

# Mechanical-T<sup>®</sup> Bolted Branch Outlet

## Style 422



17.02



### 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 or ISO 4427-2 (SDR 7 – 26)

#### Maximum Working Pressure

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

#### NOTE

- 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 submittal [publication 05.01](#)

#### Function

- Provides a direct branch connection at any location a hole can be cut in a pipe.

#### Available Branch End Configurations

- Victaulic<sup>®</sup> Original Groove System (OGS)
- Victaulic<sup>®</sup> StrengThin™ 100 Groove system (ST-100)
- Female National Pipe Thread (FNPT)
- Female British Standard Pipe Parallel Thread (BSPP)
- Female British Standard Pipe Taper Thread (BSPT)

#### Application

- This product provides a reduced size outlet in place of a reducing tee.

#### NOTES

- Not compatible for use on PVC plastic pipe.
- Must be installed so that the main and branch connections are 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 CERTIFICATION/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 pipe up to an 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 choice<sup>1</sup>)**

### NOTE

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

#### **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.

- <sup>1</sup> 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 Gasket Selection Guide for specific gasket service guideline and for a listing of services which are not compatible.

**Bolts/Nuts: (specify choice<sup>2</sup>)**

Standard: Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (M10-M16) Class 8.8 (M20 and greater). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial - heavy hex nuts) and ASTM A563M Class 9 (metric - hex nuts). Track bolts and hex nuts are zinc electroplated per ASTM B633 FE/ZN5, finish Type III (imperial) or Type II (metric).

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.

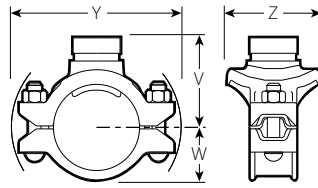
- <sup>2</sup> Optional bolts/nuts are available in imperial size only.

### 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)



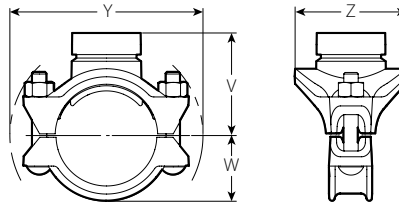
Grooved Outlet

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 <sup>3</sup> 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	2.375	2.50	2.63	3.50	2.25	6.75	3.88	2	1/2 - 13 x 3 1/4 M12 x 1.75 x 82.6	4.3			
		88.9	60.3	64	67	89	57	171	98			2.0			
4 DN100	x 2 DN50	4.500	2.375	2.50	2.63	4.00	2.75	8.13	3.88	2	1/2 - 13 x 3 1/4 M12 x 1.75 x 82.6	6.0			
		114.3	60.3	64	67	102	70	206	98			2.7			
		3 DN80	3.500	3.50	3.63	4.13	2.75	8.13	5.13			2	1/2 - 13 x 3 1/4 M12 x 1.75 x 82.6	7.1	
88.9	89		92	105	70	206	130	2	3.2						
6 DN150	x 2 DN50	6.625	2.375	2.50	2.63	5.13	3.75	10.63	3.88	2	5/8 - 11 x 5 M16 x 2 x 127	8.1			
		168.3	60.3	64	67	130	95	270	98			3.7			
			3 DN80	3.500	3.50	3.63	5.13	3.75	10.63			5.38	2	5/8 - 11 x 5 M16 x 2 x 127	9.3
			88.9	89	92	130	95	270	137			2	4.2		
4 DN100	x 2 DN50	4.500	2.375	2.75	2.88	6.25	4.88	12.88	4.50	2	3/4 - 10 x 4 1/4 M20 x 2.5 x 108	10.7			
		114.3	60.3	70	73	159	124	327	114			4.8			
			3 DN80	3.500	3.50	3.63	6.25	4.88	12.88			5.25	2	3/4 - 10 x 4 1/4 M20 x 2.5 x 108	11.2
8 DN200	x 2 DN50	8.625	2.375	2.75	2.88	6.25	4.88	12.88	4.50	2	3/4 - 10 x 4 1/4 M20 x 2.5 x 108	12.3			
		219.1	60.3	70	73	159	124	327	114			4.8			
			4 DN100	4.500	4.50	4.63	6.38	4.88	12.88			6.25	2	3/4 - 10 x 4 1/4 M20 x 2.5 x 108	5.6
		114.3	114	117	162	124	327	159							

<sup>3</sup> Center of run to end of fitting.

