

## Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

Victaulic Bolted Split-Sleeve Products (VBSP) Style 233 carbon steel restrained couplings (formerly Depend-O-Lok FxF Modified) provide a fully restrained, flexible pipe joint that 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 buried or exposed pipe applications for field joint connections where joint flexibility and thrust restraint is required. Style 233 couplings are designed to allow for dynamic (in-service) joint deflection and are most commonly used in pairs outside of a structure to accommodate differential settlement between the structure and the pipeline. The Style 233 couplings can also allow for up to 1/25 mm of axial pipe movement at the joint due to thermal pipe movement. Typical applications include water and wastewater treatment pipelines, force main and water transmission piping, and buried piping connections outside of valve vaults or other structures (when couplings are used in pairs at a minimum). The couplings provide ease of installation and come 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.

The dual-arched mechanical coupling body houses the o-ring gaskets that provide a radial seal around the circumference of the pipe, while a sealing plate provides for the axial seal across the coupling body and pipe joint. The Style 233 coupling incorporates a restraint ring welded to each pipe end (furnished with the coupling), allowing the coupling housing to straddle the restraint rings and confining the rings under the coupling body in order to prevent joint separation. The coupling housing and restraint ring welds are designed to accommodate hoop stress and end loads to meet system pressure requirements. Style 233 restrained couplings also perform at negative pipe pressures up to full vacuum. The o-ring gasket is not pressure responsive and therefore does not require internal pipe pressure to assist with the seal. The arched cross-sectional design provides stiffness to resist forces encountered during negative pressure (submerged) or vacuum service.

Style 233 couplings are available in standard nominal sizes from 8 – 144"/200 – 3600 mm, with other sizes available based on design and application requirements. The Style 233 restrained coupling can accommodate operating pressures up to 300 psi/2065 kPa (with higher pressure available) depending on the actual pipe diameter and wall thickness. For pressures and sizes not shown in the dimension and performance tables contact Victaulic for information on our engineered products by visiting our web site.

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 6-8.



8 – 144"/200 – 3600mm

### JOB/OWNER

System No. \_\_\_\_\_

Location \_\_\_\_\_

### CONTRACTOR

Submitted By \_\_\_\_\_

Date \_\_\_\_\_

### ENGINEER

Spec Sect \_\_\_\_\_ Para \_\_\_\_\_

Approved \_\_\_\_\_

Date \_\_\_\_\_

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# Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

**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               | 231S         | 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**

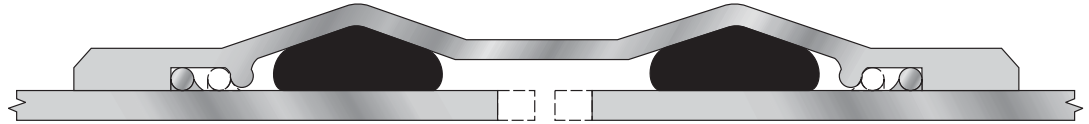
The Style 233 dimension tables list the minimum number of coupling housing segments for a particular pipe size. For special applications, restrained couplings are available in two (or more) segments to allow for installation of the coupling over an existing pipe joint or to facilitate ease of handling 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.

## Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

### BODY TYPE

#### Cross-Section

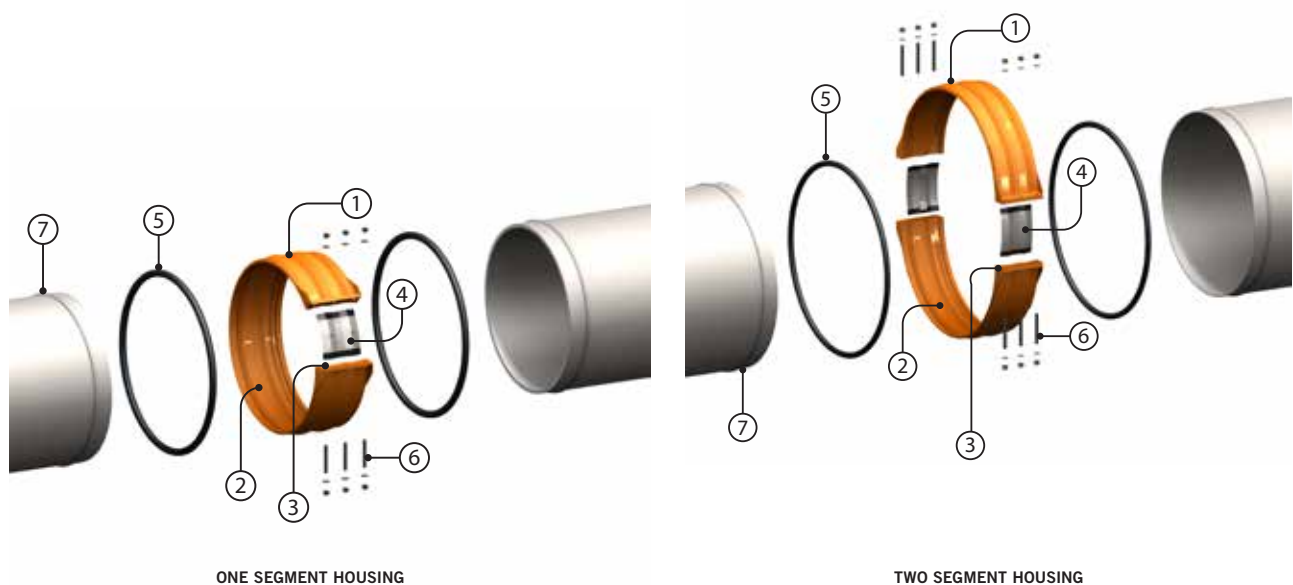
NOTE: Body type is not optional and will be determined by system requirements.



**Type 2** coupling is a shouldered coupling. This is a heavy duty coupling to accommodate higher pressures for certain pipe diameters. The shoulders welded to the edge of the coupling body provide a vertical bearing surface for the restraint rings and provide additional cross-sectional stiffness. The limit rings on the inside of the coupling body ensure that any axial movement or dynamic joint deflection is distributed across the coupling between both sides of the joint.

### COUPLING COMPONENTS

1. **Body** – Dual arch cross-section.
2. **Shoulders** – Provide additional stiffness, allow for larger o-ring gasket and provide vertical bearing surface for restraint rings.
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** – Attached to pipe ends to create a restrained joint.



## Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

### MATERIAL SPECIFICATIONS

#### Body

Carbon Steel conforming to ASTM A36 or ASTM A1011 (for gauge thicknesses)

#### Shoulders

Carbon Steel conforming to ASTM A36

#### 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.
- **Fluoroelastomer** +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

#### 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.

## Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

### LININGS AND COATINGS

Standard (specify choice on order):

- Liquid Epoxy:**  
 Liquid epoxy is applied per AWWA C210, 16 mils minimum DFT and is NSF61 approved. Epoxy can be applied as a primer for field applied top coat where UV protection due to sunlight exposure is required. This coating offers excellent corrosion protection for buried applications. A supplemental corrosion protection system such as heat shrink sleeve or tape coat system is recommended for buried applications.
- 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

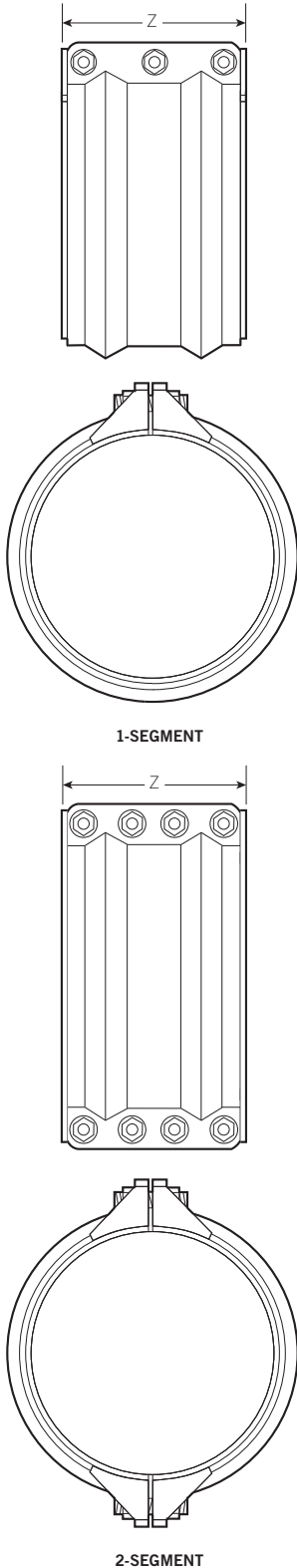
For specific pipe diameter tolerances, pipe ovality (roundness) requirements and minimum/maximum pipe diameter allowance, refer to the tables included in the Installation Manuals (below) and 26.20 Application Guidelines.

I-233.S1 - Styles 233/233S Restrained Flexible Coupling For Dynamic Joint Deflection (Type 2, One-Segment)

I-233.S2 - Styles 233/233S Restrained Flexible Coupling For Dynamic Joint Deflection (Type 2, Two-Segments)

# Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

**DIMENSIONS**

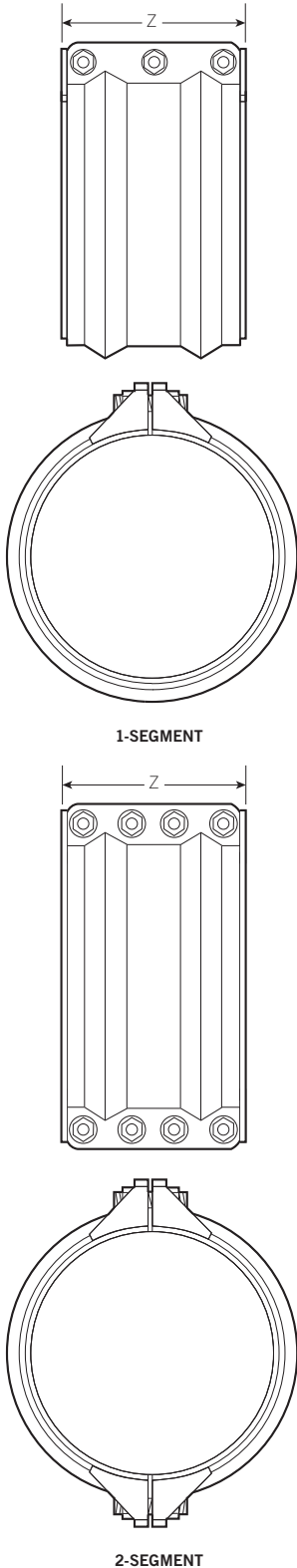


| (1)        | (2)                             | (3)         | Coupling Dimensions      |                               | (4) | (5)         | (6)        | Body Type | Tool Type |
|------------|---------------------------------|-------------|--------------------------|-------------------------------|-----|-------------|------------|-----------|-----------|
|            |                                 |             | Nominal Pipe Size In./mm | Actual Pipe O.D. Range In./mm |     |             |            |           |           |
| 8<br>200   | 7.00 - 8.88<br>177.8 - 225.6    | 300<br>2065 | 11 ga.                   | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 38<br>17   | 2         | B,C       |
| 10<br>250  | 9.00 - 10.88<br>228.6 - 276.4   | 300<br>2065 | 10 ga.                   | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 45<br>20   | 2         | B,C       |
| 12<br>300  | 11.00 - 12.88<br>279.4 - 327.2  | 200<br>1375 | 10 ga.                   | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 51<br>23   | 2         | B,C       |
|            |                                 | 300<br>2065 | 3/16                     | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 53<br>24   | 2         | B,C       |
| 14<br>350  | 13.00 - 14.88<br>330.2 - 378.0  | 200<br>1375 | 10 ga.                   | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 56<br>25   | 2         | B,C       |
|            |                                 | 300<br>2065 | 3/16                     | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 60<br>27   | 2         | B,C       |
| 16<br>400  | 15.00 - 16.88<br>381.0 - 428.8  | 200<br>1375 | 3/16                     | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 69<br>31   | 2         | B,C       |
|            |                                 | 300<br>2065 | 1/4                      | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 91<br>41   | 2         | C         |
| 18<br>450  | 17.00 - 18.88<br>431.8 - 479.6  | 200<br>1375 | 3/16                     | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 76<br>34   | 2         | B,C       |
|            |                                 | 300<br>2065 | 1/4                      | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 99<br>45   | 2         | C         |
| 20<br>500  | 19.00 - 21.88<br>482.6 - 555.8  | 200<br>1375 | 3/16                     | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 82<br>37   | 2         | B,C       |
|            |                                 | 300<br>2065 | 1/4                      | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 109<br>49  | 2         | C         |
| 24<br>600  | 22.00 - 26.88<br>558.8 - 682.8  | 150<br>1035 | 3/16                     | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 97<br>44   | 2         | B,C       |
|            |                                 | 250<br>1725 | 1/4                      | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 130<br>59  | 2         | C         |
|            |                                 | 300<br>2065 | 3/8                      | 12.50<br>317.5                | 2   | 6 - 7/8 x 8 | 250<br>113 | 2         | C         |
| 30<br>750  | 27.00 - 32.88<br>685.8 - 835.2  | 100<br>690  | 3/16                     | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 118<br>54  | 2         | B,C       |
|            |                                 | 200<br>1375 | 1/4                      | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 158<br>72  | 2         | C         |
|            |                                 | 300<br>2065 | 3/8                      | 12.50<br>317.5                | 2   | 6 - 7/8 x 8 | 297<br>135 | 2         | C         |
| 36<br>900  | 33.00 - 38.88<br>838.2 - 987.6  | 150<br>1035 | 1/4                      | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 187<br>85  | 2         | C         |
|            |                                 | 250<br>1725 | 3/8                      | 12.50<br>317.5                | 2   | 6 - 7/8 x 8 | 343<br>156 | 2         | C         |
|            |                                 | 300<br>2065 | 1/2                      | 14.75<br>374.7                | 2   | 8 - 1 x 8   | 543<br>246 | 2         | C         |
| 42<br>1050 | 39.00 - 44.88<br>990.6 - 1140.0 | 150<br>1035 | 1/4                      | 12.50<br>317.5                | 1   | 3 - 3/4 x 6 | 215<br>98  | 2         | C         |
|            |                                 | 200<br>1375 | 3/8                      | 12.50<br>317.5                | 2   | 6 - 7/8 x 8 | 390<br>177 | 2         | C         |
|            |                                 | 300<br>2065 | 1/2                      | 14.75<br>374.7                | 2   | 8 - 1 x 8   | 617<br>280 | 2         | C         |

