

# **A.C.T. PIPE AND SUPPLY**

*1400 Grand Avenue Parkway  
Pflugerville, Texas 78660*

## **WATER SUBMITTALS**

Project:

**JARO NORTH UNIT 1**

**SEGUIN, TX**

Prepared For:

**V K KNOWLTON**

Submitted By: Hannah Thompson  
If you have any questions please call (512) 252-7030

# WATER

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PVC WATER PIPE  
(4" - 16" DIAMETER)  
(JM-EAGLE / WESTLAKE)

# Blue Brute | C900

PRESSURE-RATED PVC PIPE



AWWA C900-16, CSA B137.3  
ASTM D1784 Cell Class 12454  
ANSI/NSF 61/14, UL 1285

Gasket: ASTM F477  
Joint: ASTM D3139



DELIVERING GOOD WATER TO YOU

## MARKETS



Potable



Irrigation



Reclaim



Sewer

## DESCRIPTION



### Available Pipe Sizes (CIOD)

4", 6", 8", 10", 12", 14", 16", 18", 20", 24", 30", 36", 42", 48"

Nominal Laying length = 20 feet (Laying length tolerances are in accordance with AWWA and CSA standards)

Color:

☒ Blue

☐ Green

☐ Purple

☐ White

### AWWA C900-16

|         |           |
|---------|-----------|
| 305 psi | (DR 14)   |
| 235 psi | (DR 18)   |
| 200 psi | (DR 21)   |
| 165 psi | (DR 25)   |
| 125 psi | (DR 32.5) |
| 100 psi | (DR 41)   |
| 80 psi  | (DR 51)   |

Note: FM Approvals Pressure Class 185 psi for DR18 and 250 psi for DR14.

### CSA B137.3

|         |         |
|---------|---------|
| 309 psi | (DR 14) |
| 235 psi | (DR 18) |
| 167 psi | (DR 25) |



## BENEFITS

### INSTALLATION



Field-cut with a power saw or handsaw; bevel without complicated machinery.

Does not need lining, wrapping, coating, or cathodic protection to prevent galvanic corrosion.

### FEATURES



Corrosive resistant, safe, long-lasting, and stable solution for a modern infrastructure.

Consistency in carrying capacity (flow coefficient, C=150), for savings in pumping costs, and size of the pipe.





# Blue Brute | C900

PRESSURE-RATED PVC PIPE



DELIVERING GOOD WATER TO YOU

## SUBMITTAL AND DATA SHEET

| PIPE SIZE (IN)                    | AVERAGE O.D. (IN) | NOM. I.D. (IN) | MIN. T. (IN) | APPROX. E <sub>1</sub> (IN) | APPROX. E <sub>2</sub> (IN) | APPROX. D' (IN) | APPROX. WGT (LBS/FT) |
|-----------------------------------|-------------------|----------------|--------------|-----------------------------|-----------------------------|-----------------|----------------------|
| PRESSURE CLASS 305 psi (DR 14)    |                   |                |              |                             |                             |                 |                      |
| PIPE STIFFNESS: 815 psi           |                   |                |              |                             |                             |                 |                      |
| 4                                 | 4.80              | 4.07           | 0.343        | 4.5                         | 5.5                         | 6.365           | 3.2                  |
| 6                                 | 6.90              | 5.86           | 0.493        | 5.25                        | 6.25                        | 8.887           | 6.7                  |
| 8                                 | 9.05              | 7.68           | 0.646        | 6.25                        | 7.25                        | 11.499          | 11.6                 |
| 10                                | 11.10             | 9.42           | 0.793        | 7.25                        | 8.25                        | 14.072          | 17.6                 |
| 12                                | 13.20             | 11.20          | 0.943        | 8.25                        | 9.25                        | 16.57           | 25.1                 |
| 16                                | 17.40             | 14.85          | 1.242        | 7.25                        | 8.75                        | 21.637          | 43.77                |
| 24                                | 25.80             | 21.89          | 1.843        | 9.75                        | 11.25                       | 31.958          | 98.33                |
| PRESSURE CLASS 235 psi (DR 18)    |                   |                |              |                             |                             |                 |                      |
| PIPE STIFFNESS: 364 psi           |                   |                |              |                             |                             |                 |                      |
| 4                                 | 4.80              | 4.23           | 0.267        | 4.5                         | 5.5                         | 6.204           | 2.6                  |
| 6                                 | 6.90              | 6.09           | 0.383        | 5.25                        | 6.25                        | 8.654           | 5.3                  |
| 8                                 | 9.05              | 7.98           | 0.503        | 6.25                        | 7.25                        | 11.195          | 9.2                  |
| 10                                | 11.10             | 9.79           | 0.617        | 7.25                        | 8.25                        | 13.699          | 13.9                 |
| 12                                | 13.20             | 11.65          | 0.733        | 8.25                        | 9.25                        | 16.125          | 19.7                 |
| 14                                | 15.30             | 13.50          | 0.850        | 6.5                         | 8                           | 18.603          | 26.75                |
| 16                                | 17.40             | 15.35          | 0.967        | 7.25                        | 8.75                        | 21.135          | 34.86                |
| 18                                | 19.50             | 17.20          | 1.083        | 7.75                        | 9.25                        | 23.832          | 48.95                |
| 20                                | 21.60             | 19.06          | 1.200        | 8.75                        | 10.25                       | 26.107          | 54.22                |
| 24                                | 25.80             | 22.76          | 1.433        | 9.75                        | 11.25                       | 31.089          | 77.97                |
| 30                                | 32.00             | 28.23          | 1.778        | 11.5                        | 13.5                        | 38.264          | 117.82               |
| PRESSURE CLASS 200 psi (DR 21)*   |                   |                |              |                             |                             |                 |                      |
| PIPE STIFFNESS: 224 psi           |                   |                |              |                             |                             |                 |                      |
| 14                                | 15.30             | 13.75          | 0.729        | 6.5                         | 8                           | 18.347          | 23.07                |
| 16                                | 17.40             | 15.64          | 0.829        | 7.25                        | 8.75                        | 20.097          | 30.04                |
| 18                                | 19.50             | 17.53          | 0.929        | 7.75                        | 9.25                        | 23.505          | 37.27                |
| 20                                | 21.60             | 19.42          | 1.029        | 8.75                        | 10.25                       | 25.744          | 46.71                |
| 24                                | 25.80             | 23.19          | 1.229        | 9.75                        | 11.25                       | 30.656          | 67.53                |
| 30                                | 32.00             | 28.77          | 1.524        | 11.5                        | 13.5                        | 37.725          | 103.71               |
| 36                                | 38.30             | 34.43          | 1.824        | 13.25                       | 15.25                       | 44.753          | 152.16               |
| PRESSURE CLASS 165 psi (DR 25)    |                   |                |              |                             |                             |                 |                      |
| PIPE STIFFNESS: 129 psi           |                   |                |              |                             |                             |                 |                      |
| 4                                 | 4.80              | 4.39           | 0.192        | 4.5                         | 5.5                         | 6.045           | 1.9                  |
| 6                                 | 6.90              | 6.31           | 0.276        | 5.25                        | 6.25                        | 8.427           | 3.9                  |
| 8                                 | 9.05              | 8.28           | 0.362        | 6.25                        | 7.25                        | 10.896          | 6.7                  |
| 10                                | 11.10             | 10.16          | 0.444        | 7.25                        | 8.25                        | 13.332          | 10.1                 |
| 12                                | 13.20             | 12.08          | 0.528        | 8.25                        | 9.25                        | 15.69           | 14.4                 |
| 14                                | 15.30             | 14.00          | 0.612        | 6.5                         | 8                           | 18.098          | 19.48                |
| 16                                | 17.40             | 15.92          | 0.696        | 7.25                        | 8.75                        | 20.561          | 25.38                |
| 18                                | 19.50             | 17.85          | 0.780        | 7.75                        | 9.25                        | 23.19           | 31.99                |
| 20                                | 21.60             | 19.77          | 0.864        | 8.75                        | 10.25                       | 25.395          | 39.46                |
| 24                                | 25.80             | 23.61          | 1.032        | 9.75                        | 11.25                       | 30.239          | 56.98                |
| 30                                | 32.00             | 29.29          | 1.280        | 11.5                        | 13.5                        | 37.208          | 88.49                |
| 36                                | 38.30             | 35.05          | 1.532        | 13.25                       | 15.25                       | 44.134          | 128.41               |
| 42                                | 44.50             | 40.73          | 1.780        | 15.5                        | 17.5                        | 51.56           | 176.02               |
| 48*                               | 50.80             | 46.49          | 2.032        | 16.5                        | 18.5                        | 58.393          | 231.22               |
| PRESSURE CLASS 125 psi (DR 32.5)* |                   |                |              |                             |                             |                 |                      |
| PIPE STIFFNESS: 57 psi            |                   |                |              |                             |                             |                 |                      |
| 14                                | 15.30             | 14.30          | 0.471        | 6.5                         | 8                           | 17.799          | 15.14                |
| 16                                | 17.40             | 16.27          | 0.535        | 7.25                        | 8.75                        | 20.219          | 19.63                |
| 18                                | 19.50             | 18.23          | 0.600        | 7.75                        | 9.25                        | 22.808          | 24.75                |
| 20                                | 21.60             | 20.19          | 0.665        | 8.75                        | 10.25                       | 24.973          | 30.54                |
| 24                                | 25.80             | 24.12          | 0.794        | 9.75                        | 11.25                       | 29.734          | 44.11                |
| 30                                | 32.00             | 29.91          | 0.985        | 11.5                        | 13.5                        | 36.582          | 68.45                |
| 36                                | 38.30             | 35.80          | 1.178        | 13.25                       | 15.25                       | 43.383          | 99.22                |
| 48                                | 50.80             | 47.49          | 1.563        | 16.5                        | 18.5                        | 57.399          | 178.49               |

| PIPE SIZE (IN)                 | AVERAGE O.D. (IN) | NOM. I.D. (IN) | MIN. T. (IN) | APPROX. E <sub>1</sub> (IN) | APPROX. E <sub>2</sub> (IN) | APPROX. D' (IN) | APPROX. WGT (LBS/FT) |
|--------------------------------|-------------------|----------------|--------------|-----------------------------|-----------------------------|-----------------|----------------------|
| PRESSURE CLASS 100 psi (DR 41) |                   |                |              |                             |                             |                 |                      |
| PIPE STIFFNESS: 28 psi         |                   |                |              |                             |                             |                 |                      |
| 14                             | 15.30             | 14.52          | 0.373        | 6.5                         | 8                           | 17.599          | 12.01                |
| 16                             | 17.40             | 16.51          | 0.424        | 7.25                        | 8.75                        | 19.992          | 15.63                |
| 18                             | 19.50             | 18.50          | 0.476        | 7.75                        | 9.25                        | 22.555          | 19.72                |
| 20                             | 21.60             | 20.49          | 0.527        | 8.75                        | 10.25                       | 24.691          | 24.31                |
| 24                             | 25.80             | 24.48          | 0.629        | 9.75                        | 11.25                       | 29.397          | 35.10                |
| 30                             | 32.00             | 30.35          | 0.780        | 11.5                        | 13.5                        | 36.163          | 54.65                |
| 36                             | 38.30             | 36.30          | 0.934        | 13.25                       | 15.25                       | 42.885          | 78.97                |
| 42                             | 44.50             | 42.18          | 1.085        | 15.5                        | 17.5                        | 50.108          | 108.19               |
| 48                             | 50.80             | 48.14          | 1.239        | 16.5                        | 18.5                        | 56.736          | 142.10               |
| PRESSURE CLASS 80 psi (DR 51)* |                   |                |              |                             |                             |                 |                      |
| PIPE STIFFNESS: 14 psi         |                   |                |              |                             |                             |                 |                      |
| 30                             | 32.00             | 30.67          | 0.627        | 11.5                        | 13.5                        | 35.836          | 44.08                |
| 36                             | 38.30             | 36.71          | 0.751        | 13.25                       | 15.25                       | 42.478          | 64.32                |
| 42                             | 44.50             | 42.65          | 0.872        | 15.5                        | 17.5                        | 49.652          | 88.10                |
| 48                             | 50.80             | 49.69          | 0.996        | 16.5                        | 18.5                        | 56.217          | 115.79               |

**Product Standard:** ANSI/AWWA C900-16

**CSA B137.3\*** (DR 18, 25, 4"-18"; DR 14, 4"-12")

**Pipe Compound:** ASTM D1784 Cell Class 12454

**Gasket:** ASTM F477

**Integral Bell Joint:** ASTM D3139

**Certifications:** ANSI/NSF 61, ANSI/NSF 14\*

UL 1285 (DR 14, 18, 25, up to 24"); FM 1612\* (DR 14 / DR 18; 4-12"), CSA B137.3\*

**Note:** FM Approvals Pressure Class 185 psi for DR 18 and 250 psi for DR 14.

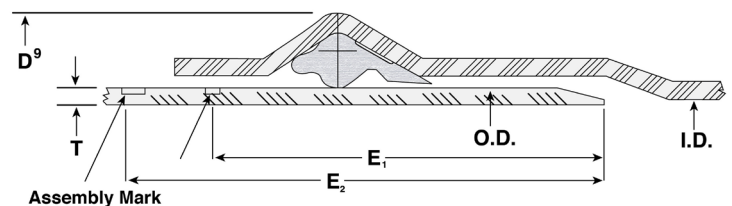
**Nominal Laying Length:** 20 feet

(Laying length tolerances with AWWA and/or CSA standards)

**Installation:** JM Eagle™ Blue Brute Installation Guide

Manning Coefficient (n) = 0.009 • Hazen-Williams Coefficient (c) = 150

\*Please call regarding availability.



**I.D.:** Inside Diameter

**O.D.:** Outside Diameter

**T:** Wall Thickness

**D9:** Bell Outside Diameter

**E<sub>1</sub>:** Distance between 1st Insertion/Assembly Mark to the end of spigot.

**E<sub>2</sub>:** Distance between 2nd Insertion/Assembly Mark to the end of spigot.



This information may have been updated. Please visit [www.jmeagle.com](http://www.jmeagle.com) for all updated information and warranty details.

**CUSTOMER SERVICE: 1.800.621.4404**

**THIS PRODUCT IS MADE IN AMERICA**

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## C900/RJ Certa-Lok® PVC Pressure Pipe Certification

C900/RJ Certa-Lok® PVC Pressure Pipe (sizes 4" through 24"; DR 25, DR 21, DR 18 and DR 14), provided by Westlake Pipe & Fittings, is manufactured in accordance with the dimensions, materials, quality control, and marking specifications found in **AWWA C900-16**. The PVC pipe and 4" – 12" PVC coupling material conforms to a minimum cell classification of 12454 as defined by **ASTM D1784**. The pipe and PVC coupling compounds are listed in **PPI TR-4** as a Standard Grade material with a Hydrostatic Design Basis (HDB) of 4000 psi. Couplings for sizes 14" – 24" are made from a glass fiber reinforced resin composite. The standard pipe laying length is 20 or 40 feet.

The C900/RJ Certa-Lok pipe and coupling system provides a restrained joint by utilizing precision-machined grooves on the pipe spigot ends and in the coupling. When assembled, splines are inserted through entry holes in the coupling, resulting in a continuous circumferential restrained joint that locks the pipe and coupling together. Flexible elastomeric gaskets located in grooves on both sides of the coupling provide a hydraulic pressure seal.

C900/RJ Certa-Lok pipe joints meet the requirements of **ASTM D3139**. All products are supplied with isoprene/styrene-butadiene rubber blend (IR/SBR) gaskets. Acrylonitrile butadiene rubber (NBR) gaskets are available as optional upgrades for some sizes. All gasket material options meet the requirements of **ASTM F477**.

### Potable Water Applications

Pipe supplied for potable water applications is blue in color. Couplings supplied are white (PVC) or tan (fiberglass) in color. The gasket material used by our vendors as well as C900/RJ Certa-Lok potable water pipe and couplings using those gaskets are listed by NSF International and Underwriters Laboratory per the table below.

| Gasket Material Option | Certifications of Gasket Material by Vendor |                                    | Certifications of Westlake Pipe & Fittings C900/RJ Pipe with Gasket Material Option |                                    |                                    |
|------------------------|---|------------------------------------|---|------------------------------------|------------------------------------|
|                        | NSF 61                                      | NSF 14*                            | NSF 61  | NSF 14                             | UL 1285                            |
| IR/SBR                 | All sizes & classes                         | DR 18: 4" – 12"<br>DR 14: 4" – 12" | All sizes & classes   | DR 18: 4" – 12"<br>DR 14: 4" – 12" | DR 18: 4" – 12"<br>DR 14: 4" – 12" |
| NBR                    | DR 18: 4" – 12"<br>DR 14: 4" – 12"          |                                    | DR 18: 4" – 12"<br>DR 14: 4" – 12"  |                                    |                                    |

\* = Includes certification that gaskets meet the requirements of **ASTM F477**.

### Sewer Applications

Pipe supplied for sewer applications is green in color and not listed by Underwriters Laboratories or NSF International. Couplings supplied are white (PVC) or tan (fiberglass) in color.

### Reclaimed Water Applications

Pipe supplied for reclaimed water applications is purple in color and not listed by Underwriters Laboratories or NSF International. Couplings supplied are white (PVC) or tan (fiberglass) in color.

Certifications are based on the applicable edition of the referenced standard in effect on the date of manufacture. If we may be of further assistance, please contact Technical Services at [technical@westlakepipe.com](mailto:technical@westlakepipe.com).

Sincerely,



Joshua E. Clapper  
Director, Product Marketing, Marketing and Development

#### Reference Standards:

- **AWWA C900-16** *Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. (100 mm Through 1500 mm)*
- **ASTM D1784** *Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds*
- **ASTM D3139** *Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals*
- **ASTM F477** *Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe*
- **NSF 14** *Plastics Piping System Components and Related Materials*
- **NSF 61** *Drinking Water Components – Health Effects*
- **PPI TR-4** *HDB/HDS/SDB/PDB/MRS Listed Materials*
- **UL 1285** *Pipe and Couplings, Polyvinyl Chloride (PVC), and Oriented Polyvinyl Chloride (PVCO) for Underground Fire Service*

TRACER WIRE  
(SOUTHWIRE)

# COPPER TRACER WIRE

## OPTIONS AT A GLANCE

### BLUE INSULATION



### RED INSULATION



### ORANGE INSULATION



## APPLICATIONS

- Used as tracer wire to locate buried conduit
- 30 volt constructions suitable for direct burial
- 30 or 600 volt depending on insulation thickness

## CONSTRUCTION DETAILS


- Soft drawn copper solid conductor
  - 16 AWG to 8 AWG
- Insulated with high molecular weight polyethylene (HMWPE)
- Color options: Orange, yellow, black, red, blue, and green

## SPECIFICATIONS

Southwire's soft-drawn copper tracer wire meets or exceeds the following ASTM specifications:

- B 3: Soft or Annealed copper wire  
UL listed as tracer wire

## COLOR GUIDE

 Fiber Optic Cable

 CATV/Telephone

 Gas

 Electric

 Water

 Sewer



### 30V

| AWG | Conductor<br>Nominal O.D.<br>(in) | Insulation<br>Thickness<br>(in) | Overall<br>Nominal O.D.<br>(in) | Approximate<br>Weight<br>(lbs/ 1000 ft) |
|-----|-----------------------------------|---------------------------------|---------------------------------|---|
| 16  | 0.0508                            | 0.030                           | 0.111                           | 11                                      |
| 14  | 0.0641                            | 0.030                           | 0.124                           | 16                                      |
| 12  | 0.0808                            | 0.030                           | 0.141                           | 24                                      |
| 10  | 0.1019                            | 0.030                           | 0.162                           | 36                                      |
| 8   | 0.1280                            | 0.030                           | 0.189                           | 56                                      |

### 600V

| AWG | Conductor<br>Nominal O.D.<br>(in) | Insulation<br>Thickness (in) | Overall<br>Nominal O.D.<br>(in) | Approximate<br>Weight<br>(lbs/ 1000 ft) |
|-----|-----------------------------------|------------------------------|---------------------------------|---|
| 16  | 0.0508                            | 0.045                        | 0.141                           | 13                                      |
| 14  | 0.0641                            | 0.045                        | 0.154                           | 19                                      |
| 12  | 0.0808                            | 0.045                        | 0.171                           | 27                                      |
| 10  | 0.1019                            | 0.045                        | 0.192                           | 40                                      |
| 8   | 0.1280                            | 0.045                        | 0.219                           | 60                                      |



# DUCTILE IRON PIPE

## (US PIPE)



# TYTON JOINT®

Ductile Iron Pipe



## PIPE

FABRICATION

RESTRAINED JOINTS

FITTINGS

GASKETS

COATINGS & LININGS

# U.S. PIPE

**A QUIKRETE® COMPANY**

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**U.S.  
PIPE**

# GENERAL INFO

## PIPE 3"–64"

### ANSI/AWWA STANDARDS

#### **ANSI/AWWA C151/A21.5, Ductile Iron Pipe, Centrifugally Cast for Water.**

Ductile Iron Tyton Joint Pipe is centrifugally cast in metal molds in accordance with ANSI/AWWA C151/A21.5.

The asphaltic outside coating is in accordance with ANSI/AWWA C151/A21.51.

As specified in ANSI/AWWA C151/A21.51, pipe weights have been calculated using standard barrel weights and weights of bells being produced.

#### **ANSI/AWWA C104/A21.4, Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.**

The cement-mortar lining and inside coating are in accordance with ANSI/AWWA C104/ A21.4.

Special linings and/or coatings can be furnished for specific conditions.

#### **ANSI/AWWA C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.**

Tyton Gaskets are furnished in accordance with ANSI/AWWA C111/A21.11.

#### **ANSI/AWWA C105/A21.5, Polyethylene Encasement for Ductile Iron Pipe Systems.**

If specifiers and users believe that corrosive soils will be encountered where our products are to be installed, please refer to ANSI/AWWA C105/A21.5, for proper external protection procedures.

#### **ASTM A746-03 "Standard specification for Ductile Iron Gravity Sewer Pipe."**

#### **ASTM A716-08 "Standard Specification for Ductile Iron Culvert Pipe."**

#### **ASTM A536 "Standard Specification for Ductile Iron Castings."**

Tyton Joint is U.S. Pipe's trademark for pipe with a push-on type connection. Simplicity, sturdiness and watertightness are built into the system by design. Convincing proof of its worldwide acceptance is shown by the fact that more than 95% of the pipe now sold by U.S. Pipe is Tyton Joint.

Tyton Joint Pipe is available in sizes 3" through 64". Sizes 3" through 42" are available in nominal 18-foot laying lengths. 4" through 30" sizes, along with sizes 48" through 64", are available in nominal 20-foot laying lengths.

Tyton Joint Pipe in sizes 3" through 36" are UL listed, and sizes 3" through 24" are FM Approved.

When Tyton Joint Pipe is used for bridge crossings or other above-ground installations, each length of pipe must be supported in a manner to restrict both vertical and horizontal movement.

A Tyton Gasket and pipe lube are the only accessories required when installing Tyton Joint Pipe. It is a circular rubber gasket that has a modified bulb shape in cross section. Gaskets are furnished in accordance with ANSI/AWWA C111/A21.1. Composition and dimensions of the gasket have been carefully engineered to ensure a watertight and lasting seal. The standard Tyton Gasket is manufactured of SBR — styrene butadiene rubber. Gaskets of special elastomers may be ordered for special applications. The gasket contour and bell socket contour ensure that the gasket will remain seated during proper assembly of the pipe. When joint restraint is required for push-on joint pipe, two options are available from U.S. Pipe.

For joint restraint of 4" through 24", Field Lok 350 Gaskets may be used. Field Lok 350 Gaskets are rated for 350 psi in sizes 4" through 24". U.S. Pipe only recommends FIELD LOK 350 gaskets in U.S. Pipe's TYTON Joint pipe and will not warranty any other restrained gaskets in our pipe.

In addition, for 12" through 42" sizes, HDSS may be used. For 4" through 36" sizes, TR Flex Pipe and Fittings may be used, and for 30" through 64" sizes, HP Lok Pipe and Fittings may be used. TR Flex Pipe and Fittings are rated for working pressures for 350 psi in 4" through 24" sizes, 250 psi in sizes 30" through 36". For HP Lok Pipe and Fittings, the working pressure is 350 psi for 30" through 64". For higher pressure applications contact your U.S. Pipe representative. Complete details on Field Lok 350 Gaskets, TR Flex Pipe and Fittings, and HP Lok Pipe and Fittings can be found on our website, [www.uspipe.com](http://www.uspipe.com).

#### **NOTE:**

U.S. Pipe qualifies for Federal Procurement under Public Law No. 94-580, Section 6002, known as the Resource Recovery Act of 1976, since, due to modern technology, recycled iron and steel scrap are used to a large degree in our Ductile Iron Pipe production.

The plain end of the pipe is furnished beveled or with a quarter ellipse on the edge to allow assembly. More than 40 years of successful experience have proved its sealing capabilities. Hydrostatic tests have shown that the system will withstand pressures far in excess of rated pressures.

#### **NOTE:**

Each of the following is a nationally recognized standards organization: American National Standards Institute (ANSI), American Water Works Association (AWWA), American Society for Testing and Materials (ASTM), Underwriters Laboratories (UL), National Fire Protection Association (NFPA), National Sanitation Foundation (NSF), Factory Mutual (FM)

# ASSEMBLY INSTRUCTIONS

## INSERTION OF GASKET (Figure 1)

All foreign matter in the socket must be removed, i.e., mud, sand, cinders, gravel, pebbles, trash, frozen material, etc. The gasket seat should be thoroughly inspected to be certain it is clean. Foreign matter in the gasket seat may cause a leak. The gasket must be wiped clean with a clean cloth, flexed, and then placed into the socket with the rounded bulb end entering first. Looping the gasket in the initial insertion will facilitate seating the gasket heel evenly around the retainer seat. Verify the lead edge of the gasket is sitting below the bell throat. 3" through 12" sizes require only one loop. For larger sizes, additional loops may be required: 14" through 36", two to three loops; 42" through 54", four to six loops; 60" and 64", six or more loops. Evenly space the loops around the socket with each loop raised 4"–5" inches. After loops are established, push each loop down to finish installation of the gasket. When installing Tyton Joint Pipe in sub-freezing weather, the gaskets, prior to their use, must be kept at a temperature of at least 40°F by suitable means, such as storing in a heated area or keeping them immersed in a tank of warm water. If the gaskets are kept in warm water, they should be dried before placing in the pipe socket.

## APPLICATION OF LUBRICANT (Figure 2)

A thin film of Tyton Joint Lubricant should be applied to the inside surface of the gasket, which will come in contact with the plain end of the pipe. In warm, dry weather conditions, the lubricant can dry out, especially when applied to warm or hot pipe. It will be necessary to add a small amount of water to hydrate the lubricant. Only Tyton Joint Lubricant should be used. Spray-on lubricants should not be used, as they may not provide sufficient lubricity. The plain end of the pipe must be cleaned of all foreign matter on the outside from the end to the stripes. Frozen materials may cling to the pipe in cold weather and must be removed. A thin film of lubricant is applied to the outside of the plain end for about 3" back from the end. Do not allow the plain end to touch the ground or trench side after lubricating since foreign matter may adhere to the plain end and cause a leak.

## INITIAL ENTRY OF PLAIN END IN SOCKET (Figure 3)

The plain end of the pipe should be aligned and carefully entered into the socket until it just makes contact with the gasket. This is the starting position for the final assembly of the joint. Note the two painted stripes on the plain end.

## COMPLETELY ASSEMBLED JOINT (Figure 4)

Joint assembly should be completed by forcing the plain end of the entering pipe past the gasket (which is thereby compressed) until the plain end makes contact with the bottom of the socket. Note that the first painted stripe will have disappeared into the socket and the front edge of the second stripe will be approximately flush with the bell face. Joint deflection may be achieved after the pipe is fully inserted. If assembly is not accomplished with the application of reasonable force by the methods indicated, the plain end of the pipe should be removed to check for the proper positioning of the gasket, adequate lubrication, and removal of foreign matter in the joint.

## ASSEMBLY GUIDE

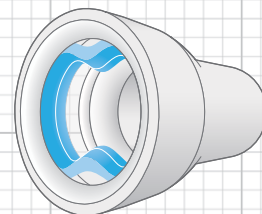


Figure 1

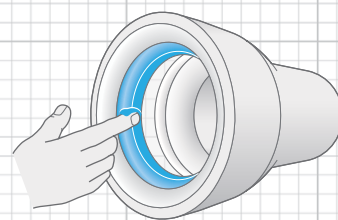


Figure 2

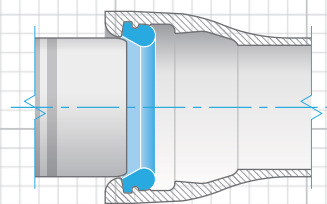


Figure 3

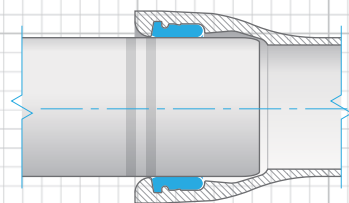


Figure 4

**NOTE:** When using Field Lok 350 Gaskets or pipe with special linings, assemble the joint until the inside edge of the first painted stripe (or the assembly mark) is flush with the bell face and to prevent damaging the cement lining or other special sewer linings.

**CAUTION:** The inside of the socket, the gasket, and the plain end to be inserted must be kept clean throughout the assembly. Joints are only as watertight as they are clean. If the joint is somewhat difficult to assemble, inspect for proper gasket positioning, adequate lubrication, and foreign matter in the joint.



# ASSEMBLY INSTRUCTIONS

## ALTERNATE METHODS OF ASSEMBLY

A feeler gage may be inserted between the bell and the plain end of the assembled joint to verify the position of the gasket. When the gage encounters the gasket, increased resistance will be felt. Note the depth of insertion of the gage. Continue probing around the periphery of the joint, noting the depth to resistance each time. If the depth of insertion is uniform, the gasket has remained in place. If, at any point, the depth of insertion increases significantly, this indicates a dislodged gasket. The joint should be disassembled, thoroughly cleaned with water, and examined for any condition that might have caused the gasket to become dislodged before attempting to reassemble the joint. *Backhoe Method of Assembly (8"-64" Pipe)*

A backhoe may be used to assemble pipe of intermediate and larger sizes. The plain end of the pipe should be carefully guided by hand into the bell of the previously assembled pipe. The bucket of the backhoe may then be used to carefully push the pipe until fully seated. A timber header should be used between the pipe and the backhoe bucket to avoid damage to the pipe. Caution: Avoid "slamming" the pipe home to prevent damage to lining material inside the bell at the back of the socket.

### **CROWBAR METHOD OF ASSEMBLY (3"-6" Pipe)**

Smaller sizes of pipe may be assembled using a crowbar as a lever and pushing against the face of the bell. See figure 5 below.

