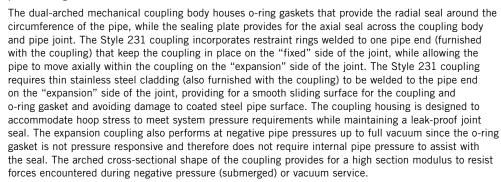
Style 231 Non-Restrained Flexible Expansion Coupling

Victaulic Bolted Split-Sleeve Products (VBSP) Style 231 carbon steel expansion couplings (formerly Depend-O-Lok FxE) provide a non-restrained, flexible pipe joint that is designed to accommodate axial pipe movement at the joint. The Style 231 coupling satisfies the requirements set forth by the AWWA C227 Standard for Bolted, Split-Sleeve Restrained and Non-Restrained Couplings for Plain-End Pipe.

This style of coupling is typically used in exposed pipe applications for field joint connections where axial pipe movement due to thermal expansion or contraction of the pipe line is a factor. Although Style 231 expansion couplings provide for a flexible joint and therefore do not prevent angular pipe movement, these couplings are not designed to accommodate static or dynamic angular deflection at the joint. Style 231 couplings should be used to accommodate axial pipe movement only. The Style 231 couplings can allow for up to 4"/100 mm of axial pipe movement at the joint and therefore assist in avoiding the accumulation of thermal stresses due to changes in pipe length. For these couplings to function properly, the pipe movement must be axially directed to the joint through the proper use of pipe supports, anchors and/or guides. External restraints must be installed to ensure the coupling does not exceed published values for expansion capabilities. Typical applications include water and wastewater treatment pipelines, force main and water transmission piping, penstock piping and other applications where changes in pipe temperature result in axial pipe movement that requires the use of an expansion joint to avoid thermal stresses. The coupling provides ease of installation and comes standard with an epoxy coating for protection against corrosion. The use of a heat-shrink sleeve or tape system can be used with minimal effort due to the low profile configuration.



Style 231 couplings are available in standard nominal sizes from 16-144"/400-3600 mm with larger sizes available based on design and application requirements. The Style 231 coupling can accommodate operating pressures up to 300 psi/2065 kPa (with higher pressure available) depending on the actual pipe diameter. For pressures and sizes not shown in the dimension and performance tables contact Victaulic for information on our engineered products.

All flexible mechanical couplings should be properly supported to minimize or eliminate undesirable loads at the joint. Pipe support requirements are defined within the Victaulic Application Guidelines document. Please see publication 26.20.

For proper closure tool selection see column marked Tool Type on pages 6-9.



16 - 144"/400 - 3600mm

JOB/OWNER	CONTRACTOR	ENGINEER
System No.	Submitted By	Spec Sect Para
Location	Date	Approved
		Date

Style 231 Non-Restrained Flexible Expansion Coupling

PRODUCT GUIDE

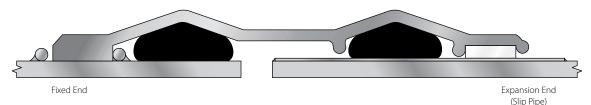
	Product Style Guide									
Submittal Number	Style Number	Coupling/Body Material	Application							
60.01	230	Carbon Steel	Non-Restrained Coupling							
60.02	230S	Stainless Steel	Non-Restrained Coupling							
60.03	231	Carbon Steel	Expansion Coupling							
60.04	2315	Stainless Steel	Expansion Coupling							
60.05	232	Carbon Steel	Restrained Coupling							
60.06	232S	Stainless Steel	Restrained Coupling							
60.07	233	Carbon Steel	Restrained Coupling For Dynamic Joint Deflection							
60.08	233S	Stainless Steel	Restrained Coupling For Dynamic Joint Deflection							
60.09	234	Carbon Steel	Restrained Single-Gasket Coupling							
60.10	234S	Stainless Steel	Restrained Single-Gasket Coupling							

SEGMENTED COUPLINGS

The Style 231 dimension tables list the minimum number of coupling housing segments for a particular pipe size. For special applications, expansion couplings are available in two (or more) segments to allow for installation of the coupling over an existing pipe joint or to facilitate ease of handling for larger size couplings. The o-ring gaskets (except Silicone) can be furnished "split" to allow for field bonding when an existing pipe joint configuration does not allow for installation of a complete o-ring onto the pipe end.

BODY TYPE Cross-Section

NOTE: Body type is not optional and will be determined by system requirements.



Type 2 coupling is a shouldered coupling. This is a heavy duty coupling to accommodate higher pressures for certain pipe diameters. The steel shoulder welded to the edge of one side of the coupling body provides additional cross-sectional stiffness and provides the mechanism for holding the coupling in place between the restraint rings attached to the pipe on the fixed side of the joint. The Teflon® shoulder provides a smooth surface at the area of contact between the coupling housing and pipe cladding to allow for unimpeded pipe movement.

Style 231 Non-Restrained Flexible Expansion Coupling

COUPLING COMPONENTS

1. Body - Dual arch cross-section.

2. Shoulders

Fixed Side – Rectangular steel bar located at coupling body edge provides additional stiffness, allows for larger o-ring gasket and provides vertical bearing surface for restraint ring.

Expansion Side – Utilizes Teflon® material to provide for a smooth sliding surface in order to accommodate larger expansion values afforded by the Style 231 Type 2 coupling.

