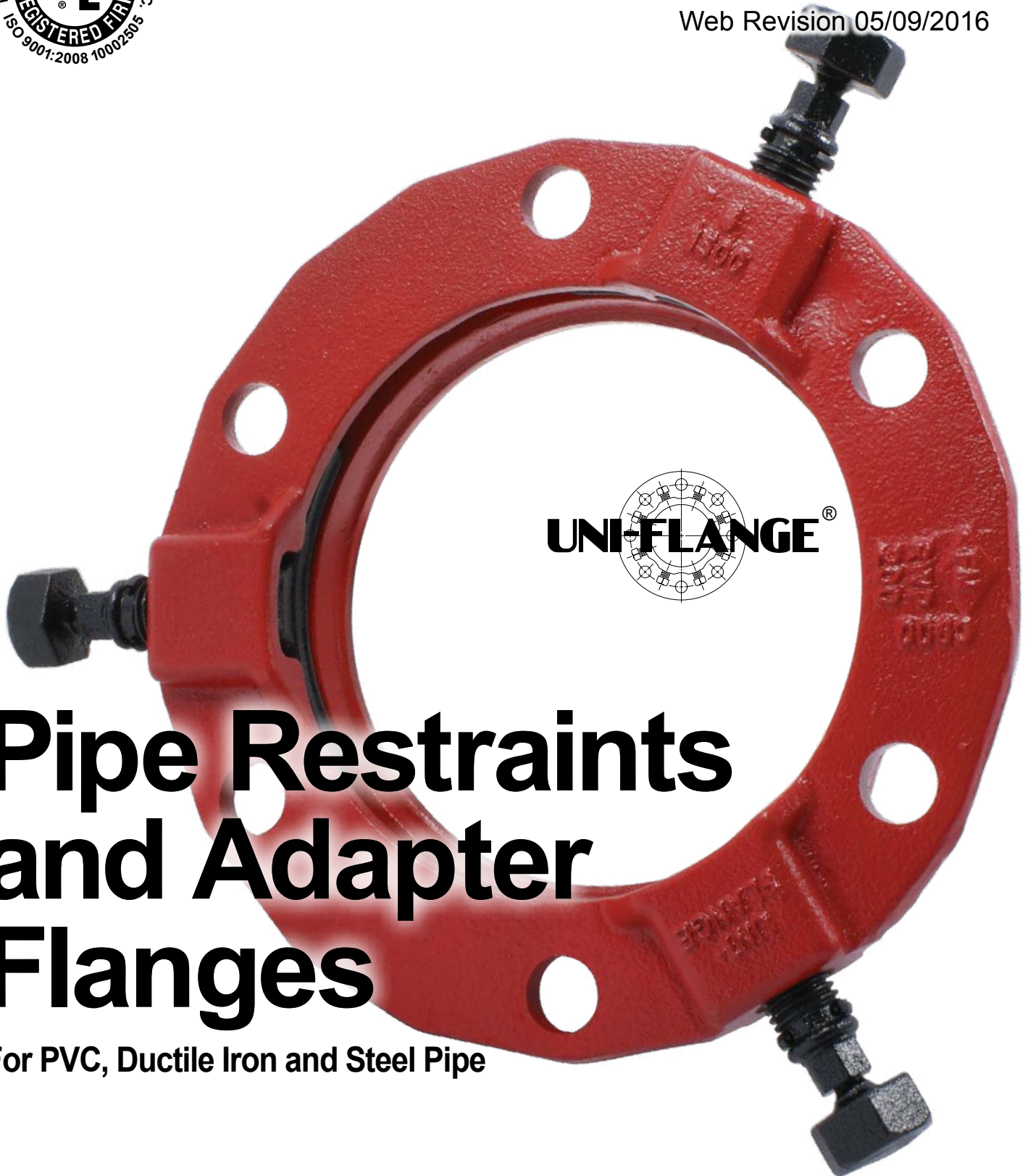




Section U

04/2016

Web Revision 05/09/2016



Pipe Restraints and Adapter Flanges

For PVC, Ductile Iron and Steel Pipe



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Note: Consult pipe manufacturer for specific installation requirements.

*** See catalog listing for specific application information**

Uni-Flange® Pipe Restraint and Adapter Flange Numbering System

PRODUCT TYPE

- RFAP** = Restrained Flange Adapter for C905 PVC, C900, C909, DR35, IPS PVC and Steel Pipe
- RFAD** = Restrained Flange Adapter for Ductile Iron Pipe
- RCDD** = Restrained Coupling for Ductile Iron Pipe
- RCDP** = Restrained Coupling for Joining Ductile Iron Pipe to C905 PVC, C900 PVC, IPS PVC, Steel, C909 or DR35 pipe
- RCPP** = Restrained Coupling for C905 PVC, C900, IPS PVC, Steel, C909 and DR35 Sewer Pipe
- UFA200** = Adapter Flange for Steel and Ductile Iron Pipe
- UFA400** = Higher Pressure Adapter Flange for Steel and Ductile Iron Pipe
- UFA420** = Extra Heavy Adapter Flange
- UFA900** = Adapter Flange for PVC Pipe
- UFR1300** = Restraint Device for PVC Pipe and MJ/Push-on Fittings
- UFR1300-P** = Restraint Device for Sewer Pipe
- UFR1309** = Restraint Device for C909 PVC and MJ/Push-on Fittings
- UFR1350** = Restraint Device for PVC Pipe Bell Joints
- UFR1355** = Restraint Device for PVC Pipe Bell Joints for Ductile Iron Pipe O.D.
- UFR1360** = Restraint Device for PVC Pressure Fittings
- UFR1390** = Restraint Device for PVC Pipe Bell Joints
- UFR1390-P** = Restraint Device for Sewer Pipe Bell Joints
- UFR1399** = Restraint Device for C909 Pipe Bell Joints
- FBS-C** = Bell Stops for C900 PVC Pipe
- UFR1400** = Wedge Action Retainer Gland Joint Restraint for Ductile Iron Pipe
- UFR1450** = Bell Joint Restraint for Ductile Iron
- UFR1405** = Split MJ Retainer Gland Joint Restraint for Ductile Iron
- UFR1455** = Joint Restraint with Split Backup Ring for Ductile Iron
- UFR1490** = Split Joint Restraint with Split Backup Ring for Ductile Iron
- UFR1495** = Mid-Span Split Restraint
- UFR2800** = Restraints for High Pressure Applications on Ductile Iron
- UFR2850** = Bell Joint Restraints for High Pressure Applications on Ductile Iron
- UFR1500** = Retainer Gland Joint Restraint for PVC Pipe
- UFR1500R** = Rapid Install MJ Restraint for C900
- UFR1599** = Retainer Gland Joint Restraint for C909 PVC
- UFRCS1300-P** = Casing Spacer for Support of Sewer Pipe Barrel
- UFRCS1300** = Casing Spacer for Support of Pipe Barrel
- UFRCS1390** = Casing Spacer for Support/Restraint of Pipe Bell Joints
- UFRCS1390-P** = Casing Spacer for Support of Sewer Pipe Barrel

C = C900/C905 PVC
D = Ductile Iron Pipe
S = Steel Size (IPS)
 PVC Pipe (steel pipe for UFA200/400/420 only)
Z = SO-EZ

OPTIONS

XL = Extra Large Diameter for Class C and D Gray Cast Iron Pipe (4" - 12" UFR1400 only)

UFR1400 - DA - 12 - XL

Optional MJ Accessory Pack
 (t-bolts and gasket,
 also includes MJ gland with
 UFR1300)

Nominal Pipe Size

Note: See catalog listings to ensure desired sizes, styles, options and pipe applications are available.

Uni-Flange® Set Screw Retainer Glands Numbering System

PRODUCT TYPE

- RGBS** = Model B Retainer Gland
- RGBAS** = Model B Retainer Gland with MJ Accessories

Nominal Pipe Size

RGBS - 3

Note: See catalog listings to ensure desired sizes, styles, options and pipe applications are available.

Information - Uni-Flange® Adapter Flange

Features of the 200, 400, 420 and 900 Series Uni-Flange® Adapters

- **Job Site Fabrication Using Plain End Pipe**

Uni-Flange® eliminates the problems of pre-engineered, pre-fabricated piping systems. Pipe fabrication can be performed on-site by using plain-end pipe (Figure 1), a pipe cutter and a wrench. No threading, welding, or grooving is necessary. Uni-Flange® eliminates the need to rely on off-site fabricators and machine shops. It is ideal for projects that involve retro-fitting or renovation of existing piping systems. Uni-Flange® keeps the project moving... DOWNTIME SAVINGS are considerable.

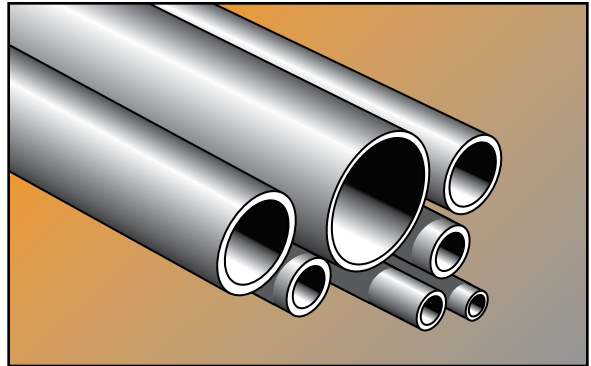


Figure 1

- **Eliminates Bolt Hole Alignment Problems**

Uni-Flange® Adapters can be freely rotated (see Figure 2) before the flange bolts are inserted and tightened. This facilitates bolt hole alignment with the facing flange. Pre-fabricated piping systems do not offer this installation advantage.

- **Permits Pipe Deflection**

Unlike conventional threaded or welded flanges, Uni-Flange® will permit pipe deflection during installation (see Figure 3). This means the Uni-Flange® can “make the connection” when other methods cannot. See Deflection Chart on page 11.

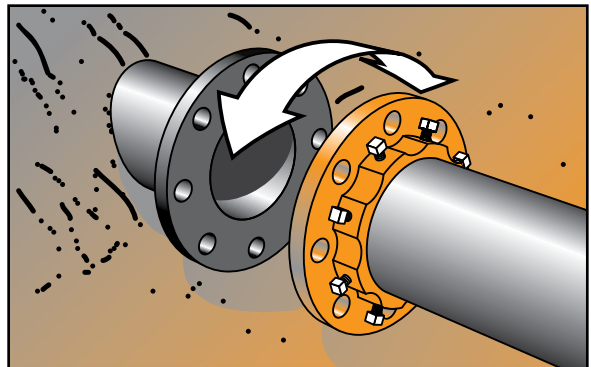


Figure 2

- **Built-In End Restraint**

Uni-Flange® offers built-in end restraint. No tie rods or other forms of anchoring are necessary within normal working pressures. Special considerations may be necessary for surges.

- **Future Maintenance Capabilities**

When future maintenance is required on flanged equipment such as meters or valves, Uni-Flange® can be easily disassembled and moved back on the pipe. This facilitates removal of the flanged equipment. When the equipment is to be replaced, simply drop it in and reinstall the Uni-Flange®. Threaded and welded flanges do not offer this feature.

- **Series 200 and 400
UL Listed**

The Uni-Flange® carries UL's listing for installation on steel or ductile iron pipes in both below and above ground systems (contact factory for details). Uni-Flange® offers significant safety factors at its full rated pressure.

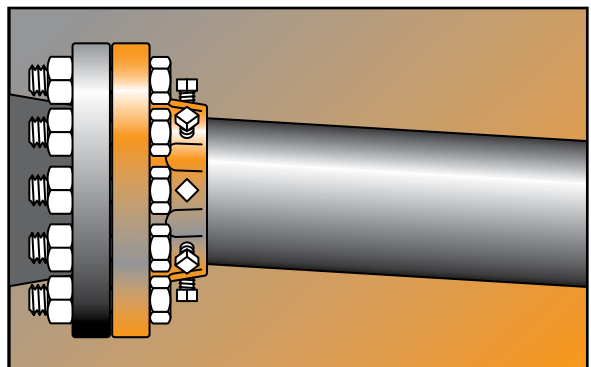


Figure 3

Uni-Flange® Adapter Flange Questions and Answers

- **Will the set screws damage the pipe?**

The principle of set screws for pipe restraint is not a new idea. Developed nearly 70 years ago and used on hundreds of thousands of connections, this pipe restraint method has proven to be effective. Due to the high strength of ductile iron and steel pipe, damage is highly unlikely if appropriate torque is applied to the set screws. Refer to technical data on page 10 for required torque.

- **Can Uni-Flange® be used face to face?**

A metal ring or spacer must be placed between the flanges. These are available from the factory.

- **Will the set screws back-out or loosen with continual use?**

When the set screw is originally tightened, it creates a pocket in the pipe. Even if the screw loosens slightly, it will remain inside this pocket and continue to restrain the flange.

- **Will the set screws hold on a high vibration connection like a pump?**

In practice, no problems have been reported under these conditions, but for added security we recommend the following:

- A. Wiring of set screws to prevent loosening
- B. Apply 'Loc-Tite' to the set screws after they are tightened

- **Will the Uni-Flange® with set screws work effectively on PVC pipe?**

It is not recommended. Over a period of time the set screws can cause pipe failure.

We recommend the Uni-Flange® Series 900 or RFAP Restrained Flange Adapter, specially designed for PVC pipe.

- **Can the Uni-Flange® Adapter Flange Series be used in underground and above ground installations?**

Yes. The Uni-Flange® Adapter Flange is approved for both above and below ground applications.

- **How exact is the cutting tolerance? How far off can the length of pipe be?**

The pipe should not exceed 1/4 inch away from the mating flange. This cutting tolerance is a vast improvement over rigid, screwed or welded flanges. See Deflection Chart on page 11. For even greater allowance, see our RFA Series.

- **Can Uni-Flange® be used on steam or gas?**

It is not recommended for prolonged use on steam due to temperature. However, it is excellent for gas when supplied with a Buna-N gasket. (Available upon request.)

- **Can Uni-Flange® be used on temperature applications?**

Yes. Our various gaskets will handle most temperature ranges. Refer to technical data for gasket availability.

- **Will abrasive materials in the piping system damage the Uni-Flange® Adapter Flange Series?**

No. Because only a small fraction of the gasket and none of the flange contacts the media, exposure to abrasive materials is extremely limited.

- **What about expansion/contraction?**

In common with other rigid systems, Uni-Flange® does not allow for pipe expansion or contraction. See Catalog Section N for Ford Expansion Joints (FEJ).

Specifications - Uni-Flange® Adapter Flanges

Features of the 200, 400 and 420 Series Uni-Flange® Adapters

The design of the Uni-Flange® Adapter is really quite simple. We took the best features of three different products and combined them into one fitting.

The FLANGE is made of ductile iron; tougher and stronger than the conventional gray iron threaded flange. Impact resistant, the flange also resists breakage when bolts are over-tightened.

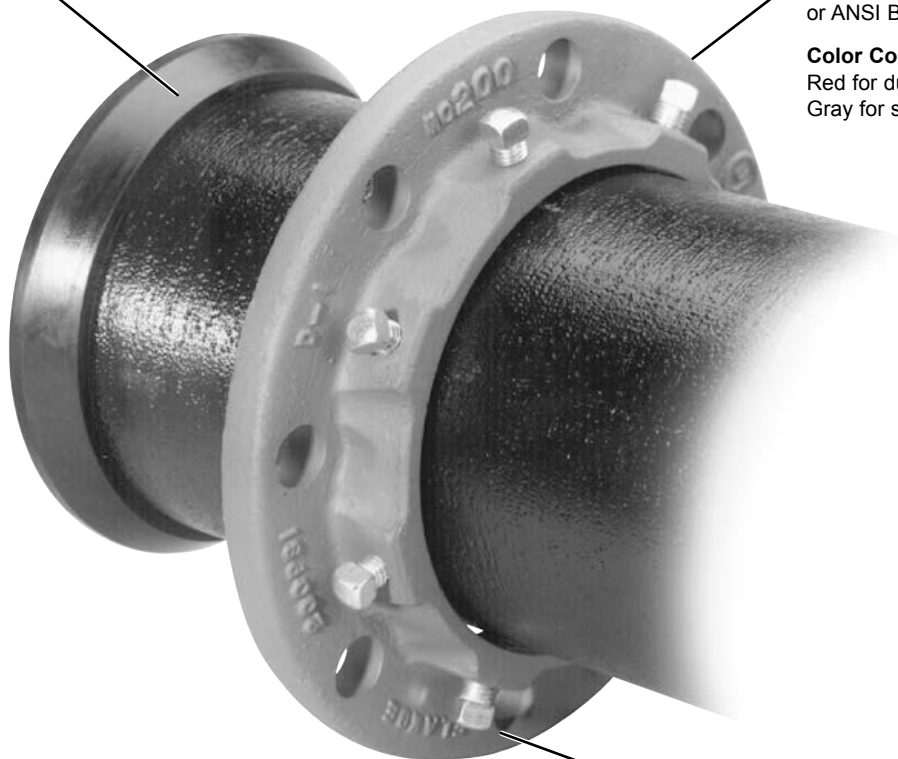
The GASKET is the standard AWWA mechanical joint gasket, which has been in use over 60 years.

The RESTRAINT is provided by a set screw locking device similar to that used in mechanical joint retainer glands. This principle has been in use throughout the world in lieu of concrete thrust blocks and other restraining devices.

Gasket - Standard gasket supplied with the Uni-Flange® Adapter Flange
- SBR Buna-S - Suitable for water and wastewater, and most moderate chemicals. Temperature range -65°F to 160°F.

Flange - Ductile iron – ASTM A536, Grade 65-45-12. Drilling to ANSI B16.1 or ANSI B16.5.

Color Code:
Red for ductile iron applications
Gray for steel applications



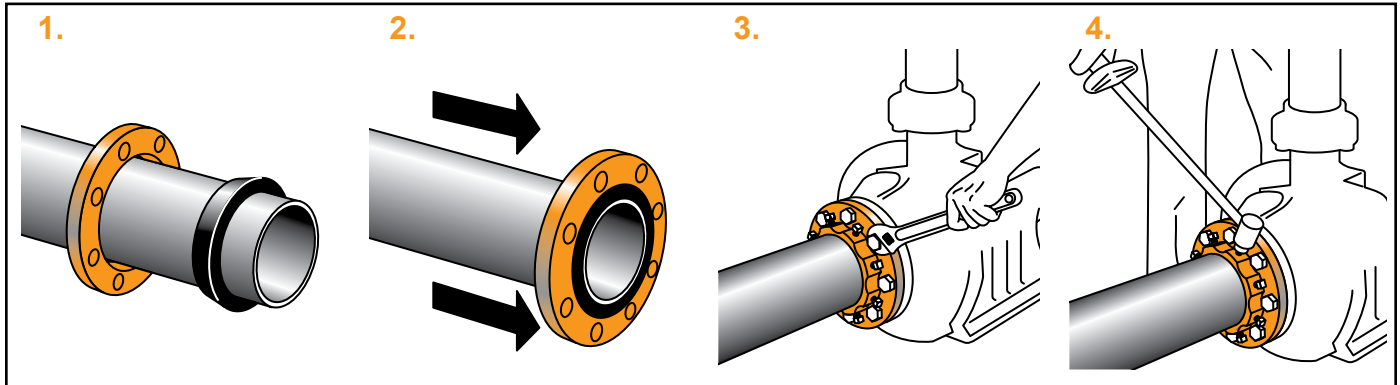
Gasket Options

EPDM (Ethylene Propylene) - Suitable for -65°F to 300°F.

NBR (Buna-N, Nitrile) - Suitable for -65°F to 220°F.

Set Screw - AISI 4140 Steel. Heat treated to Rockwell C35-44, and zinc plated for corrosion resistance.
Options: Uni-Torque set screws see page U-9
Type 410 Stainless Steel heat treated to 35-40 Rockwell C.

Uni-Flange® Installation Instructions



1. Pipe end should be cut square for most installations. (Deflected joints may require angular cut. See deflection chart on page 11.) Remove burrs and bevels. Scrape and clean the plain end of the pipe to ensure proper bare metal surface for set screw engagement and gasket seal. Thoroughly lubricate the pipe and gasket with a soap based pipe lubricant. Slide the flange onto the pipe with the gasket cavity facing the end of the pipe. Slide the lubricated gasket over the pipe end with the tapered end facing the gasket cavity in the flange. (No other gasket is necessary or should be used to seal the flange faces.)
2. Slide the flange forward until the gasket is evenly seated in the flange cavity and the Uni-Flange® face is flush with the end of the pipe. (The end of the pipe should butt against the facing flange; it cannot be more than 1/4" from the facing flange.) Hand tighten the set screws against the pipe surface.
3. Using conventional flange bolts, mate the Uni-Flange® to the standard flange. Be sure to evenly tighten the bolts alternately on opposite sides. (Use the star method - like tightening the lug nuts on a car wheel.) Do not over-tighten the flange bolts. It is not necessary to bring the Uni-Flange® Adapter to a face-to-face contact with the standard flange. A gap of approximately 1/8" between the flanges is normal.
4. Advance all set screws to the pipe surface before applying torque. Tighten in an alternating manner (star method) to the torque values shown in the appropriate table on page 10. Use of a torque wrench is highly recommended and required to verify proper torque.

Note: In installations where rapid or excessive surges may occur, or extreme thrusts encountered (e.g. near pumps or 90° bends), Ford engineers recommend the use of tie rods for additional thrust restraint.

Consult the Ford Meter Box website for the most current installation instructions.

Hydrostatic Test Pressures

The Uni-Flange® Adapter Flange Series is capable of withstanding the following hydrostatic test pressures without leakage: (Note: For hydrostatic seal only, not applicable to thrust restraint)

Series 200 - 125 lb. / 150 lb. Drilling

2 inch - 8 inch: 600 PSI
10 inch - 12 inch: 525 PSI

Series 400 - 125 lb. / 150 lb. Drilling

2 inch - 12 inch: 750 PSI
14 inch - 24 inch: 300 PSI
30 inch - 48 inch: 150 PSI

Series 420 - 250 lb. / 300 lb. Drilling

2 inch - 12 inch: 800 PSI

Recommended Water Working Pressure

The Uni-Flange® Adapter Flange Series is designed to handle the following water working pressures at a temperature of -20°F to 150°F.

Series 200 - 125 lb. / 150 lb. Drilling

2 inch - 8 inch: 200 PSI
10 inch - 12 inch: 175 PSI

Series 400 - 125 lb. / 150 lb. Drilling

2 inch - 12 inch: 250 PSI
14 inch - 24 inch: 150 PSI
30 inch - 48 inch: 100 PSI

Series 420 - 250 lb. / 300 lb. Drilling

2 inch - 12 inch: 400 PSI

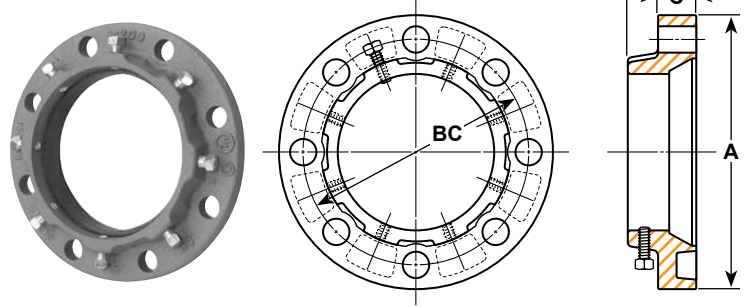
Flange Drilling: 125 lb., ANSI B16.1 for class 125 cast iron flanges
150 lb., ANSI B16.5 for steel flanges
250 lb., ANSI B16.1 for class 250 cast iron flanges
300 lb., ANSI B16.5 for steel flanges

Uni-Flange® Adapter Flanges

Series 200 Adapter Flange for Steel and Ductile Iron Pipe

Flange Drilling ANSI B16.1 125 lb. / ANSI B16.5 150 lb.

WORKING PRESSURE - 2" THROUGH 8" 200 PSI / 10" THROUGH 12" 175 PSI

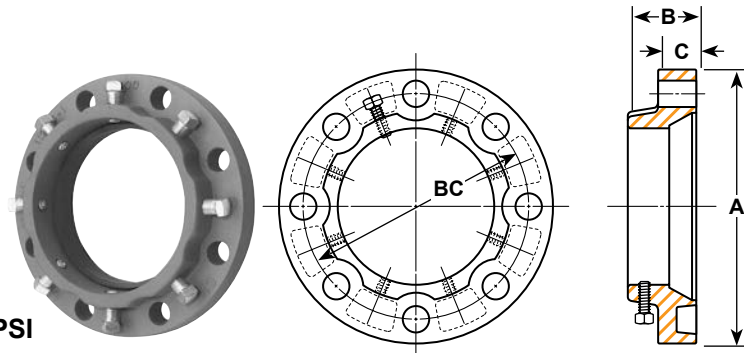


NOM. PIPE SIZE	STEEL PIPE		DUCTILE IRON PIPE		APPROX. WT. LBS.	DIMENSIONS						
	O.D. (INCHES)	CATALOG NUMBER	O.D. (INCHES)	CATALOG NUMBER		A	B	BC	C	BOLT HOLE DIA.	SET SCREWS	
											No.	SIZE
2"	2.38	UFA200-S-2	2.50	UFA200-C-2	3.5	6"	1-13/16"	4-3/4"	.75"	3/4"	2	1/2"x1"
2-1/2"	2.88	UFA200-S-25	-	-	4.0	7"	1-13/16"	5-1/2"	.75"	3/4"	4	1/2"x1"
3"	3.50	UFA200-S-3	3.96	UFA200-C-3	5.0	7-1/2"	1-13/16"	6"	.75"	3/4"	4	1/2"x1"
4"	4.50	UFA200-S-4	4.80	UFA200-C-4	7.7	9"	1-7/8"	7-1/2"	.75"	3/4"	4	1/2"x1"
5"	5.56	UFA200-S-5	-	-	8.7	10"	1-7/8"	8-1/2"	.75"	7/8"	8	1/2"x1"
6"	6.63	UFA200-S-6	6.90	UFA200-C-6	10.0	11"	1-7/8"	9-1/2"	.75"	7/8"	8	1/2"x1"
8"	8.63	UFA200-S-8	9.05	UFA200-C-8	16.5	13 1/2"	2-1/4"	11-3/4"	.88"	7/8"	8	5/8"x1-1/4"
10"	10.75	UFA200-S-10	11.10	UFA200-C-10	22.0	16"	2-1/4"	14-1/4"	1.00"	1"	12	5/8"x1-1/4"
12"	-	-	13.20	UFA200-C-12	31.0	19"	2-1/4"	17"	1.00"	1"	12	5/8"x1-1/4"

Series 400 Adapter Flange for Steel and Ductile Iron Pipe

Flange Drilling ANSI B16.1 125 lb. / ANSI B16.5 150 lb.