(1) Couplings must be used on pipe with a minimum wall thickness that meets the requirements of AWWA C200 for carbon steel pipe.  
 (2) 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 1 1/2 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 15.  
 Note: The data in this table only applies when carbon steel couplings are being used on carbon steel pipe.

# Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

**DIMENSIONS**

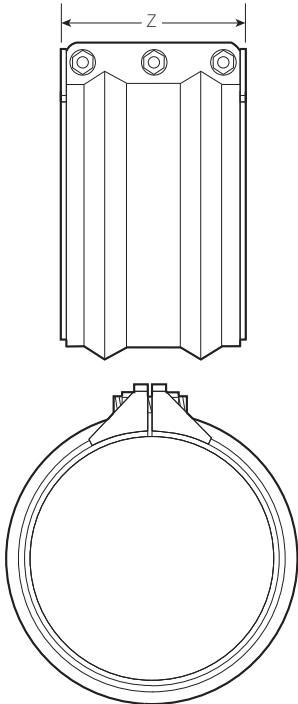


| (1)<br>Nominal Pipe Size<br>In./mm | (2)<br>Actual Pipe O.D. Range<br>In./mm | (3)<br>Maximum Working Pressure<br>psi/kPa | Coupling Dimensions   |                     | (4)<br>Min. No. of Coupling Segments | No. of Fasteners - Fastener Dimensions<br>Dia. x Length<br>In. x In. | (5)<br>Approximate Weight Each<br>Lbs/Kg. | Body Type | (6)<br>Tool Type |
|------------------------------------|---|--|-----------------------|---------------------|--------------------------------------|--|---|-----------|------------------|
|                                    |   |  | Body Thickness<br>In. | Width (Z)<br>In./mm |                                      |  |   |           |                  |
| 48<br>1200                         | 45.00 - 50.88<br>1143.0 - 1292.4        | 100<br>690                                 | 1/4                   | 12.50<br>317.5      | 1                                    | 3 - 3/4 x 6  | 242<br>110                                | 2         | C                |
|                                    |   | 150<br>1035                                | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 435<br>197                                | 2         | C                |
|                                    |   | 250<br>1725                                | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 690<br>313                                | 2         | C                |
|                                    |   | 300<br>2065                                | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 859<br>390                                | 2         | C                |
| 54<br>1350                         | 51.00 - 56.88<br>1295.4 - 1444.8        | 150<br>1035                                | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 472<br>214                                | 2         | C                |
|                                    |   | 200<br>1375                                | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 763<br>346                                | 2         | C                |
|                                    |   | 250<br>1725                                | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 951<br>431                                | 2         | C                |
| 60<br>1500                         | 57.00 - 62.88<br>1447.8 - 1597.2        | 150<br>1035                                | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 518<br>235                                | 2         | C                |
|                                    |   | 200<br>1375                                | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 837<br>380                                | 2         | C                |
|                                    |   | 250<br>1725                                | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 1042<br>473                               | 2         | C                |
| 66<br>1650                         | 63.00 - 68.88<br>1600.2 - 1749.6        | 100<br>690                                 | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 554<br>251                                | 2         | C                |
|                                    |   | 150<br>1035                                | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 893<br>405                                | 2         | C                |
|                                    |   | 200<br>1375                                | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 1133<br>514                               | 2         | C                |
| 72<br>1800                         | 69.00 - 74.88<br>1752.6 - 1902.0        | 100<br>690                                 | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 601<br>273                                | 2         | C                |
|                                    |   | 150<br>1035                                | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 967<br>439                                | 2         | C                |
|                                    |   | 200<br>1375                                | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 1224<br>555                               | 2         | C                |
| 78<br>1950                         | 75.00 - 80.88<br>1905.0 - 2054.4        | 100<br>690                                 | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 637<br>289                                | 2         | C                |
|                                    |   | 150<br>1035                                | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 1039<br>471                               | 2         | C                |
|                                    |   | 175<br>1200                                | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 1315<br>596                               | 2         | C                |
| 84<br>2100                         | 81.00 - 86.88<br>2057.0 - 2207.0        | 100<br>690                                 | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 684<br>310                                | 2         | C                |
|                                    |   | 150<br>1035                                | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 1097<br>498                               | 2         | C                |
|                                    |   | 175<br>1200                                | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 1387<br>629                               | 2         | C                |
| 90<br>2250                         | 87.00 - 92.88<br>2209.8 - 2359.2        | 100<br>690                                 | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 719<br>326                                | 2         | C                |
|                                    |   | 125<br>860                                 | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 1154<br>523                               | 2         | C                |
|                                    |   | 150<br>1035                                | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 1478<br>670                               | 2         | C                |