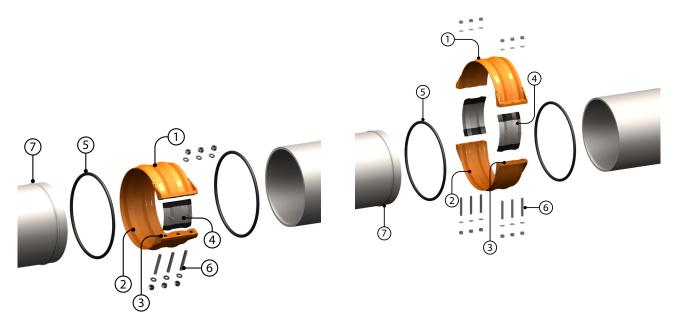
- **3. Closure Plates** Low profile bolt pads for installation and tightening of coupling; gap between plates of installed coupling allows for field flexibility.
- 4. Sealing Plate Provides axial seal across the coupling body and pipe joint.
- **5. O-ring Gaskets** Provide circumferential seal.
- 6. Fasteners

Studs - High Strength Threaded Rod

Nuts - Heavy Hex Nuts

Washers - SAE small pattern flat washers

7. Restraint Rings – Used to maintain coupling position on the "fixed" end of the pipe.



ONE SEGMENT HOUSING

TWO SEGMENT HOUSING

Style 231 Non-Restrained Flexible Expansion Coupling

MATERIAL SPECIFICATIONS

Body

Carbon Steel conforming to ASTM A36

Shoulders

Carbon steel conforming to ASTM A36 (Fixed Side)

Teflon® - PTFE commercial grade (Expansion Side)

Closure Plates

Carbon Steel conforming to ASTM A36

Sealing Plate

Stainless Steel conforming to ASTM A240 316L

O-ring Gaskets

Standard (Specify choice on order):

• **EPDM** -30°F to +230°F/-34°C to +110°C

Cold and hot water within allowable temperature range; dilute acids; excellent resistance to the deteriorative effects of ozone, oxygen, heat and most chemicals not involving hydrocarbons. NOT RECOMMENDED FOR PETROLEUM SERVICES.

• **Silicone** -30°F to +350°F/-34°C to +177°C

Dry, hot air applications; excellent resistance to many chemicals. NOT RECOMMENDED FOR HOT WATER OR STEAM APPLICATIONS.

• **Isoprene** -40°F to +160°F/-40°C to +71°C

Water; salt water; sewage; good resistance to oxygen and dilute acids

Services listed are general service recommendations only. Refer to a chemical elastomer guide for specific applications and suitability of gasket material for services that are not listed.

Optional gasket (specify choice on order):

• Nitrile -20°F to +180°F/-28°C to +82°C

Water; petroleum products, vegetable and mineral oils; air with oil vapors within allowable temperature range; good resistance to hydrocarbons; acids and bases.

Fluouroelastomer +20°F to +300°F/-7°C to +149°C
 Outstanding resistance to heat and most chemicals.

• **Neoprene** -30°F to +180°F/-34°C to +82°C

Water and wastewater; good resistance to ozone, effects of UV and some oils.

Restraint Rings

Carbon Steel conforming to ASTM A108 Grade 1018 C.S.

Fasteners

Studs - Carbon Steel conforming to ASTM A193 Grade B7 zinc plated.

Optional: Stainless Steel conforming to ASTM A193 Grade B8M 316 Class 2

Nuts - Heavy hex nuts

Carbon Steel conforming to ASTM A194 Grade 2H zinc plated

Optional: Stainless Steel conforming to ASTM A194 Grade 8M 316

Washers - Carbon Steel SAE small pattern flat washers conforming to ASTM F436 SAE pattern zinc plated Optional: Stainless Steel Type 316 SAE pattern.

Cladding

Stainless Steel conforming to ASTM A240 316L



Style 231 Non-Restrained Flexible Expansion Coupling

LININGS AND COATINGS

Standard (specify choice on order):

• Liquid Epoxy:

Liquid epoxy is applied per AWWA C210, 16 mils minimum DFT and is NSF approved. Epoxy can be applied as a primer for field applied top coat where UV protection due to sunlight exposure is required.

• Fusion Bonded Epoxy:

Fusion bonded epoxy is applied with an electrostatic spray system using a long cure epoxy powder that offers excellent chemical resistance and corrosion protection. Fusion bonded epoxy is applied per AWWA C213, 12 mils minimum DFT and is NSF61 approved.

Optional (specify choice on order):

• Phenolic Alkyd Primer:

Phenolic Alkyd primer is a lead-free and chromate-free, fast-drying, corrosion-resistant primer that accepts a variety of high-performance topcoats, but is not recommended for immersion service by itself. This primer system is typically applied at 2 to 3 mils DFT.

• Other Coating Systems (Available Upon Request):

A water based enamel coating is available. This paint offers an aesthetic coating for minimal protection, short-term installations or where corrosion protection is not a consideration. Fusion bonded nylon for chemical and abrasion resistance, as well as other coatings such as organic zinc primers and hot dipped galvanizing may also be available.

PIPE END DIMENSIONAL TOLERANCE AND OVALITY

For specific pipe diameter tolerances, pipe ovality (roundness) requirements and minimum/maximum pipe diameter allowance, refer to the tables included in the Installation Manuals, Publications (below) and 26.20 Application Guidelines.

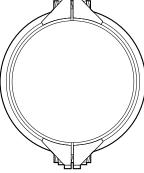
I-231.T2S1/CLAD - Styles 231/231S Expansion Coupling (Type 2, One-Segment with Cladding on Expansion Side of Pipe)

I-231.T2S2/CLAD - Styles 231/231S Expansion Coupling (Type 2, Two-Segments with Cladding on Expansion Side of Pipe)