WORKING PRESSURE - 2" THROUGH 12" 250 PSI 14" THROUGH 24" 150 PSI / 30" THROUGH 48" 100 PSI



NOM. PIPE SIZE	STEEL PIPE		DUCTILE IRON PIPE		APPROX. WT. LBS.	DIMENSIONS						
	O.D. (INCHES)	CATALOG NUMBER	O.D. (INCHES)	CATALOG NUMBER		A	B	BC	C	BOLT HOLE DIA.	SET SCREWS	
											No.	SIZE
2"	2.38	UFA400-S-2	2.50	UFA400-C-2	5.0	6"	2"	4-3/4"	1.06"	3/4"	4	1/2"x1"
2-1/2"	2.88	UFA400-S-25	-	-	7.0	7"	2-1/16"	5-1/2"	1.12"	3/4"	4	1/2"x1"
3"	3.50	UFA400-S-3	3.96	UFA400-C-3	8.0	7-1/2"	2-1/16"	6"	1.12"	3/4"	4	1/2"x1"
4"	4.50	UFA400-S-4	4.80	UFA400-C-4	11.0	9"	2-1/16"	7-1/2"	1.12"	3/4"	8	1/2"x1"
5"	5.56	UFA400-S-5	-	-	13.0	10"	2-1/8"	8-1/2"	1.12"	7/8"	8	5/8"x1-1/4"
6"	6.63	UFA400-S-6	6.90	UFA400-C-6	14.0	11"	2-1/8"	9-1/2"	1.12"	7/8"	8	5/8"x1-1/4"
8"	8.63	UFA400-S-8	9.05	UFA400-C-8	21.0	13-1/2"	2-1/8"	11-3/4"	1.12"	7/8"	8	5/8"x1-1/4"
10"	10.75	UFA400-S-10	11.10	UFA400-C-10	38.0	16"	2-3/16"	14-1/4"	1.19"	1"	12	5/8"x1-1/4"
12"	12.75	UFA400-S-12	13.20	UFA400-C-12	56.0	19"	2-1/4"	17"	1.25"	1"	12	5/8"x1-1/4"
14"	14.00	UFA400-S-14	15.30	UFA400-C-14	70.0	21"	2-5/8"	18-3/4"	1.38"	1-1/8"	12	5/8"x1-1/4"
16"	16.00	UFA400-S-16	17.40	UFA400-C-16	79.0	23-1/2"	2-11/16"	21-1/4"	1.44"	1-1/8"	16	5/8"x1-1/4"
18"	18.00	UFA400-S-18	19.50	UFA400-C-18	90.0	25"	2-13/16"	22-3/4"	1.56"	1-1/4"	16	3/4"x2"
20"	20.00	UFA400-S-20	21.60	UFA400-C-20	145.0	27-1/2"	2-15/16"	25"	1.69"	1-1/4"	20	3/4"x2"
24"	24.00	UFA400-S-24	25.80	UFA400-C-24	175.0	32"	3-1/8"	29-1/2"	1.88"	1-3/8"	20	3/4"x2"
30"	30.00	UFA400-S-30	32.00	UFA400-C-30	270.0	38-3/4"	4"	36"	2.12"	1-3/8"	28	1"x2-1/4"
36"	36.00	UFA400-S-36	38.30	UFA400-C-36	400.0	46"	4-1/2"	42-3/4"	2.38"	1-5/8"	32	1"x2-1/4"
42"	42.00	UFA400-S-42	44.50	UFA400-C-42	495.0	53"	4-3/4"	49-1/2"	2.63"	1-5/8"	36	1"x2-1/4"
48"	48.00	UFA400-S-48	50.80	UFA400-C-48	660.0	59-1/2"	4-7/8"	56"	2.75"	1-5/8"	44	1"x2-1/4"

Options: To order with *Uni-Torque set screws add "-UT" to the catalog number. Example: UFA200-S-2-UT or UFA400-S-4-UT

To order with *Uni-Torque set screws and EPDM gasket add "-UT-EPDM" to the catalog number.

Example: UFA200-S-2-UT-EPDM or UFA400-S-4-UT-EPDM

To order with stainless steel set screws in sizes 2"-16" add "-SS" to the catalog number. Example UFA200-S-2-SS or UFA400-S-4-SS.

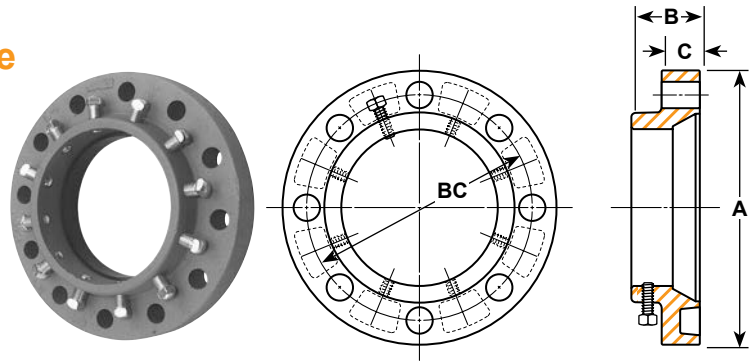
* **Caution:** Uni-Torque set screws should not be used on steel pipe thinner than schedule 40 or ductile iron pipe thinner than class 52.

Uni-Flange® Adapter Flanges

Series 420 Extra Heavy Adapter Flange for Steel and Ductile Iron Pipe Flange Drilling ANSI B16.1 250 lb. / ANSI B16.5 300 lb.

(MATCHES CLASS F FLANGE)

WORKING PRESSURE - 2" THROUGH 12" 400 PSI



NOM. PIPE SIZE	STEEL PIPE		DUCTILE IRON PIPE		APPROX WT. LBS.	DIMENSIONS						SET SCREWS	
	O.D. (INCHES)	CATALOG NUMBER	O.D. (INCHES)	CATALOG NUMBER		A	B	BC	C	BOLT HOLE DIA.		No.	SIZE
2"	2.38	UFA420-S-2	2.50	UFA420-C-2	7.0	6-1/2"	2-1/4"	5"	1.12"	3/4"		8	1/2" x 1"
3"	3.50	UFA420-S-3	3.96	UFA420-C-3	13.0	8-1/4"	2-7/16"	6-5/8"	1.12"	7/8"		8	1/2" x 1"
4"	4.50	UFA420-S-4	4.80	UFA420-C-4	21.0	10"	2-7/16"	7-7/8"	1.25"	7/8"		8	1/2" x 1"
5"	5.56	UFA420-S-5	-	-	27.0	11"	2-9/16"	9-1/4"	1.38"	7/8"		8	5/8" x 1-1/4"
6"	6.63	UFA420-S-6	6.90	UFA420-C-6	38.0	12-1/2"	2-9/16"	10-5/8"	1.44"	7/8"		12	5/8" x 1-1/4"
8"	8.63	UFA420-S-8	9.05	UFA420-C-8	57.0	15"	2-5/8"	13"	1.62"	1"		12	5/8" x 1-1/4"
10"	10.75	UFA420-S-10	11.10	UFA420-C-10	74.0	17-1/2"	2-5/8"	15-1/4"	1.88"	1-1/8"		16	5/8" x 1-1/4"
12"	12.75	UFA420-S-12	13.20	UFA420-C-12	104.0	20-1/2"	3"	17-3/4"	2.00"	1-1/4"		16	5/8" x 1-1/4"

Options: To order with *Uni-Torque set screws add "-UT" to the catalog number. Example: UFA420-S-2-UT

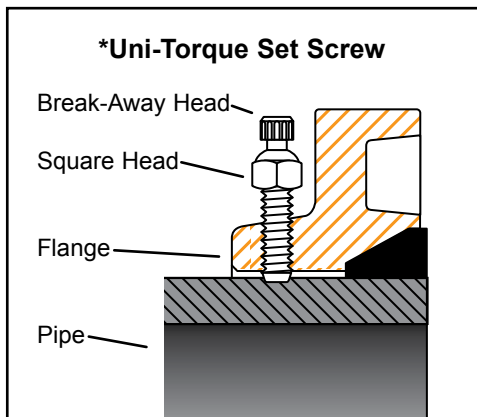
To order with *Uni-Torque set screws and EPDM gasket add "-UT-EPDM" to the catalog number.

Example: UFA420-S-2-UT-EPDM

To order with stainless steel set screws in sizes 2"-12" add "-SS" to the catalog number. Example UFA420-S-2-SS.

*** Caution:** Uni-Torque set screws should not be used on steel pipe thinner than schedule 40 or ductile iron pipe thinner than class 52.

*Optional Uni-Torque Set Screws



Optional Uni-Torque Set Screws are available for use with Uni-Flange® Adapters, 2" through 16" nominal pipe sizes with the pipe thickness shown in the table below. These set screws feature a "break-away head" that shears at the recommended torque for the recommended pipe (see table below), leaving a square head that can be used if future removal of the flange is required. To order an adapter flange with Uni-Torque set screws add "-UT" to the catalog number. Example: UFA200-S-2-UT.

UNI-TORQUE SET SCREW SIZE	PRE-SET TORQUE VALUE	*RECOMMENDED PIPE THICKNESS
1/2"x1"	65 ft-lb ± 7	Ductile Iron, Class 52-56 Steel, Schedule 40 and up
5/8"x2"	87 ft-lb ± 7	Ductile Iron, Class 52-56, Steel, Schedule 40 and up

Note: 1/2" x 1" Uni-Torque Set Screws require a 3/8", 12 point, deep well socket. 5/8" x 2" Uni-Torque Set Screws require a 7/16", 12 point, deep well socket.

*** Caution:** Uni-Torque set screws should not be used on steel pipe thinner than schedule 40 or ductile iron pipe thinner than class 52.

Recommended Set Screw Torque Values

Series 200 / 400 / 420

Series 200 Adapter Flange

FLANGE SIZE	SET SCREW SIZE	RECOMMENDED SET SCREW TORQUE VALUES (FT. LBS.)												
		DUCTILE IRON PIPE (CLASS)				STEEL PIPE (SCHEDULE)				DUCTILE IRON PIPE (PRESSURE CLASS)				
		50	51	52	53+	10	20	30	40+	150	200	250	300	350
2"	1/2"x1"	-	-	70	70	30	-	-	35	-	-	-	-	-
2-1/2"	1/2"x1"	-	-	-	-	30	-	-	35	-	-	-	-	-
3"	1/2"x1"	-	50	70	70	30	-	-	70	-	-	-	-	50
4"	1/2"x1"	-	50	70	70	30	-	-	70	-	-	-	-	50
5"	1/2"x1"	-	-	-	-	30	-	-	70	-	-	-	-	50
6"	1/2"x1"	50	60	70	70	30	-	-	90	-	-	-	-	50
8"	5/8"x1-1/4"	50	60	90	90	30	50	90	90	-	-	-	-	50
10"	5/8"x1-1/4"	50	60	90	90	40	50	90	90	-	-	-	-	50
12"	5/8"x1-1/4"	50	60	90	90	40	50	90	90	-	-	-	-	50

Series 400 and 420 Adapter Flanges

FLANGE SIZE	SET SCREW SIZE	RECOMMENDED SET SCREW TORQUE VALUES (FT. LBS.)												
		DUCTILE IRON PIPE (CLASS)				STEEL PIPE (SCHEDULE)				DUCTILE IRON PIPE (PRESSURE CLASS)				
		50	51	52	53+	10	20	30	40+	150	200	250	300	350
2"	1/2"x1"	-	-	70	70	30	-	-	35	-	-	-	-	-
2-1/2"	1/2"x1"	-	-	-	-	30	-	-	35	-	-	-	-	-
3"	1/2"x1"	-	50	70	70	30	-	-	70	-	-	-	-	50
3-1/2"	1/2"x1"	-	-	-	-	30	-	-	70	-	-	-	-	50
4"	1/2"x1"	-	50	70	70	30	-	-	70	-	-	-	-	50
5"	1/2"x1"	-	-	-	-	30	-	-	70	-	-	-	-	50
6"	5/8"x1-1/4"	50	60	80	80	30	-	-	90	-	-	-	-	50
8"	5/8"x1-1/4"	50	60	80	80	30	50	90	90	-	-	-	-	50
10"	5/8"x1-1/4"	50	60	80	80	40	50	90	90	-	-	-	-	50
12"	5/8"x1-1/4"	50	60	80	80	40	50	90	90	-	-	-	-	50
14"	5/8"x1-1/4"	60	70	90	90	-	60	90	90	-	-	50	50	60
16"	5/8"x1-1/4"	60	70	90	90	-	60	90	90	-	-	50	60	60
18"	3/4"x2"	70	80	115	115	-	60	100	115	-	-	60	70	70
20"	3/4"x2"	70	80	115	115	-	70	100	115	-	-	70	70	70
24"	3/4"x2"	70	80	115	115	-	70	100	125	-	70	70	70	80
30"	1"x2-1/4"	90	110	125	125	-	-	-	125	70	80	90	110	125
36"	1"x2-1/4"	90	110	125	125	-	-	-	125	80	90	90	110	125
42"	1"x2-1/4"	90	110	125	125	-	-	-	125	90	90	90	110	125
48"	1"x2-1/4"	90	110	125	125	-	-	-	-	90	90	110	110	125

Adapter Flanges are not suitable for use on spiral, butt-welded steel pipe.

Deflection Chart

Series 200 / 400 / 420

Uni-Flange® Adapters may be used to join flanged pipes and fittings that are slightly misaligned. They offer the following deflection capabilities at full rated working pressure of the flange. Maximum angles of deflection may require an angular pipe cut to provide sufficient pipe insertion for proper gasket compression.

NOM. PIPE SIZE	DUCTILE IRON PIPE O.D. (IN.)	STEEL PIPE O.D. (IN.)	MAXIMUM ANGLE DEFLECTION	DEFLECTION IN./18 FT. LENGTH (IN.)
2"	2.50	2.375	4° - 2'	15.23
2-1/2"	N/A	2.875	3° - 56'	14.85
3"	3.96	3.500	3° - 50'	14.47
3-1/2"	N/A	4.000	3° - 47'	14.28
4"	4.80	4.500	3° - 44'	14.09
5"	N/A	5.563	3° - 41'	13.91
6"	6.90	6.625	3° - 36'	13.59
8"	9.05	8.625	3° - 20'	12.58
10"	11.10	10.750	3° - 13'	12.14
12"	13.20	12.750	2° - 35'	9.12
14"	15.30	14.000	2° - 20'	8.80
16"	17.40	16.000	2° - 5'	7.86
18"	19.50	18.000	2° - 0'	7.54
20"	21.60	20.000	1° - 56'	7.29
24"	25.80	24.000	1° - 37'	6.10
30"	32.00	30.000	1° - 35'	5.97
36"	38.30	36.000	1° - 23'	5.22
42"	44.50	42.000	1° - 11'	4.46
48"	50.80	48.000	1° - 2'	3.89

Thrust Restraint

The Uni-Flange® Adapter Series offers the following thrust restraint capabilities.

NOM. PIPE SIZE	SERIES 200		SERIES 400		SERIES 420	
	WWP RATING (PSI)	THRUST AT RATED PRESSURE (LBS.)	WWP RATING (PSI)	THRUST AT RATED PRESSURE (LBS.)	WWP RATING (PSI)	THRUST AT RATING PRESSURE (LBS.)
2"	200	892	250	1,115	400	1,784
3"	200	1,922	250	2,403	400	3,844
4"	200	3,181	250	3,975	400	6,360
6"	200	6,924	250	8,655	400	13,848
8"	200	11,724	250	14,655	400	23,448
10"	175	15,911	250	22,730	400	36,368
12"	175	22,375	250	31,965	400	51,144
14"	-	-	150	23,091	-	-
16"	-	-	150	30,159	-	-
18"	-	-	150	38,170	-	-
20"	-	-	150	47,124	-	-
24"	-	-	150	67,858	-	-
30"	-	-	100	70,686	-	-
36"	-	-	100	101,790	-	-
42"	-	-	100	138,540	-	-
48"	-	-	100	180,956	-	-

These values are calculated using steel pipe outside diameter dimensions.

Specifications - Uni-Flange® Series 900 Adapter Flange

Features of the 900-C and the 900-S Series Adapter Flange for PVC Pipe

The Series 900 Adapter Flange joins plain-end PVC pipe to valves, pumps, meters and virtually all types of liquid and process equipment. The flange provides a power-tight, rigid flanged connection; it eliminates solvent welding, tie rodding, harnessing and other forms of restraint. The 900 Adapter Flange also facilitates maintenance of flanged systems and equipment - simply loosen the bolts and remove the flange.

The 900 Adapter Flange provides positive end restraint with a series of serrations on the inside of the flange. When the two flange halves are brought together by tightening the clamping bolts, these serrations lock the flange onto the pipe. The exclusive dual seal gasket is then added (no other gasket is necessary). Tightening the flange bolts compresses the gasket against the facing flange and down onto the pipe surface, providing a leak-proof seal.

Series 900 - Material: Ductile Iron
ASTM A536, Grade 65-45-12

Color Code:

Red for PVC with ductile iron pipe O.D.
Gray for PVC with steel pipe O.D.

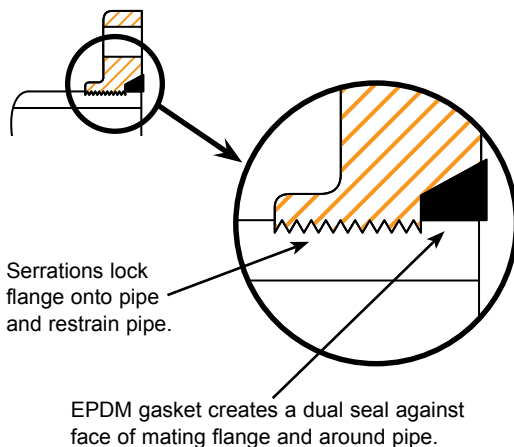
Clamping Bolts and Nuts

Drilling - ANSI B16.1 - 125 lb.
for cast iron flanges.
ANSI B16.5 - 150 lb. for steel
flanges.

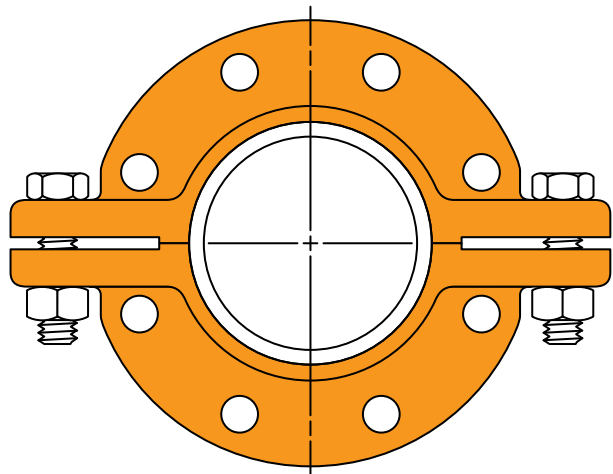
Gasket - EPDM (-65° to 300°F)
suitable for water and wastewater,
ozone and strong oxidizing
chemicals

Series 900 Installed

Lock and Seal Features of Series 900



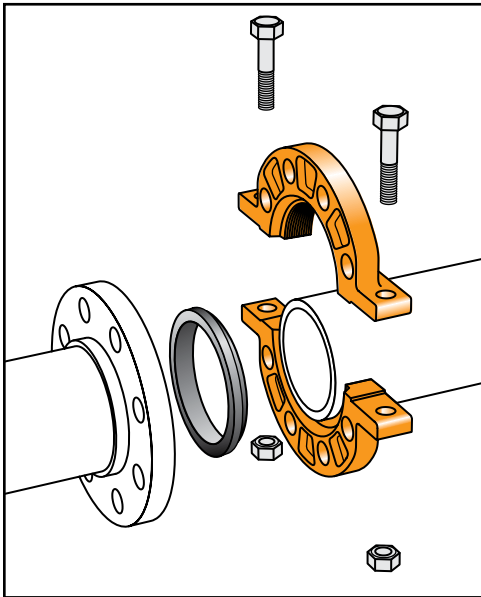
Symmetrical Force Will Not Point Load Pipe



Uni-Flange® Series 900 Adapter Flange

For PVC Pipe

Installation Instructions for Series 900 Adapter Flange

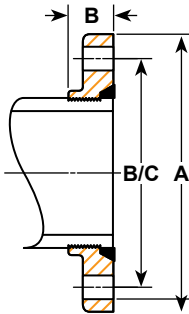


1. Cut PVC pipe to the required length. Make sure the end is clean, cut square, and free from bevels, burrs or shavings.
2. It is important to first position flange halves on pipe so that the face of the flange is aligned evenly with the square cut end of the pipe. Insert and tighten side clamping bolts alternating incrementally and evenly to the minimum recommended torque (2" - 6" 100 ft lb, 8" 150 ft lb, 10" - 12" 200 ft lb). Use of a torque wrench is recommended and required to ensure proper torque.
3. Then lubricate gasket (with a soap-based lubricant), and position it on the pipe with the tapered end in the flange gasket cavity extending slightly beyond the pipe end. No additional gaskets should be used.
4. Insert and snug all flange bolts. Beginning with the bolts closest to the side clamping bolts and working inwards, tighten the flange bolts evenly and alternately to 100 ft-lb.

Notes: The Series 900 is designed for use on PVC pipe ONLY; it is NOT recommended for use on metallic pipe. For installations on metallic pipe, use Uni-Flange® Series 200, 400 and 420.

In installations where rapid or excessive surges may occur, or extreme thrusts encountered (e.g. near pumps or 90° bends), Ford engineers recommend the use of tie rods for additional thrust restraint.

Consult the Ford Meter Box website for the most current installation instructions.



Series 900 Adapter Flange for PVC Pipe
Flange Drilling ANSI B16.1 125 lb. /
ANSI B16.5 150 lb.

NOM. PIPE SIZE	PVC PIPE WITH STEEL PIPE OD		PVC PIPE WITH OD DUCTILE IRON PIPE		APPROX. WT. LBS.	DIMENSIONS			FLANGE BOLTS		CLAMPING BOLTS	
	O.D.	CAT. NO.	O.D.	CAT. NO.		A	B	BC	No.	BOLT HOLE DIAMETER	No.	SIZE
4"	4.50	UFA900-S-4	4.80	UFA900-C-4	13.0	9	1.50	7.50	8	3/4"	2	5/8"x3"
6"	6.63	UFA900-S-6	6.90	UFA900-C-6	16.0	11	1.56	9.50	8	7/8"	2	5/8"x3"
8"	8.63	UFA900-S-8	9.05	UFA900-C-8	25.0	13.5	1.88	11.75	8	7/8"	2	3/4"x3-1/2"
10"	-	-	11.10	UFA900-C-10	39.0	16	2.00	14.25	12	1"	2	7/8"x5"
12"	-	-	13.20	UFA900-C-12	54.0	19	2.25	17.00	12	1"	2	7/8"x5"

Note: Flanges are furnished with EPDM gaskets.

All dimensions in inches unless otherwise stated.

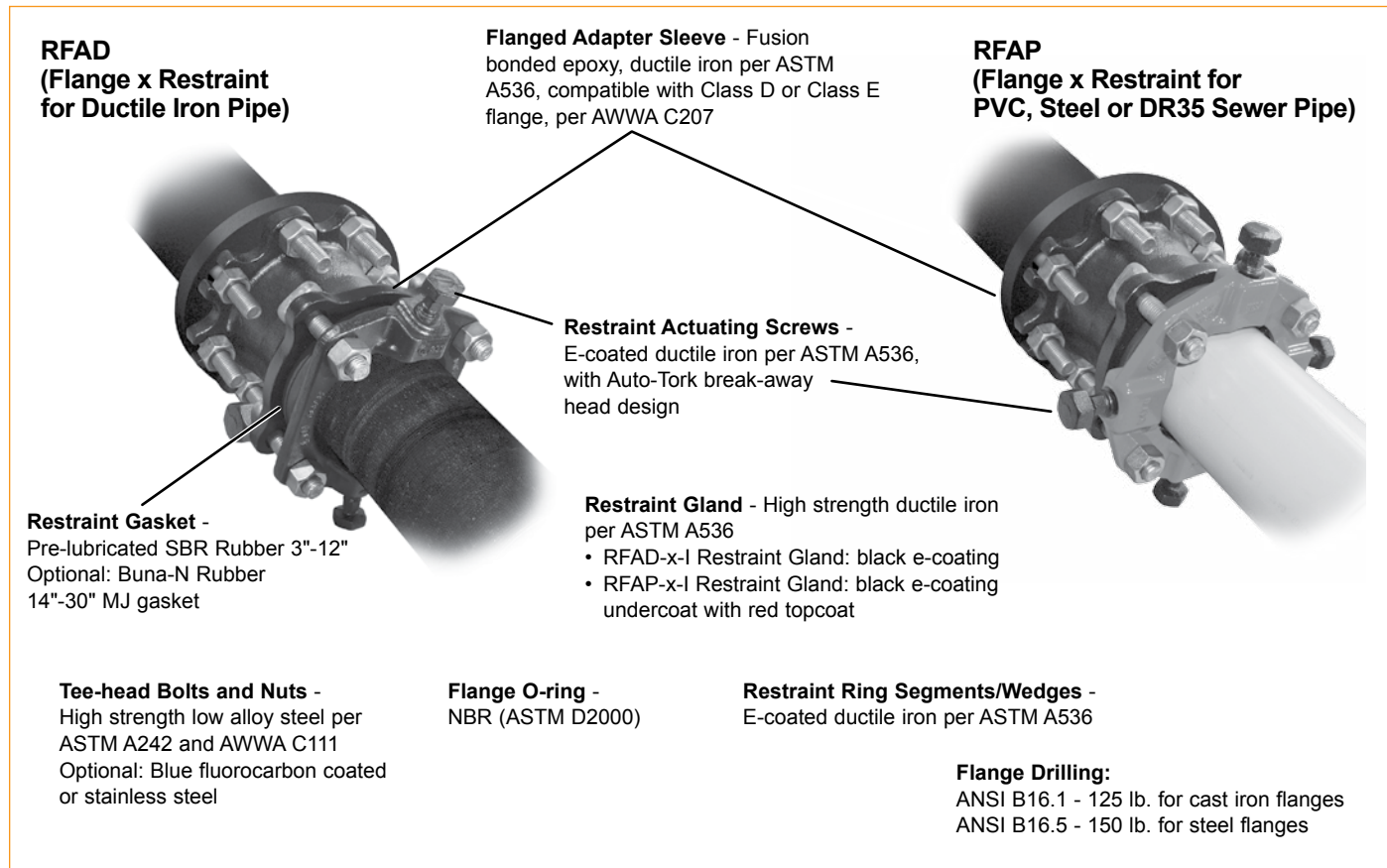
Series 900 Applications / Pressure Rating

PRODUCT TYPE	NOM. SIZE	PIPE STANDARD	TYPE	PIPE PRESSURE RATING (PSI)
Series 900-C	4"-12"	AWWA C900	DR14	305
			DR18	235
			DR25	165
Series 900-S	4"	ASTM D2241	SDR21	200
	6"		SDR26	160
	8"		SDR32.5	125
	4"	ASTM 1785	Schedule 40	220
	6"			180
	8"			160
	4"	ASTM 1785	Schedule 80	320
	6"			280
	8"			250

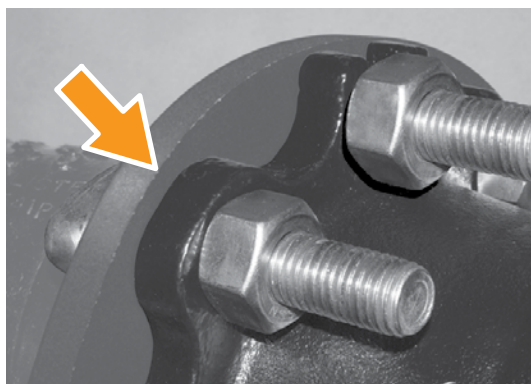
Specifications - Restrained Flange Adapter

Flange and Restraint Devices for Ductile Iron, PVC, Steel or *DR35 Sewer Pipe

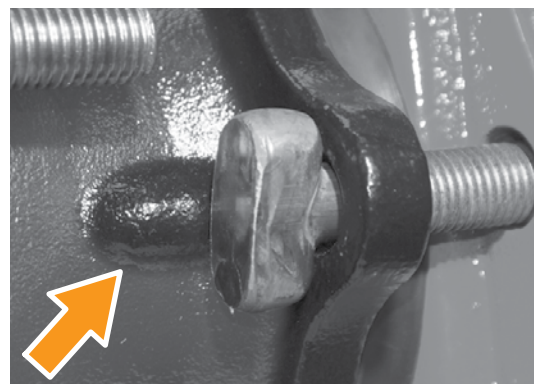
A quick and easy way to convert a plain end pipe to a restrained flange connection. These restrained flange adapters provide a true stab fit with no disassembly required. Designed with the UFR1400 or UFR1500 restraints and the SO-EZ gasket, the 4" - 12" RFAP restrained flange adapter accommodates a wider range within a nominal size pipe than any other.