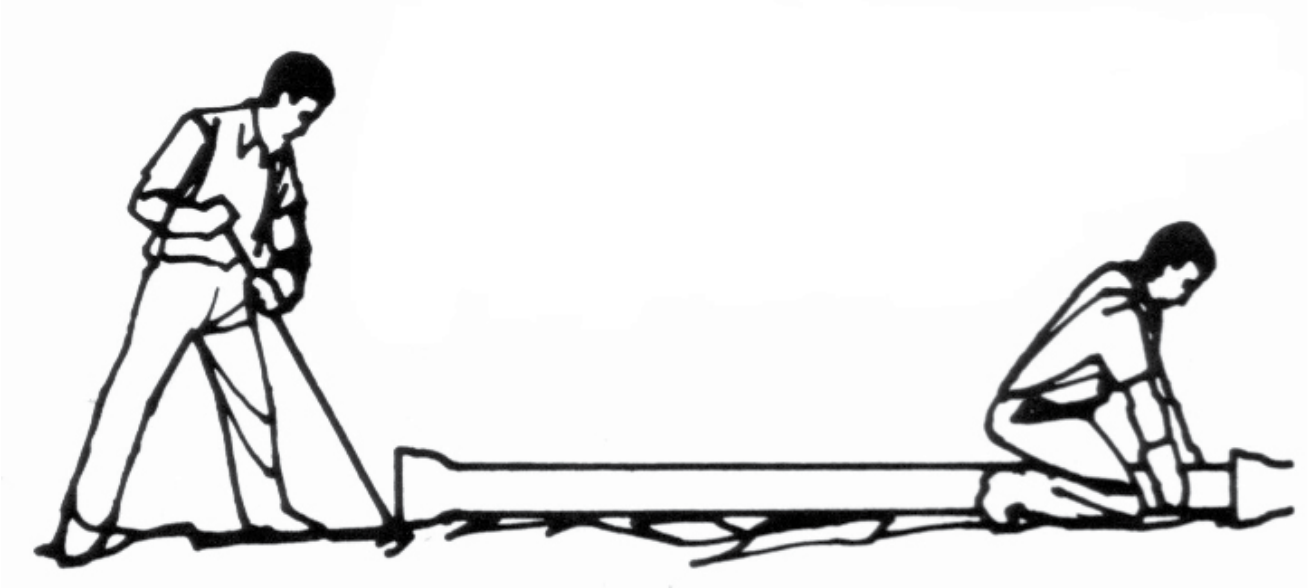


Figure 5

### **COME-A-LONG METHOD OF ASSEMBLY (3"-64" Pipe)**

Installers may prefer to use come-a-longs to assemble pipe of all sizes. This method is especially useful in tight or hard to reach locations. Two (2) 3/4-2 ton chain hoists, 24 feet of chain and two (2) bell choker slings for 3"-24" or two (2) 2-4 ton (*minimum*) chain hoists for 30"-64" sizes.

#### **NOTE:**

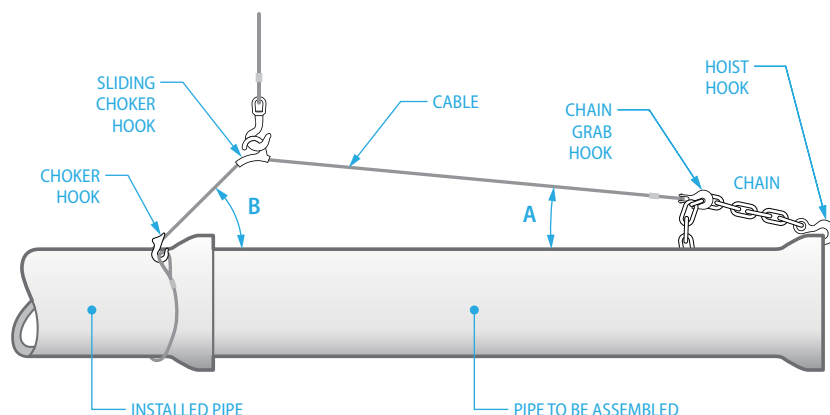
Procedures outlined in figures 1-4 on page 4, showing the assembly of Tyton Joint Pipe, should be followed before proceeding with the methods shown below.

# ASSEMBLY INSTRUCTIONS

## ALTERNATE METHODS OF ASSEMBLY

### SIDE ASSEMBLY

The most common field method of assembling larger diameter Tyton Joint Pipe is to use a backhoe to push against the face of the bell end of the pipe to be assembled. Occasionally, there are installations where a backhoe cannot be located in line with the pipe and it is, therefore, difficult to develop enough axial force to assemble the pipe. In such cases, it may be possible to use the method described below to assemble the pipe from the side of the trench. With this method, the weight of the pipe is used to provide the axial force required for assembly. In general, a choker chain or cable is hooked around the bell of the previously laid pipe. The spigot end of the pipe to be assembled is first inserted as far as possible into the bell end of the previously laid pipe. The end of the choker is then hooked into the bell end of the pipe to be laid.



One such rigging is made from a long cable with a choker on one end and a chain grab hook on the other end, with a sliding choker hook between the two other hooks. A second section of the rigging is a shorter chain with a wide throat hoisting hook on one end. The cable is first “choked” around the bell of the previously laid pipe using the fixed choker hook. The chain is hooked into the bell end of the pipe to be laid. The cable is hooked to the chain with the grab hook. The connected length of the rigging can thus be adjusted with the connection between the cable grab hook and the chain. The pipe assembly is made by lifting up on the sliding choker hook.

### A FEW RULES OF THUMB:

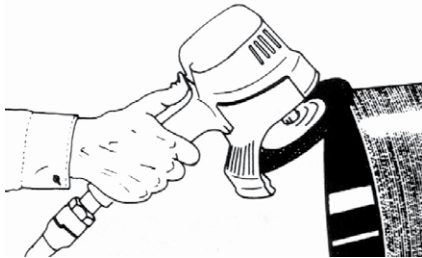
- Angle (A) should be no greater than 15 degrees.
- Angle (B) should be from 45 to 60 degrees.
- The sliding choker hook should be located from 2 to 8 feet from the bell of the previously laid pipe.
- Trial assembly may be made to get a “feel” for the correct amount of slack to be left in the rigging and the proper location of the sliding choker hook.

### A FEW PRECAUTIONS:

- The smaller the angle (A), the larger will be the assembly force and the tension in the rigging. The assembly force and the tension will generally range from 2 to 10 times the weight of the pipe being assembled. These forces are at a maximum when the assembly is bottomed out and lift is still being applied to the rigging. To minimize the loads on the rigging, it is recommended that the assembly be made slowly and the assembly stopped as soon as the joint is bottomed out.
- The rigging should be properly designed to accommodate the diameter, length, and weight of the pipe on the job and the loads previously described.
- This method should not be employed when installing Field Lok 350 Gaskets since alignment of the joint cannot be assured. For the proper installation practice, refer to U.S. Pipe brochure Field Lok 350 Gasket Joint Restraint for 4”–24” Ductile Iron Pipe for Water, Wastewater, Fire Protection and Industrial Applications.

# ASSEMBLY INSTRUCTIONS

## FILED-CUT PIPE



**NOTE:** When necessary, pipe may be rounded in accordance with U.S. Pipe's brochure, recommended methods for rounding the cut ends of out-of-round 14" and larger diameter ductile iron pipe.

When field cutting pipe up to 12" to within approximately 2 feet of the bell chime or closer, the pipe diameter should be measured with a diameter tape graduated in 100th's before cutting. Abrasive saws are commonly used to cut pipe in the field, the cut end may be readily conditioned so that it can be used to make up the next joint. The outside of the cut end should be beveled with a portable grinder or disk grinder, refer to a shop manufactured bevel as a guide for proper shape.

Additional grinding may be required to further bevel the pipe if difficulty in assembly of the joint is encountered. This operation removes any sharp, rough edges that otherwise might damage the gasket. The pipe must be cut as square as is practical. A field cut end that is not square may leak, especially if the joint is fully deflected. Measure from the factory manufactured spigot end to the desired cut location. Mark the measured distance around the diameter of the pipe at sufficient intervals to determine a square cut-line (*a line perpendicular to the axis of the pipe*). Scribe the square cut-line around the O.D. of the pipe. When ductile iron pipe 14" and larger is to be cut in the field, the material should be ordered as "Gauged Pipe." A Gauged Pipe is a pipe whose barrel circumference is within the spigot dimensional specifications as determined by diameter tape measurements over the pipe's length to within approximately 2 feet of the bell chime. Pipe that is "gauged" is specially marked to avoid confusion with a green paint stripe around the spigot and green paint on the bell face. ANSI/AWWA C151/A21.5 Standard for Ductile Iron pipe requires factory gauging of the spigot end. Accordingly, pipe selected for field cutting should also be field gauged in the location of the cut and ensured to be within the tolerances shown in Table 2. In the field a mechanical joint gland can be used as a gauging device, however, for accuracy it is recommended that a diameter tape graduated in 100th's be used.



# SPECIFICATIONS

## PIPE DIAMETER

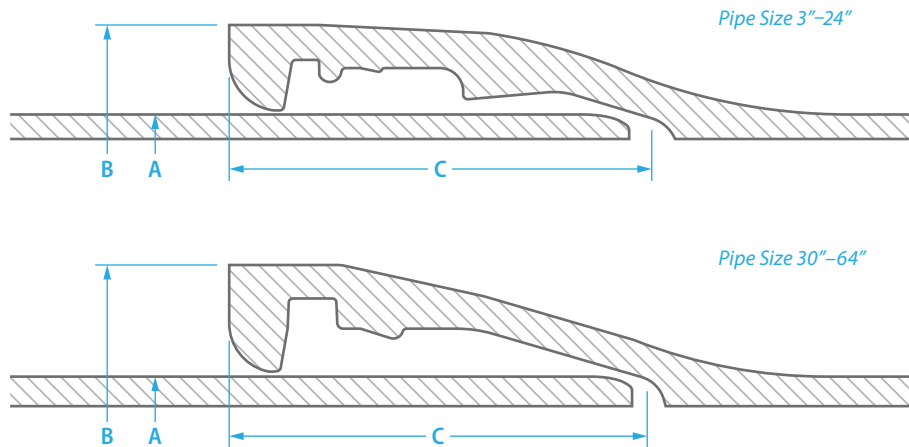
| INCH |               |         |
|------|---------------|---------|
| SIZE | PIPE DIAMETER |         |
|      | Minimum       | Maximum |
| 3    | 3.90          | 4.02    |
| 4    | 4.74          | 4.86    |
| 6    | 6.84          | 6.96    |
| 8    | 8.99          | 9.11    |
| 10   | 11.04         | 11.16   |
| 12   | 13.14         | 13.26   |
| 14   | 15.22         | 15.35   |
| 16   | 17.32         | 17.45   |
| 18   | 19.42         | 19.55   |
| 20   | 21.52         | 21.65   |
| 24   | 25.72         | 25.85   |
| 30   | 31.94         | 32.08   |
| 36   | 38.24         | 38.38   |
| 42   | 44.44         | 44.58   |
| 48   | 50.74         | 50.88   |
| 54   | 57.46         | 57.60   |
| 60   | 61.51         | 61.65   |
| 64   | 65.57         | 65.71   |

### NOTE:

For accuracy, a diameter tape graduated in 100th's must be used. Above table based on ANSI/AWWA C151/A21.51 guidelines for push-on joints.

# SPECIFICATIONS

## BELL DIMENSIONS



| INCHES |                     |                     |              |
|--------|---------------------|---------------------|--------------|
| SIZE   | PIPE OUTER DIAMETER | BELL OUTER DIAMETER | SOCKET DEPTH |
|        | A                   | B                   | C            |
| 3      | 3.96                | 5.56                | 3.00         |
| 4      | 4.80                | 6.52                | 3.15         |
| 6      | 6.90                | 8.66                | 3.38         |
| 8      | 9.05                | 10.82               | 3.69         |
| 10     | 11.10               | 12.91               | 3.75         |
| 12     | 13.20               | 15.05               | 3.75         |
| 14     | 15.30               | 17.67               | 5.00         |
| 16     | 17.40               | 19.79               | 5.00         |
| 18     | 19.50               | 21.91               | 5.00         |
| 20     | 21.60               | 24.03               | 5.50         |
| 24     | 25.80               | 28.21               | 5.95         |
| 30     | 32.00               | 35.40               | 6.55         |
| 36     | 38.30               | 41.84               | 7.00         |
| 42     | 44.50               | 49.36               | 7.90         |
| 48     | 50.80               | 55.94               | 8.60         |
| 54     | 57.56               | 63.38               | 9.40         |
| 60     | 61.61               | 67.38               | 10.10        |
| 64     | 65.67               | 71.56               | 10.65        |

### NOTE:

Actual bell configuration may vary from illustration shown. Subject to manufacturing tolerances.

# SPECIFICATIONS

## PRESSURE CLASS

| INCHES |                  |                             |      |      |      |                   |                    |
|--------|------------------|-----------------------------|------|------|------|-------------------|--------------------|
| SIZE   | OUTSIDE DIAMETER | NOMINAL THICKNESS           |      |      |      |                   | CASTING TOLERANCES |
|        |                  | Pressure Class <sup>a</sup> |      |      |      |                   |                    |
|        |                  | 150                         | 200  | 250  | 300  | 350               |                    |
| 3      | 3.96             | —                           | —    | —    | —    | —                 | c                  |
| 4      | 4.80             | —                           | —    | —    | —    | 0.25 <sup>b</sup> | 0.05               |
| 6      | 6.90             | —                           | —    | —    | —    | 0.25 <sup>b</sup> | 0.05               |
| 8      | 9.05             | —                           | —    | —    | —    | 0.25 <sup>b</sup> | 0.05               |
| 10     | 11.10            | —                           | —    | —    | —    | 0.26              | 0.06               |
| 12     | 13.20            | —                           | —    | —    | —    | 0.28              | 0.06               |
| 14     | 15.30            | —                           | —    | 0.28 | 0.30 | 0.31              | 0.07               |
| 16     | 17.40            | —                           | —    | 0.30 | 0.32 | 0.34              | 0.07               |
| 18     | 19.50            | —                           | —    | 0.31 | 0.34 | 0.36              | 0.07               |
| 20     | 21.60            | —                           | —    | 0.33 | 0.36 | 0.38              | 0.07               |
| 24     | 25.80            | —                           | 0.33 | 0.37 | 0.40 | 0.43              | 0.07               |
| 30     | 32.00            | 0.34                        | 0.38 | 0.42 | 0.45 | 0.49              | 0.07               |
| 36     | 38.30            | 0.38                        | 0.42 | 0.47 | 0.51 | 0.56              | 0.07               |
| 42     | 44.50            | 0.41                        | 0.47 | 0.52 | 0.57 | 0.63              | 0.07               |
| 48     | 50.80            | 0.46                        | 0.52 | 0.58 | 0.64 | 0.70              | 0.08               |
| 54     | 57.56            | 0.51                        | 0.58 | 0.65 | 0.72 | 0.79              | 0.09               |
| 60     | 61.61            | 0.54                        | 0.61 | 0.68 | 0.76 | 0.83              | 0.09               |
| 64     | 65.67            | 0.56                        | 0.64 | 0.72 | 0.80 | 0.87              | 0.09               |

### NOTE:

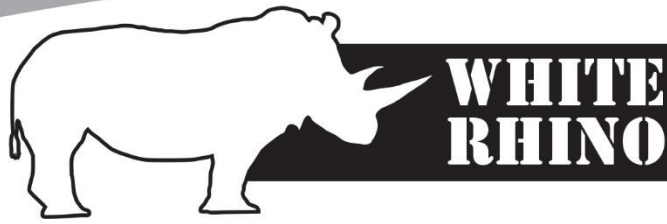
Per ANSI/AWWA C150/A21.50 the thickness in the above table includes the 0.08" service allowance and the casting tolerance by size ranges. Dimensions and weights of Special Classes (Thickness Classes) are found on pages 13, 14, 15 and 16.

<sup>a</sup> Pressure Classes are defined as the rated water pressure of the pipe in psi. The thickness shown is adequate for the rated water working pressure plus a surge allowance of 100 psi. Calculations are based on a minimum yield strength of 42,000 and a 2.0 safety factor times the sum of the working pressure and 100 psi surge allowance.

<sup>b</sup> Presently these are the lowest nominal thickness available in these sizes.

<sup>c</sup> See thickness class for 3".

**POLYETHYLENE  
ENCASEMENT FOR D.I. PIPE  
(MOUNTAIN STATES)**



## Linear Low Density Polyethylene Encasements for Ductile Iron Pipe - Printed

**Application:** Barrier encasement of ductile iron pipe to prevent corrosion  
**Raw Material:** Linear Low Density Polyethylene

**Group:** 2 (Linear)

### Finished Material

**Tensile Strength:** 4595 psi  
**Elongation:** 1126%  
**Dielectric Strength:** 1946 V/MIL  
**Impact Resistance:** 1189 grams  
**Tear Resistance:** 5539 grams force  
**Thickness:** 0.008 in. (8 MIL)  
**Color:** Available in Black, Blue, Green, Purple, and Clear

**Specification:** ANSI/AWWA C105/A21.5

**Recommendation:** DIPRA (Ductile Iron Pipe Research Association)

**Application:** Barrier encasement of ductile iron pipe to prevent corrosion

**Markings:** Material is printed with Spec number, pipe diameter range, year of manufacturing, manufacturing mark, and warning of corrosion protection/repair any damage.

Manufactured in the USA by Mountain States Plastics from virgin polyethylene.

# COMPACT DUCTILE IRON FITTINGS (STAR)



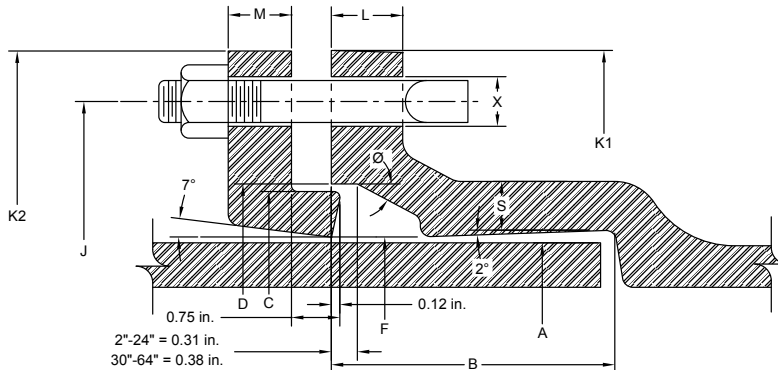
## Compact MJ Fittings

ANSI/AWWA C153/A21.53

## 2" - 64" DUCTILE IRON MECHANICAL JOINT COMPACT FITTINGS

## GENERAL SPECIFICATIONS

- MATERIAL:** Ductile Iron per ASTM A536
- PRESSURE:** 350 PSI rating for 2" - 24" sizes, 250 PSI rating for 30" - 48" sizes and 150 PSI rating for 54" - 64" sizes
- TESTING:** In accordance with ANSI/AWWA C153/A21.53, ANSI/AWWA C111/A21.11, UL and FM requirements
- LAYING LENGTH:** In accordance with ANSI/AWWA C153/A21.53 (fittings not listed in ANSI/AWWA have dimensions per Star design as noted in the catalog)
- DEFLECTION:** 2" - 4"=8° | 6"=7° | 8"-12"=5° | 14"-16"=3 1/2° | 18"-24"=3° | 30"-64"=2°
- WEIGHTS:** Are in pounds, unless noted otherwise and do not include accessories, cement lining and coating
- FLANGES:** Flanged ends on fittings match ANSI/AWWA C115/A21.15 and ANSI B16.1 class 125 flanges
- CEMENT LINING:** In accordance with ANSI/AWWA C104/A21.4 -- size 2" - 3" single thickness and sizes 4" - 64" double thickness. [Click here for a pressure jetting discussion](#) or visit [http://www.starpipeproducts.com/pressure\\_cleaning\\_guidelines.asp](http://www.starpipeproducts.com/pressure_cleaning_guidelines.asp).
- COATING:** Asphaltic seal coat inside and out in accordance with ANSI/AWWA C104/A21.4 and referenced in ANSI/AWWA C153/A21.53
- GASKETS:** SBR in accordance with ANSI/AWWA C111/A21.11 (see pg. 16)
- T-BOLTS/NUTS:** Low alloy steel in accordance with ANSI/AWWA C111/A21.11 (see pg. 18)
- APPROVALS:** 3" - 12" UL/ULC Listed | 2" and greater are UL/ANSI/NSF Standards 61 and 372 | 3" - 16" FM APPROVED. Please consult factory for detail listing and approvals.
- DIMENSIONS:** All dimensions are in inches unless noted otherwise. ([Click here for a short commentary on non-pressure sewer applications](#) or visit [http://www.starpipeproducts.com/non-pressure\\_sewer\\_applications.asp](http://www.starpipeproducts.com/non-pressure_sewer_applications.asp). Review commentary before ordering or installing fittings for this application.)
- INSTALLATION:** Per ANSI/AWWA C600 and C111 using DIP conforming to C150/C151 and PVC pipe conforming to C900/C905



## MECHANICAL JOINT DIMENSIONS

| NOM. SIZE | A DIA. | B    | C DIA. | D DIA. | F DIA. | J DIA. | K1 DIA. | K2 DIA. | L    | M    | S    | Ø   | X DIA. | BOLTS         |     |
|-----------|--------|------|--------|--------|--------|--------|---------|---------|------|------|------|-----|--------|---------------|-----|
|           |        |      |        |        |        |        |         |         |      |      |      |     |        | SIZE          | NO. |
| 2         | 2.50   | 2.50 | 3.39   | 3.50   | 2.61   | 4.75   | 6.19    | 6.25    | 0.58 | 0.62 | 0.36 | 28° | 3/4    | 5/8 x 3       | 2   |
| 3         | 3.96   | 2.50 | 4.84   | 4.94   | 4.06   | 6.19   | 7.62    | 7.69    | 0.58 | 0.62 | 0.39 | 28° | 3/4    | 5/8 x 3       | 4   |
| 4         | 4.80   | 2.50 | 5.92   | 6.02   | 4.90   | 7.50   | 9.06    | 9.12    | 0.60 | 0.75 | 0.39 | 28° | 7/8    | 3/4 x 3 1/2   | 4   |
| 6         | 6.90   | 2.50 | 8.02   | 8.12   | 7.00   | 9.50   | 11.06   | 11.12   | 0.63 | 0.88 | 0.43 | 28° | 7/8    | 3/4 x 3 1/2   | 6   |
| 8         | 9.05   | 2.50 | 10.17  | 10.27  | 9.15   | 11.75  | 13.31   | 13.37   | 0.66 | 1.00 | 0.45 | 28° | 7/8    | 3/4 x 3 1/2   | 6   |
| 10        | 11.10  | 2.50 | 12.22  | 12.34  | 11.20  | 14.00  | 15.62   | 15.62   | 0.70 | 1.00 | 0.47 | 28° | 7/8    | 3/4 x 3 1/2   | 8   |
| 12        | 13.20  | 2.50 | 14.32  | 14.44  | 13.30  | 16.25  | 17.88   | 17.88   | 0.73 | 1.00 | 0.49 | 28° | 7/8    | 3/4 x 3 1/2   | 8   |
| 14        | 15.30  | 3.50 | 16.40  | 16.54  | 15.44  | 18.75  | 20.25   | 20.25   | 0.79 | 1.25 | 0.55 | 28° | 7/8    | 3/4 x 4       | 10  |
| 16        | 17.40  | 3.50 | 18.50  | 18.64  | 17.54  | 21.00  | 22.50   | 22.50   | 0.85 | 1.31 | 0.58 | 28° | 7/8    | 3/4 x 4       | 12  |
| 18        | 19.50  | 3.50 | 20.60  | 20.74  | 19.64  | 23.25  | 24.83   | 24.75   | 1.00 | 1.38 | 0.68 | 28° | 7/8    | 3/4 x 4       | 12  |
| 20        | 21.60  | 3.50 | 22.70  | 22.84  | 21.74  | 25.50  | 27.08   | 27.00   | 1.02 | 1.44 | 0.69 | 28° | 7/8    | 3/4 x 4       | 14  |
| 24        | 25.80  | 3.50 | 26.90  | 27.04  | 25.94  | 30.00  | 31.58   | 31.50   | 1.02 | 1.56 | 0.75 | 28° | 7/8    | 3/4 x 4 1/2   | 16  |
| 30        | 32.00  | 4.00 | 33.29  | 33.46  | 32.17  | 36.88  | 39.12   | 39.12   | 1.31 | 2.00 | 0.82 | 20° | 1 1/8  | 1 x 5 1/2     | 20  |
| 36        | 38.30  | 4.00 | 39.59  | 39.76  | 38.47  | 43.75  | 46.00   | 46.00   | 1.45 | 2.00 | 1.00 | 20° | 1 1/8  | 1 x 5 1/2     | 24  |
| 42        | 44.50  | 4.00 | 45.79  | 45.96  | 44.67  | 50.62  | 53.12   | 53.12   | 1.45 | 2.00 | 1.25 | 20° | 1 3/8  | 1 1/4 x 6     | 28  |
| 48        | 50.80  | 4.00 | 52.09  | 52.26  | 50.97  | 57.50  | 60.00   | 60.00   | 1.45 | 2.00 | 1.35 | 20° | 1 3/8  | 1 1/4 x 6     | 32  |
| 54        | 57.56  | 4.00 | 58.82  | 59.02  | 57.73  | 63.20  | 65.70   | 65.70   | 1.88 | 2.00 | 1.50 | 20° | 1 3/8  | 1 1/4 x 6 1/2 | 36  |
| 60        | 61.61  | 4.00 | 62.87  | 63.07  | 61.78  | 67.72  | 70.22   | 70.22   | 1.88 | 2.00 | 1.55 | 20° | 1 3/8  | 1 1/4 x 6 1/2 | 36  |
| 64        | 65.67  | 4.00 | 66.96  | 67.13  | 65.84  | 71.86  | 74.36   | 74.36   | 1.88 | 2.00 | 1.62 | 20° | 1 3/8  | 1 1/4 x 6 1/2 | 38  |

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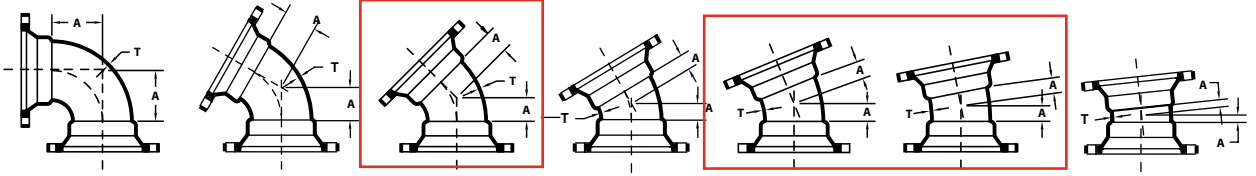
\* REGISTERED TRADEMARK OF STAR PIPE PRODUCTS



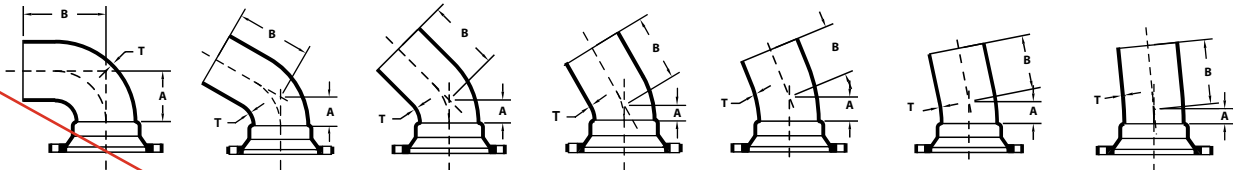


## Compact MJ Fittings

ANSI/AWWA C153/A21.53



| MJ x MJ BENDS |      | 90° MJ x MJ BENDS (1/4) |           | 60° MJ x MJ BENDS (1/6) |           | 45° MJ x MJ BENDS (1/8) |           | 30° MJ x MJ BENDS (1/12) |           | 22 1/2° MJ x MJ BENDS (1/16) |           | 11 1/4° MJ x MJ BENDS (1/32) |           | 5 5/8° MJ x MJ BENDS (1/64) |           |
|---------------|------|-------------------------|-----------|-------------------------|-----------|-------------------------|-----------|--------------------------|-----------|------------------------------|-----------|------------------------------|-----------|-----------------------------|-----------|
| NOM. SIZE     | T    | A                       | WT (LBS.) | A                       | WT (LBS.) | A                       | WT (LBS.) | A                        | WT (LBS.) | A                            | WT (LBS.) | A                            | WT (LBS.) | A                           | WT (LBS.) |
| 2             | 0.30 | 3.25                    | 14        | -                       | -         | 1.80                    | 13        | -                        | -         | 1.00                         | 9         | 1.00                         | 8         | -                           | -         |
| 3             | 0.33 | 3.50                    | 23        | -                       | -         | 1.50                    | 21        | -                        | -         | 1.00                         | 16        | 1.00                         | 14        | -                           | -         |
| 4             | 0.34 | 4.00                    | 27        | 3.00                    | 21        | 2.00                    | 23        | -                        | -         | 1.50                         | 18        | 1.25                         | 16        | 1.25                        | 16        |
| 6             | 0.36 | 5.00                    | 39        | 4.00                    | 35        | 3.00                    | 32        | -                        | -         | 2.00                         | 32        | 1.50                         | 30        | 1.50                        | 27        |
| 8             | 0.38 | 6.50                    | 57        | 4.50                    | 50        | 3.50                    | 46        | 3.00                     | 44        | 2.50                         | 46        | 1.75                         | 42        | 1.75                        | 38        |
| 10            | 0.40 | 7.50                    | 89        | -                       | -         | 4.50                    | 70        | -                        | -         | 3.00                         | 64        | 2.00                         | 58        | 2.00                        | 56        |
| 12            | 0.42 | 9.00                    | 108       | 6.50                    | 104       | 5.50                    | 98        | 4.00                     | 87        | 3.50                         | 84        | 2.25                         | 74        | 2.25                        | 73        |
| 14            | 0.47 | 11.50                   | 180       | -                       | -         | 5.00                    | 145       | -                        | -         | 3.75                         | 140       | 2.50                         | 128       | -                           | -         |
| 16            | 0.50 | 12.50                   | 264       | 7.50                    | 210       | 5.50                    | 202       | 4.50                     | 177       | 3.75                         | 178       | 2.50                         | 148       | 2.50                        | 150       |
| 18            | 0.54 | 14.00                   | 335       | -                       | -         | 6.00                    | 250       | -                        | -         | 4.50                         | 255       | 3.00                         | 205       | -                           | -         |
| 20            | 0.57 | 15.00                   | 400       | -                       | -         | 7.00                    | 305       | -                        | -         | 4.50                         | 262       | 3.00                         | 245       | 3.00                        | 239       |
| 24            | 0.61 | 17.00                   | 565       | 10.50                   | 479       | 7.50                    | 405       | 6.00                     | 385       | 4.50                         | 412       | 3.00                         | 315       | 3.00                        | 317       |
| 30            | 0.66 | 21.50                   | 1005      | 13.50                   | 843       | 11.50                   | 798       | 9.75                     | 692       | 6.75                         | 665       | 4.75                         | 568       | 4.75                        | 568       |
| 36            | 0.74 | 24.50                   | 1562      | 17.00                   | 1350      | 11.50                   | 1164      | 11.00                    | 1080      | 7.75                         | 960       | 5.00                         | 840       | 5.00                        | 825       |
| 42            | 0.82 | 29.25                   | 2506      | 19.00                   | 2150      | 14.00                   | 1792      | 12.00                    | 1465      | 9.00                         | 1350      | 6.00                         | 1319      | 6.00                        | 1125      |
| 48            | 0.90 | 33.25                   | 3045      | 21.00                   | 2650      | 15.00                   | 2390      | 13.25                    | 2075      | 10.00                        | 1886      | 6.50                         | 1700      | 6.50                        | 1600      |
| 54            | 1.05 | 37.00                   | 4023      | -                       | -         | 20.25                   | 3062      | -                        | -         | 10.25                        | 2198      | 5.00                         | 1711      | -                           | -         |
| 60            | 1.10 | 39.50                   | 4714      | -                       | -         | 21.25                   | 3487      | -                        | -         | 10.75                        | 2434      | 7.00                         | 2033      | -                           | -         |
| 64            | 1.16 | 42.00                   | 5508      | -                       | -         | 22.25                   | 4000      | -                        | -         | 11.00                        | 2727      | 7.00                         | 2245      | -                           | -         |

