivalent Length of Outlet Size Schedule 40S Stainless Steel Pipe ⁵		C_v/K_v Values	
inches DN	inches mm	Grooved ⁶ feet m	Threaded ⁷ feet m	Grooved ⁶	Threaded ⁷
¾	1.050	–	4	–	16
DN20	26.9	–	1.2	–	14
1	1.315	–	5	–	19
DN25	33.7	–	1.5	–	16
1 ¼	1.660	–	3	–	42
DN32	48.3	–	0.9	–	36
1 ½	1.900	–	6	–	48
DN40	48.3	–	1.8	–	42
2	2.375	2.0	3.0	101	48
DN50	60.3	0.6	0.9	87	42
3	3.500	6	5	189	198
DN80	88.9	1.8	1.5	163	171
4	4.500	10	7	343	391
DN100	114.3	3.0	2.1	297	338

⁵ Hazen-Williams coefficient of friction is C = 140.

⁶ The frictional resistance and C_v/K_v values shown apply to grooved outlets with OGS and ST-100 groove profiles.

⁷ The frictional resistance and C_v/K_v values posted apply to the threaded outlets with NPT, BSPP and BSPT threads.

6.0 NOTIFICATIONS

⚠️ WARNING



- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Confirm that any equipment, branch lines, or sections of piping that may have been isolated for/during testing or due to valve closures/positioning are identified, depressurized, and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Wear safety glasses, hardhat, foot protection, and hearing protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.

7.0 REFERENCE MATERIALS

- [02.06: Victaulic Potable Water Approvals ANSI/NSF](#)
- [05.01: Seal Selection Guide](#)
- [17.01: Stainless Steel Pipe Preparation Guide](#)
- [17.09: Victaulic Grooved Couplings Performance Data for Stainless Steel Pipe](#)
- [29.01: Victaulic Terms and Conditions of Sale](#)
- [I-100: Field Installation Handbook](#)

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for determining the suitability of Victaulic products for their end-use application, in accordance with industry standards, project specifications, and Victaulic’s published performance, maintenance, and safety data, as well as all warnings and installation 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, warranty, installation instructions, or this disclaimer.

Installation

Always refer to and follow the [Victaulic Installation Handbook](#) or installation instructions for 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 [victaulic.com](#).

Warranty

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

Intellectual Property Rights

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Note

All products bearing a Victaulic trademark are manufactured by Victaulic or to Victaulic specifications. All products are to be installed only in accordance with the applicable Victaulic installation instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.