- 2:1 safety factor at the full rated pressure of the pipe on which it is assembled
- Over 2" of pipe insertion adjustment can allow for uneven pipe cuts and pipe deflection



Flange end has two closed starter lugs. This allows the adapter to remain in position while assembling the other flange bolts.



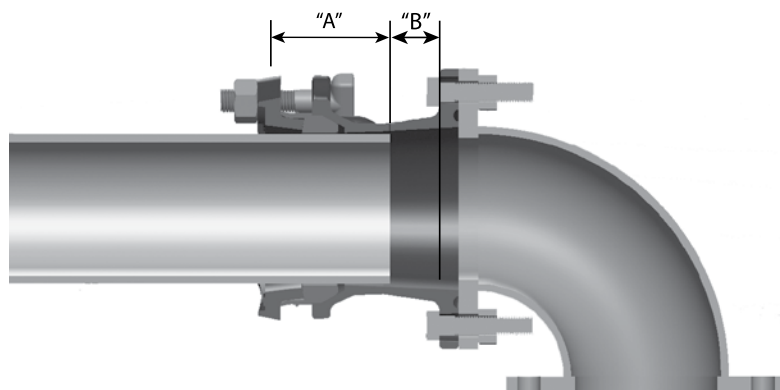
Bolt stop prevents tee-head bolts from turning during installation.

◁FM▷ Approved 4" - 12"



Uni-Flange® Restrained Flange Adapter

Flange and Restraint Devices for Ductile Iron, PVC, Steel or *DR35 Sewer Pipe



RFAD FOR DUCTILE IRON PIPE

NOMINAL PIPE SIZE	CATALOG NUMBER	PIPE O.D.	**DIMENSION "A" MIN. PIPE INSERTION	**DIMENSION "B" PIPE ADJUSTABILITY	MAX. DEFLECTION ALLOWANCE	APPROX. WT. LBS.
3"	RFAD-3-I	3.96	4-1/2"	2"	5°	19
4"	RFAD-4-I	4.80	4-1/2"	2"	5°	23
6"	RFAD-6-I	6.90	4-5/8"	2-7/8"	5°	32
8"	RFAD-8-I	9.05	4-13/16"	3"	5°	45
10"	RFAD-10-I	11.10	4-3/4"	3-3/8"	3°	61
12"	RFAD-12-I	13.20	4-3/4"	3-5/8"	3°	82

FABRICATED RFAD FOR DUCTILE IRON PIPE

14"	RFAD-1530-D14R-(I or U)	15.30	4-3/8"	3-3/4"	3°	135
16"	RFAD-1740-D16R-(I or U)	17.40	4-7/16"	3-3/4"	3°	170
18"	RFAD-1950-D18R-(I or U)	19.50	4-1/2"	3-3/4"	3°	185
20"	RFAD-2160-D20R-(I or U)	21.60	4-9/16"	3-3/4"	3°	215
24"	RFAD-2580-D24R-(I or U)	25.80	4-3/4"	3-3/4"	3°	275
30"	RFAD-3200-D30R-(I or U)	32.00	5-7/16"	3-1/2"	1°	550
36"	RFAD-3830-D36R-(I or U)	38.30	5-7/16"	3-1/2"	1°	680

Reducing RFAs available in sizes 14" - 36". Contact factory for details.

RFAP FOR C900, IPS PVC, STEEL, C909 AND *DR35 SEWER PIPE

NOMINAL PIPE SIZE	CATALOG NUMBER	PIPE O.D.	**DIMENSION "A" MIN. PIPE INSERTION	**DIMENSION "B" PIPE ADJUSTABILITY	MAX. DEFLECTION ALLOWANCE	APPROX. WT. LBS.
3"	RFAP-3-I	3.50	4-5/8"	2"	5°	23
4"	RFAP-4-I	4.21-4.80	4-5/8"	2"	5°	27
6"	RFAP-6-I	6.27-6.90	4-3/4"	2-7/8"	5°	38
8"	RFAP-8-I	8.40-9.05	4-13/16"	3"	5°	50
10"	RFAP-10-I	10.50-11.10	4-7/8"	3-3/8"	3°	65
12"	RFAP-12-I	12.50-13.20	4-7/8"	3-5/8"	3°	85

FABRICATED RFAP FOR C905 PVC PIPE

14"	RFAP-1530-D14R-(I or U)	15.30	6-1/16"	2-1/8"	3°	150
16"	RFAP-1740-D16R-(I or U)	17.40	6-1/8"	2-1/8"	3°	200
18"	RFAP-1950-D18R-(I or U)	19.50	6-1/8"	2-1/8"	3°	215
20"	RFAP-2160-D20R-(I or U)	21.60	6-3/16"	2-1/8"	3°	250
24"	RFAP-2580-D24R-(I or U)	25.80	6-7/16"	2-1/8"	3°	330
30"	RFAP-3200-D30R-(I or U)	32.00	6-5/8"	2-1/8"	1°	520
36"	RFAP-3830-D36R-(I or U)	38.30	6-3/4"	2-1/8"	1°	650

Reducing RFAs available in sizes 14" - 36". Contact factory for details.

PRESSURE RATING FOR C900, IPS PVC, C909 AND *DR35 SEWER PIPE

C900			ASTM D2241		C909	SDR35
DR25	DR18	DR14	SDR26	SDR21	PC150	
165 PSI	235 PSI	305 PSI	160 PSI	200 PSI	150 PSI	PS _≥ 46 PSI

** Not accounting for beveled, unsquared or deflected pipe ends.

*DR35 sewer applications require Buna-N gasket, add "-N" to end of catalog number.

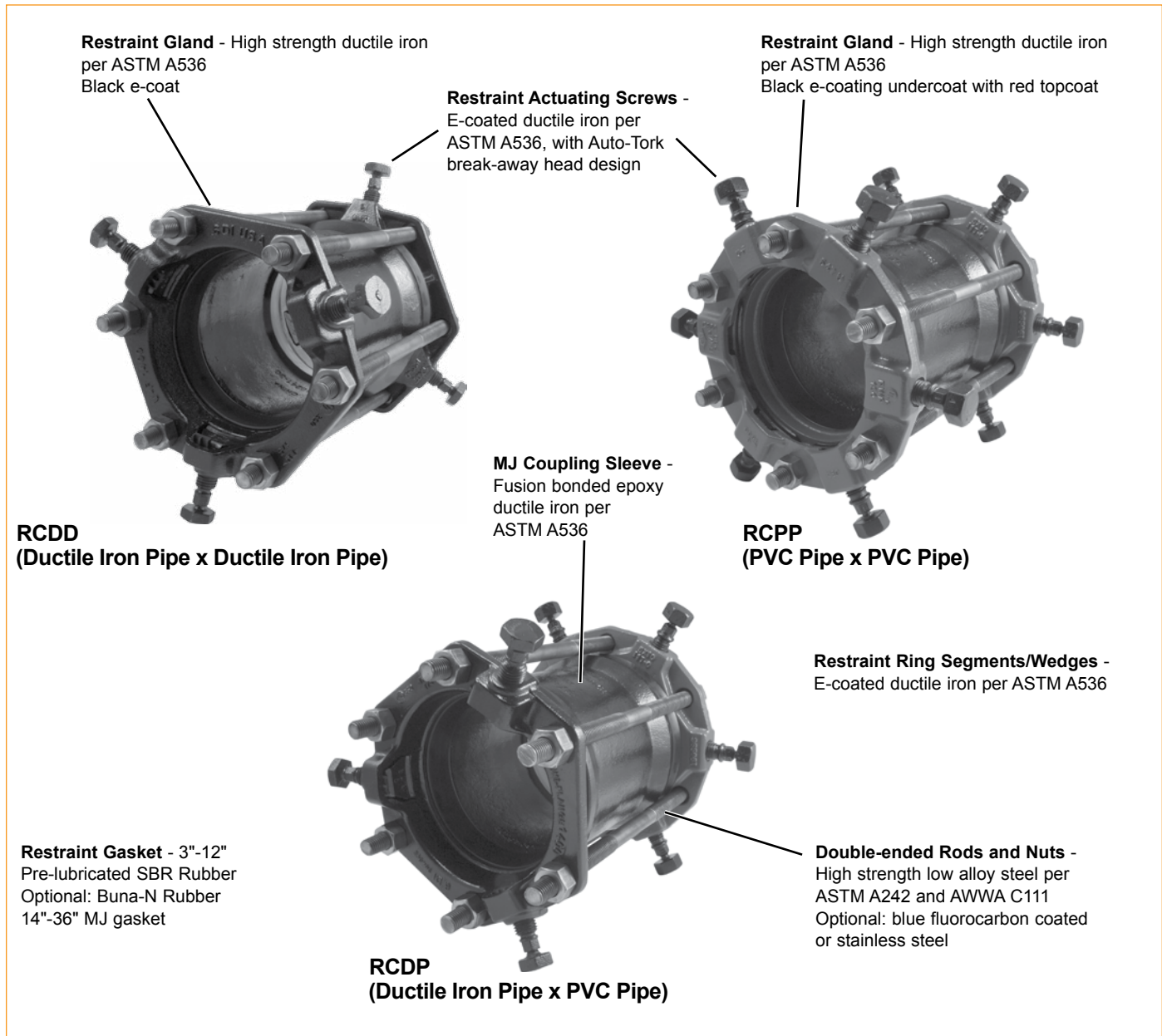
I = Import Casting U = Domestic Casting

Specifications - Restrained Couplings

Coupling and Restraint Devices for Ductile Iron, PVC, Steel or *DR35 Sewer Pipe

Restraining your pipe coupling just got SO-EZ using Ford's (stab-fit) restrained coupling.

Designed with the UFR1400 or UFR1500 restraints and the SO-EZ gasket, the 4" - 12" RCPP and RCDP restrained couplings accommodate a wider range within a nominal size pipe than any other.



- Sizes 3" - 36"
- Restraint glands epoxy coated
- A true stab fitting in sizes 3"- 12", no disassembly required
- Restrains plain-end pipe to plain-end pipe
- 7-1/2" sleeve in sizes 3"-12", 10" sleeve in sizes 14"-36"
- Corrosion resistant, high strength, low alloy steel rods and nuts
- 2:1 safety factor at the full rated pressure of the pipe on which it is installed

*SDR35 sewer applications require Buna-N gasket, add "-N" to end of catalog number.

Uni-Flange® Restrained Couplings

Coupling and Restraint Devices for Ductile Iron, PVC, Steel or *DR35 Sewer Pipe



RCDD FOR DUCTILE IRON PIPE

NOMINAL PIPE SIZE	CATALOG NUMBER	PIPE O.D.	MAX. DEFLECTION ALLOWANCE	APPROX. WT. LBS.
3"	RCDD-3-I	3.96	5°	27
4"	RCDD-4-I	4.80	5°	34
6"	RCDD-6-I	6.90	5°	48
8"	RCDD-8-I	9.05	5°	61
10"	RCDD-10-I	11.10	5°	84
12"	RCDD-12-I	13.20	5°	101

FABRICATED RCDD FOR DUCTILE IRON PIPE (MJ GASKETS)

14"	RCDD-14-(I or U)	15.30	3°	173
16"	RCDD-16-(I or U)	17.40	3°	200
18"	RCDD-18-(I or U)	19.50	3°	235
20"	RCDD-20-(I or U)	21.60	3°	265
24"	RCDD-24-(I or U)	25.80	3°	320
30"	RCDD-30-(I or U)	32.00	1°	580
36"	RCDD-36-(I or U)	38.30	1°	660

Transition and reducing couplings available in sizes 14" through 36", contact factory for more information.

RCPP FOR C900, IPS PVC, STEEL, C909 AND *DR35 SEWER PIPE

NOMINAL PIPE SIZE	CATALOG NUMBER	PIPE O.D.	MAX. DEFLECTION ALLOWANCE	APPROX. WT. LBS.
3"	RCPP-3-I	3.50	5°	35
4"	RCPP-4-I	4.21-4.80	5°	41
6"	RCPP-6-I	6.27-6.90	5°	59
8"	RCPP-8-I	8.40-9.05	5°	72
10"	RCPP-10-I	10.50-11.10	5°	94
12"	RCPP-12-I	12.50-13.20	5°	106



FABRICATED RCPP FOR C905 PVC PIPE

14"	RCPP-14-(I or U)	15.30	3°	185
16"	RCPP-16-(I or U)	17.40	3°	225
18"	RCPP-18-(I or U)	19.50	3°	270
20"	RCPP-20-(I or U)	21.60	3°	310
24"	RCPP-24-(I or U)	25.80	3°	405
30"	RCPP-30-(I or U)	32.00	1°	525
36"	RCPP-36-(I or U)	38.30	1°	630

Transition and reducing couplings available in sizes 14" through 36", contact factory for more information.

RCDP FOR DUCTILE IRON PIPE BY PVC, STEEL, OR *DR35 SEWER PIPE

NOMINAL PIPE SIZE	CATALOG NUMBER	PIPE O.D. FOR DUCTILE IRON PIPE	PIPE O.D. FOR PVC, STEEL OR SDR35 PIPE	MAX. DEFLECTION ALLOWANCE	APPROX. WT. LBS.
3"	RCDP-3-I	3.96	3.50	5°	31
4"	RCDP-4-I	4.80	4.21-4.80	5°	38
6"	RCDP-6-I	6.90	6.27-6.90	5°	55
8"	RCDP-8-I	9.05	8.40-9.05	5°	66
10"	RCDP-10-I	11.10	10.50-11.10	5°	89
12"	RCDP-12-I	13.20	12.50-13.20	5°	103



FABRICATED RCDP FOR JOINING DUCTILE IRON PIPE TO C905 PIPE

14"	RCDP-14-(I or U)	15.30	15.70	3°	180
16"	RCDP-16-(I or U)	17.40	17.40	3°	215
18"	RCDP-18-(I or U)	19.50	19.50	3°	252
20"	RCDP-20-(I or U)	21.60	21.60	3°	285
24"	RCDP-24-(I or U)	25.80	25.80	3°	360
30"	RCDP-30-(I or U)	32.00	32.00	1°	550
36"	RCDP-36-(I or U)	38.30	38.30	1°	600

Transition and reducing couplings available in sizes 14" through 36", contact factory for more information.

Pressure Rating for C900, IPS PVC, C909 and *DR35 Sewer Pipe

C900		ASTM D2241			C909	SDR35
DR25	DR18	DR14	SDR26	SDR21	PC150	
165 PSI	235 PSI	305 PSI	160 PSI	200 PSI	150 PSI	PS _≥ 46 PSI

I = Import Casting U = Domestic Casting

*DR35 sewer applications require Buna-N gasket, add "-N" to end of catalog number.

Specifications - Uni-Flange® Series 1300

Series 1300 Uni-Flange® Restraint Device for PVC Pipe used with Mechanical Joint / *Push-on Fittings

A fast, economical method of restraining water main fittings, valves and hydrants used in PVC piping systems, the Uni-Flange® Series 1300 offers guaranteed joint restraint, in every soil condition, every time. It eliminates the need for expensive, time consuming concrete thrust blocks.

The Series 1300 is a split design, incorporating a series of serrations on the inside surface. When the side clamping bolts are tightened, the serrations lock the device onto the pipe surface, providing total axial thrust restraint.

Features:

- Full contact and support of the pipe wall
- Ideal companion for push-on fittings (4" – 12")
- * Rated at full working pressure rating of any class of PVC pipe, minimum 2:1 safety factor
- Does not replace the follower gland - mechanical joint retains full deflection capabilities
- Can be installed outside of the trench, prior to pipe laying
- 4" through 16" "C" Style units can be used on ductile iron pipe, see page U-32 for installation and pressure qualifications

Series 1300 Restrainer -

Ductile Iron ASTM A536, Grade 65-45-12 or ASTM A36 Structural Steel

Color Code:

Black for PVC with ductile iron pipe O.D.

Gray for PVC with steel pipe O.D.

Contact factory for coating options.

Side Clamping Bolts and Nuts

T-Bolts / Studs -

High Strength, Low Alloy Steel

ANSI / AWWA C111 / A21.11

Optional: Type 304 Stainless Steel.

Sample Applications



Series 1300 Restraining push-on fitting



Series 1300 Restraining MJ Fitting

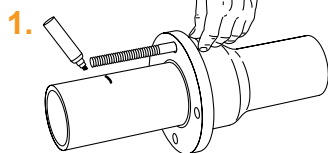


Series 1300 Restraining MJ End Cap

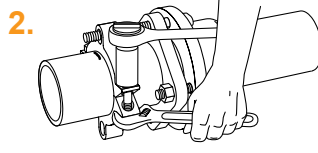
FM Approved
1300C Approved
4", 6", 8" and 10"

2"-12"

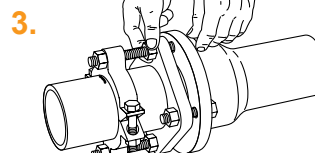
Installation Instructions



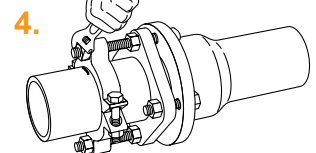
1. Insert pipe into the mechanical joint bell. Insert one of the extra long T-Bolts provided with the Series 1300 through one of the flange holes, mark a line on the pipe approximately 1 inch back from the end of the bolt.



2. Assemble the MJ gland, gasket and bolts to AWWA standards. Assemble Series 1300 clamping ring onto the pipe, even with line. (Make sure restrainer ears line up with bolt hole in MJ gland as shown.) Tighten clamping bolts evenly to recommended torque.

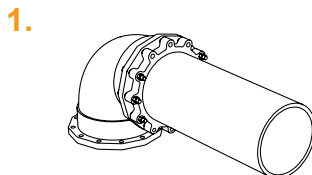


3. Insert the extra long T-Bolts/rods provided with the Series 1300 and install one nut each between the gland and clamping ring as shown.

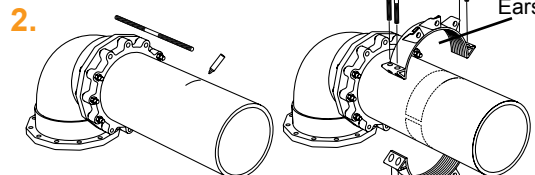


4. Tighten nuts against MJ gland to AWWA standards. Snug retaining nuts behind restrainer ears. **Do not over-tighten retaining nuts.**

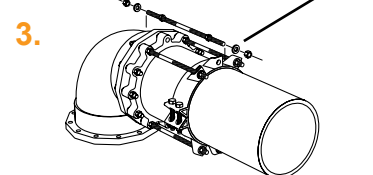
14"-42"



1. Assemble the mechanical joint, installing gasket, gland and T-Bolts to AWWA standards. Leave out T-Bolts corresponding to "ears" on 1300 Restrainer.



2. Use one of the rods (provided) as a guide to position 1300. Leave sufficient threads on the rod ends to fully engage nuts. Tighten clamping bolts to torque recommended on restrainer label, ensuring the gap between pads on both sides remains even. Stated torque values are the minimum requirement.

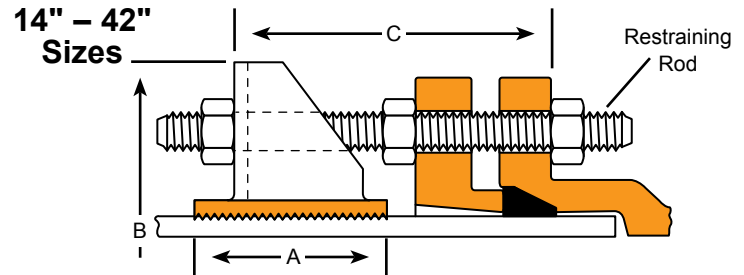
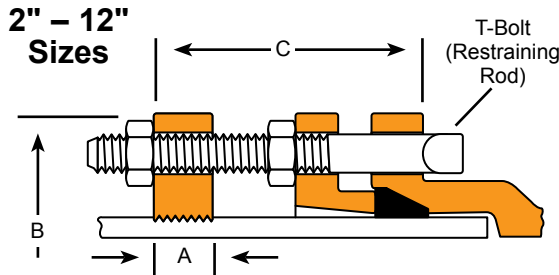


3. Connect 1300 to fitting by inserting studs through restrainer ear, gland and fitting bolt hole. Install one nut behind fitting bell, one against the gland and one behind restrainer ear (against washer which is provided).

*The safety factor is derated on 10" and 12" push-on joints that do not accommodate all of the 1300 T-Bolts. Consult the Ford Meter Box website for the most current installation instructions.

Uni-Flange® Series 1300 Pipe Restraint

**** Restraint Device for PVC Pipe used with Mechanical Joint / *Push-on Fittings**



NOM. PIPE SIZE	PVC PIPE WITH STEEL PIPE O.D. STYLE 1300-S		A	B APPROX.	C MAX.	RESTRAINT BOLTS / RODS		CLAMPING BOLTS		APPROX. WT. LBS.
	O.D.	CATALOG NUMBER				NO.	SIZE	NO.	SIZE	
2"	2.38	UFR1300-S-2-I	1-1/8"	6-1/4"	4"	2	5/8"x5"	2	5/8"x3-1/2"	6.3
2-1/2"	2.88	UFR1300-S-25-I	1-1/8"	6-7/8"	4"	2	5/8"x5"	2	5/8"x3-1/2"	7.4
3"	3.50	UFR1300-S-3-I	1-1/8"	7-11/16"	4"	2	5/8"x5"	2	5/8"x3-1/2"	7.4
4"	4.50	UFR1300-S-4-I	1-1/8"	9-1/8"	6"	2	3/4"x7"	2	5/8"x3-1/2"	8.5
6"	6.63	UFR1300-S-6-I	1-1/8"	11-1/8"	6"	2	3/4"x7"	2	5/8"x3-1/2"	10.0
8"	8.63	UFR1300-S-8-I	1-1/4"	14-5/8"	6"	2	3/4"x7"	2	3/4"x4"	15.5
10"	10.75	UFR1300-S-10-I	1-3/8"	16-5/8"	6"	4	3/4"x7"	2	7/8"x5"	26.5
12"	12.75	UFR1300-S-12-I	1-3/8"	19-1/4"	6"	4	3/4"x7"	2	7/8"x5"	28.5
14"	14.00	UFR1300-S-14-U	4"	22-1/2"	15"	6	3/4"x17"	4	7/8"x7"	72.5
16"	16.00	UFR1300-S-16-U	4"	24-9/16"	15"	6	3/4"x17"	4	7/8"x7"	77.0
18"	18.00	UFR1300-S-18-U	5"	26-11/16"	15"	8	3/4"x17"	4	1"x7"	109.0
20"	20.00	UFR1300-S-20-U	5"	29-3/16"	22"	8	3/4"x24"	6	1-1/8"x9"	144.0
24"	24.00	UFR1300-S-24-U	5"	33-7/8"	22"	12	3/4"x24"	6	1-1/8"x9"	220.0
30"	30.00	UFR1300-S-30-U	10"	40-9/10"	22"	12	1"x24"	6	1-1/8"x9"	325.0
36"	36.00	UFR1300-S-36-U	10"	48"	22"	12	1"x24"	6	1-1/8"x9"	360.0

NOM. PIPE SIZE	PVC PIPE WITH DUCTILE IRON PIPE O.D. STYLE 1300-C-I			CLAMPING BOLTS		** PVC PIPE WITH DUCTILE IRON PIPE O.D. STYLE 1300-C-U			CLAMPING BOLTS		A	B APPROX.	C MAX.	RESTRAINT BOLTS / RODS		APPROX. WT. LBS.
	O.D.	CATALOG NUMBER	No.	SIZE	O.D.	CATALOG NUMBER	No.	SIZE	No.	SIZE						
														No.	SIZE	
4"	4.80	UFR1300-C-4-I	2	5/8"x3-1/2"	4.80	UFR1300-C-4-U	2	5/8"x3-1/2"	1-1/8"	9-1/8"	6"	2	3/4"x7"	8.5		
6"	6.90	UFR1300-C-6-I	2	5/8"x3-1/2"	6.90	UFR1300-C-6-U	2	5/8"x3-1/2"	1-1/8"	11-1/8"	6"	2	3/4"x7"	10.0		
8"	9.05	UFR1300-C-8-I	2	3/4"x4"	9.05	UFR1300-C-8-U	2	3/4"x4"	1-1/4"	14-5/8"	6"	2	3/4"x7"	15.5		
10"	11.10	UFR1300-C-10-I	2	7/8"x5"	11.10	UFR1300-C-10-U	2	7/8"x5"	1-3/8"	16-5/8"	6"	4	3/4"x7"	26.5		
12"	13.20	UFR1300-C-12-I	2	7/8"x5"	13.20	UFR1300-C-12-U	2	7/8"x5"	1-3/8"	19-1/4"	6"	4	3/4"x7"	28.5		
14"	15.30	UFR1300-C-14-I	4	7/8"x7"	15.30	UFR1300-C-14-U	4	7/8"x5"	4"	22-1/2"	15"	6	3/4"x17"	72.5		
16"	17.40	UFR1300-C-16-I	4	7/8"x7"	17.40	UFR1300-C-16-U	4	7/8"x5"	4"	24-9/16"	15"	6	3/4"x17"	77.0		
18"	19.50	UFR1300-C-18-I	4	1"x7"	19.50	UFR1300-C-18-U	4	1"x7"	5"	26-11/16"	15"	8	3/4"x17"	109.0		
20"	21.60	UFR1300-C-20-I	4	1-1/8"x9"	21.60	UFR1300-C-20-U	4	1-1/8"x5-1/2"	5"	29-3/16"	22"	8	3/4"x24"	144.0		
24"	25.80	UFR1300-C-24-I	4	1-1/8"x9"	25.80	UFR1300-C-24-U	4	1-1/8"x5-1/2"	5"	33-7/8"	22"	12	3/4"x24"	220.0		
30"	32.00	UFR1300-C-30-I	6	1-1/8"x6"	32.00	UFR1300-C-30-U	6	1-1/8"x9"	10"	40-9/10"	22"	12	1"x24"	325.0		
36"	38.30	UFR1300-C-36-I	6	1-1/8"x6"	38.30	UFR1300-C-36-U	6	1-1/8"x9"	10"	48"	22"	12	1"x24"	360.0		
42"	44.50	UFR1300-C-42-I	8	1-1/8"x6"	44.50	N/A	N/A	N/A	10-3/4"	57-9/16"	22"	16	1-1/4"x24"	487.0		

I = Import Casting U = Domestic Casting or Fabrication

Note: 14" - 42" are non-returnable and may be subject to a cancellation fee.