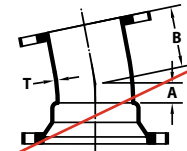
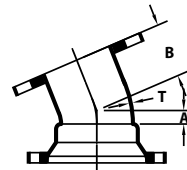
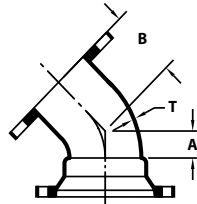
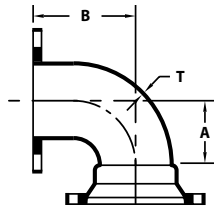


| MJ x PE BENDS |      | 90° MJ x PE BENDS (¼) |       |           | 60° MJ x PE BENDS (⅙) |       |           | 45° MJ x PE BENDS (⅛) |       |           | 30° MJ x PE BENDS (¹⁄₁₂) |       |           | 22 ½° MJ x PE BENDS (¹⁄₁₆) |       |           | 11 ¼° MJ x PE BENDS (¹⁄₃₂) |       |           | 5 5⁄8° MJ x PE BENDS (¹⁄₆₄) |       |           |
|---------------|------|-----------------------|-------|-----------|-----------------------|-------|-----------|-----------------------|-------|-----------|--------------------------|-------|-----------|----------------------------|-------|-----------|----------------------------|-------|-----------|-----------------------------|-------|-----------|
| NOM. SIZE     | T    | A                     | B     | WT (LBS.) | A                     | B     | WT (LBS.) | A                     | B     | WT (LBS.) | A                        | B     | WT (LBS.) | A                          | B     | WT (LBS.) | A                          | B     | WT (LBS.) | A                           | B     | WT (LBS.) |
| 3             | 0.33 | 3.50                  | 8.50  | 16        | -                     | -     | -         | 1.50                  | 7.00  | 13        | -                        | -     | -         | 1.00                       | 6.50  | 12        | 1.00                       | 6.50  | 12        | -                           | -     | -         |
| 4             | 0.34 | 4.00                  | 9.50  | 22        | -                     | -     | -         | 2.00                  | 7.50  | 19        | -                        | -     | -         | 1.50                       | 7.00  | 18        | 1.25                       | 6.25  | 17        | -                           | -     | -         |
| 6             | 0.36 | 5.00                  | 12.00 | 40        | -                     | -     | -         | 3.00                  | 8.50  | 31        | -                        | -     | -         | 2.00                       | 7.50  | 29        | 1.50                       | 7.00  | 27        | -                           | -     | -         |
| 8             | 0.38 | 6.50                  | 12.50 | 61        | -                     | -     | -         | 3.50                  | 9.00  | 46        | -                        | -     | -         | 2.50                       | 8.00  | 43        | 1.75                       | 7.25  | 39        | -                           | -     | -         |
| 10            | 0.40 | 7.50                  | 13.00 | 83        | -                     | -     | -         | 4.50                  | 10.00 | 68        | -                        | -     | -         | 3.00                       | 8.50  | 61        | 2.00                       | 7.50  | 52        | -                           | -     | -         |
| 12            | 0.42 | 9.00                  | 14.50 | 114       | -                     | -     | -         | 5.50                  | 11.00 | 95        | -                        | -     | -         | 3.50                       | 9.00  | 81        | 2.25                       | 7.75  | 70        | -                           | -     | -         |
| 14            | 0.47 | 11.50                 | 19.50 | 197       | -                     | -     | -         | 5.00                  | 13.00 | 148       | -                        | -     | -         | 3.75                       | 11.25 | 133       | 2.50                       | 10.50 | 122       | -                           | -     | -         |
| 16            | 0.50 | 12.50                 | 20.50 | 248       | -                     | -     | -         | 5.50                  | 13.50 | 184       | -                        | -     | -         | 3.75                       | 11.75 | 166       | 2.50                       | 10.50 | 148       | -                           | -     | -         |
| 18            | 0.54 | 14.00                 | 21.00 | 325       | -                     | -     | -         | 6.00                  | 13.00 | 235       | -                        | -     | -         | 6.00                       | 13.00 | 235       | 6.00                       | 13.00 | 235       | -                           | -     | -         |
| 20            | 0.57 | 15.00                 | 22.50 | 390       | -                     | -     | -         | 7.00                  | 14.00 | 300       | -                        | -     | -         | 7.00                       | 14.00 | 300       | 7.00                       | 14.00 | 300       | -                           | -     | -         |
| 24            | 0.61 | 17.00                 | 25.00 | 575       | -                     | -     | -         | 7.50                  | 14.50 | 390       | -                        | -     | -         | 7.50                       | 14.50 | 395       | 7.50                       | 14.50 | 400       | -                           | -     | -         |
| 30            | 0.66 | 22.75                 | 31.75 | 865       | 13.50                 | 22.50 | 846       | 10.50                 | 19.50 | 715       | 9.75                     | 18.75 | 762       | 6.75                       | 15.75 | 600       | 4.75                       | 13.75 | 535       | 4.75                        | 13.75 | 505       |
| 36            | 0.74 | 24.50                 | 33.50 | 1355      | -                     | -     | -         | 12.00                 | 21.00 | 1040      | -                        | -     | -         | 7.75                       | 16.75 | 865       | 5.00                       | 14.00 | 725       | -                           | -     | -         |
| 42            | 0.82 | 29.25                 | 38.25 | 2055      | -                     | -     | -         | 14.00                 | 23.00 | 1460      | -                        | -     | -         | 9.00                       | 18.00 | 1200      | 6.00                       | 15.00 | 1030      | -                           | -     | -         |
| 48            | 0.90 | 33.25                 | 42.25 | 2805      | -                     | -     | -         | 15.00                 | 24.00 | 1905      | -                        | -     | -         | 10.00                      | 19.00 | 1575      | 6.50                       | 15.50 | 1290      | -                           | -     | -         |

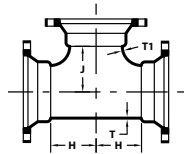
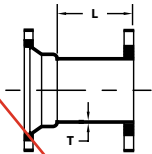


## Compact MJ Fittings

ANSI/AWWA C153/A21.53



| MJ x FE BENDS |      | 90° MJ x FE BENDS (1/4) |       |           | 45° MJ x FE BENDS (1/8) |       |           | 22 1/2° MJ x FE BENDS (1/16) |       |           | 11 1/4° MJ x FE BENDS (1/32) |       |           |
|---------------|------|-------------------------|-------|-----------|-------------------------|-------|-----------|------------------------------|-------|-----------|------------------------------|-------|-----------|
| NOM. SIZE     | T    | A                       | B     | WT (LBS.) | A                       | B     | WT (LBS.) | A                            | B     | WT (LBS.) | A                            | B     | WT (LBS.) |
| 3             | 0.33 | 3.50                    | 5.50  | 20        | 1.50                    | 3.00  | 17        | 1.00                         | 3.00  | 17        | 1.00                         | 3.00  | 15        |
| 4             | 0.34 | 4.00                    | 6.50  | 26        | 2.00                    | 4.00  | 24        | 1.50                         | 4.00  | 26        | 1.25                         | 4.00  | 19        |
| 6             | 0.36 | 5.00                    | 8.00  | 47        | 3.50                    | 5.00  | 40        | 2.00                         | 5.00  | 36        | 1.50                         | 5.00  | 30        |
| 8             | 0.38 | 6.50                    | 9.00  | 68        | 3.50                    | 5.50  | 57        | 2.50                         | 5.50  | 53        | 1.75                         | 5.50  | 50        |
| 10            | 0.40 | 7.50                    | 11.00 | 102       | 4.50                    | 6.50  | 83        | 3.00                         | 6.50  | 102       | 2.00                         | 6.50  | 75        |
| 12            | 0.42 | 9.00                    | 12.00 | 134       | 5.50                    | 7.50  | 110       | 3.50                         | 7.50  | 134       | 2.25                         | 7.50  | 88        |
| 14            | 0.47 | 11.50                   | 14.00 | 227       | 5.00                    | 7.50  | 207       | 3.75                         | 7.50  | 166       | ---                          | ---   | ---       |
| 16            | 0.50 | 12.50                   | 15.00 | 306       | 5.50                    | 8.00  | 239       | 3.75                         | 8.00  | 228       | ---                          | ---   | ---       |
| 18            | 0.54 | 14.00                   | 16.50 | 357       | 6.00                    | 8.50  | 268       | 4.50                         | 8.50  | 259       | 3.00                         | 8.50  | 247       |
| 20            | 0.57 | 15.00                   | 18.00 | 445       | 7.00                    | 9.50  | 339       | 4.50                         | 9.50  | 321       | 3.00                         | 9.50  | 307       |
| 24            | 0.61 | 17.00                   | 22.00 | 650       | 7.50                    | 11.00 | 474       | 4.50                         | 11.00 | 444       | 3.00                         | 11.00 | 427       |
| 30            | 0.66 | 21.50                   | 25.00 | 1070      | 10.50                   | 15.00 | 858       | ---                          | ---   | ---       | ---                          | ---   | ---       |
| 36            | 0.74 | 24.50                   | 28.00 | 1554      | 11.50                   | 18.00 | 1240      | 7.75                         | 18.00 | 1176      | 5.00                         | 18.00 | 1118      |
| 42            | 0.82 | 29.25                   | 31.00 | 2190      | 14.00                   | 21.00 | 1820      | ---                          | ---   | ---       | 6.00                         | 21.00 | 1627      |
| 48            | 0.90 | 33.25                   | 34.00 | 3015      | 15.00                   | 24.00 | 2421      | ---                          | ---   | ---       | ---                          | ---   | ---       |



| MJ x FLANGE ADAPTER |      |       |           |
|---------------------|------|-------|-----------|
| NOM. SIZE           | T    | L     | WT (LBS.) |
| 3                   | 0.33 | 3.50  | 13        |
| 4                   | 0.34 | 3.50  | 22        |
| 6                   | 0.36 | 3.50  | 32        |
| 8                   | 0.38 | 3.50  | 47        |
| 10                  | 0.40 | 4.00  | 66        |
| 12                  | 0.42 | 4.00  | 91        |
| 14                  | 0.47 | 5.00  | 141       |
| 16                  | 0.50 | 5.00  | 170       |
| 18                  | 0.54 | 5.00  | 176       |
| 20                  | 0.57 | 5.00  | 252       |
| 24                  | 0.61 | 5.00  | 320       |
| 30                  | 0.66 | 7.00  | 558       |
| 36                  | 0.74 | 8.50  | 796       |
| 42                  | 0.82 | 12.00 | 1180      |
| 48                  | 0.90 | 12.00 | 1499      |
| 54                  | 1.05 | 13.00 | 1900      |
| 60                  | 1.10 | 13.00 | 2163      |

| MJ x MJ TEES |      |      |      |      |           |
|--------------|------|------|------|------|-----------|
| NOM. SIZE    | T    | T1   | H    | J    | WT (LBS.) |
| 2 x 2        | 0.39 | 0.39 | 3.25 | 3.25 | 20        |
| 3 x 2        | 0.48 | 0.39 | 3.50 | 3.50 | 43        |
| 3 x 3        | 0.33 | 0.33 | 3.00 | 3.00 | 28        |
| 4 x 2        | 0.34 | 0.30 | 3.00 | 4.00 | 29        |
| 4 x 3        | 0.34 | 0.33 | 3.50 | 4.00 | 30        |
| 4 x 4        | 0.34 | 0.34 | 4.00 | 4.00 | 32        |
| 6 x 3        | 0.36 | 0.33 | 3.50 | 5.00 | 42        |
| 6 x 4        | 0.36 | 0.34 | 4.00 | 5.00 | 46        |
| 6 x 4 x 6    | 0.36 | 0.36 | 5.00 | 5.00 | 50        |
| 6 x 6        | 0.36 | 0.36 | 5.00 | 5.00 | 56        |
| 6 x 6 x 8    | 0.36 | 0.38 | 6.50 | 6.50 | 62        |
| 8 x 3        | 0.38 | 0.33 | 4.00 | 6.50 | 52        |
| 8 x 4        | 0.38 | 0.34 | 4.00 | 6.50 | 60        |
| 8 x 6        | 0.38 | 0.36 | 5.00 | 6.50 | 72        |
| 8 x 6 x 6    | 0.38 | 0.38 | 5.00 | 6.50 | 62        |
| 8 x 6 x 8    | 0.38 | 0.38 | 6.00 | 6.50 | 85        |
| 8 x 8        | 0.38 | 0.38 | 6.50 | 6.50 | 86        |
| 10 x 3       | 0.40 | 0.33 | 4.00 | 7.50 | 75        |
| 10 x 4       | 0.40 | 0.34 | 4.00 | 7.50 | 78        |
| 10 x 6       | 0.40 | 0.36 | 5.00 | 7.50 | 90        |
| 10 x 8       | 0.40 | 0.38 | 6.50 | 7.50 | 105       |
| 10 x 10      | 0.40 | 0.40 | 7.50 | 7.50 | 120       |
| 12 x 3       | 0.42 | 0.33 | 4.00 | 8.75 | 90        |
| 12 x 4       | 0.42 | 0.34 | 4.00 | 8.75 | 94        |

(Con't)

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\* REGISTERED TRADEMARK OF STAR PIPE PRODUCTS



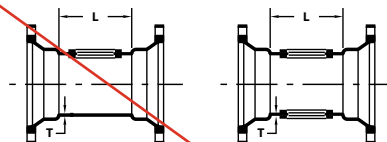
## Compact MJ Fittings

ANSI/AWWA C153/A21.53

| MJ x MJ TEES (Con't) |      |      |       |       |           |
|----------------------|------|------|-------|-------|-----------|
| NOM. SIZE            | T    | T1   | H     | J     | WT (LBS.) |
| 12 x 6               | 0.42 | 0.36 | 5.00  | 8.75  | 110       |
| 12 x 8               | 0.42 | 0.38 | 6.50  | 8.75  | 125       |
| 12 x 10              | 0.42 | 0.40 | 7.50  | 8.75  | 140       |
| 12 x 12              | 0.42 | 0.42 | 8.75  | 8.75  | 160       |
| 14 x 6               | 0.47 | 0.36 | 6.50  | 10.50 | 182       |
| 14 x 8               | 0.47 | 0.38 | 7.50  | 10.50 | 190       |
| 14 x 10              | 0.47 | 0.40 | 8.50  | 10.50 | 206       |
| 14 x 12              | 0.47 | 0.42 | 9.50  | 10.50 | 221       |
| 14 x 14              | 0.47 | 0.47 | 10.50 | 10.50 | 251       |
| 16 x 6               | 0.50 | 0.36 | 6.50  | 11.50 | 218       |
| 16 x 8               | 0.50 | 0.38 | 7.50  | 11.50 | 223       |
| 16 x 10              | 0.50 | 0.40 | 8.50  | 11.50 | 264       |
| 16 x 12              | 0.50 | 0.42 | 9.50  | 11.50 | 280       |
| 16 x 14              | 0.50 | 0.47 | 10.50 | 11.50 | 316       |
| 16 x 16              | 0.50 | 0.50 | 11.50 | 11.50 | 322       |
| 18 x 6               | 0.54 | 0.36 | 6.50  | 12.50 | 275       |
| 18 x 8               | 0.54 | 0.38 | 7.50  | 12.50 | 295       |
| 18 x 10              | 0.54 | 0.40 | 8.50  | 12.50 | 315       |
| 18 x 12              | 0.54 | 0.42 | 9.50  | 12.50 | 335       |
| 18 x 14              | 0.54 | 0.47 | 10.50 | 12.50 | 380       |
| 18 x 16              | 0.54 | 0.50 | 11.50 | 12.50 | 405       |
| 18 x 18              | 0.54 | 0.54 | 12.50 | 12.50 | 435       |
| 20 x 4               | 0.57 | 0.34 | 5.50  | 14.00 | 295       |
| 20 x 6               | 0.57 | 0.36 | 6.50  | 14.00 | 315       |
| 20 x 8               | 0.57 | 0.38 | 8.00  | 14.00 | 345       |
| 20 x 10              | 0.57 | 0.40 | 9.00  | 14.00 | 370       |
| 20 x 12              | 0.57 | 0.42 | 10.00 | 14.00 | 395       |
| 20 x 14              | 0.57 | 0.47 | 11.00 | 14.00 | 440       |
| 20 x 16              | 0.57 | 0.50 | 12.00 | 14.00 | 465       |
| 20 x 18              | 0.57 | 0.54 | 13.00 | 14.00 | 505       |
| 20 x 20              | 0.57 | 0.57 | 14.00 | 14.00 | 535       |
| 24 x 4               | 0.61 | 0.34 | 6.00  | 16.00 | 398       |
| 24 x 6               | 0.61 | 0.36 | 7.00  | 16.00 | 415       |
| 24 x 8               | 0.61 | 0.38 | 8.00  | 16.00 | 445       |
| 24 x 10              | 0.61 | 0.40 | 9.00  | 16.00 | 470       |
| 24 x 12              | 0.61 | 0.42 | 10.00 | 16.00 | 500       |
| 24 x 14              | 0.61 | 0.47 | 11.00 | 16.00 | 550       |
| 24 x 16              | 0.61 | 0.50 | 12.00 | 16.00 | 580       |
| 24 x 18              | 0.61 | 0.54 | 13.00 | 16.00 | 625       |
| 24 x 20              | 0.61 | 0.57 | 14.00 | 16.00 | 660       |
| 24 x 24              | 0.61 | 0.61 | 16.00 | 16.00 | 720       |
| 30 x 6               | 0.66 | 0.36 | 8.00  | 20.00 | 685       |
| 30 x 8               | 0.66 | 0.38 | 8.50  | 20.00 | 739       |
| 30 x 10              | 0.66 | 0.40 | 10.00 | 20.00 | 760       |
| 30 x 12              | 0.66 | 0.42 | 10.00 | 20.00 | 830       |
| 30 x 14              | 0.66 | 0.47 | 11.00 | 20.00 | 880       |
| 30 x 16              | 0.66 | 0.50 | 12.50 | 20.00 | 878       |
| 30 x 18              | 0.66 | 0.54 | 14.00 | 20.00 | 1039      |
| 30 x 20              | 0.66 | 0.57 | 15.00 | 20.00 | 1000      |
| 30 x 24              | 0.66 | 0.61 | 21.00 | 22.00 | 1389      |
| 30 x 30              | 0.66 | 0.66 | 20.00 | 20.00 | 1323      |
| 36 x 4               | 0.74 | 0.34 | 7.00  | 23.50 | 924       |
| 36 x 6               | 0.74 | 0.36 | 8.00  | 23.50 | 1045      |

(Con't)➔

| MJ x MJ TEES (Con't) |      |      |       |       |           |
|----------------------|------|------|-------|-------|-----------|
| NOM. SIZE            | T    | T1   | H     | J     | WT (LBS.) |
| 36 x 8               | 0.74 | 0.38 | 9.00  | 23.50 | 1095      |
| 36 x 10              | 0.74 | 0.40 | 9.00  | 23.50 | 1024      |
| 36 x 12              | 0.74 | 0.42 | 10.00 | 23.50 | 1072      |
| 36 x 14              | 0.74 | 0.47 | 11.00 | 23.50 | 1135      |
| 36 x 16              | 0.74 | 0.50 | 12.50 | 23.50 | 1210      |
| 36 x 18              | 0.74 | 0.54 | 13.00 | 23.50 | 1251      |
| 36 x 20              | 0.74 | 0.57 | 15.00 | 23.50 | 1350      |
| 36 x 24              | 0.74 | 0.61 | 16.00 | 23.50 | 1550      |
| 36 x 30              | 0.74 | 0.66 | 20.00 | 23.50 | 1986      |
| 36 x 36              | 0.74 | 0.74 | 23.50 | 23.50 | 2072      |
| 42 x 6               | 0.82 | 0.36 | 9.00  | 27.50 | 1366      |
| 42 x 8               | 0.82 | 0.38 | 9.00  | 27.50 | 1369      |
| 42 x 12              | 0.82 | 0.42 | 14.00 | 27.50 | 1885      |
| 42 x 16              | 0.82 | 0.50 | 13.00 | 27.50 | 1929      |
| 42 x 18              | 0.82 | 0.54 | 16.00 | 27.50 | 2072      |
| 42 x 20              | 0.82 | 0.57 | 18.00 | 27.50 | 1947      |
| 42 x 24              | 0.82 | 0.61 | 20.00 | 27.50 | 2270      |
| 42 x 30              | 0.82 | 0.66 | 22.00 | 29.50 | 2608      |
| 42 x 36              | 0.82 | 0.74 | 30.00 | 30.00 | 3000      |
| 42 x 42              | 0.82 | 0.82 | 30.00 | 30.00 | 3175      |
| 48 x 6               | 0.90 | 0.36 | 10.00 | 32.00 | 1949      |
| 48 x 12              | 0.90 | 0.42 | 14.00 | 32.00 | 2535      |
| 48 x 16              | 0.90 | 0.50 | 13.00 | 32.00 | 2657      |
| 48 x 18              | 0.90 | 0.54 | 16.00 | 32.00 | 2293      |
| 48 x 24              | 0.90 | 0.61 | 23.00 | 32.00 | 2870      |
| 48 x 30              | 0.90 | 0.66 | 23.00 | 32.00 | 3050      |
| 48 x 36              | 0.90 | 0.74 | 33.50 | 32.25 | 3900      |
| 48 x 42              | 0.90 | 0.82 | 33.50 | 33.50 | 4100      |
| 48 x 48              | 0.90 | 0.90 | 33.50 | 33.50 | 4250      |
| 54 x 20              | 1.05 | 0.57 | 23.00 | 37.00 | 3486      |
| 54 x 24              | 1.05 | 0.61 | 23.00 | 37.00 | 3505      |
| 54 x 30              | 1.05 | 0.66 | 29.30 | 37.00 | 4162      |
| 54 x 36              | 1.05 | 0.77 | 29.30 | 37.00 | 4257      |
| 54 x 42              | 1.05 | 0.88 | 31.00 | 39.00 | 4610      |
| 60 x 30              | 1.10 | 0.66 | 29.50 | 39.00 | 4648      |
| 64 x 64              | 1.16 | 1.16 | 43.30 | 43.30 | 7454      |



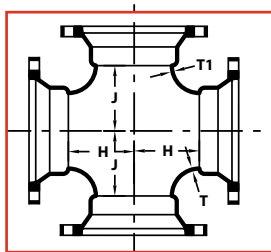
| MJ x MJ TAPPED TEES / CROSSES (2" TAP) |      |      |         |           |
|--|------|------|---------|-----------|
| NOM. SIZE                              | T    | L    | MAX TAP | WT (LBS.) |
| 3                                      | 0.33 | 6.00 | 2 ½     | 18        |
| 4                                      | 0.34 | 6.00 | 3       | 25        |
| 6                                      | 0.36 | 6.00 | 3       | 42        |
| 8                                      | 0.38 | 6.00 | 3       | 55        |
| 10                                     | 0.40 | 6.00 | 3       | 70        |
| 12                                     | 0.42 | 6.00 | 3       | 85        |
| 16                                     | 0.50 | 6.00 | 3       | 164       |
| 24                                     | 0.61 | 8.00 | 3       | 325       |

Threads in Accordance with ANSI/ASME B1.20.1



# Compact MJ Fittings

ANSI/AWWA C153/A21.53

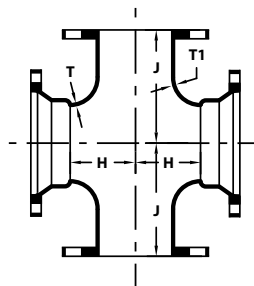


## MJ CROSSES

| NOM. SIZE | T    | T1   | H     | J     | WT (LBS.) |
|-----------|------|------|-------|-------|-----------|
| 3 x 3     | 0.33 | 0.33 | 3.00  | 3.00  | 35        |
| 4 x 3     | 0.34 | 0.33 | 3.50  | 4.00  | 38        |
| 4 x 4     | 0.34 | 0.34 | 4.00  | 4.00  | 40        |
| 6 x 3     | 0.36 | 0.33 | 3.50  | 5.00  | 48        |
| 6 x 4     | 0.36 | 0.34 | 4.00  | 5.00  | 57        |
| 6 x 6     | 0.36 | 0.36 | 5.00  | 5.00  | 80        |
| 8 x 4     | 0.38 | 0.34 | 4.00  | 6.00  | 68        |
| 8 x 6     | 0.38 | 0.36 | 5.00  | 6.00  | 74        |
| 8 x 8     | 0.38 | 0.38 | 6.00  | 6.00  | 105       |
| 10 x 4    | 0.40 | 0.34 | 4.00  | 7.00  | 112       |
| 10 x 6    | 0.40 | 0.36 | 5.00  | 7.00  | 119       |
| 10 x 8    | 0.40 | 0.38 | 6.50  | 7.00  | 124       |
| 10 x 10   | 0.40 | 0.40 | 7.00  | 7.00  | 145       |
| 12 x 4    | 0.42 | 0.34 | 4.00  | 8.50  | 119       |
| 12 x 6    | 0.42 | 0.36 | 5.00  | 8.50  | 126       |
| 12 x 8    | 0.42 | 0.38 | 6.00  | 8.50  | 149       |
| 12 x 10   | 0.42 | 0.40 | 7.50  | 8.50  | 179       |
| 12 x 12   | 0.42 | 0.42 | 8.50  | 8.50  | 200       |
| 14 x 6    | 0.47 | 0.36 | 6.50  | 10.50 | 200       |
| 14 x 8    | 0.47 | 0.38 | 7.50  | 10.50 | 228       |
| 14 x 10   | 0.47 | 0.40 | 8.50  | 10.50 | 255       |
| 14 x 12   | 0.47 | 0.42 | 9.50  | 10.50 | 269       |
| 14 x 14   | 0.47 | 0.47 | 10.50 | 10.50 | 335       |
| 16 x 6    | 0.50 | 0.36 | 6.50  | 11.50 | 240       |
| 16 x 8    | 0.50 | 0.38 | 7.50  | 11.50 | 260       |
| 16 x 10   | 0.50 | 0.40 | 8.50  | 11.50 | 317       |
| 16 x 12   | 0.50 | 0.42 | 9.50  | 11.50 | 320       |
| 16 x 16   | 0.50 | 0.50 | 11.50 | 11.50 | 385       |
| 18 x 12   | 0.54 | 0.42 | 9.50  | 12.50 | 348       |
| 18 x 18   | 0.54 | 0.54 | 12.50 | 12.50 | 478       |
| 20 x 8    | 0.57 | 0.38 | 8.00  | 14.00 | 379       |
| 20 x 10   | 0.57 | 0.40 | 9.00  | 14.00 | 395       |
| 20 x 12   | 0.57 | 0.42 | 10.00 | 14.00 | 413       |
| 20 x 16   | 0.57 | 0.50 | 12.00 | 14.00 | 527       |
| 20 x 18   | 0.57 | 0.54 | 13.00 | 14.00 | 554       |
| 20 x 20   | 0.57 | 0.57 | 14.00 | 14.00 | 590       |
| 24 x 6    | 0.61 | 0.36 | 7.00  | 16.00 | 481       |
| 24 x 8    | 0.61 | 0.38 | 8.00  | 16.00 | 500       |
| 24 x 10   | 0.61 | 0.40 | 9.00  | 16.00 | 499       |
| 24 x 12   | 0.61 | 0.42 | 10.00 | 16.00 | 529       |
| 24 x 16   | 0.61 | 0.50 | 12.00 | 16.00 | 641       |
| 24 x 18   | 0.61 | 0.54 | 13.00 | 16.00 | 868       |
| 24 x 20   | 0.61 | 0.57 | 14.00 | 16.00 | 757       |
| 24 x 24   | 0.61 | 0.61 | 16.00 | 16.00 | 881       |

## MJ CROSSES (Con't)

| NOM. SIZE | T    | T1   | H     | J     | WT (LBS.) |
|-----------|------|------|-------|-------|-----------|
| 30 x 12   | 0.66 | 0.42 | 10.00 | 20.00 | 882       |
| 30 x 20   | 0.66 | 0.57 | 15.00 | 20.00 | 1074      |
| 30 x 24   | 0.66 | 0.61 | 16.00 | 20.00 | 1246      |
| 30 x 30   | 0.66 | 0.66 | 22.00 | 22.00 | 1691      |
| 36 x 16   | 0.74 | 0.50 | 12.50 | 23.50 | 1262      |
| 36 x 24   | 0.74 | 0.61 | 16.00 | 23.50 | 1785      |
| 36 x 36   | 0.74 | 0.74 | 26.00 | 26.00 | 2811      |
| 42 x 24   | 0.82 | 0.61 | 20.00 | 27.50 | 2668      |
| 42 x 30   | 0.82 | 0.66 | 22.00 | 29.50 | 2950      |
| 42 x 36   | 0.82 | 0.74 | 30.00 | 30.00 | 3607      |
| 42 x 42   | 0.82 | 0.82 | 30.00 | 30.00 | 3725      |
| 48 x 20   | 0.90 | 0.57 | 20.00 | 32.00 | 2636      |
| 48 x 24   | 0.90 | 0.61 | 23.00 | 32.00 | 2921      |
| 48 x 30   | 0.90 | 0.66 | 23.00 | 32.00 | 4505      |
| 48 x 36   | 0.90 | 0.74 | 33.50 | 32.25 | 4700      |
| 48 x 48   | 0.90 | 0.90 | 33.50 | 33.50 | 5827      |
| 54 x 54   | 1.05 | 1.05 | 35.80 | 35.80 | 5890      |



## MJ x FLANGE CROSS

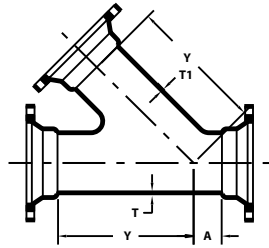
| NOM. SIZE | T    | T1   | H    | J     | WT (LBS.) |
|-----------|------|------|------|-------|-----------|
| 6 x 6     | 0.36 | 0.36 | 5.00 | 8.00  | 84        |
| 8 x 6     | 0.38 | 0.36 | 5.00 | 9.00  | 100       |
| 8 x 8     | 0.38 | 0.38 | 6.50 | 9.00  | 130       |
| 10 x 10   | 0.40 | 0.40 | 7.50 | 11.00 | 185       |
| 12 x 6    | 0.42 | 0.36 | 5.00 | 12.00 | 140       |
| 12 x 8    | 0.42 | 0.38 | 6.50 | 12.00 | 175       |
| 12 x 10   | 0.42 | 0.40 | 7.50 | 12.00 | 206       |
| 12 x 12   | 0.42 | 0.42 | 8.75 | 12.00 | 256       |
| 16 x 12   | 0.50 | 0.42 | 9.50 | 15.00 | 371       |

(Con't)➡



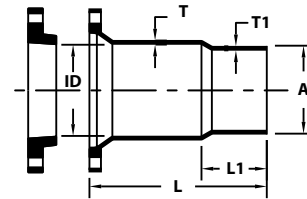
# Compact MJ Fittings

ANSI/AWWA C153/A21.53



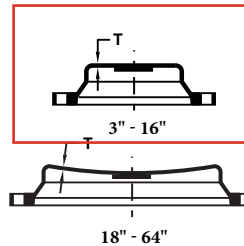
## 45° MJ LATERALS

| NOM. SIZE | T    | T1   | A    | Y     | WT (LBS.) |
|-----------|------|------|------|-------|-----------|
| 3 x 3     | 0.33 | 0.33 | 2.50 | 8.50  | 36        |
| 4 x 3     | 0.34 | 0.33 | 2.50 | 8.50  | 40        |
| 4 x 4     | 0.34 | 0.34 | 2.50 | 8.50  | 41        |
| 6 x 4     | 0.36 | 0.34 | 1.50 | 11.00 | 53        |
| 6 x 6     | 0.36 | 0.36 | 3.00 | 12.50 | 85        |
| 8 x 3     | 0.38 | 0.33 | 0.50 | 13.00 | 74        |
| 8 x 4     | 0.38 | 0.34 | 0.50 | 13.00 | 77        |
| 8 x 6     | 0.38 | 0.36 | 2.00 | 14.50 | 90        |
| 8 x 8     | 0.38 | 0.38 | 3.50 | 16.00 | 102       |
| 10 x 4    | 0.40 | 0.34 | 0.00 | 15.00 | 150       |
| 10 x 6    | 0.40 | 0.36 | 1.00 | 16.00 | 158       |
| 10 x 8    | 0.40 | 0.38 | 2.50 | 17.00 | 172       |
| 10 x 10   | 0.40 | 0.40 | 3.50 | 19.00 | 210       |
| 12 x 4    | 0.42 | 0.34 | 0.00 | 16.50 | 150       |
| 12 x 6    | 0.42 | 0.36 | 1.50 | 18.50 | 186       |
| 12 x 8    | 0.42 | 0.38 | 1.50 | 18.50 | 188       |
| 12 x 10   | 0.42 | 0.40 | 3.00 | 20.00 | 250       |
| 12 x 12   | 0.42 | 0.42 | 4.50 | 22.50 | 272       |
| 14 x 6    | 0.47 | 0.36 | 0.00 | 19.50 | 245       |
| 14 x 8    | 0.47 | 0.38 | 1.50 | 21.00 | 279       |
| 14 x 10   | 0.47 | 0.40 | 3.00 | 22.50 | 316       |
| 14 x 14   | 0.47 | 0.47 | 6.00 | 25.00 | 474       |
| 16 x 4    | 0.50 | 0.34 | 0.00 | 21.00 | 272       |
| 16 x 6    | 0.50 | 0.36 | 0.00 | 21.00 | 300       |
| 16 x 8    | 0.50 | 0.38 | 0.50 | 22.50 | 349       |
| 16 x 10   | 0.50 | 0.40 | 2.00 | 24.00 | 370       |
| 16 x 12   | 0.50 | 0.42 | 3.50 | 25.00 | 453       |
| 16 x 14   | 0.50 | 0.47 | 5.00 | 26.50 | 500       |
| 16 x 16   | 0.50 | 0.50 | 6.50 | 28.00 | 575       |