Style 231 Non-Restrained Flexible **Expansion Coupling**

DIMENSIONS Coupling Dimensions (1) (3) (5) (2) (4) (6) 0 0 14.38 3/16 2 В,С 365.3 44.0 200 117.0 16.38 1 5 - 34 x 6 3/16 2 B,C 416.1 53.1 18.38 128.0 3/16 1 5 - ¾ x 6 2 B.C 15.00 - 16.88 381.0 - 428.8 16 400 4669 581 14.38 110.0 1/4 1 4 - 3/4 x 6 2 C 365.3 300 2065 16 38 132.0 1/4 1 5 - 3/4 x 6 2 C 416.1 59.9 18.38 145.0 1/4 1 5 - ¾ x 6 2 C 466.9 65.8 14 38 106.0 3/16 1 $4 - \frac{3}{4} \times 6$ 2 B,C 365.3 48.1 16.38 127.0 3/16 1 5 - ¾ x 6 2 B.C 416.1 57.6 18.38 138.0 1 5 - 34 x 6 3/16 2 B,C 466.9 17.00 - 18.88 431.8 - 479.6 450 14 38 120.0 1/4 1 4 - 3/4 x 6 2 C365.3 54.4 300 2065 16.38 143.0 1/4 1 5 - 34 x 6 2 C 416.1 64.9 18 38 1570 1-SEGMENT 1/4 1 5 - 3/4 x 6 2 C 466.9 71.2 14.38 115.0 3/16 4 - ¾ x 6 2 B,C 365.3 52.2 16.38 136.0 1 5 - 3/4 x 6 3/16 2 0 0 B,C 416.1 18.38 150.0 3/16 5 - ¾ x 6 2 B,C 20 500 19.00 - 21.88 482.6 - 555.8 466.9 68.0 14.38 131.0 1 4 - ¾ x 6 1/4 2 C 365.3 300 16 38 155.0 1/4 1 5 - 3/4 x 6 2 C 416.1 70.3 18.38 170.0 1/4 1 5 - ¾ x 6 2 C 466.9 77.1 14.38 155.0 1/4 1 4 - 3/4 x 6 2 C 365.3 70.3 16.38 179.0 5 - ¾ x 6 2 C4161 812 0 0 18.38 196.0 5 - ¾ x 6 1/4 1 2 C 22.00 - 26.88 558.8 - 682.8 466.9 88.9 600 14 38 301.0 3/8 2 8 - 1/8 x 8 2 C 365.3 136.5



2-SEGMENT

466.9 (1) Couplings must be used on pipe with a minimum wall thickness that meets the requirements of AWWA C200 for carbon steel pipe.

16.38

416.1

18 38

2

2

- (2) Actual pipe 0.D. required at time of order. For actual pipe 0.D. round down to the nearest 1/8" to determine proper coupling size required.
- (3) For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
 (4) 1-segment couplings may be available as 2-segment couplings to allow for in-place pipe installations. Contact Victaulic for details.
- (5) Coupling weights are based on nominal pipe diameter and include all accessories. Weight may vary based on actual size of pipe.
- (6) Closure Tool Recommendations:
- B= CTM-02 Large Manual Closure Tool
- C= CTH-01 10-Ton Hydraulic Closure Tool
 *For more details on closure tools refer to page 17.

Note: The data in this table only applies when carbon steel couplings are being used on carbon steel pipe.

3/8

3/8

300 2065

377.0

171.0

411.0

2

C

C

10 - 1/8 x 8

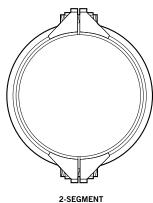
10 - 1/8 x 8

Style 231 Non-Restrained Flexible

Expansion Coupling

DIMENSIONS 0

	1-SE	GMENT	
-		Z ——	
		0	
			0 =
			0
			0
			0



(1)	(2)	(3)	Coupling [Coupling Dimensions			(5)		(6)	
Nominal Pipe Size In./mm	Actual Pipe O.D. Range In./mm	Maximum Working Pressure psi/kPa	Body Thickness In.	Width (Z) In./mm	Min. No. of Coupling Segments	No. of Fasteners - Fastener Dimensions Dia. x Length In. x In.	Approximate Weight Each Lbs/Kg.	Body Type	Tool Type	
			1/4	14.38 365.3	1	4 - ¾ x 6	187.0 84.8	2	С	
		100 690	1/4	16.38 416.1	1	5 - ¾ x 6	214.0 97.1	2	С	
30	27.00 - 32.88		1/4	18.38 466.9	1	5 - ¾ x 6	237.0 107.5	2	С	
750	685.8 - 835.2		3/8	14.38 365.3	2	8 - 1/8 x 8	355.0 161.0	2	С	
		300 2065	3/8	16.38 416.1	2	10 - % x 8	437.0 198.2	2	С	
			3/8	18.38 466.9	2	10 - % x 8	479.0 217.3	2	С	
			1/4	14.38 365.3	1	4 - ¾ x 6	223.0 101.2	2	С	
		75 515	1/4	16.38 416.1	1	5 - ¾ x 6	287.0 130.2	2	С	
36 33.00-	33.00- 38.88		1/4	18.38 466.9	1	5 - ¾ x 6	314.0 142.4	2	С	
900	838.2 - 987.6		3/8	14.38 365.3	2	8 - 1/8 x 8	412.0 186.9	2	С	
		300 2065	3/8	16.38 416.1	2	10 - 1/8 x 8	501.0 227.2	2	С	
			3/8	18.38 466.9	2	10 - 1/8 x 8	551.0 249.9	2	С	
		50 345	1/4	14.38 365.3	1	4 - ¾ x 6	256.0 116.1	2	С	
			1/4	16.38 416.1	1	5 - ¾ x 6	323.0 146.5	2	С	
42	39.00 - 44.88		1/4	18.38 466.9	1	5 - ¾ x 6	353.0 160.0	2	С	
1050	990.6 - 1140.0		3/8	14.38 365.3	2	8 - 1/8 x 8	466.0 211.4	2	С	
		250 1725	3/8	16.38 416.1	2	10 - 1/8 x 8	562.0 254.9	2	С	
			3/8	18.38 466.9	2	10 - 1/8 x 8	618.0 280.3	2	С	
			1/4	14.38 365.3	1	4 - ¾ x 6	288.0 130.6	2	С	
		50 345	1/4	16.38 416.1	1	5 - ¾ x 6	359.0 162.8	2	С	
48	45.00 - 50.88		1/4	18.38 466.9	1	5 - ¾ x 6	393.0 178.3	2	С	
1200	1143 - 1292.4		3/8	14.38 365.3	2	8 - 1/8 x 8	520.0 235.9	2	С	
		250 1725	3/8	16.38 416.1	2	10 - 1/8 x 8	624.0 283.0	2	С	
			3/8	18.38 466.9	2	10 - 1/8 x 8	686.0 311.2	2	С	

- (1) Couplings must be used on pipe with a minimum wall thickness that meets the requirements of AWWA C200 for carbon steel pipe.
 (2) Actual pipe O.D. required at time of order. For actual pipe O.D. round down to the nearest 1/8" to determine proper coupling size required.
- (3) For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
- (4) 1-segment couplings may be available as 2-segment couplings to allow for in-place pipe installations. Contact Victaulic for details.