** 4" through 16" "C" style units can be used on ductile iron pipe. See page U-32 for installation and pressure qualifications.

All dimensions in inches unless otherwise stated.

Suggested Specification - Series 1300

Restraint devices for PVC pipe shall incorporate a series of serrations on the inside diameter to provide positive restraint, exact fit, and full contact and support of the pipe wall. Restraint devices shall be manufactured of high strength ductile iron, ASTM A536, Grade 65-45-12 or ASTM A36 structural steel. Bolts and connecting hardware shall be of high strength low alloy material in accordance with ANSI / AWWA C111/A21.11.

All restraint devices for PVC pipe shall have a water working pressure rating equivalent to the full rated pressure of the PVC pipe on which they are installed, with a minimum 2:1 safety factor in any nominal pipe size. Notarized certification from the manufacturer of the restraint device shall be provided with submittals. Restraint devices for Mechanical Joint or Push-on fittings shall be Uni-Flange® 1300 or approved equal.

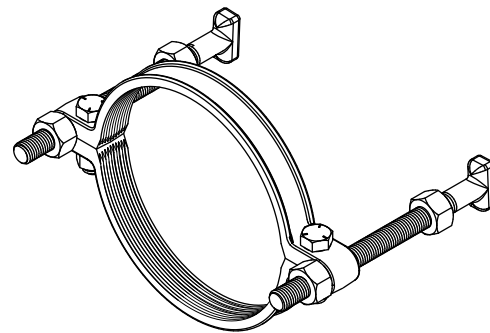
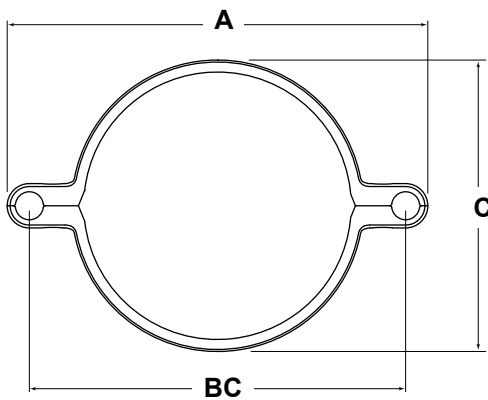
*The safety factor is derated on push-on joints that do not accommodate all of the 1300 T-Bolts.

Uni-Flange® Series 1300-P Pipe Restraint

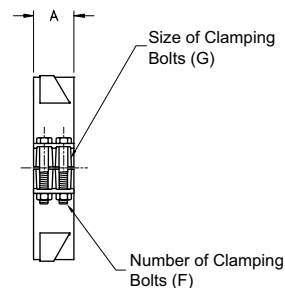
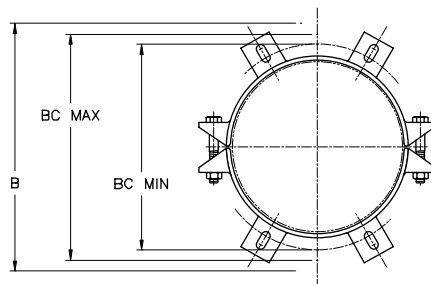
Restraint Device for Sewer Pipe

Features:

- Specially designed for ASTM 3034 type PSM sewer pipe
- Optimized clamping bolt/tie rod location minimizes pipe wall stress, ideal for thin wall pipe
- Rods are high strength, low alloy steel per ANSI/AWWA C111/A21.11
- High-quality ductile iron construction per ASTM A536 4" – 12"
- Carbon steel per ASTM A36 15" – 27"
- Epoxy e-coat for superior corrosion resistance
- 50 PSI working pressure rating 2:1 safety factor



NOM. PIPE SIZE	SEWER PIPE STYLE 1300-P		A	BC	C	RESTRAINT BOLTS / RODS		CLAMPING BOLTS		APPROX. WT. LBS.
	O.D.	CATALOG NUMBER				No.	SIZE	No.	SIZE	
4"	4.22	UFR1300-P-4-I	8-57/64"	7-1/2"	4-59/64"	2	3/4"x7"	2	5/8"	5.5
6"	6.20	UFR1300-P-6-I	10-57/64"	9-1/2"	6-63/64"	2	3/4"x7"	2	5/8"	5.9
8"	8.40	UFR1300-P-8-I	13-9/64"	11-3/4"	9-3/32"	2	3/4"x7"	2	5/8"	6.3
10"	10.50	UFR1300-P-10-I	15-23/64"	14"	11-29/64"	2	3/4"x7"	2	5/8"	8.3
12"	12.50	UFR1300-P-12-I	18"	16-1/4"	13-29/64"	2	3/4"x7"	2	5/8"	9.5



NOM. PIPE SIZE	SEWER PIPE STYLE 1300-P		A	B APPROX.	RESTRAINT BOLTS / RODS		CLAMPING BOLTS		BC MIN.	BC MAX.	APPROX. WT. LBS.
	O.D.	CATALOG NUMBER			No.	SIZE	No.	SIZE			
15"	15.30	UFR1300-P-15-U	4"	22-1/2"	4	3/4"x17"	4	7/8"x7"	18.50	20.50	50.0
18"	18.70	UFR1300-P-18-U	4"	26-3/16"	4	3/4"x17"	4	7/8"x7"	21.88	23.88	62.0
21"	22.05	UFR1300-P-21-U	4"	28-13/16"	4	3/4"x24"	4	7/8"x7"	24.56	26.56	68.5
24"	24.80	UFR1300-P-24-U	4"	32-3/16"	4	3/4"x24"	4	7/8"x7"	27.94	29.94	76.5
27"	27.95	UFR1300-P-27-U	4"	35-3/8"	4	3/4"x24"	4	7/8"x7"	31.09	33.09	85.0

Contact factory for larger sizes. Exact pipe OD is required.

Specifications - Uni-Flange® Series 1350

Series 1350 Uni-Flange® Restraint Device for PVC Pipe Bell Joints

The Uni-Flange® Series 1350 offers the fastest, most economical method of restraining bell and spigot joints of PVC pipe in new installations. Total thrust restraint is guaranteed, in any soil condition.

The Series 1350 consists of two basic components: a Series 1300 split restraint device, which is installed on the spigot end of the pipe, and a Series 1350 solid backup ring, which has a beveled leading edge and sits behind the pipe bell.

Features:

- Fast and Easy - 1350 solid backup ring eliminates the need to tighten extra bolts and nuts
- Can be installed outside of the trench, prior to pipe laying
- Full contact and support of the pipe wall
- Rated at full working pressure rating of any class of PVC pipe, minimum 2:1 safety factor

Note: Series 1350 (4" – 12" sizes) is NOT recommended for use on AWWA C900, DR14 PVC pipe. Use Series 1390 for C900 DR14 PVC pipe.

Split Ring Restraint - Uni-Flange®

Series 1300 made from ductile iron per ASTM A536, Grade 65-45-12, or ASTM A36 structural steel.

Color Code:

Black for PVC with ductile iron pipe O.D.
Gray for PVC with steel pipe O.D.
Contact factory for coating options.

Side Clamping Bolts and Nuts

T-Bolts / Studs - High strength, low alloy steel ANSI / AWWA C111/A21.11.
Optional: Type 304 Stainless Steel

Backup Ring - 2" - 18" Sizes: Ductile Iron per ASTM A536, Grade 65-45-12.
20" - 24" Steel per ASTM A36



**2" - 12"
Series 1350 Installed**



**14" - 24"
Series 1350 Installed**

Suggested Specification - Series 1350

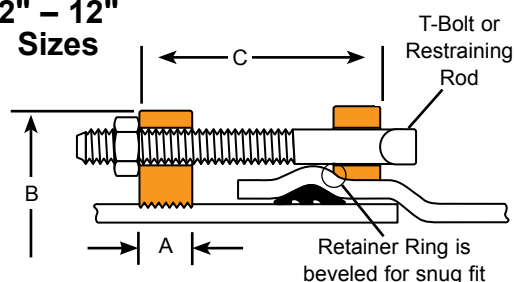
Restraint devices for bell and spigot joints of PVC pipe shall consist of a split restraint ring installed on the spigot, connected to a solid backup ring seated behind the bell. The split restraint ring shall incorporate a series of serrations on the inside diameter to provide positive restraint, exact fit, and full contact and support of the pipe wall. The solid backup ring shall have a beveled leading edge to ensure exact fit behind the pipe bell. Restraint devices shall be of ductile iron, ASTM A536, Grade 65-45-12, or ASTM A36 structural steel. Connecting bolts shall be of high strength, low alloy material in accordance with ANSI / AWWA C111 / A21.11.

All restraint devices shall carry a water working pressure rating equivalent to the full rated pressure of the PVC pipe they are installed on, with a minimum 2:1 safety factor in any nominal pipe size. Notarized certification from the manufacturer of the restraint device shall be provided with submittals. Restraint devices for bell and spigot joints of PVC pipe shall be Uni-Flange® 1350 or approved equal.

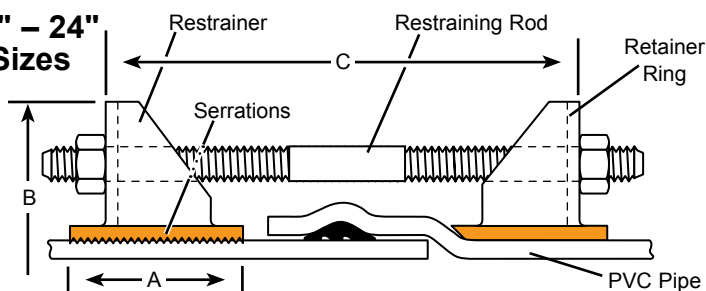
Uni-Flange® Series 1350 Pipe Restraint

Restraint Device for PVC Pipe Bell Joints

**2" – 12"
Sizes**



**14" – 24"
Sizes**



NOM. PIPE SIZE	PVC PIPE WITH STEEL PIPE O.D. STYLE 1350-S		PVC PIPE WITH DUCTILE IRON PIPE O.D. STYLE 1350-C		A	B APPROX.	C MAX.	RESTRAINT BOLTS / RODS		CLAMPING BOLTS		APPROX. WT. LBS.
	O.D.	CATALOG NUMBER	O.D.	CATALOG NUMBER				No.	SIZE	No.	SIZE	
2"	2.38	UFR1350-S-2-I	N/A	—	1-1/8"	6-1/4"	4"	2	5/8"x5"	2	5/8"x3-1/2"	8.5
3"	3.50	UFR1350-S-3-I	N/A	—	1-1/8"	7-11/16"	4"	2	5/8"x5"	2	5/8"x3-1/2"	11.0
4"	4.50	UFR1350-S-4-I	4.80	UFR1350-C-4-(I or U)	1-1/8"	9-1/8"	6"	2	3/4"x9"	2	5/8"x3-1/2"	13.0
6"	6.63	UFR1350-S-6-I	6.90	UFR1350-C-6-(I or U)	1-1/8"	11-7/8"	6"	2	3/4"x9"	2	5/8"x3-1/2"	16.5
8"	8.63	UFR1350-S-8-I	9.05	UFR1350-C-8-(I or U)	1-1/4"	14-5/8"	8"	2	3/4"x12"	2	3/4"x4"	26.5
10"	10.75	UFR1350-S-10-I	11.10	UFR1350-C-10-(I or U)	1-3/8"	16-5/8"	8"	4	3/4"x17"	2	7/8"x5"	43.5
12"	12.75	UFR1350-S-12-I	13.20	UFR1350-C-12-(I or U)	1-3/8"	19-1/4"	8"	4	3/4"x17"	2	7/8"x5"	50.0
14"	14.00	UFR1350-S-14-U	15.30	UFR1350-C-14-(I or U)	4"	23-3/16"	15"	6	3/4"x24"	4	♦	118.0
16"	16.00	UFR1350-S-16-U	17.40	UFR1350-C-16-(I or U)	4"	25-3/8"	15"	6	3/4"x24"	4	♦	127.0
18"	18.00	UFR1350-S-18-U	19.50	UFR1350-C-18-(I or U)	5"	27-3/8"	15"	8	3/4"x24"	4	1"x7"	166.0
20"	20.00	UFR1350-S-20-U	21.60	UFR1350-C-20-(I or U)	5"	29-3/4"	21-1/2"	8	3/4"x30"	♦	♦	223.0
24"	24.00	UFR1350-S-24-U	25.80	UFR1350-C-24-(I or U)	5"	33-7/8"	21-1/2"	12	3/4"x36"	♦	♦	334.0
30"												
36"												
42"												

USE SERIES 1390 FOR THESE SIZES

I = Import Casting U = Domestic Casting or Fabrication

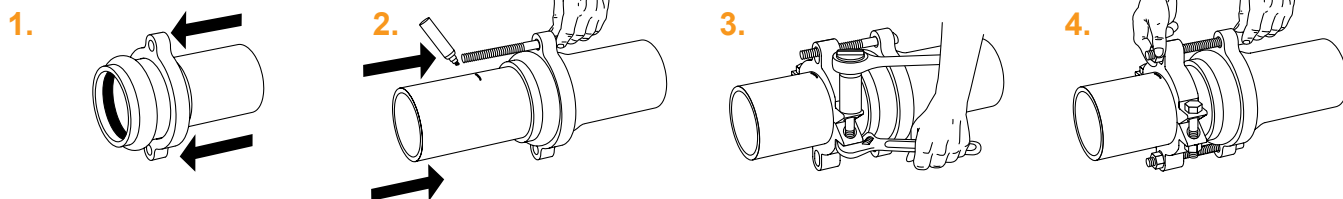
Note: 14" - 24" are non-returnable and may be subject to a cancellation fee.

All dimensions in inches unless otherwise stated.

♦ Contact factory for details.

Installation Instructions

2"-12"



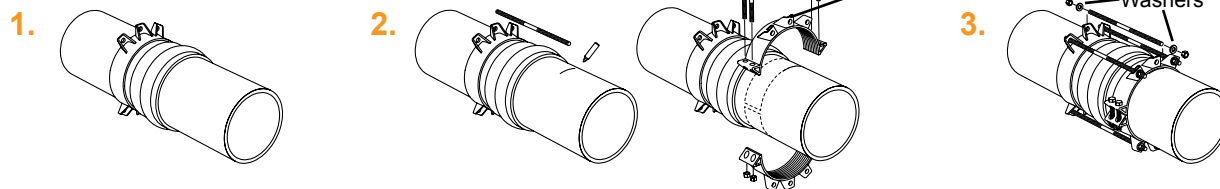
1. Slide bell ring over pipe and onto bell. Make sure beveled side of ring faces the pipe bell.

2. Assemble push-on joint using standard procedure. Mark assembly line for restrainer using an extra long bolt as a guide.

3. Assemble Series 1300 serrated clamping ring onto pipe, evenly tighten clamping bolts to recommended torque.

4. Insert T-Bolts/restraint rods and snug nuts. **Do not over-tighten retaining nuts.** (Hand tight - then one full turn.)

14"-24"



1. Assemble pipe bell joint. Slide 1350 Restrainer ring up the length of pipe until it seats against the back of the pipe bell. Make sure the beveled edge is facing bell.

2. Use one of the rods (provided) as a guide to position serrated restrainer. Leave sufficient threads on the rod ends to fully engage nuts. Install the serrated restrainer on plain end of pipe; tighten clamping bolts to torque recommended on restrainer label, ensuring the gap between pads on both sides remains even. Stated torque values are the minimum requirement.

3. Connect 1300 to restrainer ring with rods provided. Use one washer (these are provided) behind each ear, install nut behind washer and tighten. **Do not over-tighten retaining nuts.** (Hand tight - then one full turn.)

Specifications - Uni-Flange® Series 1355

Series 1355 Uni-Flange® Restraint Device for PVC Pipe Bell Joints for Ductile Iron Pipe O.D.

The Uni-Flange® Series 1355 offers fast, economical, guaranteed restraint of PVC pipe bell and spigot joints in new or existing installations in any soil condition. The Series 1355 eliminates the need for concrete thrust blocks and offers an alternative to "factory restrained joint" metallic pipes.

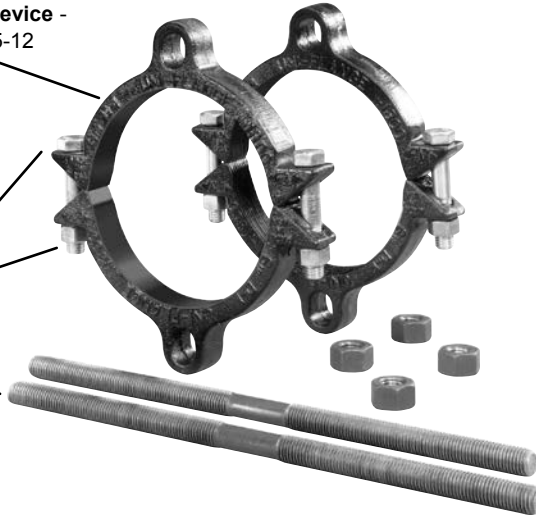
The Series 1355 consists of a Series 1300 split restraint device and a smooth split backup ring. One is installed on the pipe spigot and the other behind the pipe bell. The two are connected to each other with double ended rods (provided).

Uni-Flange® Series 1355-C Restraint Device -
Ductile iron per ASTM A536, Grade 65-45-12
or ASTM A36 structural steel

Color Code:
Black for PVC with ductile iron
pipe O.D.

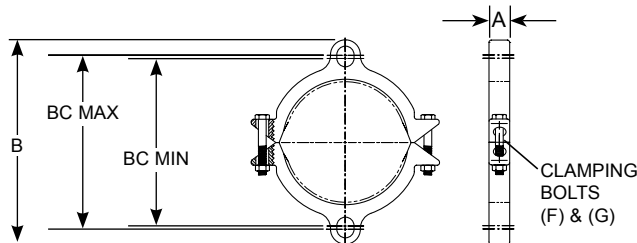
**Side Clamping Bolts
and Nuts**

**Threaded Rods - High strength,
low alloy steel ANSI / AWWA
C111/A21.11**

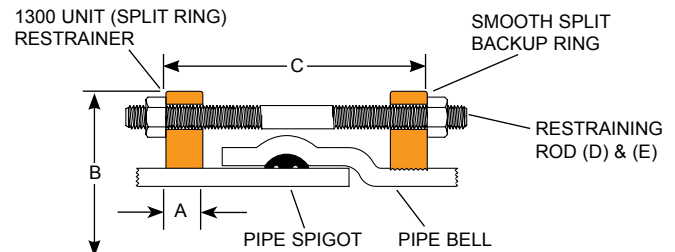


**4" - 12"
Series 1355 Installed**

1300 SPLIT RESTRAINER



1355 ASSEMBLY



NOM PIPE SIZE	PVC PIPE WITH DI PIPE OD STYLE 1355-C		A	B APPROX	C MAX	RESTRAINING RODS		CLAMPING BOLTS		BC MAX	BC MIN
	OD	CATALOG No.				No. D	SIZE E	No. F	SIZE G		
4"	4.80	UFR1355-C-4-U	1-1/8"	9-1/8"	12"	2	3/4" x 17"	4	5/8" x 3-1/2"	7.50"	7.14"
6"	6.90	UFR1355-C-6-U	1-1/8"	11-1/8"	13"	2	3/4" x 17"	4	5/8" x 3-1/2"	9.50"	9.14"
8"	9.05	UFR1355-C-8-U	1-1/4"	14-5/8"	15"	2	3/4" x 17"	4	3/4" x 4"	12.98"	11.36"
10"	11.10	UFR1355-C-10-U	1-3/8"	16-5/8"	16"	4	3/4" x 24"	4	7/8" x 5"	15.00"	13.50"
12"	13.20	UFR1355-C-12-U	1-3/8"	19-1/4"	18"	4	3/4" x 24"	4	7/8" x 5"	17.62"	15.62"

Suggested Specification - Series 1355

Restraint devices for bell and spigot joints of PVC pipe having ductile iron pipe O.D. shall consist of two split restraint rings, one installed on the spigot connected to one installed on the pipe barrel behind the bell. One restraint device shall incorporate a series of serrations on the inside diameter to provide positive restraint, exact fit, and full contact and support of the pipe wall on the spigot end. Restraint devices shall be of ductile iron, ASTM A536, Grade 65-45-12 or ASTM A36 structural steel, and connecting rods shall be of high strength, low alloy material in accordance with ANSI / AWWA C111/A21.11.

All restraint devices shall have a water working pressure rating equivalent to the full rated pressure of the PVC pipe they are installed on, with a minimum 2:1 safety factor in any nominal pipe size. Notarized certification from the manufacturer of the restraint device shall be provided with submittals. Restraint devices for bell and spigot joints of PVC pipe having ductile iron pipe O.D. shall be Uni-Flange® 1355 or approved equal.

Specifications - Uni-Flange® Series 1360

Series 1360 Uni-Flange® Restraint Device for PVC Pressure Fittings U.S. Patent No. 8096591

More and more municipalities and consulting engineers are specifying PVC pipe joined with PVC pressure fittings.

Uni-Flange® offers the fastest, most economical and reliable method of restraining PVC pressure fittings with the Series 1360. The 1360 provides complete fitting restraint in a matter of minutes, using only a wrench.

The Uni-Flange® Series 1360 consists of two split rings. The Series 1300 is installed on PVC pipe and connected to a specially designed backup ring that sits securely behind the fitting bell. The backup ring is beveled on the leading edge and the two halves are designed to interlock. No clamping bolts are required.

The Uni-Flange® Series 1360 offers guaranteed joint restraint every time, eliminating the need for expensive and time consuming concrete thrust blocks. No waiting for trucks. No building forms. Trenches can be backfilled immediately. The 1360 keeps the job moving.

Split Ring Restraint - Uni-Flange®

Series 1300 is made from ductile iron per ASTM A536, Grade 65-45-12, or ASTM A36 structural steel.

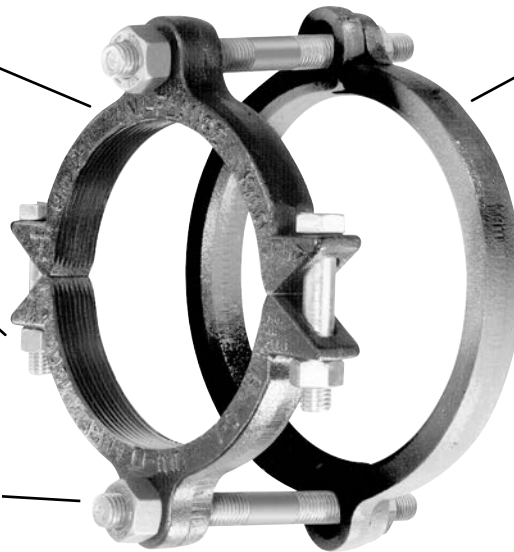
Color Code:

Black for PVC with ductile iron pipe O.D.
Gray for PVC with steel pipe O.D.
Contact factory for coating options.

Side Clamping Bolts and Nuts

Connecting Rods - High strength, low alloy steel per ANSI / AWWA C111/A21.11
Optional: Type 304 stainless steel

Split Backup Ring - Ductile iron per ASTM A536, Grade 65-45-12 or steel per ASTM A36.



Series 1360 Installed

Applications / Pressure Rating

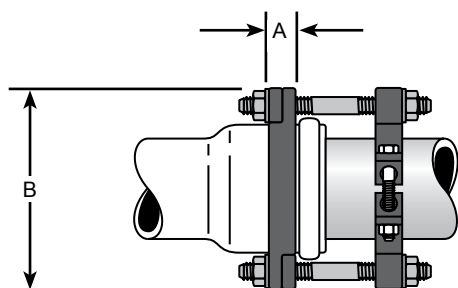
The Uni-Flange® Series 1360 carries a water working pressure rating of 150 PSI in 2" through 8" nominal sizes. Larger sizes carry the same pressure rating as the fittings on which they are installed. (Contact fitting manufacturer for rating.) The bell run O.D. is required for sizes 14" and larger (See bell run illustration at top of next page). All sizes incorporate a minimum 2:1 safety factor at the full rated pressure.