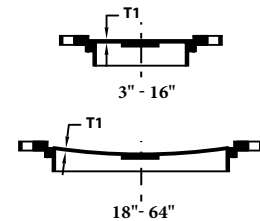


## MJ x PE CUTTING IN SLEEVE W/ OVER SIZE GLAND

| NOM. SIZE | ID    | T    | T1   | A     | L     | L1   | WT (LBS.) |
|-----------|-------|------|------|-------|-------|------|-----------|
| 4         | 5.10  | 0.36 | 0.34 | 4.80  | 20.00 | 9.00 | 50        |
| 6         | 7.20  | 0.38 | 0.36 | 6.90  | 20.00 | 9.00 | 62        |
| 8         | 9.40  | 0.40 | 0.38 | 9.05  | 20.00 | 9.00 | 70        |
| 10        | 11.50 | 0.42 | 0.40 | 11.10 | 20.00 | 9.00 | 105       |
| 12        | 13.60 | 0.47 | 0.42 | 13.20 | 20.00 | 9.00 | 128       |
| 16        | 17.94 | 0.54 | 0.50 | 17.40 | 20.00 | 9.00 | 275       |



CAP

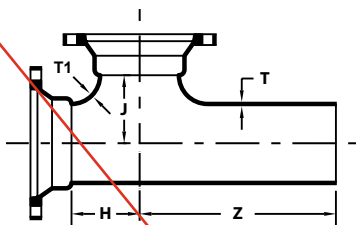


PLUG

## MJ CAPS & PLUGS (SOLID OR TAPPED)

| NOM. SIZE | T    | T1   | MAX. TAP | WT (LBS.) |      |
|-----------|------|------|----------|-----------|------|
|           |      |      |          | PLUGS     | CAPS |
| 3         | 0.46 | 0.50 | 2        | 9         | 8    |
| 4         | 0.34 | 0.40 | 2        | 13        | 9    |
| 6         | 0.42 | 0.42 | 2        | 20        | 15   |
| 8         | 0.44 | 0.44 | 2        | 30        | 23   |
| 10        | 0.46 | 0.46 | 2        | 39        | 33   |
| 12        | 0.48 | 0.48 | 2        | 52        | 44   |
| 14        | 0.55 | 0.55 | 2 1/2    | 93        | 64   |
| 16        | 0.56 | 0.56 | 2 1/2    | 116       | 79   |
| 18        | 0.54 | 0.54 | 2 1/2    | 135       | 121  |
| 20        | 0.57 | 0.57 | 2 1/2    | 161       | 140  |
| 24        | 0.61 | 0.65 | 3        | 239       | 199  |
| 30        | 0.70 | 0.66 | 4        | 387       | 361  |
| 36        | 1.03 | 1.00 | 4        | 689       | 635  |
| 42        | 1.13 | 1.13 | 4        | 965       | 896  |
| 48        | 1.43 | 1.25 | 4        | 1291      | 1329 |
| 54        | 2.16 | 2.19 | 6        | 2050      | 2167 |
| 60        | 2.25 | 2.38 | 6        | 2446      | 2571 |
| 64        | 2.38 | 2.56 | 6        | 2850      | 3018 |

Threads in Accordance with ANSI/ASME B1.20.1



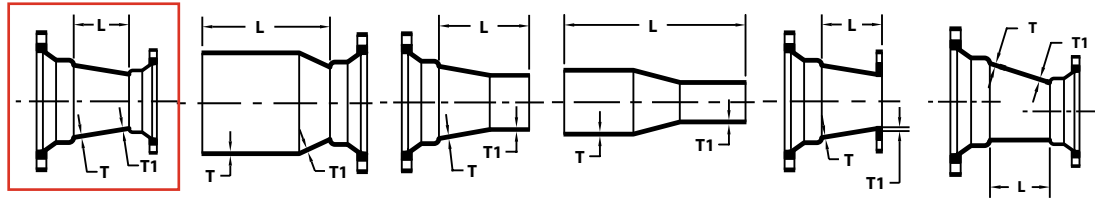
## MJ x PE x MJ TEES

| NOM. SIZE | T    | T1   | H     | J     | Z     | WT (LBS.) |
|-----------|------|------|-------|-------|-------|-----------|
| 6 x 4     | 0.36 | 0.34 | 4.00  | 5.00  | 12.00 | 49        |
| 6 x 6     | 0.36 | 0.36 | 5.00  | 5.00  | 12.00 | 57        |
| 8 x 6     | 0.38 | 0.36 | 5.50  | 6.50  | 11.50 | 74        |
| 8 x 8     | 0.38 | 0.38 | 6.50  | 6.50  | 15.00 | 91        |
| 10 x 10   | 0.40 | 0.40 | 7.50  | 7.50  | 13.00 | 115       |
| 12 x 12   | 0.42 | 0.42 | 8.75  | 8.75  | 14.50 | 155       |
| 16 x 16   | 0.50 | 0.50 | 11.50 | 11.50 | 20.63 | 337       |



# Compact MJ Fittings

ANSI/AWWA C153/A21.53



| REDUCERS  |      |      | MJ x MJ |           | SEB   |           | LEB   |           | PE x PE |           | MJ x FE |           | ECCENTRIC |           |
|-----------|------|------|---------|-----------|-------|-----------|-------|-----------|---------|-----------|---------|-----------|-----------|-----------|
| NOM. SIZE | T    | T1   | L       | WT (LBS.) | L     | WT (LBS.) | L     | WT (LBS.) | L       | WT (LBS.) | L       | WT (LBS.) | L         | WT (LBS.) |
| 4 x 3     | 0.34 | 0.33 | 3.00    | 16        | 8.50  | 17        | 8.50  | 16        | 14.00   | 14        | 5.00    | 19        | 3.00      | 15        |
| 6 x 2     | 0.36 | 0.30 | ---     | ---       | ---   | ---       | ---   | ---       | ---     | ---       | 7.00    | 23        | ---       | ---       |
| 6 x 3     | 0.36 | 0.33 | 5.00    | 22        | 10.62 | 24        | 10.50 | 19        | 16.00   | 19        | 6.00    | 25        | ---       | ---       |
| 6 x 4     | 0.36 | 0.34 | 4.00    | 24        | 9.50  | 23        | 9.50  | 23        | 15.00   | 22        | 5.00    | 30        | 4.00      | 24        |
| 8 x 4     | 0.38 | 0.34 | 5.00    | 32        | 10.50 | 30        | 10.50 | 34        | 16.00   | 30        | 7.00    | 38        | 5.00      | 31        |
| 8 x 6     | 0.38 | 0.36 | 4.00    | 36        | 9.50  | 35        | 9.50  | 32        | 15.00   | 33        | 6.00    | 41        | ---       | ---       |
| 10 x 4    | 0.40 | 0.34 | 7.00    | 46        | 12.50 | 44        | 12.50 | 43        | ---     | ---       | ---     | ---       | ---       | ---       |
| 10 x 6    | 0.40 | 0.36 | 5.00    | 47        | 10.50 | 46        | 10.50 | 46        | 16.00   | 46        | 7.00    | 54        | 5.00      | 46        |
| 10 x 8    | 0.40 | 0.38 | 4.00    | 50        | 9.50  | 49        | 9.50  | 50        | 15.00   | 47        | 6.00    | 62        | 4.00      | 48        |
| 12 x 4    | 0.42 | 0.34 | 9.00    | 58        | 14.50 | 60        | 14.50 | 57        | 20.00   | 58        | 11.00   | 66        | ---       | ---       |
| 12 x 6    | 0.42 | 0.36 | 7.00    | 60        | 12.50 | 53        | 12.50 | 57        | 18.00   | 57        | 9.00    | 69        | 7.00      | 60        |
| 12 x 8    | 0.42 | 0.38 | 5.00    | 60        | 10.50 | 61        | 10.50 | 59        | 16.00   | 54        | 7.00    | 82        | 5.00      | 59        |
| 12 x 10   | 0.42 | 0.40 | 4.00    | 64        | 9.50  | 53        | 9.50  | 58        | 15.00   | 54        | 7.00    | 85        | 4.00      | 61        |
| 14 x 6    | 0.47 | 0.36 | 9.00    | 110       | 16.90 | 100       | 14.50 | 105       | ---     | ---       | ---     | ---       | ---       | ---       |
| 14 x 8    | 0.47 | 0.38 | 7.00    | 122       | 14.90 | 99        | 12.40 | 98        | 20.30   | 91        | ---     | ---       | ---       | ---       |
| 14 x 10   | 0.47 | 0.40 | 5.00    | 120       | 12.90 | 96        | 10.40 | 92        | 18.30   | 88        | 8.00    | 112       | ---       | ---       |
| 14 x 12   | 0.47 | 0.42 | 4.00    | 132       | 11.90 | 90        | 9.40  | 92        | 17.30   | 89        | ---     | ---       | 4.00      | 94        |
| 16 x 6    | 0.50 | 0.36 | 11.00   | 120       | 21.00 | 125       | 16.50 | 144       | 24.30   | 93        | 13.00   | 128       | ---       | ---       |
| 16 x 8    | 0.50 | 0.38 | 9.00    | 118       | 18.00 | 124       | 14.50 | 136       | 22.30   | 119       | 11.00   | 133       | 9.00      | 119       |
| 16 x 10   | 0.50 | 0.40 | 7.00    | 118       | 15.00 | 124       | 12.50 | 125       | 20.50   | 119       | 9.00    | 136       | 9.00      | 129       |
| 16 x 12   | 0.50 | 0.42 | 5.00    | 115       | 12.90 | 122       | 10.50 | 116       | 18.30   | 99        | 7.00    | 145       | 5.00      | 115       |
| 16 x 14   | 0.50 | 0.47 | 4.00    | 131       | 12.00 | 133       | 12.00 | 135       | 19.70   | 129       | ---     | ---       | ---       | ---       |
| 18 x 8    | 0.54 | 0.38 | 13.00   | 201       | 20.00 | 170       | 19.50 | 195       | ---     | ---       | 16.00   | 190       | 13.00     | 165       |
| 18 x 10   | 0.54 | 0.40 | 10.00   | 196       | 18.00 | 165       | 17.40 | 185       | 25.50   | 160       | 12.00   | 179       | ---       | ---       |
| 18 x 12   | 0.54 | 0.42 | 7.00    | 180       | 15.50 | 150       | 14.00 | 150       | 19.50   | 150       | 12.00   | 198       | ---       | ---       |
| 18 x 14   | 0.54 | 0.47 | 6.00    | 200       | 15.00 | 175       | 15.00 | 200       | ---     | ---       | ---     | ---       | 6.00      | 168       |
| 18 x 16   | 0.54 | 0.50 | 5.00    | 196       | 12.50 | 170       | 12.50 | 192       | ---     | ---       | ---     | ---       | 5.00      | 174       |
| 20 x 6    | 0.57 | 0.36 | ---     | ---       | 24.00 | 182       | ---   | ---       | ---     | ---       | 18.00   | 203       | ---       | ---       |
| 20 x 8    | 0.57 | 0.38 | 16.00   | 227       | 24.00 | 191       | ---   | ---       | ---     | ---       | ---     | ---       | ---       | ---       |
| 20 x 10   | 0.57 | 0.40 | 16.00   | 220       | 22.12 | 200       | 19.00 | 210       | ---     | ---       | ---     | ---       | ---       | ---       |
| 20 x 12   | 0.57 | 0.42 | 12.00   | 227       | 17.50 | 170       | 16.00 | 205       | 21.50   | 164       | 14.00   | 234       | 8.00      | 183       |
| 20 x 14   | 0.57 | 0.47 | 10.00   | 200       | 18.00 | 190       | 17.90 | 205       | ---     | ---       | ---     | ---       | ---       | ---       |
| 20 x 16   | 0.57 | 0.50 | 7.00    | 231       | 13.50 | 185       | 13.50 | 200       | ---     | ---       | 9.00    | 237       | 8.00      | 217       |
| 20 x 18   | 0.57 | 0.54 | 4.00    | 225       | 12.00 | 200       | 12.00 | 215       | ---     | ---       | ---     | ---       | 8.00      | 235       |
| 24 x 6    | 0.61 | 0.36 | 22.00   | 279       | ---   | ---       | ---   | ---       | ---     | ---       | 22.00   | 284       | ---       | ---       |
| 24 x 8    | 0.61 | 0.38 | 20.00   | 263       | ---   | ---       | ---   | ---       | 22.50   | 201       | ---     | ---       | 20.00     | 287       |
| 24 x 10   | 0.61 | 0.40 | 18.00   | 286       | 21.50 | 235       | ---   | ---       | ---     | ---       | 20.00   | 306       | 18.00     | 287       |
| 24 x 12   | 0.61 | 0.42 | 16.00   | 263       | 21.50 | 275       | 21.00 | 290       | 22.50   | 213       | 18.00   | 318       | 16.00     | 285       |
| 24 x 14   | 0.61 | 0.47 | 14.00   | 310       | 22.00 | 310       | 21.90 | 315       | 25.00   | 238       | 16.00   | 323       | 14.00     | 298       |
| 24 x 16   | 0.61 | 0.50 | 13.00   | 279       | 21.00 | 285       | 17.50 | 285       | 23.10   | 323       | ---     | ---       | 12.00     | 299       |
| 24 x 18   | 0.61 | 0.54 | 10.00   | 284       | 18.00 | 300       | 18.00 | 310       | 21.00   | 228       | ---     | ---       | ---       | ---       |
| 24 x 20   | 0.61 | 0.57 | 7.00    | 328       | 15.00 | 276       | 13.50 | 275       | 24.00   | 271       | ---     | ---       | 7.00      | 370       |
| 30 x 12   | 0.66 | 0.42 | 30.00   | 530       | ---   | ---       | 39.00 | 565       | ---     | ---       | ---     | ---       | ---       | ---       |
| 30 x 14   | 0.66 | 0.47 | 30.00   | 585       | ---   | ---       | 39.00 | 598       | ---     | ---       | ---     | ---       | 30.00     | 583       |
| 30 x 16   | 0.66 | 0.50 | 30.00   | 633       | 39.00 | 565       | 39.00 | 623       | 48.00   | 690       | ---     | ---       | 30.00     | 613       |
| 30 x 18   | 0.66 | 0.54 | 28.00   | 658       | 37.00 | 654       | 37.00 | 635       | ---     | ---       | ---     | ---       | 28.00     | 800       |
| 30 x 20   | 0.66 | 0.57 | 24.00   | 628       | 33.00 | 590       | 33.00 | 603       | ---     | ---       | ---     | ---       | 24.00     | 630       |
| 30 x 24   | 0.66 | 0.61 | 10.00   | 478       | 24.50 | 536       | 24.50 | 526       | ---     | ---       | ---     | ---       | 10.00     | 570       |
| 36 x 4    | 0.74 | 0.34 | 36.00   | 712       | ---   | ---       | ---   | ---       | ---     | ---       | ---     | ---       | ---       | ---       |

(Cont)➡

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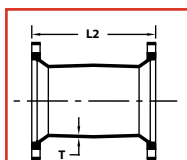
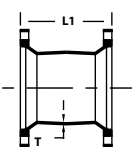
\* REGISTERED TRADEMARK OF STAR PIPE PRODUCTS



## Compact MJ Fittings

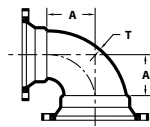
ANSI/AWWA C153/A21.53

| REDUCERS (Con't) |      |      | MJ x MJ |           | SEB   |           | LEB   |           | PE x PE |           | MJ x FE |           | ★ ECCENTRIC |           |
|------------------|------|------|---------|-----------|-------|-----------|-------|-----------|---------|-----------|---------|-----------|-------------|-----------|
| NOM. SIZE        | T    | TI   | L       | WT (LBS.) | L     | WT (LBS.) | L     | WT (LBS.) | L       | WT (LBS.) | L       | WT (LBS.) | L           | WT (LBS.) |
| 36 x 6           | 0.74 | 0.36 | 36.00   | 731       | ---   | ---       | ---   | ---       | ---     | ---       | ---     | ---       | ---         | ---       |
| 36 x 8           | 0.74 | 0.38 | 36.00   | 750       | ---   | ---       | ---   | ---       | ---     | ---       | ---     | ---       | ---         | ---       |
| 36 x 10          | 0.74 | 0.40 | 36.00   | 775       | ---   | ---       | ---   | ---       | ---     | ---       | ---     | ---       | ---         | ---       |
| 36 x 12          | 0.74 | 0.42 | 36.00   | 1058      | ---   | ---       | ---   | ---       | ---     | ---       | ---     | ---       | ---         | ---       |
| 36 x 16          | 0.74 | 0.50 | 40.00   | 1016      | 27.00 | 595       | 45.00 | 901       | ---     | ---       | ---     | ---       | ---         | ---       |
| 36 x 18          | 0.74 | 0.54 | 38.00   | 983       | 37.00 | 800       | ---   | ---       | ---     | ---       | ---     | ---       | 38.00       | 963       |
| 36 x 20          | 0.74 | 0.57 | 36.00   | 1165      | 45.00 | 850       | 45.00 | 950       | ---     | ---       | ---     | ---       | ---         | ---       |
| 36 x 24          | 0.74 | 0.61 | 19.00   | 822       | 33.12 | 746       | 33.00 | 810       | 42.00   | 747       | 21.00   | 807       | 19.00       | 765       |
| 36 x 30          | 0.74 | 0.66 | 15.50   | 811       | 24.62 | 788       | 24.50 | 758       | ---     | ---       | 17.50   | 846       | 15.50       | 811       |
| 42 x 24          | 0.82 | 0.61 | 40.00   | 1356      | 49.00 | 1204      | 49.00 | 1320      | ---     | ---       | 42.00   | 1410      | 40.00       | 1782      |
| 42 x 30          | 0.82 | 0.66 | 20.00   | 1083      | 29.12 | 1150      | 29.00 | 1015      | ---     | ---       | ---     | ---       | 20.00       | 1435      |
| 42 x 36          | 0.82 | 0.74 | 15.50   | 1114      | 24.62 | 962       | 24.50 | 1013      | ---     | ---       | ---     | ---       | 15.50       | 1114      |
| 48 x 20          | 0.90 | 0.57 | 40.00   | 1580      | 49.00 | 1320      | ---   | ---       | ---     | ---       | ---     | ---       | ---         | ---       |
| 48 x 24          | 0.90 | 0.61 | 40.00   | 1761      | ---   | ---       | ---   | ---       | ---     | ---       | ---     | ---       | 40.00       | 1800      |
| 48 x 30          | 0.90 | 0.66 | 40.00   | 1779      | 49.00 | 1594      | 49.00 | 1711      | ---     | ---       | ---     | ---       | 40.00       | 1960      |
| 48 x 36          | 0.90 | 0.74 | 28.00   | 1641      | 37.00 | 1456      | 37.00 | 1540      | ---     | ---       | ---     | ---       | 28.00       | 1668      |
| 48 x 42          | 0.90 | 0.82 | 15.50   | 1426      | 24.50 | 1241      | 24.50 | 1275      | ---     | ---       | ---     | ---       | 15.50       | 1470      |
| 54 x 36          | 1.05 | 0.74 | 27.50   | 1916      | ---   | ---       | ---   | ---       | ---     | ---       | ---     | ---       | ---         | ---       |
| 54 x 42          | 1.05 | 0.82 | 19.25   | 1817      | ---   | ---       | ---   | ---       | ---     | ---       | ---     | ---       | ---         | ---       |
| 60 x 48          | 1.10 | 0.90 | 18.00   | 2053      | ---   | ---       | ---   | ---       | ---     | ---       | ---     | ---       | ---         | ---       |



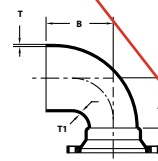
## MJ SLEEVES

| NOM. SIZE | T    | SHORT SLEEVES |           | LONG SLEEVES |           |
|-----------|------|---------------|-----------|--------------|-----------|
|           |      | L1            | WT (LBS.) | L2           | WT (LBS.) |
| 2         | 0.30 | 7.50          | 8         | 12.00        | 13        |
| 3         | 0.33 | 7.50          | 12        | 12.00        | 17        |
| 4         | 0.34 | 7.50          | 15        | 12.00        | 22        |
| 6         | 0.36 | 7.50          | 23        | 12.00        | 29        |
| 8         | 0.38 | 7.50          | 31        | 12.00        | 45        |
| 10        | 0.40 | 7.50          | 45        | 12.00        | 61        |
| 12        | 0.42 | 7.50          | 57        | 12.00        | 79        |
| 14        | 0.47 | 9.50          | 94        | 15.00        | 128       |
| 16        | 0.50 | 9.50          | 118       | 15.00        | 159       |
| 18        | 0.54 | 9.00          | 145       | 15.00        | 200       |
| 20        | 0.57 | 9.00          | 173       | 15.00        | 236       |
| 24        | 0.61 | 9.00          | 226       | 15.00        | 306       |
| 30        | 0.66 | 15.00         | 472       | 24.00        | 634       |
| 36        | 0.74 | 15.00         | 673       | 24.00        | 889       |
| 42        | 0.82 | 15.00         | 887       | 24.00        | 1114      |
| 48        | 0.90 | 15.00         | 1059      | 24.00        | 1406      |
| 54        | 1.05 | 21.00         | 1534      | 24.00        | 1687      |
| 60        | 1.10 | 21.00         | 1758      | 24.00        | 1930      |
| 64        | 1.16 | 21.00         | 1974      | 24.00        | 2167      |



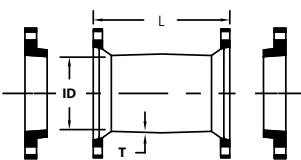
## MJ x MJ RED 90°

| Nom. SIZE | T    | TI   | A     | WT (LBS.) |
|-----------|------|------|-------|-----------|
| 20 x 16   | 0.57 | 0.50 | 15.00 | 348       |
| 48 x 36   | 0.90 | 0.74 | 33.25 | 2500      |



## PE x MJ RED 90°

| Nom. SIZE | T    | TI   | A     | B     | WT (LBS.) |
|-----------|------|------|-------|-------|-----------|
| 48 x 36   | 0.90 | 0.74 | 33.25 | 42.25 | 2643      |



## MJ DUAL PURPOSE SLEEVES W/ OVERSIZE GLANDS

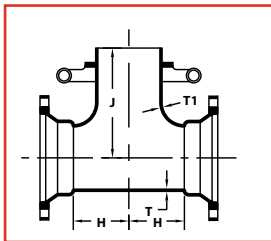
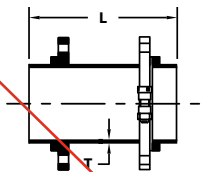
| NOM. SIZE | PIPE SIZE     | T    | L     | (I.D.) | WT (LBS.) |
|-----------|---------------|------|-------|--------|-----------|
| 4         | 4.80 - 5.00   | 0.34 | 12.00 | 5.10   | 20        |
| 6         | 6.90 - 7.10   | 0.36 | 12.00 | 7.20   | 36        |
| 8         | 9.05 - 9.30   | 0.38 | 12.00 | 9.40   | 46        |
| 10        | 11.10 - 11.40 | 0.40 | 12.00 | 11.50  | 62        |
| 12        | 13.20 - 13.50 | 0.42 | 12.00 | 13.60  | 76        |
| 16        | 17.40 - 17.80 | 0.50 | 15.00 | 17.94  | 172       |





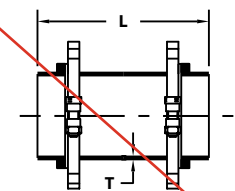
# Compact MJ Fittings

ANSI/AWWA C153/A21.53

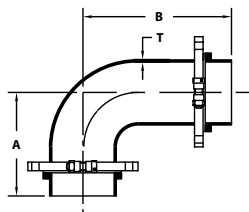


| SWIVEL x SOLID HYDRANT ADAPTERS W/ SWIVEL GLAND |      |       |           |
|---|------|-------|-----------|
| NOM. SIZE                                       | T    | L     | WT (LBS.) |
| 4 x 13  | 0.34 | 13.00 | 32        |
| 6 x 13  | 0.36 | 11.50 | 47        |
| 6 x 18  | 0.36 | 18.00 | 60        |
| 6 x 24  | 0.36 | 24.00 | 71        |
| 6 x 36  | 0.36 | 36.00 | 94        |
| 6 x 48  | 0.36 | 48.00 | 122       |
| 8 x 13  | 0.38 | 13.00 | 54        |
| 8 x 18  | 0.38 | 18.00 | 80        |
| 8 x 24  | 0.38 | 24.00 | 97        |
| 8 x 48  | 0.38 | 48.00 | 161       |
| 12 x 13   | 0.42 | 13.00 | 113       |

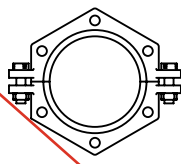
| MJ x SWIVEL HYDRANT TEES W/ SWIVEL GLAND |      |      |      |       |           |
|--|------|------|------|-------|-----------|
| NOM. SIZE                                | T    | T1   | H    | J     | WT (LBS.) |
| 6 x 4                                    | 0.36 | 0.34 | 4.00 | 10.00 | 54        |
| 6 x 6                                    | 0.36 | 0.36 | 5.00 | 10.25 | 65        |
| 8 x 4                                    | 0.38 | 0.34 | 4.00 | 11.00 | 69        |
| 8 x 6                                    | 0.38 | 0.36 | 5.00 | 11.25 | 85        |
| 8 x 8                                    | 0.38 | 0.38 | 6.50 | 11.50 | 100       |
| 10 x 4                                   | 0.40 | 0.34 | 4.00 | 12.50 | 86        |
| 10 x 6                                   | 0.40 | 0.36 | 5.00 | 12.75 | 105       |
| 10 x 8                                   | 0.40 | 0.38 | 6.50 | 12.75 | 118       |
| 12 x 4                                   | 0.42 | 0.34 | 4.00 | 13.50 | 104       |
| 12 x 6                                   | 0.42 | 0.36 | 5.00 | 13.75 | 126       |
| 12 x 8                                   | 0.42 | 0.38 | 6.50 | 13.75 | 128       |
| 14 x 6                                   | 0.47 | 0.36 | 6.50 | 15.00 | 211       |
| 16 x 4                                   | 0.50 | 0.34 | 5.50 | 16.00 | 207       |
| 16 x 6                                   | 0.50 | 0.36 | 6.50 | 16.00 | 279       |
| 18 x 6                                   | 0.54 | 0.36 | 6.50 | 18.00 | 278       |
| 20 x 6                                   | 0.57 | 0.36 | 6.50 | 18.50 | 358       |
| 20 x 8                                   | 0.57 | 0.38 | 8.00 | 18.50 | 362       |
| 24 x 6                                   | 0.61 | 0.36 | 7.00 | 19.00 | 430       |
| 24 x 8                                   | 0.61 | 0.38 | 8.00 | 19.00 | 459       |
| 36 x 6                                   | 0.74 | 0.36 | 8.00 | 22.50 | 980       |
| 42 X 6                                   | 0.82 | 0.36 | 9.00 | 30.00 | 1371      |



| SWIVEL x SWIVEL HYDRANT ADAPTERS W/ 2 SWIVEL GLANDS |      |       |           |
|---|------|-------|-----------|
| NOM. SIZE   | T    | L     | WT (LBS.) |
| 6 x 12  | 0.36 | 12.00 | 50        |
| 6 x 18  | 0.36 | 18.00 | 62        |
| 6 x 24  | 0.36 | 24.00 | 74        |



| SWIVEL x SWIVEL HYDRANT ELL W/ 2 SWIVEL GLANDS |      |       |       |           |
|--|------|-------|-------|-----------|
| NOM. SIZE                                      | T    | A     | B     | WT (LBS.) |
| 6  | 0.36 | 10.50 | 16.00 | 71        |



| SWIVEL GLANDS |           |                   |
|---------------|-----------|-------------------|
| NOM. SIZE     | WT (LBS.) | T-HEAD BOLTS      |
| 4             | 8         | (2) 3/4" x 3 1/2" |
| 6             | 11        | (2) 3/4" x 3 1/2" |
| 8             | 13        | (2) 3/4" x 3 1/2" |
| 12            | 25        | (2) 3/4" x 4"     |

STAR® PIPE PRODUCTS

# PIPE JOINT RESTRAINT DEVICES FOR DIP (STAR)



## Stargrip® series 3000

Mechanical Joint Wedge Action Restraint  
for Ductile Iron Pipe  
Patent #5,772,252



Stargrip® series 3000 for Ductile Iron Pipe

## SUBMITTAL INFORMATION

PROJECT NAME: ENGINEER: CONTRACTOR: SPEC. SECTION: 

## FEATURES &amp; ADVANTAGES

- The Wedge Assembly is designed with a Break-Off Torque Control Nut that will only break off in one direction, ensuring proper installation.
- The Stargrip® offers a full 5° deflection through 12" size, 3° on 14"-24", 2° on 30"-36" and 1° on 42"-48".
- Minimum safety factor of 2:1
- Stargrip® sizes 3"-36" are listed with Underwriters Laboratories Inc. and sizes 3"-12" are approved by Factory Mutual Research.
- The Wedge Assembly is designed to fit specific pipe sizes and is field repairable.
- No special tools are required for installation of the Stargrip®.
- Stargrip® eliminates tie rods and thrust blocks.
- Stargrip® may also be used on steel pipe\* up to 12" (\*transition gasket required on 12" and under). For 14" and larger steel applications, contact Star Pipe.