## 4.1 DIMENSIONS

### Style 422 Strengthen 100 Outlet

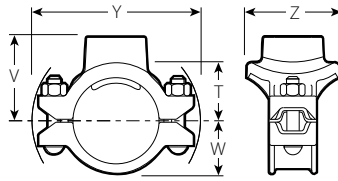


Size		Dimensions								Bolt/Nut		Weight
Nominal Outside Diameter inches DN	Actual Outside Diameter inches mm	Minimum Hole Diameter inches mm	Maximum Hole Diameter inches mm	V Grooved <sup>3</sup> inches mm	W inches mm	Y inches mm	Z inches mm	Qty	Size inches mm	Approx. (Each) Grooved lb kg		
3 DN80	x 2 DN50	3.500	2.375	2.50	2.63	3.50	2.25	6.75	3.88	2	1/2 - 13 x 3 1/4 M12 x 1.75 x 82.6	4.3
		88.9	60.3	64	67	89	57	171	98			2.0
4 DN100	x 2 DN50	4.500	2.375	2.50	2.63	4.00	2.75	8.13	3.88	2	1/2 - 13 x 3 1/4 M12 x 1.75 x 82.6	6.0
		114.3	60.3	64	67	102	70	206	98			2.7
		3 DN80	3.500	3.500	3.50	3.63	4.13	2.75	8.13	5.13	2	1/2 - 13 x 3 1/4 M12 x 1.75 x 82.6
6 DN150	x 2 DN50	6.625	2.375	2.50	2.63	5.13	3.75	10.63	3.88	2	5/8 - 11 x 5 M16 x 2 x 127	8.1
		168.3	60.3	64	67	130	95	270	98			3.7
		3 DN80	3.500	3.500	3.50	3.63	5.13	3.75	10.63	5.38	2	5/8 - 11 x 5 M16 x 2 x 127
	4 DN100	4.500	4.500	4.50	4.63	5.38	3.75	10.63	6.25	2	5/8 - 11 x 5 M16 x 2 x 127	10.8 4.9
8 DN200	x 2 DN50	8.625	2.375	2.75	2.88	6.25	4.88	12.88	4.50	2	3/4 - 10 x 4 1/4 M20 x 2.5 x 108	10.7
		219.1	60.3	70	73	159	124	327	114			4.8
		3 DN80	3.500	3.500	3.50	3.63	6.25	4.88	12.88	5.25	2	3/4 - 10 x 4 1/4 M20 x 2.5 x 108
	4 DN100	4.500	4.500	4.50	4.63	6.38	4.88	12.88	6.25	2	3/4 - 10 x 4 1/4 M20 x 2.5 x 108	12.4 5.6

<sup>3</sup> Center of run to end of fitting.