Suggested Specification - Series 1360

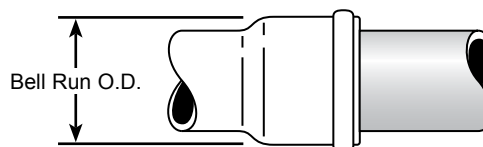
Restraint devices for PVC pipe and PVC pressure fittings shall consist of a split restraint ring installed on the spigot, connected to a split backup ring that sits behind the gasket race of the fitting. The split restraint ring shall incorporate a series of serrations on the inside diameter to provide positive restraint, exact fit, and full contact and support of the pipe wall. The two halves of the split backup ring shall form a beveled leading edge to ensure exact fit behind the fitting gasket race. Restraint devices shall be of ductile iron, ASTM A536, Grade 65-45-12, or ASTM A36 structural steel and connecting rods shall be of high strength, low alloy material in accordance with ANSI / AWWA C111 / A21.11. Restraint devices shall be Uni-Flange® 1360 or approved equal.

Uni-Flange® Series 1360 Pipe Restraint

U.S. Patent No. 8096591



Supply bell run outside diameter with order for units 14" and larger.



Restraint Device For AWWA C907 PVC Pressure Fittings

NOM. PIPE SIZE	PIPE O.D. (INCHES)	A	B APPROX.	CATALOG NUMBER FOR FITTINGS	CONNECTING RODS NUMBER AND SIZE	SIDE BOLT QUANTITY AND SIZE		APPROX. WT. LBS.
						RESTRAINT	BACKUP RING	
4"	4.80	1-1/8"	9-1/8"	UFR1360-C-4-(I or U)	(2) 3/4"x12"	(2) 5/8"x3-1/2"	—	13.5
6"	6.90	1-1/8"	11-7/8"	UFR1360-C-6-(I or U)	(2) 3/4"x12"	(2) 5/8"x3-1/2"	—	18.0
8"	9.05	1-1/8"	14-9/16"	UFR1360-C-8-(I or U)	(2) 3/4"x12"	(2) 3/4"x4"	—	29.0
10"	11.10	4"	19-11/16"	UFR1360-C-10-(I or U)	(4) 3/4"x17"	(2) 7/8"x5"	(2) 7/8" x 3-1/2"	54.5
12"	13.20	4"	21-15/16"	UFR1360-C-12-(I or U)	(4) 3/4"x17"	(2) 7/8"x5"	(2) 7/8" x 3-1/2"	81.0
14"	15.30	4"	24-1/4"	*UFR1360-C-14-(I or U)	(6) 3/4"x24"	♦	(4) 7/8"x7"	127.0
16"	17.40	4"	26-9/16"	*UFR1360-C-16-(I or U)	(6) 3/4"x30"	♦	(4) 7/8"x7"	140.0
18"	19.50	4"	28-7/8"	*UFR1360-C-18-(I or U)	(8) 3/4"x30"	(4) 1"x7"	(4) 7/8"x7"	181.0
20"	21.60	5"	31-1/8"	*UFR1360-C-20-(I or U)	(8) 3/4"x30"	♦	(4) 1" x 9"	227.0
24"	25.80	5"	35-7/8"	*UFR1360-C-24-(I or U)	(12) 3/4"x36"	♦	(4) 1" x 9"	328.0
30"	32.00	7"	44-1/16"	*UFR1360-C-30-(I or U)	(12) 1"x40"	♦	(6) 1-1/8" x 9"	551.0
36"	38.30	7"	51-15/16"	*UFR1360-C-36-(I or U)	(12) 1"x40"	♦	(6) 1-1/8" x 9"	583.0

* The bell run outside diameter must be provided. Contact factory for details. (See bell run illustration above.)

I = Import Casting U = Domestic Casting or Fabrication

♦ Contact factory for details.

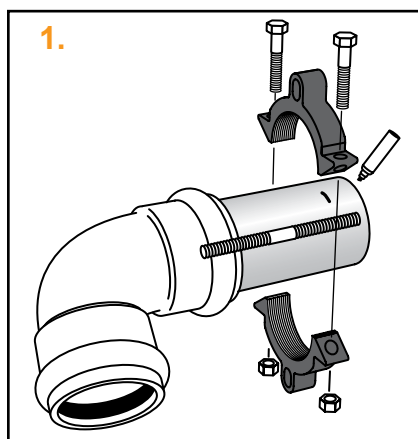
Restraint Device For IPS Class 200 PVC Fittings

NOM. PIPE SIZE	PIPE O.D. (INCHES)	A	B	CATALOG NUMBER	CONNECTING RODS QUANTITY AND SIZE	SIDE BOLTS QUANTITY AND SIZE	APPROX. WT. LBS.
2"	2.38	1-1/8"	6-3/8"	UFR1360-S-2-I	(2) 5/8"x11"	(2) 5/8"x3-1/2"	9.5
2-1/2"	2.88	1-1/8"	6-7/8"	UFR1360-S-25-I	(2) 5/8"x11"	(2) 5/8"x3-1/2"	10.0
3"	3.50	1-1/8"	7-5/8"	UFR1360-S-3-I	(2) 5/8"x11"	(2) 5/8"x3-1/2"	10.5
4"	4.50	1-1/8"	9-1/8"	UFR1360-S-4-I	(2) 3/4"x12"	(2) 5/8"x3-1/2"	14.0
6"	6.63	1-1/8"	11-9/16"	UFR1360-S-6-I	(2) 3/4"x12"	(2) 5/8"x3-1/2"	17.5
8"	8.63	1-1/8"	13-3/8"	UFR1360-S-8-I	(2) 3/4"x12"	(2) 3/4"x4"	26.0

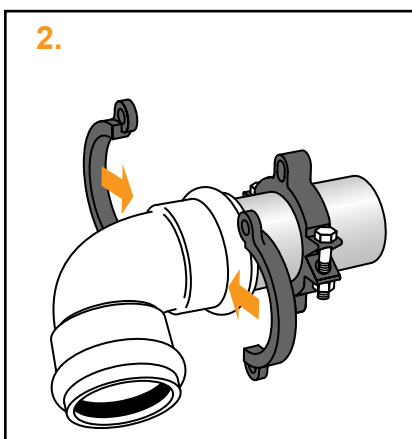
Contact factory for information on sizes larger than 8".

I = Import Casting

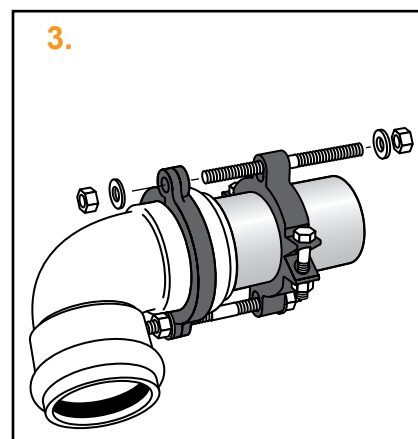
Installation Instructions



1. Install pipe into fitting. Install Series 1300 split clamping ring on the spigot end of the pipe. (Use connecting rod as a guide to position serrated restrainer.) Tighten clamping bolts evenly to the recommended torque.



2. Install split backup ring behind gasket race of fitting. Make sure the bevel faces the gasket race. The two halves interlock at the bolt holes.



3. Insert rods through Series 1300 and backup ring. Place washers against restrainer and backup ring ears. Snug retaining nuts against washers. Do not overtighten retaining nuts. (Hand tight - then one full turn.)

Consult the Ford Meter Box website for the most current installation instructions.

Specifications - Uni-Flange® Series 1390

Series 1390 Uni-Flange® Restraint Device for PVC Pipe Bell Joints

The Uni-Flange® Series 1390 offers fast, economical, guaranteed restraint of PVC pipe bell and spigot joints in new or existing installations in any soil condition. The Series 1390 eliminates the need for concrete thrust blocks and offers an alternative to "factory restrained joint" metallic pipes.

The Series 1390 consists of two Series 1300 split restraint devices. One is installed on the pipe spigot and the other behind the pipe bell. The two are connected to each other with double ended rods (provided).

Note: 1390 restraining rods will span 2"-12" FC1 style flexible couplings (Section M) when positioned to avoid the coupling bolts. Please contact the factory for other coupling applications.

Features:

- Provides restraint for new, or existing, in-ground piping systems
- Full contact and support of the pipe wall
- Rated at full working pressure rating of any class of PVC pipe, minimum 2:1 safety factor
- 4" through 16" "C" style units can be used on ductile iron pipe. See page U-32 for installation and pressure qualifications.

Two Uni-Flange® Series 1300-C Restraint Devices - Ductile Iron per ASTM A536, Grade 65-45-12, or ASTM A36 Structural Steel

Color Code:

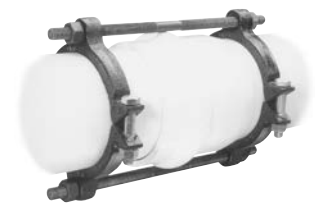
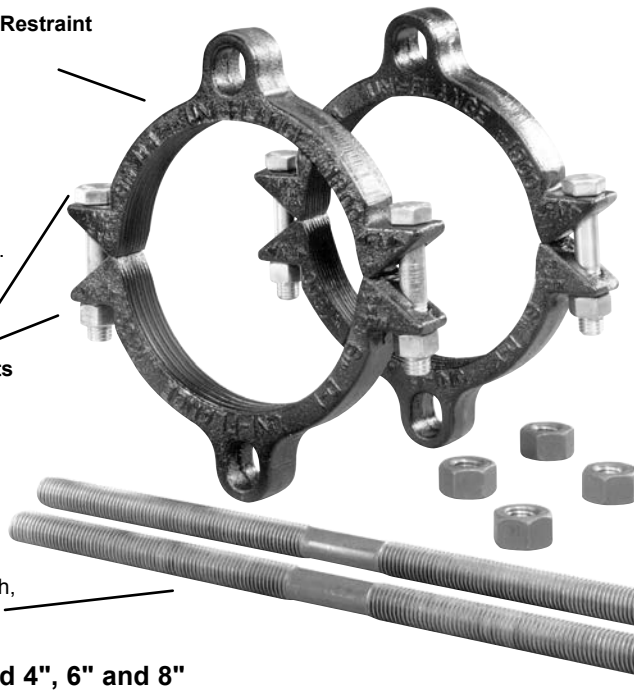
Black for PVC with ductile iron pipe O.D.

Gray for PVC with steel pipe O.D.
Contact factory for coating options.

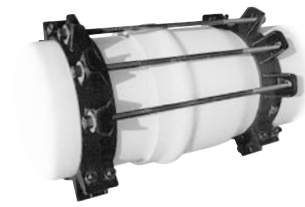
Side Clamping Bolts and Nuts

Threaded Rods - High strength, low alloy steel ANSI / AWWA C111/A21.11.

1390 C <FM> Approved 4", 6" and 8"



**2" - 12"
Series 1390 Installed**



**14" - 42"
Series 1390 Installed**

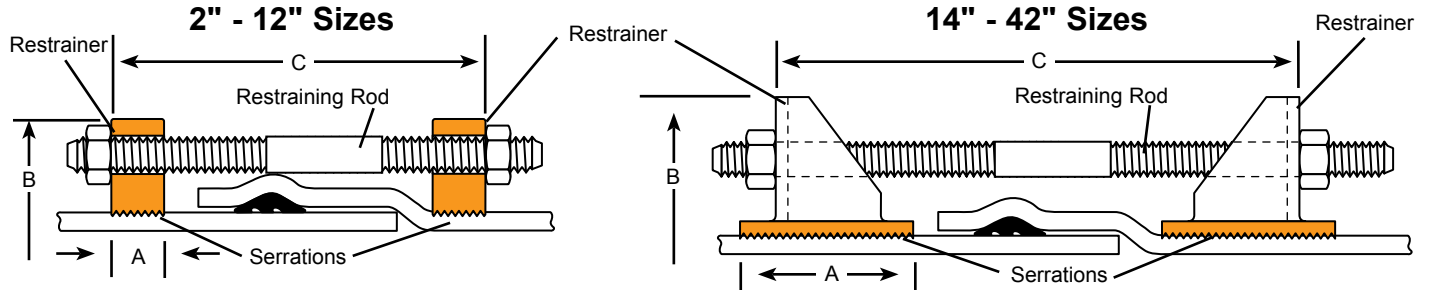
Suggested Specification - Series 1390

Restraint devices for bell and spigot joints of PVC pipe shall consist of two split restraint rings, one installed on the spigot, connected to one installed on the pipe barrel behind the bell. The restraint devices shall incorporate a series of serrations on the inside diameter to provide positive restraint, exact fit, full contact and support of the pipe wall. Restraint devices shall be of ductile iron, ASTM A536, Grade 65-45-12 or ASTM A36 structural steel, and connecting rods shall be of high strength, low alloy material in accordance with ANSI / AWWA C111/A21.11.

All restraint devices shall have a water working pressure rating equivalent to the full rated pressure of the PVC pipe they are installed on, with a minimum 2:1 safety factor in any nominal pipe size. Notarized certification from the manufacturer of the restraint device shall be provided with submittals. Restraint devices for bell and spigot joints of PVC pipe shall be Uni-Flange® 1390 or approved equal.

Uni-Flange® Series 1390 Pipe Restraint

Restraint Device for PVC Pipe Bell Joints



NOM. PIPE SIZE	PVC PIPE WITH STEEL PIPE O.D. STYLE 1390-S		*PVC PIPE WITH DUCTILE IRON PIPE O.D. STYLE 1390-C		A	B APPROX.	C MAX.	RESTRAINT BOLTS / RODS		CLAMPING BOLTS		APPROX. WT. LBS.
	O.D.	CATALOG NUMBER	O.D.	CATALOG NUMBER				No.	SIZE	No.	SIZE	
2"	2.38	UFR1390-S-2-I	N/A	—	1-1/8"	6-1/4"	10"	2	5/8"x11"	4	5/8"x3-1/2"	11.5
2-1/2"	2.88	UFR1390-S-25-I	N/A	—	1-1/8"	6-7/8"	10"	2	5/8"x11"	4	5/8"x3-1/2"	12.8
3"	3.50	UFR1390-S-3-I	N/A	—	1-1/8"	7-11/16"	10"	2	5/8"x11"	4	5/8"x3-1/2"	13.5
4"	4.50	UFR1390-S-4-I	4.80	UFR1390-C-4-(lorU)	1-1/8"	9-1/8"	12"	2	3/4"x17"	4	5/8"x3-1/2"	17.0
6"	6.63	UFR1390-S-6-I	6.90	UFR1390-C-6-(lorU)	1-1/8"	11-1/8"	13"	2	3/4"x17"	4	5/8"x3-1/2"	18.5
8"	8.63	UFR1390-S-8-I	9.05	UFR1390-C-8-(lorU)	1-1/4"	14-5/8"	15"	2	3/4"x17"	4	3/4"x4"	29.0
10"	10.75	UFR1390-S-10-I	11.10	UFR1390-C-10-(lorU)	1-3/8"	16-5/8"	16"	4	3/4"x24"	4	7/8"x5"	53.0
12"	12.75	UFR1390-S-12-I	13.20	UFR1390-C-12-(lorU)	1-3/8"	19-1/4"	18"	4	3/4"x24"	4	7/8"x5"	56.5
14"	14.00	UFR1390-S-14-U	15.30	UFR1390-C-14-(lorU)	4"	22-1/2"	24"	6	3/4"x30"	8	♦	136.0
16"	16.00	UFR1390-S-16-U	17.40	UFR1390-C-16-(lorU)	4"	24-9/16"	28"	6	3/4"x30"	8	♦	147.0
18"	18.00	UFR1390-S-18-U	19.50	UFR1390-C-18-(lorU)	5"	26-11/16"	28"	8	3/4"x30"	8	1"x7"	206.0
20"	20.00	UFR1390-S-20-U	21.60	UFR1390-C-20-(lorU)	5"	29-3/16"	34"	8	3/4"x36"	♦	♦	263.0
24"	24.00	UFR1390-S-24-U	25.80	UFR1390-C-24-(lorU)	5"	33-7/8"	34"	12	3/4"x36"	♦	♦	406.0
30"	30.00	UFR1390-S-30-U	32.00	UFR1390-C-30-(lorU)	10"	40-9/10"	38"	12	1"x42"	12	♦	601.0
36"	36.00	UFR1390-S-36-U	38.30	UFR1390-C-36-(lorU)	10"	48"	38"	12	1"x42"	12	♦	672.0
42"	-	-	44.50	UFR1390-C-42-(I)	10-3/4"	57-9/16"	46"	16	1-1/4"x52"	16	1-1/8"x6"	1240.0

I = Import Casting U = Domestic Casting or Fabrication

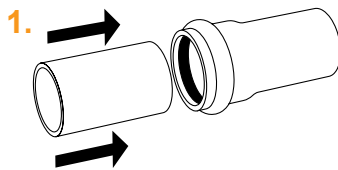
Note: 14" - 42" are non-returnable and may be subject to a cancellation fee.

* 4" through 16" "C" style units can be used on ductile iron pipe. See page U-32 for installation and pressure qualifications.

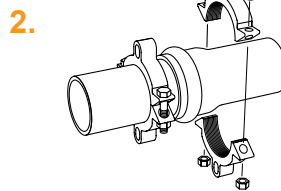
♦ Contact factory for details.

Installation Instructions

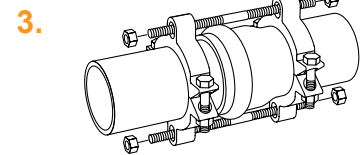
2"-12"



1. Assemble spigot pipe end to bell, using standard procedure.

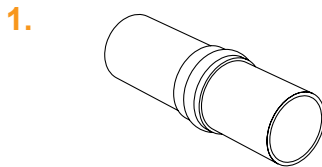


2. Assemble Series 1390 clamping rings onto spigot pipe and just behind bell end as shown (use restraining rods as a guide to position restrainers) and tighten bolts evenly to recommended torque.

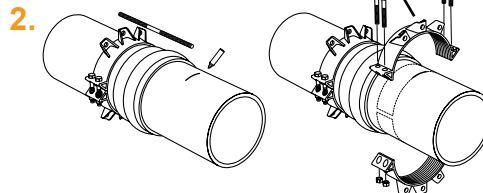


3. Insert threaded rods and nuts as shown and tighten nuts behind restrainers. **Do not over-tighten retaining nuts.** (Hand tight - then one full turn.)

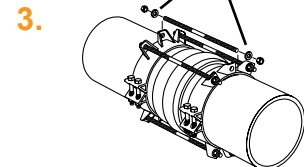
14"-42"



1. Assemble pipe bell.



2. Assemble one restrainer on spigot end of pipe and one directly behind pipe bell. Use one of the rods (provided) as a guide to position serrated restrainers. Leave sufficient threads on the ends of the rod ends to fully engage nuts. Tighten all clamping bolts to torque recommended on restrainer label. Stated torque values are the minimum requirement. Apply torque to each side, ensuring the gaps between the pads on both sides remain even.



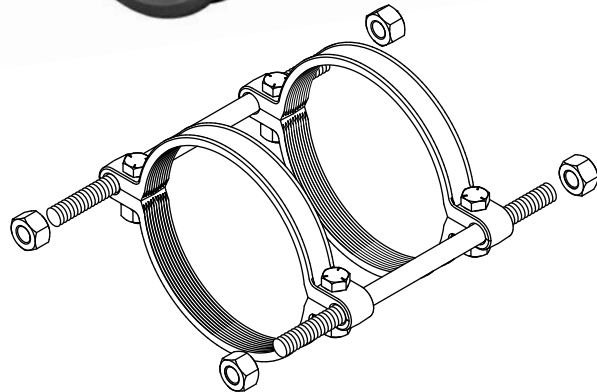
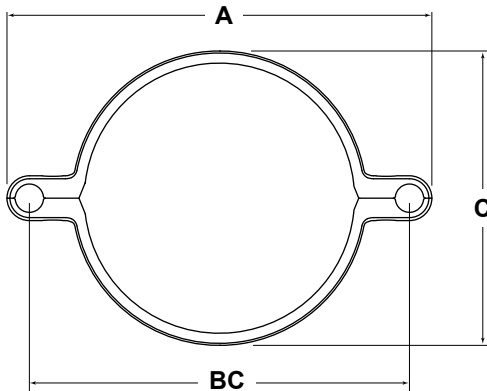
3. Connect the two restrainers using rods provided. Place a washer (these are provided) behind restrainer "ears." Tighten all nuts. **Do not over-tighten retaining nuts.** (Hand tight - then one full turn.)

Specifications - Uni-Flange® Series 1390-P

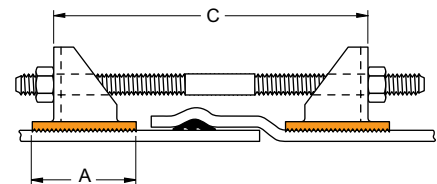
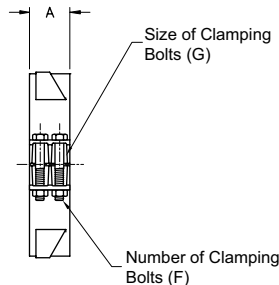
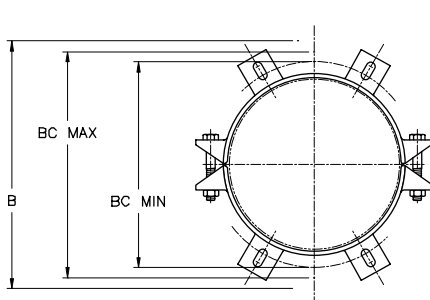
Series 1390-P Uni-Flange® Restraint Device for Sewer Pipe Bell Joints

Features:

- Specially designed for ASTM 3034 type PSM sewer pipe
- Optimized clamping bolt/tie rod location minimizes pipe wall stress, ideal for thin wall pipe
- Rods are high strength, low alloy steel per ANSI/AWWA C111/A21.11
- High-quality ductile iron construction per ASTM A536 4" – 12"
- Carbon steel per ASTM A36 15" – 27"
- Epoxy e-coat for superior corrosion resistance
- 50 PSI working pressure rating 2:1 safety factor



NOM. PIPE SIZE	SEWER PIPE STYLE 1300-P		A	BC	C	RESTRAINT BOLTS / RODS		CLAMPING BOLTS		APPROX. WT. LBS.
	O.D.	CATALOG NUMBER				No.	SIZE	No.	SIZE	
4"	4.22	UFR1390-P-4-I	8-57/64"	7-1/2"	4-59/64"	2	3/4"x7"	2	5/8"	9.4
6"	6.20	UFR1390-P-6-I	10-57/64"	9-1/2"	6-63/64"	2	3/4"x7"	2	5/8"	10.3
8"	8.40	UFR1390-P-8-I	13-9/64"	11-3/4"	9-3/32"	2	3/4"x7"	2	5/8"	11.3
10"	10.50	UFR1390-P-10-I	15-23/64"	14"	11-29/64"	2	3/4"x7"	2	5/8"	15.1
12"	12.50	UFR1390-P-12-I	18"	16-1/4"	13-29/64"	2	3/4"x7"	2	5/8"	17.5



NOM. PIPE SIZE	SEWER PIPE STYLE 1300-P		A	B APPROX.	C MAX.	RESTRAINT BOLTS / RODS		CLAMPING BOLTS		BC MIN.	BC MAX.	APPROX. WT. LBS.
	O.D.	CATALOG NUMBER				No.	SIZE	No.	SIZE			
15"	15.30	UFR1390-P-15-U	4"	22-1/2"	28"	4	3/4"x30"	4	7/8"x7"	18.50	20.50	100
18"	18.70	UFR1390-P-18-U	4"	26-3/16"	28"	4	3/4"x30"	4	7/8"x7"	21.88	23.88	124
21"	22.05	UFR1390-P-21-U	4"	28-13/16"	28"	4	3/4"x36"	4	7/8"x7"	24.56	26.56	137
24"	24.80	UFR1390-P-24-U	4"	32-3/16"	28"	4	3/4"x36"	4	7/8"x7"	27.94	29.94	153
27"	27.95	UFR1390-P-27-U	4"	35-3/8"	28"	4	3/4"x36"	4	7/8"x7"	31.09	33.09	170

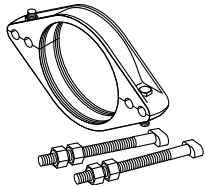
Contact factory for larger sizes. Exact pipe OD is required.

Uni-Flange® Pipe Restraints for AWWA C909 PVC Pipe - Series 1309 and 1399 Restraint Device

Series 1309 Uni-Flange® Restraint Device for C909 PVC Pipe used with Mechanical Joint / *Push-on Fittings

A fast, economical method of restraining water main fittings, valves and hydrants used in PVC piping systems.

Series 1309-C Restraint Device for C900 PVC and C909 PVC Pipe, C906 HDPE and Ductile Iron Pipe for Mechanical Joint / Push-on Fittings



NOM PIPE SIZE	C909 PVC PIPE WITH DUCTILE IRON PIPE OD STYLE 1309-C		RESTRAINING BOLTS		CLAMPING BOLTS		BOLT CIRCLE MIN	BOLT CIRCLE MAX	APPROX. WT. LBS.
	O.D.	CATALOG No.	No. D	SIZE E	No. F	SIZE G			
4"	4.80	UFR1309-C-4-I	2	3/4" x 7"	2	5/8" x 3"	7.24"	8.00"	11.0
6"	6.90	UFR1309-C-6-I	2	3/4" x 7"	2	5/8" x 3"	9.58"	10.58"	13.0
8"	9.05	UFR1309-C-8-I	2	3/4" x 7"	2	3/4" x 3"	11.50"	12.50"	16.5
10"	11.10	UFR1309-C-10-I	4	3/4" x 7"	2	3/4" x 3-1/2"	14.25"	15.25"	28.0
12"	13.20	UFR1309-C-12-I	4	3/4" x 7"	2	7/8" x 3-1/2"	16.33"	17.33"	31.0
14"	15.30	UFR1309-C-14-U	6	3/4" x 17"	6	1-1/8" x 9"	18.44"	20.38"	85.0
16"	17.40	UFR1309-C-16-U	6	3/4" x 17"	6	1-1/8" x 9"	20.56"	22.50"	90.0
18"	19.50	UFR1309-C-18-U	8	3/4" x 17"	6	1-1/8" x 9"	22.63"	24.03"	97.0

Suggested Specification - Series 1309

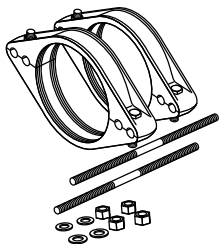
Restraint devices for C909 PVC pipe shall incorporate a series of serrations on the inside diameter to provide positive restraint, exact fit, full contact and support of the pipe wall. Restraint devices shall be manufactured of high strength ductile iron, ASTM A536, Grade 65-45-12 or ASTM A36 structural steel. Bolts and connecting hardware shall be of high strength low alloy material in accordance with ANSI / AWWA C111/A21.11.