## MATERIAL SPECIFICATIONS:

- Gland: Ductile Iron per ASTM A536, Grade 65-45-12
- Wedges: Ductile Iron per ASTM A536, Grade 65-45-12 heat treated to a minimum of 370 BHN
  - Wedge Finish: Fluorocarbon Star-Blue resin bonded coating, thermally cured dry lubricant

## GLAND FINISH OPTIONS (Please check one):

Standard: Star Multi-Coat™ 2-phase coating process consisting of a zinc rich primer base coat and an alkyd enamel top coating

Optional: Starbond™ TGIC polyester powder coating applied by an electrostatic spray process

Optional: Other (specify) \_\_\_\_\_

## HARDWARE OPTIONS (Please check):

Standard: T-bolts are high strength low alloy steel manufactured in accordance with ANSI/AWWA C111/A21.11-00

Optional: T-bolts and nuts alloy SS 304 per ASTM F593

Optional: T-bolts and nuts alloy SS 316 per ASTM F593

Optional: T-bolts and nuts Fluoropolymer Star-Blue coated high strength low alloy steel manufactured in accordance with ANSI/AWWA C111/A21.11-00

## COUNTRY OF ORIGIN OPTION (Please check one):

Import

Domestic

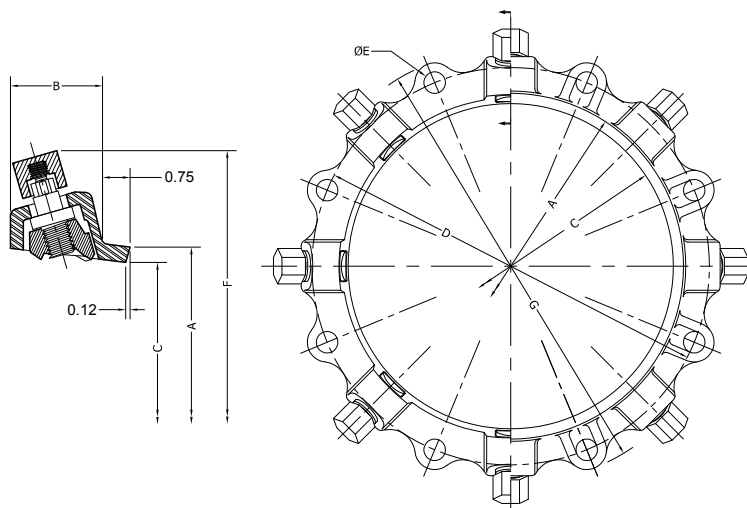




## Stargrip® series 3000

Mechanical Joint Wedge Action Restraint  
for Ductile Iron Pipe  
Patent #5,772,252

## TECHNICAL INFORMATION



STARGRIP® 3000 SPECIFICATIONS\*

Please  
check sizes:

| NOM.<br>SIZE | MAX<br>PRESSURE<br>RATING<br>(PSI) | A     | B    | C     | D     | E     | F     | F W/NUTS<br>TWISTED<br>OFF | G     | NO. OF<br>WEDGES | NO. OF<br>T-BOLTS | APPROX<br>WT.<br>(LBS) |
|--------------|------------------------------------|-------|------|-------|-------|-------|-------|----------------------------|-------|------------------|-------------------|------------------------|
| 3            | 350                                | 4.84  | 2.40 | 4.06  | 6.19  | 3/4   | 9.85  | 8.78                       | 8.13  | 2                | 4                 | 7                      |
| 4            | 350                                | 5.92  | 2.40 | 4.90  | 7.50  | 7/8   | 11.06 | 9.62                       | 9.12  | 2                | 4                 | 9                      |
| 6            | 350                                | 8.02  | 2.40 | 7.00  | 9.50  | 7/8   | 13.06 | 11.72                      | 11.12 | 3                | 6                 | 13                     |
| 8            | 350                                | 10.17 | 2.51 | 9.15  | 11.75 | 7/8   | 15.25 | 13.84                      | 13.37 | 4                | 6                 | 17                     |
| 10           | 350                                | 12.22 | 2.51 | 11.20 | 14.00 | 7/8   | 17.25 | 15.88                      | 15.62 | 6                | 8                 | 23                     |
| 12           | 350                                | 14.32 | 2.51 | 13.30 | 16.25 | 7/8   | 19.50 | 17.98                      | 17.88 | 8                | 8                 | 31                     |
| 14           | 350                                | 16.40 | 2.91 | 15.44 | 18.75 | 7/8   | 21.25 | 20.12                      | 20.90 | 10               | 10                | 54                     |
| 16           | 350                                | 18.50 | 2.91 | 17.54 | 21.00 | 7/8   | 23.34 | 22.22                      | 23.00 | 12               | 12                | 60                     |
| 18           | 250                                | 20.60 | 2.91 | 19.64 | 23.25 | 7/8   | 26.40 | 24.90                      | 25.25 | 12               | 12                | 69                     |
| 20           | 250                                | 22.70 | 2.67 | 21.74 | 25.50 | 7/8   | 28.56 | 27.00                      | 27.50 | 14               | 14                | 72                     |
| 24           | 250                                | 26.90 | 3.50 | 25.94 | 30.00 | 7/8   | 33.86 | 32.34                      | 31.54 | 16               | 16                | 170                    |
| 30           | 250                                | 33.29 | 3.49 | 32.17 | 36.88 | 1-1/8 | 40.12 | 38.62                      | 39.12 | 20               | 20                | 197                    |
| 36           | 250                                | 39.59 | 3.49 | 38.47 | 43.75 | 1-1/8 | 46.42 | 44.92                      | 46.00 | 24               | 24                | 242                    |
| 42           | 250                                | 45.79 | 5.15 | 44.75 | 50.62 | 1-3/8 | 54.86 | 53.32                      | 53.12 | 28               | 28                | 425                    |
| 48           | 250                                | 52.09 | 5.15 | 51.05 | 57.50 | 1-3/8 | 61.16 | 59.62                      | 60.00 | 32               | 32                | 500                    |

\*All dimensions in inches except where indicated.

## Notes:

- Stargrips® must be adequately wrapped or protected if they are covered by concrete to ensure that concrete does not enter the wedge pocket.
- For applications exceeding the maximum pressure ratings listed, please contact Star Pipe Products for recommendations (see Tandem Stargrip®).
- For applications on existing pipe, the pipe needs to be structurally sound and the surface needs to be relatively free of any corrosive by-products in order for the wedges to function properly. Please contact Star Pipe Products for technical assistance.
- Sizes 42" & 48" require extra long 1 1/4" x 8 1/2" T-bolts.



# JOINT RESTRAINT DEVICES FOR PVC (STAR)

**PVC Stargrip® series 4000**Mechanical Joint Wedge Action Restraint  
for AWWA C900/C905 and IPS PVC Pipe

PVC Stargrip® Series 4000 for PVC Pipe

**SUBMITTAL INFORMATION**PROJECT NAME: ENGINEER: CONTRACTOR: SPEC. SECTION: **FEATURES & ADVANTAGES**

- The design eliminates tie rods and thrust blocks and has been proven in the market since 1992.
- Can be used on 4"-12" AWWA C900, 14"-36" AWWA C905 PVC pipe or 3"-12" IPS PVC pipe\* (**\*transition gasket required on IPS PVC Pipe 12" and under**).
- Listed with Underwriters Laboratories in sizes 4"-12" for use on DR18 class 235 C900 PVC pipe at 150 PSI. Approved by Factory Mutual Research in sizes 4"-12" for use on DR18 class 235 at 150 PSI and for sizes 4"-10" DR14 class 305 C900 PVC pipe at 200 PSI.
- Tested to and meets the requirements of ASTM F1674 through 14" size for DR18 PVC pipe.
- The safety factor is twice (2:1) the standardized pressure rating listed on Page 18.
- Double headed torque limiting bolts utilize 1 1/4" wrench size on both hex heads.
- Will fit any Mechanical Joint configuration, meaning compatibility with different types of installations.
- PVC Stargrip® offers 5° deflection through 12", 3° on 14"-24" and 2° on 30"-36".
- Larger ID allows easier installation on out-of-round pipe.
- Torque limiting bolts are designed with collars so that a wrench won't slip off the bottom for easier installation and so you won't over torque and damage PVC pipe.
- All sizes have curved wedges that will not flatten pipe.
- For use on HDPE or C909 pipe, please contact Star Engineering.

**MATERIAL SPECIFICATIONS:**

- Gland: Ductile Iron per ASTM A536, Grade 65-45-12
- Wedges: Ductile Iron per ASTM A536, Grade 65-45-12 heat treated to a minimum of 370 BHN
  - ♦ Wedge Finish: Fluorocarbon Star-Blue resin bonded coating, thermally cured dry lubricant

**GLAND FINISH OPTIONS (Please check one):**

Standard: Star Multi-Coat™ 2-phase coating process consisting of a zinc rich primer base coat and an alkyl enamel top coating

Optional: Starbond™ TGIC polyester powder coating applied by an electrostatic spray process

Optional: Other (specify) \_\_\_\_\_

**HARDWARE OPTIONS (Please check):**

Standard: T-bolts are high strength low alloy steel manufactured in accordance with ANSI/AWWA C111/A21.11-00

Optional: T-bolts and nuts alloy SS 304 per ASTM F593

Optional: T-bolts and nuts alloy SS 316 per ASTM F593

Optional: T-bolts and nuts Fluoropolymer Star-Blue coated high strength low alloy steel manufactured in accordance with ANSI/AWWA C111/A21.11-00

**COUNTRY OF ORIGIN OPTION (Please check one):**

Import

Domestic

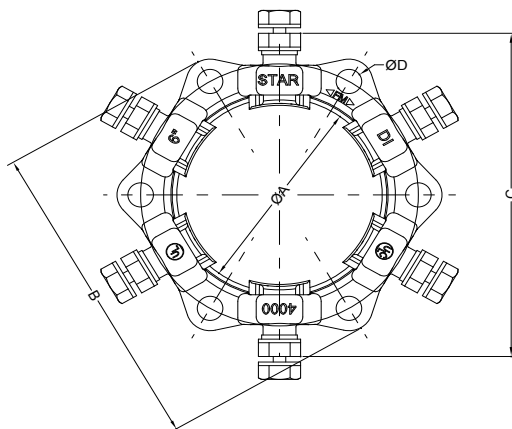




## PVC Stargrip® series 4000

Mechanical Joint Wedge Action Restraint  
for AWWA C900/C905 and IPS PVC Pipe

## TECHNICAL INFORMATION



## PVC STARGRIP® 4000 SPECIFICATIONS\*

Please  
check sizes:

| NOM.<br>SIZE | C900/C905<br>PIPE CI OD | IPS PIPE OD<br>(TRANSITION<br>GASKET REQUIRED) | ØA    | B     | C¹    | ØD    | T-BOLTS<br>SIZE<br>(QTY) | WEDGES<br>(QTY) | APPROX<br>WT.<br>(LBS) |
|--------------|-------------------------|--|-------|-------|-------|-------|--------------------------|-----------------|------------------------|
| 3            | N/A                     | 3.50   | 4.09  | 7.69  | 8.50  | 3/4   | 5/8 (4)                  | 4               | 7                      |
| 4            | 4.80                    | 4.50   | 4.93  | 9.12  | 9.53  | 7/8   | 3/4 (4)                  | 4               | 9                      |
| 6            | 6.90                    | 6.63   | 7.03  | 11.12 | 11.63 | 7/8   | 3/4 (6)                  | 6               | 13                     |
| 8            | 9.05                    | 8.63   | 9.18  | 13.37 | 13.97 | 7/8   | 3/4 (6)                  | 6               | 17                     |
| 10           | 11.10                   | 10.75  | 11.23 | 15.62 | 16.18 | 7/8   | 3/4 (8)                  | 8               | 23                     |
| 12           | 13.20                   | 12.75  | 13.33 | 17.87 | 18.18 | 7/8   | 3/4 (8)                  | 8               | 28                     |
| 14           | 15.30                   | N/A  | 15.45 | 20.75 | 20.36 | 7/8   | 3/4 (10)                 | 10              | 50                     |
| 16           | 17.40                   | N/A  | 17.55 | 23.00 | 22.46 | 7/8   | 3/4 (12)                 | 12              | 60                     |
| 18           | 19.50                   | N/A  | 19.65 | 25.25 | 24.56 | 7/8   | 3/4 (12)                 | 12              | 65                     |
| 20           | 21.60                   | N/A  | 21.75 | 27.50 | 26.66 | 7/8   | 3/4 (14)                 | 14              | 76                     |
| 24           | 25.80                   | N/A  | 25.95 | 32.00 | 30.86 | 7/8   | 3/4 (16)                 | 16              | 98                     |
| 30           | 32.00                   | N/A  | 32.18 | 39.38 | 36.82 | 1-1/8 | 1 (20)                   | 20              | 173                    |
| 36           | 38.30                   | N/A  | 38.48 | 46.25 | 43.12 | 1-1/8 | 1 (24)                   | 24              | 219                    |

\*All dimensions in inches except where indicated.

1 - dimension after assembly on pipe

## MAXIMUM WORKING PRESSURE RATING WITH OCCASSIONAL &amp; RECURRING SURGES

| NOM.<br>SIZE (IN) | C900 |      |      | C905 |      |      |        | ASTM D2241 |       |       |
|-------------------|------|------|------|------|------|------|--------|------------|-------|-------|
|                   | DR14 | DR18 | DR25 | DR18 | DR21 | DR25 | DR32.5 | SDR17      | SDR21 | SDR26 |
| 3                 |      |      |      |      |      |      |        | 250        | 200   | 160   |
| 4                 | 305  | 235  | 165  |      |      |      |        | 250        | 200   | 160   |
| 6                 | 305  | 235  | 165  |      |      |      |        | 250        | 200   | 160   |
| 8                 | 305  | 235  | 165  |      |      |      |        | 250        | 200   | 160   |
| 10                | 305  | 235  | 165  |      |      |      |        | 250        | 200   | 160   |
| 12                | 305  | 235  | 165  |      |      |      |        | 250        | 200   | 160   |
| 14                |      |      |      | 235  | 200  | 165  | 125    |            |       |       |
| 16                |      |      |      | 235  | 200  | 165  | 125    |            |       |       |
| 18                |      |      |      | 200  | 200  | 165  | 125    |            |       |       |
| 20                |      |      |      | 200  | 200  | 165  | 125    |            |       |       |
| 24                |      |      |      | 165  | 165  | 165  | 125    |            |       |       |
| 30                |      |      |      |      |      | 165  | 125    |            |       |       |
| 36                |      |      |      |      |      | 165  | 125    |            |       |       |





# Pipe Restrainers series 1100

1100C Bell Restrainers for AWWA C900 PVC Pipe  
and 1100S Bell Joint for IPS PVC Pipe



Series 1100C for C900/C905 PVC Pipe

## SUBMITTAL INFORMATION

PROJECT NAME:

ENGINEER:

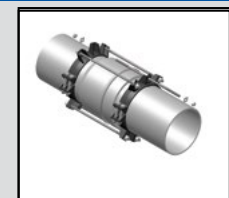
CONTRACTOR:

SPEC. SECTION:



## FEATURES & ADVANTAGES

- 360° contact, no pipe distortion or point loading
- Restrainers work with Push-On Pipe Bells.
- All restrainers are machined to exact tolerances.
- Rated pressures carry a 2:1 safety factor.
- Can be installed outside the trench, to ease installation
- Clamping Bolts: SAE J429 Grade 5
- Series 1100C is approved by Factory Mutual Research in sizes 4"-6" for use on C900 PVC DR18, for 150 PSI.
- Available in sizes 4"-48"



1100C on pipe bell

## MATERIAL SPECIFICATIONS:

- Restrainer Castings: Ductile Iron per ASTM A536, Grade 65-45-12

## PIPE RESTRAINER OPTIONS (Please check one):

SERIES 1100C  
(Bell Restrainers for AWWA C900  
PVC Pipe)

SERIES 1100S  
(Bell Restrainers for IPS PVC Pipe -  
NOT available in domestic.)

## RESTRAINER CASTINGS FINISH OPTIONS (Please check one):

Standard: alkyd enamel coating

Optional: Starbond™ TGIC polyester powder coating  
applied by an electrostatic spray process

Optional: Other (specify) \_\_\_\_\_

## COUNTRY OF ORIGIN OPTION (Please check one):

Import

Domestic - AIS Compliant (Available in sizes 4" to 36")  
(Series 1100S is NOT available in domestic.)

## HARDWARE OPTIONS (Please check one):

### STANDARD:

- Clamp Bolt: SAE J429 Grade 5
- Clamp Nut: SAE J995 Grade 2 or ASTM A563 Grade "A" or "B"
- Restraint Bolt/Rod/Nut: High strength low alloy steel per ANSI/AWWA C111/A21.11
- Washer: carbon steel per ASTM F844

### OPTIONAL SS ALLOY 304:

- Clamp Bolt: SS alloy 304 per ASTM A193 Grade B8, Class 2
- Clamp Nut: SS alloy 304 per ASTM A194 Grade 8, S1
- Restraint Bolt/Rod: SS alloy 304 per ASTM F593 CW
- Restraint Nut: SS alloy 304 per ASTM F594 CW
- Washer: SS alloy 304

### OPTIONAL SS ALLOY 316:

- Clamp Bolt: SS alloy 316 per ASTM A193 Grade B8M, Class 2
- Clamp Nut: SS alloy 316 per ASTM A194 Grade 8M, S1
- Restraint Bolt/Rod: SS alloy 316 per ASTM F593 CW
- Restraint Nut: SS alloy 316 per ASTM A194 Grade 8M
- Washer: SS alloy 316

### OPTIONAL STAR BLUE:

- Clamp Bolt: Fluoropolymer Star Blue coated SAE J429 Grade 5
- Clamp Nut: Fluoropolymer Star Blue coated SAE J995 Grade 2 or ASTM A563 Grade "A" or "B"
- Restraint Bolt/Rod/Nut: Fluoropolymer Star Blue coated high strength low alloy steel per ANSI/AWWA C111/A21.11
- Washer: Fluoropolymer Star Blue coated carbon steel per ASTM F844

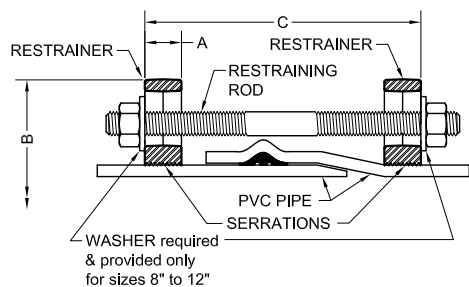




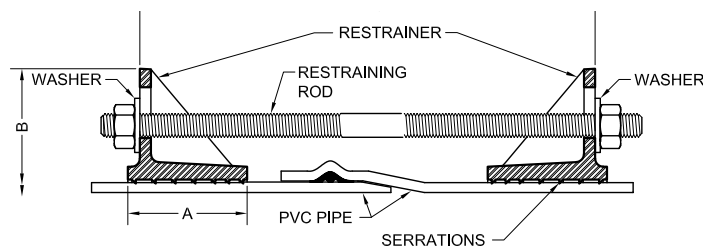
# Pipe Restrainers series 1100

1100C Bell Restrainers for AWWA C900 PVC Pipe  
and 1100S Bell Joint for IPS PVC Pipe

## TECHNICAL INFORMATION



4"-12" Sizes



14"-48" Sizes

### PIPE RESTRAINERS 1100 SPECIFICATIONS\*

Please  
check sizes:

| NOM.<br>SIZE | PVC PIPE<br>WITH<br>DUCTILE<br>IRON PIPE<br>O.D. STYLE<br>1100C | PVC PIPE<br>WITH STEEL<br>PIPE O.D.<br>STYLE<br>1100S | A     | B<br>APPROX. | C<br>MAX. | RESTRAINT BOLTS/<br>RODS |            | CLAMPING BOLTS |               | APPROX<br>WT.<br>(LBS) |
|--------------|---|---|-------|--------------|-----------|--------------------------|------------|----------------|---------------|------------------------|
|              | O.D.  | O.D.  |       |              |           | QTY                      | SIZE       | QTY            | SIZE          |                        |
| 4            | 4.80  | 4.50  | 1.12  | 9.29         | 12.00     | 2                        | 3/4 x 17   | 4              | 5/8 x 3 1/2   | 16                     |
| 6            | 6.90  | 6.63  | 1.15  | 11.13        | 13.00     | 2                        | 3/4 x 17   | 4              | 5/8 x 3 1/2   | 20                     |
| 8            | 9.05  | 8.63  | 1.47  | 14.76        | 15.00     | 2                        | 3/4 x 17   | 4              | 3/4 x 4       | 32                     |
| 10           | 11.10   | 10.75   | 1.38  | 16.82        | 16.00     | 4                        | 3/4 x 24   | 4              | 7/8 x 5       | 52                     |
| 12           | 13.20   | 12.75   | 1.42  | 19.46        | 18.00     | 4                        | 3/4 x 24   | 4              | 7/8 x 5       | 56                     |
| 14           | 15.30   | N/A   | 4.00  | 22.68        | 24.00     | 6                        | 3/4 x 30   | 8              | 7/8 x 7       | 150                    |
| 16           | 17.40   | N/A   | 3.75  | 24.65        | 28.00     | 6                        | 3/4 x 30   | 8              | 7/8 x 6 1/2   | 117                    |
| 18           | 19.50   | N/A   | 4.25  | 26.65        | 28.00     | 8                        | 3/4 x 30   | 8              | 7/8 x 6 1/2   | 147                    |
| 20           | 21.60   | N/A   | 5.00  | 28.88        | 28.00     | 8                        | 3/4 x 36   | 8              | 1 1/8 x 8 1/2 | 206                    |
| 24           | 25.80   | N/A   | 5.00  | 33.98        | 34.00     | 12                       | 3/4 x 36   | 8              | 1 1/8 x 8 1/2 | 265                    |
| 30           | 32.00   | N/A   | 7.00  | 42.48        | 38.00     | 12                       | 1 x 48     | 12             | 1 1/8 x 6     | 492                    |
| 36           | 38.30   | N/A   | 9.00  | 49.10        | 38.00     | 12                       | 1 x 48     | 12             | 1 1/8 x 6     | 561                    |
| 42           | 44.50   | N/A   | 11.00 | 57.00        | 46.00     | 16                       | 1 1/4 x 54 | 12             | 1 1/2 x 10    | 1916                   |
| 48           | 50.80   | N/A   | 11.00 | 63.88        | 46.00     | 16                       | 1 1/4 x 54 | 12             | 1 1/2 x 10    | 2242                   |

\*All dimensions in inches except where indicated.

| Standardized Pressure Ratings** |                     |      |      |      |      |        |        |      |      |                |       |               |                        |        |        |     |  |
|---------------------------------|---------------------|------|------|------|------|--------|--------|------|------|----------------|-------|---------------|------------------------|--------|--------|-----|--|
| NOM.<br>SIZE<br>(IN.)           | AWWA C900<br>(CIOD) |      |      |      |      |        |        |      |      | AWWA C909 PVC0 |       |               | ASTMD2241*<br>(IPS OD) |        |        |     |  |
|                                 |                     |      |      |      |      |        |        |      |      | IPEX PVC0      |       | JM EAGLE PVC0 |                        |        |        |     |  |
|                                 | DR14                | DR17 | DR18 | DR21 | DR25 | DR27.5 | DR32.5 | DR41 | DR51 | PC235          | PC235 | PC165         | SDR 17                 | SDR 21 | SDR 26 |     |  |
| 4                               | 200                 | -    | 150  | -    | 100  | -      | -      | -    | -    | -              | -     | -             | -                      | 250    | 200    | 160 |  |
| 6                               | 200                 | -    | 150  | -    | 100  | -      | -      | -    | -    | -              | -     | -             | -                      | 250    | 200    | 160 |  |
| 8                               | 200                 | -    | 150  | -    | 100  | -      | -      | -    | -    | -              | -     | -             | -                      | 250    | 200    | 160 |  |
| 10                              | 200                 | -    | 150  | -    | 100  | -      | -      | -    | -    | -              | -     | -             | -                      | 250    | 200    | 160 |  |
| 12                              | 200                 | -    | 150  | -    | 100  | -      | -      | -    | -    | -              | -     | -             | -                      | 250    | 200    | 160 |  |
| 14                              | 305                 | 250  | 235  | 200  | 165  | -      | -      | -    | -    | 235            | -     | -             | -                      | -      | -      | -   |  |
| 16                              | -                   | 250  | 235  | 200  | 165  | -      | -      | -    | -    | 200            | -     | 165           | -                      | -      | -      | -   |  |
| 18                              | -                   | 250  | 235  | 200  | 165  | -      | -      | -    | -    | 200            | -     | -             | -                      | -      | -      | -   |  |
| 20                              | -                   | -    | 235  | 200  | 165  | -      | -      | -    | -    | -              | -     | -             | -                      | -      | -      | -   |  |
| 24                              | -                   | -    | 235  | 200  | 165  | -      | -      | -    | -    | -              | -     | -             | -                      | -      | -      | -   |  |
| 30                              | -                   | -    | 235  | 200  | 165  | 150    | 125    | 100  | 80   | -              | -     | -             | -                      | -      | -      | -   |  |
| 36                              | -                   | -    | 235  | 200  | 165  | 150    | 125    | 100  | 80   | -              | -     | -             | -                      | -      | -      | -   |  |
| 42                              | -                   | -    | -    | 200  | 165  | 150    | 125    | 100  | 80   | -              | -     | -             | -                      | -      | -      | -   |  |
| 48                              | -                   | -    | -    | -    | 165  | 150    | 125    | 100  | 80   | -              | -     | -             | -                      | -      | -      | -   |  |

\* Transition Push-On Gasket Required

\*\*For ordinary water works with transient surges only. Ratings are for PVC pipes  
with SERIES 1100 Restrainer.

RESILIENT SEATED  
GATE VALVES  
(CLOW / MUELLER)

**CLOW**  
VALVE CO.

ClowValve.com

# RESILIENT WEDGE GATE VALVES

2" THROUGH 12"  
MODEL 2639 / 2640

AWWA C509 250 PSI • UL/FM APPROVED 200 PSI • NSF  
61 CERTIFIED • FULL WATER WAY • FUSION BONDED  
EPOXY COATED • 10-YEAR LIMITED WARRANTY



Clow Valve is a division of McWane, Inc.

For Generations

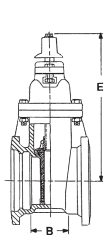
# RESILIENT WEDGE VALVE

In 1975, Clow recognized the increased requirements and escalating maintenance cost of water systems in the United States.

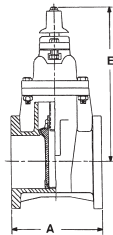
Clow responded by introducing the first R/W (Resilient Wedge) Gate Valve in America. This introduction revolutionized the valve market in the U.S.

Clow was the first to introduce and still leads in the design and technical development of the bubble-tight resilient seating valve.

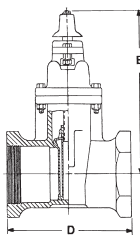
The Clow Resilient Wedge Valve, with its unique features and benefits, was the first to be manufactured with both AWWA and UL/FM approval for all water system requirements.



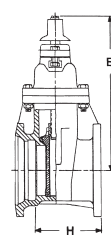
**F-6100**  
MECHANICAL JOINT  
2"– 12"



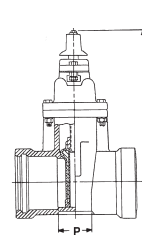
**F-6102**  
FLANGED  
2"– 12"



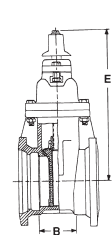
**F-6103**  
THREADED ENDS  
2"– 3"



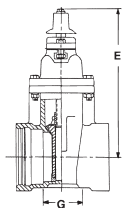
**F-6106**  
FLANGED X MJ  
3"– 12"



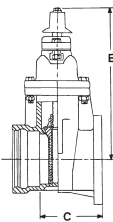
**F-6110**  
PUSH ON FOR SDR PVC  
2"– 12"



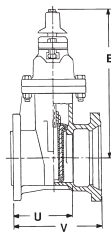
**F-6111**  
MECHANICAL CUTTING  
IN JOINT  
4"– 12"



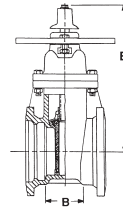
**F-6112**  
TYTON ENDS FOR DUCTILE  
IRON AND C900 PVC PIPE  
4"– 12"



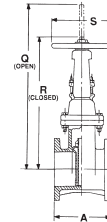
**F-6113**  
FLANGED X TYTON  
4"– 12"



**F-6114**  
MECHANICAL JOINT  
FOR TAPPING  
3"– 12"



**F-6120**  
MECHANICAL JOINT POST  
INDICATOR VALVE  
2"– 12"



**F-6136**  
FLANGED OS & Y  
CONSTRUCTION  
2"– 12"

| VALVE SIZE | A      | B      | C      | D     | E      | G     | H      | P     | Q      | R      | S     | U      | V      | NO. OF TURNS<br>TO FULL OPEN |
|------------|--------|--------|--------|-------|--------|-------|--------|-------|--------|--------|-------|--------|--------|------------------------------|
| 2"         | 7      | 3-1/4  | —      | 5-3/8 | 10-7/8 | —     | —      | 3     | 10     | 12     | 7-1/4 | —      | —      | 6-1/2                        |
| 2-1/2"     | 7-1/2  | —      | —      | 7-1/8 | 11-3/8 | —     | —      | 3-1/4 | 16-3/8 | 13-7/8 | 7-1/4 | —      | —      | 8                            |
| 3"         | 8      | 3-1/2  | —      | 7-1/8 | 12-3/8 | —     | 5-3/4  | 3-1/2 | 18-7/8 | 15-5/8 | 10    | 5-3/4  | 8-1/4  | 10                           |
| 4"         | 9      | 4-1/2  | 6-3/4  | —     | 14-3/4 | 4-5/8 | 6-3/4  | 4-1/2 | 22-3/4 | 18-1/4 | 10    | 6-3/4  | 9-1/4  | 13-1/2                       |
| 6"         | 10-1/2 | 5-1/2  | 7-7/8  | —     | 19     | 5-1/4 | 8      | 5     | 30-1/8 | 23-3/4 | 12    | 8      | 10-1/2 | 19-1/2                       |
| 8"         | 11-1/2 | 8-1/8  | 8-1/2  | —     | 22-1/2 | 5-5/8 | 9-3/4  | 5-1/2 | 37-3/4 | 29-1/4 | 14    | 10-3/4 | 13-1/4 | 25-1/2                       |
| 10"        | 13     | 10-1/2 | 10     | —     | 26-1/2 | 7     | 11-3/4 | 7     | 45-2/4 | 35-3/8 | 18    | 12-1/2 | 14-7/8 | 31-1/2                       |
| 12"        | 14     | 10-3/4 | 11-1/4 | —     | 30     | 8-1/2 | 12     | 8-1/2 | 53-1/8 | 40-5/8 | 18    | 12-1/2 | 15     | 37-3/4                       |

**NOTE:** It is recommended that valves be installed with stems vertical when used in raw sewage, or sludge applications, or in water with excessive sediment. Flanged end connections are not recommended for buried service.



# ENGINEERING FEATURES

## THRUST BEARINGS

Acetal thrust bearings above and below the thrust collar reduce friction and minimize operating torque.

## COPPER ALLOY STEM

Long, trouble-free life with high-strength, non-corrosive copper alloy stem and stem nut.

## STAINLESS STEEL HARDWARE

304 stainless steel nuts and bolts provide long-life corrosion protection.

## 100% COATED WEDGE

A fully encapsulated wedge ensures a bubble-tight seal every time, up to rated pressure (250 PSI), with its twin seal design.

## ELLIPTICAL BOLT HOLES

Hole design on MJ connection eliminates the need for anti-rotation bolts.

## MINIMAL FLOW LOSS

A smooth, unobstructed waterway, which is free of pockets, cavities, and depressions, allows for minimal flow loss and lower pumping costs. All valves accept a full-size tapping cutter.

## LIFTING LUG

Integrated lifting lugs on follower plate for setting the valve into position. Available 4"–12".



## REPLACEABLE O-RINGS

Upper O-rings are replaceable with the valve fully open and subjected to full-rated working pressure.

## NO FLAT GASKETS

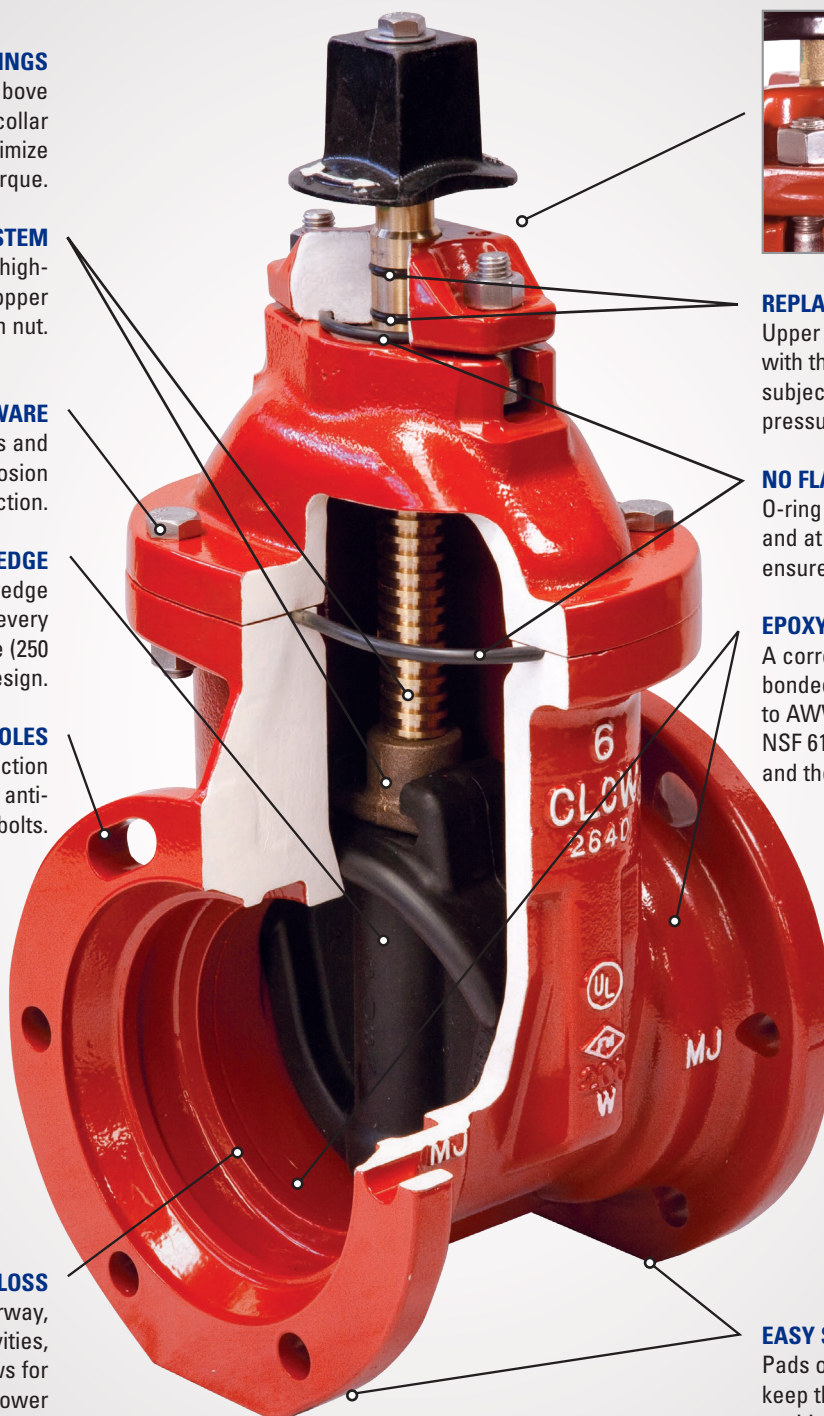
O-ring seals at the stuffing box and at the bonnet to body flange ensure the best possible seal.