 (5) Coupling weights are based on nominal pipe diameter and include all accessories. Weight may vary based on actual size of pipe.

 (6) Closure Tool Recommendations:*

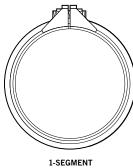
 B = CTM-02 Large Manual Closure Tool

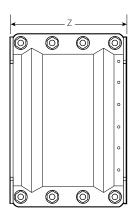
- C= CTH-01 10-Ton Hydraulic Closure Tool *For more details on closure tools refer to page 17.

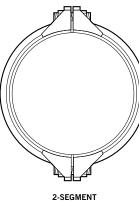
Style 231 Non-Restrained Flexible **Expansion Coupling**

DIMENSIONS









(1)	(2)	(3)	Coupling D	imensions	(4)		(5)	_	(6)
Nominal Pipe Size In./mm	Actual Pipe O.D. Range In./mm	Maximum Working Pressure psi/kPa	Body Thickness In.	Width (Z) In./mm	Min. No. of Coupling Segments	No. of Fasteners - Fastener Dimensions Dia. x Length In. x In.	Approximate Weight Each Lbs/Kg.	Body Type	Tool Type
			3/8	14.38 365.3	2	8 - 1/8 x 8	562.0 254.9	2	С
54 1350	51.00 - 56.88 1295.4 - 1444.8	200 1375	3/8	16.38 416.1	2	10 - 1/8 x 8	671.0 304.4	2	С
			3/8	18.38 466.9	2	10 - % x 8	738.0 334.8	2	С
			3/8	14.38 365.3	2	8 - 1/8 x 8	616.0 279.4	2	С
60 1500	57.00 - 62.88 1447.8 - 1597.2	200 1375	3/8	16.38 416.1	2	10 - % x 8	732.0 332.0	2	С
			3/8	18.38 466.9	2	10 - 1/8 x 8	806.0 365.6	2	С
			3/8	14.38 365.3	2	8 - 1/8 x 8	660.0 299.4	2	С
66 1650	63.00 - 68.88 1600.2 - 1749.6	175 1200	3/8	16.38 416.1	2	10 - % x 8	779.0 353.3	2	С
			3/8	18.38 466.9	2	10 - % x 8	859.0 389.6	2	С
	72 69.00 - 74.88 1800 1752.6 - 1902.0		3/8	14.38 365.3	2	8 - 1/8 x 8	714.0 323.9	2	С
			3/8	16.38 416.1	2	10 - % x 8	840.0 381.0	2	С
			3/8	18.38 466.9	2	10 - % x 8	926.0 420.0	2	С
			3/8	14.38 365.3	2	8 - 7/8 x 8	756.0 342.9	2	С
78 1950	75.00 - 80.88 1905.0 - 2054.4		3/8	16.38 416.1	2	10 - % x 8	888.0 402.8	2	С
			3/8	18.38 466.9	2	10 - % x 8	980.0 444.5	2	С
			3/8	14.38 365.3	2	8 - 1/8 x 8	810.0 367.4	2	С
84 2100	81.00 - 86.88 2057.4 - 2206.8	150 1035	3/8	16.38 416.1	2	10 - % x 8	949.0 430.5	2	С
			3/8	18.38 466.9	2	10 - % x 8	1047.0 474.9	2	С
			3/8	14.38 365.3	2	8 - 7/8 x 8	852.0 386.5	2	С
90 2250	87.00 - 92.88 2209.8 - 2359.2	100 690	3/8	16.38 416.1	2	10 - % x 8	996.0 451.8	2	С
			3/8	18.38 466.9	2	10 - % x 8	1099.0 498.5	2	С
			3/8	14.38 365.3	2	8 - 7/8 x 8	917.0 415.9	2	С
96 2400		100 690	3/8	16.38 416.1	2	10 - 1/8 x 8	1070.0 485.3	2	С
			3/8	18.38 466.9	2	10 - % x 8	1181.0 535.7	2	С
			3/8	14.38 365.3	2	8 - 7/8 x 8	1002.0 454.5	2	С
108 2700	102.00 - 113.88 2590.8 - 2892.6	100 690	3/8	16.38 416.1	2	10 - % x 8	1164.0 528.0	2	С
			3/8	18.38 466.9	2	10 - % x 8	1286.0 583.3	2	С

- (1) Couplings must be used on pipe with a minimum wall thickness that meets the requirements of AWWA C200 for carbon steel pipe.
- (2) Actual pipe O.D. required at time of order. For actual pipe O.D. round down to the nearest % to determine proper coupling size required.
 (3) For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
 (4) 1-segment couplings may be available as 2-segment couplings to allow for in-place pipe installations. Contact Victaulic for details.
- (5) Coupling weights are based on nominal pipe diameter and include all accessories. Weight may vary based on actual size of pipe.
 (6) Closure Tool Recommendations:*

Note: The data in this table only applies when carbon steel couplings are being used on carbon steel pipe.

