

# Olivehurst Public Utility District



## Agenda Item Staff Report

**Meeting Date: 5/21/26**

### Item description/summary:

Consider Approval for a Request for Bid (RFB) for Olivehurst PUD Purchase of Water Service Materials in order to replace water service at the following location:

2<sup>nd</sup> AVE  
BEAVER LN  
WESTERN AVE  
9<sup>TH</sup> AVE  
11<sup>TH</sup> AVE

Olivehurst Public Utility District (OPUD) is requesting Bids for MATERIALS for Replacement of existing water service lines based on locations where next year the County will begin to add sidewalk, curb, gutter, and storm through there Olivehurst Resiliency Project and some WATER MAIN for inhouse main replacement. During infrastructure repair and asphalt pulverization, this typically tend to loosen packed water services which can be up to 50+ years old and cause future leaks that will be expensive due to moratorium restrictions that would be in place, so it makes sense while funding is available to replace all remaining location on old existing AC main with rusted saddles (outside of Steel Main Replacement Project) to make necessary transfers to new services to align with the County Project. OPUD would use the RFB to have materials purchased but do the work in house in order to save overall cost.

### Fiscal Analysis:

Cost of materials would be roughly \$160k. The funding would be provided as part of the Steel Main Replacement Project and due to the benefits of the project we have remaining funds that would cover the material purchase cost.

### Employee Feedback

n/a

### Sample Motion:

Move forward to approve for Request for Bid for water service materials

Prepared by: Swarnjit Boyal, Public Works Manager

# EXHIBIT A – BID SET

**OLIVEHURST PUBLIC UTILITY DISTRICT**

**NOTICE OF REQUEST FOR SEALED BID'S**

(DATE) MAY 21, 2026

OWNER: **Olivehurst Public Utility District**  
PROJECT: **OPUD WATER MAIN & SERVICE LINE MATERIAL RFB**

TO: Contractor / Bidder

BID DUE DATE: **June 12, 2026 2:00 P.M.**

BID OPENING DATE/TIME: June 12, 2026 Shortly after Bid Due Date.

SUBMIT BID

TO: **Olivehurst Public Utility District**  
1970 9th Avenue  
Olivehurst, CA 95961  
(530) 682-0736

Notice is hereby given to all prospective Contractors /Suppliers to **submit a sealed BID** on or before the above date. Contractor / Supplier agree to supply all equipment described in the available CONTRACT DOCUMENTS consisting of Plans, proposal document and Specifications. OPUD is looking for BIDS for the purchase of various water service material and pipe material. Copies of the CONTRACT DOCUMENTS may be obtained from Olivehurst Public Utility District, upon the non-refundable payment of \$ 50 per set, or you may request a free electronic copy from the District Public Works Manager via email at [sboyal@opud.org](mailto:sboyal@opud.org).

Any question should be submitted to the Public Works manager via email at [sboyal@opud.org](mailto:sboyal@opud.org) or via phone at 530-682-0736.

Sincerely,



Swarnjit Boyal, MS  
Public Works Manager

**OLIVEHURST PUBLIC UTILITY DISTRICT**

1970 9<sup>TH</sup> Avenue  
Olivehurst, CA 95961  
Phone: (530) 682-0736

**OLIVEHURST PUBLIC UTILITY DISTRICT**

*Our mission is to provide high quality services to enhance our community's quality of life.*



**BOARD OF DIRECTORS**

Dennise Burbank Lacey Nelson John Floe Mary Jane Griego Marc Perrault

**GENERAL MANAGER**

John Tillotson

May 21st, 2026

To: Prospective Bidders

RE: Purchase of aforementioned Water Service Materials for Service Line Replacements throughout Historic Olivehurst

Bids shall include any and all taxes, freight, federal/state fees, hazardous waste disposal fee, weight certificate of completed unit, etc. and be an 'Out-The-Door' cost. **Please make sure to include a specification page/build sheet of materials in order to verify compliance with the requested specifications above.** Any questions shall be directed to the OPUD Public Works Department at 530-682-0736 or via email at [sboyal@opud.org](mailto:sboyal@opud.org). Attached please find an example of what OPUD is looking for (or similar). Item # & MFG# was used as sample from local vendor as reference only. Olivehurst Public Utility District will be accepting as specified below:

**Bid FORM for following water service materials:**

RFB - BID SHEET FOR WATER SERVICES MATERIAL SUBMITAL - BID FORM

|    | Title  | Brand                    | Item #           | MFG #              | Unit of Measure | Quantity | Price       | TOTAL |
|----|--|--------------------------|------------------|--------------------|-----------------|----------|-------------|-------|
| 1  | B-25028N Ball Corporation Stop, 1 in, MNPT x 110 CTS, Brass                                  | Mueller Co or similar    | MUEB25028N1      | 025028330N         | Each            | 160      |             |       |
| 2  | Angle Meter Valve, 1 in, 110 CTS x Meter Nut, Brass  | Mueller Co or similar    | MUEB24258N1      | 024258330N         | Each            | 160      |             |       |
| 3  | Bushing, 5/8 x 3/4 to 1 in, MNPT x Meter Nut, Brass  | Mueller Co or similar    | MUEH10879N58341  | H-10879N 5/8X3/4X1 | Per Pair        | 80       |             |       |
| 4  | Potable Water Polyethylene Pipe, SDR 9, 4710, 1 in, 100 ft L, CTS                            | VARIES                   | WPP1100BLK       | WPP1100BLK         | Per Roll        | 35       |             |       |
| 5  | Double Strap Pipe Saddle, 10 in, 1 in FNPT   | A.Y. McDonald or similar | MCD3826101       | 4148-035           | Each            | 30       |             |       |
| 6  | Hinged Pipe Saddle, 8 in, 1 in FNPT  | FORD or similar          | FORS91804        | S91-804            | Each            | 10       |             |       |
| 7  | Double Strap Pipe Saddle, 8 in, 1 in FNPT  | A.Y. McDonald or similar | MCD382681        | 4148-015           | Each            | 95       |             |       |
| 8  | 2-Piece Pipe Saddle, 12 in, 1 in FNPT  | FORD or similar          | FORS911204       | S91-1204           | Each            | 30       |             |       |
| 9  | Tracer Wire, 10 AWG, 45 mil, Blue, (500 ft rolls or spool)                                   | VARIES                   | TRW10BLU45       | TRW10BLU45         | Each            | 8        |             |       |
| 10 | Copper Split Bolt Connector (Needs to be compatible with 10 AWG Tracer wire mentioned above) | VARIES                   | TRWCSBCS8        | TRWCSBCS8          | Each            | 160      |             |       |
| 11 | DR 18 PVC Pipe, 6 in, Bell x plain, 20ft L sticks, Blue                                      | VARIES                   | PVPDR186         | PVPDR186           | LF              | 20       |             |       |
| 12 | DR 18 PVC Pipe, 8 in, Bell x plain, 20ft L sticks, Blue                                      | VARIES                   | PVPDR188         | PVPDR188           | LF              | 300      |             |       |
| 13 | DR 18 PVC Pipe, 12 in, Bell x plain, 20ft L sticks, Blue                                     | VARIES                   | PVPDR1812        | PVPDR1812          | LF              | 20       |             |       |
| 14 | Cross, 12 x 8 in, Flange, Cement Lined   | Various Vendors          | DCFCROSSFLG128   | DCFCROSSFLG128     | Each            | 1        |             |       |
| 15 | Reducer Coupling, 8 x 6 in, Flange, Cement Lined   | Various Vendors          | DCFREDFLG86      | DCFREDFLG86        | Each            | 1        |             |       |
| 16 | Reducer Coupling, 12 x 8 in, Flange, Cement Lined  | Various Vendors          | DCFREDFLG128     | DCFREDFLG128       | Each            | 1        |             |       |
| 17 | 22.5 deg Elbow, 8 in, Mechanical Joint, Fusion Bond Epoxy Coated                             | Various Vendors          | DCFE2212MJ8      | DCFE2212MJ8        | Each            | 2        |             |       |
| 18 | 22.5 deg Elbow, 8 in, Mechanical Joint x Flange, Cement Lined                                | Various Vendors          | DCF2212MJFLG8    | DCF2212MJFLG8      | Each            | 1        |             |       |
| 19 | Non-Rising Stem Gate Valve, 8 in, Flange, Ductile Iron                                       | Various Vendors          | WGVFF8           | WGVFF8             | Each            | 2        |             |       |
| 20 | Non-Rising Stem Gate Valve, 12 in, Mechanical Joint x Flange, Ductile Iron                   | Various Vendors          | WGVMF12          | WGVMF12            | Each            | 1        |             |       |
| 21 | Non-Rising Stem Gate Valve, 6 in, Flange, Ductile Iron                                       | Various Vendors          | WGVFF6           | WGVFF6             | Each            | 1        |             |       |
| 22 | Gland, 6 in, Mechanical Joint, PVC, Steel Hardware, Domestic                                 | Star® Pipe Products      | STTDSRETPVCAIS6  | PVCPKS4006G2DD     | Each            | 2        |             |       |
| 23 | Gland, 8 in, Mechanical Joint, PVC, Steel Hardware, Domestic                                 | Star® Pipe Products      | STTDSRETPVCAIS8  | PVCPKS4008G2DD     | Each            | 3        |             |       |
| 24 | Gland, 12 in, Mechanical Joint, PVC, Steel Hardware, Domestic                                | Star® Pipe Products      | STTDSRETPVCAIS12 | PVCPKS4012G2DD     | Each            | 1        |             |       |
| 25 | Bolt Set, 10 to 12 in 150#, Zinc CR+3, Grade 2   | Various Vendors          | WBLBS1012        | WBLBS1012          | Each            | 2        |             |       |
| 26 | Bolt Set, 8 in 150#, Zinc CR+3, Grade 2  | Various Vendors          | WBLBS8           | WBLBS8             | Each            | 8        |             |       |
| 27 | Ring Gasket, 8 in, Star Tite   | Star® Pipe Products      | STTRG8           | FAH08RG            | Each            | 4        |             |       |
| 28 | Ring Gasket, 6 in, Star Tite   | Star® Pipe Products      | STTRG6           | FAH06RG            | Each            | 4        |             |       |
| 29 | Full Face Gasket, 12 in, Star Tite   | Star® Pipe Products      | STTFFG12         | FAH12FFG           | Each            | 2        |             |       |
| 30 | Full Face Gasket, 8 in, Star Tite  | Star® Pipe Products      | STTFFG8          | FAH08FFG           | Each            | 2        |             |       |
| 31 | 860 Transition Coupling, 12 in, Various, Carbon Steel  | HYMAX®                   | HYM2CPLG12       | 860-540-0315-16    | Each            | 1        |             |       |
| 32 | 874 Transition Coupling, 8 in, Flange x Various, Carbon Steel                                | HYMAX®                   | HYMFA8           | 874-54-08021712    | Each            | 1        |             |       |
| 33 | 22.5 deg Elbow, 6 in, Mechanical Joint x Flange, Cement Lined                                | Various Vendors          | DCF2212MJFLG6    | DCF2212MJFLG6      | Each            | 1        |             |       |
| 34 |  |                          |                  |                    |                 |          | TAX (8.25%) |       |
|    |  |                          |                  |                    |                 |          |             | SUM   |

Machine inserted corporation stops were developed by Hieronymus Mueller in conjunction with his development of the drilling and tapping machine used to make pressure taps in water mains. During the development of the machine inserted corporation stop, Mr. Mueller designed an inlet thread which became known as the Mueller or “CC” thread. This thread form was eventually adopted by the American Water Works Association and is listed in ANSI/AWWA Standard C800 as the AWWA Taper thread.

Mueller Co. pioneered other design concepts in the waterworks industry such as the copper flare connection, Mueller 110® Compression Connection and the Mueller ORISEAL® Valves, which use O-ring seals to assure leak-tight performance. Mueller Co. offers corporation stops in three designs: machined key (commonly referred to as ground key), ORISEAL type (1-1/2" and 2" sizes only) and ball type.

All three designs are available with a wide range of inlet/outlet combinations including the Mueller 110 Compression Connection, Mueller Grip Compression Connection and Pack Joint Connection. These three designs are all compatible with the Mueller line of drilling and tapping machines, and small drilling machines.

All service brass will comply with AWWA C-800. Components in contact with potable water will also comply with latest requirements of the Federal Safe Drinking Water Act.

### Mueller 300™ Ball Type Corporation Valves



- Blow-Out Proof Stem Design** -prevents separation and assures dependable, safe operation.
- Straight Design** - allows maximum flow with minimum pressure loss.
- Manufactured and Tested** - to ANSI/AWWA C800 standard.
- Double O-ring Stem Seals** - are supported in precision machined grooves and provide secure, leak tight sealing.
- Inlet Threads** - are either AWWA taper (Mueller “CC”) or AWWA iron pipe.
- Stainless Steel Reinforced Seat Seal** - assures reliable seal under full flow and pressure.
- End Piece O-ring** - provides secondary seal to prevent leakage.
- 300psig** -maximum working pressure.
- Extra Strong** - key to ball connection provides strong, reliable performance and resists breakage.
- Outlets** - include copper flare connection, Mueller 110 Compression Connection, Mueller Grip Compression Connection, Mueller INSTA-TITE, Pack Joint Connection and iron pipe thread connection.
- Stem Rotation** - full 360 degree.
- Fluorocarbon Coated Ball** - ensures smooth , easy turning operation.

Rev. 3-17 Shaded area indicates changes



**B-25008N**

**Mueller® 300™ Ball Corporation Valve**  
**Inlet:** AWWA taper (MUELLER "CC") thread  
**Outlet:** MUELLER® 110® Conductive Compression Connection for CTS O.D.\* tubing



**B-25028N**

**Mueller 300 Ball Corporation Valve**  
**Inlet:** AWWA I.P. thread  
**Outlet:** MUELLER® 110® Conductive Compression Connection for CTS O.D. tubing

|      |         |    |           |        |           |    |
|------|---------|----|-----------|--------|-----------|----|
| 3/4" | 3/4"x1" | 1" | 1"x1-1/4" | 1-1/2" | 1-1/2"x2" | 2" |
|------|---------|----|-----------|--------|-----------|----|

|      |         |    |           |        |           |    |
|------|---------|----|-----------|--------|-----------|----|
| 3/4" | 3/4"x1" | 1" | 1"x1-1/4" | 1-1/2" | 1-1/2"x2" | 2" |
|------|---------|----|-----------|--------|-----------|----|



**B-25009N**

**Mueller 300 Ball Corporation Valve**  
**Inlet:** AWWA taper (MUELLER "CC") thread  
**Outlet:** MUELLER® 110® Compression Connection for IPS PE\* pipe



**B-25029N**

**Mueller 300 Ball Corporation Valve**  
**Inlet:** AWWA I.P. thread  
**Outlet:** MUELLER 110® Compression Connection for IPS PE\* pipe

|      |           |    |
|------|-----------|----|
| 3/4" | 3/4" x 1" | 1" |
|------|-----------|----|

|      |           |    |
|------|-----------|----|
| 3/4" | 3/4" x 1" | 1" |
|------|-----------|----|



**E-25009N**

**Mueller 300 Ball Corporation Valve**  
**Inlet:** AWWA taper (MUELLER "CC") thread  
**Outlet:** MUELLER Pack Joint for IPS PE\* pipe  
*\*\*Note: 3/4" size only may also be used on PVC*



**E-25029N**

**Mueller 300 Ball Corporation Valve**  
**Inlet:** AWWA I.P. thread  
**Outlet:** MUELLER Pack Joint for IPS PE\* pipe  
*\*\*Note: 3/4" size only may also be used on PVC*

|         |    |        |    |
|---------|----|--------|----|
| 3/4"*** | 1" | 1-1/2" | 2" |
|---------|----|--------|----|

|         |    |        |    |
|---------|----|--------|----|
| 3/4"*** | 1" | 1-1/2" | 2" |
|---------|----|--------|----|



**V-25056N**

**Mueller 300 Ball Corporation Valve**  
**Inlet:** AWWA taper (MUELLER "CC") thread  
**Outlet:** MUELLER Pack Joint for IPS PVC\* pipe



**V-25058N**

**Mueller 300 Ball Corporation Valve**  
**Inlet:** AWWA I.P. thread  
**Outlet:** MUELLER Pack Joint for IPS PVC\* pipe

|    |        |    |
|----|--------|----|
| 1" | 1-1/2" | 2" |
|----|--------|----|

|    |        |    |
|----|--------|----|
| 1" | 1-1/2" | 2" |
|----|--------|----|



**P-25008N**

**Mueller 300 Ball Corporation Valve**  
**Inlet:** AWWA taper (MUELLER "CC") thread  
**Outlet:** MUELLER Pack Joint Connection for CTS O.D. \* tubing



**P-25028N**

**Mueller 300 Ball Corporation Valve**  
**Inlet:** AWWA I.P. thread  
**Outlet:** MUELLER Pack Joint Connection for CTS O.D.\* tubing

|      |         |    |        |           |    |
|------|---------|----|--------|-----------|----|
| 3/4" | 3/4"x1" | 1" | 1-1/2" | 1-1/2"x2" | 2" |
|------|---------|----|--------|-----------|----|

|      |           |    |        |              |    |
|------|-----------|----|--------|--------------|----|
| 3/4" | 3/4" x 1" | 1" | 1-1/2" | 1-1/2" x 2"‡ | 2" |
|------|-----------|----|--------|--------------|----|

\*See charts on pages 5.12-5.16 for tubing and pipe that may be used with these connections.

NOTE: Sizes shown above represent nominal size of inlet and outlet connections. When two sizes are given, the first is size of inlet and the second is size of outlet.

‡ Requires minimum ordering quantity. Contact MUELLER Customer Service Center for minimum order requirements and availability.



**MUELLER® 300™ Ball Angle Meter Valve**  
 MUELLER 110® Conductive Compression Connection for CTS O.D.\* tubing x meter swivel nut\*\* Quarter turn check - lock wing. 360° turn option available by adding -3 suffix to catalog number.  
 Example: B-24258-3

## B-24258N

|              |               |           |                    |
|--------------|---------------|-----------|--------------------|
| Catalog size | 5/8"x3/4" R † | 5/8"x3/4" | 5/8"x3/4"x3/4" R † |
| Meter size   | 5/8"          | 5/8"      | 5/8"x3/4", 3/4"    |
| Tubing size  | 3/4"          | 3/4"      | 3/4"               |

|              |                 |                 |        |    |
|--------------|-----------------|-----------------|--------|----|
| Catalog size | 5/8"x3/4"x3/4"  | 5/8"x3/4"x1"    | 1" R † | 1" |
| Meter size   | 5/8"x3/4", 3/4" | 5/8"x3/4", 3/4" | 1"     | 1" |
| Tubing size  | 3/4"            | 1"              | 1"     | 1" |



MUELLER 300 Ball Angle Meter Valve  
 MUELLER Pack Joint Connection for CTS O.D.\* tubing x meter swivel nut\*\* Quarter turn check - lock wing. 360° turn option available by adding -3 suffix to catalog number.  
 Example: P-24258-3

## P-24258N

|              |               |           |                    |
|--------------|---------------|-----------|--------------------|
| Catalog size | 5/8"x3/4" R † | 5/8"x3/4" | 5/8"x3/4"x3/4" R † |
| Meter size   | 5/8"          | 5/8"      | 5/8"x3/4", 3/4"    |
| Tubing size  | 3/4"          | 3/4"      | 3/4"               |

|              |                 |                 |        |    |
|--------------|-----------------|-----------------|--------|----|
| Catalog size | 5/8"x3/4"x3/4"  | 5/8"x3/4"x1"    | 1" R † | 1" |
| Meter size   | 5/8"x3/4", 3/4" | 5/8"x3/4", 3/4" | 1"     | 1" |
| Tubing size  | 3/4"            | 1"              | 1"     | 1" |



**MUELLER 300 Ball Angle Meter Valve**  
 MUELLER 110 Conductive Compression Connection for IPS PE\* pipe x meter swivel nut\*\* Quarter turn check - lock wing. 360° turn option available by adding -3 suffix to catalog number.  
 Example: B-24259-3

## B-24259N

|              |                 |                 |    |
|--------------|-----------------|-----------------|----|
| Catalog size | 5/8"x3/4"x3/4"  | 5/8"x3/4"x1"    | 1" |
| Meter size   | 5/8"x3/4", 3/4" | 5/8"x3/4", 3/4" | 1" |
| Tubing size  | 3/4"            | 1"              | 1" |



**MUELLER 300 Ball Angle Meter Valve**  
 MUELLER Pack Joint Connection for IPS PE\* pipe x meter swivel nut\*\* Quarter turn check - lock wing. 360° turn option available by adding -3 suffix to catalog number.  
 Example: B-24259-3

## E-24259N

|              |                 |    |
|--------------|-----------------|----|
| Catalog size | 5/8"x3/4"x3/4"  | 1" |
| Meter size   | 5/8"x3/4", 3/4" | 1" |
| Tubing size  | 3/4"            | 1" |



**MUELLER 300 Ball Angle Meter Valve**  
 MUELLER INSTA-TITE Connection for IPS PE\* pipe x meter swivel nut\*\* Quarter turn check - lock wing. 360° turn option available by adding -3 suffix to catalog number.  
 Example: B-24266-3

## B-24266N

|              |              |   |
|--------------|--------------|---|
| Catalog size | 5/8x3/4x3/4  | 1 |
| Meter size   | 5/8x3/4, 3/4 | 1 |
| Tubing size  | 3/4          | 1 |



**MUELLER 300 Ball Angle Meter Valve**  
 MUELLER INSTA-TITE Connection for CTS O.D.\* tubing x meter swivel nut\*\* Quarter turn check - lock wing. 360° turn option available by adding -3 suffix to catalog number.  
 Example: B-24267-3

## B-24267N

Note: Two-piece factory assembly

|              |              |   |
|--------------|--------------|---|
| Catalog size | 5/8x3/4x3/4  | 1 |
| Meter size   | 5/8x3/4, 3/4 | 1 |
| Tubing size  | 3/4          | 1 |

\* See charts on pages 8D.17 and 8D.18 for tubing and pipe that can be used with this connection.

\*\* Meter swivel nuts are regularly furnished with a saddle feature to aid in meter installation and removal. A plain swivel nut is available as an option by adding a suffix of -1 to the catalog number.

† The "R" indicates this valve has a reduced port. Port size is one nominal size smaller than the valve inlet/outlet

# 8E.6



## MISCELLANEOUS METER SETTING EQUIPMENT

Rev. 4-20 Shaded area indicates changes



**H-10887**

**Brass meter idler**  
Has same end-to-end and thread dimensions as meter. Used to continue service during meter repairs

|                   |        |             |      |         |
|-------------------|--------|-------------|------|---------|
| Catalog size      | 5/8"   | 5/8" x 3/4" | 3/4" | 1"      |
| Cover size        | 5/8"   | 5/8" x 3/4" | 3/4" | 1"      |
| Length            | 7-1/2" | 7-1/2"      | 9"   | 10-3/4" |
| Meter thread size | 3/4"   | 1"          | 1"   | 1-1/4"  |



**H-14338**

**Brass locking device (padlock and valve not included)**  
For use on Mueller® MARK II ORISEAL® Meter Valves - cannot be used on valves having angle lever handles.

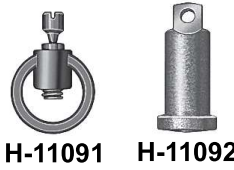
|              |      |    |
|--------------|------|----|
| Catalog size | 3/4" | 1" |
|--------------|------|----|



**Water meter increaser**  
Used on threaded ends of 5/8" meter to increase threads to 5/8 x 3/4 or 3/4 meter size (1" thread)  
**H-10888**: for plain nuts  
**H-10888-99002**: for saddle nuts

**H-10888N H-10888N-02**

|              |             |             |
|--------------|-------------|-------------|
| Catalog size | 5/8" x 3/4" | 5/8" x 3/4" |
| Meter size   | 5/8"        | 5/8"        |
| Length       | 11/16"      | 1"          |



**H-11091 H-11092**

**Lock wing sealing device**  
This device is used to detect unauthorized use of valve or stop. Used with lock wings drilled 3/8" or 1/2". The H-11090 is made up of a collar and set screw (H-11091) and a pin (H-11092). The pin is available in 3/8" or 1/2" sizes and the collar with set screw is used on both sizes.



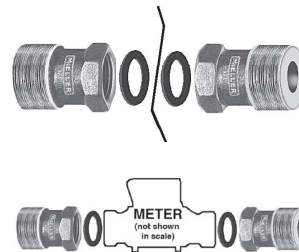
**H-11090**



**Meter bushing with rubber washer**  
Used on threaded ends of 5/8 x 3/4 or 3/4 meters to adapt to 1" meter thread size (1-1/4")  
**H-10889**: for saddle nuts  
**H-10889-99000**: for plain nuts

**H-10889N H-10889N-00**

|              |                   |                   |
|--------------|-------------------|-------------------|
| Catalog size | 3/4" x 1"         | 3/4" x 1"         |
| Meter size   | 5/8" x 3/4", 3/4" | 5/8" x 3/4", 3/4" |
| Length       | 1-1/4"            | 15-16"            |



**H-10879N**

**Meter bushing with rubber washer (complete for both ends)**  
Used on threaded ends of 5/8x3/4 meter to adapt to 1" meter thread size (1-1/4") and standard length.

|              |             |           |                  |           |                    |             |         |             |
|--------------|-------------|-----------|------------------|-----------|--------------------|-------------|---------|-------------|
| Catalog size | 5/8" x 3/4" | 5/8" x 1" | 5/8" x 3/4" x 1" | 3/4" x 1" | 5/8" x 3/4" x 3/4" | 1" x 1 1/2" | 1" x 2" | 1 1/2" x 2" |
| Meter size   | 5/8"        | 5/8"      | 5/8" x 3/4"      | 3/4"      | 5/8" x 3/4"        | 1"          | 1"      | 1 1/2"      |
| Length       | 1.019"      | 2.062"    | 2.062"           | 1.13"     | 1.019"             | 1"          | 3"      | 1.875"      |



**H-10893**

**Meter coupling washer**  
**H-10893**: Fiber washer

|              |      |                   |    |        |           |       |
|--------------|------|-------------------|----|--------|-----------|-------|
| Catalog size | 5/8" | 3/4"              | 1" | 1-1/4" | 1-1/2" ** | 2" ** |
| Meter size   | 5/8" | 5/8" x 3/4", 3/4" | 1" | 1-1/4" | 1-1/2"    | 2"    |



**H-10895**

**Meter coupling washer**  
**H-10895**: Rubber washer

|              |      |                   |    |        |           |       |
|--------------|------|-------------------|----|--------|-----------|-------|
| Catalog size | 5/8" | 3/4"              | 1" | 1-1/4" | 1-1/2" ** | 2" ** |
| Meter size   | 5/8" | 5/8" x 3/4", 3/4" | 1" | 1-1/4" | 1-1/2"    | 2"    |

\*\* Flange gasket for 1-1/2" and 2" sizes.