## EPOXY COATING

A corrosion resistant fusion-bonded epoxy coating, conforming to AWWA C550 and certified by NSF 61, protects both the interior and the exterior of the valve.

## EASY STORAGE

Pads on the bottom of all valves keep the valve in an upright position for easier storage and protection from the elements.



**VALVE RATING:** All valves are rated at 250 PSI for AWWA service and 200 PSI for UL/FM service. All valves are hydrostatically tested to 500 PSI.

## RECOMMENDED SPECIFICATIONS

1. Valves shall conform to the latest revision of AWWA Standard C509 covering resilient seated gate valves for water supply service.
2. The valves shall have an iron body, bonnet, and O-ring plate. The wedge shall be fully encapsulated with rubber.
3. The sealing rubber shall be permanently bonded to the wedge per ASTM D249.
4. Valves shall be supplied with O-ring seals at all pressure retaining joints. No flat gaskets shall be allowed.
5. The valves shall be either non-rising stem (NRS) or rising stem (OS&Y), opened by turning left or right, and provided with 2" square operating nut or a handwheel. The operating nut and the handwheel shall be marked indicating the direction to open with the word "OPEN" and an arrow. **OPEN LEFT**
6. NRS stems shall be cast copper alloy with integral collars in full compliance with AWWA C509. All stems shall operate with copper alloy stem nuts independent of the wedge.
7. All NRS stems shall have two O-rings located above thrust collar and one below. The upper o-rings shall be replaceable with valve fully opened and subjected to full pressure. The stems on 2"-12" NRS valves shall have a low torque thrust bearing located both above and below the stem collar to reduce friction during operation.
8. The waterway shall be smooth, unobstructed and free of all pockets, cavities and depressions in the seat area. Valves made with a tapping flange shall accept a full size tapping cutter.
9. The body, bonnet and O-ring plate shall be coated both on the interior and exterior with fusion bonded epoxy. Epoxy shall be applied in accordance with AWWA C550 and certified per NSF 61.
10. Each valve shall have the manufacturer's name, the pressure rating, country of origin and the year in which it was manufactured cast on the body. Prior to shipment from the factory, each valve shall be hydrostatically pressure tested according to the requirements of AWWA C509 (and UL/FM where applicable).
11. Valves shall have all component parts cast and assembled in the USA and shall be manufactured by the Clow Valve Company.

## COMMITTED TO ENVIRONMENTAL RESPONSIBILITY

Clow Valve Company is committed to protecting our natural resources through environmentally responsible manufacturing practices, including the use of 80+% recycled content in our hydrants and valves.



**Clow**  
VALVE CO.  
ClowValve.com

902 South 2nd Street  
Oskaloosa, IA 52577  
Ph 641-673-8611  
Fx 641-673-8269



REVISION A-2018

\*PATENT PENDING



# MUELLER® 2360 SERIES™ RESILIENT WEDGE GATE VALVE

**Mueller Co.**

**10.1**

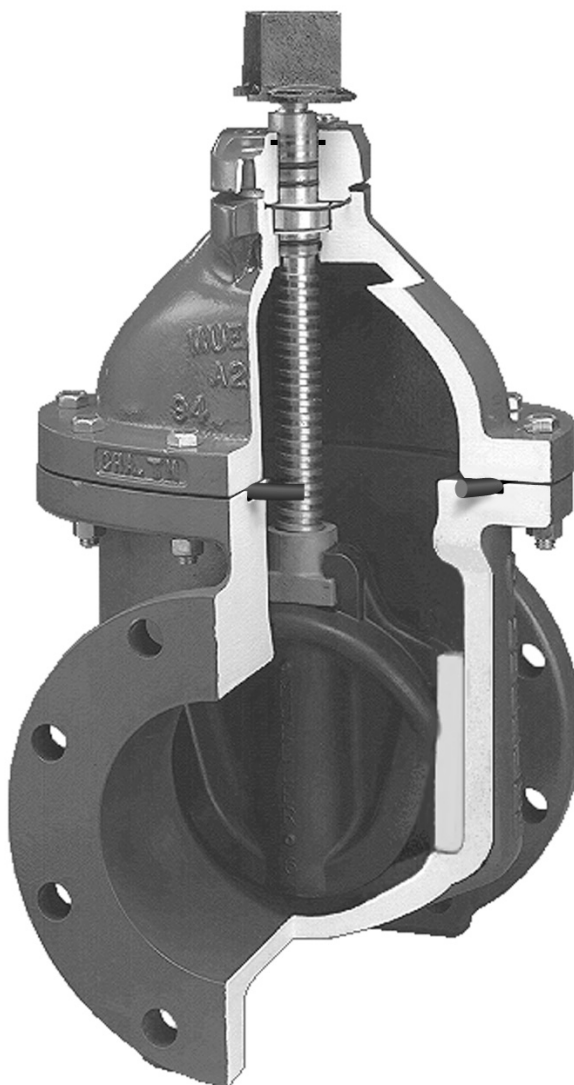
Rev. 2-06

## MUELLER® 2300 Series Resilient Wedge Gate Valves

Mueller® Resilient Wedge Gate Valves have features to make them easier to operate and to preserve the sealing capability and interior coating integrity for many years of reliable service. In addition to popular end connection options, Mueller brand RW valves can be ordered with Mueller's exclusive Aqua-Grip™ System that incorporates an O-ring sealed compression connection and integral pipe restraint in one "ready to use" easy and quick to install package.

### Mueller 2" – 12" 2360 Series Resilient Wedge Gate Valve Features

- ❑ **TRIPLE O-RING SEALS PLUS DIRT SEAL** – two above thrust collar and one below, retain lubricant in this critical area. Top two are replaceable with valve fully open and under pressure. Fourth seal at top serves as dirt seal†.
- ❑ **TWO ANTI-FRICTION WASHERS WITH LUBRICATION** – made of polymer, one above and one below the thrust collar, reduce operating torque to open or close valve.
- ❑ **STEM** – forged manganese bronze bar stock is upset, then machined to form a thrust collar for superior strength in this critical area.
- ❑ **WEDGE** – cast iron, fully encapsulated in molded rubber - no exposed iron.
- ❑ **EXTENDED WEDGE GUIDES** – molded as part of wedge, ride inside body channels to maintain wedge alignment throughout its travel.
- ❑ **GUIDE CAP BEARINGS** – made of polymer and snapped over rubber covered wedge guides, provide bearing surfaces that protect both wedge and interior body coating from wear and aid in easy operation – even the largest valves installed horizontally. Rollers, tracks or scrapers are not needed.



- ❑ **SMOOTH, OVERSIZED FLOW WAY** – full, round, unobstructed flow way accommodates full size cutters, provides superior flow characteristics and reduces pumping costs.\*\*
- ❑ **MUELLER® PRO-GARD™ FUSION EPOXY COATING** – 10 mils\* thick protects all inside and outside iron surfaces, and complies with AWWA C550 and certified to ANSI/NSF 61.
- ❑ **250 PSIG MAXIMUM WORKING PRESSURE** – Hydrostatically tested at 500 psig. Surpasses ANSI/AWWA Standard C509 by 25%. UL/FM: 200 psig MWP.\*\*\*
- ❑ **AMERICAN MADE QUALITY** – factory in Chattanooga, TN with ISO 9001:2000 certification, and UL 262, FM 1120/1130. Certified to ANSI/NSF 61. Manufactured and tested in compliance with ANSI/AWWA Standard C509. UL Listed and FM Approved.
- ❑ **BI-DIRECTIONAL FLOW**
- ❑ **FLAT BOTTOM SURFACES** – stands upright for easier handling and storage.
- ❑ **10-YEAR LIMITED WARRANTY** – assured reliability (see separate Mueller Warranty document for terms).

### Mueller 14" – 48" 2361 Series Resilient Wedge Gate Valve Features

In addition to all the features of the smaller 2360 series valves, large size Mueller 2361 series RW valves offer these features:

- ❑ **STEM** – Manganese bronze casting with integral thrust collar.
- ❑ **WEDGE** – Ductile iron, fully encapsulated in molded rubber.
- ❑ **BODY AND BONNET** – Ductile iron.



- ❑ **COMPLIANCE** – In addition to those above: ANSI/AWWA Standard C515.
- ❑ **MAXIMUM WORKING PRESSURE** – 14"-48" AWWA valves rated at 250 psig – tested at 500 psig. UL/FM valves 200 psig MWP (14"-16" 250 psig MWP).\*\*\*

\*Nominal

\*\*16" valve requires 1/2" undersized cutter.

\*\*\*250 psi UL/FM rating available as an option.

†Dirt seal on 4"-12" valves.

Double-Disc Style gate valves follow the RW valve pages.

# FIRE HYDRANTS (MUELLER)



# MUELLER® SUPER CENTURION® FIRE HYDRANT

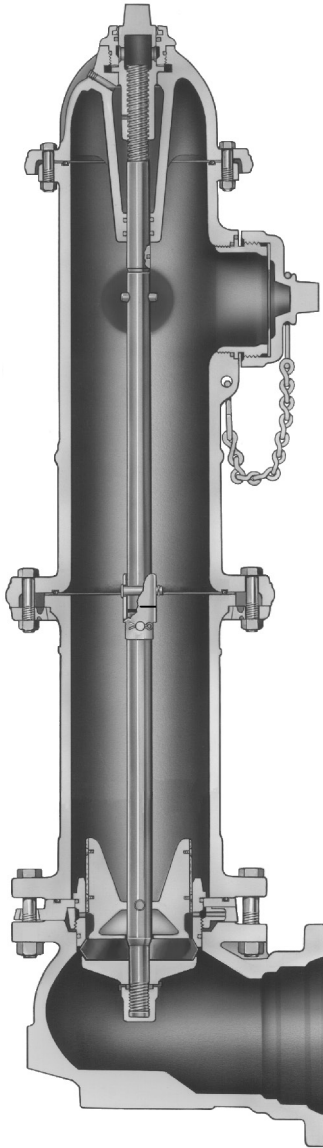
Mueller Co.

9.3

Rev. 9-09

## MUELLER SUPER CENTURION 250™ 3-Way Fire Hydrant Features

- ❑ **ANTI-FRICTION WASHER**  
helps assure easy turning operation for the life of the hydrant.
- ❑ **OIL FILLER PLUG**  
permits quick check of oil level. Lets you add oil without removing bonnet.
- ❑ **OIL RESERVOIR O-RING SEALS**  
seal oil in, water out.
- ❑ **STAINLESS STEEL SAFETY STEM COUPLING -**  
pulls free if hydrant is hit by a vehicle preventing damage to the stem and main valve. Coupling will not break into pieces that could drop into lower barrel and affect valve operation. Top of lower stem is below the top of the lower barrel so that a tire cannot depress the stem and open the main valve. Repair is easy and economical.
- ❑ **SAFETY FLANGE -** breaks cleanly to help prevent barrel damage, yet is strong enough to withstand normal handling. Allows economical repair, adding of extension section, rotation or changing of upper barrel without digging or water shut-off.
- ❑ **BRONZE UPPER VALVE PLATE**  
conical design for smooth flow.
- ❑ **DRAIN VALVE FACINGS**  
specially designed, long-life facings provide effective sealing.
- ❑ **DUCTILE IRON CAP NUT**  
retains main valve. Seats against cap nut gasket to prevent corrosion of stem threads. Locked in place by a stainless steel lock washer. Mueller HP Epoxy coated for durability.
- ❑ **250 PSIG - 3-way hydrant:**  
250 psig (1723 kPa) maximum working pressure, 500 psig (3447 kPa)
- ❑ **SHOE DESIGNED FOR MAXIMUM FLOW AND EASY CONNECTION**  
with its smooth transitional contours, extended neck and integral anti-rotation pads, allowing use of standard tee-head bolts. The inside of the shoe is covered with MUELLER HP® Epoxy Coating. This thermosetting epoxy forms a tough corrosion-resistant barrier to chemicals, physical impact and electrical currents.
- ❑ **HOLD-DOWN NUT -** with integral weather seal. Design discourages unauthorized removal of the hold-down nut or bronze operating nut. Resilient wiper seal between hold-down nut and operating nut prevents water entry to protect operating nut from freezing. Wiper seal material is resistant to ultra-violet ray deterioration. O-ring seal provides second level of protection.
- ❑ **MEETS OR EXCEEDS**  
all applicable requirements of ANSI/AWWA C502 Standard and UL 246 and FM 1510 specifications.
- ❑ **O-RING SEALS AT BONNET, GROUND, AND SHOE FLANGES**  
for better leak resistance, easier maintenance.
- ❑ **SEALED OIL RESERVOIR -** O-ring sealed to prevent leakage. Provides positive lubrication of stem threads and bearing surfaces each time the hydrant is operated. Filled at the factory.
- ❑ **FULL FLOW OPENINGS**  
large radius hose and pumper openings produce low friction loss.
- ❑ **FIELD REPLACEABLE HOSE AND PUMPER NOZZLES -** O-ring sealed. Threaded in place and retained by stainless steel locks. Nozzles are easily replaced.
- ❑ **ELECTRO-GALVANIZED BOLTS AND NUTS -** provide corrosion protection.
- ❑ **NON-KINKING CHAINS**  
heavy-duty chains are securely attached to the hydrant. Special chain loop permits free turning of the cap.
- ❑ **BRONZE SEAT RING -** threaded into drain ring and O-ring sealed. Seat ring is easily removed or installed from above ground. Each time main valve is opened or closed, double drain valves force-flush both drain valve openings to keep them open for effective barrel drainage. Bronze drain valves are integral parts of main valve assembly.
- ❑ **REVERSIBLE, COMPRESSION TYPE MAIN VALVE -** closes with pressure for positive seal. Rubber material has long service life, yet is reversible providing a convenient spare in place.



# MUELLER® FIRE HYDRANT STORZ Pumper Connections

## Quick-Connect / Full Pressure Rating

**M**ueller Centurion hydrants (traditional or Modern styles), can be ordered with an integral, Mueller designed and manufactured Storz connection on the pumper nozzle. The connection is also available separately to retrofit hydrants in the field. Making our own Storz connection means your Centurion hydrants remain '100% Mueller' for assurance of reliability.

The Mueller Storz connection allows the fire department to connect its pumper hose to the hydrant with a quick, quarter-turn action. The action is fast and smooth so fire fighters can get to their tasks quickly without the thread alignment, cross threading, or leakage problems sometimes associated with threaded connections.

The Mueller Storz option is available for 4" and 5" pumper nozzles on any Centurion 200™, 250™, or Modern hydrant. Mueller hydrants retain their UL Approval, FM Listing, AWWA Compliance and published pressure rating when ordered with the Storz option. Hydrants are also compliant with NFPA 1963. To order, specify Storz size, and locking or non-locking caps.



Mueller also offers latching and non-latching 5" Storz adaptors for connection to 4-1/2" NST nozzles. Mueller Storz adaptors feature the same caps used on the integral Storz nozzle and meet the requirements of NFPA 1963. Mueller Storz adaptors are rated for 250 psi operating pressure.

***For more information, contact your local authorized Mueller Distributor, Mueller Sales Representative, or call our Customer Service Center at 1-800-423-1323.***



**Smart Move™**

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Canada: 1.705.719.9965  
International: 1.423.490.9555

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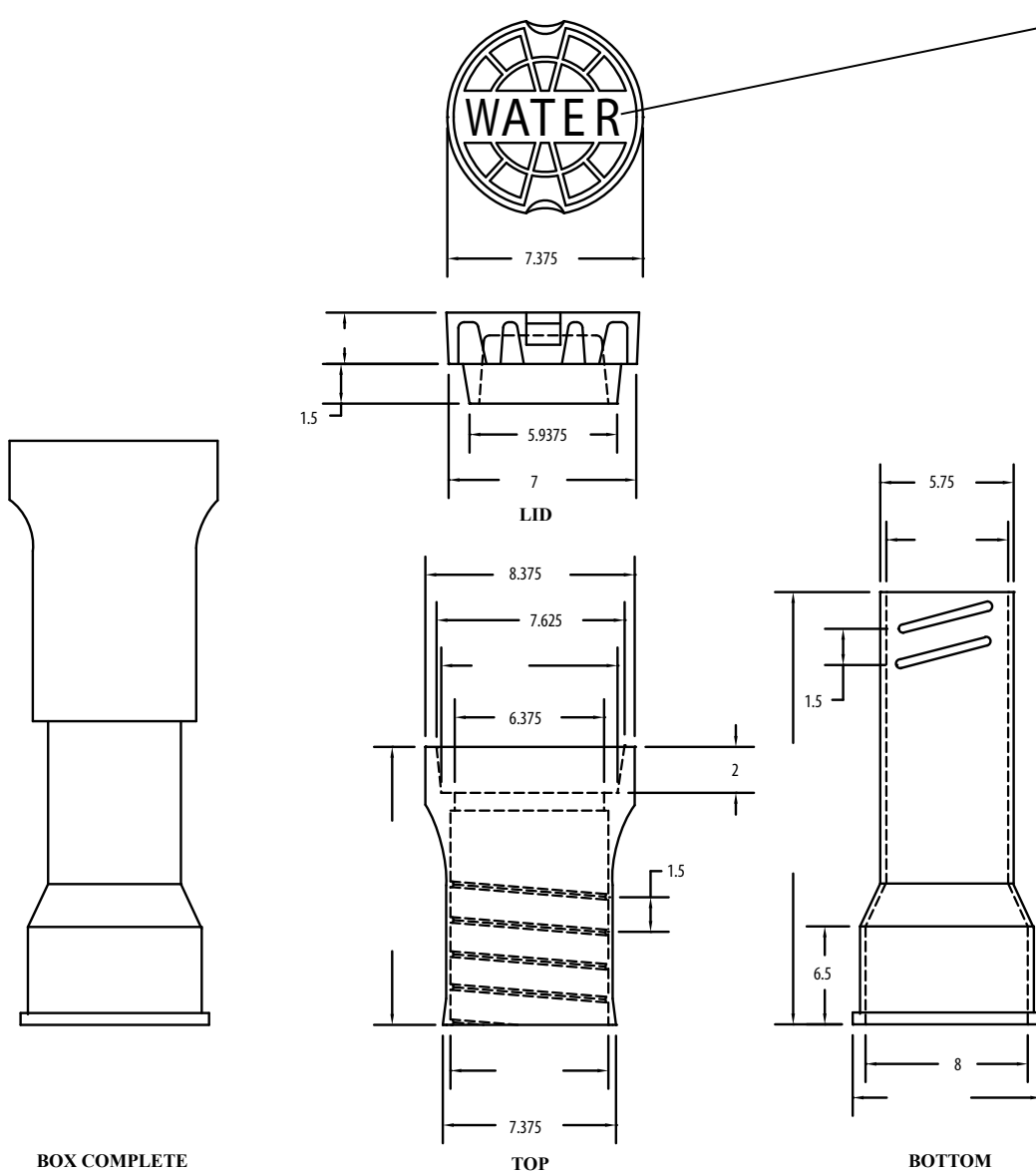
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**Form 12272 - Rev 11/15**

MISCELLANEOUS GRAY IRON  
CASTINGS - VALVE BOXES  
(STAR)

**2 PIECE STANDARD SCREW TYPE VALVE BOX**
**VB-0001**

| ITEM CODE     | HEIGHT       | LENGTH    |           |
|---------------|--------------|-----------|-----------|
|               |              | TOP       | BOT.      |
| VB461S        | 19-21        | 10        | 15        |
| VB462S        | 27-32        | 10        | 24        |
| <b>VB562S</b> | <b>27-37</b> | <b>16</b> | <b>24</b> |
| VB564S        | 39-50        | 16        | 36        |
| VB664S        | 39-60        | 26        | 36        |


**LID LETTER OPTIONS\***
**WATER**

SEWER

RECLAIM

IRRIGATION

GAS

FIRE

\*Unless specified, all VB shipped with "WATER" lids.

**Notes:**

- Material - Cast Iron Per ASTM A48 Class 30B
- Dimensions in Inches



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STAR® PIPE PRODUCTS  
HOUSTON **CORPORATE** | TOLL FREE 1-800-999-3009 | FAX 281-558-9000  
www.starpipeproducts.com

# SERVICE SADDLES

## (SMITH BLAIR)



# Service Saddle

## Double Stainless Steel Strap

# 317



**Description:** Double strap Ductile Iron service saddle with TaperSeal™ gasket and wraparound 304 Stainless Steel strap for added corrosion resistance

**Application:** For outlets of 5/8" through 4".

### Key Features:

- Meets applicable AWWA C800 Standards
- The wide saddle body provides stability on the pipe
- Designed with PVC and other soft or brittle pipe in mind
- The gasket fully bonds to the cavity to hold it in place
- NPT, CC and other threaded outlets available in sizes 5/8" thru 4"
- Wide bands spread the load over larger area to prevent damage to the pipe when tightening the straps
- A closed lug on one side, combined with the strap, acts as a hinge for easier installation

### Materials Specifications (subject to change):

**BODIES:** Ductile Iron per ASTM A536

**STRAPS:** Type 304 Stainless Steel. Double Strap 1.50" wide

**NUTS:** Type 304 Stainless Steel fluoropolymer coated

**WASHERS:** Type 304 Stainless Steel

**STUDS:** Type 304 Stainless Steel

**GASKET:** Nitrile (Buna N) NSF 61® compounded to resist oil, acids, alkalies, most (aliphatic) hydrocarbon fluids, water and other chemicals

**Temperature Range:** -20°F to 180°F

**FINISH:** Flexi-Coat® Fusion-Bonded Epoxy Finish per AWWA C213

**Working Pressure:** Up to 300 PSI, depending on size and application

**Pipe Applications:** Steel, Ductile Iron, Cast Iron, Asbestos Cement, PVC and HDPE (with spring washers)

**Taps:** 5/8", 3/4", 1", 1 1/4", 1 1/2" and 2" CC Taps; 3/4", 1", 1 1/4", 1 1/2", 2", 2 1/2", 3" and 4" NPT Taps

**Sizes (in inches):** Varies by tap type; see tables for size details



# Service Saddle

## Double Stainless Steel Strap

317

### BSP Thread Tap Codes

| SIZE   | CODE NUMBER | EXAMPLE                 |
|--------|-------------|-------------------------|
| 1/2"   | 59          | 3" NPT 317-00076017-000 |
| 3/4"   | 50          |                         |
| 1"     | 51          |                         |
| 1 1/4" | 54          |                         |
| 1 1/2" | 52          | 3" BSP 317-00076056-000 |
| 2"     | 53          |                         |
| 2 1/2" | 55          |                         |
| 3"     | 56          |                         |

### 3/4" and 1" NPT Taps

\*Sized for use on C900 PVC Pipe

| STANDARD                  |                         |                     | CATALOG NUMBER   |                  | CTN.<br>QTY | METRIC          |                     |                    |
|---------------------------|-------------------------|---------------------|------------------|------------------|-------------|-----------------|---------------------|--------------------|
| NOM.<br>SIZES INCH-<br>ES | O.D.<br>RANGE<br>INCHES | WT.<br>EACH<br>LBS. | 3/4" NPT/20 MM   | 1" NPT/25 MM     |             | NOM.<br>SIZE MM | O.D.<br>RANGE<br>MM | WT.<br>EACH<br>KG. |
| 1-1/4-1-1/2               | 1.61-1.92               | 3                   | 317-00019206-000 | 317-00019208-000 | 6           | 32-40           | 41-48               | 1                  |
| 2                         | 2.35-2.56               | 3                   | 317-00025606-000 | 317-00025608-000 | 6           | 50              | 60-65               | 1                  |
| 2-1/4-2-1/2               | 2.44-2.91               | 3                   | 317-00029106-000 | 317-00029108-000 | 6           | 57-65           | 62-73               | 2                  |
| 3                         | 2.97-3.54               | 4                   | 317-00035406-000 | 317-00035408-000 | 6           | 80              | 76-89               | 2                  |
| 3-4                       | 3.74-4.13               | 6                   | 317-00041306-000 | 317-00041308-000 | 6           | 80-100          | 95-105              | 3                  |
| 4                         | 4.40-4.50               | 6                   | 317-00045006-000 | 317-00045008-000 | 6           | 100             | 112-114             | 3                  |
| 4*                        | 4.40-4.80               | 6                   | 317-00048006-000 | 317-00048008-000 | 6           | 100             | 112-122             | 3                  |
| 4-5                       | 5.00-5.63               | 6                   | 317-00056306-000 | 317-00056308-000 | 6           | 100-125         | 121-143             | 3                  |
| 6                         | 5.94-6.70               | 6                   | 317-00066306-000 | 317-00066308-000 | 6           | 150             | 151-170             | 3                  |
| 6*                        | 5.94-6.90               | 6                   | 317-00069006-000 | 317-00069008-000 | 4           | 150             | 151-175             | 3                  |
| 6                         | 6.84-7.60               | 7                   | 317-00076006-000 | 317-00076008-000 | 4           | 150             | 174-193             | 3                  |
| 6-8                       | 7.69-8.72               | 8                   | 317-00087206-000 | 317-00087208-000 | 4           | 150-200         | 195-221             | 4                  |
| 6-8*                      | 7.69-9.05               | 8                   | 317-00090506-000 | 317-00090508-000 | 4           | 150-200         | 195-230             | 4                  |
| 8-10                      | 8.54-10.10              | 8                   | 317-00101006-000 | 317-00101008-000 | 4           | 200-250         | 217-256             | 4                  |
| 10*                       | 10.75-11.10             | 9                   | 317-00111006-000 | 317-00111008-000 | 4           | 250             | 273-282             | 4                  |
| 10-12                     | 10.64-12.12             | 10                  | 317-00121206-000 | 317-00121208-000 | 4           | 250-300         | 271-307             | 4                  |
| 12*                       | 12.75-13.20             | 9                   | 317-00132006-000 | 317-00132008-000 | 4           | 300             | 324-335             | 6                  |
| 12-14                     | 12.62-14.32             | 15                  | 317-00143206-000 | 317-00143208-000 | 4           | 300-350         | 321-363             | 7                  |
| 12-14                     | 14.73-15.65             | 18                  | 317-00156506-000 | 317-00156508-000 | 1           | 300-350         | 375-397             | 8                  |
| 14-16                     | 15.95-17.25             | 19                  | 317-00172506-000 | 317-00172508-000 | 1           | 350-400         | 406-438             | 9                  |
| 16                        | 17.25-17.80             | 19                  | 317-00178006-000 | 317-00178008-000 | 1           | 410             | 438-452             | 9                  |
| 16-18                     | 17.40-18.88             | 19                  | 317-00188806-000 | 317-00188808-000 | 1           | 400-450         | 442-479             | 9                  |
| 18*                       | 19.38-19.68             | 19                  | 317-00195006-000 | 317-00195008-000 | 1           | 450             | 492-500             | 9                  |
| 20*                       | 21.55-21.65             | 19                  | 317-00216006-000 | 317-00216008-000 | 1           | 500             | 547-550             | 9                  |
| 24*                       | 25.75-25.85             | 30                  | 317-00258006-000 | 317-00258008-000 | 1           | 600             | 654-657             | 14                 |

When properly sized from the factory, this product (denoted by \*) meets the requirements listed in the Uni-Bell PVC Pipe Association's "Handbook of PVC Pipe" and in the AWWA's "Manual M23: PVC Pipe Design and Installation."



## 1¼", 1½", 2" and 2½" NPT Taps

\*Sized for use on C900 PVC Pipe

| STANDARD                |                         |                     | CATALOG NUMBER   |                  |                  |                  | CTN.<br>QTY | METRIC             |                     |                    |
|-------------------------|-------------------------|---------------------|------------------|------------------|------------------|------------------|-------------|--------------------|---------------------|--------------------|
| NOM.<br>SIZES<br>INCHES | O.D.<br>RANGE<br>INCHES | WT.<br>EACH<br>LBS. | 1-1/4" NPT/32 MM | 1-1/2" NPT/40 MM | 2" NPT/50 MM     | 2-1/2" NPT/65 MM |             | NOM.<br>SIZE<br>MM | O.D.<br>RANGE<br>MM | WT.<br>EACH<br>KG. |
| 2                       | 2.35-2.56               | 3                   | 317-00025610-000 | 317-00025612-000 | -                | -                | 6           | 50                 | 60-65               | 1                  |
| 3                       | 2.97-3.54               | 5                   | 317-00035410-000 | 317-00035412-000 | 317-00035414-000 | -                | 6           | 80                 | 76-89               | 2                  |
| 3-4                     | 3.74-4.13               | 8                   | 317-00041310-000 | 317-00041312-000 | 317-00041314-000 | 317-00041316-000 | 6           | 80-100             | 95-105              | 3                  |
| 4                       | 4.40-4.50               | 6                   | 317-00045010-000 | 317-00045012-000 | 317-00045014-000 | 317-00045016-000 | 6           | 100                | 112-114             | 3                  |
| 4*                      | 4.40-4.80               | 6                   | 317-00048010-000 | 317-00048012-000 | 317-00048014-000 | 317-00048016-000 | 6           | 100                | 112-122             | 3                  |
| 4-5                     | 4.74-5.14               | 6                   | 317-00051410-000 | 317-00051412-000 | 317-00051414-000 | 317-00051416-000 | 6           | 100                | 120-130             | 3                  |
| 4-5                     | 5.00-5.63               | 9                   | 317-00056310-000 | 317-00056312-000 | 317-00056314-000 | 317-00056316-000 | 4           | 100-125            | 121-143             | 4                  |
| 6                       | 6.94-6.70               | 9                   | 317-00066310-000 | 317-00066312-000 | 317-00066314-000 | 317-00066316-000 | 4           | 150                | 151-170             | 4                  |
| 6*                      | 5.94-6.90               | 9                   | 317-00069010-000 | 317-00069012-000 | 317-00069014-000 | 317-00069016-000 | 4           | 150                | 151-175             | 4                  |
| 6                       | 6.84-7.60               | 7                   | 317-00076010-000 | 317-00076012-000 | 317-00076014-000 | 317-00076016-000 | 4           | 150                | 174-193             | 3                  |
| 6-8                     | 7.69-8.72               | 11                  | 317-00087210-000 | 317-00087212-000 | 317-00087214-000 | 317-00087216-000 | 4           | 150-200            | 195-221             | 5                  |
| 6-8*                    | 7.69-9.05               | 11                  | 317-00090510-000 | 317-00090512-000 | 317-00090514-000 | 317-00090516-000 | 4           | 150-200            | 195-230             | 5                  |
| 8-10                    | 8.54-10.10              | 9                   | 317-00101010-000 | 317-00101012-000 | 317-00101014-000 | 317-00101016-000 | 4           | 200-250            | 217-256             | 4                  |
| 10*                     | 10.75-11.10             | 9                   | 317-00111010-000 | 317-00111012-000 | 317-00111014-000 | 317-00111016-000 | 4           | 250                | 273-282             | 5                  |
| 10-12                   | 10.64-12.12             | 11                  | 317-00121210-000 | 317-00121212-000 | 317-00121214-000 | 317-00121216-000 | 4           | 250-300            | 271-307             | 5                  |
| 12*                     | 12.75-13.20             | 9                   | 317-00132010-000 | 317-00132012-000 | 317-00132014-000 | 317-00132016-000 | 4           | 300                | 324-335             | 6                  |
| 12-14                   | 12.62-14.32             | 14                  | 317-00143210-000 | 317-00143212-000 | 317-00143214-000 | 317-00143216-000 | 4           | 300-350            | 321-363             | 6                  |
| 12-14                   | 14.73-15.65             | 18                  | 317-00156510-000 | 317-00156512-000 | 317-00156514-000 | 317-00156516-000 | 1           | 300-350            | 375-397             | 8                  |
| 14-16                   | 15.95-17.25             | 19                  | 317-00172510-000 | 317-00172512-000 | 317-00172514-000 | 317-00172516-000 | 1           | 350-400            | 406-438             | 9                  |
| 16                      | 17.25-17.80             | 19                  | 317-00178010-000 | 317-00178012-000 | 317-00178014-000 | 317-00178016-000 | 1           | 410                | 438-452             | 9                  |
| 16-18                   | 17.40-18.88             | 19                  | 317-00188810-000 | 317-00188812-000 | 317-00188814-000 | 317-00188816-000 | 1           | 400-450            | 442-479             | 9                  |
| 18*                     | 19.38-19.68             | 19                  | 317-00195010-000 | 317-00195012-000 | 317-00195014-000 | 317-00195016-000 | 1           | 450                | 492-500             | 9                  |
| 20*                     | 21.55-21.65             | 19                  | 317-00216010-000 | 317-00216012-000 | 317-00216014-000 | 317-00216016-000 | 1           | 500                | 547-500             | 9                  |
| 24*                     | 25.75-25.85             | 30                  | 317-00258010-000 | 317-00258012-000 | 317-00258014-000 | 317-00258016-000 | 1           | 600                | 654-657             | 14                 |

When properly sized from the factory, this product (denoted by \*) meets the requirements listed in the Uni-Bell PVC Pipe Association's "Handbook of PVC Pipe" and in the AWWA's "Manual M23: PVC Pipe Design and Installation."