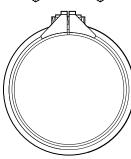
www.victaulic.com



Style 231 Non-Restrained Flexible **Expansion Coupling**

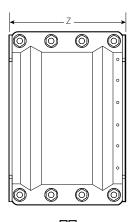
DIMENSIONS

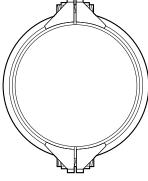




<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>
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1-SEGMENT





2-SEGMENT

(1)	(2)	(3)	Coupling Dimensions		(4)		(5)		(6)
Nominal Pipe Size In./mm	Actual Pipe O.D. Range In./mm	Maximum Working Pressure psi/kPa	Body Thickness In.	Width (Z) In./mm	Min. No. of Coupling Segments	No. of Fasteners - Fastener Dimensions Dia. x Length In. x In.	Approximate Weight Each Lbs/Kg.	Body Type	Tool Type
	120 114.00 - 125.88 3000 2895.6 - 3197.4		3/8	14.38 365.3	2	8 - 1/8 x 8	1098.0 498.0	2	С
			3/8	16.38 416.1	2	10 - 1/8 x 8	1272.0 577.0	2	С
			3/8	18.38 466.9	2	10 - 1/8 x 8	1406.0 637.8	2	С
			3/8	14.38 365.3	2	8 - % x 8	1267.0 574.7	2	С
144 3600	126.00 - 150.00 3200.4 - 3810.0		3/8	16.38 416.1	2	10 - 1/8 x 8	1462.0 663.2	2	С
			3/8	18.38 466.9	2	10 - 1/8 x 8	1616.0 733.0	2	С

- (1) Couplings must be used on pipe with a minimum wall thickness that meets the requirements of AWWA C200 for carbon steel pipe.
 (2) Actual pipe O.D. required at time of order. For actual pipe O.D. round down to the nearest 1/8" to determine proper coupling size required.
- (3) For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
- (4) 1-segment couplings may be available as 2-segment couplings to allow for in-place pipe installations. Contact Victaulic for details. (5) Coupling weights are based on nominal pipe diameter and include all accessories. Weight may vary based on actual size of pipe.

- (6) Closure Tool Recommendations:*

 B= CTM-02 Large Manual Closure Tool
 C= CTH-01 10-Ton Hydraulic Closure Tool

*For more details on closure tools refer to page 17.

Note: The data in this table only applies when carbon steel couplings are being used on carbon steel pipe.



Style 231 Non-Restrained Flexible **Expansion Coupling**

PERFORMANCE

	(1)				(2)	
Maximum Working Pressure psi/kPa Carbon Steel	Maximum Working Pressure psi/kPa Stainless Steel	Maximum Working Pressure psi/kPa Ductile Iron	Body Type	Width (Z) In./mm	Pipe End Separation Min - Max In./mm	Max. Allowable Axial Pipe Movement In./mm
			2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
200 1375	200 1375	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
			2	18.38	0 - 4.00	4.00 101.6
			2	14.38	0 - 2.00	2.00 50.8
300	300 2065	N/R	2	16.38	0 - 3.00	3.00 76.2
2003	2003			18.38	0 - 4.00	4.00
				14.38	0 - 2.00	101.6 2.00
200	200	N/R		16.38	0 - 3.00	50.8 3.00
13/5	13/5			416.1 18.38	0 - 4.00	76.2 4.00
				466.9 14.38	0 - 101.6 0 - 2.00	101.6 2.00
300	300 2065	NI/D		365.3 16.38	0 - 50.8 0 - 3.00	50.8 3.00
2065		N/R		416.1 18.38	0 - 76.2 0 - 4.00	76.2 4.00
			2	466.9	0 - 101.6	101.6
200	200	N/R	2	365.3	0 - 50.8	50.8
1375	1375		2	416.1	0 - 76.2	76.2
			2	466.9	0 - 101.6	4.00 101.6
	300 2065	N/R	2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
300 2065			2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
			2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
			2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
150 1035	150 1035	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
			2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
			2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
300 2065	300 2065	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
			2	18.38 466.9	0 - 4.00	4.00 101.6
			2	14.38	0 - 2.00	2.00 50.8
100 690	100 690	N/R	2	16.38	0 - 3.00	3.00 76.2
333	330		2	18.38	0 - 4.00	4.00 101.6
				14.38	0 - 2.00	2.00
	300		2	16.38	0 - 3.00	50.8 3.00
	2005			18.38	0 - 4.00	76.2 4.00 101.6
	Working Pressure psi/kPa Carbon Steel 200 1375 300 2065 200 1375 300 2065 200 1375 300 2065 150 1035 300 2065	Maximum Working Pressure psi/kPa Carbon Steel Maximum Working Pressure psi/kPa Stainless Steel 200 1375 200 1375 300 2065 2065 200 1375 300 2065 200 2065 2065 200 1375 1375 300 2065 2065 200 1375 1375 300 2065 2065 200 1375 1375 300 2065 2065 300 2065 2065 150 1035 150 1035 300 2065 2065 300 2065 2065 300 690 300 2065	Maximum Working Pressure psi/kPa Carbon Steel Maximum Working Pressure psi/kPa Stainless Steel Maximum Working Pressure psi/kPa Ductile Iron 200 1375 200 1375 N/R 300 2065 200 2065 N/R 300 2065 200 1375 N/R 300 2065 200 2065 N/R 300 2065 200 2065 N/R 300 2065 200 2065 N/R 300 2065 300 2065 N/R 150 1035 150 1035 N/R 300 2065 300 2065 N/R 100 690 100 690 N/R	Maximum Working Pressure psi/kPa Carbon Steel Stainless Stee	Maximum Pressure psi/Rp Stainless Steel Maximum Pressure psi/Rp Stainless Steel Maximum Pressure psi/Rp Stainless Steel Maximum Maximum Pressure psi/Rp Stainless Steel Maximum Maximum	Maximum Working Pressure psil/Ra Carbon Steel Carbon Steel

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⁽¹⁾ For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.