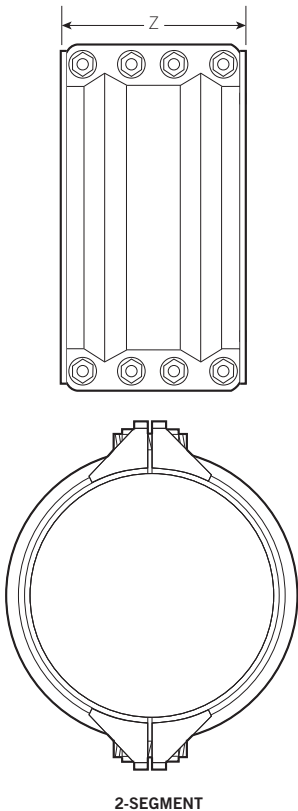
- (1) Couplings must be used on pipe with a minimum wall thickness that meets the requirements of AWWA C200 for carbon steel pipe.
  - (2) For actual Pipe O.D. round down to the nearest 1/8" to determine proper coupling size required.
  - (3) For allowable test or transient pressure, the maximum working pressure may be increased to 1 1/2 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-Q2 Large Manual Closure Tool  
 C= CTH-01 10-Ton Hydraulic Closure Tool
- \*For more details on closure tools refer to page 15.  
 Note: The data in this table only applies when carbon steel couplings are being used on carbon steel pipe.

# Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

**DIMENSIONS**



1-SEGMENT



2-SEGMENT

| (1)<br>Nominal Pipe Size<br>In./mm | (2)<br>Actual Pipe O.D. Range<br>In./mm | (3)<br>Maximum Working Pressure<br>psi/kPa | Coupling Dimensions   |                     | (4)<br>Min. No. of Coupling Segments | No. of Fasteners - Fastener Dimensions<br>Dia. x Length<br>In. x In. | (5)<br>Approximate Weight Each<br>Lbs/Kg. | Body Type | (6)<br>Tool Type |
|------------------------------------|---|--|-----------------------|---------------------|--------------------------------------|--|---|-----------|------------------|
|                                    |   |  | Body Thickness<br>In. | Width (Z)<br>In./mm |                                      |  |   |           |                  |
| 96<br>2400                         | 93.00 - 101.88<br>2362.2 - 2587.8       | 100<br>690                                 | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 775<br>352                                | 2         | C                |
|                                    |   | 125<br>860                                 | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 1241<br>563                               | 2         | C                |
|                                    |   | 150<br>1035                                | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 1587<br>720                               | 2         | C                |
| 108<br>2700                        | 102.00 - 113.88<br>2590.8 - 2892.6      | 75<br>515                                  | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 846<br>384                                | 2         | C                |
|                                    |   | 100<br>690                                 | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 1371<br>622                               | 2         | C                |
|                                    |   | 125<br>860                                 | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 1750<br>1130.8                            | 2         | C                |
| 120<br>3000                        | 114.00 - 125.88<br>2895.6 - 3197.4      | 75<br>515                                  | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 929<br>421                                | 2         | C                |
|                                    |   | 100<br>690                                 | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 1502<br>681                               | 2         | C                |
|                                    |   | 125<br>860                                 | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 1912<br>867                               | 2         | C                |
| 144<br>3600                        | 126.00 - 150.00<br>3200.4 - 3810.0      | 50<br>345                                  | 3/8                   | 12.50<br>317.5      | 2                                    | 6 - 7/8 x 8  | 1073<br>487                               | 2         | C                |
|                                    |   | 75<br>515                                  | 1/2                   | 14.75<br>374.7      | 2                                    | 8 - 1 x 8  | 1746<br>792                               | 2         | C                |
|                                    |   | 100<br>690                                 | 5/8                   | 15.00<br>381.0      | 2                                    | 8 - 1 x 8  | 2238<br>1015                              | 2         | C                |

- (1) Couplings must be used on pipe with a minimum wall thickness that meets the requirements of AWWA C200 for carbon steel pipe.
  - (2) 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 1 1/2 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 15.  
 Note: The data in this table only applies when carbon steel couplings are being used on carbon steel pipe.



# Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

**PERFORMANCE**

| Nominal Pipe Size<br>In./mm | (1)   |  |   | Body Type | (2) (3)<br>Pipe End Separation<br>Min - Max<br>In./mm | (3) (4)<br>Max. Allow. Deflection<br>Degrees | (5)<br>Max. Permissible End Load<br>lbf/N |
|-----------------------------|---|--|---|-----------|---|--|---|
|                             | Maximum Working Pressure<br>psi/kPa<br>Carbon Steel | Maximum Working Pressure<br>psi/kPa<br>Stainless Steel | Maximum Working Pressure<br>psi/kPa<br>Ductile Iron |           |   |  |   |
| 8<br>200                    | 300<br>2065   | 300<br>2065  | 300<br>2065   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 4° 0'  | 15079<br>67075                            |
| 10<br>250                   | 300<br>2065   | 300<br>2065  | 300<br>2065   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 3° 30'                                       | 23561<br>104805                           |
| 12<br>300                   | 200<br>1375   | 200<br>1375  | 200<br>1375   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 3° 15'                                       | 22619<br>100614                           |
|                             | 300<br>2065   | 300<br>2065  | 250<br>1725   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 3° 15'                                       | 33929<br>150924                           |
| 14<br>350                   | 200<br>1375   | 200<br>1375  | 200<br>1375   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 3° 0'  | 30787<br>136947                           |
|                             | 300<br>2065   | 300<br>2065  | 250<br>1725   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 3° 0'  | 46181<br>205423                           |
| 16<br>400                   | 200<br>1375   | 200<br>1375  | 200<br>1375   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 3° 0'  | 40212<br>178872                           |
|                             | 300<br>2065   | 300<br>2065  | 300<br>2065   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 3° 0'  | 60318<br>268308                           |
| 18<br>450                   | 200<br>1375   | 200<br>1375  | 175<br>1200   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 3° 0'  | 50893<br>226383                           |
|                             | 300<br>2065   | 300<br>2065  | 250<br>1725   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 3° 0'  | 76340<br>339577                           |
| 20<br>500                   | 200<br>1375   | 200<br>1375  | 150<br>1035   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 2° 30'                                       | 62831<br>279486                           |
|                             | 300<br>2065   | 300<br>2065  | 250<br>1725   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 2° 30'                                       | 94247<br>419232                           |
| 24<br>600                   | 150<br>1035   | 150<br>1035  | 125<br>860  | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 2° 0'  | 67858<br>301847                           |
|                             | 250<br>1725   | 250<br>1725  | 200<br>1375   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 2° 0'  | 113097<br>503081                          |
|                             | 300<br>2065   | 250<br>1725  | 200<br>1375   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 2° 0'  | 135716<br>603695                          |
| 30<br>750                   | 100<br>690  | 100<br>690   | 100<br>690  | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 1° 45'                                       | 70685<br>314423                           |
|                             | 200<br>1375   | 200<br>1375  | 150<br>1035   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 1° 45'                                       | 141371<br>628850                          |
|                             | 300<br>2065   | 200<br>2065  | 150<br>1035   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 1° 45'                                       | 212057<br>943277                          |
| 36<br>900                   | 150<br>1035   | 150<br>1035  | 125<br>860  | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 1° 30'                                       | 152681<br>679159                          |
|                             | 250<br>1725   | 175<br>1200  | 125<br>860  | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 1° 30'                                       | 254469<br>1131935                         |
|                             | 300<br>2065   | 200<br>1375  | 175<br>1200   | 2         | 1.00 - 2.00<br>25.4 - 50.8                            | 1° 30'                                       | 305362<br>1358318                         |
| 42<br>1050                  | 150<br>1035   | 150<br>1035  | 125<br>860  | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 1° 15'                                       | 207816<br>924412                          |
|                             | 200<br>1375   | 150<br>1035  | 125<br>860  | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 1° 15'                                       | 277088<br>1232549                         |
|                             | 300<br>2065   | 200<br>1375  | 150<br>1035   | 3         | 1.00 - 2.00<br>25.4 - 50.8                            | 1° 15'                                       | 415632<br>1848823                         |
| 48<br>1200                  | 100<br>690  | 100<br>690   | 100<br>690  | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 1° 7'  | 180955<br>804928                          |
|                             | 150<br>1035   | 150<br>1035  | 100<br>690  | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 1° 7'  | 271433<br>1207394                         |
|                             | 250<br>1725   | 176<br>1200  | 125<br>860  | 2         | 1.00 - 2.00<br>25.4 - 50.8                            | 1° 7'  | 452389<br>2012327                         |
|                             | 300<br>2065   | 200<br>1375  | 175<br>1200   | 2         | 1.00 - 2.00<br>25.4 - 50.8                            | 1° 7'  | 542867<br>2414793                         |