All restraint devices for C909 PVC pipe shall have a water working pressure rating equivalent to the full rated pressure of the C909 PVC pipe on which they are installed, with a minimum 2:1 safety factor in any nominal pipe size. Notarized certification from the manufacturer of the restraint device shall be provided with submittals. Restraint devices for Mechanical Joint or Push-on fittings shall be Uni-Flange® 1309 or approved equal.

Series 1399 Uni-Flange® Restraint Device for C909 PVC Pipe Bell Joints

The Uni-Flange® Series 1399 offers fast, economical, guaranteed restraint of PVC pipe bell and spigot joints in new or existing installations in any soil condition.

Series 1399 Restrainer Split Restraint for C909 PVC Push-on Joints (New or Existing Installations)



NOM PIPE SIZE	PIPE O.D.	PRESSURE RATING (PSI)	CATALOG NUMBER	No. OF RODS	ROD LENGTH	ROD DIA.	■MAX BELL DIA.	APPROX. WT. (LBS)
4"	4.80	235	UFR1399-C-4-I	2	17"	3/4"	7.25	20
6"	6.90	235	UFR1399-C-6-I	2	17"	3/4"	9.83	25
8"	9.05	235	UFR1399-C-8-I	2	17"	3/4"	11.75	35
10"	11.10	235	UFR1399-C-10-I	4	24"	3/4"	14.50	55
12"	13.20	235	UFR1399-C-12-I	4	24"	3/4"	16.58	70
14"	15.30	235	UFR1399-C-14-U	6	30"	3/4"	19.50"	190
16"	17.40	235	UFR1399-C-16-U	6	30"	3/4"	21.75"	200
18"	19.50	235	UFR1399-C-18-U	6	30"	3/4"	23.88"	214

■ **Note:** Connecting rods **WILL NOT CLEAR** a pipe bell with a maximum diameter larger than the listed measurement. These diameters do not include joint deflection. Confirm pipe bell diameter before ordering.

Suggested Specification - Series 1399

Restraint devices for bell and spigot joints of C909 PVC pipe shall consist of split restraint rings, one installed on the spigot, connected to one installed on the pipe barrel behind the bell. The restraint devices shall incorporate a series of serrations on the inside diameter to provide positive restraint, exact fit, full contact and support of the pipe wall. Restraint devices shall be of ductile iron, ASTM A536, Grade 65-45-12 or ASTM A36 structural steel, and connecting rods shall be of high strength, low alloy material in accordance with ANSI / AWWA C111/A21.11.

All Restraint devices shall have a water working pressure rating equivalent to the full rated pressure of the C909 PVC pipe they are installed on, with a minimum 2:1 safety factor in any nominal pipe size. Notarized certification from the manufacturer of the restraint device shall be provided with submittals. Restraint devices for bell and spigot joints of PVC pipe shall be Uni-Flange® 1399 or approved equal.

* The safety factor is derated on 10" and 12" push-on joints that do not accommodate all of the 1300 T-bolts.

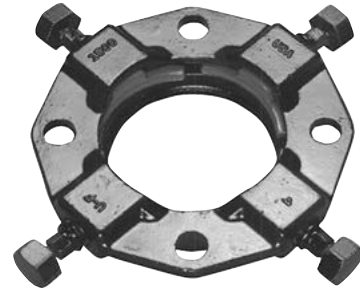
Uni-Flange® Pipe Restraints for AWWA C909 PVC Pipe - Series 1559 Restraint Device

MJ Retainer Gland Joint Restraint for C909 PVC Pipe

THRUST RESTRAINT

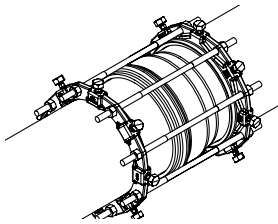
The Series 1559 restraint glands (UFR1500) incorporate a series of ductile iron restraint segments that fit in pockets around the inner surface of the specially designed gland housing. These segments are contoured to fit each pipe size and have integrally cast restraint edges along their bottom surface. After the seal is made, the Auto-Tork segment actuating screws are tightened. This locks the restraint segments onto the pipe surface, providing complete and total thrust restraint for the joint.

The restraint segments of the 1559 are the key to the design. They spread the restraining force, offering even distribution and support of the pipe. This is important with PVC pipe, especially for thinner wall classes. The restraint segments are designed with a "slot" at the top which accepts the channeled foot of the activating bolt so they cannot fall out of their pockets. The Series 1559 meets or exceeds the capabilities of "factory restrained joint pipe" at a fraction of the cost.



The unique design of the Series 1559 restraint glands offer even distribution and support of the pipe wall. This design utilizes **Ring Segments** and is an exclusive feature of the Series 1559.

Series 1559 Restraint for C909 PVC Bell Joints (New Installations Only)



NOM. PIPE SIZE	PIPE O.D.	PRESSURE RATING (PSI)	CATALOG NUMBER	NO. OF RODS	ROD LENGTH	ROD DIA.	*MAX BELL DIA.	APPROX. WEIGHT (LBS)
4"	4.80	235	UFR1559-C-4-(I or U)	4	17"	5/8"	6.62"	25
6"	6.90	235	UFR1559-C-6-(I or U)	6	17"	5/8"	8.62"	33
8"	9.05	235	UFR1559-C-8-(I or U)	6	17"	5/8"	10.88"	45
10"	11.10	235	UFR1559-C-10-(I or U)	8	24"	5/8"	13.12"	58
12"	13.20	235	UFR1559-C-12-(I or U)	8	24"	5/8"	15.38"	62
16"	17.40	165	UFR1559-C-16-(I or U)	12	24"	3/4"	20.12"	130

* **Note:** Connecting rods **WILL NOT CLEAR** a pipe bell with a maximum diameter larger than the listed measurement. These diameters do not include joint deflection. Confirm pipe bell diameter before ordering.

I = Import Casting U = Domestic Casting

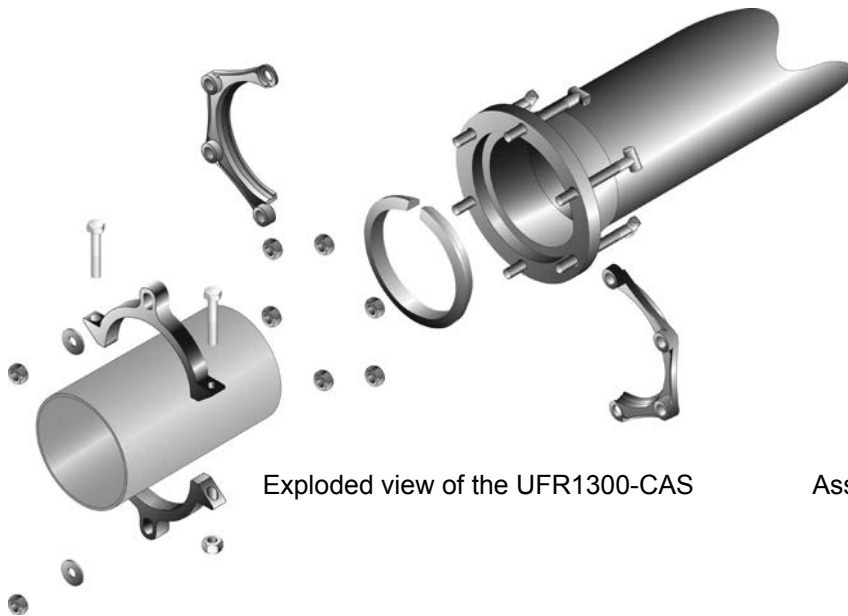
Sample Specification - Series 1559

Restraint for C909 PVC pipe joined with standardized mechanical joint fittings shall be incorporated in the design of the follower gland and shall provide full circle contact and support of the pipe wall. Restraint shall be accomplished by a series of ring segments mechanically retained inside the gland housing and designed to grip the pipe wall in an even and uniform manner. Restraining ring segments shall be actuated by bolts featuring "Auto-Tork" twist off heads to ensure proper installation torque is applied. A safety stop on the "Auto-Tork" bolt shall limit the force applied to the ring segment against the pipe. All components of the restrainer, including the gland, bolts, and restraint segments shall be of high strength ductile iron, ASTM A536, Grade 65-45-12. Restraining devices shall be manufactured by a facility independently certified to ISO 9001 quality standard and shall be Ford / Uni-Flange® Series 1559 or approved equal.

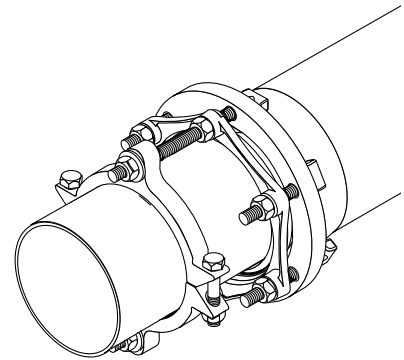
Uni-Flange® Series 1300-CAS and 1300-SAS

Mechanical Joint Repair Kit for Ductile Iron and PVC Pipe

The Uni-Flange® Mechanical Joint Repair Kit is designed to repair an existing mechanical joint installation. The two-piece gland and split gasket provide easy installation on existing pipe. The Uni-Flange® Mechanical Joint Repair Kit offers the ability to repair a leak while restraining the existing joint.



Exploded view of the UFR1300-CAS



Assembled view of the UFR1300-CAS



PACKAGE CONTAINS

- 1 - Series 1300 Restrainer
- 1 - Set of high strength, low alloy T-bolts & nuts (AWWA C111)
- 1 - Split Mechanical Joint Gasket
- 1 - Split (Two-Piece) Mechanical Joint Gland

The kit is shrink wrapped in a weather resistant carton

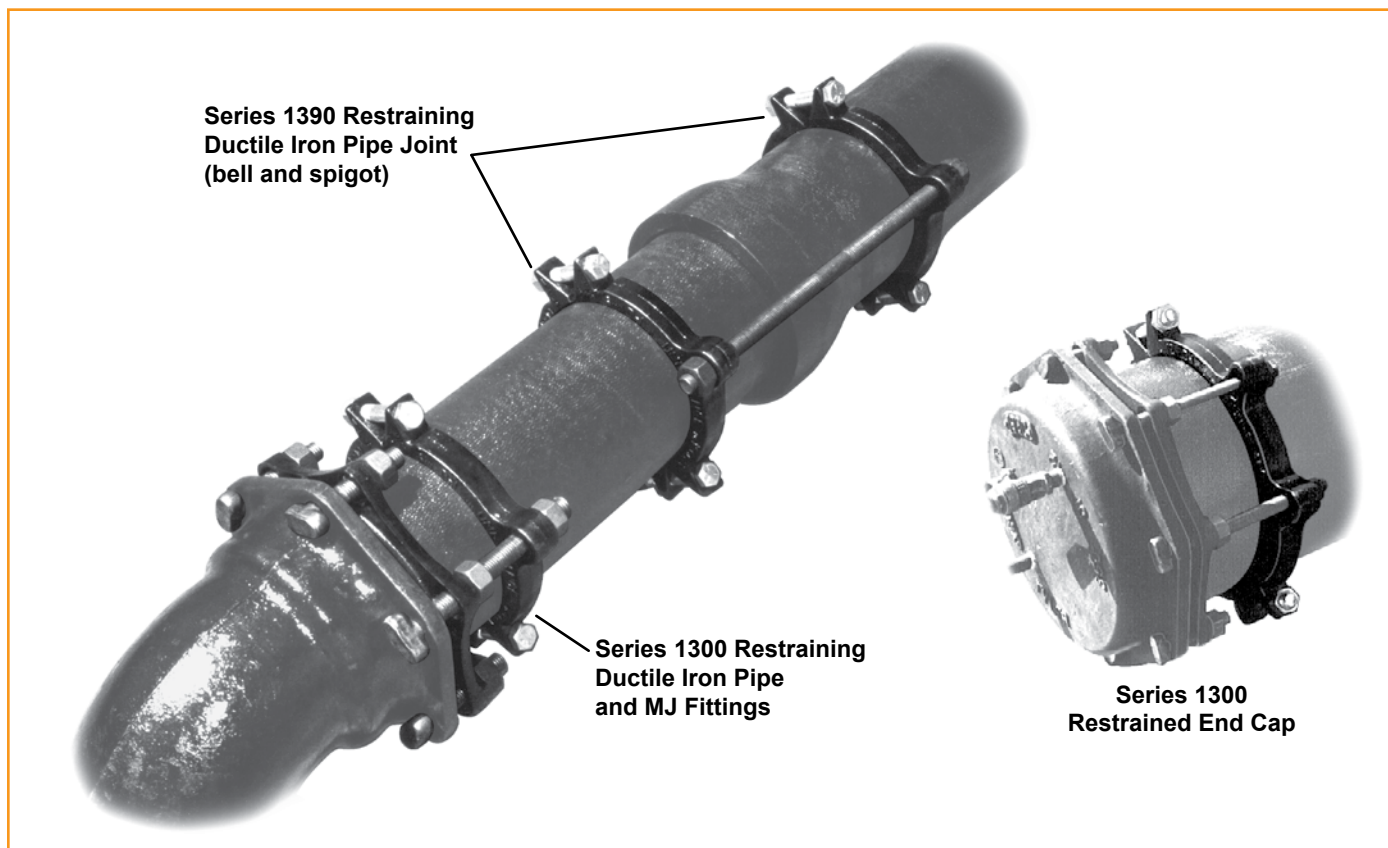
NOM. PIPE SIZE	PVC PIPE WITH STEEL PIPE O.D.		DUCTILE IRON PIPE O.D.		APPROX. WT. LBS.
	O.D.	CATALOG NUMBER	O.D.	CATALOG NUMBER	
4"	4.50	UFR1300-SAS-4-I	4.80	UFR1300-CAS-4-(IorU)	18.0
6"	6.63	UFR1300-SAS-6-I	6.90	UFR1300-CAS-6-(IorU)	22.0
8"	8.63	UFR1300-SAS-8-I	9.05	UFR1300-CAS-8-(IorU)	28.0
10"	10.75	UFR1300-SAS-10-I	11.10	UFR1300-CAS-10-(IorU)	41.0
12"	12.75	UFR1300-SAS-12-I	13.20	UFR1300-CAS-12-(IorU)	43.0

Note: The UFR1300-CAS and UFA1300-SAS are rated for a 150 PSI hydraulic seal.

I = Import Casting U = Domestic Casting

Uni-Flange® Series 1300, 1390 and Casing Spacers for Use on Ductile Iron Pipe

Both the 1300 and 1390 offer full circumferential contact and support of the pipe wall. This is recommended by many pipe manufacturers and is **especially important when thinner walled pipes are used, such as AWWA C151, Class 50 or the "pressure class" ductile iron pipe**. There are no set screws that may distort / point load the pipe or damage the cement mortar lining. (In fact, the Series 1300 / 1390 combination is very similar to certain "factory restrained joint pipe" with easier installation, faster availability and a lower overall cost.)



Pressure Ratings, Ductile Iron Applications

Series 1300-C, 1309-C, 1390-C and 1399-C for Ductile Iron Pipe			
*NOMINAL PIPE SIZE	PIPE STANDARD	TYPE AND SIZE	*PRESSURE RATING (PSI)
4" - 16"	ANSI / A21.51 AWWA C-151	Ductile 4" - 8"	250
		Ductile 10" - 12"	200
		Ductile 14"	150
		Ductile 16"	100

Note: Not recommended for use on machined end pipe or fittings.

* For higher pressure requirements or larger size bell and spigot restraint, see Series 1450, 1455 or 1490.

For maximum pressure requirements up to 500 PSI, see Series 2800.

Installation requires maximum torque values stated in installation instructions.

To Order: See 4" - 16" 1300-C, 1390-C and Casing Spacer product listings within this catalog.

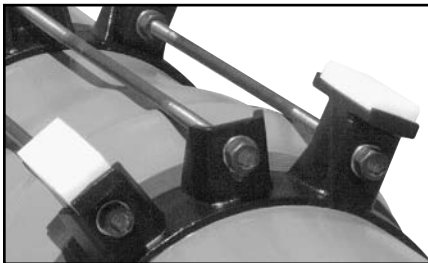
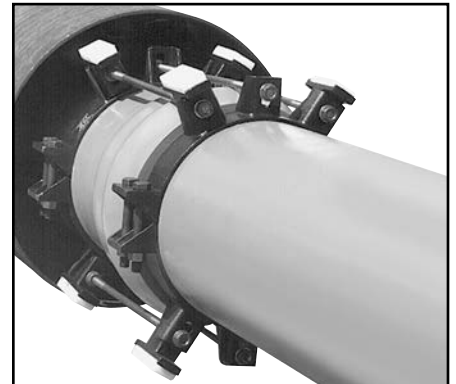
Information - Restrained Casing Spacers

Advantages of Uni-Flange® System for Restrained Casing Spacers for PVC Pipe and *Ductile Iron Pipe

The Ford Restrained Casing Spacers, in 4" through 24" pipe sizes, offer several advantages over conventional methods of positioning carrier pipes within casings under roadways, railroads, bridges and canals.

TWO IN ONE !!

- The only casing spacer to combine axial joint restraint (thrust restraint preventing pipeline separation) with casing spacer performance. It is two products in one. This reduces material inventories and installation costs. From the owner to the distributor, to the installer....everyone saves.



BOLT-ON SIMPLICITY !!

- No special off-site fabrication is required. The Uni-Flange® system uses standardized, off the shelf components that can be added to the restrainers, on the job-site. Parts are interchangeable and the installer can "custom build" each restrained casing spacer according to job-site conditions. Lead times are substantially reduced or eliminated.

HIGH STRENGTH COMPONENTS !!

- The restrainer and casing spacer runner supports are all manufactured of high strength ductile iron. They are stronger and tougher than conventional fabricated casing spacers, which are made from light gauge carbon or stainless steel. The Uni-Flange® restrained casing spacer is built for the rugged conditions encountered when pulling or pushing a carrier pipe through a casing.

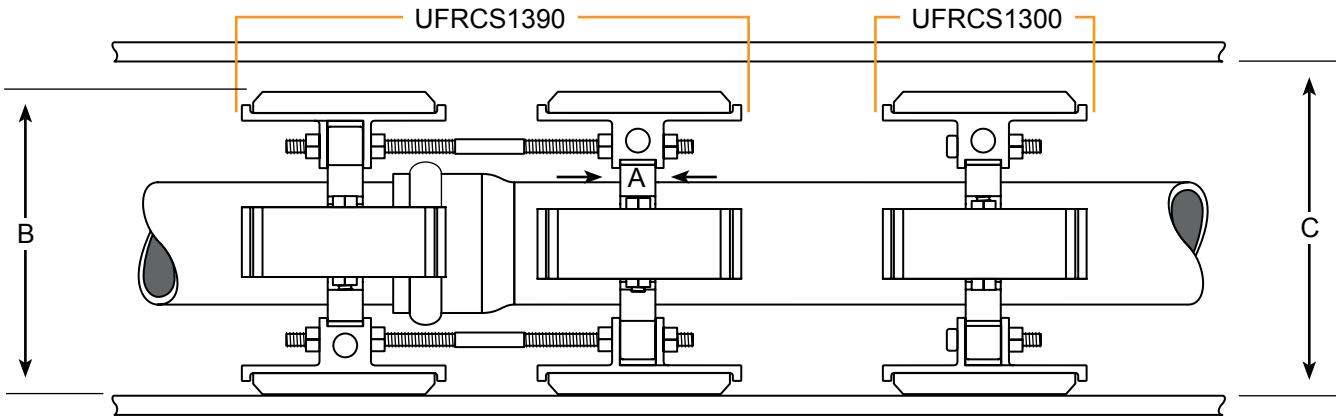


SLIPPERY & TOUGH !!

- The Uni-Flange® Restrained Casing Spacer features runners made from Ultra High Molecular Weight Polymer. Measuring 7/8" thick by 2-1/4" wide by 5-5/8" long, these runners offer a very low coefficient of friction, helping the carrier pipe "glide" easily over the continuous surface of any casing. Dielectric insulation is provided between the carrier pipe and casing and the runners are very resistant to abrasion and impact. They will not absorb moisture. Our runners are tougher and stronger than the runner material used in most fabricated casing spacers.

* Suitable for 4" through 16" ductile iron pipe. See page U-32 for installation and pressure requirements.

Specifications



Dimensions

NOM. PIPE SIZE	ACTUAL PIPE OD (IN.)	A	B (APPROX.)	1390 RESTRAINT ROD		C MIN. CASING SIZE (ID)	RATED (PSI) PRESSURE PVC PIPE*	RATED (PSI) PRESSURE DUCTILE IRON*
				No.	SIZE			
4"	4.80	1-1/8"	11-3/4"	2	3/4"x17"	12.4"	200	250
6"	6.90	1-1/8"	13-3/8"	2	3/4"x17"	14"	200	250
8"	9.05	1-1/8"	17-1/8"	2	3/4"x17"	17.875"	200	250
10"	11.10	1-3/8"	19-3/4"	4	3/4"x24"	21.5"	200	200
12"	13.20	1-3/8"	21-7/8"	4	3/4"x24"	23"	200	200
14"	15.30	4"	26-3/8"	6	3/4"x30"	27"	175	150
16"	17.40	4"	28-3/8"	6	3/4"x30"	30"	175	100
18"	19.50	5"	30-1/2"	8	3/4"x30"	31"	175	NA
20"	21.60	7"	32-1/4"	8	3/4"x36"	33"	175	NA
24"	25.80	7"	38-1/4"	12	3/4"x36"	39"	175	NA

* Working pressure rating for the restrained carrier pipe is a minimum 2:1 safety factor on all sizes.

Note: Restrained Casing Spacers are also available for PVC pipe with steel equivalent OD (IPS) and up to 36" at a reduced pressure rating. Contact Ford Meter Box for details.

MATERIALS AND SPECIFICATIONS

Restrainer Body and Runner Supports:	High strength ductile iron, ASTM A536, 65,000 PSI tensile strength, 45,000 PSI yield strength, 12% elongation capability (Grade 65-45-12)
Color Code:	Black for PVC with ductile iron pipe O.D., gray for PVC with steel pipe O.D.
Restraining Rods / Nuts:	High strength, low alloy ASTM A242, ANSI / AWWA C111 / A21.11
Clamping Bolts / Nuts:	SAE J429, Grade 5
Runners:	Ultra High Molecular Weight Polymer Tensile Impact: 600-1200 ft. lbs. / in. Coefficient of Friction: .14 - .17 ASTM D-1894

Suggested Specification - Casing Spacers

Carrier pipes to be installed inside casings shall be installed with self-restraining casing spacers. Casing spacers shall provide axial thrust restraint to prevent pipe joint separation during and after installation. They shall also provide dielectric insulation between the carrier pipe and the casing and facilitate installation of the carrier pipe into the casing.

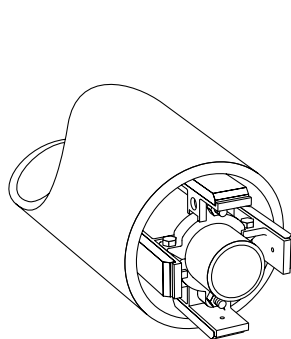
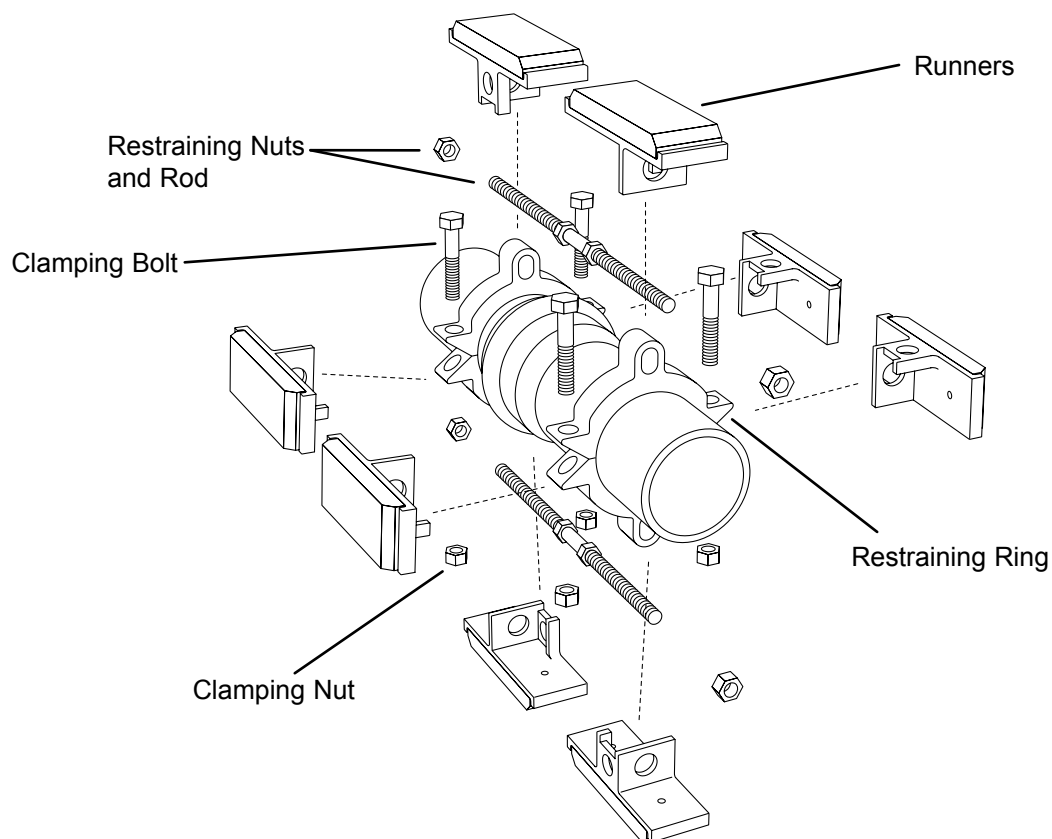
Restrained casing spacers shall be manufactured of high strength ductile iron, ASTM A536, Grade 65-45-12. Restraining rods shall be of high strength, low alloy material meeting the requirements of ANSI / AWWA C111 / A21.11. Casing spacer runners shall be of ultra high molecular weight polymer.