(2) The maximum pipe end separation in the tables also represents the maximum allowable axial pipe movement within the coupling. At maximum pipe end separation, axial pipe movement can only be accommodated in the direction of pipe expansion (pipe ends moving toward each other) within the coupled joint. At no time during operation should the pipe ends exceed the maximum listed values. The temperature of the pipe at time of installation will impact the separation between pipe ends. Consult publication 26.20 or contact Victaulic for details.

Style 231 Non-Restrained Flexible **Expansion Coupling**

PERFORMANCE

		(1)				(2)	
Nominal Pipe Size In./mm	Maximum Working Pressure psi/kPa Carbon Steel	Maximum Working Pressure psi/kPa Stainless Steel	Maximum Working Pressure psi/kPa Ductile Iron	Body Type	Width (Z) In./mm	Pipe End Separation Min - Max In./mm	Max. Allowable Axial Pipe Movement In./mm
				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
	75 515	75 515	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
36				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
900				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
	300 2065	300 2065	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
	50 345	50 345	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
42				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
1050				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
	250 1725	250 1725	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
		50 345	N/R	2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
	50 345			2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
48				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
1200			N/R	2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
	250 1725	250 1725		2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
54 1350	200 1375	200 1375	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
60 1500	200 1375	200 1375	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
66 1650	175 1200	175 1200	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6

⁽¹⁾ For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.

(2) The maximum pipe end separation in the tables also represents the maximum allowable axial pipe movement within the coupling. At maximum pipe end separation, axial pipe movement can only be accommodated in the direction of pipe expansion (pipe ends moving toward each other) within the coupled joint. At no time during operation should the pipe ends exceed the maximum listed values. The temperature of the pipe at time of installation will impact the separation between pipe ends. Consult publication 26.20 or contact Victaulic for details.

Style 231 Non-Restrained Flexible **Expansion Coupling**

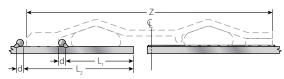
PERFORMANCE

		(1)				(2)	
Nominal Pipe Size In./mm	Maximum Working Pressure psi/kPa Carbon Steel	Maximum Working Pressure psi/kPa Stainless Steel	Maximum Working Pressure psi/kPa Ductile Iron	Body Type	Width (Z) In./mm	Pipe End Separation Min - Max In./mm	Max. Allowable Axial Pipe Movement In./mm
				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
72 1800	175 1200	175 1200	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
78 1950	150 1035	150 1035	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
84 2100	150 1035	150 1035	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
		100 690		2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
90 2250	100 690			2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
			N/R	2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
96 2400	100 690	100 690		2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
108 2700	100 690	100 690	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
120 3000	75 515	75 515	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6
				2	14.38 365.3	0 - 2.00 0 - 50.8	2.00 50.8
144 3600	75 515	75 515	N/R	2	16.38 416.1	0 - 3.00 0 - 76.2	3.00 76.2
				2	18.38 466.9	0 - 4.00 0 - 101.6	4.00 101.6

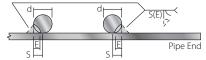
For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
 The maximum pipe end separation in the tables also represents the maximum allowable axial pipe movement within the coupling. At maximum pipe end separation, axial pipe movement can only be accommodated in the direction of pipe expansion (pipe ends moving toward each other) within the coupled joint. At no time during operation should the pipe ends exceed the maximum listed values. The temperature of the pipe at time of installation will impact the separation between pipe ends. Consult publication 26.20 or contact Victaulic for details.

Style 231 Non-Restrained Flexible **Expansion Coupling**

RESTRAINT RINGS



Type 2 - Restraint Ring Location



Restraint Ring Single Flare Bevel Groove Weld Detail

					Restrair	nt Rings	
	(1)				(2	2)	(3)
Nominal Pipe Size In./mm	Maximum Working Pressure psi/kPa	Body Type	Width (Z) In./mm	Diameter- (d) In./mm	Location (L1) In./mm	Location (L2) In./mm	Weld Size (E) In
			14.38 365.3	1/4	4.50 114.3	6.25 158.8	3/32
	200 1375	2	16.38 416.1	1/4	4.50 114.3	6.25 158.8	3/32
16			18.38 466.9	1/4	4.50 114.3	6.25 158.8	3/32
400			14.38 365.3	1/4	4.50 114.3	6.25 158.8	3/32
	300 2065	2	16.38 416.1	1/4	4.50 114.3	6.25 158.8	3/32
			18.38 466.9	1/4	4.50 114.3	6.25 158.8	3/32
			14.38 365.3	1/4	4.50 114.3	6.25 158.8	3/32
	200 1375	2	16.38 416.1	1/4	4.50 114.3	6.25 158.8	3/32
18			18.38 466.9	1/4	4.50 114.3	6.25 158.8	3/32
450		2	14.38 365.3	1/4	4.50 114.3	6.25 158.8	3/32
	300 2065		16.38 416.1	1/4	4.50 114.3	6.25 158.8	3/32
			18.38 466.9	1/4	4.50 114.3	6.25 158.8	3/32
		2	14.38 365.3	1/4	4.50 114.3	6.25 158.8	3/32
	200 1375		16.38 416.1	1/4	4.50 114.3	6.25 158.8	3/32
20			18.38 466.9	1/4	4.50 114.3	6.25 158.8	3/32
500			14.38 365.3	1/4	4.50 114.3	6.25 158.8	3/32
	300 2065	2	16.38 416.1	1/4	4.50 114.3	6.25 158.8	3/32
			18.38 466.9	1/4	4.50 114.3	6.25 158.8	3/32
			14.38 365.3	1/4	4.50 114.3	6.25 158.8	3/32
	150 1035	2	16.38 416.1	1/4	4.50 114.3	6.25 158.8	3/32
24			18.38 466.9	1/4	4.50 114.3	6.25 158.8	3/32
600			14.38 365.3	1/4	4.50 114.3	6.25 158.8	3/32
	300 2065	2	16.38 416.1	1/4	4.50 114.3	6.25 158.8	3/32
			18.38 466.9	1/4	4.50 114.3	6.25 158.8	3/32

⁽¹⁾ For allowable test or transient pressure, the maximum working pressure may be increased to 1% times the values

shown.