\*\* Flange gasket for 1-1/2" and 2" sizes.

8E-COUPPLINGS/MISC.

Potable Water Polyethylene Pipe, SDR 9, 4710, 1 in, 100 ft L, CTS, Black



**Approved Vendors**

**Potable Water Polyethylene Pipe, SDR 9, 4710, 1 in, 100 ft L, CTS, Black**

**Part:** WPP1100BLK **MFG:** WPP1100BLK

---

**Description**

Potable Water Polyethylene Pipe, SDR 9, 4710, 1 in, 100 ft L, CTS, Black

Potable Water Polyethylene Pipe, SDR 9, 4710, 1 in, 100 ft L, CTS, Black

## Specifications


|                 |               |
|-----------------|---------------|
| Type            | Potable Water |
| Nominal Size    | 1 in          |
| Length          | 100 ft        |
| Color           | Black         |
| Pressure Rating | 250 psi       |
| End Style       | CTS           |

|                 |                  |
|-----------------|------------------|
| Schedule Rating | SDR 9            |
| Resin Type      | 4710             |
| Brand           | Approved Vendors |

|                          |                  |
|--------------------------|------------------|
| Manufacturer             | Approved Vendors |
| Manufacturer Part Number | WPP1100BLK       |



**FORD**  
**Insert, 1 in, Insert, 304/304L**  
**Stainless Steel**  
 Part: FOR52  
 MFG:  
 INSERT-52

**FORD**  
**Adapter, 1 in, MNPT x CTS Quick**  
**Joint, Lead Free Brass**  
 Part: FORC8444QNL  
 MFG:  
 C84-44-Q-NL




**FORD**  
**FB1100 Ball Corporation**  
**MNPT x CTS Quick Joint, I**  
 Part: FORFB11004QNL  
 MFG:  
 FB1100-4-Q-NL

Actual Product Not Shown

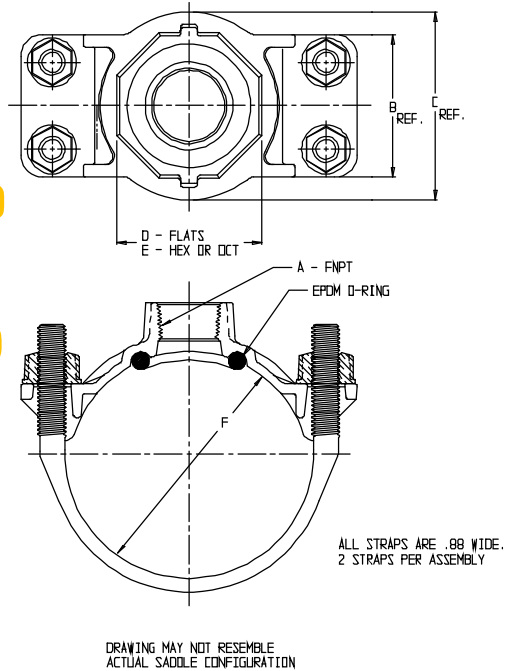
# SUBMITTAL DATA SHEET

## Silicon Bronze Strap Saddle - 3826

Ductile Iron/Cement-Asbestos/Cast Iron x FNPT



| MODEL  | SIZE       | A     | B    | C    | D    | E   | F             |
|--------|------------|-------|------|------|------|-----|---------------|
| 3826   | 4 X 3/4    | 3/4   | 3.19 | 3.19 | 1.69 | HEX | 4.74 - 5.40   |
| 3826   | 4 X 1      | 1     | 3.19 | 3.19 | 1.69 | HEX | 4.74 - 5.40   |
| 3826   | 4 X 1 1/2  | 1 1/2 | 3.19 | 4.19 | 3.10 | DCT | 4.74 - 5.40   |
| 3826   | 4 X 2      | 2     | 3.19 | 4.19 | 3.10 | DCT | 4.74 - 5.40   |
| 3826   | 6 X 3/4    | 3/4   | 3.19 | 3.19 | 1.69 | HEX | 6.84 - 7.50   |
| 3826   | 6 X 1      | 1     | 3.19 | 3.19 | 1.69 | HEX | 6.84 - 7.50   |
| 3826   | 6 X 1 1/4  | 1 1/4 | 3.19 | 4.19 | 3.10 | DCT | 6.84 - 7.50   |
| 3826   | 6 X 1 1/2  | 1 1/2 | 3.19 | 4.19 | 3.10 | DCT | 6.84 - 7.50   |
| 3826   | 6 X 2      | 2     | 3.19 | 4.19 | 3.10 | DCT | 6.84 - 7.50   |
| 3826   | 8 X 3/4    | 3/4   | 3.19 | 3.19 | 1.69 | HEX | 8.99 - 9.67   |
| X 3826 | 8 X 1      | 1     | 3.19 | 3.19 | 1.69 | HEX | 8.99 - 9.67   |
| 3826   | 8 X 1 1/4  | 1 1/4 | 3.19 | 4.19 | 3.10 | DCT | 8.99 - 9.67   |
| 3826   | 8 X 1 1/2  | 1 1/2 | 3.19 | 4.19 | 3.10 | DCT | 8.99 - 9.67   |
| 3826   | 8 X 2      | 2     | 3.19 | 4.19 | 3.10 | DCT | 8.99 - 9.67   |
| 3826   | 10 X 3/4   | 3/4   | 3.19 | 3.19 | 1.69 | HEX | 11.04 - 12.12 |
| X 3826 | 10 X 1     | 1     | 3.19 | 3.19 | 1.69 | HEX | 11.04 - 12.12 |
| 3826   | 10 X 1 1/2 | 1 1/2 | 3.19 | 4.19 | 3.10 | DCT | 11.04 - 12.12 |
| 3826   | 10 X 2     | 2     | 3.19 | 4.19 | 3.10 | DCT | 11.04 - 12.12 |
| 3826   | 12 X 3/4   | 3/4   | 3.19 | 3.19 | 1.69 | HEX | 13.20 - 14.38 |
| 3826   | 12 X 1     | 1     | 3.19 | 3.19 | 1.69 | HEX | 13.20 - 14.38 |
| 3826   | 12 X 1 1/2 | 1 1/2 | 3.19 | 4.19 | 3.10 | DCT | 13.20 - 14.38 |
| 3826   | 12 X 2     | 2     | 3.19 | 4.19 | 3.10 | DCT | 13.20 - 14.38 |
| 3826   | 18 X 3/4   | 3/4   | 4.93 | 5.00 | 3.46 | DCT | 19.50 - 20.50 |
| 3826   | 18 X 1     | 1     | 4.93 | 5.00 | 3.46 | DCT | 19.50 - 20.50 |
| 3826   | 18 X 1 1/2 | 1 1/2 | 4.93 | 5.00 | 3.46 | DCT | 19.50 - 20.50 |
| 3826   | 18 X 2     | 2     | 4.93 | 5.00 | 3.46 | DCT | 19.50 - 20.50 |
| 3826   | 30 X 3/4   | 3/4   | 4.93 | 5.00 | 3.46 | DCT | 31.74 - 32.74 |
| 3826   | 30 X 1     | 1     | 4.93 | 5.00 | 3.46 | DCT | 31.74 - 32.74 |
| 3826   | 30 X 1 1/2 | 1 1/2 | 4.93 | 5.00 | 3.46 | DCT | 31.74 - 32.74 |
| 3826   | 30 X 2     | 2     | 4.93 | 5.00 | 3.46 | DCT | 31.74 - 32.74 |



### SUBMITTAL INFORMATION

- Manufactured in compliance with ANSI/AWWA C800 (latest revision)
- Brass components conform to ASTM B62 and ASTM B584, UNS C83600 -85-5-5-5 (latest revision)
- Certified to NSF/ANSI 61
- Silicon Bronze strap(s) and cast brass nuts with enlarged washer bearing surface
- EPDM o-ring
- Pipe and tap size, and thread type identified on saddle
- Outlet boss with large wrench flats



**A.Y. McDonald Mfg. CO.**  
P.O. Box 508  
Dubuque, IA 52004-508

**Toll Free: 1-800-292-2737**  
**Fax: 1-800-832-9296**  
**Hours: 7:00 a.m. – 5:00 p.m., CST**

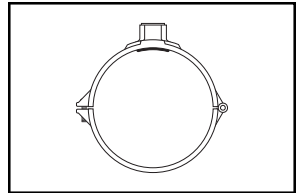
[sales@aymcdonald.com](mailto:sales@aymcdonald.com)  
[www.aymcdonald.com](http://www.aymcdonald.com)

A.Y. McDonald considers the information on this assembly drawing correct when published. Item and option availability, including specifications, are subject to change without notice.

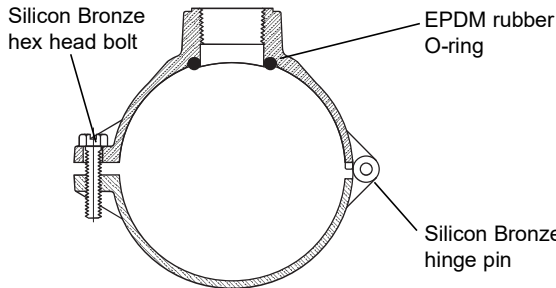
**Submitted by:**

# SUBMITTAL INFORMATION

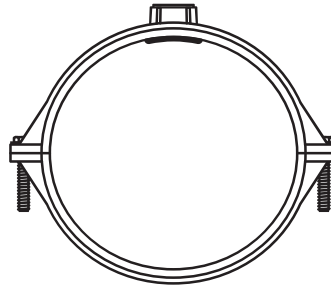
## Brass Saddles For C900 PVC - (S91-xxx style)



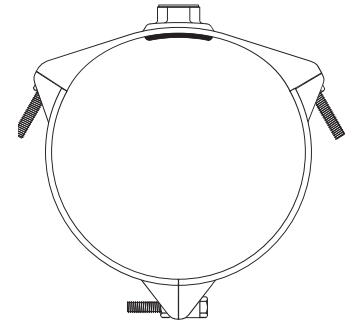
### S91 BRASS SADDLES WITH IRON PIPE TAPS FOR C900 PVC PIPE



**Style A (Hinged Design)**



**Style B 2-Piece (Bolted Design)**



**Style C 3-Piece (Bolted Design)**

| PVC PIPE SIZE | ACTUAL O.D. | TAP SIZE | APPROX. WT. LBS. | CATALOG NUMBER | STYLE | ✓ SUBMITTED ITEM(S) |
|---------------|-------------|----------|------------------|----------------|-------|---------------------|
| 2"            | 2.50        | 1/2"     | .9               | S91-201        | A     |                     |
|               |             | 3/4"     | 1.1              | S91-203        | A     |                     |
| 4"            | 4.80        | 1/2"     | 1.8              | S91-401        | A     |                     |
|               |             | 3/4"     | 1.8              | S91-403        | A     |                     |
|               |             | 1"       | 2.0              | S91-404        | A     |                     |
|               |             | 1-1/2"   | 6.5              | S91-406        | A     |                     |
|               |             | 2"       | 6.4              | S91-407        | A     |                     |
|               |             | 3/4"     | 2.6              | S91-603        | A     |                     |
| 6"            | 6.90        | 1"       | 2.6              | S91-604        | A     |                     |
|               |             | 1-1/2"   | 8.9              | S91-606        | A     |                     |
|               |             | 2"       | 7.3              | S91-607        | A     |                     |
|               |             | 1/2"     | 2.8              | S91-801        | A     |                     |
| 8"            | 9.05        | 3/4"     | 2.8              | S91-803        | A     |                     |
|               |             | 1"       | 3.2              | S91-804        | A     |                     |
|               |             | 1-1/2"   | 8.0              | S91-806        | A     |                     |
|               |             | 2"       | 8.5              | S91-807        | A     |                     |
| 10"           | 11.10       | 3/4"     | 9.3              | S91-1003       | B     |                     |
|               |             | 1"       | 9.1              | S91-1004       | B     |                     |
|               |             | 1-1/2"   | 10.5             | *S71-S91-1006  | C     |                     |
|               |             | 2"       | 10.5             | *S71-S91-1007  | C     |                     |
|               |             | 3/4"     | 11.1             | S91-1203       | B     |                     |
| 12"           | 13.20       | 1"       | 11.0             | S91-1204       | B     |                     |
|               |             | 1-1/2"   | 11.5             | *S71-S91-1206  | C     |                     |
|               |             | 2"       | 11.0             | *S71-S91-1207  | C     |                     |

\* These saddles will cover Steel size PVC and C900 PVC O.D. range.

### FEATURES

- All brass conforms to AWWA Standard C800 (ASTM B62 and ASTM B584, UNS NO C83600 - 85-5-5-5)
- Style A Saddle body and strap permanently held together with silicon bronze pin for saddles sized 2" thru 8"
- Bolt is 5/16" slotted hex head silicon bronze for saddles sized 2" thru 8"
- A three-piece bolted design is used for S91 Saddles sized 10" and 12" with 1-1/2" and 2" taps, two-piece for 3/4" and 1" taps
- All 10" and 12" saddles are held together with 1/2" silicon bronze bolts (3/4" hex head)
- 150 psi working pressure rating

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

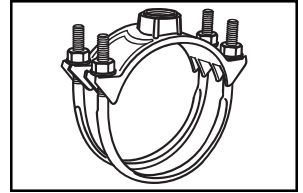
www.fordmeterbox.com

01/12/16

Submitted By:

# SUBMITTAL INFORMATION

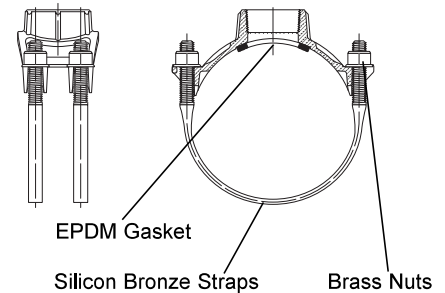
## Brass Saddles - (202B-xxx-xxx style)



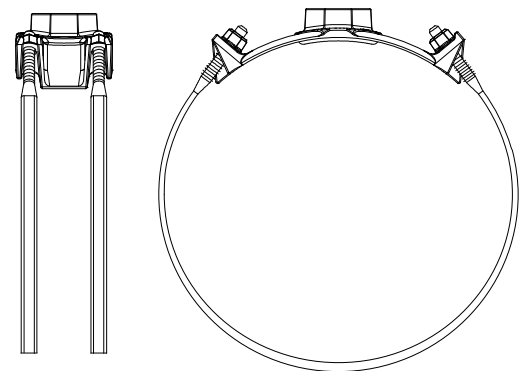
### 202B DOUBLE STRAP BRASS SADDLES FOR AC AND DUCTILE IRON PIPE

| NOM. PIPE SIZE | O.D. RANGE    | APPROX. WT. LBS. | CATALOG NUMBER | ✓ SUBMITTED ITEM(S) |
|----------------|---------------|------------------|----------------|---------------------|
| *4"            | 4.80 - 5.40   | 6.6              | 202B-540-Tap   |                     |
|                | 4.80 - 5.10   | 7.3              | 202B-510-Tap   |                     |
|                | 5.10 - 5.40   | 7.3              | 202B-540-Tap   |                     |
| **6"           | 6.90 - 7.50   | 7.7              | 202B-750-Tap   |                     |
| 8"             | 9.05 - 9.62   | 8.8              | 202B-962-Tap   |                     |
| 10"            | 11.10 - 12.12 | 10.7             | 202B-1212-Tap  |                     |
| 12"            | 13.20 - 14.38 | 11.8             | 202B-1438-Tap  |                     |
| **14"          | 15.30 - 16.25 | 18.0             | 202B-1625-Tap  |                     |
|                | 16.30 - 17.25 | 19.1             | 202B-1725-Tap  |                     |
| **16"          | 17.40 - 18.40 | 23.0             | 202B-1840-Tap  |                     |
|                | 18.50 - 19.25 | 24.0             | 202B-1925-Tap  |                     |
|                | 19.50 - 20.50 | 25.0             | 202B-2050-Tap  |                     |
| **20"          | 21.20 - 22.20 | 25.5             | 202B-2220-Tap  |                     |
|                | 22.50 - 23.50 | 25.7             | 202B-2350-Tap  |                     |
| **24"          | 23.80 - 24.80 | 26.0             | 202B-2480-Tap  |                     |
|                | 25.60 - 26.50 | 26.5             | 202B-2650-Tap  |                     |
| **30"          | 31.74 - 32.74 | 27.0             | 202B-3274-Tap  |                     |

#### 4" - 12"



#### 14" - 30"



#### OUTLET TAP CODE

| CC (AWWA) THREAD |             | IP THREAD |             | ✓ SUBMITTED ITEM(S) |
|------------------|-------------|-----------|-------------|---------------------|
| THREAD           | CODE NUMBER | THREAD    | CODE NUMBER |                     |
| 3/4" CC          | CC3         | 3/4" IP   | IP3         |                     |
| 1" CC            | CC4         | 1" IP     | IP4         |                     |
| 1-1/4" CC        | Δ CC5       | 1-1/4" IP | Δ IP5       |                     |
| 1-1/2" CC        | CC6         | 1-1/2" IP | IP6         |                     |
| 2" CC            | CC7         | 2" IP     | IP7         |                     |

Δ Contact factory for availability

\* **Please Note:** 4" Saddles with 2" taps have a limited range. Specifically, 4.80 - 5.10 or 5.10 - 5.40. All other tap sizes have the standard 4.80 - 5.40 range.

\*\* Only the 6" (6.90-7.50 range) saddle and 14" saddles and larger are available with a 1-1/4" tap.

**To Order:** Select the catalog number for the desired pipe range and complete the catalog number by adding the outlet thread tap code. Example: A double strap saddle for 6.90 D.I. pipe with a 3/4" CC thread would be 202B-750-CC3.

#### FEATURES

- All brass conforms to AWWA Standard C800 (ASTM B62 and ASTM B584, UNS C83600, 85-5-5-5)
- Straps are 5/8" high quality silicon bronze flattened to provide a wider bearing surface against pipe
- Gasket is EPDM rubber ASTM D2000

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.



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

Overseas Fax: 260-563-0167

www.fordmeterbox.com

02/22/18

Submitted By:



# SOLOSHOT™ EXTRA-HIGH STRENGTH – 1045 CCS TRACER WIRE

## APPLICATION

Copper-clad steel (CCS) tracer wire. Install with underground plastic utility pipes, wires, and cables to ensure future location. Best choice for horizontal directional drilling/boring applications when ground above the utilities cannot be disturbed because buildings, roadways, or other obstructions may be in the way.



## Product Description

#10 AWG (0.1019" diameter) hard drawn, high carbon 1055 grade steel, extra-high strength solid copper-clad steel conductor (EHS-CCS) rated at 30 volts, insulated with a 45 mil, high-density, high molecular weight polyethylene (HDPE) insulation rated for direct burial use at 600 volts.

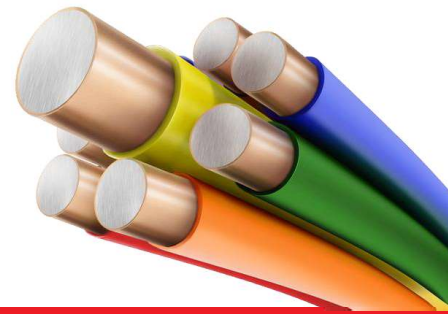
### APWA UNIFORM COLOR CODE

|                                       |                        |
|---------------------------------------|------------------------|
| <span style="color: red;">█</span>    | <b>ELECTRIC</b>        |
| <span style="color: yellow;">█</span> | <b>GAS</b>             |
| <span style="color: orange;">█</span> | <b>COMMUNICATION</b>   |
| <span style="color: blue;">█</span>   | <b>POTABLE WATER</b>   |
| <span style="color: green;">█</span>  | <b>SEWER</b>           |
| <span style="color: purple;">█</span> | <b>RECLAIMED WATER</b> |

blue color



- 1045\*-EHS-500** – 500' spool
  - 1045\*-EHS-1000** – 1000' spool
  - 1045\*-EHS-2500** – 2500' spool
- (\* denotes color, pg. 2)



## FEATURES AND BENEFITS

- 45 mil HDPE insulation
- 2,032 lb break load
- 6 times the breaking strength of solid copper
- Lighter than solid copper means reduced freight expenses
- Copper-clad steel (CCS) wire combines the strength of hard drawn high-carbon steel with the conductivity and corrosion resistance of solid copper
- Bonded metals mean no separating, no corrosion, and no theft appeal
- More stable pricing than solid copper
- Provided exclusively by Copperhead Industries
- Rated for direct bury
- Color-coded to meet American Public Works (APWA) standards for utility identification



## SPECIFICATIONS

### PART #: 1045\*-EHS-\*\*

10 (AWG), 45 (insulation mil), \* (indicates insulation color: Y=Yellow, B=Blue, G=Green, N=Orange, P=Purple, R=Red, BN=Brown, K=Black, W=White), EHS (Extra-High Strength), \*\* (indicates spool size: 500, 1000 or 2500 foot lengths)

### MADE IN USA

Copperhead® copper-clad steel tracer wire is 100% made in the USA.

### PRODUCT DESCRIPTION

Tracer wire for directional drilling/boring shall be Copperhead® SoloShot™ #10 AWG (0.1019" diameter) hard drawn, high carbon 1055 grade steel, solid extra-high-strength copper-clad steel conductor (EHS-CCS) rated at 30 volts, insulated with 45 mil, high-density, high molecular weight polyethylene (HDPE) insulation rated for direct burial use at 600 volts. EHS-CCS conductor must be at 21% conductivity for locate purposes. Break load of 2032 lbs. HDPE insulation shall be RoHS compliant and utilize virgin grade material. Insulation color shall meet the APWA color code standard for identification of buried utilities. Manufacturers supplying copper-clad steel tracer wire must have available detailed performance data including 5 years of underground testing in terms of durability related to damage of protective insulation and effects of potential corrosion of the specific copper-clad steel used. Origin of copper-clad steel manufacturer is required and steel core must be manufactured in the United States. If manufacturer has not completed 5-year corrosion testing, a 5-year warranty must be provided. Tracer wire shall be Copperhead® SoloShot™ EHS-CCS HDPE 45 mil and made in the USA.

### PRINT LINE

Physical, permanent markings: surface legend print on insulation to repeat at minimum interval of every two linear feet. Ink colors will include Black ink for Yellow, Blue, Red, Orange, Purple, Brown, White, and Green insulation, and White ink for Black insulation. **COPPERHEAD \* 10 AWG-SOLID EHS-CCS HORIZONTAL DIRECTIONAL DRILL TRACER WIRE \* 45 MIL HDPE 600 VOLT \* DIRECT BURIAL ONLY**

### SPOOL LABEL

Wound wire on a compact spool made of plastic or wood.

### COPPERHEAD INDUSTRIES

1045\*-EHS-\*\*

10 AWG-Solid CCS Directional Drill Tracer Wire

45 Mil HDPE 600 Volt

Direct Burial Only

copperheadwire.com

### CONDUCTOR

This specification describes the properties of the conductor to be used in the fabrication of Extra-High Strength tracer wire.

**Material Description:** Copperhead® copper-clad steel wire as manufactured by Copperweld® is composed of a steel core with a uniform and continuous copper cladding thoroughly bonded to the steel throughout. Wire must conform to ASTM B1010 and ASTM B227.

- **Cladding:** The steel and copper interface must have a metallurgical bond achieved through a high heat and pressure bonding process. Established process for porosity-free material.
- **Steel:** Extra-high strength with 0.54 carbon or greater. Verified to meet required mechanical properties.
- **Copper:** UNS-C10200; OF Copper according to ASTM B-170 (latest revision). High conductivity, oxygen free copper to achieve optimal signal performance.

**Surface Condition:** Wire surface shall be free of any defects, including flakes, grooves, pits, and voids. Wire surface shall be smooth, bright and shiny, and free of excessive copper dust and residual drawing lubricants.

**Physical, Mechanical, and Electrical Properties:** The wire shall conform to the properties listed in Table 1.



| #12 CCS High Carbon 1055 Grade Steel<br>21% Conductivity | CCS Conductor           |
|--|-------------------------|
| Conductor Size   | 10 AWG                  |
| Conductor Type   | Copper-Clad Steel (CCS) |
| Temper   | Hard Drawn (HD)         |
| Average Break Load                                       | 2,032 lbs.              |
| Minimum Tensile Strength                                 | 247,000 psi             |
| Minimum Elongation                                       | 1%                      |
| Nominal Copper Thickness (% of Diameter)                 | 3%                      |
| Nominal Copper Weight                                    | 13%                     |
| Nominal DC Resistance (ohms/1000 ft.)                    | 4.756                   |

Table 1: Physical, Mechanical, and Electrical Properties

\*Diameter tolerances:  $\pm 1\%$

## INSULATION

This specification describes the properties of the material to be used in the insulating of Extra-High Strength tracer wire.