Restrained casing spacers shall be provided at all pipe bell joints. In addition, casing spacers shall be installed every ten feet of the pipeline to support the pipe barrel and the weight of its contents. Restrained casing spacers shall be Uni-Flange® Series UFRCS1300 (pipe barrel) or UFRCS1390 (for pipe bell joints) or approved equal.

How to Order Restrained Casing Spacers

Casing Spacers for Support of 4", 6" and 8" Pipe Barrel and Pipe Bell Joint

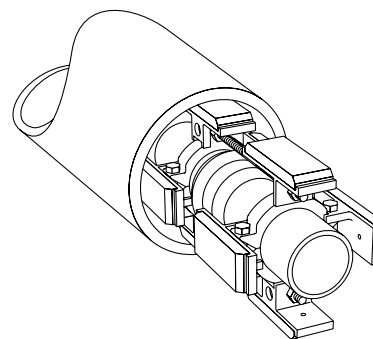
The indicated parts are provided when ordering the catalog number for pipe bell joint casing spacers from the chart shown below.
Note: The UFRCS1390 unit also provides restraint when used at pipe bell joint. See the order chart below.



**CASING SPACER FOR
SUPPORT OF PIPE BARREL**

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NUMBER OF RUNNERS	APPROX. SHIPPING WEIGHT
4"	4.80	UFRCS1300-C-4-(I or U)	4	15.9
6"	6.90	UFRCS1300-C-6-(I or U)	4	17.3
8"	9.05	UFRCS1300-C-8-(I or U)	4	22.7

UFRCS1300-S-I style is available in sizes 4" - 8".



**RESTRAINED CASING SPACER FOR
PIPE BELL JOINT**

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NUMBER OF RUNNERS	APPROX. SHIPPING WEIGHT
4"	4.80	UFRCS1390-C-4-(I or U)	8	34.5
6"	6.90	UFRCS1390-C-6-(I or U)	8	37.2
8"	9.05	UFRCS1390-C-8-(I or U)	8	48.1

UFRCS1390-S-I style is available in sizes 4" - 8".

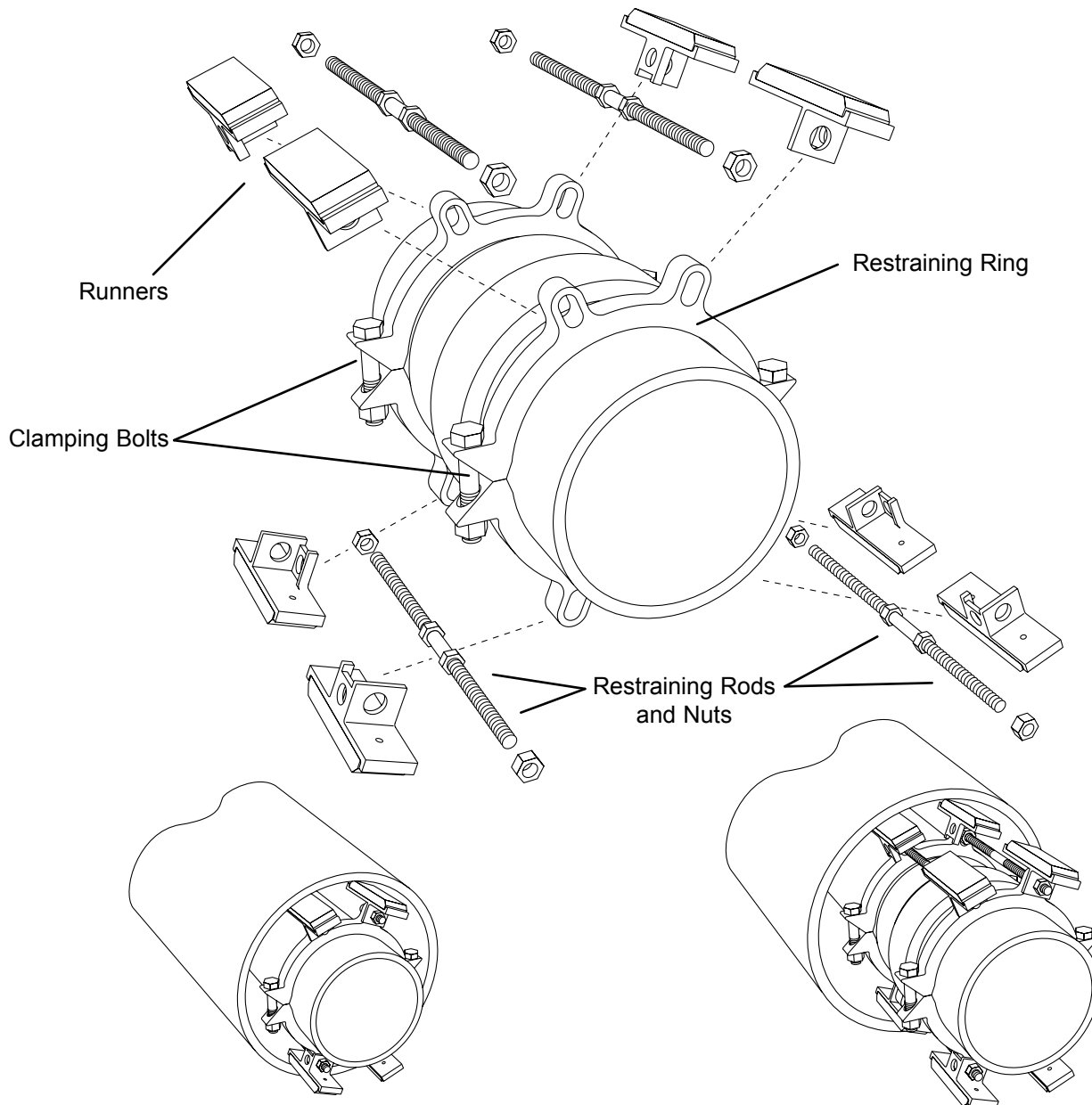
I = Import Casting U = Domestic Casting

See page 34 for minimum casing size (I.D.).

How to Order Restrained Casing Spacers

Casing Spacers for Support of 10" and 12" Pipe Barrel and Pipe Bell Joint

The indicated parts are provided when ordering the catalog number for pipe bell joint casing spacers from the chart shown below.
 Note: The UFRCS1390 unit also provides restraint when used at pipe bell joint. See the order chart below.



**CASING SPACER FOR
SUPPORT OF PIPE BARREL**

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NUMBER OF RUNNERS	APPROX. SHIPPING WEIGHT
10"	11.10	UFRCS1300-C-10-(I or U)	4	30.4
12"	13.20	UFRCS1300-C-12-(I or U)	4	32.2

UFRCS1300-S-I style is available in sizes 10" and 12".

**RESTRAINED CASING SPACER FOR
PIPE BELL JOINT**

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NUMBER OF RUNNERS	APPROX. SHIPPING WEIGHT
10"	11.10	UFRCS1390-C-10-(I or U)	8	69.3
12"	13.20	UFRCS1390-C-12-(I or U)	8	72.8

UFRCS1390-S-I style is available in sizes 10" and 12".

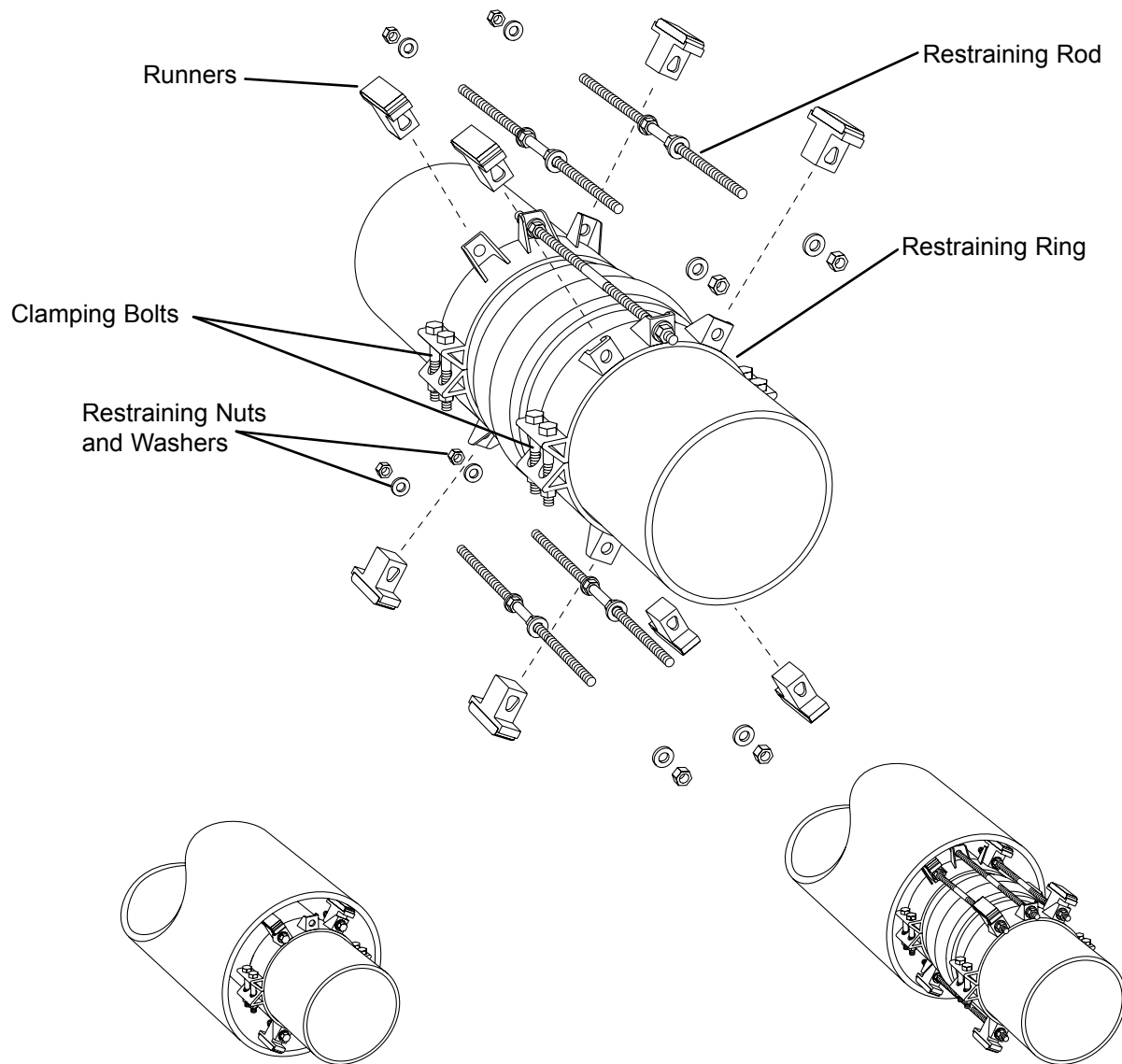
I = Import Casting U = Domestic Casting

See page 34 for minimum casing size (I.D.).

How to Order Restrained Casing Spacers

Casing Spacers for Support of 14" through 24" Pipe Barrel and Pipe Bell Joint

The indicated parts are provided when ordering the catalog number for pipe bell joint casing spacers from the chart shown below.
Note: The UFRCS1390 unit also provides restraint when used at pipe bell joint. See the order chart below.



CASING SPACER FOR SUPPORT OF PIPE BARREL

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NUMBER OF RUNNERS	APPROX. SHIPPING WEIGHT
14"	15.30	UFRCS1300-C-14-(I or U)	4	77.1
16"	17.40	UFRCS1300-C-16-(I or U)	4	82.4
18"	19.50	UFRCS1300-C-18-(I or U)	4	108.1
20"	21.60	UFRCS1300-C-20-(I or U)	4	134.1
24"	25.80	UFRCS1300-C-24-(I or U)	4	197.1

UFRCS1300-S-U style is available in sizes 14" - 24".
UFRCS1300-C-U style is available in sizes 30" - 36".

RESTRAINED CASING SPACER FOR PIPE BELL JOINT

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NUMBER OF RUNNERS	APPROX. SHIPPING WEIGHT
14"	15.30	UFRCS1390-C-14-(I or U)	8	170.9
16"	17.40	UFRCS1390-C-16-(I or U)	8	183.8
18"	19.50	UFRCS1390-C-18-(I or U)	8	240.0
20"	21.60	UFRCS1390-C-20-(I or U)	8	292.0
24"	25.80	UFRCS1390-C-24-(I or U)	8	432.0

UFRCS1390-S-U style is available in sizes 14" - 24".
UFRCS1390-C-U style is available in sizes 32" - 36".

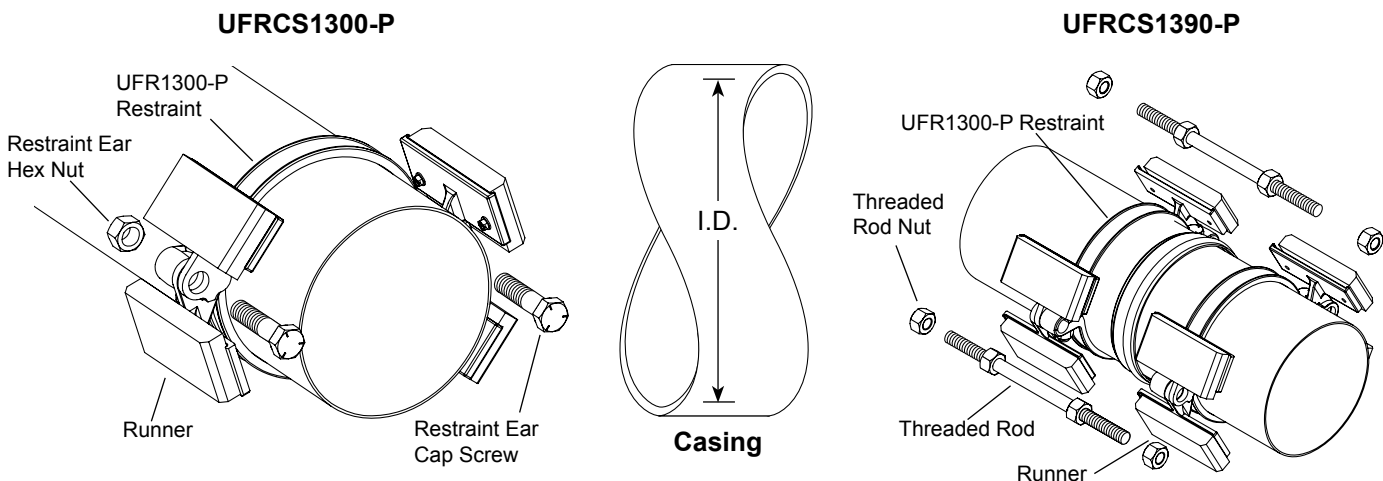
I = Import Casting U = Domestic Casting or Fabrication

How to Order Restrained Casing Spacers for Sewer Pipe

Casing Spacers for Support of 4" through 12" Pipe Barrel and Pipe Bell Joint

Features:

- High strength ductile iron, ASTM A53, 65,000 PSI tensile strength, 45,000 PSI yield strength, 4" – 12" 12% elongation capability. (Grade 65-45-12)
- Carbon steel per ASTM A36 15" – 24"
- Restraining Rods/Nuts: High strength, low alloy ASTM A242, ANSI/AWWA C111
- Clamping Bolts / Nuts: SAE J429, Grade 5
- Runners:
 - Ultra high molecular weight polymer
 - Tensile Impact: 600-1200 ft. lbs. / in²
 - Coefficient of Friction: .10 ASTM D-1894
 - Dielectric Constant: 2.3 ASTM D-150
 - Temperature Range: -220 F. to +1800 F. continuous service
- Runners installed on tie rod ears and clamping bolt pads
- The UFRCS1390 provides joint restraint. The UFRCS1300 provides pipe support only
- 50 PSI rated working pressure with a 2:1 safety factor



CASING SPACER FOR SUPPORT OF PIPE BARREL - UFRCS1300-P

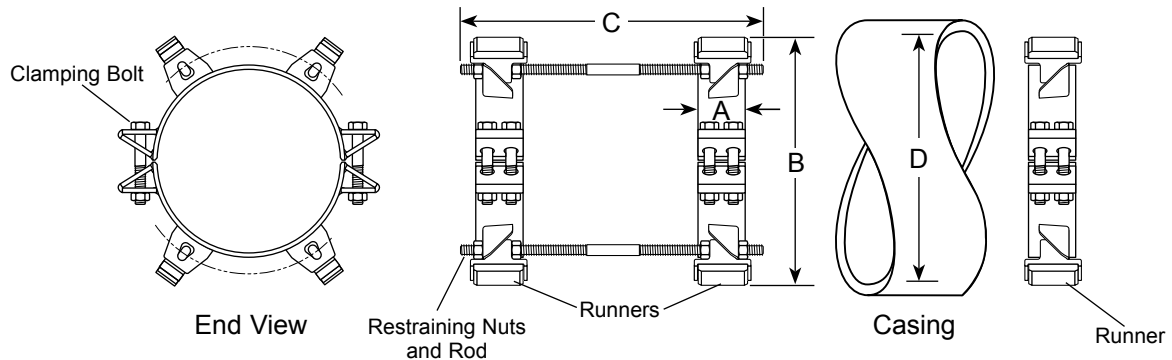
NOM. PIPE SIZE	ACTUAL PIPE O.D.	CATALOG NUMBER	APPROX. SHIPPING WEIGHT	MIN. CASING SIZE (ID)	RUNNER QTY.
4"	4.22"	UFRCS1300-P-4-I	11.0	10-1/2"	4
6"	6.28"	UFRCS1300-P-6-I	11.0	12-1/8"	4
8"	8.40"	UFRCS1300-P-8-I	12.0	14-1/2"	4
10"	10.50"	UFRCS1300-P-10-I	14.0	16-3/4"	4
12"	12.50"	UFRCS1300-P-12-I	15.5	19-1/8"	4

RESTRAINED CASING SPACER FOR PIPE BELL JOINT - UFRCS1390-P

NOM. PIPE SIZE	ACTUAL PIPE O.D.	CATALOG NUMBER	APPROX. SHIPPING WEIGHT	MIN. CASING SIZE (ID)	RUNNER QTY.
4"	4.22"	UFRCS1390-P-4-I	23.0	10-1/2"	8
6"	6.28"	UFRCS1390-P-6-I	24.0	12-1/8"	8
8"	8.40"	UFRCS1390-P-8-I	26.0	14-1/2"	8
10"	10.50"	UFRCS1390-P-10-I	30.0	16-3/4"	8
12"	12.50"	UFRCS1390-P-12-I	32.5	19-1/8"	8

How to Order Restrained Casing Spacers for Sewer Pipe

Casing Spacers for Support of 15" through 24" Pipe Barrel and Pipe Bell Joint



CASING SPACER FOR SUPPORT OF PIPE BARREL - UFRCS1300-P

NOM. PIPE SIZE	O.D.	CATALOG NUMBER	A	B APPROX.	C APPROX.	D MIN CASING SIZE (I.D.)	RUNNER QTY.	APPROX. WT. LBS.
15"	15.30	UFRCS1300-P-15-U	4"	24-7/8"	N/A	26"	4	50.0
18"	18.70	UFRCS1300-P-18-U	4"	28-9/16"	N/A	30"	4	62.0
21"	22.05	UFRCS1300-P-21-U	4"	31-3/16"	N/A	32"	4	68.5
24"	24.80	UFRCS1300-P-24-U	4"	34-9/16"	N/A	36"	4	76.5

Contact factory for larger sizes. Exact pipe and bell OD are required.

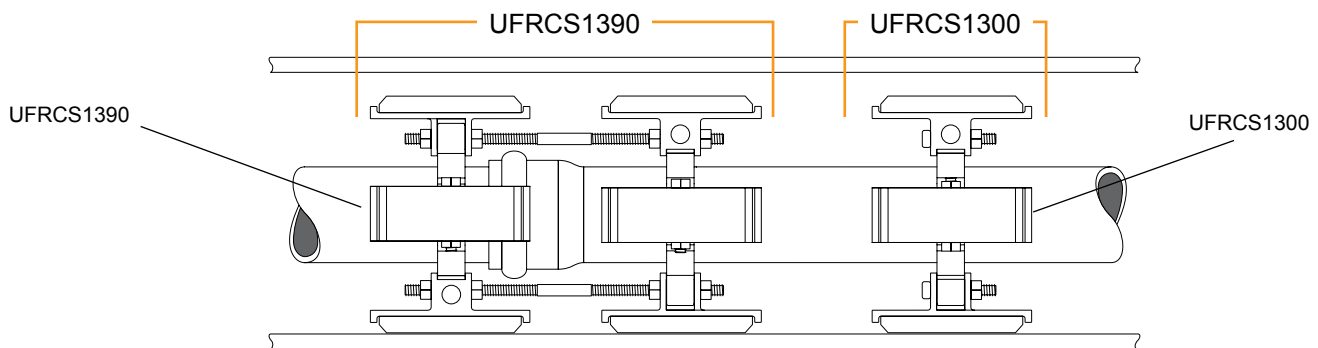
RESTRAINED CASING SPACER FOR PIPE BELL JOINT - UFRCS1390-P

NOM. PIPE SIZE	O.D.	CATALOG NUMBER	A	B APPROX.	C APPROX.	D MIN CASING SIZE (I.D.)	RUNNER QTY.	APPROX. WT. LBS.
15"	15.30	UFRCS1390-P-15-U	4"	24-7/8"	30"	26"	4	132
18"	18.70	UFRCS1390-P-18-U	4"	28-9/16"	30"	30"	4	156
21"	22.05	UFRCS1390-P-21-U	4"	31-3/16"	30"	32"	4	169
24"	24.80	UFRCS1390-P-24-U	4"	34-9/16"	30"	36"	4	185

Contact factory for larger sizes. Exact pipe and bell OD are required.

UFRCS Installation Recommendations

Uni-Flange® System for Restrained Casing Spacers



Installation Recommendations

Each pipe bell joint within the casing should be restrained and supported with a UFRCS1390 restrained casing spacer. Additionally, Uni-Flange® engineers recommend a UFRCS1300 be installed every ten feet of the pipeline. The UFRCS1300 casing spacer supports the weight of the pipe barrel and its contents.

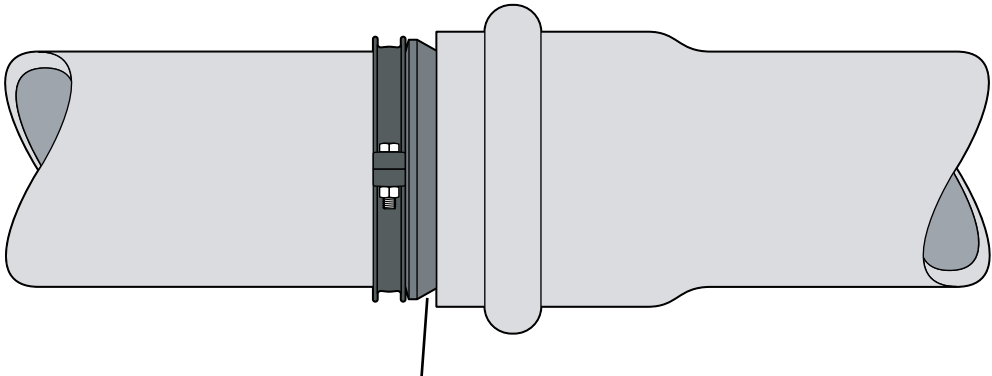
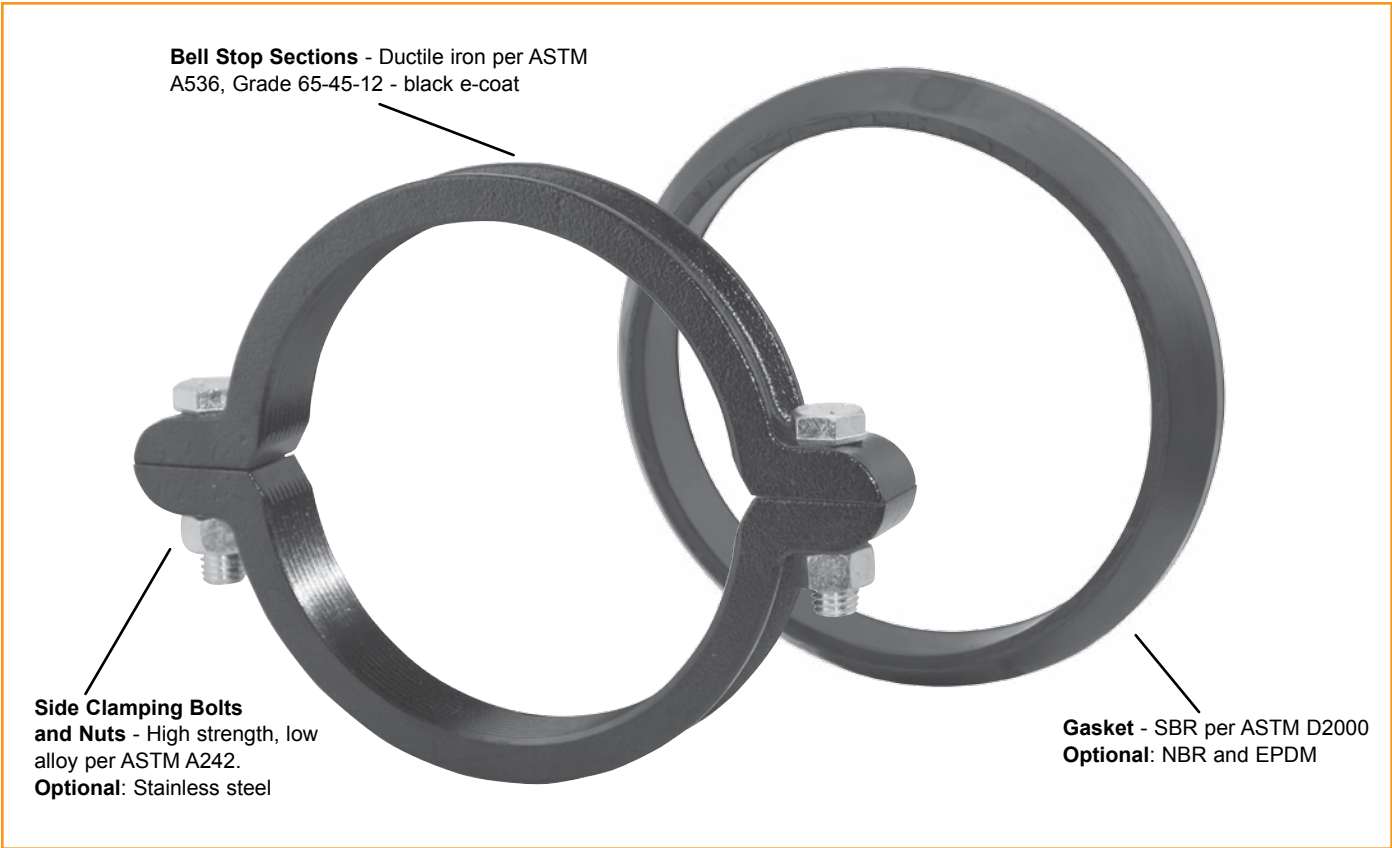
CARRIER PIPE SIZE	RUNNER LOCATION AND QUANTITY
4" - 8"	Runners installed on tie rod ears and clamping bolt pads. Total (4) on the UFRCS1300 and (8) on the UFRCS1390.
10" - 36"	Runners installed on tie rod ears. Total (4) for UFRCS1300 and (8) for UFRCS1390.