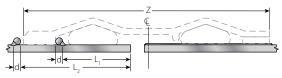
(2) Restraint rings must be welded perpendicular to the pipe axis with a tolerance of L± 1/16/11.6 mm. Each restraint ring shipment includes restraint ring placement and welding data that is specific to application or project require

ments. Contact Victaulic for details.

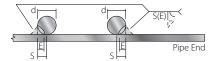
(3) Flare bevel groove weld size in table is the minimum requirement. Depth of preparation $S = (d) \div 2$; Weld size $E \approx S * 0.625$ per AWS D1.1. The coupling shoulder must have unrestricted contact with the ring and the pipe O.D.

Style 231 Non-Restrained Flexible Expansion Coupling

RESTRAINT RINGS



Type 2 - Restraint Ring Location



Restraint Ring Single Flare Bevel Groove Weld Detail

					Restraii	nt Rings	
	(1)					2)	(3)
Nominal Pipe Size In./mm	Maximum Working Pressure psi/kPa	Body Type	Width (Z) In./mm	Diameter- (d) In./mm	Location (L1) In./mm	Location (L2) In./mm	Weld Size (E) In
			14.38 365.3	1/4	4.50 114.3	6.25 158.8	3/32
	100 690	2	16.38 416.1	1/4	4.50 114.3	6.25 158.8	3/32
30			18.38 466.9	1/4	4.50 114.3	6.25 158.8	3/32
750			14.38 365.3	1/4	4.50 114.3	6.25 158.8	3/32
	300 2065	2	16.38 416.1	1/4	4.50 114.3	6.25 158.8	3/32
			18.38 466.9	1/4	4.50 114.3	6.25 158.8	3/32
			14.38 365.3	3/8	4.50 114.3	6.50 158.8	1/8
	75 515	2	16.38 416.1	3/8	4.50 114.3	6.50 158.8	1/8
36			18.38 466.9	3/8	4.50 114.3	6.50 158.8	1/8
900		2	14.38 365.3	3/8	4.50 114.3	6.50 158.8	1/8
	300 2065		16.38 416.1	3/8	4.50 114.3	6.50 158.8	1/8
			18.38 466.9	3/8	4.50 114.3	6.50 158.8	1/8
			14.38 365.3	3/8	4.50 114.3	6.50 158.8	1/8
	50 345	2	16.38 416.1	3/8	4.50 114.3	6.50 158.8	1/8
42			18.38 466.9	3/8	4.50 114.3	6.50 158.8	1/8
1050			14.38 365.3	3/8	4.50 114.3	6.50 158.8	1/8
	250 1725	2	16.38 416.1	3/8	4.50 114.3	6.50 158.8	1/8
			18.38 466.9	3/8	4.50 114.3	6.50 158.8	1/8
			14.38 365.3	3/8	4.50 114.3	6.50 158.8	1/8
	50 345	2	16.38 416.1	3/8	4.50 114.3	6.50 158.8	1/8
48			18.38 466.9	3/8	4.50 114.3	6.50 158.8	1/8
1200			14.38 365.3	3/8	4.50 114.3	6.50 158.8	1/8
	250 1725	2	16.38 416.1	3/8	4.50 114.3	6.50 158.8	1/8
			18.38 466.9	3/8	4.50 114.3	6.50 158.8	1/8

⁽¹⁾ For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown

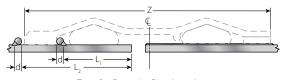
shown.

(2) Restraint rings must be welded perpendicular to the pipe axis with a tolerance of L± 1/16*/1.6 mm. Each restraint ring shipment includes restraint ring placement and welding data that is specific to application or project require ments. Contact Victaulic for details.

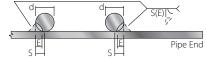
⁽³⁾ Flare bevel groove weld size in table is the minimum requirement. Depth of preparation S = (d) ÷ 2; Weld size E ≈ S * 0.625 per AWS D1.1. The coupling shoulder must have unrestricted contact with the ring and the pipe 0.D.

Style 231 Non-Restrained Flexible **Expansion Coupling**

RESTRAINT RINGS



Type 2 - Restraint Ring Location



Restraint Ring Single Flare Bevel Groove Weld Detail

				Restraint Rings					
	(1)				(2)		(3)		
Nominal Pipe Size In./mm	Maximum Working Pressure psi/kPa	Body Type	Width (Z) In./mm	Diameter- (d) In./mm	Location (L1) In./mm	Location (L2) In./mm	Weld Size (E) In		
54 1350	200 1375	2	14.38 365.3	3/8	4.50 114.3	6.50 165.1	1/8		
			16.38 416.1	3/8	4.50 114.3	6.50 165.1	1/8		
			18.38 466.9	3/8	4.50 114.3	6.50 165.1	1/8		
60 1500	200 1375	2	14.38 365.3	3/8	4.50 114.3	6.50 165.1	1/8		
			16.38 416.1	3/8	4.50 114.3	6.50 165.1	1/8		
			18.38 466.9	3/8	4.50 114.3	6.50 165.1	1/8		
66 1650	175 1200	2	14.38 365.3	3/8	4.50 114.3	6.50 165.1	1/8		
			16.38 416.1	3/8	4.50 114.3	6.50 165.1	1/8		
			18.38 466.9	3/8	4.50 114.3	6.50 165.1	1/8		
72 1800	175 1200	2	14.38 365.3	3/8	4.50 114.3	6.50 165.1	1/8		
			16.38 416.1	3/8	4.50 114.3	6.50 165.1	1/8		
			18.38 466.9	3/8	4.50 114.3	6.50 165.1	1/8		
78 1950	150 1035	2	14.38 365.3	3/8	4.50 114.3	6.50 165.1	1/8		
			16.38 416.1	3/8	4.50 114.3	6.50 165.1	1/8		
			18.38 466.9	3/8	4.50 114.3	6.50 165.1	1/8		
84 2100	150 1035	2	14.38 365.3	3/8	4.50 114.3	6.50 165.1	1/8		
			16.38 416.1	3/8	4.50 114.3	6.50 165.1	1/8		
			18.38 466.9	3/8	4.50 114.3	6.50 165.1	1/8		
90 2250	100 690	2	14.38 365.3	3/8	4.50 114.3	6.50 165.1	1/8		
			16.38 416.1	3/8	4.50 114.3	6.50 165.1	1/8		
			18.38 466.9	3/8	4.50 114.3	6.50 165.1	1/8		
96 2400	100 690	2	14.38 365.3	3/8	4.50 114.3	6.50 165.1	1/8		
			16.38 416.1	3/8	4.50 114.3	6.50 165.1	1/8		
			18.38 466.9	3/8	4.50 114.3	6.50 165.1	1/8		