**Material Description:** Insulation is comprised of a co-polymer high molecular weight natural high density polyethylene (HDPE) designed specifically for high-speed copper wire insulating. It contains the required levels and types of primary antioxidant and metal deactivator additives to satisfy most Wire and Cable industry requirements. HDPE material will be produced with an excellent balance of surface smoothness, processing ease, tensile and elongation properties, abrasion toughness, environmental stress crack, thermal stress crack resistance, and electrical consistency. Insulation must conform to ASTM D1248.

**Physical, Mechanical, and Electrical Properties:** The wire shall conform to the properties listed in Table 2.

| High Density Polyethylene Insulator        | Value                       |
|--|-----------------------------|
| Density (ASTM D 792)                       | 0.943 g/cc                  |
| Bulk Density (ASTM D 1895)                 | 0.58 g/cc                   |
| Melt Index (ASTM D 1238/E)                 | 0.70 dg/min                 |
| Tensile-Yield (ASTM D 638)                 | 4300 psi                    |
| Tensile-Ultimate (ASTM D 638)              | 2900 psi                    |
| Tensile-Elongation (ASTM D 638)            | 850%                        |
| Flexural Modulus (ASTM D 790/1)            | 120,000 psi                 |
| Hardness (ASTM D 2240)                     | 63 Shore D                  |
| Environmental Stress-Crack (ASTM D 1693/B) | F20 > 48 h                  |
| Thermal Stress-Crack (ASTM D 2951)         | F0 > 1000 h                 |
| Brittleness Temperature (ASTM D 746)       | < -95° F                    |
| Melting Point (DSC) (ASTM D 3417)          | 262° F                      |
| Softening Point (Vicat) (ASTM D 1525)      | 250° F                      |
| Oxidative Induction Time (ASTM D 3895)     | > 50 min. @ 200° C          |
| Dielectric Constant (ASTM D 1531)          | 2.34 @ 1MHz                 |
| Dissipation Factor (ASTM D 1531)           | 0.00007 @ 1 MHz             |
| Volume Resistivity (ASTM D 257)            | 5 x 10 <sup>17</sup> ohm-cm |
| Dielectric Strength (ASTM D 3755)          | 1000 volts @ 20 mils        |

Table 2: Physical, Mechanical, and Electrical Properties

## QUALITY ASSURANCE

- Copperhead products are manufactured under a quality control system that ensures products are free of defects and meet performance requirements.
- Copperhead provides best-in-class customer service. We promise to put forth our best efforts for our customers and to treat everyone we encounter with courtesy and respect.



Subject To  
Brand On Hand



Approved Vendors

## Copper Split Bolt Connector

Part: TRWCSBCS8 MFG: TRWCSBCS8



### Description

Copper Split Bolt Connector

## Specifications

|                  |                  |
|------------------|------------------|
| Type             | Splice Kit       |
| Number of Pieces | 1                |
| Brand            | Approved Vendors |

|                          |                  |
|--------------------------|------------------|
| Manufacturer             | Approved Vendors |
| Manufacturer Part Number | TRWCSBCS8        |



## AWWA C900/IB PVC Pressure Pipe | Gasketed Integral Bell

NAPCO's AWWA C900 Gasketed Integral Bell PVC Pipe product line is manufactured to meet the needs of modern municipal water, wastewater, and reclaimed water systems. With top quality raw materials and modern processing technology, our C900 pipe meets all industry standards in addition to our own rigorous quality control requirements.

Our C900 pipe utilizes Rieber style gaskets throughout the entire product offering to create a leak-free joint.



| Short Form Specification                        |   |                |                        |                 |             |                   |                 |                 |             |                 |  |
|---|---|----------------|------------------------|-----------------|-------------|-------------------|-----------------|-----------------|-------------|-----------------|--|
| <b>Pipe Standard:</b>                           | AWWA C900-16  |                |                        |                 |             |                   |                 |                 |             |                 |  |
| <b>Diameter Std.:</b>                           | Cast Iron Outside Diameter (CIOD)   |                |                        |                 |             |                   |                 |                 |             |                 |  |
| <b>Nominal Sizes:</b>                           | 4", 6", 8", 10", 12", 14", 16", 18", 20", 24", 30", 36"   |                |                        |                 |             |                   |                 |                 |             |                 |  |
| <b>Dimension Ratios &amp; Pressure Ratings"</b> | <table border="0"> <tr> <td>DR 51 – 80 psi</td> <td><b>DR 18 – 235 psi</b></td> </tr> <tr> <td>DR 41 – 100 psi</td> <td>(185 psi)**</td> </tr> <tr> <td>DR 32.5 – 125 psi</td> <td>DR 14 – 305 psi</td> </tr> <tr> <td>DR 25 – 165 psi</td> <td>(250 psi)**</td> </tr> <tr> <td>DR 21 – 200 psi</td> <td></td> </tr> </table> | DR 51 – 80 psi | <b>DR 18 – 235 psi</b> | DR 41 – 100 psi | (185 psi)** | DR 32.5 – 125 psi | DR 14 – 305 psi | DR 25 – 165 psi | (250 psi)** | DR 21 – 200 psi |  |
| DR 51 – 80 psi                                  | <b>DR 18 – 235 psi</b>  |                |                        |                 |             |                   |                 |                 |             |                 |  |
| DR 41 – 100 psi                                 | (185 psi)**   |                |                        |                 |             |                   |                 |                 |             |                 |  |
| DR 32.5 – 125 psi                               | DR 14 – 305 psi   |                |                        |                 |             |                   |                 |                 |             |                 |  |
| DR 25 – 165 psi                                 | (250 psi)**   |                |                        |                 |             |                   |                 |                 |             |                 |  |
| DR 21 – 200 psi                                 |   |                |                        |                 |             |                   |                 |                 |             |                 |  |
| <b>Lay Length:</b>                              | 20' [6.1m]  |                |                        |                 |             |                   |                 |                 |             |                 |  |
| <b>Pipe Compound:</b>                           | ASTM D1784 Cell Class 12454   |                |                        |                 |             |                   |                 |                 |             |                 |  |
| <b>Pipe Joint Std.:</b>                         | ASTM D3139  |                |                        |                 |             |                   |                 |                 |             |                 |  |
| <b>Max. Angular Joint Deflection:‡</b>          | 1°  |                |                        |                 |             |                   |                 |                 |             |                 |  |
| <b>Gasket Standard:</b>                         | ASTM F477, UL 157   |                |                        |                 |             |                   |                 |                 |             |                 |  |
| <b>Gasket Material Offerings:</b>               | Standard – SBR<br>Optional – NBR or EPDM  |                |                        |                 |             |                   |                 |                 |             |                 |  |
| <b>Installation Std.:</b>                       | AWWA C605   |                |                        |                 |             |                   |                 |                 |             |                 |  |

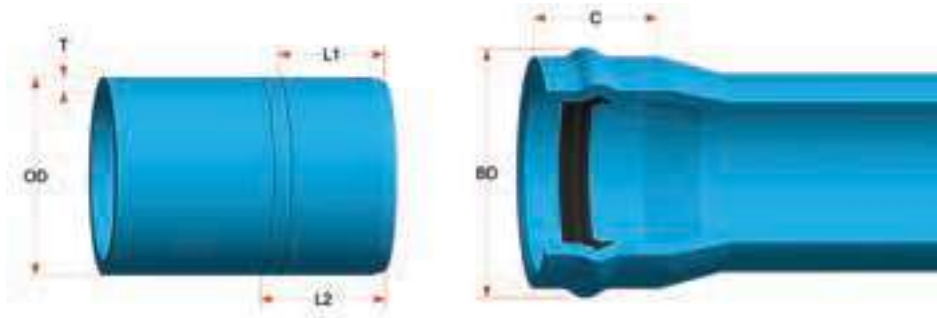
| Applications            | Potable Water   | Waste-water | Reclaimed Water |
|-------------------------|---|-------------|-----------------|
| <b>Color:</b>           | Blue  | Green       | Purple          |
| <b>Certifications:*</b> | NSF 14, NSF 61<br>CSA B137.3*<br>UL 1285<br>FM 1612**<br>BNQ 3624-250 (24in)*,<br>BNQ 3660-950 (24in) | CSA B137.3* | CSA B137.3*     |

\*See Certification Letter for full explanation and list of exceptions.  
 \*\*FM 1612 calculates pressure ratings differently than AWWA for 4"-12" only with DR 18 as 185 psi and DR 14 as 250 psi.  
 ‡See Installation Guide for more information.





## AWWA C900/IB PVC Pressure Pipe | Gasketed Integral Bell



C900/IB PIPE DIMENSIONS & PERFORMANCE

| Nom. Size      | Outside Diameter (OD) | DR   | Pressure Class psi [kPa] | Min. Wall Thickness (T) | Internal Diameter (ID) | Approx. Bell Diameter (BD) | Bell Depth (C)    | 1 <sup>st</sup> Insertion Mark (L1) | 2 <sup>nd</sup> Insertion Mark (L2) |
|----------------|-----------------------|------|--------------------------|-------------------------|------------------------|----------------------------|-------------------|-------------------------------------|-------------------------------------|
| 4"<br>[100mm]  | 4.800<br>[121.9]      | 25   | 165 [1150]               | 0.192 [4.88]            | 4.416 [112.1]          | 6.250<br>[158.8]           | 5.000<br>[127]    | 3.375<br>[85.7]                     | 4.375<br>[111.1]                    |
|                |                       | 18   | 235 [1620]               | 0.267 [6.78]            | 4.266 [108.3]          |                            |                   |                                     |                                     |
|                |                       | 14   | 305 [2130]               | 0.343 [8.70]            | 4.114 [104.5]          |                            |                   |                                     |                                     |
| 6"<br>[150mm]  | 6.900<br>[175.3]      | 25   | 165 [1150]               | 0.276 [7.00]            | 6.348 [161.3]          | 8.625<br>[219.1]           | 5.750<br>[146.1]  | 4.625<br>[117.5]                    | 5.625<br>[135.3]                    |
|                |                       | 18   | 235 [1620]               | 0.383 [9.72]            | 6.134 [155.9]          |                            |                   |                                     |                                     |
|                |                       | 14   | 305 [2130]               | 0.493 [12.50]           | 5.914 [150.3]          |                            |                   |                                     |                                     |
| 8"<br>[200mm]  | 9.050<br>[229.9]      | 25   | 165 [1150]               | 0.362 [9.20]            | 8.326 [211.5]          | 11.500<br>[292.1]          | 7.000<br>[177.8]  | 5.625<br>[135.3]                    | 6.625<br>[168.3]                    |
|                |                       | 18   | 235 [1620]               | 0.503 [12.80]           | 8.044 [204.3]          |                            |                   |                                     |                                     |
|                |                       | 14   | 305 [2130]               | 0.646 [16.40]           | 7.758 [197.1]          |                            |                   |                                     |                                     |
| 10"<br>[250mm] | 11.100<br>[281.9]     | 25   | 165 [1150]               | 0.444 [11.30]           | 10.212 [259.3]         | 14.000<br>[355.6]          | 7.250<br>[184.2]  | 6.125<br>[155.6]                    | 7.125<br>[181.0]                    |
|                |                       | 18   | 235 [1620]               | 0.617 [15.70]           | 9.866 [250.3]          |                            |                   |                                     |                                     |
|                |                       | 14   | 305 [2130]               | 0.793 [20.10]           | 9.514 [241.7]          |                            |                   |                                     |                                     |
| 12"<br>[300mm] | 13.200<br>[335.3]     | 25   | 165 [1150]               | 0.528 [13.40]           | 12.144 [308.5]         | 16.563<br>[420.7]          | 8.000<br>[203.2]  | 6.875<br>[174.6]                    | 7.875<br>[200]                      |
|                |                       | 18   | 235 [1620]               | 0.733 [18.60]           | 11.734 [298.1]         |                            |                   |                                     |                                     |
|                |                       | 14   | 305 [2130]               | 0.943 [23.90]           | 11.314 [287.5]         |                            |                   |                                     |                                     |
| 14"<br>[350mm] | 15.300<br>[388.6]     | 32.5 | 125 [860]                | 0.471 [12.0]            | 14.358 [364.7]         | 19.063<br>[484.2]          | 9.000<br>[228.6]  | 7.500<br>[190.5]                    | 8.500<br>[215.9]                    |
|                |                       | 25   | 165 [1150]               | 0.612 [15.6]            | 14.076 [357.5]         |                            |                   |                                     |                                     |
|                |                       | 21   | 200                      | 0.729                   | 13.842                 |                            |                   |                                     |                                     |
|                |                       | 18   | 235 [1620]               | 0.850 [21.6]            | 13.600 [345.4]         |                            |                   |                                     |                                     |
|                |                       | 14   | 305                      | 1.093                   | 13.114                 |                            |                   |                                     |                                     |
| 16"<br>[400mm] | 17.400<br>[442.0]     | 41   | 100                      | 0.424                   | 16.552                 | 21.750<br>[552.5]          | 10.000<br>[254.0] | 8.500<br>[215.9]                    | 9.500<br>[241.3]                    |
|                |                       | 32.5 | 125 [860]                | 0.535 [13.6]            | 16.330 [414.8]         |                            |                   |                                     |                                     |
|                |                       | 25   | 165 [1150]               | 0.696 [17.7]            | 16.008 [406.6]         |                            |                   |                                     |                                     |
|                |                       | 21   | 200                      | 0.829                   | 15.742                 |                            |                   |                                     |                                     |
|                |                       | 18   | 235 [1620]               | 0.967 [24.6]            | 15.466 [392.8]         |                            |                   |                                     |                                     |
|                |                       | 14   | 305                      | 1.243                   | 14.914                 |                            |                   |                                     |                                     |

# VINYLTECH AWWA C900-07

## TECHNICAL DATA SUBMITTAL



### CONFORMANCE

These specifications designate the requirements for manufacturing and installing Vinyltech AWWA C900-07 water pipe.

**AWWA C900-07** - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. (100mm Through 300mm), for Water Transmission and Distribution

**AWWA C605** - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water

**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

**ASTM D2412** - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading

### PIPE COMPOUND

The pipe shall be extruded from compounds meeting (PVC1120) the requirements of Cell Classification 12454, as defined in ASTM D1784, Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds. The PVC shall also be listed by the National Sanitation Foundation (NSF) for use in potable water.

### PIPE

Vinyltech pipe shall be manufactured in accordance with AWWA C900-07.

### GASKET JOINT

The gasket shall be reinforced with a steel band and meet the requirements of ASTM F477. Vinyltech pipe shall have an integral bell end with a locked-in factory installed gasket and shall meet the joint requirements of ASTM D3139.

### MARKING

The pipe shall be marked in accordance with AWWA C900 as in the following example.

- Manufacturer's name and production codes
- Nominal size, dimension ratio number, and O.D. base (for example, 8" DR 18 CIS)
- Materials cell classification (PVC1120)
- AWWA pressure class (235 psi or 305 psi) and hydrostatic test pressure (T600, or T800)
- AWWA designation number (AWWA C900-07)
- National Sanitation Foundation (NSF-61)
- Underwriters Laboratories (UL) logo, third party certification.
- Production date and time code (VABB15B 48.34)
- FM Approvals (FM) logo, required FM pressure rating (150 or 200 psi), third party certification

### QUALITY CONTROL

Each length of the pipe including the bell shall be hydrostatically tested. The pipe shall meet all additional test requirements as described in AWWA C900-07. Our full time quality assurance staff continually administers a rigid program of tests to maintain the production of the best pipe products available.

### INSTALLATION

Recommended installation procedures of Vinyltech Corporation are outlined in AWWA C605, Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water. The AWWA Manual M23, PVC Pipe-Design and Installation, is also an invaluable resource guide for design and installation.

### TAPPING

The consistent success of tapping PVC pressure pipe is contingent upon the use of proper procedures and equipment. Vinyltech recommends strict compliance with the requirements as specified in AWWA C605.

### ASSEMBLING THE PIPE

Assembly of Vinyltech PVC water pipe is easily accomplished. A depth of entry mark is on each spigot end to serve as a visual check for rapid, accurate joint inspection. **Do not over insert.**

- Remove any mud, sand, or other foreign matter from the belled and spigot ends of the pipe. Carefully clean the gasket area.
- With a clean applicator (a brush or hand) lubricate the entire surface of the pipe from the spigot end to the depth of entry mark and the contact surface of the gasket with **Vinyltech Brand Lubricant**.
- Brace the bell to avoid disturbing the already installed joints. Align the pipe, insert the spigot into the bell and push.
- Do not insert past the entry mark line.**



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AWWA C900-07

# VINYLTECH AWWA C900-07

## TECHNICAL DATA SUBMITTAL

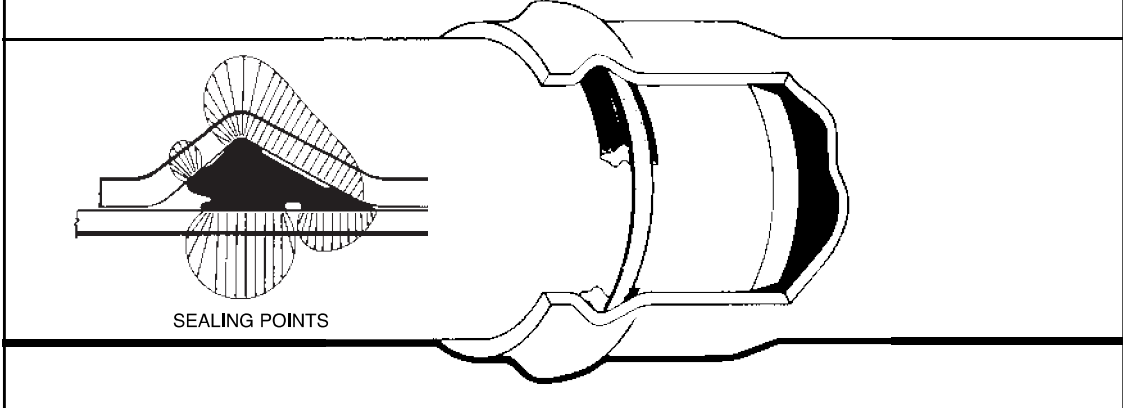
### C900 DR 18 PRESSURE CLASS 235

| NOMINAL SIZE (IN)<br>(mm) | OUTER DIAMETER (IN) | MINIMUM WALL (IN) | LIFTS PER TRUCK | FEET PER LIFT | APPROXIMATE WEIGHT (LB/100') |
|---------------------------|---------------------|-------------------|-----------------|---------------|------------------------------|
| 4 (100)                   | 4.800               | 0.267             | 16              | 1020          | 251.6                        |
| 6 (150)                   | 6.900               | 0.383             | 16              | 440           | 521.2                        |
| 8 (200)                   | 9.050               | 0.503             | 20              | 200           | 903.0                        |
| 10 (250)                  | 11.100              | 0.617             | 12              | 240           | 1364.4                       |
| 12 (300)                  | 13.200              | 0.733             | 28              | 60-80         | 1935.8                       |

### C900 DR 14 PRESSURE CLASS 305

| NOMINAL SIZE (IN)<br>(mm) | OUTER DIAMETER (IN) | MINIMUM WALL (IN) | LIFTS PER TRUCK | FEET PER LIFT | APPROXIMATE WEIGHT (LB/100') |
|---------------------------|---------------------|-------------------|-----------------|---------------|------------------------------|
| 4 (100)                   | 4.800               | 0.343             | 16              | 1020          | 317.5                        |
| 6 (150)                   | 6.900               | 0.493             | 16              | 440           | 658.7                        |
| 8 (200)                   | 9.050               | 0.646             | 20              | 200           | 1139.7                       |
| 10 (250)                  | 11.100              | 0.793             | 12              | 240           | 1722.3                       |
| 12 (300)                  | 13.200              | 0.943             | 28              | 60-80         | 2445.5                       |

### CROSS SECTIONAL VIEW



## THE RIEBER SEALING SYSTEM

The Rieber system provides a proven pipe joint with an excellent track record in the field. It is the fastest growing system in the world because of its many advantages.

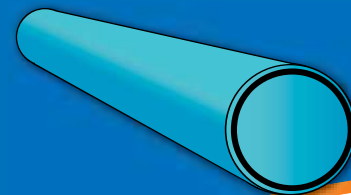
- Factory installed, locked-in gasket
- The pipe bell forms over the gasket, making a perfect fit
- Avoids the possibility of installing the wrong gasket
- Reduces installation problems
- The locked-in gasket eliminates gasket roll-out during joining
- The gasket is molded vs. extruded and spliced
- Works equally well under pressure or vacuum
- Three sealing points achieved vs. two
- **LEAK-PROOF JOINTS**
- **“THE WORLDS BEST JOINT”**

**AWWA C900-07**



# C900 : PVC Pressure Pipe

SPECIFICATION DATA



Diamond (C900) PVC Pipe (4" through 12") is made of 12454 compound per ASTM D1784, in accordance with the dimensional, chemical, and physical requirements of AWWA C900.

Diamond (C900) PVC Pipe bears the mark of NSF, International (NSF), the listing of Underwriters Laboratory, Inc. (UL), and (DR14 & DR18) bears the listing of Factory Mutual(FM). Some factory locations produce C900 bearing the mark of the Canadian Standards Association (CSA).



Diamond (C900) PVC Pipe utilizes a gasket, per ASTM F477, to seal the integral bell socket to the spigot of the next joint (which conforms to the requirements of ASTM D3139.) Each male end is beveled to facilitate joint assembly, and the spigot is referenced marked to ensure proper insertion depth. Diamond furnished lubricant is to be used in the joining process. Specialty gaskets may be available upon request.

**Diamond C900 is supplied in 20 foot laying lengths.**



## Physical Properties of PVC 12454:

| Property              | ASTM Test | Minimum         |
|-----------------------|-----------|-----------------|
| Specific Gravity      | D792      | 1.40            |
| Tensile Strength, psi | D638      | 7,000           |
| Tensile Modulus, psi  | D638      | 400,000         |
| IZOD Impact Strength  | D256      | .65ft., lb./in. |

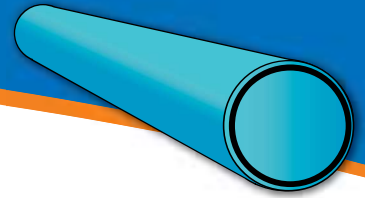
### SHORT FORM Specification for Diamond C900 PVC Water Pipe

Diamond C900 PVC Water Pipe shall be made of compounds conforming to ASTM D1784 with a cell classification of 12454. Diamond C900 shall meet all the dimensional, chemical, and physical requirements as outlined in AWWA C900 and will be supplied in 20 foot laying lengths. Joints shall meet the requirements of ASTM D3139 and shall be formed using Rieber Technology. Gaskets shall meet the requirements of ASTM F477. Potable water pipe shall be manufactured from National Sanitation Foundation (NSF) approved compounds.

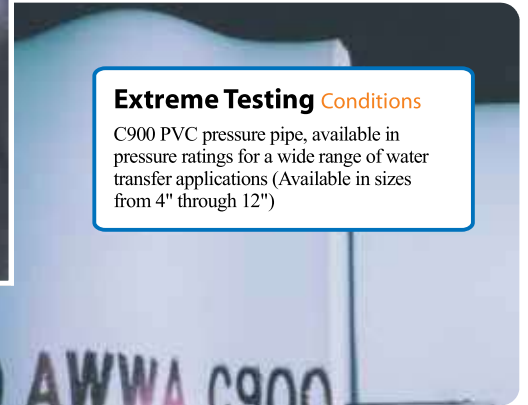
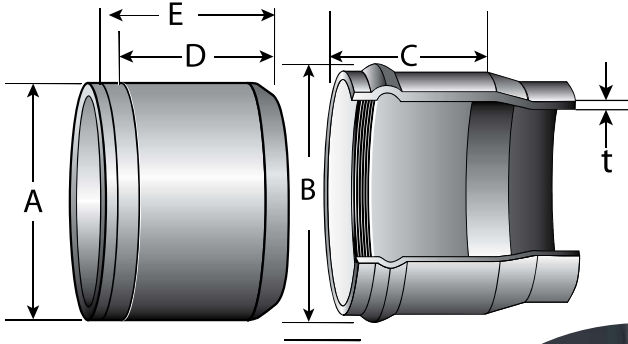


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DISTRIBUTION PIPE FOR THE 21st CENTURY



### Rieber Joint Illustration



#### Extreme Testing Conditions

C900 PVC pressure pipe, available in pressure ratings for a wide range of water transfer applications (Available in sizes from 4" through 12")



## C900™

### AWWA C900 SPECIFICATION DATA

| Nominal Pipe Size in. (mm) | Outside Dia. A Inches | Bell Dia. B Inches | Approximate Bell Depth C Inches | Assembly Mark 1 (D) Inches # | Assembly Mark 2 (E) Inches # | C900 DR-14 305 psi Min Wall (t) Inches | C900 DR-18 235 psi Min Wall (t) Inches | C900 DR-25 165 psi Min Wall (t) Inches |
|----------------------------|-----------------------|--------------------|---------------------------------|------------------------------|------------------------------|--|--|--|
| 4" (100)                   | 4.800                 | 6-1/2"             | 6                               | 4-1/4"                       | 5-1/4"                       | 0.343                                  | 0.267                                  | 0.192                                  |
| 6" (150)                   | 6.900                 | 9-1/4"             | 6.5                             | 4-5/8"                       | 5-5/8"                       | 0.493                                  | 0.383                                  | 0.276                                  |
| 8" (200)                   | 9.050                 | 11-3/4"            | 7                               | 5-1/8"                       | 6-1/8"                       | 0.646                                  | 0.503                                  | 0.362                                  |
| 10" (250)                  | 11.100                | 14-1/4"            | 7.5                             | 5-3/4"                       | 6-3/4"                       | 0.793                                  | 0.617                                  | 0.444                                  |
| 12" (300)                  | 13.200                | 16-3/4"            | 8                               | 6-1/8"                       | 7-1/8"                       | 0.943                                  | 0.733                                  | 0.528                                  |


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| Series 1500 N-Domestic TDW MJ TUF Grip Dual Wedge.....          | 82-85       |
| Series 2000 Domestic TLP MJ TUF Grip for PVC/PVCO.....          | 86-88       |
| Series 2000 Non-Domestic TLP MJ TUF Grip PVC/PVCO.....          | 89-91       |
| Series 2000S Split TLP TUF Grip for PVC.....                    | 92-94       |
| Series 3000PP (PVC Pipe to Pipe Bell to Spigot).....            | 95-96       |
| Series 3000PS (PVC Pipe Stop for Bell to Spigot).....           | 97          |
| Series 3000MJ (MJ Fitting to PVC Pipe).....                     | 98-99       |
| Series 3000PO (Push-On Fitting to PVC pipe).....                | 100         |
| Series 100 (MJ Retainer Gland to DI Pipe).....                  | 10,22,61    |
| Sure Stop 350 Push On Tyton Joint Restraint Gasket....          | 101-102     |
| Sure Stop-PVC 350 Push On Tyton Joint Res Gasket....            | 103-104     |
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| Service or Curb Box Screw Type.....                             | 38          |
| Valve or Road Two-Piece Box Screw Type.....                     | 39,43       |
| Valve or Road Two-Piece Slip Type.....                          | 41          |
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| Glands C110 (Solid, DUO, Swivel).....                           | 20,22,23    |
| Gaskets MJ, Tyton, Transition, DUO.....                         | 20,29,69,70 |

**NOTICE:** 1). Weights published in this catalog are approximate and provided for shipping purpose only. Actual weights may vary as products are manufactured in multiple locations. All products meet the applicable ANSI/AWWA specification.  
 2). Laying length: In accordance with ANSI/AWWA C110/A21.10, ANSI B16.1, ANSI/AWWA C153/A21.53. Fittings not listed in ANSI/AWWA have dimensions as per Tyler Union design. Standard tolerance applies to laying length dimensions.  
 3). For projects where fitting weights, specifications, or dimensions are critical, advise upon order placement.



## MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

Sizes 3"-12" UL & 3"-10" FM Listed  
For Fire Main Equipment

### SAMPLE SPECIFICATIONS (Current ANSI/AWWA revisions apply)

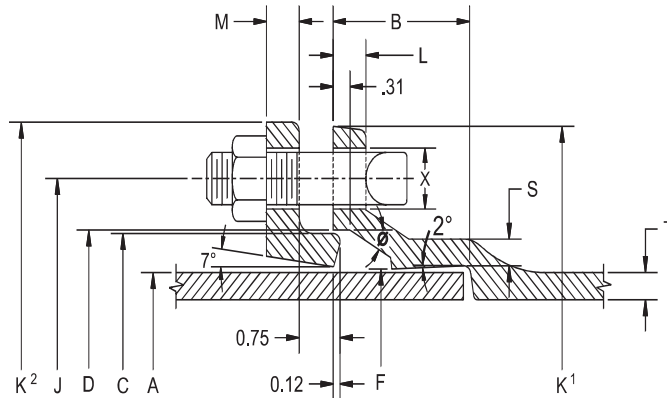
Mechanical joint watermain fittings with accessories, 2" through \*64" shall be manufactured from ductile iron in accordance with and meet all applicable terms and provisions of standards ANSI/AWWA C153/A21.53 and ANSI/AWWA C111/A21.11. Ductile iron mechanical joint fittings 2" through 24" shall be rated for 350 PSI working pressure. Ductile iron 30" through 48" shall be rated for 250 psi working pressure. Flanged ductile iron fittings in 24" (610 mm) and smaller sizes may be rated for 350 psi (2,413 kPa) with the use of special (annular ring or comparable) gaskets. All coated and lined fittings meet requirements of NSF-61, NSF-372, and Annex G.

NOTE - EXCEPTIONS: Mechanical joint fittings with flanged branches are rated for water pressure of 250 PSI.

NOTE - Wyes over 12" are not pressure rated. Contact manufacturer for rating in your application.

NOTE - Fittings are cement lined and seal coated in accordance with ANSI/AWWA C104/A21.4. Fittings are available double cement-lined, bare, or epoxy coated upon request. Epoxy coating per ANSI/AWWA C116

NOTE - Installation per AWWA C600 and AWWA C651, current revision



NOMINAL JOINT DIMENSIONS IN INCHES

BOLTS

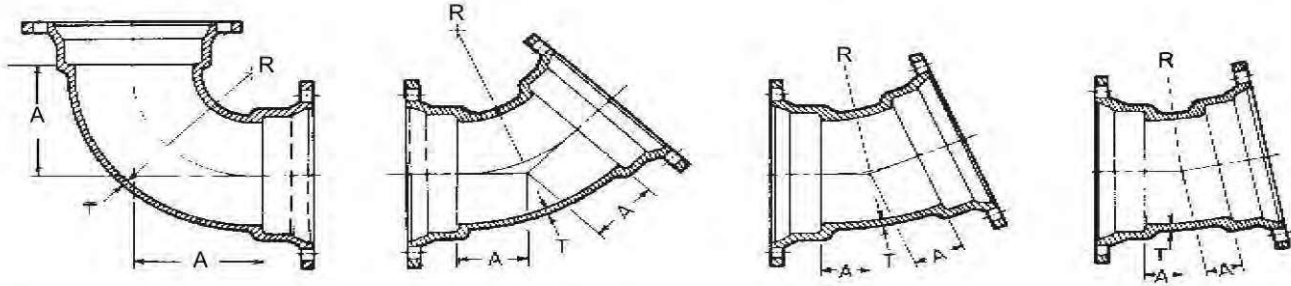
| Size | A Dia. | B    | C Dia. | D Dia. | F Dia. | J Dia. | K <sup>1</sup> Dia. | K <sup>2</sup> Dia. | L    | M    | S    | T   | X     | Size        | No. |
|------|--------|------|--------|--------|--------|--------|---------------------|---------------------|------|------|------|-----|-------|-------------|-----|
| 2    | 2.51   | 2.50 | 3.50   | 3.60   | 2.61   | 4.75   | 6.19                | 6.89                | .58  | .62  | .36  | .30 | 3/4   | 5/8x3       | 2   |
| 3    | 3.96   | 2.50 | 4.84   | 4.94   | 4.06   | 6.19   | 7.62                | 7.69                | .58  | .62  | .39  | .33 | 3/4   | 5/8x3       | 4   |
| 4    | 4.80   | 2.50 | 5.92   | 6.02   | 4.90   | 7.50   | 9.06                | 9.12                | .60  | .75  | .39  | .34 | 7/8   | 3/4x3 1/2   | 4   |
| 6    | 6.90   | 2.50 | 8.02   | 8.12   | 7.00   | 9.50   | 11.06               | 11.12               | .63  | .88  | .43  | .36 | 7/8   | 3/4x3 1/2   | 6   |
| 8    | 9.05   | 2.50 | 10.17  | 10.27  | 9.15   | 11.75  | 13.31               | 13.37               | .66  | 1.00 | .45  | .38 | 7/8   | 3/4x4       | 6   |
| 10   | 11.10  | 2.50 | 12.22  | 12.34  | 11.20  | 14.00  | 15.62               | 15.62               | .70  | 1.00 | .47  | .40 | 7/8   | 3/4x4       | 8   |
| 12   | 13.20  | 2.50 | 14.32  | 14.44  | 13.30  | 16.25  | 17.88               | 17.88               | .73  | 1.00 | .49  | .42 | 7/8   | 3/4x4       | 8   |
| 14   | 15.30  | 3.50 | 16.40  | 16.54  | 15.44  | 18.75  | 20.31               | 20.25               | .79  | 1.25 | .55  | .47 | 7/8   | 3/4x4 1/2   | 10  |
| 16   | 17.40  | 3.50 | 18.50  | 18.64  | 17.54  | 21.00  | 22.56               | 22.50               | .85  | 1.31 | .58  | .50 | 7/8   | 3/4x4 1/2   | 12  |
| 18   | 19.50  | 3.50 | 20.60  | 20.74  | 19.64  | 23.25  | 24.83               | 24.75               | 1.00 | 1.38 | .68  | .54 | 7/8   | 3/4x4 1/2   | 12  |
| 20   | 21.60  | 3.50 | 22.70  | 22.84  | 21.74  | 25.50  | 27.08               | 27.00               | 1.02 | 1.44 | .69  | .57 | 7/8   | 3/4x4 1/2   | 14  |
| 24   | 25.80  | 3.50 | 26.90  | 27.04  | 25.94  | 30.00  | 31.58               | 31.50               | 1.02 | 1.56 | .75  | .61 | 7/8   | 3/4x5       | 16  |
| 30   | 32.00  | 4.00 | 33.29  | 33.46  | 32.17  | 36.88  | 39.12               | 39.12               | 1.31 | 2.00 | .82  | .66 | 1 1/8 | 1x6         | 20  |
| 36   | 38.30  | 4.00 | 39.59  | 39.76  | 38.47  | 43.75  | 46.00               | 46.00               | 1.45 | 2.00 | 1.00 | .74 | 1 1/8 | 1x6         | 24  |
| 42   | 44.50  | 4.00 | 45.79  | 45.96  | 44.67  | 50.62  | 53.12               | 53.12               | 1.45 | 2.00 | 1.35 | .82 | 1 3/8 | 1 1/4x6 1/2 | 28  |
| 48   | 50.80  | 4.00 | 52.09  | 52.26  | 50.97  | 57.50  | 60.00               | 60.00               | 1.45 | 2.00 | 1.35 | .90 | 1 3/8 | 1 1/4x6 1/2 | 32  |

NOTE: 2 Inch MJ ASTM A536 ductile iron Compact fittings (2"-22.5 bend, 2"-45 bend, 2"-90 bend, 2"x12" solid sleeve, 2"x2" tee, 4"x2" tee, and 4"x2" reducer) are available. Contact Tyler Union for availability or additional product dimensions.

\*NOTE: Contact Tyler Union for 54"-64" product information.

\*NOTE: For projects where product weights, specifications, or dimensions are critical, advise upon order placement.

**BENDS**

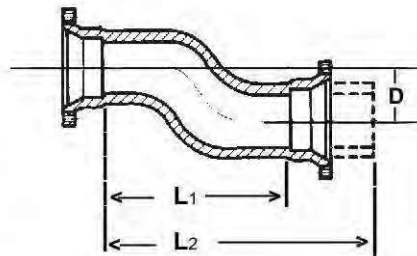


| Size     | 90° Bends (1/4) |            |            |           | 45° Bends (1/8) |             |           | 22½° Bends (1/16) |              |           | 11¼° Bends (1/32) |       |        |
|----------|-----------------|------------|------------|-----------|-----------------|-------------|-----------|-------------------|--------------|-----------|-------------------|-------|--------|
|          | T               | A          | R          | Weight    | A               | R           | Weight    | A                 | R            | Weight    | A                 | R     | Weight |
| 3        | .34             | 3.5        | 2.5        | 19        | 2.00            | 2.41        | 17        | 1.50              | 2.51         | 15        | 1.25              | 2.53  | 16     |
| 4        | .35             | 4.0        | 3.0        | 22        | 2.50            | 3.56        | 20        | 1.75              | 3.81         | 18        | 1.50              | 5.12  | 18     |
| 6        | .37             | 6.5        | 6.0        | 49        | 3.50            | 7.25        | 39        | 2.25              | 6.35         | 31        | 1.50              | 5.12  | 29     |
| <b>8</b> | <b>.39</b>      | <b>7.5</b> | <b>7.0</b> | <b>64</b> | <b>4.00</b>     | <b>8.44</b> | <b>56</b> | <b>2.85</b>       | <b>11.80</b> | <b>50</b> | 2.06              | 15.80 | 45     |
| 10       | .41             | 9.5        | 9.0        | 102       | 5.01            | 10.88       | 78        | 3.35              | 14.35        | 66        | 2.32              | 18.36 | 59     |
| 12       | .43             | 10.5       | 10.0       | 129       | 5.98            | 13.25       | 102       | 3.86              | 16.90        | 87        | 2.56              | 20.90 | 82     |
| 14       | .51             | 12.0       | 11.5       | 214       | 5.50            | 12.06       | 155       | 3.93              | 17.25        | 142       | 2.59              | 21.25 | 136    |
| 16       | .52             | 13.0       | 12.5       | 273       | 5.98            | 13.25       | 204       | 3.98              | 17.50        | 178       | 2.62              | 21.50 | 157    |
| 18       | .59             | 15.5       | 14.0       | 411       | 6.50            | 12.36       | 292       | 7.50              | 30.19        | 286       | 3.00              | 60.84 | 283    |
| 20       | .60             | 17.0       | 15.5       | 519       | 7.00            | 13.59       | 372       | 8.50              | 35.19        | 376       | 3.50              | 71.07 | 374    |
| 24       | .62             | 17.0       | 15.5       | 721       | 7.50            | 14.89       | 490       | 9.00              | 37.69        | 512       | 3.50              | 76.12 | 487    |
| 30       | .66             | 21.50      | 19.0       | 930       | 10.50           | 9.31        | 716       | 6.75              | 21.36        | 665       | 4.75              | 22.84 | 600    |
| 36       | .74             | 24.50      | 22.0       | 1450      | 11.50           | 21.73       | 1110      | 7.75              | 26.39        | 960       | 5.00              | 25.38 | 820    |
| 42       | .82             | 29.25      | 26.7       | 2205      | 14.00           | 27.76       | 1610      | 9.00              | 32.68        | 1350      | 6.00              | 35.54 | 1180   |
| 48       | .90             | 33.25      | 30.75      | 2990      | 15.00           | 30.17       | 2090      | 10.00             | 27.70        | 1760      | 6.50              | 40.61 | 1475   |

\*\*Note: 2 inch compact ductile iron fittings are available, contact Tyler Union for information

**\*OFFSETS (MJ x MJ) or (MJ x PE)**

| Size | D  | Dimensions |      | Weights |       |
|------|----|------------|------|---------|-------|
|      |    | L1         | L2   | MJxMJ   | MJxPE |
| 3    | 6  | 9          | 14.5 | 23      | 29    |
| 3    | 12 | 15         | 20.5 | 34      | 39    |
| 3    | 18 | 21         | 26.5 | 40      | 48    |
| 3    | 24 | 27         | 32.5 | 47      | 53    |
| 4    | 6  | 10         | 15.5 | 32      | 44    |
| 4    | 12 | 16         | 21.5 | 42      | 54    |
| 4    | 18 | 22         | 27.5 | 56      | 65    |
| 4    | 24 | 28         | 33.5 | 65      | 72    |
| 6    | 6  | 12         | 17.5 | 55      | 54    |
| 6    | 12 | 18         | 23.5 | 72      | 68    |
| 6    | 18 | 24         | 29.5 | 88      | 96    |
| 6    | 24 | 30         | 35.5 | 111     | 117   |
| 8    | 6  | 13         | 18.5 | 79      | 78    |
| 8    | 12 | 19         | 24.5 | 103     | 110   |
| 8    | 18 | 25         | 30.5 | 128     | 124   |
| 10   | 6  | 15         | 20.5 | 112     | 130   |
| 10   | 12 | 21         | 26.5 | 148     | 172   |
| 10   | 18 | 27         | 32.5 | 176     | 189   |
| 12   | 6  | 17         | 22.5 | 157     | ..... |
| 12   | 12 | 23         | 28.5 | 174     | 198   |
| 12   | 18 | 29         | 34.5 | 210     | 270   |



| Size | Dimensions |    |      | Weight |       |
|------|------------|----|------|--------|-------|
|      | D          | L1 | L2   | MJxMJ  | MJxPE |
| 12   | 24         | 35 | 40.5 | 298    | 334   |
| 12   | 30         | 41 | 46.5 | 283    | 205   |

**BENDS**

**5-5/8 Bends (1/64) MJ x MJ**

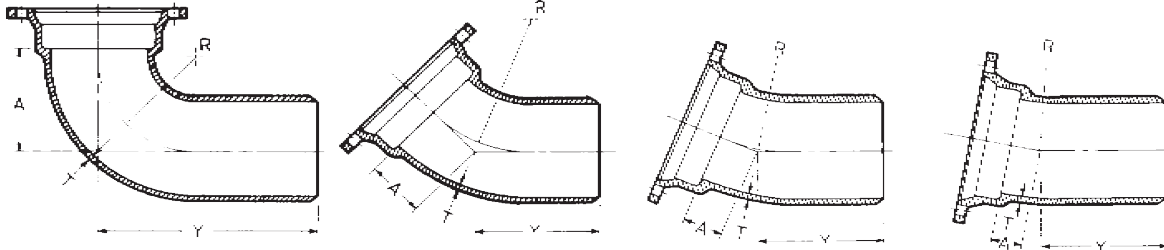
| Size | Dimensions |       | Weight |
|------|------------|-------|--------|
|      | *A         | R     |        |
| 3    | 1.25       | 5.08  | 16     |
| 4    | 1.50       | 7.61  | 18     |
| 6    | 1.50       | 10.15 | 29     |
| 8    | 1.75       | 12.69 | 45     |
| 10   | 2.00       | 15.23 | 59     |
| 12   | 2.30       | 17.77 | 82     |
| 14   | 2.50       | 20.31 | 136    |
| 16   | 2.50       | 20.31 | 157    |
| 18   | 3.00       | 25.38 | 283    |
| 20   | 3.00       | 25.38 | 374    |
| 24   | 3.00       | 25.38 | 487    |
| 30   | 3.75       | 32.97 | 600    |
| 36   | 4.00       | 34.55 | 820    |
| 42   | 5.00       | 42.71 | 1180   |
| 48   | 5.50       | 47.35 | 1475   |



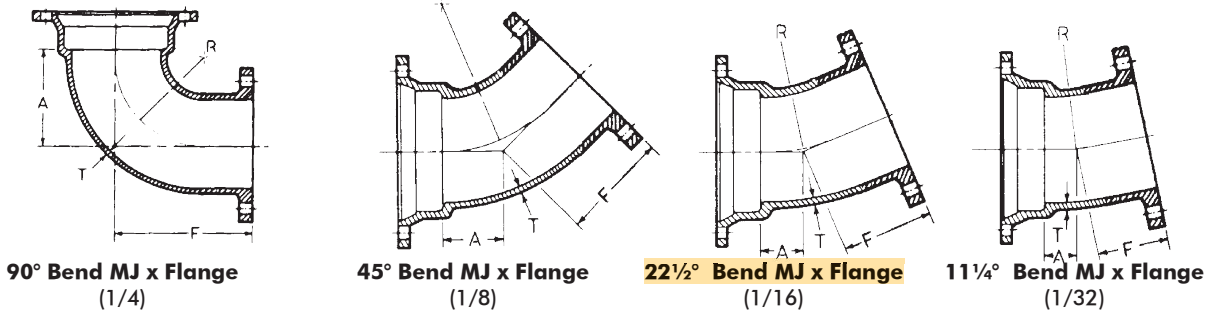
# MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

Sizes 3"-12" UL & 3"-10" FM Listed  
For Fire Main Equipment

## BENDS



| Size | 90° Bend MJ x PE (1/4) |            |      |      |        | 45° Bend MJ x PE (1/8) |      |       |        |      | 22 1/2° Bend MJ x PE (1/16) |       |        |      |       | 11 1/4° Bend MJ x PE (1/32) |        |  |  |  |
|------|------------------------|------------|------|------|--------|------------------------|------|-------|--------|------|-----------------------------|-------|--------|------|-------|-----------------------------|--------|--|--|--|
|      | T                      | Dimensions |      | R    | Weight | A                      | Y    | R     | Weight | A    | Y                           | R     | Weight | A    | Y     | R                           | Weight |  |  |  |
| 3    | .34                    | 3.5        | 9.0  | 2.5  | 18     | 2.0                    | 7.5  | 2.41  | 17     | 1.50 | 7.00                        | 2.51  | 19     | 1.25 | 6.75  | 7.62                        | 15     |  |  |  |
| 4    | .35                    | 4.0        | 9.5  | 3.0  | 26     | 2.5                    | 8.0  | 3.56  | 22     | 1.75 | 7.25                        | 3.81  | 20     | 1.50 | 7.00  | 5.12                        | 20     |  |  |  |
| 6    | .37                    | 6.0        | 11.5 | 5.0  | 45     | 3.2                    | 8.7  | 5.49  | 38     | 2.25 | 7.75                        | 6.35  | 33     | 1.50 | 7.00  | 5.12                        | 32     |  |  |  |
| 8    | .39                    | 7.5        | 13.0 | 7.0  | 64     | 4.0                    | 9.5  | 8.44  | 55     | 2.84 | 8.34                        | 11.80 | 51     | 2.05 | 7.55  | 15.80                       | 44     |  |  |  |
| 10   | .41                    | 9.5        | 15.0 | 9.0  | 108    | 5.0                    | 10.5 | 10.88 | 78     | 3.35 | 8.85                        | 14.35 | 66     | 2.31 | 7.81  | 18.36                       | 60     |  |  |  |
| 12   | .43                    | 9.0        | 14.4 | 6.0  | 114    | 6.0                    | 11.5 | 13.25 | 104    | 3.50 | 9.00                        | 12.70 | 89     | 2.56 | 8.06  | 20.90                       | 79     |  |  |  |
| 14   | .51                    | 12.0       | 20.0 | 11.5 | 219    | 5.5                    | 13.4 | 10.85 | 165    | 3.93 | 11.93                       | 17.25 | 152    | 2.59 | 10.59 | 21.25                       | 137    |  |  |  |
| 16   | .52                    | 13.0       | 21.0 | 12.5 | 254    | 6.0                    | 14.0 | 13.25 | 206    | 3.98 | 11.98                       | 17.50 | 181    | 2.62 | 10.62 | 21.50                       | 161    |  |  |  |
| 20   | .57                    | 15.0       | 23.0 | 13.5 | 400    | 7.0                    | 15.3 | 13.97 | 290    | 7.00 | 14.00                       | 35.19 | 290    | 7.00 | 14.00 | 21.07                       | 290    |  |  |  |
| 24   | .62                    | 17.0       | 25.0 | 15.5 | 710    | 7.5                    | 16.6 | 14.69 | 460    | 9.00 | 17.66                       | 37.69 | 455    | 9.00 | 26.12 | 12.00                       | 475    |  |  |  |
| 30   | .68                    | 21.5       | 30.5 | 19.0 | 865    | 10.5                   | 19.5 | 19.31 | 715    | 6.75 | 15.75                       | 21.36 | 600    | 4.75 | 13.75 | 22.84                       | 535    |  |  |  |

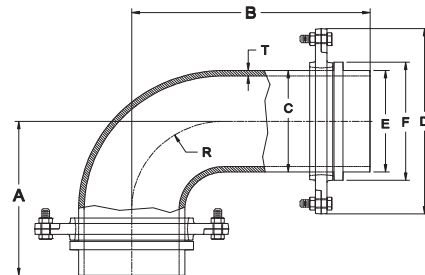


| Size | 90° Bend MJ x Flange (1/4) |            |      |      |        | 45° Bend MJ x Flange (1/8) |       |     |        |      | 22 1/2° Bend MJ x Flange (1/16) |     |        |      |       | 11 1/4° Bend MJ x Flange (1/32) |        |     |  |  |
|------|----------------------------|------------|------|------|--------|----------------------------|-------|-----|--------|------|---------------------------------|-----|--------|------|-------|---------------------------------|--------|-----|--|--|
|      | T                          | Dimensions |      | F    | Weight | A                          | R     | F   | Weight | A    | R                               | F   | Weight | A    | R     | F                               | Weight |     |  |  |
| 3    | .34                        | 3.5        | 2.5  | 5.5  | 21     | ...                        | ...   | ... | ...    | ...  | ...                             | ... | ...    | ...  | ...   | ...                             | ...    | ... |  |  |
| 4    | .35                        | 4.0        | 3.0  | 6.5  | 28     | 2.50                       | 3.56  | 4.0 | 34     | 1.75 | 3.81                            | 4.0 | 34     | 1.50 | 5.12  | 4.0                             | 19     |     |  |  |
| 6    | .37                        | 6.0        | 5.0  | 8.0  | 45     | 3.25                       | 5.49  | 5.0 | 57     | 2.25 | 5.35                            | 5.0 | 57     | 1.50 | 5.12  | 5.0                             | 30     |     |  |  |
| 8    | .39                        | 7.5        | 7.0  | 9.0  | 73     | 4.25                       | 7.93  | 5.5 | 83     | 2.50 | 7.62                            | 5.5 | 83     | 1.75 | 7.70  | 5.5                             | 50     |     |  |  |
| 10   | .41                        | 9.5        | 9.0  | 11.0 | 113    | 5.00                       | 9.76  | 6.5 | 122    | 3.00 | 10.16                           | 6.5 | 122    | 2.00 | 10.25 | 6.5                             | 75     |     |  |  |
| 12   | .43                        | 10.5       | 10.0 | 12.0 | 141    | 6.00                       | 12.19 | 7.5 | 159    | 3.50 | 12.70                           | 7.5 | 159    | 2.25 | 12.82 | 7.5                             | 88     |     |  |  |
| 14   | .51                        | 12.0       | 11.5 | 14.0 | 217    | 5.50                       | 10.85 | 8.5 | 207    |      |                                 |     |        |      |       |                                 |        |     |  |  |
| 16   | .52                        | 13.0       | 12.5 | 15.0 | 280    | 6.00                       | 12.02 | 9.5 | 290    |      |                                 |     |        |      |       |                                 |        |     |  |  |

## 90° Swivel x Swivel Hydrant Ell

| Size     | T   | Dimensions |      |      |      |      |      |     | *R |
|----------|-----|------------|------|------|------|------|------|-----|----|
|          |     | *A         | *B   | C    | D    | E    | F    |     |    |
| **Weight |     |            |      |      |      |      |      |     |    |
| 6        | .37 | 10.5       | 15.5 | 6.90 | 11.2 | 6.81 | 7.98 | 6.0 | 74 |

\*\* Weight includes two swivel glands.