- (1) For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
- (2) Maximum allowable axial pipe movement at the joint is the difference between the maximum and minimum pipe end separation. At maximum pipe end separation, axial movement can only occur via pipe expansion into the joint and vice versa.
- (3) Pipe end movement and deflection are non-concurrent.
- (4) Published deflection values are intended and available for both static (installed) and dynamic (in-service) joint deflection. The coupling closure should be located 90 degrees from the direction of joint deflection.
- (5) The maximum permissible end loads listed in the table are calculated using the nominal pipe OD. The actual maximum permissible end load will be less or greater than the published figures depending on the actual pipe OD.

# Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

**PERFORMANCE**

| Nominal Pipe Size<br>In./mm | (1)   |  |   | Body Type | (2) (3)                                    | (3) (4)                           | (5)                                |
|-----------------------------|---|--|---|-----------|--|-----------------------------------|------------------------------------|
|                             | Maximum Working Pressure<br>psi/kPa<br>Carbon Steel | Maximum Working Pressure<br>psi/kPa<br>Stainless Steel | Maximum Working Pressure<br>psi/kPa<br>Ductile Iron |           | Pipe End Separation<br>Min - Max<br>In./mm | Max. Allow. Deflection<br>Degrees | Max. Permissible End Load<br>lbf/N |
| 54<br>1350                  | 150<br>1035   | 100<br>690   | 75<br>515   | 2         | 0.50 - 1.50<br>12.7 - 38.1                 | 1° 0'                             | 343533<br>1528111                  |
|                             | 200<br>1375   | 150<br>1035  | 125<br>1035   | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 1° 0'                             | 458044<br>2037481                  |
|                             | 250<br>1725   | 200<br>1375  | 150<br>1375   | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 1° 0'                             | 572555<br>2546852                  |
| 60<br>1500                  | 150<br>1035   | 100<br>690   | 75<br>515   | 2         | 0.50 - 1.50<br>12.7 - 38.1                 | 0° 54'                            | 424115<br>1886558                  |
|                             | 200<br>1375   | 125<br>860   | 100<br>690  | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 54'                            | 565486<br>2515407                  |
|                             | 250<br>1725   | 175<br>1200  | 125<br>860  | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 54'                            | 706858<br>3144261                  |
| 66<br>1650                  | 100<br>690  | 100<br>690   | 75<br>515   | 2         | 0.50 - 1.50<br>12.7 - 38.1                 | 0° 49'                            | 342119<br>1521821                  |
|                             | 150<br>1035   | 125<br>860   | 100<br>690  | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 49'                            | 513179<br>2282734                  |
|                             | 200<br>1375   | 150<br>1035  | 125<br>860  | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 49'                            | 684238<br>3043643                  |
| 72<br>1800                  | 100<br>690  | 75<br>515  | 75<br>515   | 2         | 0.50 - 1.50<br>12.7 - 38.1                 | 0° 45'                            | 407150<br>1811094                  |
|                             | 150<br>1035   | 125<br>860   | 100<br>690  | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 45'                            | 610725<br>2716640                  |
|                             | 200<br>1375   | 150<br>1375  | 125<br>860  | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 45'                            | 814300<br>3622187                  |
| 78<br>1950                  | 100<br>690  | 75<br>515  | 50<br>345   | 2         | 0.50 - 1.50<br>12.7 - 38.1                 | 0° 42'                            | 477836<br>2125521                  |
|                             | 150<br>1035   | 100<br>690   | 75<br>515   | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 42'                            | 716754<br>3188281                  |
|                             | 175<br>1200   | 125<br>860   | 100<br>690  | 3         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 42'                            | 836213<br>3719661                  |
| 84<br>2100                  | 100<br>690  | 75<br>515  | 50<br>345   | 2         | 0.50 - 1.50<br>12.7 - 38.1                 | 0° 39'                            | 554176<br>2465098                  |
|                             | 150<br>1035   | 100<br>690   | 75<br>515   | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 39'                            | 831265<br>3697651                  |
|                             | 175<br>1200   | 125<br>860   | 100<br>690  | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 39'                            | 969809<br>4313926                  |
| 90<br>2250                  | 100<br>690  | 75<br>515  | 50<br>345   | 2         | 0.50 - 1.50<br>12.7 - 38.1                 | 0° 36'                            | 636172<br>2829834                  |
|                             | 125<br>860  | 100<br>690   | 75<br>515   | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 36'                            | 795215<br>3537293                  |
|                             | 150<br>1035   | 125<br>860   | 100<br>690  | 2         | 1.00 - 2.00<br>25.4 - 50.8                 | 0° 36'                            | 954258<br>4244751                  |

- (1) For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
- (2) Maximum allowable axial pipe movement at the joint is the difference between the maximum and minimum pipe end separation. At maximum pipe end separation, axial movement can only occur via pipe expansion into the joint and vice versa.
- (3) Pipe end movement and deflection are non-concurrent.
- (4) Published deflection values are intended and available for both static (installed) and dynamic (in-service) joint deflection. The coupling closure should be located 90 degrees from the direction of joint deflection.
- (5) The maximum permissible end loads listed in the table are calculated using the nominal pipe OD. The actual maximum permissible end load will be less or greater than the published figures depending on the actual pipe OD.

## Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

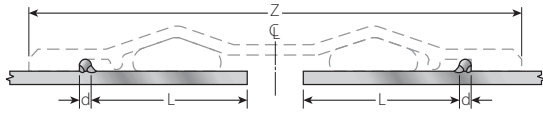
### PERFORMANCE

| Nominal Pipe Size<br>In./mm | (1)   |  |   | Body Type | (2) (3)<br>Pipe End Separation<br>Min - Max<br>In./mm | (3) (4)<br>Max. Allow. Deflection<br>Degrees | (5)<br>Max. Permissible End Load<br>lbf/N |
|-----------------------------|---|--|---|-----------|---|--|---|
|                             | Maximum Working Pressure<br>psi/kPa<br>Carbon Steel | Maximum Working Pressure<br>psi/kPa<br>Stainless Steel | Maximum Working Pressure<br>psi/kPa<br>Ductile Iron |           |   |  |   |
| 96<br>2400                  | 100<br>690  | 50<br>345  | 50<br>345   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 0° 33'                                       | 723822<br>3219721                         |
|                             | 125<br>860  | 75<br>515  | 50<br>345   | 2         | 1.00 - 2.00<br>25.4 - 50.8                            | 0° 33'                                       | 904778<br>4024653                         |
|                             | 150<br>1035   | 100<br>1035  | 75<br>515   | 2         | 1.00 - 2.00<br>25.4 - 50.8                            | 0° 33'                                       | 1085734<br>4829586                        |
| 108<br>2700                 | 75<br>515   | 50<br>345  | 25<br>170   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 0° 30'                                       | 687066<br>3056222                         |
|                             | 100<br>690  | 75<br>515  | 50<br>345   | 2         | 1.00 - 2.00<br>25.4 - 50.8                            | 0° 30'                                       | 916088<br>4074963                         |
|                             | 125<br>860  | 100<br>690   | 75<br>515   | 2         | 1.00 - 2.00<br>25.4 - 50.8                            | 0° 30'                                       | 1145110<br>5093703                        |
| 120<br>3000                 | 75<br>515   | 50<br>345  | 25<br>170   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 0° 27'                                       | 848230<br>3773115                         |
|                             | 100<br>690  | 50<br>345  | 50<br>345   | 2         | 1.00 - 2.00<br>25.4 - 50.8                            | 0° 27'                                       | 1130973<br>5030819                        |
|                             | 125<br>860  | 75<br>515  | 50<br>345   | 3         | 1.00 - 2.00<br>25.4 - 50.8                            | 0° 27'                                       | 1413716<br>6288523                        |
| 144<br>3600                 | 50<br>345   | 25<br>170  | 25<br>170   | 2         | 0.50 - 1.50<br>12.7 - 38.1                            | 0° 22'                                       | 814300<br>3622187                         |
|                             | 75<br>515   | 50<br>515  | 50<br>345   | 2         | 1.00 - 2.00<br>25.4 - 50.8                            | 0° 22'                                       | 1221451<br>5433285                        |
|                             | 100<br>690  | 75<br>690  | 50<br>345   | 2         | 1.00 - 2.00<br>25.4 - 50.8                            | 0° 22'                                       | 1628601<br>7244379                        |

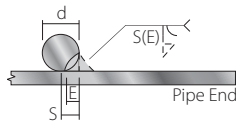
- (1) For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
- (2) Maximum allowable axial pipe movement at the joint is the difference between the maximum and minimum pipe end separation. At maximum pipe end separation, axial movement can only occur via pipe expansion into the joint and vice versa.
- (3) Pipe end movement and deflection are non-concurrent.
- (4) Published deflection values are intended and available for both static (installed) and dynamic (in-service) joint deflection. The coupling closure should be located 90 degrees from the direction of joint deflection.
- (5) The maximum permissible end loads listed in the table are calculated using the nominal pipe OD. The actual maximum permissible end load will be less or greater than the published figures depending on the actual pipe OD.

# Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

## RESTRAINT RINGS

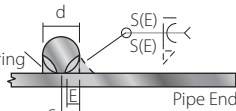


Type 2 - Restraint Ring Location



Restraint Ring Single Flare Bevel Groove Weld Detail

Back Weld - Must not extend past the back edge of the restraint ring



Restraint Ring Double Flare Bevel Groove Weld Detail

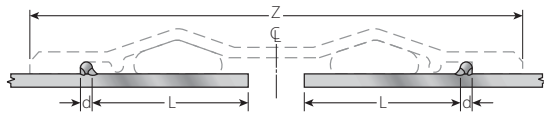
| Nominal Pipe Size<br>In./mm | (1)<br>Maximum Working Pressure<br>psi/kPa | (2)<br>Body Type | Width (Z)<br>In./mm | Restraint Ring      |                        |                      |
|-----------------------------|--|------------------|---------------------|---------------------|------------------------|----------------------|
|                             |  |                  |                     | Diameter (d)<br>In. | Location (L)<br>In./mm | Weld Size (E)<br>In. |
| 8<br>200                    | 300<br>2065                                | 2                | 12.50<br>317.5      | 1/4                 | 4.00<br>101.6          | 3/32                 |
| 10<br>250                   | 300<br>2065                                | 2                | 12.50<br>317.5      | 1/4                 | 4.00<br>101.6          | 3/32                 |
| 12<br>300                   | 200<br>1375                                | 2                | 12.50<br>317.5      | 1/4                 | 4.00<br>101.6          | 3/32                 |
|                             | 300<br>2065                                | 2                | 12.50<br>317.5      | 1/4                 | 4.00<br>101.6          | 3/32                 |
| 14<br>350                   | 200<br>1375                                | 2                | 12.50<br>317.5      | 1/4                 | 4.00<br>101.6          | 3/32                 |
|                             | 300<br>2065                                | 2                | 12.50<br>317.5      | 1/4                 | 4.00<br>101.6          | 3/32                 |
| 16<br>400                   | 200<br>1375                                | 2                | 12.50<br>317.5      | 1/4                 | 4.00<br>101.6          | 3/32                 |
|                             | 300<br>2065                                | 3                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
| 18<br>450                   | 200<br>1375                                | 2                | 12.50<br>317.5      | 1/4                 | 4.00<br>101.6          | 3/32                 |
|                             | 300<br>2065                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
| 20<br>500                   | 200<br>1375                                | 2                | 12.50<br>317.5      | 1/4                 | 4.00<br>101.6          | 3/32                 |
|                             | 300<br>2065                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
| 24<br>600                   | 150<br>1035                                | 2                | 12.50<br>317.5      | 1/4                 | 4.00<br>101.6          | 3/32                 |
|                             | 250<br>1725                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 300<br>2065                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
| 30<br>750                   | 100<br>690                                 | 2                | 12.50<br>317.5      | 1/4                 | 4.00<br>101.6          | 3/32                 |
|                             | 200<br>1375                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 300<br>2065                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
| 36<br>900                   | 150<br>1035                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 250<br>1725                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 300<br>2065                                | 2                | 14.75<br>374.7      | 1/2                 | 4.38<br>111.1          | 5/32                 |
| 42<br>1050                  | 150<br>1035                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 200<br>1375                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 300<br>2065                                | 2                | 14.75<br>374.7      | 1/2                 | 4.38<br>111.1          | 5/32                 |