⁽¹⁾ For allowable test or transient pressure, the maximum working pressure may be increased to 1% times the values

shown.

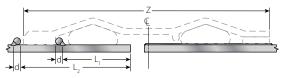
(2) Restraint rings must be welded perpendicular to the pipe axis with a tolerance of L± 1/16*/1.6 mm. Each restraint ring shipment includes restraint ring placement and welding data that is specific to application or project require

ments. Contact Victaulic for details.

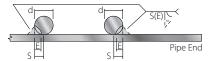
(3) Flare bevel groove weld size in table is the minimum requirement. Depth of preparation $S = (d) \div 2$; Weld size $E \approx S * 0.625$ per AWS D1.1. The coupling shoulder must have unrestricted contact with the ring and the pipe 0.D.

Style 231 Non-Restrained Flexible Expansion Coupling

RESTRAINT RINGS



Type 2 - Restraint Ring Location



Restraint Ring Single Flare Bevel Groove Weld Detail

				Restraint Rings				
	(1)				(2)		(3)	
Nominal Pipe Size In./mm	Maximum Working Pressure psi/kPa	Body Type	Width (Z) In./mm	Diameter- (d) In./mm	Location (L1) In./mm	Location (L2) In./mm	Weld Size (E) In	
108 2700	100 690	2	14.38 365.3	3/8	4.50 114.3	6.50 165.1	1/8	
			16.38 416.1	3/8	4.50 114.3	6.50 165.1	1/8	
			18.38 466.9	3/8	4.50 114.3	6.50 165.1	1/8	
120 3000	75 515	2	14.38 365.3	3/8	4.50 114.3	6.50 165.1	1/8	
			16.38 416.1	3/8	4.50 114.3	6.50 165.1	1/8	
			18.38 466.9	3/8	4.50 114.3	6.50 165.1	1/8	
144 3600	75 515	2	14.38 365.3	3/8	4.50 114.3	6.50 165.1	1/8	
			16.38 416.1	3/8	4.50 114.3	6.50 165.1	1/8	
			18.38 466.9	3/8	4.50 114.3	6.50 165.1	1/8	

- (1) For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
- (2) Restraint rings must be welded perpendicular to the pipe axis with a tolerance of L± ½16"/1.6 mm. Each restraint ring shipment includes restraint ring placement and welding data that is specific to application or project require ments. Contact Victaulic for details.
- ments. Contact Victaulic for details.

 (3) Flare bevel groove weld size in table is the minimum requirement. Depth of preparation S = (d) ÷ 2; Weld size E ≈ S * 0.625 per AWS D1.1. The coupling shoulder must have unrestricted contact with the ring and the pipe 0.D.

Style 231 Non-Restrained Flexible Expansion Coupling

CLOSURE TOOLS



MANUAL TOOL



HYDRAULIC TOOL

Manual Tools

- CTM-01: for use on 5" and 8" body widths
- CTM-02: for use on 10" body widths for use on 12" body widths with thickness of 3/16" or less

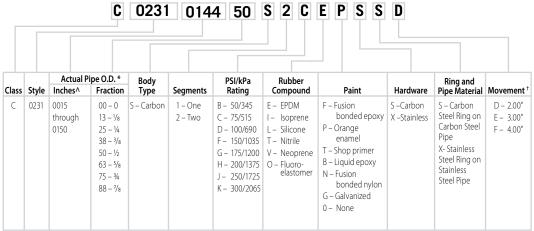
Hydraulic Tools

- CTH-01*: for use on 12" body widths with thickness of ¼" or greater for use on 14", 16" and 18" body widths
- CTH-02: for use on all type 3 couplings
- Hydraulic tool package comes standard with:
 - one (1) tool head
 - one (1) hydraulic cylinder
 - one (1) hydraulic hose
 - one (1) hand pump
- * A CTH-01 hydraulic closure tool can be used in applications where the CTM-02 manual closure tool is recommended.

Note: The closure tools listed above are designed specifically for Victaulic Style 230, 231, 232 and 233 couplings. If ordering custom product, contact Victaulic for appropriate tool selection

Style 231 Non-Restrained Flexible Expansion Coupling

PRODUCT CONFIGURATOR



[^] Couplings are available in a range of nominal sizes from 16 – 144".

ENGINEERED PRODUCTS OPTIONS

For non-standard products the Victaulic Engineered Products group can assist with specialty joints designed to meet the specific size, pressure and temperature requirements of your system.

WARRANTY

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

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.

TESTING

Victaulic Style 231 couplings are designed to allow for a 50 percent increase over the published maximum working pressure for test and/or transient pressures. Due to the huge volume of air that can be involved in jobsite air testing and the nature of air or gas that is pressurized, jobsite air testing should be limited to 25 psi/175 kPa or less.



^{*} For actual pipe O.D. round down to the nearest 1/8" to determine proper coupling size required.

[†] Movement provided is dependent on size and body type and must correspond to allowable movements published in the product submittal.