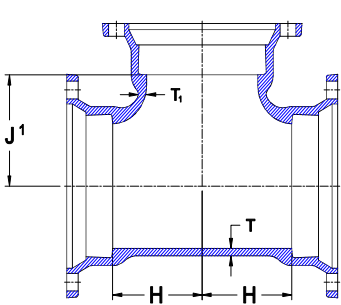




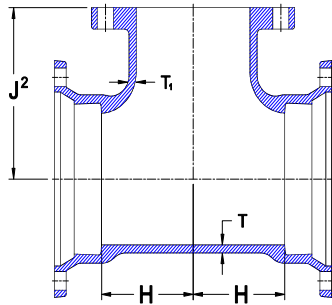
# MECHANICAL JOINT C153 DUCTILE IRON COMPACT FITTINGS

Sizes 3"-12" UL & 3"-10" FM Listed  
For Fire Main Equipment

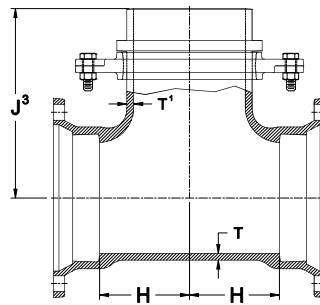
## TEES



MJ Tee

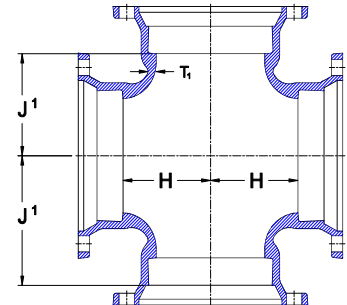


MJ x FE Tee



MJ x Swivel Tee

## CROSS



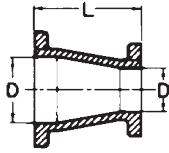
Cross

| Size  | T   | T <sup>1</sup> | Dimensions |                 |                 |       | *J <sup>3</sup> | MJ  | Weights |       |  |
|-------|-----|----------------|------------|-----------------|-----------------|-------|-----------------|-----|---------|-------|--|
|       |     |                | *H         | *J <sup>1</sup> | *J <sup>2</sup> | MJxFE |                 |     | †MJxS   | Cross |  |
| 3     | .34 | .34            | 3.5        | 3.50            | 5.5             | ...   | 26              | 29  | ...     | 31    |  |
| 4x3   | .35 | .34            | 3.5        | 4.00            | 6.5             | ...   | 35              | 34  | ...     | 39    |  |
| 4     | .35 | .35            | 4.0        | 4.00            | 6.5             | ...   | 36              | 39  | ...     | 45    |  |
| 6x3   | .37 | .34            | 4.0        | 4.00            | 6.5             | ...   | 51              | 54  | ...     | ...   |  |
| 6x4   | .37 | .35            | 4.0        | 5.00            | 8.0             | ...   | 52              | 57  | ...     | 62    |  |
| 6     | .37 | .37            | 5.0        | 5.00            | 8.0             | 10.50 | 66              | 68  | 77      | 79    |  |
| 8x3   | .39 | .34            | 4.0        | 6.50            | 9.0             | ...   | 56              | ... | ...     | ...   |  |
| 8x4   | .39 | .35            | 4.5        | 6.50            | 9.0             | ...   | 72              | 82  | ...     | 84    |  |
| 8x6   | .39 | .37            | 5.5        | 6.50            | 9.0             | 11.50 | 79              | 81  | 105     | 98    |  |
| 8     | .39 | .39            | 6.5        | 6.50            | 9.0             | 11.50 | 90              | 101 | 116     | 112   |  |
| 10x3  | .41 | .34            | 4.0        | 7.50            | 11.0            | ...   | 80              | ... | ...     | ...   |  |
| 10x4  | .41 | .35            | 4.5        | 7.50            | 11.0            | ...   | 82              | 92  | ...     | 98    |  |
| 10x6  | .41 | .37            | 5.5        | 7.50            | 11.0            | 13.00 | 99              | 116 | 114     | 121   |  |
| 10x8  | .41 | .39            | 6.5        | 7.50            | 11.0            | 13.00 | 116             | 128 | 138     | 135   |  |
| 10    | .41 | .41            | 7.5        | 7.50            | 11.0            | ...   | 132             | 144 | ...     | 156   |  |
| 12x3  | .43 | .34            | 4.0        | 8.75            | 12.0            | ...   | 99              | ... | ...     | ...   |  |
| 12x4  | .43 | .35            | 4.5        | 8.75            | 12.0            | ...   | 108             | 118 | ...     | 119   |  |
| 12x6  | .43 | .37            | 5.5        | 8.75            | 12.0            | 14.25 | 119             | 133 | 132     | 138   |  |
| 12x8  | .43 | .39            | 6.5        | 8.75            | 12.0            | 14.25 | 126             | 146 | 149     | 149   |  |
| 12x10 | .43 | .41            | 7.5        | 8.75            | 12.0            | ...   | 159             | 174 | ...     | 187   |  |
| 12    | .43 | .43            | 8.75       | 8.75            | 12.0            | ...   | 171             | 198 | ...     | 202   |  |
| 14x6  | .51 | .44            | 6.5        | 10.50           | 14.0            | 16.00 | 183             | 205 | 211     | 210   |  |
| 14x8  | .51 | .45            | 7.5        | 10.50           | 14.0            | ...   | 211             | ... | ...     | 231   |  |
| 14x10 | .51 | .46            | 8.5        | 10.50           | 14.0            | ...   | 229             | 244 | ...     | 255   |  |
| 14x12 | .51 | .47            | 9.5        | 10.50           | 14.0            | ...   | 245             | 284 | ...     | 269   |  |
| 14    | .51 | .51            | 10.5       | 10.50           | 14.0            | ...   | 281             | 291 | ...     | 299   |  |
| 16x6  | .52 | .45            | 6.5        | 11.50           | 15.0            | 17.00 | 222             | 230 | 243     | 250   |  |
| 16x8  | .52 | .46            | 7.5        | 11.50           | 15.0            | ...   | 245             | 248 | ...     | 264   |  |
| 16x10 | .52 | .47            | 8.5        | 11.50           | 15.0            | ...   | 265             | 287 | ...     | 286   |  |
| 16x12 | .52 | .48            | 9.5        | 11.50           | 15.0            | ...   | 277             | 312 | ...     | 312   |  |
| 16x14 | .52 | .51            | 10.5       | 11.50           | 15.0            | ...   | 317             | 348 | ...     | ...   |  |
| 16    | .52 | .52            | 11.5       | 11.50           | 15.0            | ...   | 337             | 324 | ...     | 451   |  |
| 18x6  | .59 | .44            | 6.5        | 14.50           | 15.5            | 18.00 | 275             | 261 | 279     | ...   |  |
| 18x8  | .59 | .45            | 7.5        | 14.50           | 14.5            | ...   | 280             | 351 | ...     | ...   |  |
| 18x10 | .59 | .47            | 8.5        | 12.50           | ...             | ...   | 286             | ... | ...     | ...   |  |
| 18x12 | .59 | .49            | 9.5        | 12.50           | ...             | ...   | 372             | ... | ...     | ...   |  |
| 18x14 | .59 | .56            | 10.5       | 12.50           | ...             | ...   | 415             | ... | ...     | ...   |  |
| 18x16 | .59 | .57            | 11.5       | 12.50           | ...             | ...   | 445             | ... | ...     | ...   |  |
| 18x18 | .59 | .59            | 13.0       | 12.50           | ...             | ...   | 490             | ... | ...     | ...   |  |

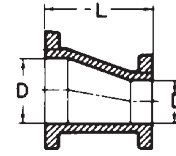
NOTE: Contact TU Inside Sales representative for MJ Crosses larger than 16 inch. †MJxSwl Weights include swivel gland.

\*\*NOTE: 2"x2" and 4"x2" Compact C153 tees area available, contact Tyler Union for information.

### REDUCERS



**Concentric Reducer**



**\*Eccentric Reducer**

| Concentric Reducer |         |              |     | Concentric Reducer |         |              |      |
|--------------------|---------|--------------|-----|--------------------|---------|--------------|------|
| Size D             | Size D' | Dimensions L | Wts | Size D             | Size D' | Dimensions L | Wts  |
| 3                  | 2       | 6            | 17  | 18                 | 8       | 19           | 265  |
| 4                  | 2       | 7            | 23  | 18                 | 10      | 19           | 290  |
| 4                  | 3       | 7            | 29  | 18                 | 12      | 19           | 320  |
| 6                  | 2       | 9            | 30  | 18                 | 14      | 19           | 350  |
| 6                  | 3       | 9            | 44  | 18                 | 16      | 19           | 405  |
| 6                  | 4       | 9            | 46  | 20                 | 10      | 20           | 418  |
| 6                  | 5       | 9            | 56  | 20                 | 12      | 20           | 465  |
| 8                  | 3       | 11           | 61  | 20                 | 14      | 20           | 430  |
| 8                  | 4       | 11           | 63  | 20                 | 16      | 20           | 445  |
| 8                  | 5       | 11           | 70  | 20                 | 18      | 20           | 470  |
| 8                  | 6       | 11           | 75  | 24                 | 12      | 24           | 608  |
| 10                 | 4       | 12           | 98  | 24                 | 14      | 24           | 565  |
| 10                 | 6       | 12           | 107 | 24                 | 16      | 24           | 610  |
| 10                 | 8       | 12           | 116 | 24                 | 18      | 24           | 645  |
| 12                 | 4       | 14           | 119 | 24                 | 20      | 24           | 695  |
| 12                 | 6       | 14           | 130 | 30                 | 16      | 30           | 945  |
| 12                 | 8       | 14           | 152 | 30                 | 18      | 30           | 970  |
| 12                 | 10      | 14           | 178 | 30                 | 20      | 30           | 1144 |
| 14                 | 6       | 16           | 165 | 30                 | 24      | 30           | 1155 |
| 14                 | 8       | 16           | 185 | 42                 | 24      | 42           | 1810 |
| 14                 | 10      | 16           | 205 | 42                 | 30      | 42           | 2060 |
| 14                 | 12      | 16           | 235 | 42                 | 36      | 42           | 2345 |
| 16                 | 6       | 18           | 210 | 48                 | 30      | 48           | 2615 |
| 16                 | 8       | 18           | 230 | 48                 | 36      | 48           | 2940 |
| 16                 | 10      | 18           | 255 | 48                 | 42      | 48           | 3320 |
| 16                 | 12      | 18           | 285 |                    |         |              |      |
| 16                 | 14      | 18           | 315 |                    |         |              |      |

| *Eccentric Reducer |         |              |     | *Eccentric Reducer |         |              |      |
|--------------------|---------|--------------|-----|--------------------|---------|--------------|------|
| Size D             | Size D' | Dimensions L | Wts | Size D             | Size D' | Dimensions L | Wts  |
| 4                  | 3       | 7            | 30  | 18                 | 14      | 19           | 350  |
| 6                  | 3       | 9            | 45  | 18                 | 16      | 19           | 385  |
| 6                  | 4       | 9            | 52  | 20                 | 10      | 20           | 350  |
| 8                  | 4       | 11           | 70  | 20                 | 12      | 20           | 370  |
| 8                  | 6       | 11           | 80  | 20                 | 14      | 20           | 402  |
| 10                 | 4       | 12           | 95  | 20                 | 16      | 20           | 449  |
| 10                 | 6       | 12           | 98  | 20                 | 18      | 20           | 455  |
| 10                 | 8       | 12           | 123 | 24                 | 12      | 24           | 535  |
| 12                 | 4       | 14           | 120 | 24                 | 14      | 24           | 570  |
| 12                 | 6       | 14           | 135 | 24                 | 16      | 24           | 614  |
| 12                 | 8       | 14           | 149 | 24                 | 18      | 24           | 645  |
| 12                 | 10      | 14           | 177 | 24                 | 20      | 24           | 695  |
| 14                 | 6       | 16           | 165 | 30                 | 16      | 30           | 778  |
| 14                 | 8       | 16           | 185 | 30                 | 18      | 30           | 810  |
| 14                 | 10      | 16           | 205 | 30                 | 20      | 30           | 870  |
| 14                 | 12      | 16           | 294 | 30                 | 24      | 30           | 970  |
| 16                 | 6       | 18           | 210 | 36                 | 24      | 36           | 1425 |
| 16                 | 8       | 18           | 230 | 36                 | 30      | 36           | 2120 |
| 16                 | 10      | 18           | 255 | 42                 | 24      | 42           | 2340 |
| 16                 | 12      | 18           | 285 | 42                 | 30      | 42           | 2060 |
| 16                 | 14      | 18           | 315 | 42                 | 36      | 42           | 2345 |
| 18                 | 8       | 19           | 265 | 48                 | 30      | 48           | 2625 |
| 18                 | 10      | 19           | 290 | 48                 | 36      | 48           | 2950 |
| 18                 | 12      | 19           | 306 | 48                 | 42      | 48           | 3320 |

**NOTE: Eccentric Reducers not included in AWWA C110**

**NOTE: Eccentric Reducers Offset**  
 $1/2 D \text{ minus } 1/2 D' = \text{Offset}$   
**Example:**  
 6x3 Ecc.Reducer  
 $3 - 1\frac{1}{2} = 1\frac{1}{2}" \text{ Offset}$



**DOMESTIC PRODUCT SUBMITTAL**

**TUFGRIP™ DUAL WEDGE®**  
PATENT PENDING

**Series 1500 DUAL WEDGE® - For PVC, Ductile, and HDPE Pipe**  
"A Proven Third Generation Mechanical Joint Restraint"

MJ TUF Grip™ TDW



Torque Nut



*Tyler Union's TUF Grip restraint represents the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining PVC, Ductile, and HDPE Pipe.*

**"BETTER BY DESIGN"**

**SPECIFICATIONS:**

- Proven to restrain plain end PVC, Ductile iron, and HDPE pipe in diameters 4" thru 24". \*\*Note: IPS diameter pipe requires the use of an MJ Transition gasket
- Restraint design conforms with applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Cast of ASTM A536 compliant 65-45-12 ductile iron complete with a cast on date code and country of origin for traceability
- Restraints and all components are designed and proven for a 2:1 safety factor based on the pipe pressure rating
- Restraint deflection rating when installed on nominal diameter pipe is 4"-12" - 3°, 14"-16" - 2°, and 18"-24" - 1.5°
- Standard coating for Domestic restraint is 4-6 mil of TUF-Bond™ (thermoset polyester for impact, corrosion and UV protection)
- Gripping wedges are heat treated to a minimum 420 Brinell Hardness
- Gripping wedge, wedge collar bolt, and twist off torque limiting nut shall be e-coated
- FM approved for 4" thru 12" applications and UL listed and approved for 4" thru 24" applications
- Not recommended for use on plain end fittings
- Color coded orange for use on multiple classes of pipe and to distinguish from traditional restraints.

**FEATURES & ADVANTAGES:**

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Approved for use on multiple classes of pipe – Pressure ratings and associated pipe classes provided on page 2 and 3
- Suitable for Potable and Wastewater applications
- Controlled wedge contour to accommodate contact circumference when assembled on different types of pipe.

ISO 9001-2008 Registered

Listed with Underwriters Laboratory

Factory Mutual Approved

| Product Source/Type | Name of Project | Name of Contractor | Project Engineer | Spec. Section and/or Project No. |
|---------------------|-----------------|--------------------|------------------|----------------------------------|
|                     |                 |                    |                  |                                  |

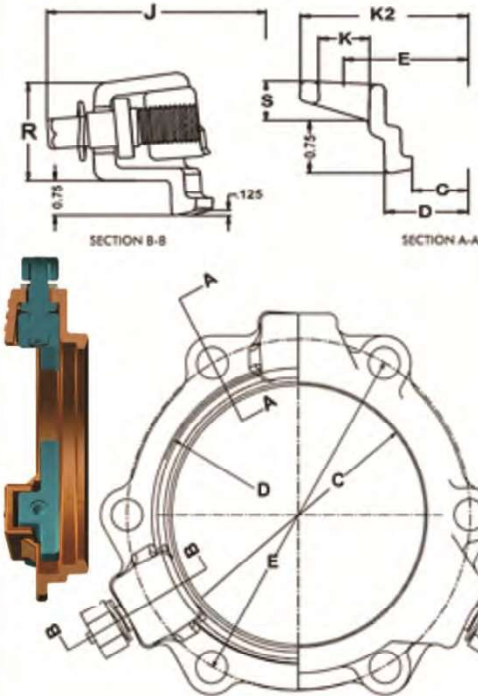
**\*Tyler Union Waterworks Contact Information\***

**Tyler:** 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478

**Anniston:** 1501 W 17<sup>th</sup> St. • Anniston, AL 36201 • (800) 226-7601

**Corona:** 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471

**Series 1500 DUAL WEDGE® - PVC, Ductile, and HDPE Restraint**



**TUFGrip™ MJ Restraint Dimensions**

| Size (inches) | C     | D     | E     | K2    | J     | K     | R    | S    |
|---------------|-------|-------|-------|-------|-------|-------|------|------|
| 3             | 4.08  | 4.88  | 6.19  | 7.67  | 9.82  | 3/4   | 2.20 | 0.86 |
| 4             | 4.93  | 5.92  | 7.50  | 8.98  | 10.67 | 7/8   | 2.20 | 0.73 |
| 6             | 7.03  | 8.02  | 9.50  | 10.98 | 12.77 | 7/8   | 2.24 | 0.82 |
| 8             | 9.18  | 10.17 | 11.75 | 13.23 | 14.92 | 7/8   | 2.28 | 0.82 |
| 10            | 11.23 | 12.22 | 14.00 | 15.70 | 16.97 | 7/8   | 2.37 | 0.93 |
| 12            | 13.33 | 14.32 | 16.25 | 17.95 | 19.07 | 7/8   | 2.40 | 0.93 |
| 14            | 15.44 | 16.40 | 18.75 | 20.43 | 21.18 | 7/8   | 2.57 | 0.91 |
| 16            | 17.54 | 18.50 | 21.00 | 22.88 | 23.28 | 7/8   | 2.57 | 1.05 |
| 18            | 19.64 | 20.60 | 23.25 | 25.43 | 25.38 | 7/8   | 2.57 | 1.05 |
| 20            | 21.74 | 22.70 | 25.50 | 27.50 | 27.48 | 7/8   | 2.66 | 1.15 |
| 24            | 25.94 | 26.90 | 30.00 | 32.00 | 31.68 | 7/8   | 2.72 | 1.35 |
| 30            | 32.18 | 33.30 | 36.88 | 39.42 | 39.78 | 1-1/8 | 3.86 | 1.53 |
| 36            | 38.48 | 39.60 | 43.75 | 46.29 | 46.08 | 1-1/8 | 3.86 | 1.53 |
| 42            | 44.68 | 45.80 | 50.62 | 53.62 | 53.08 | 1-3/8 | 4.56 | 2.05 |
| 48            | 50.98 | 52.10 | 57.50 | 60.50 | 59.28 | 1-3/8 | 4.56 | 2.05 |

| SERIES 1500 TDW - TUF Grip™ - APPLICATION CHART |  |            |                  |             |                    |                 | Pressure Rating |             |           |
|---|--|------------|------------------|-------------|--------------------|-----------------|-----------------|-------------|-----------|
| Size (Inches)                                   | Part No. - Gland Only<br>Domestic / Non-Domestic | Wedge Qty. | T-Head Bolt Qty. | Bolt Size   | Gland weight(lbs.) | Weight (w/Acc.) | DI Pipe         | C-900 C-905 | Pipe O.D. |
| 4   | 603000 / 602000                                  | 2          | 4                | 3/4" x 3.5" | 7.1                | 11.8            | 350             | *305/DR14   | 4.80      |
| 6   | 603005 / 602005                                  | 3          | 6                | 3/4" x 4"   | 11.2               | 18.8            | 350             | *305/DR14   | 6.90      |
| 8   | 603015 / 602010                                  | 3          | 6                | 3/4" x 4"   | 13.1               | 20.3            | 350             | *305/DR14   | 9.05      |
| 10  | 603020 / 602015                                  | 6          | 8                | 3/4" x 4"   | 26.0               | 32.5            | 350             | *305/DR14   | 11.10     |
| 12  | 603025 / 602020                                  | 8          | 8                | 3/4" x 4"   | 31.5               | 40.4            | 350             | *305/DR14   | 13.20     |
| 14  | 603030 / 602025                                  | 10         | 10               | 3/4" x 4.5" | 43.3               | 53.6            | 350             | *235/DR18   | 15.30     |
| 16  | 603035 / 602030                                  | 12         | 12               | 3/4" x 4.5" | 54.1               | 66.3            | 350             | *235/DR18   | 17.40     |
| 18  | 603040 / 602035                                  | 12         | 12               | 3/4" x 4.5" | 59.8               | 72.2            | 250             | *235/DR25   | 19.50     |
| 20  | 603045 / 602040                                  | 14         | 14               | 3/4" x 4.5" | 69.8               | 83.8            | 250             | *235/DR25   | 21.60     |
| 24  | 603050 / 602045                                  | 16         | 16               | 3/4" x 5"   | 90.4               | 106.9           | 250             | *235/DR25   | 25.80     |

\*Note: The pressure ratings are rated working water pressure for the restraint. See page 3 for additional ratings.

ISO 9001-2008 Registered | Listed with Underwriters Laboratory | Factory Mutual Approved

**STOP-LOOK :**

- For Approvals, 3-12 inch were tested at 3° of deflection, 14-16 inch were tested at 2° of deflection, and 18-24 inch were tested at 1.5° of deflection; 4-16 inch test were to 700 psi and 18-24 tests were to 500 psi.
- The Series 1500 TUF Grip is specified for use on PVC, Ductile, and HDPE Pipe but can be used on some sizes of cast grey iron or pit cast pipe if the pipe is not severely corroded, is in sound condition, and has an outside diameter compatible with the as provided dimensions.
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651.

**\*Tyler Union Waterworks Contact Information\***  
**Tyler:** 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478  
**Anniston:** 1501 W 17<sup>th</sup> St. • Anniston, AL 36201 • (800) 226-7601  
**Corona:** 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471



**TUFGRIP™ DUAL WEDGE®**  
PATENT PENDING

**\*\*SERIES 1500 TDW-TUF GRIP™ RESTRAINT RATINGS**

| SIZE<br>(Inches) | Ductile Pipe | AWWA C900 |      |      | AWWA C905 |      |        | AWWA     | ASTM D2241 |       |       | HDPE* AWWA C906 |     |      |        |      |
|------------------|--------------|-----------|------|------|-----------|------|--------|----------|------------|-------|-------|-----------------|-----|------|--------|------|
|                  | C151/A21.51  | DR14      | DR18 | DR25 | DR18      | DR25 | DR32.5 | C909     | SDR17      | SDR21 | SDR26 | DR7.3           | DR9 | DR11 | DR13.5 | DR17 |
| 4                | 350          | 305       | 235  | 165  | -         | -    | -      | 235/150* | 250        | 200   | 160   | 254             | 200 | 160  | 128    | 100  |
| 6                | 350          | 305       | 235  | 165  | -         | -    | -      | 235/150* | 250        | 200   | 160   | 254             | 200 | 160  | 128    | 100  |
| 8                | 350          | 305       | 235  | 165  | -         | -    | -      | 235/150* | 250        | 200   | 160   | 254             | 200 | 160  | 128    | 100  |
| 10               | 350          | 305       | 235  | 165  | -         | -    | -      | 235/150* | 250        | 200   | 160   | 254             | 200 | 160  | 128    | 100  |
| 12               | 350          | 305       | 235  | 165  | -         | -    | -      | 235/150* | 250        | 200   | 160   | 254             | 200 | 160  | 128    | 100  |
| 14               | 350          | -         | -    | -    | 235       | 165  | 125    | -        | -          | -     | -     | 254             | 200 | 160  | 128    | 100  |
| 16               | 350          | -         | -    | -    | 235       | 165  | 125    | -        | -          | -     | -     | 254             | 200 | 160  | 128    | 100  |
| 18               | 250          | -         | -    | -    | 200       | 165  | 125    | -        | -          | -     | -     | -               | -   | -    | -      | -    |
| 20               | 250          | -         | -    | -    | 200       | 165  | 125    | -        | -          | -     | -     | -               | -   | -    | -      | -    |
| 24               | 250          | -         | -    | -    | 165       | 165  | 125    | -        | -          | -     | -     | -               | -   | -    | -      | -    |

**\*\*Note: Pressure Ratings for Ordinary Water Works Restraint Application with Transitory Surges Only**

**\*\*Note: AWWA C909 PVC Restraint Pressure Rating is per the Pressure Rating Listed on the Pipe**

**\*Note: HDPE application require a separate stiffener ring, 4-16 for DI OD Pipe & 4-12 for IPS OD Pipe**

**Steps: 1 and 2**



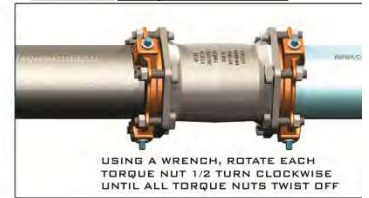
**Step: 3**



**Steps: 4 and 5**



**Steps: 6 and 7**



1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the Orange TUF Grip onto the beveled end of the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe being restrained.
2. Evenly lubricate the beveled pipe end, exterior pipe wall, and inside surface of the gasket with a lubricant that meets the requirements of AWWA C111. Now place the \*\*MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the pipe end. **\*\*NOTE:** Use MJ transition gasket with IPS diameter pipe.
3. Fully insert the beveled pipe end into the MJ socket pipe landing. Keeping the pipe straight in the MJ socket, slide/push the MJ gasket firmly and evenly into the MJ socket recess. Joint must be kept straight during assembly.
4. Push the TUF Grip compression lip extension evenly against the thick side of the MJ gasket and insert all T-Head bolts with nuts. Use only T-Head bolts and nuts that meet AWWA C111 requirements. With the TUF Grip restraint lip extension against the MJ gasket, evenly hand-tighten the nuts on the T-Head bolts making sure the restraint body is centered on the pipe and within in the MJ socket. If joint deflection is needed, deflect the pipe only after hand tightening of all nuts is completed. Joint deflection is 3° max for 4"-12", 2° max for 14"-16", 1.5° max for 18"-24". **NOTE:** Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the T-Head bolts and nuts a few turns at a time in an alternating or star pattern. Maintain equal spacing or distance between the TUF Grip bolt flange and the MJ socket bolt flange as the MJ gasket is compressed. Repeat the process in an alternating pattern for all T-Head bolts and nuts. The T-Head bolt and nut torque requirement for restraints is 4"- 24"-75-90 ft.-lbs. **NOTE:** The C909 PVC T-Head bolt and nut torque is 55-65 ft.-lbs. for 4"-8" and 65-75 ft.-lbs. for 10"-12" restraints. **DO NOT OVER-TORQUE T-HEAD BOLTS and NUTS WHEN ASSEMBLING PVC and PVC PIPE!**
6. **\*\*Hand-tighten** the torque limiting nuts attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut 1/2 turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. **NEVER** turn a torque limiting nut more than 1/2 turn without turning the remaining torque nuts an equal amount! **\*\*NOTE:** For IPS and PVC applications, ensure step 5 is completed before engaging wedges. Failure to comply will result in excessive pipe wall deflection and torque nuts will not twist off as designed.
7. When all torque limiting nuts twist off, the mechanical joint and restraint assembly are complete.