## 3" and 4" NPT Taps

\*Sized for use on C900 PVC Pipe

| STANDARD                |                         |                     | CATALOG NUMBER   |                  | CTN.<br>QTY | METRIC       |                  |              |
|-------------------------|-------------------------|---------------------|------------------|------------------|-------------|--------------|------------------|--------------|
| NOM.<br>SIZES<br>INCHES | O.D.<br>RANGE<br>INCHES | WT.<br>EACH<br>LBS. | 3" NPT/80 MM     | 4" NPT/100 MM    |             | NOM. SIZE MM | O.D.<br>RANGE MM | WT. EACH KG. |
| 6                       | 6.84-7.60               | 13                  | 317-00076017-000 | 317-00076018-000 | 2           | 150          | 174-193          | 6            |
| 8-10                    | 8.54-10.10              | 15                  | 317-00101017-000 | 317-00101018-000 | 3           | 200-250      | 217-256          | 7            |
| 10*                     | 10.75-11.10             | 14                  | -                | -                | -           | -            | -                | -            |
| 10-12                   | 11.30-12.12             | 14                  | 317-00121217-000 | 317-00121218-000 | 2           | 250-300      | 271-307          | 6            |
| 12*                     | 12.75-13.20             | 18                  | -                | -                | -           | -            | -                | -            |
| 12-14                   | 13.40-14.32             | 18                  | 317-00143217-000 | 317-00143218-000 | 2           | 300-350      | 321-363          | 8            |

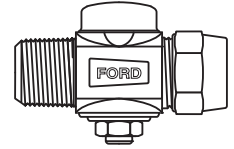
When properly sized from the factory, this product (denoted by \*) meets the requirements listed in the Uni-Bell PVC Pipe Association's "Handbook of PVC Pipe" and in the AWWA's "Manual M23: PVC Pipe Design and Installation."



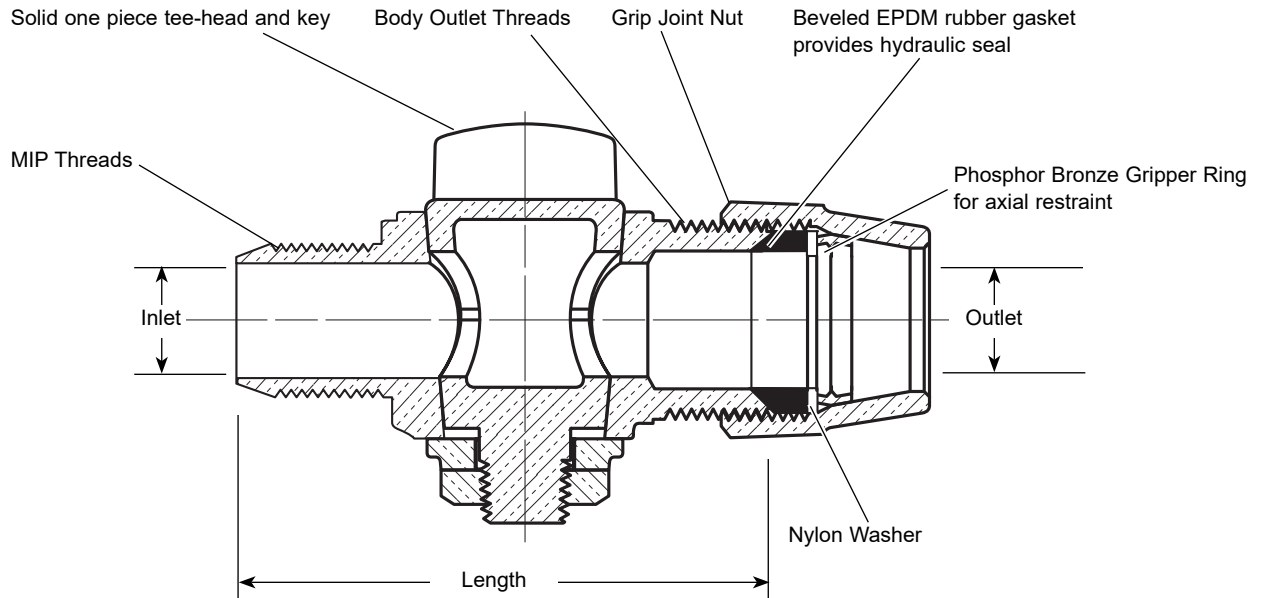
**BRASS GOODS**  
**(FORD METER BOX)**

# SUBMITTAL INFORMATION

## Corporation Stops - (F1100-x-G-NL style)



### MALE IRON PIPE THREAD INLET BY GRIP JOINT FOR COPPER OR PLASTIC TUBING (CTS) OUTLET



| VALVE SIZE | INLET SIZE | OUTLET SIZE | VALVE LENGTH | BODY OUTLET THREADS | APPROX. WT. LBS | PART NUMBER   | ✓ SUBMITTED ITEM(S) |
|------------|------------|-------------|--------------|---------------------|-----------------|---------------|---------------------|
| 3/4"       | 3/4"       | 3/4"        | 3-3/4"       | 3/4" Flare Copper   | 1.6             | F1100-3-G-NL  |                     |
| 3/4"       | 3/4"       | 1"          | 3-7/8"       | 1" Flare Copper     | 1.6             | F1100-34-G-NL |                     |
| 1"         | 1"         | 1"          | 4-9/16"      | 1" Flare Copper     | 2.6             | F1100-4-G-NL  |                     |

**Note:** Ford recommends using insert stiffeners with plastic pipe or tubing.

## FEATURES

- All brass that comes in contact with potable water conforms to AWWA Standard C800 (ASTM B584, UNS C89833)
- The product has the letters "NL" cast into the main body for lead-free identification
- Certified to NSF/ANSI Standard 61 and NSF/ANSI Standard 372 where applicable
- Brass components that do not come in contact with potable water conform to AWWA Standard C800 (ASTM B62 and ASTM B584, UNS C83600, 85-5-5-5)
- Body design provides larger, more rugged wrench flats for proper installation
- Meets 100 PSI working pressure requirement of AWWA Standard C800

The Ford Meter Box Company considers the information in this submittal form to be correct at the time of publication. Item and option availability, including specifications, are subject to change without notice. Please verify that your product information is current.



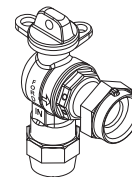
**The Ford Meter Box Company, Inc.**  
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443  
Phone: 260-563-3171 / Fax: 800-826-3487  
Overseas Fax: 260-563-0167  
www.fordmeterbox.com

03/23/17

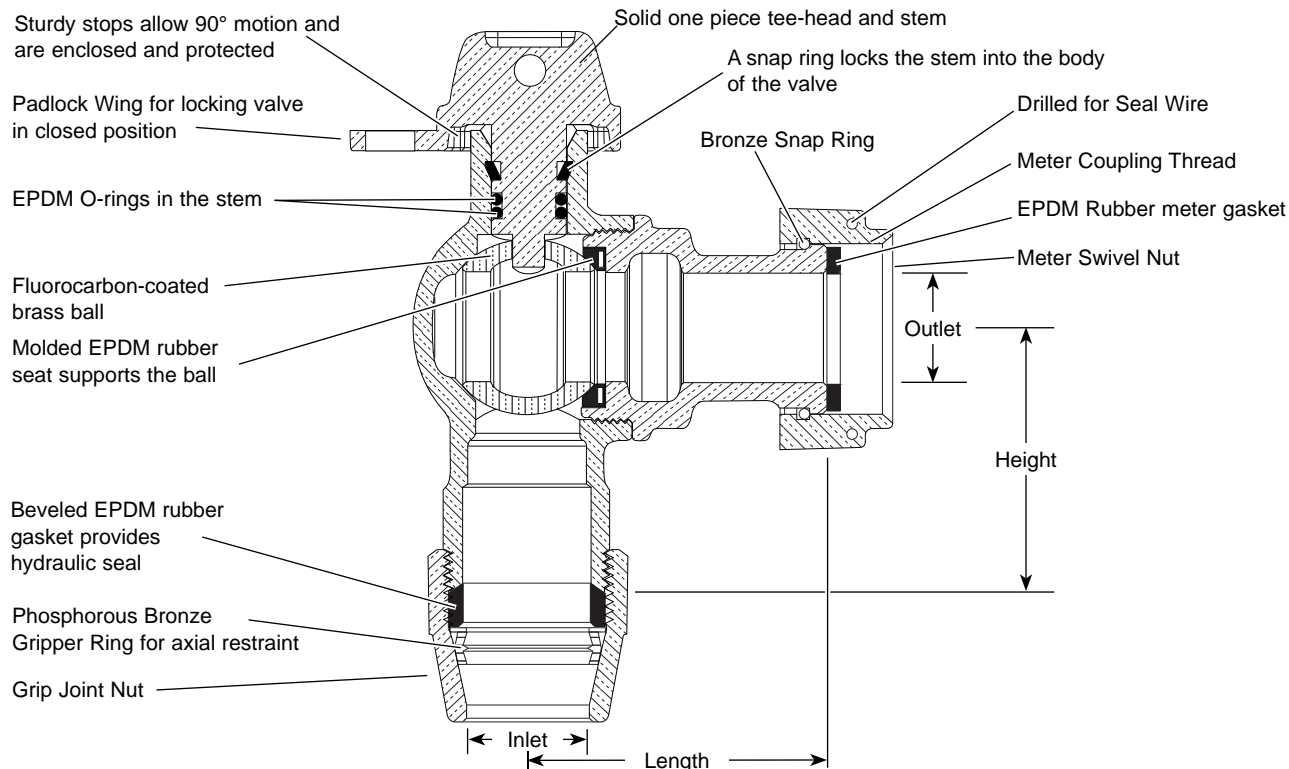
Submitted By:

# SUBMITTAL INFORMATION

## Angle Ball Meter Valves - (BA43-444W-G-NL style)



### GRIP JOINT FOR COPPER OR PLASTIC TUBING (CTS) INLET BY METER SWIVEL NUT OUTLET



| VALVE SIZE | SERVICE LINE SIZE INLET | METER SIZE OUTLET | LENGTH   | HEIGHT   | APPROX. Wt. LBS | PART NUMBER    | ✓ SUBMITTED ITEM(S) |
|------------|-------------------------|-------------------|----------|----------|-----------------|----------------|---------------------|
| 1"         | 1"                      | 1"                | 2-43/64" | 2-29/64" | 3.7             | BA43-444W-G-NL |                     |



**Note:** Ford recommends using insert stiffeners with plastic pipe or tubing.

### FEATURES

- All brass that comes in contact with potable water conforms to AWWA Standard C800 (UNS NO C89833)
- Brass components that do not come in contact with potable water conform to AWWA Standard C800 (ASTM B-62 and ASTM B-584, UNS NO C83600 - 85-5-5-5)
- Ends are integral or secured with adhesive to prevent unintentional disassembly
- Hole for attaching handle is provided in tee-head
- 300 PSI working pressure
- Padlock Wing for locking valve in closed position
- Conforms to AWWA C700 for Meter threads
- UL Classified to ANSI/NSF Standard 61 and Annex G

**Note:** Recommended for inlet side shut-off

**Optional full 360° tee-head rotation.** Insert "R" into part number. Example: BA43-331WR-G-NL

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Overseas Fax: 260-563-0167

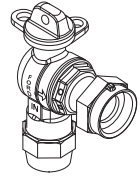
<http://www.fordmeterbox.com>

11/23/10

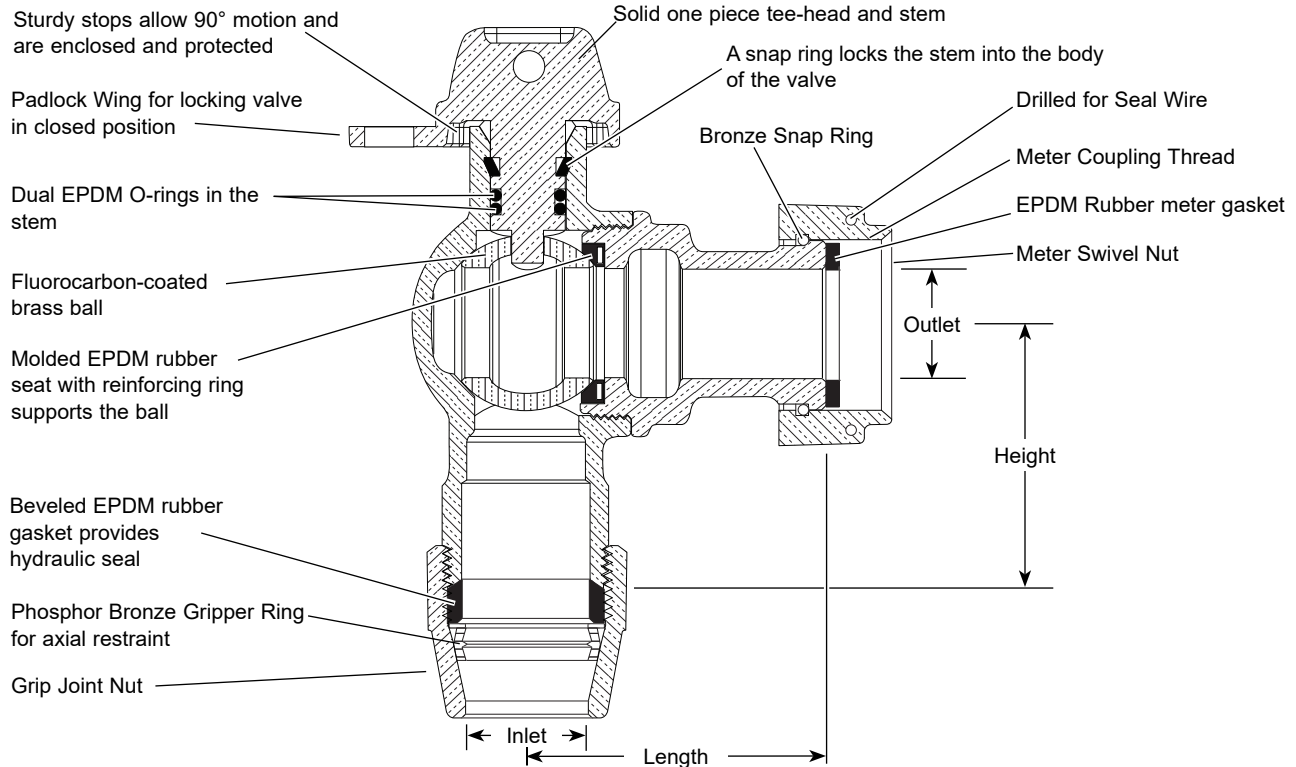
Submitted By:

# SUBMITTAL INFORMATION

## Angle Ball Meter Valves - (BA43-3xxW-G-NL style)



### GRIP JOINT FOR COPPER OR PLASTIC TUBING (CTS) INLET BY METER SWIVEL NUT OUTLET



| VALVE SIZE | SERVICE LINE SIZE INLET | METER SIZE OUTLET | LENGTH   | HEIGHT  | APPROX. WT. LBS | PART NUMBER    | ✓ SUBMITTED ITEM(S) |
|------------|-------------------------|-------------------|----------|---------|-----------------|----------------|---------------------|
| 3/4"       | 3/4"                    | 5/8"x3/4" & 3/4"  | 2-19/64" | 1-7/8"  | 2.2             | BA43-332W-G-NL |                     |
| 3/4"       | 1"                      | 5/8"x3/4" & 3/4"  | 2-19/64" | 2-7/32" | 2.4             | BA43-342W-G-NL |                     |

**Note:** Ford recommends using insert stiffeners with plastic pipe or tubing.

### FEATURES

- All brass that comes in contact with potable water conforms to AWWA Standard C800 (ASTM B584, UNS C89833)
- The product has the letters "NL" cast into the main body for lead-free identification
- Certified to NSF/ANSI Standard 61 and NSF/ANSI Standard 372 where applicable
- Brass components that do not come in contact with potable water conform to AWWA Standard C800 (ASTM B62 and ASTM B584, UNS C83600, 85-5-5-5)
- Ends are integral or secured with adhesive to prevent unintentional disassembly
- Hole for attaching handle is provided in tee-head
- 300 PSI working pressure
- Padlock wing for locking valve in closed position
- Conforms to AWWA C700 for meter threads

**Note:** Recommended for inlet side shut-off

**Optional full 360° tee-head rotation.** Insert "R" into part number. Example: BA43-332WR-G-NL

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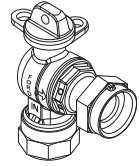
**The Ford Meter Box Company, Inc.**  
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03/22/17

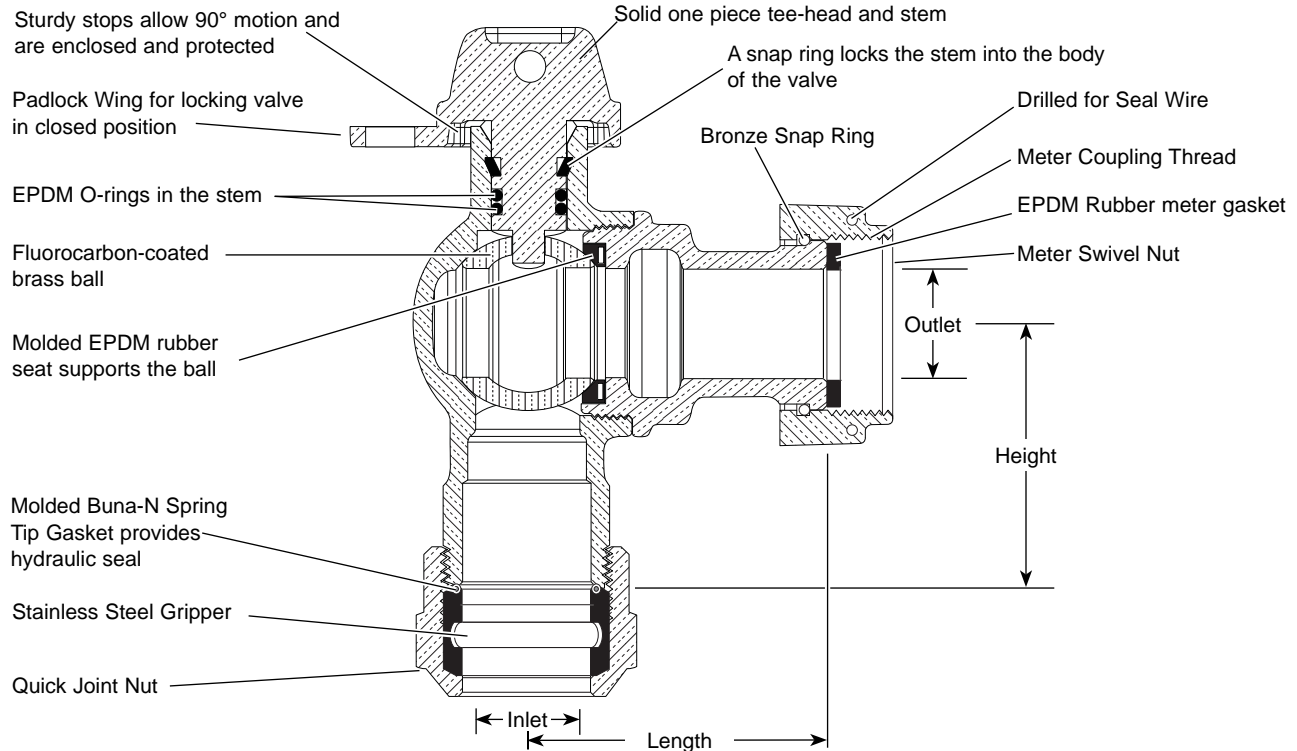
Submitted By:

# SUBMITTAL INFORMATION

## Angle Ball Meter Valves - (BA43-3xxW-Q-NL style)



### QUICK JOINT FOR COPPER OR PLASTIC TUBING (CTS) INLET BY METER SWIVEL NUT OUTLET



| VALVE SIZE | SERVICE LINE SIZE INLET | METER SIZE OUTLET  | LENGTH   | HEIGHT  | APPROX. WT. LBS | PART NUMBER    | ✓ SUBMITTED ITEM(S) |
|------------|-------------------------|--------------------|----------|---------|-----------------|----------------|---------------------|
| 3/4"       | 3/4"                    | 5/8" x 3/4" & 3/4" | 2-19/64" | 2-1/8"  | 2.3             | BA43-332W-Q-NL |                     |
| 3/4"       | 1"                      | 5/8" x 3/4" & 3/4" | 2-19/64" | 2-7/32" | 2.6             | BA43-342W-Q-NL |                     |
| 3/4"       | 1"                      | 1"                 | 1-63/64" | 2-7/32" | 2.6             | BA43-344W-Q-NL |                     |

**Note:** Ford recommends using insert stiffeners with plastic pipe or tubing.

### FEATURES

- All brass that comes in contact with potable water conforms to AWWA Standard C800 (ASTM B584, UNS C89833)
- The product has the letters "NL" cast into the main body for lead-free identification
- Certified to NSF/ANSI Standard 61 and NSF/ANSI Standard 372 where applicable
- Brass components that do not come in contact with potable water conform to AWWA Standard C800 (ASTM B62 and ASTM B584, UNS C83600, 85-5-5-5)
- Ends are integral or secured with adhesive to prevent unintentional disassembly
- Hole for attaching handle is provided in tee-head
- 300 PSI working pressure
- Padlock Wing for locking valve in closed position
- Conforms to AWWA C700 for Meter threads

**Note:** Recommended for inlet side shut-off

**Optional full 360° tee-head rotation.** Insert "R" into part number. Example: BA43-331WR-Q-NL

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Overseas Fax: 260-563-0167  
www.fordmeterbox.com

05/27/14

Submitted By:

**POLYETHYLENE TUBING  
FOR POTABLE WATER  
SERVICES  
(ENDOT INDUSTRIES)**

# EndoPoly PE 4710 Copper Tube Size

## High Density Polyethylene

### • Meets the Requirements of ASTM D2737

- EndoPoly water service tubing may be joined with approved compression fittings.

### EndoPoly Water Service Tubing | 250 PSI | @73.4°F (CTS) | SODR 9

| Size   | O.D.   | I.D.   | Min. Wall | Weight Per 100' |
|--------|--------|--------|-----------|-----------------|
| 3/4"   | 0.875" | 0.675" | .097"     | 10.0 lbs.       |
| 1"     | 1.125" | 0.865" | .125"     | 16.5 lbs.       |
| 1-1/4" | 1.375" | 1.059" | .153"     | 24.8 lbs.       |
| 1-1/2" | 1.625" | 1.253" | .181"     | 34.3 lbs.       |
| 2"     | 2.125" | 1.629" | .236"     | 59.2 lbs.       |

### Color Specifications

Available in: **Black** (water). EndoPoly pipe & tubing is color-coded with permanent indented printing and footage tape: **Light Blue** Tape = 250 PSI Tubing

### Standards

ENDOT's EndoPoly pipe and tubing meets the applicable standards of ASTM D3350 (Cell Classification 445574C), ASTM D2737 or D2239, NSF-14 & 61, AWWA C901, and BOCA

### Guarantee

ENDOT's pipe and tubing is guaranteed against rot, rust and electrolytic corrosion, and to be free of defects in material and workmanship. ENDOT's liability will be limited to the replacement of pipe or tubing acknowledged to be defective. See Warranty for details. Use of pipe sealing compounds, pipe dope and detergent type lubricants voids all warranties.

- Chlorine Resistance CC3 & CC2

For the latest information on products and services, visit: [endot.com](http://endot.com)



### ENDOT INDUSTRIES

#### CORPORATE HEADQUARTERS

60 Green Pond Road, Rockaway, NJ 07866  
800-443-6368 | FAX 973-625-4087

**PLANT LOCATIONS:** Rockaway, NJ | Greeneville, TN | Pryor Creek, OK

**EMAIL:** [info@endot.com](mailto:info@endot.com) | [endot.com](http://endot.com)



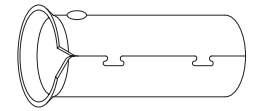
4/19 1M

INSERT STIFFNERS FOR  
POLY TUBING  
(FORD METER BOX)

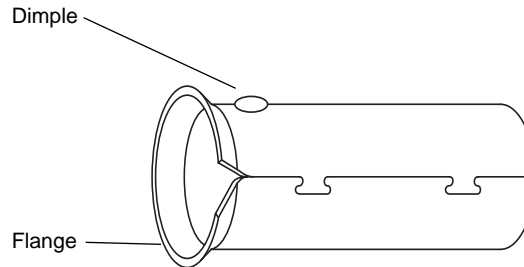


# SUBMITTAL INFORMATION

## Stainless Steel Inserts - (Insert-xx style)



### STAINLESS STEEL INSERTS FOR POLYETHYLENE PIPE (PEP) OR TUBING (PET)



#### 70 Series For Polyethylene Pipe (PEP)

| CATALOG NUMBER     | NOMINAL SIZE | PEP ID | APPROX. WT. LBS.* | STD. PKG. QTY. | ✓ SUBMITTED ITEM(S) |
|--------------------|--------------|--------|-------------------|----------------|---------------------|
| INSERT-71          | 3/4"         | 0.824  | 4.4               | 100            |                     |
| ** INSERT-53-72    | 1"           | 1.049  | 2.9               | 50             |                     |
| ◆** INSERT-53-72-Q | 1"           | 1.049  | 2.9               | 50             |                     |
| INSERT-73          | 1-1/4"       | 1.380  | 5.8               | 75             |                     |
| INSERT-74          | 1-1/2"       | 1.610  | 5.5               | 45             |                     |
| INSERT-75          | 2"           | 2.067  | 9.7               | 50             |                     |

#### 50 series For Polyethylene Tubing (PET)

| CATALOG NUMBER     | NOMINAL SIZE | PET ID | APPROX. WT. LBS.* | STD. PKG. QTY. | ✓ SUBMITTED ITEM(S) |
|--------------------|--------------|--------|-------------------|----------------|---------------------|
| INSERT-51          | 3/4"         | 0.681  | 4.8               | 200            |                     |
| INSERT-52          | 1"           | 0.875  | 4.2               | 100            |                     |
| ** INSERT-53-72    | 1-1/4"       | 1.069  | 2.9               | 50             |                     |
| ◆** INSERT-53-72-Q | 1-1/4"       | 1.069  | 2.9               | 50             |                     |
| INSERT-54          | 1-1/2"       | 1.263  | 3.1               | 25             |                     |
| INSERT-55          | 2"           | 1.653  | 6.0               | 40             |                     |
| ◆ INSERT-54-Q      | 1-1/2"       | 1.263  | 2.6               | 30             |                     |
| ◆ INSERT-55-Q      | 2"           | 1.653  | 5.8               | 50             |                     |

\* Weights for insert stiffeners are for standard package quantities.

\*\*Insert -53 and -72 fit both 1-1/4" plastic tubing (1.069 I.D.) and 1" plastic pipe (1.049 I.D.).

◆ These inserts are specifically designed and required for Quick Joint fittings. They are not interchangeable with other Compression Fittings.

## FEATURES

- Insert stiffeners conform to the AWWA Standard C901 for Polyethylene (PE) Pressure Pipe and Tubing.
- Insert stiffeners are solid 304 tubular stainless steel (ASTM 240-92B).
- Dimpled and flanged to retain placement within the service line.
- Key lock construction with a minimum of two key locks to maintain solid structural integrity.

**Note:** Consult pipe or tubing manufacturer for specific installation requirements. Ford recommends using insert stiffeners when using plastic pipe or tubing.

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### The Ford Meter Box Company, Inc.

P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443

Phone: 260-563-3171 / Fax: 800-826-3487

Overseas Fax: 260-563-0167

<http://www.fordmeterbox.com>

06/01/06

Submitted By:

SEAMLESS TYPE 'K' SOFT  
COPPER TUBING  
(CAMBRIDGE-LEE)



# CAMBRIDGE-LEE INDUSTRIES, LLC.

Reading Tube Division

P.O. Box 14026, Reading, PA 19612 - 4026

Phone 610 - 926 4141 Fax 610 - 926 7317

**Distributor:**

**Address:**

**Order No.:**

**Product:**

**Customer:**

**Address:**

**P.O. No.:**

## Standard Tube Certificate of Conformance

| Tube Type                                     | Specification No.* | Specification Title  |
|---|--------------------|--|
| Type K, L & M                                 | ASTM B 88          | Standard Specification for Seamless Copper Water Tube  |
|   | NSF 61             | ANSI/NSF Standard 61 Drinking Water System Components Health Effects <sup>1</sup>                    |
| Coils and Straight Lengths Marked as ACR      | ASTM B 280         | Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service |
| Type DWV Drainage                             | ASTM B 306         | Standard Specification for Copper Drainage Tube (DWV)  |
| Type K & L Straight Lengths Marked as OXY/MED | ASTM B 819         | Standard Specification for Seamless Copper Tube for Medical Gas Systems                              |

Cambridge-Lee Industries, LLC, located in Reading, PA, USA, manufactures seamless copper tubing in the United States of America and is fully compliant with the "Buy American" requirements of Public Law 111-5, the American Recovery and Investment Act of 2009.

Cambridge-Lee Industries, LLC, manufactures seamless copper tubing with recycled scrap. Our production meets the LEED, Leadership in Energy and Environmental Design qualifications. The process of scrap recycling entails the purchase of #1 grade scrap and converting it in a finished cast form, which meets specification; alloy C12200, for standard product production. Currently, operations purchases about 65% of #1 scrap. The remaining capacity is cathode copper and run around.

Cambridge-Lee Industries, LLC certifies that the copper tube manufactured is grade UNS C12200 and meets the applicable chemical, mechanical, cleanliness and eddy current testing requirements of the current specification(s) indicated above.

When specified at order placement and for an additional cost, CLI – RTD can supply product mill test reports of the current ASTM standard.