## 4.2 DIMENSIONS

### Style 422 Threaded NPT, BSPT or BSPP



Threaded Outlet

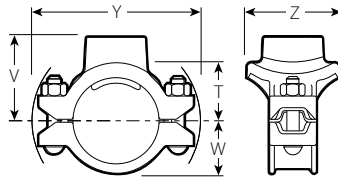
Size		Dimensions									Bolt/Nut		Weight	
Nominal Outside Diameter inches DN	Actual Outside Diameter inches mm	Minimum Hole Diameter inches mm	Maximum Hole Diameter inches mm	T <sup>4</sup> inches mm	V Thread <sup>5</sup> inches mm	W inches mm	Y inches mm	Z inches mm	Qty	Size inches mm	Approx. (Each) Thread lb kg			
2 DN50	x DN20	2.375 60.3	x 1.050 26.9	1.50	1.63	2.00	2.50	1.63	5.63	2.75	2	1/2 - 13 x 2 3/4	3.0	
				38	41	51	64	41	143	70		M12 x 1.75 x 69.9	1.4	
				1.315	1.50	1.63	1.88	2.50	1.63	5.63	2.75	2	1/2 - 13 x 2 3/4	2.9
	DN25			38	41	48	64	41	143	70		M12 x 1.75 x 69.9	1.3	
2 1/2	x DN20	2.875 73.0	x 1.050 26.9	1.50	1.63	2.13	2.75	1.88	5.88	2.75	2	1/2 - 13 x 2 3/4	3.2	
				38	41	54	70	48	149	70		M12 x 1.75 x 69.9	1.5	
				1.315	1.50	1.63	2.13	2.75	1.88	5.88	2.75	2	1/2 - 13 x 2 3/4	2.9
	DN25			38	41	54	70	48	149	70		M12 x 1.75 x 69.9	1.3	
DN65	x DN20	76.1	x 1.050 26.9	1.50	1.63	2.25	2.88	1.88	5.88	2.75	2	1/2 - 13 x 2 3/4	3.2	
				38	41	57	73	48	149	70		M12 x 1.75 x 69.9	1.4	
				1.315	1.50	1.63	2.25	2.88	1.88	5.88	2.75	2	1/2 - 13 x 2 3/4	3.1
	DN25			38	41	57	73	48	149	70		M12 x 1.75 x 69.9	1.4	
3 DN80	x DN20	3.500 88.9	x 1.050 26.9	1.50	1.63	3.00	3.50	2.75	6.38	2.75	2	1/2 - 13 x 2 3/4	3.6	
				38	41	76	89	70	162	70		M12 x 1.75 x 69.9	1.6	
				1.315	1.50	1.63	2.88	3.50	2.75	6.38	2.75	2	1/2 - 13 x 2 3/4	3.5
				33.7	38	41	73	89	70	162	70	2	M12 x 1.75 x 69.9	1.6
				1.900	2.00	2.13	2.75	3.50	2.75	6.38	3.88	2	1/2 - 13 x 2 3/4	4.8
	DN40			48.3	51	54	70	89	70	162	98		M12 x 1.75 x 69.9	2.2
4 DN100	x DN20	4.500 114.3	x 1.050 26.9	1.50	1.63	3.00	3.50	2.75	8.13	2.75	2	1/2 - 13 x 3/4	5.3	
				38	41	76	89	70	206	70		M12 x 1.75 x 82.6	2.4	
				1.315	1.50	1.63	2.88	3.50	2.75	8.13	2.75	2	1/2 - 13 x 3/4	5.3
				33.7	38	41	73	89	70	206	70	2	M12 x 1.75 x 82.6	2.4
				1.900	2.00	2.13	3.25	4.00	2.75	8.13	3.25	2	1/2 - 13 x 3/4	5.6
	DN40			48.3	51	54	83	102	70	206	83		M12 x 1.75 x 82.6	2.5
6 DN150	x DN20	6.625 168.3	x 1.050 26.9	2.00	2.13	4.50	5.13	3.75	10.63	3.25	2	5/8 - 11 x 5	9.4	
				51	54	114	130	95	270	83		M16 x 2 x 127	4.3	
				1.315	2.00	2.13	4.50	5.13	3.75	10.63	3.25	2	5/8 - 11 x 5	9.2
				33.7	51	54	114	130	95	270	83	2	M16 x 2 x 127	4.2
				1.900	2.00	2.13	4.38	5.13	3.75	10.63	3.25	2	5/8 - 11 x 5	8.6
	DN40			48.3	51	54	111	130	95	270	83		M16 x 2 x 127	3.9
2 DN50	x DN20	2.375 60.3	x 1.050 26.9	2.50	2.63	2.75	3.50	2.75	6.75	3.88	2	1/2 - 13 x 3/4	5.0	
				64	67	70	89	70	171	98		M12 x 1.75 x 82.6	2.3	
				2.375	2.50	2.63	2.75	3.50	2.75	6.75	3.88	2	1/2 - 13 x 3/4	5.0
	DN50			60.3	64	67	70	89	70	171	98		M12 x 1.75 x 82.6	2.3

<sup>4</sup> Center of run to end of fitting.