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**TUFGRIP™ DUAL WEDGE®**  
PATENT PENDING

**Series 1500 DUAL WEDGE® - For PVC, Ductile, and HDPE Pipe**  
“A Proven Third Generation Mechanical Joint Restraint”

MJ TUF Grip™ TDW



Torque Nut



*Tyler Union's TUF Grip restraint represents the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining PVC, Ductile, and HDPE Pipe.*

**“BETTER BY DESIGN”**

**SPECIFICATIONS:**

- Proven to restrain plain end PVC, Ductile iron, and HDPE pipe in diameters 4” thru 24”. \*\*Note: IPS diameter pipe requires the use of an MJ Transition gasket
- Restraint design conforms with applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Cast of ASTM A536 compliant 65-45-12 ductile iron complete with a cast on date code and country of origin for traceability
- Restraints and all components are designed and proven for a 2:1 safety factor based on the pipe pressure rating
- Restraint deflection rating when installed on nominal diameter pipe is 4”-12” - 3°, 14”-16” - 2°, and 18”-24” - 1.5°
- Standard coating for Non-Domestic restraint is 4-6 mil of enamel paint
- Gripping wedges are heat treated to a minimum 420 Brinell Hardness
- Gripping wedge, wedge collar bolt, and twist off torque limiting nut shall be e-coated
- FM approved for 4” thru 12” applications and UL listed and approved for 4” thru 24” applications
- Not recommended for use on plain end fittings
- Color coded orange for use on multiple classes of pipe and to distinguish from traditional restraints.

**FEATURES & ADVANTAGES:**

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Approved for use on multiple classes of pipe – Pressure ratings and associated pipe classes provided on page 2 and 3
- Suitable for Potable and Wastewater applications
- Controlled wedge contour to accommodate contact circumference when assembled on different types of pipe.

ISO 9001-2008 Registered

Listed with Underwriters Laboratory

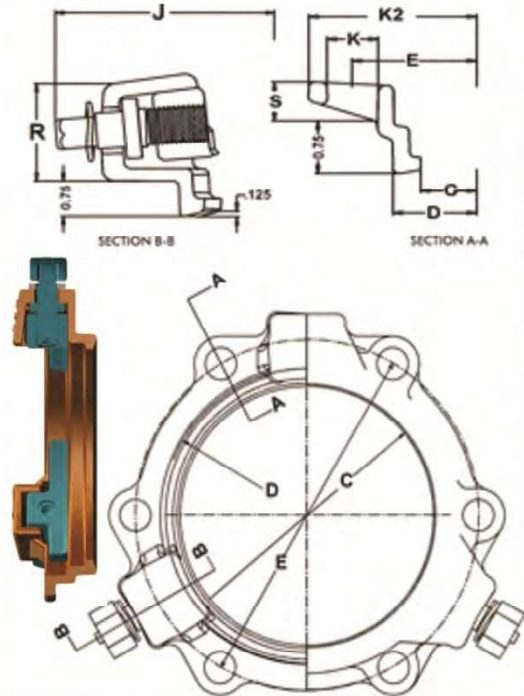
Factory Mutual Approved

| Product Source/Type | Name of Project | Name of Contractor | Project Engineer | Spec. Section and/or Project No. |
|---------------------|-----------------|--------------------|------------------|----------------------------------|
|                     |                 |                    |                  |                                  |

**\*Tyler Union Waterworks Contact Information\***

**Tyler:** 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478  
**Anniston:** 1501 W 17<sup>th</sup> St. • Anniston, AL 36201 • (800) 226-7601  
**Corona:** 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471

**Series 1500 DUAL WEDGE® - PVC, Ductile, and HDPE Restraint**



**TUFGrip™ MJ Restraint Dimensions**

| Size (inches) | C     | D     | E     | K2    | J     | K     | R    | S    |
|---------------|-------|-------|-------|-------|-------|-------|------|------|
| 3             | 4.08  | 4.88  | 6.19  | 7.67  | 9.82  | 3/4   | 2.20 | 0.86 |
| 4             | 4.93  | 5.92  | 7.50  | 8.98  | 10.67 | 7/8   | 2.20 | 0.73 |
| 6             | 7.03  | 8.02  | 9.50  | 10.98 | 12.77 | 7/8   | 2.24 | 0.82 |
| 8             | 9.18  | 10.17 | 11.75 | 13.23 | 14.92 | 7/8   | 2.28 | 0.82 |
| 10            | 11.23 | 12.22 | 14.00 | 15.70 | 16.97 | 7/8   | 2.37 | 0.93 |
| 12            | 13.33 | 14.32 | 16.25 | 17.95 | 19.07 | 7/8   | 2.40 | 0.93 |
| 14            | 15.44 | 16.40 | 18.75 | 20.43 | 21.18 | 7/8   | 2.57 | 0.91 |
| 16            | 17.54 | 18.50 | 21.00 | 22.88 | 23.28 | 7/8   | 2.57 | 1.05 |
| 18            | 19.64 | 20.60 | 23.25 | 25.43 | 25.38 | 7/8   | 2.57 | 1.05 |
| 20            | 21.74 | 22.70 | 25.50 | 27.50 | 27.48 | 7/8   | 2.66 | 1.15 |
| 24            | 25.94 | 26.90 | 30.00 | 32.00 | 31.68 | 7/8   | 2.72 | 1.35 |
| 30            | 32.18 | 33.30 | 36.88 | 39.42 | 39.78 | 1-1/8 | 3.86 | 1.53 |
| 36            | 38.48 | 39.60 | 43.75 | 46.29 | 46.08 | 1-1/8 | 3.86 | 1.53 |
| 42            | 44.68 | 45.80 | 50.62 | 53.62 | 53.08 | 1-3/8 | 4.56 | 2.05 |
| 48            | 50.98 | 52.10 | 57.50 | 60.50 | 59.28 | 1-3/8 | 4.56 | 2.05 |

| SERIES 1500 TDW - TUF Grip™ - APPLICATION CHART |                       |              |            |                  |             |                    |                 | Pressure Rating |             |           |
|---|-----------------------|--------------|------------|------------------|-------------|--------------------|-----------------|-----------------|-------------|-----------|
| Size (Inches)                                   | Part No. - Gland Only |              | Wedge Qty. | T-Head Bolt Qty. | Bolt Size   | Gland weight(lbs.) | Weight (w/Acc.) | DI Pipe         | C-900 C-905 | Pipe O.D. |
|   | Domestic              | Non-Domestic |            |                  |             |                    |                 |                 |             |           |
| 4   | 603000                | / 602000     | 2          | 4                | 3/4" x 3.5" | 7.1                | 11.8            | 350             | *305/DR14   | 4.80      |
| 6   | 603005                | / 602005     | 3          | 6                | 3/4" x 4"   | 11.2               | 18.8            | 350             | *305/DR14   | 6.90      |
| 8   | 603015                | / 602010     | 3          | 6                | 3/4" x 4"   | 13.1               | 20.3            | 350             | *305/DR14   | 9.05      |
| 10  | 603020                | / 602015     | 6          | 8                | 3/4" x 4"   | 26.0               | 32.5            | 350             | *305/DR14   | 11.10     |
| 12  | 603025                | / 602020     | 8          | 8                | 3/4" x 4"   | 31.5               | 40.4            | 350             | *305/DR14   | 13.20     |
| 14  | 603030                | / 602025     | 10         | 10               | 3/4" x 4.5" | 43.3               | 53.6            | 350             | *235/DR18   | 15.30     |
| 16  | 603035                | / 602030     | 12         | 12               | 3/4" x 4.5" | 54.1               | 66.3            | 350             | *235/DR18   | 17.40     |
| 18  | 603040                | / 602035     | 12         | 12               | 3/4" x 4.5" | 59.8               | 72.2            | 250             | *235/DR25   | 19.50     |
| 20  | 603045                | / 602040     | 14         | 14               | 3/4" x 4.5" | 69.8               | 83.8            | 250             | *235/DR25   | 21.60     |
| 24  | 603050                | / 602045     | 16         | 16               | 3/4" x 5"   | 90.4               | 106.9           | 250             | *235/DR25   | 25.80     |

\*Note: The pressure ratings are rated working water pressure for the restraint. See page 3 for additional ratings.

|                          |                                     |                         |
|--------------------------|-------------------------------------|-------------------------|
| ISO 9001-2008 Registered | Listed with Underwriters Laboratory | Factory Mutual Approved |
|--------------------------|-------------------------------------|-------------------------|

**STOP-LOOK :**

- For Approvals, 3-12 inch were tested at 3° of deflection, 14-16 inch were tested at 2° of deflection, and 18-24 inch were tested at 1.5° of deflection; 4-16 inch test were to 700 psi and 18-24 tests were to 500 psi.
- The Series 1500 TUF Grip is specified for use on PVC, Ductile, and HDPE Pipe but can be used on some sizes of cast grey iron or pit cast pipe if the pipe is not severely corroded, is in sound condition, and has an outside diameter compatible with the as provided dimensions.
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651.

**\*Tyler Union Waterworks Contact Information\***

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**Corona:** 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471

**NON-DOMESTIC PRODUCT SUBMITTAL**

**TUFGRIP™ DUAL WEDGE®**  
PATENT PENDING

**\*\*SERIES 1500 TDW-TUF GRIP™ RESTRAINT RATINGS**

| SIZE<br>(Inches) | Ductile Pipe | AWWA C900 |      |      | AWWA C905 |      |        | AWWA     | ASTM D2241 |       |       | HDPE* AWWA C906 |     |      |        |      |
|------------------|--------------|-----------|------|------|-----------|------|--------|----------|------------|-------|-------|-----------------|-----|------|--------|------|
|                  | C151/A21.51  | DR14      | DR18 | DR25 | DR18      | DR25 | DR32.5 | C909     | SDR17      | SDR21 | SDR26 | DR7.3           | DR9 | DR11 | DR13.5 | DR17 |
| 4                | 350          | 305       | 235  | 165  | -         | -    | -      | 235/150* | 250        | 200   | 160   | 254             | 200 | 160  | 128    | 100  |
| 6                | 350          | 305       | 235  | 165  | -         | -    | -      | 235/150* | 250        | 200   | 160   | 254             | 200 | 160  | 128    | 100  |
| 8                | 350          | 305       | 235  | 165  | -         | -    | -      | 235/150* | 250        | 200   | 160   | 254             | 200 | 160  | 128    | 100  |
| 10               | 350          | 305       | 235  | 165  | -         | -    | -      | 235/150* | 250        | 200   | 160   | 254             | 200 | 160  | 128    | 100  |
| 12               | 350          | 305       | 235  | 165  | -         | -    | -      | 235/150* | 250        | 200   | 160   | 254             | 200 | 160  | 128    | 100  |
| 14               | 350          | -         | -    | -    | 235       | 165  | 125    | -        | -          | -     | -     | 254             | 200 | 160  | 128    | 100  |
| 16               | 350          | -         | -    | -    | 235       | 165  | 125    | -        | -          | -     | -     | 254             | 200 | 160  | 128    | 100  |
| 18               | 250          | -         | -    | -    | 200       | 165  | 125    | -        | -          | -     | -     | -               | -   | -    | -      | -    |
| 20               | 250          | -         | -    | -    | 200       | 165  | 125    | -        | -          | -     | -     | -               | -   | -    | -      | -    |
| 24               | 250          | -         | -    | -    | 165       | 165  | 125    | -        | -          | -     | -     | -               | -   | -    | -      | -    |

**\*\*Note: Pressure Ratings for Ordinary Water Works Restraint Application with Transitory Surges Only**

**\*\*Note: AWWA C909 PVC Restraint Pressure Rating is per the Pressure Rating Listed on the Pipe**

**\*Note: HDPE application require a separate stiffener ring. 4-16 for DI OD Pipe & 4-12 for IPS OD Pipe**

**Steps: 1 and 2**



**Step: 3**



**Steps: 4 and 5**



**Steps: 6 and 7**



1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the Orange TUF Grip onto the beveled end of the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe being restrained.
2. Evenly lubricate the beveled pipe end, exterior pipe wall, and inside surface of the gasket with a lubricant that meets the requirements of AWWA C111. Now place the \*\*MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the pipe end. **\*\*NOTE:** Use MJ transition gasket with IPS diameter pipe.
3. Fully insert the beveled pipe end into the MJ socket pipe landing. Keeping the pipe straight in the MJ socket, slide/push the MJ gasket firmly and evenly into the MJ socket recess. Joint must be kept straight during assembly.
4. Push the TUF Grip compression lip extension evenly against the thick side of the MJ gasket and insert all T-Head bolts with nuts. Use only T-Head bolts and nuts that meet AWWA C111 requirements. With the TUF Grip restraint lip extension against the MJ gasket, evenly hand-tighten the nuts on the T-Head bolts making sure the restraint body is centered on the pipe and within in the MJ socket. If joint deflection is needed, deflect the pipe only after hand tightening of all nuts is completed. Joint deflection is 3° max for 4"-12", 2° max for 14"-16", 1.5° max for 18"-24". **NOTE:** Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the T-Head bolts and nuts a few turns at a time in an alternating or star pattern. Maintain equal spacing or distance between the TUF Grip bolt flange and the MJ socket bolt flange as the MJ gasket is compressed. Repeat the process in an alternating pattern for all T-Head bolts and nuts. The T-Head bolt and nut torque requirement for restraints is 4"- 24"-75-90 ft.-lbs. **NOTE:** The C909 PVC T-Head bolt and nut torque is 55-65 ft.-lbs. for 4"-8" and 65-75 ft.-lbs. for 10"-12" restraints. **DO NOT OVER-TORQUE T-HEAD BOLTS and NUTS WHEN ASSEMBLING PVC and PVC PIPE!**
6. **\*\*Hand-tighten** the torque limiting nuts attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut 1/2 turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. **NEVER** turn a torque limiting nut more than 1/2 turn without turning the remaining torque nuts an equal amount! **\*\*NOTE:** For IPS and PVC applications, ensure step 5 is completed before engaging wedges. Failure to comply will result in excessive pipe wall deflection and torque nuts will not twist off as designed.
7. When all torque limiting nuts twist off, the mechanical joint and restraint assembly are complete.

**\*Tyler Union Waterworks Contact Information\***

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# TUFGRIP™

**Series 2000 for PVC & PVCO Pipe**  
"A Proven Third Generation Mechanical Joint Restraint"

MJ TUFGrip™ TLP



Tyler Union's TUF Grip restraints represent the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining PVC pipe.



Designed by Harold Kennedy & Associates, Inc.

**"BETTER BY DESIGN"**

## SPECIFICATIONS:

- Proven to restrain plain end PVC pipe in diameters 3" thru 36" and PVCO pipe in diameters 4" thru 12"
- Restraint conforms to applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Rated for working water pressure of 305 psi for 3"-12", 235 psi for 14"-24", 150 psi for 30", and 125 psi for 36" (details on page 2)
- Cast of ASTM compliant 65-45-12 ductile iron complete with cast on date code and country of origin for traceability
- Restraint and all components are designed and proven for a 2:1 safety factor based on the PVC and PVCO pipe pressure rating
- Deflection rating when installed on pipe with nominal diameter shall be 3° for 3" thru 12", 2° for 14" thru 16", and 1.5° for 18" thru 36"
- Standard coating for Domestic restraint is 4-6 mil of TUF-Bond™ (thermoset polyester for impact, corrosion, and UV protection)
- Gripping wedge, wedge collar bolt and twist off torque limiting nut shall be e-coated
- FM approved for 4" thru 12" applications and UL listed and approved for 3" thru 12" applications
- Color coded red for pipe type (C900 PVC/C905 PVC/ \*C909 PVCO/D2241 PVC) - \*Note: Refer to page 2 for C909 pipe applications

## FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- There is no washer or spacer to remove when installing restraints on 3" to 12" ASTM D2241 PVC pipe with IPS outside diameter
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for Potable and Wastewater applications
- Approved for use on multiple classes of pipe - Additional pressure ratings and associated pipe classes provided on pages 2 and 3

**ISO 9001-2008 Registered**

**Listed with Underwriters Laboratory**

**Factory Mutual Approved**

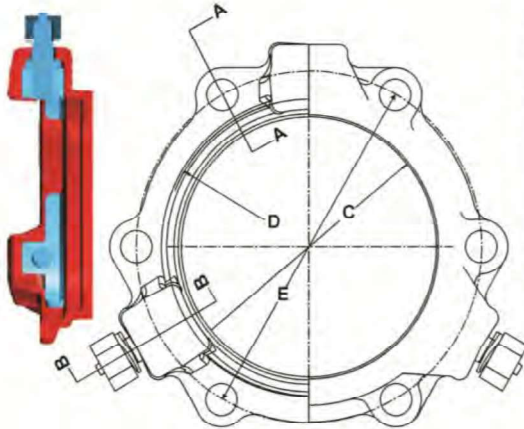
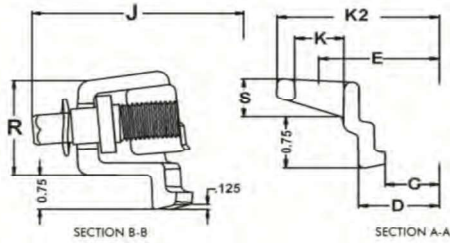
| Product Source/Type | Name of Project | Name of Contractor | Project Engineer | Spec. Section and/or Project No. |
|---------------------|-----------------|--------------------|------------------|----------------------------------|
|                     |                 |                    |                  |                                  |

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**Corona:** 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471



**TUFGrip™ MJ Restraint Dimensions**

| Size (inches) | C     | D     | E     | K2    | J     | K     | R    | S    |
|---------------|-------|-------|-------|-------|-------|-------|------|------|
| 3             | 4.08  | 4.88  | 6.19  | 7.67  | 9.82  | 3/4   | 2.20 | 0.86 |
| 4             | 4.93  | 5.92  | 7.50  | 8.98  | 10.67 | 7/8   | 2.20 | 0.73 |
| 6             | 7.03  | 8.02  | 9.50  | 10.98 | 12.77 | 7/8   | 2.24 | 0.82 |
| 8             | 9.18  | 10.17 | 11.75 | 13.23 | 14.92 | 7/8   | 2.28 | 0.82 |
| 10            | 11.23 | 12.22 | 14.00 | 15.70 | 16.97 | 7/8   | 2.37 | 0.93 |
| 12            | 13.33 | 14.32 | 16.25 | 17.95 | 19.07 | 7/8   | 2.40 | 0.93 |
| 14            | 15.44 | 16.40 | 18.75 | 20.43 | 21.18 | 7/8   | 2.57 | 0.91 |
| 16            | 17.54 | 18.50 | 21.00 | 22.88 | 23.28 | 7/8   | 2.57 | 1.05 |
| 18            | 19.64 | 20.60 | 23.25 | 25.43 | 25.38 | 7/8   | 2.57 | 1.05 |
| 20            | 21.74 | 22.70 | 25.50 | 27.50 | 27.48 | 7/8   | 2.66 | 1.15 |
| 24            | 25.94 | 26.90 | 30.00 | 32.00 | 31.68 | 7/8   | 2.72 | 1.35 |
| 30            | 32.18 | 33.30 | 36.88 | 39.42 | 39.78 | 1-1/8 | 3.86 | 1.53 |
| 36            | 38.48 | 39.60 | 43.75 | 46.29 | 46.08 | 1-1/8 | 3.86 | 1.53 |

**SERIES 2000 TLP-PVC TUF Grip™ - APPLICATION CHART**

| Size (Inches) | Part No. - Gland Only<br>Domestic / Non-Domestic | Wedge Qty. | T-Head Bolt Qty. | Bolt Size   | Gland Weight(lbs.) | Weight (w/Acc.) | *Pressure Rating | Pipe O.D. (Inches) |
|---------------|--|------------|------------------|-------------|--------------------|-----------------|------------------|--------------------|
| 3             | CALL / 113928                                    | 2          | 4                | 5/8" x 3"   | 7.0                | 11.0            | *305 / DR14      | 3.50               |
| 4             | 516002 / 113935                                  | 2          | 4                | 3/4" x 3.5" | 8.3                | 12.2            | *305 / DR14      | 4.50-4.80          |
| 6             | 516019 / 113942                                  | 3          | 6                | 3/4" x 4"   | 12.4               | 18.3            | *305 / DR14      | 6.63-6.90          |
| 8             | 516026 / 113959                                  | 3          | 6                | 3/4" x 4"   | 14.9               | 20.8            | *305 / DR14      | 8.63-9.12          |
| 10            | 516033 / 113973                                  | 6          | 8                | 3/4" x 4"   | 25.7               | 33.4            | *305 / DR14      | 10.75-11.10        |
| 12            | 516040 / 113980                                  | 8          | 8                | 3/4" x 4"   | 34.1               | 42.0            | *305 / DR14      | 12.75-13.20        |
| 14            | 516248 / 113997                                  | 10         | 10               | 3/4" x 4.5" | 45.1               | 55.4            | *235 / DR18      | 15.30              |
| 16            | 516262 / 114000                                  | 12         | 12               | 3/4" x 4.5" | 56.2               | 68.4            | *235 / DR18      | 17.40              |
| 18            | 516286 / 114017                                  | 12         | 12               | 3/4" x 4.5" | 62.4               | 74.8            | *235 / DR25      | 19.50              |
| 20            | 516309 / 114024                                  | 14         | 14               | 3/4" x 4.5" | 72.9               | 86.9            | *235 / DR25      | 21.60              |
| 24            | 516323 / 114031                                  | 16         | 16               | 3/4" x 5"   | 93.2               | 109.8           | *235 / DR25      | 25.80              |
| 30            | CALL / 461302                                    | 20         | 20               | 1" x 7.5"   | 251                | 293             | *150 / DR25      | 32.00              |
| 36            | CALL / 461357                                    | 24         | 24               | 1" x 7.5"   | 281                | 331             | *125 / DR25      | 38.30              |

**\*Note: The pressure ratings are rated working water pressures for the restraint. See page 3 for additional ratings.**

**ISO 9001-2008 Registered**

**Listed with Underwriters Laboratory**

**Factory Mutual Approved**

**STOP-LOOK :**

- Extra length T-Head bolts are provided with 30"- 36" restraints to facilitate mechanical joint assembly per AWWA C600.
- For UL/FM Approvals, 3"- 12" were tested to 755 psi, 14"-16" were tested to 755 psi and 18"- 24" inch were tested to 535 psi.
- TUF Grip 30-36 inch provided with TRU-Lock™ mechanical joint gasket to ensure pressure rating & safety factors are met.
- Mechanical joint T-head bolt torques for C909 applications are as provided; \*55-65 ft.-lbs for 4" to 8" and \*65 to 75 ft.-lbs. for 10" to 12" assembly. You must specify restraints are for C909 PVC pipe upon order placement. Call for availability.
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651.
- TUF Grip 4" to 24" restraints shall meet the requirements of ASTM F1674, current revision.