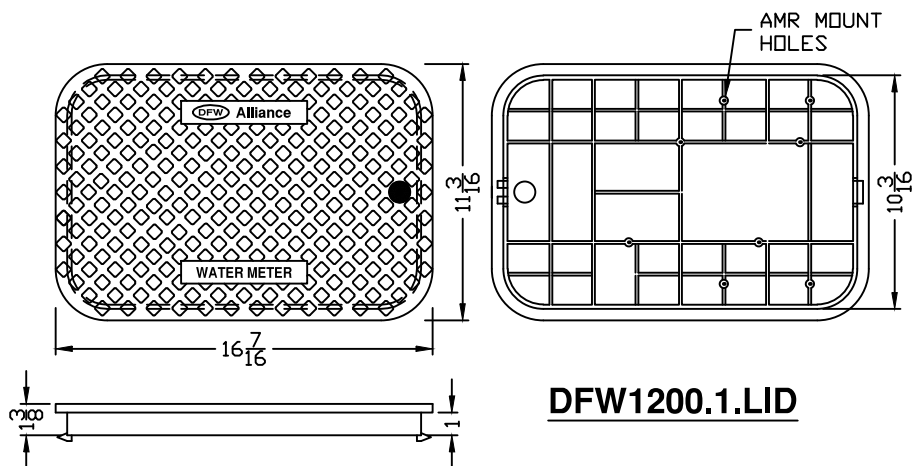
Copper tube manufactured by Cambridge-Lee Industries does not contain mercury or come in contact with mercury, mercury compounds or mercury containing devices at any stage in manufacturing, inspection, packaging or shipping.

All of the specifications require a minimum copper plus silver content of 99.9% and phosphorus content between .015 - .040%. As indicated by the compositional requirements, the copper tube is essentially lead free.

<sup>1</sup> NSF Standard 61 Restriction Statement: Copper tube (Alloy C12200) is Certified by NSF/ANSI 61 for use in drinking water supplies of pH 6.5 and above. Product is Certified to NSF/ANSI 372 and conforms with the lead content requirements for "lead free" plumbing as defined by California, Vermont, Maryland, and Louisiana state laws and the U.S. Safe Drinking Water Act.

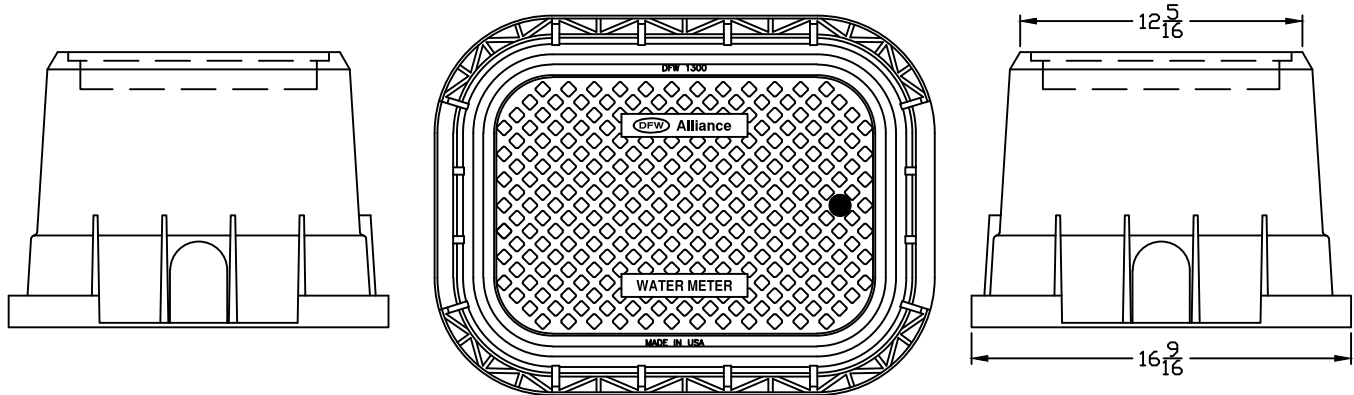
# METER BOXES

## (DFW PLASTICS)

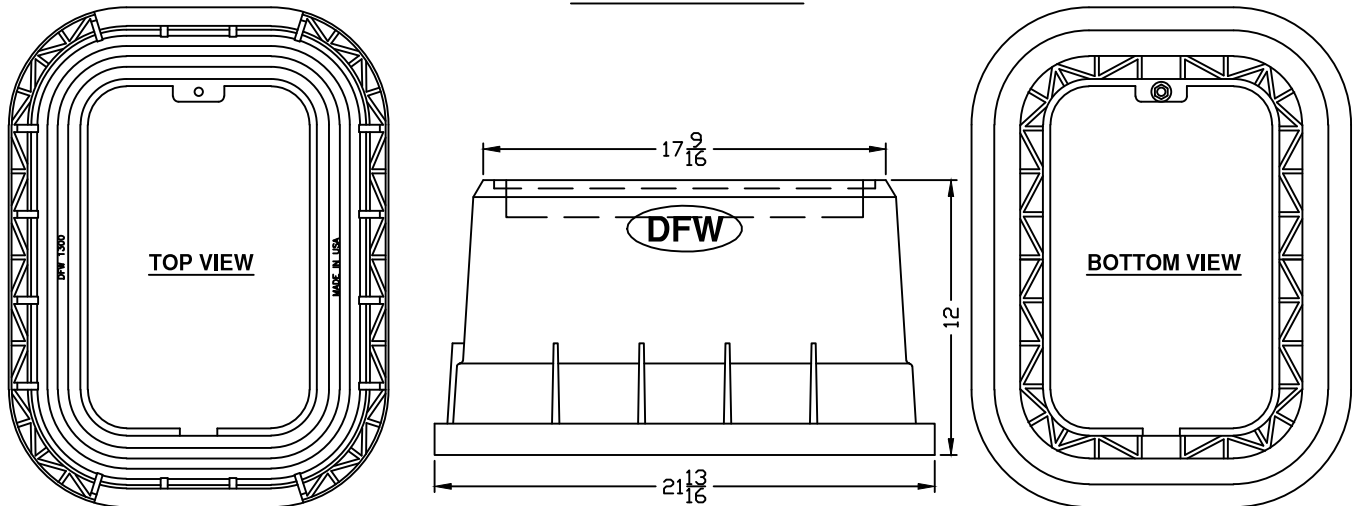


| LID KEY |             |
|---------|-------------|
| 1       | BLACK COLOR |

**DFW1200.1.LID**



**DFW1300.12.1**



**DFW1300.12.BODY**

**NOTES**

- 1) DIM'S  $\pm 1/8"$  U.N.O.
- 2) LID MATERIAL: POLYPROPYLENE
- 3) BODY MATERIAL: POLYPROPYLENE
- 4) WALL THICKNESS:  $1/8" \pm 5\%$
- 5) I.W.A. = INSIDE WORK AREA

DFW PLASTICS, INC. ENGAGES IN ONGOING RESEARCH AND DEVELOPMENT TO IMPROVE AND ENHANCE ITS PRODUCTS. THEREFORE, DFW PLASTICS, INC. RESERVES THE RIGHT TO CHANGE PRODUCT OR SYSTEM SPECIFICATIONS WITHOUT NOTICE.



DFW PLASTICS, INC.  
PO BOX 648  
BEDFORD, TEXAS 76095  
(817) 439-3600  
(817) 439-3700 (f)  
www.dfwplasticsinc.com

DFW1300.12.1

CREATED: 09/12/2013

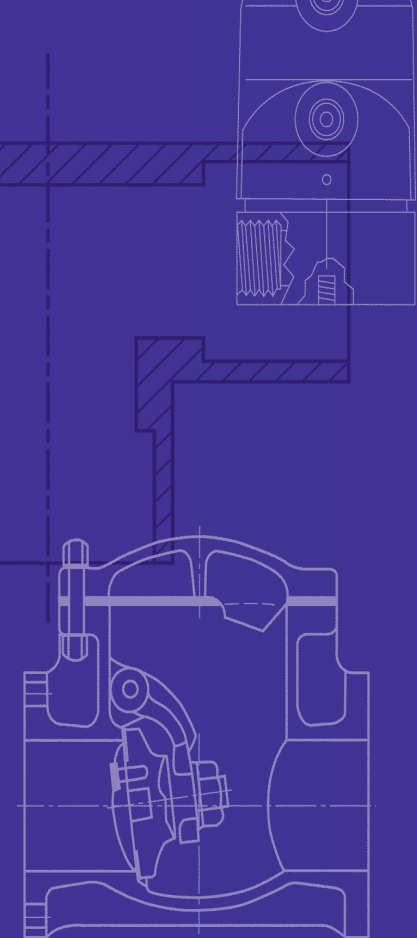
UPDATED: 03/20/2014

ACCEPTED: JMc

DRAWN BY: RMc

PLOT SCALE: 1:8

SCH 40 PVC  
BELLED-END PIPE  
(IPEX)



**Xirtec<sup>140</sup>**  
PVC PROCESS PIPING SYSTEM

**CORZAN<sup>®</sup>**  
CPVC PROCESS PIPING SYSTEM



INDUSTRIAL SYSTEMS

## VINYL PROCESS PIPING SYSTEMS

Complete systems of pipe, valves and fittings designed, manufactured and backed by one company.

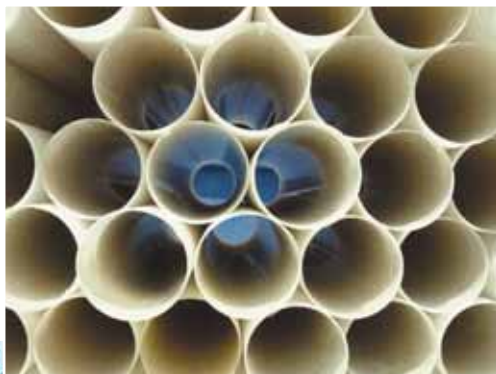
We build tough products for tough environments<sup>®</sup>

  
**IPEX**

# Pipe

IPEX features one of the most comprehensive ranges of thermoplastic pipe for today's industrial applications. Available in Schedule 40 and 80 with sizes ranging from 1/4" to 24", as well as SDR in sizes ranging from 1/2" to 48", IPEX vinyl pressure pipe exceeds the most stringent and demanding standards set by key standards organizations including ASTM, AWWA, CSA and NSF, to name a few.

But *unlike* almost all other pipe manufacturers in the world, IPEX's commitment to quality doesn't stop at the end of the manufacturing process or at our pipe yard. Xirtec and Corzan pipe are part of complete PVF systems. Dimensional matching, compatibility of compounds, chemical, physical and thermal properties and system accountability make IPEX pipe a key component of the high-performance Xirtec and Corzan systems.



## PVC

Schedule 40 from 1/2" to 24";

Schedule 80 from 1/4" to 24" and

SDR (standard dimensional ratio) from 1/2" to 48"

## CPVC

Schedule 40 and 80, 1/2" to 16"



## Xirtec<sup>140</sup>

All Xirtec<sup>140</sup> PVC Schedule 40 and 80 pipe shall meet ASTM D1785 and shall be third party certified to CSA B137.3 or NSF 14.

## CORZAN<sup>®</sup>

All Corzan CPVC Schedule 40 and 80 pipe shall meet ASTM F441.



See Volume I:  
Vinyl Process Piping  
Systems for more details.

PVC SIZE RANGE

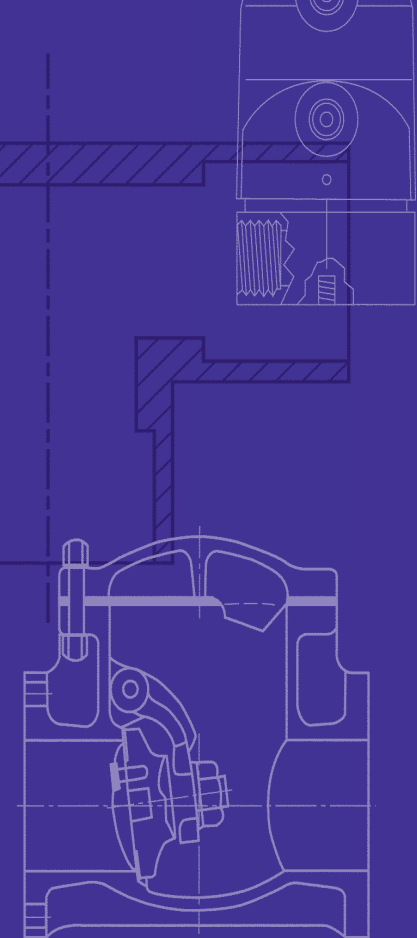
CPVC SIZE RANGE

|                   |               | IPEX<br>SCHEDULE 40<br>PVC/CPVC |               |                                    | IPEX<br>SCHEDULE 80<br>PVC/CPVC |               |                                    |
|-------------------|---------------|---------------------------------|---------------|------------------------------------|---------------------------------|---------------|------------------------------------|
| Diameter<br>(in.) | O.D.<br>(in.) | Wall<br>Thickness<br>(in.)      | I.D.<br>(in.) | *Max.<br>Pressure<br>73°F<br>(psi) | Wall<br>Thickness<br>(in.)      | I.D.<br>(in.) | *Max.<br>Pressure<br>73°F<br>(psi) |
| 1/4               | .540          | —                               | —             | —                                  | .119                            | .302          | 1,130                              |
| 3/8               | .675          | —                               | —             | —                                  | .126                            | .423          | 920                                |
| 1/2               | .840          | .109                            | .602          | 600                                | .147                            | .526          | 850                                |
| 3/4               | 1.050         | .113                            | .804          | 480                                | .154                            | .722          | 690                                |
| 1                 | 1.315         | .133                            | 1.029         | 450                                | .179                            | .936          | 630                                |
| 1-1/4             | 1.660         | .141                            | 1.360         | 370                                | .191                            | 1.255         | 520                                |
| 1-1/2             | 1.900         | .145                            | 1.590         | 330                                | .200                            | 1.476         | 470                                |
| 2                 | 2.375         | .154                            | 2.047         | 280                                | .218                            | 1.913         | 400                                |
| 2-1/2             | 2.875         | .203                            | 2.445         | 300                                | .276                            | 2.290         | 420                                |
| 3                 | 3.500         | .216                            | 3.042         | 260                                | .300                            | 2.864         | 370                                |
| 4                 | 4.500         | .237                            | 3.998         | 220                                | .337                            | 3.786         | 320                                |
| 6                 | 6.625         | .280                            | 6.031         | 180                                | .432                            | 5.709         | 280                                |
| 8                 | 8.625         | .322                            | 7.941         | 160                                | .500                            | 7.565         | 250                                |
| 10                | 10.750        | .365                            | 9.976         | 140                                | .593                            | 9.493         | 230                                |
| 12                | 12.750        | .406                            | 11.888        | 130                                | .687                            | 11.294        | 230                                |
| 14                | 14.000        | .438                            | 13.072        | 130                                | .750                            | 12.412        | 220                                |
| 16                | 16.000        | .500                            | 14.936        | 130                                | .843                            | 14.224        | 220                                |
| 18                | 18.000        | .562                            | 16.809        | 130                                | .937                            | 16.014        | 220                                |
| 20                | 20.000        | .593                            | 18.743        | 120                                | 1.031                           | 17.814        | 220                                |
| 24                | 24.000        | .687                            | 22.544        | 120                                | 1.218                           | 21.418        | 210                                |

\* Pipe pressure ratings must be devalued for higher temperatures.



SCH 80 PVC BELLED-END  
PVC PIPE  
(IPEX)



**Xirtec<sup>140</sup>**  
PVC PROCESS PIPING SYSTEM

**CORZAN<sup>®</sup>**  
CPVC PROCESS PIPING SYSTEM



INDUSTRIAL SYSTEMS

## VINYL PROCESS PIPING SYSTEMS

Complete systems of pipe, valves and fittings designed, manufactured and backed by one company.

We build tough products for tough environments<sup>®</sup>

  
**IPEX**

# Pipe

IPEX features one of the most comprehensive ranges of thermoplastic pipe for today's industrial applications. Available in Schedule 40 and 80 with sizes ranging from 1/4" to 24", as well as SDR in sizes ranging from 1/2" to 48", IPEX vinyl pressure pipe exceeds the most stringent and demanding standards set by key standards organizations including ASTM, AWWA, CSA and NSF, to name a few.

But *unlike* almost all other pipe manufacturers in the world, IPEX's commitment to quality doesn't stop at the end of the manufacturing process or at our pipe yard. Xirtec and Corzan pipe are part of complete PVF systems. Dimensional matching, compatibility of compounds, chemical, physical and thermal properties and system accountability make IPEX pipe a key component of the high-performance Xirtec and Corzan systems.



## PVC

Schedule 40 from 1/2" to 24";  
Schedule 80 from 1/4" to 24" and  
SDR (standard dimensional ratio) from 1/2" to 48"

## CPVC

Schedule 40 and 80, 1/2" to 16"



## Xirtec<sup>140</sup>

All Xirtec<sup>140</sup> PVC Schedule 40 and 80 pipe shall meet ASTM D1785 and shall be third party certified to CSA B137.3 or NSF 14.

## CORZAN<sup>®</sup>

All Corzan CPVC Schedule 40 and 80 pipe shall meet ASTM F441.



See Volume I:  
Vinyl Process Piping  
Systems for more details.

PVC SIZE RANGE

CPVC SIZE RANGE

|                   |               | IPEX<br>SCHEDULE 40<br>PVC/CPVC |               |                                    | IPEX<br>SCHEDULE 80<br>PVC/CPVC |               |                                    |
|-------------------|---------------|---------------------------------|---------------|------------------------------------|---------------------------------|---------------|------------------------------------|
| Diameter<br>(in.) | O.D.<br>(in.) | Wall<br>Thickness<br>(in.)      | I.D.<br>(in.) | *Max.<br>Pressure<br>73°F<br>(psi) | Wall<br>Thickness<br>(in.)      | I.D.<br>(in.) | *Max.<br>Pressure<br>73°F<br>(psi) |
| 1/4               | .540          | —                               | —             | —                                  | .119                            | .302          | 1,130                              |
| 3/8               | .675          | —                               | —             | —                                  | .126                            | .423          | 920                                |
| 1/2               | .840          | .109                            | .602          | 600                                | .147                            | .526          | 850                                |
| 3/4               | 1.050         | .113                            | .804          | 480                                | .154                            | .722          | 690                                |
| 1                 | 1.315         | .133                            | 1.029         | 450                                | .179                            | .936          | 630                                |
| 1-1/4             | 1.660         | .141                            | 1.360         | 370                                | .191                            | 1.255         | 520                                |
| 1-1/2             | 1.900         | .145                            | 1.590         | 330                                | .200                            | 1.476         | 470                                |
| 2                 | 2.375         | .154                            | 2.047         | 280                                | .218                            | 1.913         | 400                                |
| 2-1/2             | 2.875         | .203                            | 2.445         | 300                                | .276                            | 2.290         | 420                                |
| 3                 | 3.500         | .216                            | 3.042         | 260                                | .300                            | 2.864         | 370                                |
| 4                 | 4.500         | .237                            | 3.998         | 220                                | .337                            | 3.786         | 320                                |
| 6                 | 6.625         | .280                            | 6.031         | 180                                | .432                            | 5.709         | 280                                |
| 8                 | 8.625         | .322                            | 7.941         | 160                                | .500                            | 7.565         | 250                                |
| 10                | 10.750        | .365                            | 9.976         | 140                                | .593                            | 9.493         | 230                                |
| 12                | 12.750        | .406                            | 11.888        | 130                                | .687                            | 11.294        | 230                                |
| 14                | 14.000        | .438                            | 13.072        | 130                                | .750                            | 12.412        | 220                                |
| 16                | 16.000        | .500                            | 14.936        | 130                                | .843                            | 14.224        | 220                                |
| 18                | 18.000        | .562                            | 16.809        | 130                                | .937                            | 16.014        | 220                                |
| 20                | 20.000        | .593                            | 18.743        | 120                                | 1.031                           | 17.814        | 220                                |
| 24                | 24.000        | .687                            | 22.544        | 120                                | 1.218                           | 21.418        | 210                                |

\* Pipe pressure ratings must be devalued for higher temperatures.

# SCH 80 PVC FITTINGS

## (SPEARS)



# PVC SCHEDULE 80 FITTINGS

80-2-1000

## Performance Engineered & Tested



SPEARS® Schedule 80 PVC fitting designs combine years of proven experience with computer generated stress analysis to yield the optimum physical structure and performance for each fitting. Material reinforcement is uniformly placed in stress concentration areas for substantially improved pressure handling capability. Resulting products are subjected to numerous verification tests to assure obtaining the very best PVC fittings available.

### Full 1/4" Through 12" Availability

Spears® comprehensive line of injection molded PVC fittings offers a variety of configurations in molded Schedule 80 sizes 1/4" through 12" conforming to ASTM D 2467 and Spears® exclusive CL150 Flanges in sizes 1/2" through 16".

### Exceptional Chemical & Corrosion Resistance

Unlike metal, PVC fittings never rust, scale, or pit, and will provide many years of maintenance-free service and extended system life.

### High Temperature Ratings

PVC thermoplastic can handle fluids at service temperatures up to 140° F (60°C), allowing a wide range of process applications, including corrosive fluids.

### Lower Installation Costs

Substantially lower material costs than steel alloys or lined steel, combined with lighter weight and ease of installation, can reduce installation costs by as much as 60% over conventional metal systems.

### Higher Flow Capacity

Smooth interior walls result in lower pressure loss and higher volume than conventional metal fittings.

### Additional Fabricated Configurations through 36"

Extra large, hard-to-find, and custom configurations are fabricated from NSF Certified pipe. Fittings are engineered and tested to provide full pressure handling capabilities according to Spears® specifications.

### Advanced Design Specialty Fittings

Spears® wide range of innovative, improved products include numerous metal-to-plastic transition fittings and unions with Spears® patented special reinforced (SR) plastic threads.

### PVC Valves

SPEARS® PVC Valve products are available for total system compatibility and uniformity; see SPEARS® THERMOPLASTIC VALVES PRODUCT GUIDE & ENGINEERING SPECIFICATIONS (V-4).



### Sample Engineering Specifications

All PVC Schedule 80 fittings shall be produced by Spears® Manufacturing Company from PVC Type I, cell classification 12454, conforming to ASTM Standard D 1784. All injection molded PVC Schedule 80 fittings shall be Certified for potable water service by NSF International and manufactured in strict compliance to ASTM D 2467. All fabricated fittings shall be produced in accordance with Spears® General Specifications for Fabricated Fittings. All PVC flanges shall be designed and manufactured to meet CL150 bolt pattern per ANSI Standard B16.5 and rated for a maximum internal pressure of 150 psi, non-shock at 73°F.

**PROGRESSIVE PRODUCTS FROM SPEARS® INNOVATION & TECHNOLOGY**

Visit our web site: [www.spearsmfg.com](http://www.spearsmfg.com)



### PVC Thermoplastic Pipe Temperature Pressure De-Rating

To determine the maximum internal pressure rating at an elevated temperature, simply multiply the pipe pressure rating at 73°F by the percentage specified for the desired temperature.

| System Operating Temperature °F (°C) | 73 (23) | 80 (27) | 90 (32) | 100 (38) | 110 (43) | 120 (49) | 130 (54) | 140 (60) |
|--------------------------------------|---------|---------|---------|----------|----------|----------|----------|----------|
| PVC                                  | 100%    | 90%     | 75%     | 62%      | 50%      | 40%      | 30%      | 22%      |

NOTE: Valves, Unions and Specialty Products have different elevated temperature ratings than pipe.

### Typical Material Properties

| Properties                                       | ASTM Test Method  | PVC                    |
|--|-------------------|------------------------|
| Mechanical Properties, 73°F                      |                   |                        |
| Specific Gravity, g/cm³                          | D 792             | 1.41                   |
| Tensile Strength, psi                            | D 638             | 7,000                  |
| Modulus of Elasticity, psi                       | D 638             | 440,000                |
| Compressive Strength, psi                        | D 695             | 9,000                  |
| Flexural Strength, psi                           | D 790             | 13,200                 |
| Izod Impact, notched, ft-lb / in                 | D 256             | .65                    |
| Thermal Properties                               |                   |                        |
| Heat Deflection Temperature, °F at 66 psi        | D 648             | 165                    |
| Thermal Conductivity, BTU / hr / sq ft / °F / in | C 177             | 1.2                    |
| Coefficient of Linear Expansion, in / in / °F    | D 696             | 3.0 x 10 <sup>-5</sup> |
| Flammability                                     |                   |                        |
| Limited Oxygen Index, %                          | D 2863            | 43                     |
| UL 94 Rating                                     | 94V-0             |                        |
| Other Properties                                 |                   |                        |
| Water Absorption, % 24 hr.                       | D 570             | .05                    |
| Industry Standard Color                          | White / Dark Gray |                        |
| ASTM Cell Classification                         | D 1784            | 12454                  |
| NSF Potable Water Approved                       | YES               |                        |

### PVC Chemical Resistance

PVC is generally inert to most mineral acids, bases, salts and paraffinic hydrocarbon solutions. For more information on PVC chemical resistance refer to the Chemical Resistance of Rigid Vinyls Based on Immersion Test, published by the GEON® company.

### NOT FOR USE WITH COMPRESSED AIR OR GASES

Spears® Manufacturing Company DOES NOT RECOMMEND the use of thermoplastic piping products for systems to transport or store compressed air or gases, or the testing of thermoplastic piping systems with compressed air or gases in above and below ground locations. The use of our product in compressed air or gas systems automatically voids any warranty for such products, and its use against our recommendation is entirely the responsibility and liability of the installer.

**WARNING:** DO NOT USE COMPRESSED AIR OR GAS TO TEST ANY PVC OR CPVC THERMOPLASTIC PIPING PRODUCT OR SYSTEM, AND DO NOT USE DEVICES PROPELLED BY COMPRESSED AIR OR GAS TO CLEAR SYSTEMS. THESE PRACTICES MAY RESULT IN EXPLOSIVE FRAGMENTATION OF SYSTEM PIPING COMPONENTS CAUSING SERIOUS OR FATAL BODILY INJURY.



### SPEARS® MANUFACTURING COMPANY • CORPORATE OFFICE

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Denver, CO 80238  
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# CASING SPACERS

## (C.C.I.)



# CASING SPACER - MODEL CSC8

## SPECIFICATION & CERTIFICATE OF COMPLIANCE

The CCI Model CSC8 Casing Spacer shall be constructed of circular Carbon Steel bands, which bolt together forming a shell around the carrier pipe. The casing spacer shall be lined with a ribbed PVC extrusion with a retaining section that overlaps the edges of the shell and prevents slippage. The spacer shall be designed using runners with or without risers to support the carrier pipe within the casing and to maintain a minimum clearance of 1.0 in. between the casing ID and the carrier pipe OD.

The runners shall be Glass Reinforced Polymer with the ends of the runners beveled to facilitate installation over rough weld beads or the welded ends of misaligned or deformed casing pipe. The runners shall be attached to support structures (shell or risers) at appropriate positions to properly support the carrier pipe within the casing and for ease of installation. They shall have a minimum length of 7.0 in. and a minimum width of 2.0 in.

The shell shall be manufactured of 8.0 in. wide, Hot Rolled, Pickled, & Oiled 14-Gauge Carbon Steel. The riser shall be constructed of Hot Rolled, Pickled, & Oiled 10-Gauge Carbon Steel, 6.75 in. minimum lengths with a height to be determined based on the annular space between the carrier pipe OD and the casing ID.

Recommended positioning is to place one casing spacer 1-2 feet on each side of the bell joint and one every 6-8 feet apart thereafter for a total of three casing spacers per carrier pipe joint. CCI engineering reserves the right to recommend spacing according to the application.

### PHYSICAL PROPERTIES

#### **SHELL & RISERS**

Shell – 14-Gauge Hot Rolled, Pickled & Oiled Steel

Risers – 10-Gauge Hot Rolled, Pickled & Oiled Steel

#### **FINISH**

Copolymer-Based Thermoplastic Coating

Adhesion: ASTM D4541 >1,000 psi

Hardness: Durometer Shore 'D' 53

Max Operating Temperature (Constant): 150°F (65°C)

#### **RUNNERS**

2" Wide Glass Reinforced Polymer

Length: 7" (177.8 mm) Minimum

Tensile Strength: ASTM D638 27.0 ksi

Compressive Strength: ASTM D695 33.0 ksi

Flexural Strength: ASTM D695 40 ksi

Izod Impact @ 73°F (23°C): 11 kJ/m<sup>2</sup>

Melting Point: ASTM D3418 504°F (262°C)

#### **LINER – PVC (EPDM Alternate)**

Thickness: 0.09" (2.29mm) Minimum

Hardness: ASTM D2240 Durometer Shore 'A' 80-90

Dielectric Strength: ASTM D149-13 1,000 VPM

Water Absorption: 1% Maximum

Overlaps edges

#### **ASSEMBLY HARDWARE**

Bolts: 5/16"-18UNC x 2" Long Stainless Steel

Nuts: 5/16" Stainless Steel Hex

Washers: 5/16" Stainless Steel SAE 2330

#### **WELDING**

All risers shall be welded to the shell by MIG welding.

All welds are to be fully passivated.

**CCI Piping Systems certifies the Model CSC8 Carbon Steel Casing Spacers are of the highest quality which meet or exceed industry standards.**

## CCI PIPING SYSTEMS, LLC

1026 O'Neal Drive • Breaux Bridge, LA 70517

ccipipe.com • sales@ccipipe.com

337.332.5808 • 800.867.2772



# END SEALS FOR ENCASEMENT PIPE (C.C.I.)



## CCI PIPELINE SYSTEMS

Specifications & Certificates of Compliance:

**CCI End Seals Model ESW** and ESC

The CCI Model ESW Wrap-Around and Model ESC Pull-On end seals are manufactured of 1/8" thick neoprene rubber; assuring excellent chemical resistant and resiliency, also included are 1/2" wide T-304 stainless steel banding with 100% non-magnetic worm gear mechanism.

The CCI Model ESC casing end seal is a one-piece glued seal. It can be pulled-on at the time of construction.



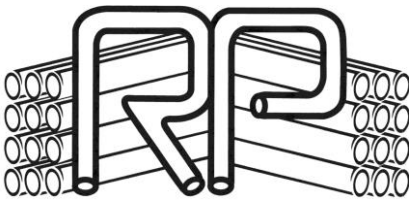
The CCI Model ESW casing end seal is a wrap-around seal and is designed to facilitate installation when the carrier line has already been joined together and the installation is complete.

CCI Pipeline Systems certifies that the standard Model ESC and the Model ESW casing end seals are of the highest quality and meet or exceed industry standards.

### **Physical Properties**

|                    |                |
|--------------------|----------------|
| Temperature Limits | -20°F to 170°F |
| Color              | Black          |
| Finish             | Smooth         |
| Durometer 'A'      | 70 +/- 5       |
| Average Tensile    | 1000 PSI       |
| Average Elongation | 350%           |

# ENCASEMENT PIPE (ROBINSON)



## **Robinson Pipe & Supply**

**PO Box 2073**

**Bellaire, TX 77402-2037**

**713-672-9999 Fax: 713-673-2844**

**Email: cary@robinsonpipe.net**

October 10, 2024

ACT Pipe & Supply  
1400 Grand Avenue Pkwy  
Pflugerville, TX 78660

Attn: Colton Mendenhall

This letter is to certify the specification for the following carbon steel casing being quoted to you by Robinson Pipe & Supply, Inc. The casing will be an ASTM A252 Grade 2 or better which will be a better grade than AWWA C200, ASTM A-36, A-570, A-135, or A-139 and will meet and exceed the specifications of AWWA C200, ASTM A-36, A-570, A-135, or A-139. This should provide a minimum psi yield of 35,000 and a tensile of 60,000 Non-Hydro. In addition, the material will have a minimum wall thickness as shown below. If you need further assistance, please feel free to call me. Thank you.

CASING

24.00" OD X .375 Steel Casing

60.00" OD X .500 Steel Casing

Best regards,

Cary Robinson  
President

**Your specialist in Line Pipe, Casing, Tubing, & Supplies**

**Prime Pipe, Surplus, Structural, Used, Piling, Road Bore, Water Well, Foundation & Elevator  
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