<sup>5</sup> Center of run to engaged pipe end, female threaded outlet only (dimensions approximate).

4.2 DIMENSIONS (CONTINUED)

Style 422 Threaded NPT, BSPT or BSPP



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 <sup>4</sup> inches mm	V Thread <sup>5</sup> inches mm	W inches mm	Y inches mm	Z inches mm	Qty	Size inches mm	Approx. (Each) Thread lb kg		
8 DN200	¾ DN20	8.625 219.1	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 x 4 ¼ M20 x 2.5 x 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 x 4 ¼ M20 x 2.5 x 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 x 4 ¼ M20 x 2.5 x 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 x 4 ¼ M20 x 2.5 x 108	11.8 5.4
	10 DN250	10.750 273.0	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	¾ - 10 x 4 ¼ M20 x 2.5 x 108	17.1 7.7
	1		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 x 4 ¼ M20 x 2.5 x 108	16.9 7.7
	1 ½		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 x 4 ¼ M20 x 2.5 x 108	16.3 7.4
	2		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 x 4 ¼ M20 x 2.5 x 108	15.5 7.0

<sup>4</sup> Center of run to end of fitting.

<sup>5</sup> 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 point (1) and (2) for the Style 422 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<sub>v</sub>/K<sub>v</sub> values for flow of water at +60°F/+16°C are shown in the table.

Formulas for C<sub>v</sub>/K<sub>v</sub> Values:

Formulas for C<sub>v</sub> 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<sub>v</sub> = Flow Coefficient

Formulas for K<sub>v</sub> values:

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

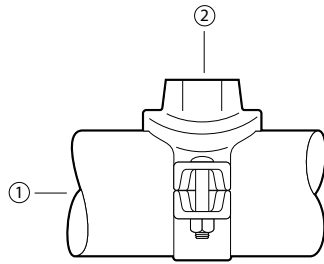
$$Q = K_v \times \sqrt{\Delta P}$$

**Where:**

Q = Flow (m<sup>3</sup>/hr)

ΔP = Pressure Drop (Bar)

K<sub>v</sub> = Flow Coefficient



Exaggerated for clarity

Outlet Size		Flow Data – Frictional Resistance		Flow Characteristics	
Nominal inches DN	Actual Outside Diameter inches mm	Equivalent Length of Outlet Size Schedule 40 Stainless Steel Pipe (C = 140) FT <sup>6</sup>		C <sub>v</sub> /K <sub>v</sub> Values	
		Grooved <sup>7</sup> feet	Threaded <sup>8</sup> feet	Grooved <sup>7</sup>	Threaded <sup>8</sup>
¾ DN20	1.050 26.9	–	4 1.2192	–	16 14
1 DN25	1.315 33.7	–	8 2.4384	–	21 18
1½ DN40	1.900 48.3	–	11 3.3528	–	53 46
2 DN50	2.375 60.3	9 2.7432	10.5 3.2004	112 97	104 90
3 DN80	3.500 88.9	14 4.2672	15.5 4.7244	249 215	237 205
4 DN100	4.500 114.3	20 6.096	22 6.7056	421 364	401 347







<sup>6</sup> Hazen-Williams coefficient of friction is C = 140.

<sup>7</sup> The frictional resistance and C<sub>v</sub>/K<sub>v</sub> values shown apply to grooved outlets with OGS and ST-100 groove profiles.

<sup>8</sup> The frictional resistance and C<sub>v</sub>/K<sub>v</sub> 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, remove, adjust, or maintain any Victaulic piping products.
- Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Wear safety glasses, hardhat, and foot 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: Gasket Selection Guide](#)
- [17.01: Stainless Steel Pipe Preparation Guide](#)
- [17.09: Victaulic Grooved Couplings Performance Data for Stainless Steel Pipe](#)
- [26.01: Victaulic Design Data](#)
- [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 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](http://www.victaulic.com).

### Warranty

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

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