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[www.tylerunion.com](http://www.tylerunion.com)

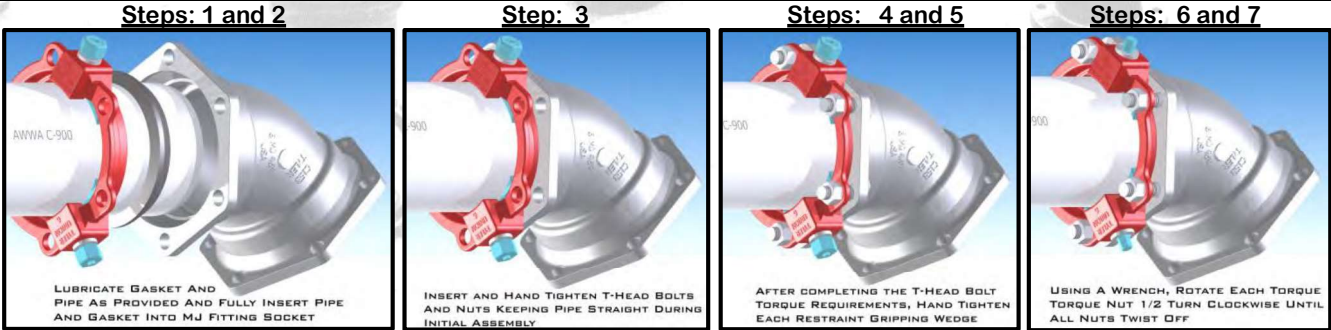
**TUFGRIP™**

| <b>**ADDITIONAL SERIES 2000 TLP-TUF GRIP™ RESTRAINT RATINGS</b> |                  |             |             |                  |             |               |                   |              |              |
|---|------------------|-------------|-------------|------------------|-------------|---------------|-------------------|--------------|--------------|
| <b>SIZE (Inches)</b>  | <b>AWWA C900</b> |             |             | <b>AWWA C905</b> |             |               | <b>ASTM D2241</b> |              |              |
|   | <b>DR14</b>      | <b>DR18</b> | <b>DR25</b> | <b>DR18</b>      | <b>DR25</b> | <b>DR32.5</b> | <b>SDR17</b>      | <b>SDR21</b> | <b>SDR26</b> |
| 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          | -            |
| 14  | -                | -           | -           | 235              | 165         | 125           | -                 | -            | -            |
| 16  | -                | -           | -           | 235              | 165         | 125           | -                 | -            | -            |
| 18  | -                | -           | -           | 200              | 165         | -             | -                 | -            | -            |
| 20  | -                | -           | -           | 200              | 165         | -             | -                 | -            | -            |
| 24  | -                | -           | -           | 165              | 165         | 125           | -                 | -            | -            |
| 30  | -                | -           | -           | -                | 165         | 125           | -                 | -            | -            |
| 36  | -                | -           | -           | -                | 125         | 125           | -                 | -            | -            |

**\*\*Note: Pressure Ratings for Ordinary Water Works Restraint Application with Transitory Surges Only**

**\*\*Note: AWWA C909 PVC0 Restraint Pressure Rating is per the Pressure Rating Listed on the Pipe**

**Assembly steps for (3"-12" ASTM D2241 IPS PVC), (4"-12" AWWA C909 PVC0), and (4"-36" AWWAC900/C905 PVC)**




1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the RED TUF Grip onto the beveled end of the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe being restrained.
2. Evenly lubricate the beveled pipe end, exterior pipe wall, and inside surface of the gasket with a lubricant that meets the requirements of AWWA C111. Now place the **\*\*MJ gasket** over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the pipe end. **\*\*NOTE:** Use MJ transition gasket with IPS diameter pipe.
3. Fully insert the beveled pipe end into the MJ socket pipe landing. Keeping the pipe straight in the MJ socket, slide/push the MJ gasket firmly and evenly into the MJ socket recess. Joint must be kept straight during assembly.
4. Push the TUF Grip compression lip extension evenly against the thick side of the MJ gasket and insert all T-Head bolts with nuts. Use only T-Head bolts and nuts that meet AWWA C111 requirements. With the TUF Grip restraint lip extension against the MJ gasket, evenly hand-tighten the nuts on the T--Head bolts making sure the restraint body is centered on the pipe and within in the MJ socket. If joint deflection is needed, deflect the pipe only after hand tightening of all nuts is completed. Joint deflection is 3° max for 3", 5° max for 4"-12", 2° max for 14"-16", 1.5° max for 18"-36". **NOTE:** Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the T-Head bolts and nuts a few turns at a time in an alternating or star pattern. Maintain equal spacing or distance between the TUF Grip bolt flange and the MJ socket bolt flange as the MJ gasket is compressed. Repeat the process in an alternating pattern for all T-Head bolts and nuts. The T-Head bolt and nut torque requirement for restraints is 3"- 45-60 ft.-lbs., 4"- 24"-75-90 ft.-lbs., and 30"- 36"- 100-120 ft.-lbs. **NOTE:** The C909 PVC0 T-Head bolt and nut torque is 55-65 ft.-lbs. for 4"-8" and 65-75 ft.-lbs. for 10"-12" restraints. **DO NOT OVER-TORQUE T-HEAD BOLTS and NUTS WHEN ASSEMBLING PVC and PVC0 PIPE!**
6. **\*\*Hand-tighten** the torque limiting nuts attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut 1/2 turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. **NEVER** turn a torque limiting nut more than 1/2 turn without turning the remaining torque nuts an equal amount! **\*\*NOTE:** For IPS and PVC0 applications, ensure step 5 is completed before engaging wedges. Failure to comply will result in excessive pipe wall deflection and torque nuts will not twist off as designed.
7. When all torque limiting nuts twist off, the mechanical joint and restraint assembly are complete.

**\*Tyler Union Waterworks Contact Information\***

**Tyler:** 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478  
**Anniston:** 1501 W 17<sup>th</sup> St. • Anniston, AL 36201 • (800) 226-7601  
**Corona:** 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471  
[www.tylerunion.com](http://www.tylerunion.com)


# TUFGRIP<sup>™</sup>

**Series 2000 for PVC & PVCO Pipe**  
"A Proven Third Generation Mechanical Joint Restraint"




MJ TUFGrip<sup>™</sup> TLP

Torque Nut



**TYLER UNION**<sup>®</sup>  
Quality Waterworks Products

*Tyler Union's TUF Grip restraints represent the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining PVC pipe.*



Designed by Harold Kennedy & Associates, Inc.

**“BETTER BY DESIGN”**

**SPECIFICATIONS:**

- Proven to restrain plain end PVC pipe in diameters 3” thru 36” and PVCO pipe in diameters 4” thru 12”
- Restraint design conforms to applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Rated for working water pressure of 305 psi for 3”-12”, 235 psi for 14”-24”, 150 psi for 30”, and 125 psi for 36” (details on page 2)
- Cast of ASTM compliant 65-45-12 ductile iron complete with cast on date code and country of origin for traceability
- Restraint and all components are designed and proven for a 2:1 safety factor based on the PVC and PVCO pipe pressure rating
- Deflection rating when installed on pipe with nominal diameter shall be 3° for 3” thru 12”, 2° for 14” thru 16”, and 1.5° for 18” thru 36”
- Standard coating for Non-Domestic restraint is 4-6 mil of \*Alkyd resin baking enamel
- Gripping wedge, wedge collar bolt and twist off torque limiting nut shall be e-coated
- FM approved for 4” thru 12” applications and UL listed and approved for 3” thru 12” applications
- Color coded red for pipe type (C900 PVC/C905 PVC/ \*C909 PVCO/D2241 PVC) - \*Note: Refer to page 2 for C909 pipe applications

**FEATURES & ADVANTAGES:**

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- There is no washer or spacer to remove when installing restraints on 3” to 12” ASTM D2241 PVC pipe with IPS outside diameter
- Restraint’s heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for Potable and Wastewater applications
- Approved for use on multiple classes of pipe - Additional pressure ratings and associated pipe classes provided on pages 2 and 3

**ISO 9001-2008 Registered**

**Listed with Underwriters Laboratory**

**Factory Mutual Approved**

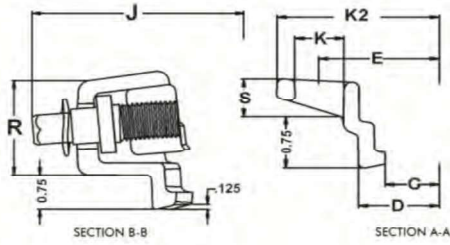
| Product Source/Type | Name of Project | Name of Contractor | Project Engineer | Spec. Section and/or Project No. |
|---------------------|-----------------|--------------------|------------------|----------------------------------|
|                     |                 |                    |                  |                                  |

**\*Tyler Union Waterworks Contact Information\***

**Tyler:** 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478

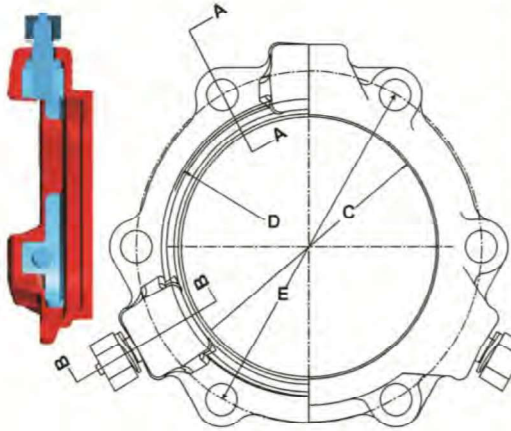
**Anniston:** 1501 W 17<sup>th</sup> St. • Anniston, AL 36201 • (800) 226-7601

**Corona:** 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471



**TUFGrip™ MJ Restraint Dimensions**

| Size (inches) | C     | D     | E     | K2    | J     | K     | R    | S    |
|---------------|-------|-------|-------|-------|-------|-------|------|------|
| 3             | 4.08  | 4.88  | 6.19  | 7.67  | 9.82  | 3/4   | 2.20 | 0.86 |
| 4             | 4.93  | 5.92  | 7.50  | 8.98  | 10.67 | 7/8   | 2.20 | 0.73 |
| 6             | 7.03  | 8.02  | 9.50  | 10.98 | 12.77 | 7/8   | 2.24 | 0.82 |
| 8             | 9.18  | 10.17 | 11.75 | 13.23 | 14.92 | 7/8   | 2.28 | 0.82 |
| 10            | 11.23 | 12.22 | 14.00 | 15.70 | 16.97 | 7/8   | 2.37 | 0.93 |
| 12            | 13.33 | 14.32 | 16.25 | 17.95 | 19.07 | 7/8   | 2.40 | 0.93 |
| 14            | 15.44 | 16.40 | 18.75 | 20.43 | 21.18 | 7/8   | 2.57 | 0.91 |
| 16            | 17.54 | 18.50 | 21.00 | 22.88 | 23.28 | 7/8   | 2.57 | 1.05 |
| 18            | 19.64 | 20.60 | 23.25 | 25.43 | 25.38 | 7/8   | 2.57 | 1.05 |
| 20            | 21.74 | 22.70 | 25.50 | 27.50 | 27.48 | 7/8   | 2.66 | 1.15 |
| 24            | 25.94 | 26.90 | 30.00 | 32.00 | 31.68 | 7/8   | 2.72 | 1.35 |
| 30            | 32.18 | 33.30 | 36.88 | 39.42 | 39.78 | 1-1/8 | 3.86 | 1.53 |
| 36            | 38.48 | 39.60 | 43.75 | 46.29 | 46.08 | 1-1/8 | 3.86 | 1.53 |



**SERIES 2000 TLP-PVC TUF Grip™ - APPLICATION CHART**

| Size (Inches) | Part No. - Gland Only<br>Domestic / Non-Domestic | Wedge Qty. | T-Head Bolt Qty. | Bolt Size   | Gland Weight(lbs.) | Weight (w/Acc.) | *Pressure Rating | Pipe O.D. (Inches) |
|---------------|--|------------|------------------|-------------|--------------------|-----------------|------------------|--------------------|
| 3             | CALL / 113928                                    | 2          | 4                | 5/8" x 3"   | 7.0                | 11.0            | *305 / DR14      | 3.50               |
| 4             | 516002 / 113935                                  | 2          | 4                | 3/4" x 3.5" | 8.3                | 12.2            | *305 / DR14      | 4.50-4.80          |
| 6             | 516019 / 113942                                  | 3          | 6                | 3/4" x 4"   | 12.4               | 18.3            | *305 / DR14      | 6.63-6.90          |
| 8             | 516026 / 113959                                  | 3          | 6                | 3/4" x 4"   | 14.9               | 20.8            | *305 / DR14      | 8.63-9.12          |
| 10            | 516033 / 113973                                  | 6          | 8                | 3/4" x 4"   | 25.7               | 33.4            | *305 / DR14      | 10.75-11.10        |
| 12            | 516040 / 113980                                  | 8          | 8                | 3/4" x 4"   | 34.1               | 42.0            | *305 / DR14      | 12.75-13.20        |
| 14            | 516248 / 113997                                  | 10         | 10               | 3/4" x 4.5" | 45.1               | 55.4            | *235 / DR18      | 15.30              |
| 16            | 516262 / 114000                                  | 12         | 12               | 3/4" x 4.5" | 56.2               | 68.4            | *235 / DR18      | 17.40              |
| 18            | 516286 / 114017                                  | 12         | 12               | 3/4" x 4.5" | 62.4               | 74.8            | *235 / DR25      | 19.50              |
| 20            | 516309 / 114024                                  | 14         | 14               | 3/4" x 4.5" | 72.9               | 86.9            | *235 / DR25      | 21.60              |
| 24            | 516323 / 114031                                  | 16         | 16               | 3/4" x 5"   | 93.2               | 109.8           | *235 / DR25      | 25.80              |
| 30            | CALL / 461302                                    | 20         | 20               | 1" x 7.5"   | 251                | 293             | *150 / DR25      | 32.00              |
| 36            | CALL / 461357                                    | 24         | 24               | 1" x 7.5"   | 281                | 331             | *125 / DR25      | 38.30              |

**\*Note: The pressure ratings are rated working water pressures for the restraint. See page 3 for additional ratings.**

**ISO 9001-2008 Registered**

**Listed with Underwriters Laboratory**

**Factory Mutual Approved**

**STOP-LOOK :**

- Extra length T-Head bolts are provided with 30"- 36" restraints to facilitate mechanical joint assembly per AWWA C600.
- For UL/FM Approvals, 3"- 12" were tested to 755 psi, 14"-16" were tested to 755 psi and 18"- 24" inch were tested to 535 psi.
- TUF Grip 30-36 inch provided with TRU-Lock™ mechanical joint gasket to ensure pressure rating & safety factors are met.
- Mechanical joint T-head bolt torques for C909 applications are as provided; \*55-65 ft.-lbs for 4" to 8" and \*65 to 75 ft.-lbs. for 10" to 12" assembly. You must specify restraints are for C909 PVC pipe upon order placement. Call for availability.
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651.
- TUF Grip 4" to 24" restraints shall meet the requirements of ASTM F1674, current revision.

**\*Tyler Union Waterworks Contact Information\***

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**Anniston:** 1501 W 17<sup>th</sup> St. • Anniston, AL 36201 • (800) 226-7601

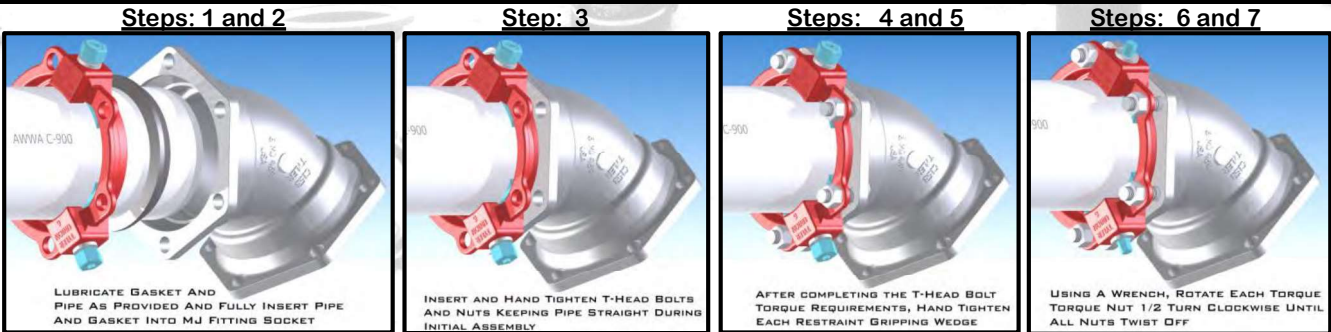
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[www.tylerunion.com](http://www.tylerunion.com)

| <b>**ADDITIONAL SERIES 2000 TLP-TUF GRIP™ RESTRAINT RATINGS</b> |                  |             |             |                  |             |               |                   |              |              |
|---|------------------|-------------|-------------|------------------|-------------|---------------|-------------------|--------------|--------------|
| <b>SIZE (Inches)</b>  | <b>AWWA C900</b> |             |             | <b>AWWA C905</b> |             |               | <b>ASTM D2241</b> |              |              |
|   | <b>DR14</b>      | <b>DR18</b> | <b>DR25</b> | <b>DR18</b>      | <b>DR25</b> | <b>DR32.5</b> | <b>SDR17</b>      | <b>SDR21</b> | <b>SDR26</b> |
| 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          | -            |
| 14  | -                | -           | -           | 235              | 165         | 125           | -                 | -            | -            |
| 16  | -                | -           | -           | 235              | 165         | 125           | -                 | -            | -            |
| 18  | -                | -           | -           | 200              | 165         | -             | -                 | -            | -            |
| 20  | -                | -           | -           | 200              | 165         | -             | -                 | -            | -            |
| 24  | -                | -           | -           | 165              | 165         | 125           | -                 | -            | -            |
| 30  | -                | -           | -           | -                | 165         | 125           | -                 | -            | -            |
| 36  | -                | -           | -           | -                | 125         | 125           | -                 | -            | -            |

**\*\*Note: Pressure Ratings for Ordinary Water Works Restraint Application with Transitory Surges Only**  
**\*\*Note: AWWA C909 PVC Restraint Pressure Rating is per the Pressure Rating Listed on the Pipe**

**Assembly steps for (3"-12" ASTM D2241 IPS PVC), (4"-12" AWWA C909 PVCO), and (4"-36" AWWAC900/C905 PVC)**



1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the RED TUF Grip onto the beveled end of the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe being restrained.
2. Evenly lubricate the beveled pipe end, exterior pipe wall, and inside surface of the gasket with a lubricant that meets the requirements of AWWA C111. Now place the \*\*MJ gasket over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the pipe end. **\*\*NOTE:** Use MJ transition gasket with IPS diameter pipe.
3. Fully insert the beveled pipe end into the MJ socket pipe landing. Keeping the pipe straight in the MJ socket, slide/push the MJ gasket firmly and evenly into the MJ socket recess. Joint must be kept straight during assembly.
4. Push the TUF Grip compression lip extension evenly against the thick side of the MJ gasket and insert all T-Head bolts with nuts. Use only T-Head bolts and nuts that meet AWWA C111 requirements. With the TUF Grip restraint lip extension against the MJ gasket, evenly hand-tighten the nuts on the T-Head bolts making sure the restraint body is centered on the pipe and within in the MJ socket. If joint deflection is needed, deflect the pipe only after hand tightening of all nuts is completed. Joint deflection is 3° max for 3", 5° max for 4"-12", 2° max for 14"-16", 1.5° max for 18"-36". **NOTE:** Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the T-Head bolts and nuts a few turns at a time in an alternating or star pattern. Maintain equal spacing or distance between the TUF Grip bolt flange and the MJ socket bolt flange as the MJ gasket is compressed. Repeat the process in an alternating pattern for all T-Head bolts and nuts. The T-Head bolt and nut torque requirement for restraints is 3"- 45-60 ft.-lbs., 4"- 24"-75-90 ft.-lbs., and 30"- 36"- 100-120 ft.-lbs. **NOTE:** The C909 PVCO T-Head bolt and nut torque is 55-65 ft.-lbs. for 4"-8" and 65-75 ft.-lbs. for 10"-12" restraints. **DO NOT OVER-TORQUE T-HEAD BOLTS and NUTS WHEN ASSEMBLING PVC and PVCO PIPE!**
6. **\*\*Hand-tighten the torque limiting nuts attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut 1/2 turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. NEVER turn a torque limiting nut more than 1/2 turn without turning the remaining torque nuts an equal amount! **\*\*NOTE:** For IPS and PVCO applications, ensure step 5 is completed before engaging wedges. Failure to comply will result in excessive pipe wall deflection and torque nuts will not twist off as designed.**
7. When all torque limiting nuts twist off, the mechanical joint and restraint assembly are complete.

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[www.tylerunion.com](http://www.tylerunion.com)

RESILIENT  
WEDGE VALVES

**CLOW VALVE COMPANY**

**CLOW AWWA Resilient Wedge Gate Valves  
Meet or Exceed the Requirements of  
AWWA Standard C509**

| Size Range      | Water Working Pressure psi | Bubble Tight Test psi | Hydrostatic Shell Test psi |
|-----------------|----------------------------|-----------------------|----------------------------|
| AWWA 2"-12"     | 250                        | 250                   | 500                        |
| ULFM 2 1/2"-12" | 200                        | 200                   | 400                        |

**Available in either non-rising stem, outside screw & yoke.**

**Available End Connections & Size Range**

**Figure No.**

|                           |                        |        |
|---------------------------|------------------------|--------|
| FLG End (NRS)             | 2"-12"                 | F-6102 |
| M.J.                      | 2"-12" (except 2 1/2") | F-6100 |
| FLG & M.J.                | 3"-12"                 | F-6106 |
| Push-on for PVC (SDR)     | 2"-12"                 | F-6110 |
| FLG End (OS & Y)          | 2"-12"                 | F-6136 |
| M.J. for Tapping          | 3"-12"                 | F-6114 |
| Tyton for D.I. & C900 PVC | 4"-12"                 | F-6112 |
| M.J. Cutting-in           | 4"-12"                 | F-6111 |
| Tyton for D.I. X FLG      | 4"-12"                 | F-6113 |
| Threaded                  | 2"-3"                  | F-6103 |

**Accessories (Illustrated in the Gate Valve Section)**

|                          |                               |
|--------------------------|-------------------------------|
| Indicator Posts          | 2" Sq. Operating Nuts         |
| "T" Handles              | Handwheels                    |
| Stem Guides              | Extension Stems               |
| Electric Motor Actuators | Floor Boxes                   |
|                          | Chain Wheels                  |
|                          | Floorstands (non-rising stem) |

|            |           |                        |
|------------|-----------|------------------------|
| MODEL 2639 | AWWA C509 | FULL BODY DUCTILE IRON |
| MODEL 2640 | AWWA C509 | FULL BODY GRAY IRON    |

2640-100  
A 6/23/14

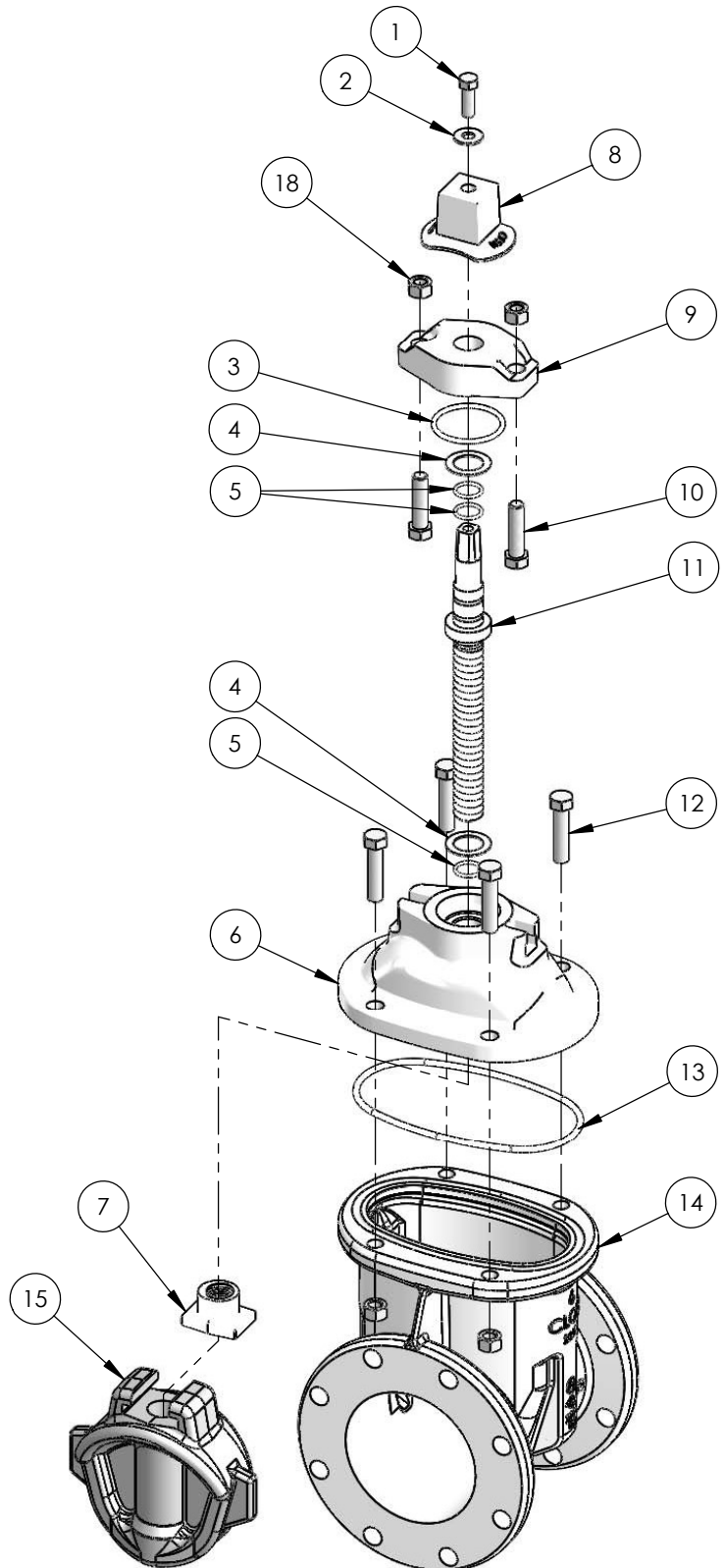
Complies with applicable requirements of AWWA C509