- (1) For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
- (2) For applications other than air or gas, where a liquid or other medium is flowing through pipe, restraint ring weld requirements are as follows:  
Type 2 couplings require a full circumferential double flare bevel groove weld based on the weld sizes shown in the table. For low pressure air or gas applications, where the weight of the medium flowing through the pipe is not a consideration, a single flare bevel groove weld and/or less than a full circumference of weld may be allowed to attach the restraint rings. Contact Victaulic for specific details. Each restraint ring shipment includes restraint ring placement and welding data that is specific to application or project requirements.
- (3) Restraint rings must be welded perpendicular to the pipe axis with a tolerance of  $\pm 1/16$  in.
- (4) 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. For a double flare bevel groove weld, the weld on the back side of the restraint ring must not extend beyond the outermost edge of the ring. The coupling shoulder must have unrestricted contact with the ring and the pipe O.D.

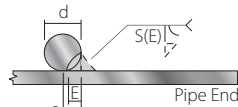
Note: The data in this table only applies when carbon steel couplings are being used on carbon steel pipe.

# Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

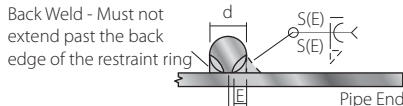
## RESTRAINT RINGS



Type 2 - Restraint Ring Location



Restraint Ring Single Flare Bevel Groove Weld Detail



Restraint Ring Double Flare Bevel Groove Weld Detail

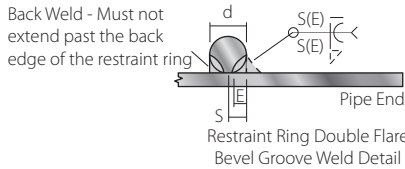
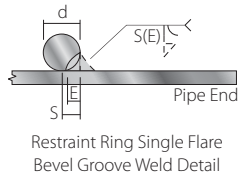
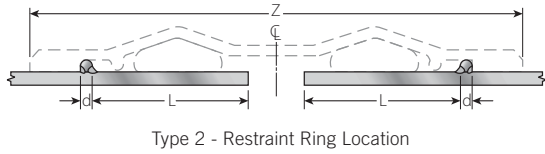
| Nominal Pipe Size<br>In./mm | (1)<br>Maximum Working Pressure<br>psi/kPa | (2)<br>Body Type | Width (Z)<br>In./mm | Restraint Ring      |                        |                      |
|-----------------------------|--|------------------|---------------------|---------------------|------------------------|----------------------|
|                             |  |                  |                     | Diameter (d)<br>In. | Location (L)<br>In./mm | Weld Size (E)<br>In. |
| 48<br>1200                  | 100<br>690                                 | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 150<br>1035                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 250<br>1725                                | 2                | 14.75<br>374.7      | 1/2                 | 4.38<br>111.1          | 5/32                 |
|                             | 300<br>2065                                | 2                | 15.00<br>381.0      | 5/8                 | 4.38<br>111.1          | 7/32                 |
| 54<br>1350                  | 150<br>1035                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 200<br>1375                                | 2                | 14.75<br>374.7      | 1/2                 | 4.38<br>111.1          | 5/32                 |
|                             | 250<br>1725                                | 2                | 15.00<br>381.0      | 5/8                 | 4.38<br>111.1          | 7/32                 |
| 60<br>1500                  | 150<br>1035                                | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 200<br>1375                                | 2                | 14.75<br>374.7      | 1/2                 | 4.38<br>111.1          | 5/32                 |
|                             | 250<br>1725                                | 2                | 15.00<br>381.0      | 5/8                 | 4.38<br>111.1          | 7/32                 |
| 66<br>1650                  | 100<br>690                                 | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 150<br>1035                                | 2                | 14.75<br>374.7      | 1/2                 | 4.38<br>111.1          | 5/32                 |
|                             | 200<br>1375                                | 2                | 15.00<br>381.0      | 5/8                 | 4.38<br>111.1          | 7/32                 |
| 72<br>1800                  | 100<br>690                                 | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 150<br>1035                                | 2                | 14.75<br>374.7      | 1/2                 | 4.38<br>111.1          | 5/32                 |
|                             | 200<br>1375                                | 2                | 15.00<br>381.0      | 5/8                 | 4.38<br>111.1          | 7/32                 |
| 78<br>1950                  | 100<br>690                                 | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 150<br>1035                                | 2                | 14.75<br>374.7      | 1/2                 | 4.38<br>111.1          | 5/32                 |
|                             | 175<br>1200                                | 2                | 15.00<br>381.0      | 5/8                 | 4.38<br>111.1          | 7/32                 |
| 84<br>2100                  | 100<br>690                                 | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 150<br>1035                                | 2                | 14.75<br>374.7      | 1/2                 | 4.38<br>111.1          | 5/32                 |
|                             | 175<br>1200                                | 2                | 15.00<br>381.0      | 5/8                 | 4.38<br>111.1          | 7/32                 |
| 90<br>2250                  | 100<br>690                                 | 2                | 12.50<br>317.5      | 3/8                 | 3.88<br>98.4           | 1/8                  |
|                             | 125<br>860                                 | 2                | 14.75<br>374.7      | 1/2                 | 4.38<br>111.1          | 5/32                 |
|                             | 150<br>1035                                | 2                | 15.00<br>381.0      | 5/8                 | 4.38<br>111.1          | 7/32                 |

- (1) For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
- (2) For applications other than air or gas, where a liquid or other medium is flowing through pipe, restraint ring weld requirements are as follows:  
 Type 2 couplings require a full circumferential double flare bevel groove weld based on the weld sizes shown in the table. For low pressure air or gas applications, where the weight of the medium flowing through the pipe is not a consideration, a single flare bevel groove weld and/or less than a full circumference of weld may be allowed to attach the restraint rings. Contact Victaulic for specific details. Each restraint ring shipment includes restraint ring placement and welding data that is specific to application or project requirements.
- (3) Restraint rings must be welded perpendicular to the pipe axis with a tolerance of  $L \pm \frac{1}{16} \times 1.6$  mm.
- (4) 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. For a double flare bevel groove weld, the weld on the back side of the restraint ring must not extend beyond the outermost edge of the ring. The coupling shoulder must have unrestricted contact with the ring and the pipe O.D.

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

# Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

## RESTRAINT RINGS



| Nominal Pipe Size In./mm | (1) Maximum Working Pressure psi/kPa | (2) Body Type | Width (Z) In./mm | Restrained Ring  |                         |                       |
|--------------------------|--------------------------------------|---------------|------------------|------------------|-------------------------|-----------------------|
|                          |                                      |               |                  | Diameter (d) In. | (3) Location (L) In./mm | (4) Weld Size (E) In. |
| 96<br>2400               | 100<br>690                           | 2             | 12.50<br>317.5   | 3/8              | 3.88<br>98.4            | 1/8                   |
|                          | 125<br>860                           | 2             | 14.75<br>374.7   | 1/2              | 4.38<br>111.1           | 5/32                  |
|                          | 150<br>1035                          | 2             | 15.00<br>381.0   | 5/8              | 4.38<br>111.1           | 7/32                  |
| 108<br>2700              | 75<br>515                            | 2             | 12.50<br>317.5   | 3/8              | 3.88<br>98.4            | 1/8                   |
|                          | 100<br>690                           | 2             | 14.75<br>374.7   | 1/2              | 4.38<br>111.1           | 5/32                  |
|                          | 125<br>860                           | 2             | 15.00<br>381.0   | 5/8              | 4.38<br>111.1           | 7/32                  |
| 120<br>3000              | 75<br>515                            | 2             | 12.50<br>317.5   | 3/8              | 3.88<br>98.4            | 1/8                   |
|                          | 100<br>690                           | 2             | 14.75<br>374.7   | 1/2              | 4.38<br>111.1           | 5/32                  |
|                          | 125<br>860                           | 2             | 15.00<br>381.0   | 5/8              | 4.38<br>111.1           | 7/32                  |
| 144<br>3600              | 50<br>345                            | 2             | 12.50<br>317.5   | 3/8              | 3.88<br>98.4            | 1/8                   |
|                          | 75<br>515                            | 2             | 14.75<br>374.7   | 1/2              | 4.38<br>111.1           | 5/32                  |
|                          | 100<br>690                           | 2             | 15.00<br>381.0   | 5/8              | 4.38<br>111.1           | 7/32                  |

- (1) For allowable test or transient pressure, the maximum working pressure may be increased to 1½ times the values shown.
- (2) For applications other than air or gas, where a liquid or other medium is flowing through pipe, restraint ring weld requirements are as follows:  
Type 2 couplings require a full circumferential double flare bevel groove weld based on the weld sizes shown in the table. For low pressure air or gas applications, where the weight of the medium flowing through the pipe is not a consideration, a single flare bevel groove weld and/or less than a full circumference of weld may be allowed to attach the restraint rings. Contact Victaulic for specific details. Each restraint ring shipment includes restraint ring placement and welding data that is specific to application or project requirements.
- (3) Restraint rings must be welded perpendicular to the pipe axis with a tolerance of  $\pm 1/16 \pm 1.6$  mm.
- (4) 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. For a double flare bevel groove weld, the weld on the back side of the restraint ring must not extend beyond the outermost edge of the ring. The coupling shoulder must have unrestricted contact with the ring and the pipe O.D.

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

## Style 233 Restrained Flexible Coupling For Dynamic Joint Deflection

### 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  $\frac{3}{16}$ " or less

### Hydraulic Tools

- CTH-01\*: for use on 12" body widths with thickness of  $\frac{1}{4}$ " 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 233 Restrained Flexible Coupling For Dynamic Joint Deflection

## PRODUCT CONFIGURATOR

**C 0233 0144 50 S 2 D E P S SO**

| Class | Style | Actual Pipe O.D.*   |  | Body Type  | Segments           | PSI/kPa Rating   | Rubber Compound   | Paint  | Hardware                                      | Ring and Pipe Material  |
|-------|-------|---------------------|--|------------|--------------------|--|---|--|---|---|
|       |       | Inches <sup>^</sup> | Fraction   |            |                    |  |   |  |   |   |
| C     | 0233  | 0007 through 0150   | 00 - 0<br>13 - 1/8<br>25 - 1/4<br>38 - 3/8<br>50 - 1/2<br>63 - 5/8<br>75 - 3/4<br>88 - 7/8 | S - Carbon | 1 - One<br>2 - Two | A - 25/170<br>B - 50/345<br>C - 75/515<br>D - 100/690<br>E - 125/860<br>F - 150/1035<br>G - 175/1200<br>H - 200/1375<br>J - 250/1725<br>K - 300/2056 | E - EPDM<br>I - Isoprene<br>L - Silicone<br>T - Nitrile<br>V - Neoprene<br>O - Fluoro-elastomer | F - Fusion bonded epoxy<br>P - Orange enamel<br>T - Shop primer<br>B - Liquid epoxy<br>N - Fusion bonded nylon<br>G - Galvanized<br>0 - None | S - Carbon<br>X - Stainless<br>G - Galvanized | SO - Carbon Steel Ring on Carbon Steel Pipe<br>DO - Carbon Steel Ring on Ductile Iron Pipe<br>XO - Stainless Steel Ring on Stainless Steel Pipe |

<sup>^</sup> Couplings are available in a range of nominal sizes from 8 - 144".  
 \* For actual pipe O.D. round down to the nearest 1/8" to determine proper coupling size required.

## 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 233 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.

Victaulic offers a dished head assembly prepared with a restraint ring for the Style 233 coupling for field testing a section of pipeline or to end a pipeline and allow for future expansion. Contact Victaulic for details.

For complete contact information, visit [www.victaulic.com](http://www.victaulic.com)

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