2"-12" R/S VALVE NRS  
EXPLODED VIEW MATERIAL LIST

**CLOW VALVE COMPANY**

MODELS 2639 & 2640

| ITEM NO. | DESCRIPTION    | Material - 2639       | Material - 2640       | QTY. |
|----------|----------------|-----------------------|-----------------------|------|
| 1        | Hex Head Bolt  | Stainless Steel       | Stainless Steel       | 1    |
| 2        | Flat Washer    | Stainless Steel       | Stainless Steel       | 1    |
| 3        | O-Ring         | Rubber                | Rubber                | 1    |
| 4        | Thrust Washer  | Delrin                | Delrin                | 2    |
| 5        | O-Ring         | Rubber                | Rubber                | 3    |
| 6        | Cover          | Ductile Iron          | Gray Iron             | 1    |
| 7        | Stem Nut       | Copper Alloy          | Copper Alloy          | 1    |
| 8        | Operating Nut  | Gray Iron             | Gray Iron             | 1    |
| 9        | Follower Plate | Ductile Iron          | Ductile Iron          | 1    |
| 10       | Hex Head Bolt  | Stainless Steel       | Stainless Steel       | 2    |
| 11       | Stem           | Copper Alloy          | Copper Alloy          | 1    |
| 12       | Cover Bolt     | Stainless Steel       | Stainless Steel       | --   |
| 13       | Cover O-Ring   | Rubber                | Rubber                | 1    |
| 14       | Body           | Ductile Iron          | Gray Iron             | 1    |
| 15       | Wedge          | Ductile Iron / Rubber | Ductile Iron / Rubber | 1    |
| 18       | Hex Nut        | Stainless Steel       | Stainless Steel       | 6    |



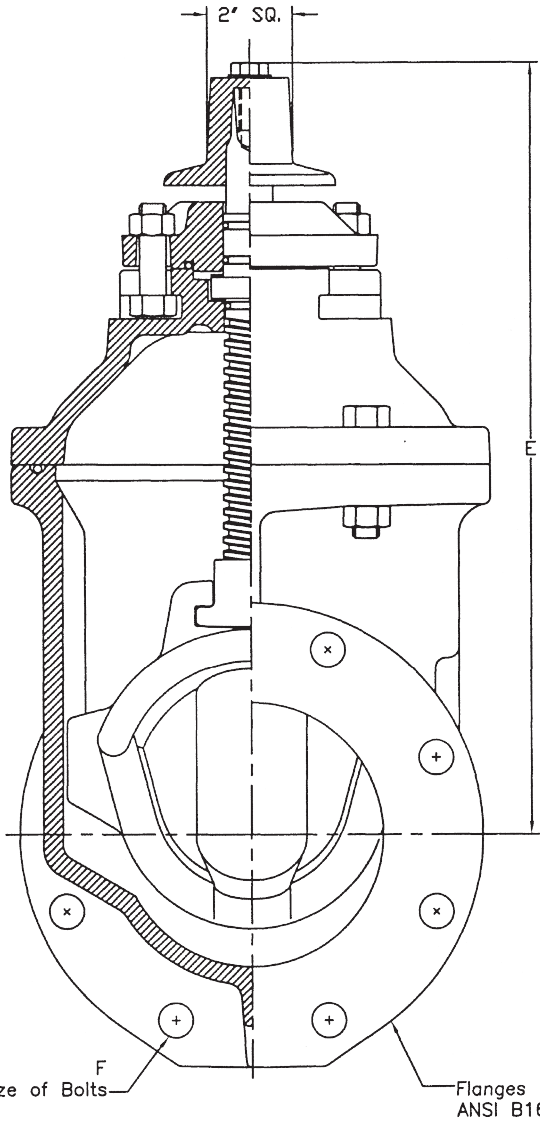
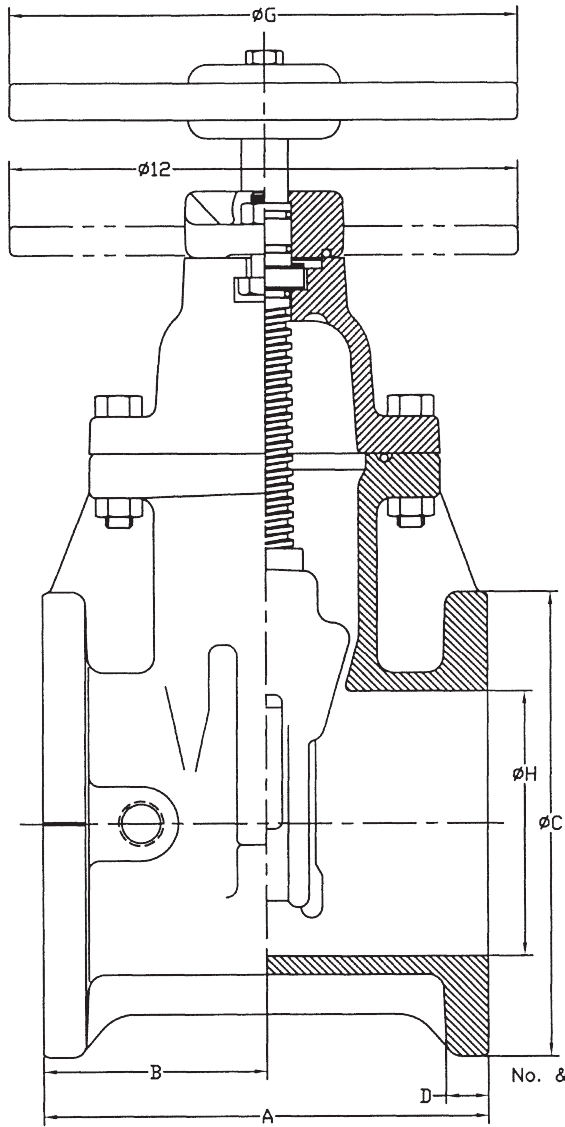
Complies with applicable requirements of AWWA C509

2"-12" R/W VALVE FLANGED ENDS  
GENERAL DIMENSION

**CLOW VALVE COMPANY**

MODEL 2639 & 2640

F-6102



Flanges  
ANSI B16.1 CL. 125

| VALVE SIZE | A   | B  | C   | D     | E   | F      | G  | H   |
|------------|-----|----|-----|-------|-----|--------|----|-----|
| 2          | 7   | 3½ | 6   | 5/8   | 10¾ | 4-5/8  | 7¼ | 2   |
| 2½         | 7½  | 3¾ | 7   | 11/16 | 11¾ | 4-5/8  | 7¼ | 2½  |
| 3          | 8   | 4  | 7½  | ¾     | 12¾ | 4-5/8  | 10 | 3   |
| 4          | 9   | 4½ | 9   | 15/16 | 14¾ | 8-5/8  | 10 | 4¼  |
| X 6        | 10½ | 5¼ | 11  | 1     | 19  | 8-¾    | 12 | 6¼  |
| X 8        | 11½ | 5¾ | 13½ | 1¼    | 22½ | 8-¾    | 14 | 8¼  |
| X 10       | 13  | 6½ | 16  | 1¾    | 26½ | 12-7/8 | 18 | 10¼ |
| X 12       | 14  | 7  | 19  | 1¼    | 30  | 12-7/8 | 18 | 12¼ |

# Carbon Steel Flange Nut & Bolt Set

ASTM A307 GRADE A / SAE J995 GRADE 2

## FEATURES

- For 150# & 300# ANSI Flanges
- Lengths for Joining Two Flanges\*
- Material: Carbon Steel
- Finish: Zinc Plated
- Sizes: 1/2" to 24" (150#), 1/2" to 12" (300#)

## STANDARDS

### Bolts:

- Material - ASTM A307A Grade A
- Dimensions - ASME B18.2.1
- Thread - Class 2A

### Nuts:

- Material - SAE J995 Grade 2
- Dimensions - ASME B18.2.2
- Thread - Class 2B

## BOLT PROPERTIES

- Tensile: 60 KSI Minimum
- Elongation: 18% Minimum
- Hardness: 69 - 100 Rb



\*Based on 1/16" raised face and 1/8" gasket

| 300# Pack Quantities & Bolt Sizes (inches) |      |         |          |             |
|--|------|---------|----------|-------------|
| Size                                       | Bolt | Nut Qty | Diameter | Bolt Length |
| 1/2  | 4    | 4       | 1/2-13   | 2-1/4       |
| 3/4  | 4    | 4       | 5/8-11   | 2-1/2       |
| 1  | 4    | 4       | 5/8-11   | 2-1/2       |
| 1-1/4                                      | 4    | 4       | 5/8-11   | 2-3/4       |
| 1-1/2                                      | 4    | 4       | 3/4-10   | 3           |
| 2  | 8    | 8       | 5/8-11   | 3           |
| 2-1/2                                      | 8    | 8       | 3/4-10   | 3-1/4       |
| 3  | 8    | 8       | 3/4-10   | 3-1/2       |
| 4  | 8    | 8       | 3/4-10   | 3-3/4       |
| 5  | 8    | 8       | 3/4-10   | 4-1/4       |
| 6  | 12   | 12      | 3/4-10   | 4-1/4       |
| 8  | 12   | 12      | 7/8-9    | 4-3/4       |
| 10   | 16   | 16      | 1-8      | 5-1/2       |
| 12   | 16   | 16      | 1-1/8-7  | 5-3/4       |

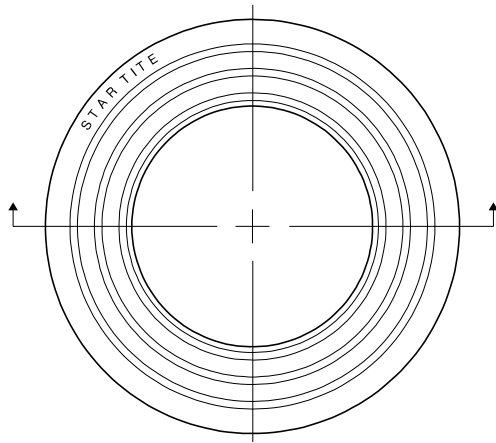
| 150# Pack Quantities & Bolt Sizes (inches) |      |         |          |             |
|--|------|---------|----------|-------------|
| Size                                       | Bolt | Nut Qty | Diameter | Bolt Length |
| 1/2  | 4    | 4       | 1/2-13   | 2           |
| 3/4  | 4    | 4       | 1/2-13   | 2           |
| 1  | 4    | 4       | 1/2-13   | 2-1/4       |
| 1-1/4                                      | 4    | 4       | 1/2-13   | 2-1/4       |
| 1-1/2                                      | 4    | 4       | 1/2-13   | 2-1/2       |
| 2  | 4    | 4       | 5/8-11   | 2-3/4       |
| 2-1/2                                      | 4    | 4       | 5/8-11   | 3           |
| 3  | 4    | 4       | 5/8-11   | 3           |
| 4  | 8    | 8       | 5/8-11   | 3           |
| 5  | 8    | 8       | 3/4-10   | 3-1/4       |
| 6  | 8    | 8       | 3/4-10   | 3-1/4       |
| 8  | 8    | 8       | 3/4-10   | 3-1/2       |
| 10   | 12   | 12      | 7/8-9    | 4           |
| 12   | 12   | 12      | 7/8-9    | 4           |
| 14   | 12   | 12      | 1-8      | 4-1/2       |
| 16   | 16   | 16      | 1-8      | 4-1/2       |
| 18   | 16   | 16      | 1-1/8-7  | 5           |
| 20   | 20   | 20      | 1-1/8-7  | 5-1/2       |
| 24   | 20   | 20      | 1-1/8-7  | 6           |

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# Star-Tite™ Flanged Gasket

3" to 36", Ring Style



TOP VIEW



SECTION VIEW

## INTRODUCTION

Historically, flat red rubber gaskets have been used for sealing flanged joints. These gaskets may not have NSF/ANSI 61 or NSF/ANSI 372 certification and do not qualify for higher ratings in standards such as ANSI/AWWA C110/A21.10. The Star-Tite™ flanged gasket is a specially designed gasket that qualifies for the higher rating. It also is listed by UL as satisfying both NSF/ANSI 61 and NSF/ANSI 372 requirements for potability.



## LOWER TORQUE

The Star-Tite™ Ring Gasket has about one half the area to compress when compared to a full face gasket, which results in a reduction of the torque required to achieve a proper seal. In addition, the Star-Tite™ Ring Gasket incorporates three bulbs that are molded into the gasket, a geometry that improves the performance when compared to a typical flat full face red rubber gasket.

## HIGHER PERFORMANCE

AWWA standard ANSI/AWWA C110/A21.10 describes specially designed gaskets as follows:

**Also available for most sizes are specially designed gaskets, either ring or full-face, using one or more annular rings molded into the gasket to improve the gasket performance.**

### Appendix A, Section A.2, Gaskets

Footnotes below the pressure rating tables in ANSI/AWWA C110/A21.10 for flanged fittings allow the rating of flanged fittings that use these special gaskets to be 350 psi in sizes 24-inch and less. The Star-Tite™ gasket qualifies as one of these special gasket designs. When normal flat full face red rubber gaskets are used, the rating is 250 psi.

The bulb type rings on the Star-Tite™ ring gasket allow the gasket material to compress in three localized areas of the flange. The inner bulb is located inside the tapered pipe thread that is typical with fabricated pipe. This creates a pressure boundary that prevents leakage through the threaded connection, which is shown in Figure 1 on the next page. The outer two bulbs better accommodate minor misalignment that occasionally occurs when flat surfaces are mated together.

STAR® PIPE PRODUCTS



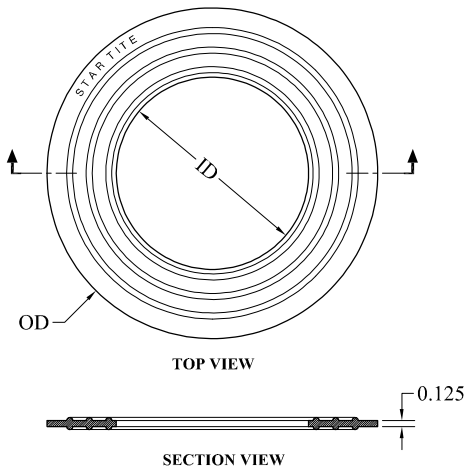
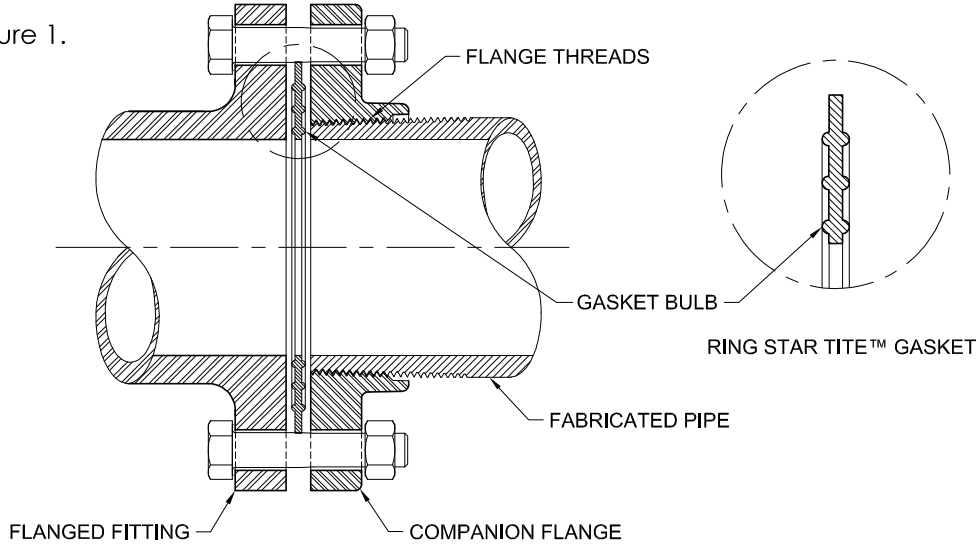


# Star-Tite™ Flanged Gasket

3" to 36", Ring Style

## TECHNICAL INFORMATION

Figure 1.



| Table 1 - FLANGE ACCESSORY PACKS C111/A.21.11* |        |        |               |             |                           |                     |                   |
|--|--------|--------|---------------|-------------|---------------------------|---------------------|-------------------|
| NOM. SIZE                                      | ID     | OD     | BOLTS         | BOLTS (QTY) | MAX PRESSURE RATING (PSI) | BOLT TORQUE (FT-LB) | APPROX. WT. (LBS) |
| 3  | 3.000  | 5.375  | 5/8 x 2 1/2   | 4           | 350                       | 110                 | 2                 |
| 4  | 4.000  | 6.875  | 5/8 x 3       | 8           | 350                       | 110                 | 4                 |
| 6  | 6.000  | 8.750  | 3/4 x 3 1/2   | 8           | 350                       | 110                 | 5                 |
| 8  | 8.000  | 11.000 | 3/4 x 3 1/2   | 8           | 350                       | 110                 | 5                 |
| 10   | 10.000 | 13.375 | 7/8 x 4       | 12          | 350                       | 130                 | 12                |
| 12   | 12.000 | 16.125 | 7/8 x 4       | 12          | 350                       | 130                 | 13                |
| 14   | 14.000 | 17.750 | 1 x 4 1/2     | 12          | 350                       | 150                 | 19                |
| 16   | 16.000 | 20.250 | 1 x 4 1/2     | 16          | 350                       | 160                 | 25                |
| 18   | 18.000 | 21.625 | 1 1/8 x 5     | 16          | 350                       | 180                 | 36                |
| 20   | 20.000 | 23.875 | 1 1/8 x 5     | 20          | 350                       | 200                 | 45                |
| 24   | 24.000 | 28.250 | 1 1/4 x 5 1/2 | 20          | 350                       | 220                 | 61                |
| 30   | 30.000 | 34.750 | 1 1/4 x 6 1/2 | 28          | 250                       | 140                 | 94                |
| 36   | 36.000 | 41.250 | 1 1/2 x 7     | 32          | 250                       | 160                 | 172               |

\*All dimensions in inches except where indicated.

## GENERAL SPECIFICATIONS

- HEX BOLTS:** Per ANSI/ASME B18.2.1- Material per ASTM A307 Grade B, Zinc Plated
- HEX NUTS:** Per ANSI/ASME B18.2.2 - Material per ASTM A563 Grade A or B, Zinc Plated
- GASKET MATERIAL:** Vulcanized Styrene Butadiene Rubber (SBR)
- DIMENSIONS:** Refer to Table 1 above or FAH03-36RG submittal drawing number A6531.
- CERTIFICATIONS:** UL listed to NSF/ANSI 61 and NSF/ANSI 372 for potability.
- PRESSURE RATING:** 350 psi for sizes 3" to 24"; 250 psi for sizes 30" to 36".

STAR® PIPE PRODUCTS



Star® Pipe Products

## Full Face Gasket, 8 in, Star Tite

Part: STTFFG8 MFG: FAH08FFG

### Description

Star® Pipe Products, FAH08FFG, Gasket, Full Face, 8 in Nominal, Star Tite

### Specifications

|              |           |
|--------------|-----------|
| Type         | Full Face |
| Nominal Size | 8 in      |
| Material     | Star Tite |

|       |                     |
|-------|---------------------|
| Brand | Star® Pipe Products |
|-------|---------------------|

|                          |                    |
|--------------------------|--------------------|
| Manufacturer             | Star Pipe Products |
| Manufacturer Part Number | FAH08FFG           |



Star® Pipe Products

## Full Face Gasket, 12 in, Star Tite

Part: STTFFG12 MFG: FAH12FFG

### Description

Star® Pipe Products, FAH12FFG, Gasket, Full Face, 12 in Nominal, Star Tite

### Specifications

|              |           |
|--------------|-----------|
| Type         | Full Face |
| Nominal Size | 12 in     |
| Material     | Star Tite |

|       |                     |
|-------|---------------------|
| Brand | Star® Pipe Products |
|-------|---------------------|

|                          |                    |
|--------------------------|--------------------|
| Manufacturer             | Star Pipe Products |
| Manufacturer Part Number | FAH12FFG           |

# HYMAX 2

## HYMAX<sup>®</sup> 2 COUPLING (4" - 12")



### FEATURES

- ADVANCED WIDE-RANGE COUPLING WITH A PATENTED FLIP GASKET
- ELIMINATES GASKET REMOVAL MISTAKES AND MAXIMIZES INSTALLER WORK EFFICIENCY
- ONLY 2-4 TOP FACING BOLTS, FOR FASTER AND SAFER INSTALLATION
- READY-TO-USE DESIGN TO ELIMINATE EXTENSIVE PREPARATORY UNDER-PIPE DIGGING
- ALLOWS 4° DYNAMIC DEFLECTION ON EACH END, REDUCING FUTURE PIPE DAMAGE
- PATENTED HYDRAULICALLY-ASSISTED GASKET WITH 2-STAGE SEALING
- SUITABLE FOR ALL TYPES OF PIPES - DUCTILE IRON, CAST IRON, STEEL, COPPER, PE, PVC, AC, GRP
- ONE PRODUCT CAN CONNECT PIPES OF TWO DIFFERENT MATERIALS
- BASED ON THE GAME-CHANGING HYMAX THAT HAS BEEN FIELD-PROVEN IN MILLIONS OF INSTALLATIONS IN THE US
- PRODUCT PERFORMANCE, OD RANGE AND PRESSURES ARE IDENTICAL TO THOSE OF THE ORIGINAL HYMAX

### SPECIFICATIONS

| STANDARDS  | SIZE   | MATERIALS  |
|--|--|--|
| HYMAX2 MEETS OR EXCEEDS STANDARDS AWWA C-219, NSF 61, NSF 372. | AVAILABLE IN NOMINAL DIAMETER FROM 4" - 12" STANDARD. CALL KRAUSZ FOR DETAILS. | <p><b>END RINGS</b> 4"– 12" ASTM A283 / A283M GRADE C STEEL.</p> <hr/> <p><b>CENTER RING</b> 4"– 12" ASTM A53 GRADE A STEEL.</p> <hr/> <p><b>GASKETS</b> EPDM COMPOUNDED FOR WATER AND SEWEGE, MEETS INTERNATIONAL STANDARDS FOR CONTACT WITH DRINKING WATER.</p> <hr/> <p><b>BRIDGE</b> AISI 304 STAINLESS STEEL.</p> <hr/> <p><b>SPHERICAL SPACERS</b> AISI 304L STAINLESS STEEL.</p> <hr/> <p><b>COATING</b> 100% FUSION BONDED EPOXY FOR ENHANCED CORROSION PROTECTION. NOMINAL THICKNESS 14 MIL.</p> <hr/> <p><b>NUTS &amp; BOLTS</b> AISI 304 STAINLESS STEEL. ROLLED THREAD AND ANTI-GALLING COATING.</p> |

# PRODUCT SPECIFICATIONS

# HYMAX 2



## PRODUCT PERFORMANCE (\*)

|  |                    |
|--|--------------------|
| <b>WORKING TEMPERATURE</b>                 | -20°F UP TO +125°F |
| <b>DYNAMIC DEFLECTION</b>                  | UP TO 4° PER SIDE  |
| <b>MIN. PIPE INSERTION</b>                 | 2.25"              |
| <b>MAXIMUM OFFSET FOR MISALIGNED PIPES</b> | 0.51"              |
| <b>MAXIMUM OUT OF ROUNDES</b>              | 0.31"              |
| <b>WORKING PRESSURE</b>                    | 260                |
| <b>RATED PRESSURE</b>                      | 390                |
| <b>VACUUM TEST</b>                         | 12 PSI             |

\* See Submittal Drawings For Details.

## PRODUCT TABLES

### HYMAX<sup>®</sup>2 NOMINAL SIZES (4" - 12")

| Krausz Part Number | Nominal Diameter (inch) | Overall Range (inch) | Range in closed gasket position (inch) | Range in open gasket position (inch) | Bolt Qty. and Size (mm) | Torque (Ft-Lbs) | Approx. Weight (Lbs) |
|--------------------|-------------------------|----------------------|--|--------------------------------------|-------------------------|-----------------|----------------------|
| 860-54-0108-16     | 4                       | 4.25-5.63            | 4.25-5.00                              | 4.92-5.63                            | 2 -M14                  | 75              | 15                   |
| 860-54-0130-16     | 5                       | 5.12-6.38            | 5.12-5.75                              | 5.71-6.38                            | 2 -M14                  | 75              | 19                   |
| 860-54-0163-16     | 6                       | 6.42-7.68            | 6.42-7.05                              | 7.01-7.68                            | 2 -M14                  | 75              | 23                   |
| 860-54-0190-16     | 7                       | 7.48-8.74            | 7.48-8.11                              | 8.07-8.74                            | 2 -M14                  | 75              | 24                   |
| X 860-54-0217-16   | 8                       | 8.54-9.84            | 8.54-9.17                              | 9.13-9.84                            | 2 -M14                  | 75              | 28                   |
| 860-54-0272-16     | 10                      | 10.70-12.00          | 10.70-11.37                            | 11.33-12.00                          | 2 -M14                  | 75              | 32                   |
| 860-54-0278-16     | 10                      | 10.96-12.26          | 10.96-11.63                            | 11.59-12.26                          | 2 -M14                  | 75              | 33                   |
| X 860-54-0315-16   | 12                      | 12.40-13.66          | 12.40-13.03                            | 12.99-13.66                          | 2 -M14                  | 80              | 39                   |
| 860-54-0334-16     | 12                      | 13.15-14.41          | 13.15-13.78                            | 13.74-14.41                          | 2 -M14                  | 80              | 39                   |

For specific sizes of products in stock, call Krausz for details.