Consult the Ford Meter Box website for the most current installation instructions.

Ford Bell Stops

Bell Stop and Gasket for C900 PVC

The Ford Bell Stop, for use on C900 PVC bell joints, prevents over-insertion of the spigot into the bell, bell damage and loss of pipe due to over-insertion.



Gasket serves as a cushion and evenly distributes the load around the bell and restraint, with a 10,000 pound rated push load.

NOM. PIPE SIZE	CATALOG NUMBER	O.D.	APPROX. SHIPPING WEIGHT
4"	FBS-C-4-I	4.80	3.0
6"	FBS-C-6-I	6.90	4.0
8"	FBS-C-8-I	9.05	5.0
10"	FBS-C-10-I	11.10	7.0
12"	FBS-C-12-I	13.20	8.0

Uni-Flange® Series 1400

Wedge Action MJ Retainer Gland Joint Restraint for Ductile Iron Pipe

WORKING PRESSURE - 3" THROUGH 16" **350 PSI**
- 18" THROUGH 48" **250 PSI**

Actuating Screw -

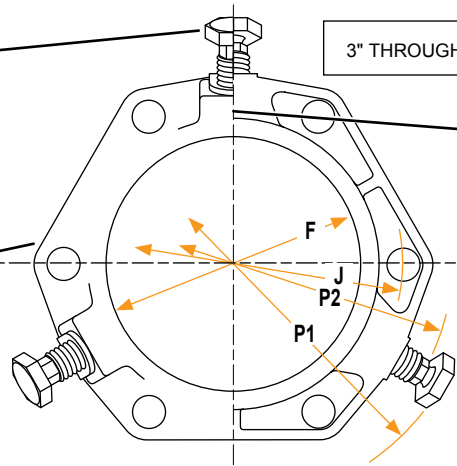
Ductile iron wedge actuating screw, with the Auto-Tork break-away head design, ensures proper torque during installation.

Gland -

Gland body is of high strength ductile iron per ASTM A536, Grade 65-45-12. Compatible with all mechanical joints conforming to ANSI / AWWA C111 / A21.11.

Color Code:

All components black epoxy coated applied by the e-coat process.



3" THROUGH 48" SIZES - 100% DUCTILE IRON CONSTRUCTION

Wedges are ductile iron and heat treated to a hardness of 370 BHN minimum.

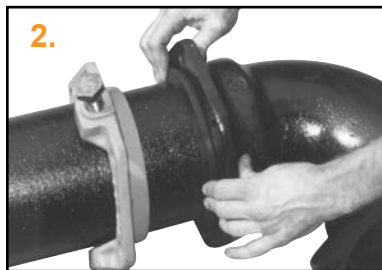
The Uni-Flange® Series 1400 offers a minimum 2:1 safety factor at the full rated pressure of the device, in all sizes, when tested in dead-end situations.

Note: UFR1400s are not to be used with plain end fittings.
For higher pressure rating applications, see Series 2800.

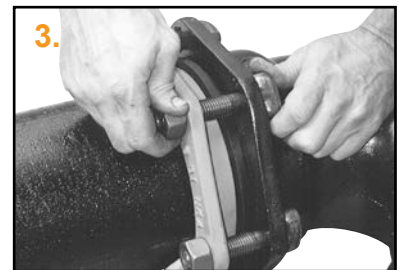
Uni-Flange® Series 1400 Installation Instructions



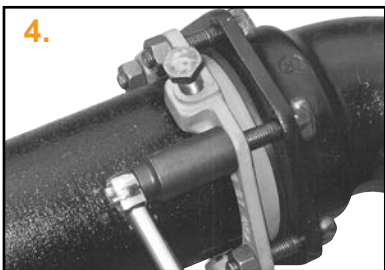
1. Clean the socket and plain end. Lubricate gasket and plain end with approved pipe lubricant meeting AWWA C111. Place the gland on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end.



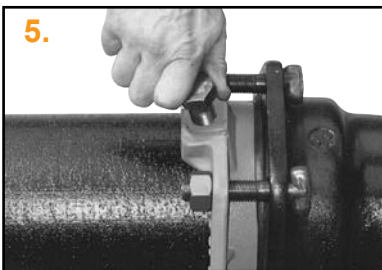
2. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly. (In cold conditions, it is best to warm the gasket to approximately room temperature to facilitate assembly.)



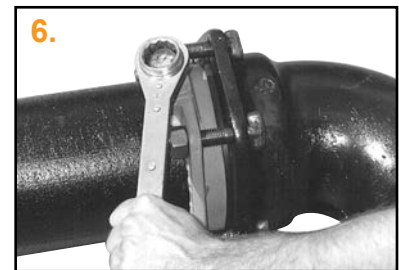
3. Push the gland toward the socket and center it around the pipe with the gland lip against the gasket. Insert T-bolts and hand tighten nuts with the gland centered around the pipe. Set deflection after joint assembly but before tightening bolts (Maximum deflection is 5° on 3" - 12", 3° on 14" - 24", 1° on 30" - 48" sizes.)



4. Tighten the T-bolts to the same torque recommended in AWWA C111 (**45-60 ft-lb on 3" - 24" sizes, 100-120 ft-lb on 30" - 36" sizes and 120-150 ft-lb on 42" - 48" sizes**). Tighten in an alternating manner (6 o'clock, 12 o'clock, 3 o'clock, 9 o'clock), maintaining the same gap between the gland and the MJ bell face at all points around the MJ socket. Repeat the process until all bolts are within the approximate torque range. Use of a torque wrench is strongly recommended to ensure proper torque.



5. After correct assembly of the mechanical joint, bring all wedges in contact with the pipe surface by turning all the Auto-Tork actuating screws in a clockwise direction until contact is made and screw is "hand tight."



6. Continue tightening the Auto-Tork screws in an alternating manner until all heads have twisted off.

7. Although it is not a requirement, it is always good practice to recheck T-bolt torque prior to backfilling and/or applying water pressure.

Note: The Series 1400 can be re-used or re-installed after the Auto-Tork screw heads have been twisted off. In this case, use a torque wrench to tighten the hex head of the wedge activating screw to 75 - 110 ft-lb.

Consult the Ford Meter Box website for the most current installation instructions.

Uni-Flange® Series 1400

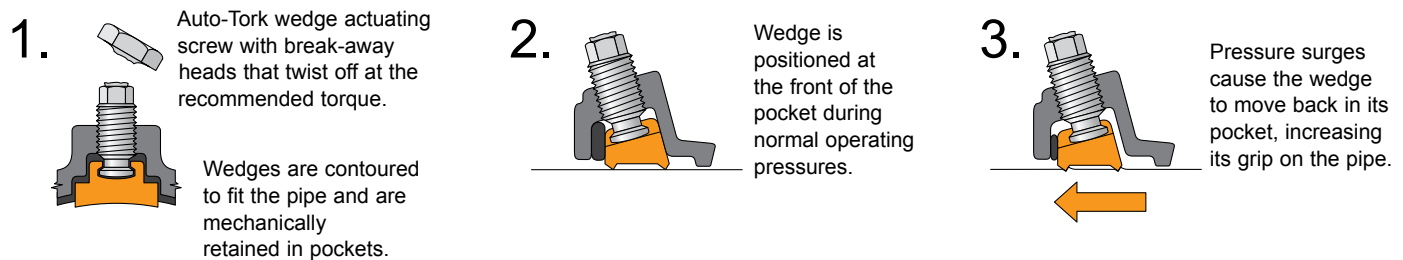
Information - Wedge Action MJ Retainer Gland for Ductile Iron Pipe

HISTORY

The Series 1400 was originally designed to provide joint restraint for ductile iron pipelines installed in areas subject to earthquakes. Its unique "controlled expansion and flexibility" feature has allowed it to withstand several major earthquakes; one as large as magnitude 7.7 in 1983 and another of magnitude 7.8 in 1993. Uni-Flange® has licensed this technology and has adapted the design to AWWA standards and dimensions.

HOW IT WORKS

The Series 1400 is a mechanical joint restraining gland, incorporating individually actuated wedges located around the circumference of the pipe. When the specially designed wedge actuating screws are tightened, the teeth on the bottom of each wedge lock onto the pipe surface. Under normal operating conditions, this is all the restraint that is required. If external forces cause the pipe to move, the wedge teeth remain locked on the pipe and the wedge moves against the actuating screw, enclosed in its ductile iron pocket. This feature allows the joint to prevent separation yet remain resilient and flexible after assembly. In high pressure applications, or when surge pressures occur, the 1400 uses the line pressure to increase its restraining grip on the pipe. If the pressure decreases, the wedge returns to its original position and controlled expansion and flexibility are available again.



ADVANTAGES OF THE SERIES 1400

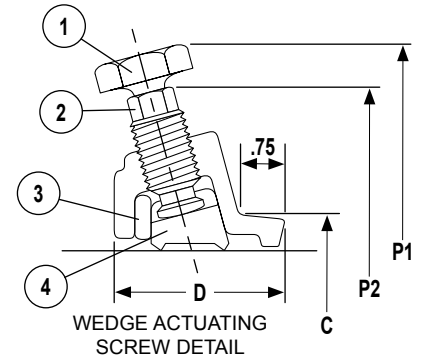
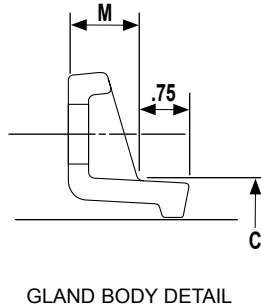
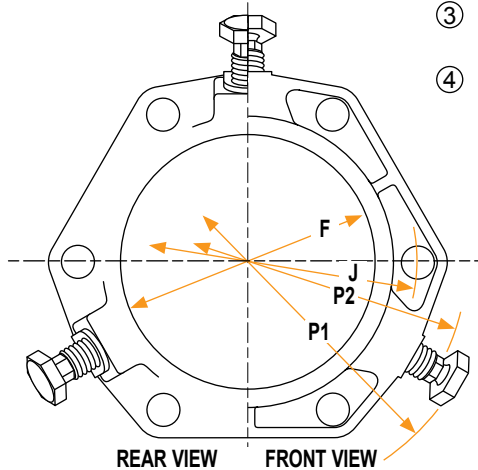
- **Eliminates** the need of costly and time consuming **concrete thrust blocks**.
- **Auto-Tork wedge actuating screws ensure proper installation.** Auto-Tork screws are designed with a break-away head that twists off at the recommended torque, leaving a hex head in case future maintenance or removal is required. This gives a visual indicator and ensures correct installation every time.
- **Wedges are contoured to fit the pipe.** This provides greater surface area contact, increasing the restraint capability and distributing the restraining force. The Series 1400 can be used on any thickness or class of ductile iron pipe.
- **High Pressure Capabilities.** The Series 1400 is rated at 350 PSI in 3" - 16" nominal sizes, 250 PSI in 18" - 48". Minimum 2:1 safety factor in all sizes. For higher pressure rating applications, see Series 2800.
- **Proven Technology.** The Series 1400 design has decades of successful field service.
- **The Series 1400 Offers 5° deflection** on sizes 3"-12", **3° deflection** on sizes 14"-24" and **1° deflection** on 30" through 48" sizes. This advantage is provided even after installation and pressurization.
- **No special tools necessary.** Designed for use with standard mechanical joint bells conforming to AWWA C111. The same wrench used to tighten the T-bolt nuts can be used on the wedge actuating screws.
- **Wedges are mechanically retained in pockets.** The Series 1400 wedges cannot fall out! All necessary parts show up at the job site and no parts are lost in the trench if the gland is removed from the pipe for system maintenance or relocation.
- **Used with ordinary ductile iron pipe and mechanical joint sockets.** There is no need to order, pay for and wait for special factory fabricated parts. Totally field adaptable; no beveling, special segments or welded rings required.
- **4" - 12" FM approved, and 4" - 48" UL listed.** Contact factory for details.



Uni-Flange® Series 1400

Information - Wedge Action MJ Retainer Gland Joint Restraint for Ductile Iron Pipe

- ① Auto-Tork break-away head, 1-1/4" across the flat (same as 3/4" heavy hex nut)
- ② 5/8" hex-head, operating screw
- ③ Rubber spacer (positions wedge during assembly)
- ④ Wedge



Series 1400 MJ Retainer Gland for Ductile Iron Pipe

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	PRESSURE RATING (PSI)	NO. OF WEDGES	APPROX. WEIGHT (LBS.)	P1*	P2**	C	D	F	M	J	NO. OF BOLT HOLES
3"	3.96	UFR1400-D-3-(I or U)	350	2	6.0	11.04	9.06	4.84	2.65	4.06	0.68	6.19	4
4"	4.80	UFR1400-D-4-(I or U)	350	2	7.5	11.9	10.0	5.92	2.65	4.90	0.88	7.50	4
6"	6.90	UFR1400-D-6-(I or U)	350	3	11.0	14.0	12.1	8.02	2.65	7.00	0.88	9.50	6
8"	9.05	UFR1400-D-8-(I or U)	350	4	14.5	16.2	14.3	10.17	2.65	9.15	1.10	11.75	6
10"	11.10	UFR1400-D-10-(I or U)	350	6	22.0	18.2	16.3	12.22	2.75	11.20	1.10	14.00	8
12"	13.20	UFR1400-D-12-(I or U)	350	8	28.0	20.3	18.4	14.32	2.75	13.30	1.10	16.25	8
14"	15.30	UFR1400-D-14-(I or U)	350	10	42.0	22.9	20.9	16.40	3.00	15.44	1.50	18.75	10
16"	17.40	UFR1400-D-16-(I or U)	350	12	50.0	25.0	23.0	18.50	3.00	17.54	1.56	21.00	12
18"	19.50	UFR1400-D-18-(I or U)	250	12	67.0	28.1	25.8	20.60	3.05	19.64	1.65	23.25	12
20"	21.60	UFR1400-D-20-(I or U)	250	14	75.0	30.2	27.9	22.70	3.10	21.75	1.70	25.50	14
24"	25.80	UFR1400-D-24-(I or U)	250	16	85.0	34.4	32.1	26.90	3.20	25.94	1.85	30.00	16
30"	32.00	***UFR1400-D-30-(I or U)	250	20	221.0	40.6	38.6	33.29	3.55	32.17	2.25	36.88	20
36"	38.30	***UFR1400-D-36-(I or U)	250	24	256.0	46.9	44.9	39.59	3.76	38.47	2.25	43.75	24
42"	44.50	***UFR1400-D-42-(I or U)	250	28	475	53.9	53.9	45.79	5.68	44.79	2.56	50.62	28
48"	50.80	***UFR1400-D-48-(I or U)	250	32	573	60.2	60.2	52.09	5.68	51.09	2.56	57.50	32

I = Import Casting U = Domestic Casting

All dimensions in inches unless otherwise stated.

* Maximum O.D. of gland on pipe before break-away heads have been removed (as received).

** Maximum O.D. of gland on pipe after wedges have been activated and break-away heads have been removed.

*** 30" through 48" sizes include a Uni-Seal gasket.

Note: 4" - 12" oversized 1400 retainer glands are available for gray cast iron pipe by adding "-XL" to the end of the catalog number. Contact factory for details.

Note: Not to be used on plain end fittings.

Uni-Flange® Series 1400

Wedge Action MJ Retainer Gland Joint Restraint for Ductile Iron Pipe

SERIES 1400 WEDGE ACTION RETAINER GLAND PACKAGED WITH ACCESSORIES



PACKAGE CONTAINS

- 1 - Series 1400 wedge action retainer gland
- 1 - Set of high strength, low alloy T-bolts & nuts (AWWA C111)
- 1 - Mechanical joint gasket (AWWA C111) 3" - 24" sizes, Uni-Seal Gasket 30" - 48" sizes

3" through 12" sizes are shrink wrapped in a weather resistant carton. 14" through 48" sizes are bulk packaged.

Series 1400-DA Retainer MJ Retainer Gland for Ductile Iron Pipe with Accessories

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NO. OF WEDGES	PRESSURE RATING (PSI)	APPROX. WEIGHT (LBS.)
3"	3.96	UFR1400-DA-3-(I or U)	2	350	8.0
4"	4.80	UFR1400-DA-4-(I or U)	2	350	10.5
6"	6.90	UFR1400-DA-6-(I or U)	3	350	15.5
8"	9.05	UFR1400-DA-8-(I or U)	4	350	19.8
10"	11.10	UFR1400-DA-10-(I or U)	6	350	29.5
12"	13.20	UFR1400-DA-12-(I or U)	8	350	35.0
14"	15.30	UFR1400-DA-14-(I or U)	10	350	52.0
16"	17.40	UFR1400-DA-16-(I or U)	12	350	62.0
18"	19.50	UFR1400-DA-18-(I or U)	12	250	79.0
20"	21.60	UFR1400-DA-20-(I or U)	14	250	88.0
24"	25.80	UFR1400-DA-24-(I or U)	16	250	101.0
30"	32.00	UFR1400-DA-30-(I or U)	20	250	262.0
36"	38.30	UFR1400-DA-36-(I or U)	24	250	306.0
42"	44.50	UFR1400-DA-42-(I or U)	28	250	575.0
48"	50.80	UFR1400-DA-48-(I or U)	32	250	690.0

30" thru 48" sizes include a Uni-Seal Gasket.

I = Import Casting U = Domestic Casting

Note: Not to be used on plain end fittings.

Sample Specification – Series 1400

Restraint for standardized mechanical joints shall be incorporated in the design of the follower gland and shall impart multiple points of wedge action against the pipe, increasing its resistance as the pressure increases. The assembled joint shall maintain its flexibility after burial and shall maintain its integrity by a controlled and limited expansion of each joint during the wedging action. Restraining glands shall be manufactured of high strength ductile iron, conforming to the requirements of ASTM A536. Wedges shall be contoured to properly fit on the pipe and shall be manufactured of ductile iron, heat-treated to a minimum hardness of 370 BHN. Dimensions of the glands shall be such that they can be used with the standardized mechanical joint bell and tee head bolts conforming to the requirements of ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of latest revision. Twist-off heads shall be incorporated in the design of the wedge actuating screws to ensure proper torque. All ductile iron components shall be phosphate washed and coated with an electrostatically applied, heat cured epoxy coating. The restraining device shall have a water working pressure rating of 350 PSI in sizes 3" through 16" and 250 PSI in sizes 18" and larger with a safety factor of at least 2:1 against separation when tested in a dead-end situation. Restraint device shall be Uni-Flange Series 1400 or approved equal.

Uni-Flange® Series 1400

Wedge Action MJ Retainer Gland Joint Restraint for Ductile Iron Pipe

SERIES 1400 WEDGE ACTION RETAINER GLAND PACKAGED WITH ACCESSORIES



PACKAGE CONTAINS

- 1 - Series 1400 wedge action retainer gland
- 1 - Set of high strength, low alloy T-bolts & nuts (AWWA C111)
- 1 - SO-EZ gasket 3" - 12" sizes (AWWA C111)

3" through 12" sizes are shrink wrapped in a weather resistant carton.

Series 1400-ZA Retainer MJ Retainer Gland for Ductile Iron Pipe with Accessories

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	No. OF WEDGES	PRESSURE RATING (PSI)	APPROX. WEIGHT (LBS.)
3"	3.96	UFR1400-ZA-3-(I or U)	2	350	8.0
4"	4.80	UFR1400-ZA-4-(I or U)	2	350	10.5
6"	6.90	UFR1400-ZA-6-(I or U)	3	350	15.5
8"	9.05	UFR1400-ZA-8-(I or U)	4	350	19.8
10"	11.10	UFR1400-ZA-10-(I or U)	6	350	29.5
12"	13.20	UFR1400-ZA-12-(I or U)	8	350	35.0

I = Import Casting U = Domestic Casting

Note: Not to be used on plain end fittings.

Sample Specification – Series 1400

Restraint for standardized mechanical joints shall be incorporated in the design of the follower gland and shall impart multiple points of wedge action against the pipe, increasing its resistance as the pressure increases. The assembled joint shall maintain its flexibility after burial and shall maintain its integrity by a controlled and limited expansion of each joint during the wedging action. Restraining glands shall be manufactured of high strength ductile iron conforming to the requirements of ASTM A536. Wedges shall be contoured to properly fit on the pipe and shall be manufactured of ductile iron, heat-treated to a minimum hardness of 370 BHN. Dimensions of the glands shall be such that they can be used with the standardized mechanical joint bell and tee head bolts conforming to the requirements of ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of latest revision. Twist-off heads shall be incorporated in the design of the wedge actuating screws to ensure proper torque. All ductile iron components shall be phosphate washed and coated with an electrostatically applied, heat cured epoxy coating. The restraining device shall have a water working pressure rating of 350 PSI in sizes 3" through 12" with a safety factor of at least 2:1 against separation when tested in a dead-end situation. Restraint device shall be Uni-Flange Series 1400 or approved equal.

Uni-Flange® Series 1405

Split MJ Retainer Gland Joint Restraint for Ductile Iron

Working Pressure: 3" - 12" = 350 PSI
14" - 16" = 300 PSI
18" - 36" = 200 PSI

Safety Factor: 2:1 safety factor at rated working pressure

Actuating Screws

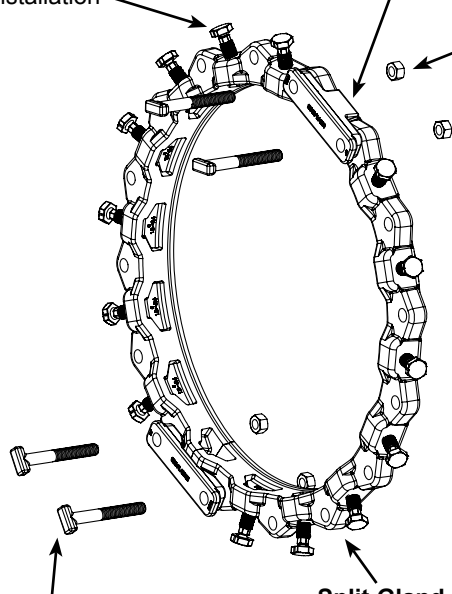
Ductile iron wedge actuating screw, with the Auto-Tork break-away head design, ensures proper torque during installation

Connector Plates/Rings

High strength ductile iron per ASTM A536, Grade 65-45-12
3" - 8" uses connector ring
10" - 36" uses connector plate

Heavy Hex Nuts

High strength, low alloy steel per ASTM A242, ANSI/AWWA C111/A21.11

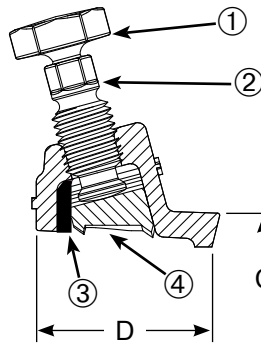


Tee Bolts

High strength low alloy steel per ASTM A242 and ANSI/AWWA C111

Split Gland Body

High strength ductile iron per ASTM A536, Grade 65-45-12. Compatible with all mechanical joints conforming to ANSI/AWWA C111/A21.11 and fittings conforming to AWWA C110 and C153



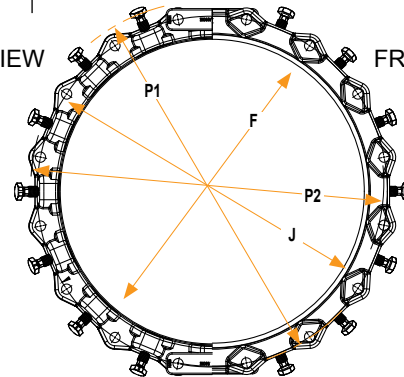
Wedges

Ductile iron wedges are heat-treated to a hardness of 370 BHN minimum

1. Auto-Tork break-away head, 1-1/4" across the flat (same as 3/4" heavy hex nut)
2. 5/8" hex head, operating screw
3. Rubber spacer (positions wedge during assembly)
4. Wedge

REAR VIEW

FRONT VIEW



Color Code

All ductile iron components are black e-coat epoxy

NOM. PIPE SIZE	PIPE O.D.	CATALOG NUMBER	PRESSURE RATING (PSI)	NO. OF WEDGES	APPROX. WT. LBS.	P1*	P2**	C	D	F	J	NO. OF BOLT HOLES
3"	3.96	UFR1405-DA-3-(I)	350	2	6.0	11.0	9.1	4.84	2.65	4.06	6.19	4
4"	4.80	UFR1405-DA-4-(I)	350	2	7.5	11.9	10.0	5.92	2.65	4.90	7.50	4
6"	6.90	UFR1405-DA-6-(I)	350	3	11.0	14.0	12.1	8.02	2.65	7.00	9.50	6
8"	9.05	UFR1405-DA-8-(I)	350	4	14.5	16.2	14.0	10.17	2.65	9.15	11.75	6
10"	11.10	UFR1405-DA-10-(I)	350	6	23.0	18.2	16.3	12.22	2.75	11.20	14.00	8
12"	13.20	UFR1405-DA-12-(I)	350	8	28.5	20.3	18.4	14.32	2.75	13.30	16.25	8
14"	15.30	UFR1405-DA-14-(I or U)	300	8	53.0	22.9	20.9	16.40	3.00	15.44	18.75	10
16"	17.40	UFR1405-DA-16-(I or U)	300	10	59.6	25.0	23.0	18.50	3.00	17.54	21.00	12
18"	19.50	UFR1405-DA-18-(I or U)	200	10	74.2	28.1	25.8	20.60	3.05	19.64	23.25	12
20"	21.60	UFR1405-DA-20-(I or U)	200	12	78.4	30.2	27.9	22.70	3.10	21.75	25.50	14
24"	25.80	UFR1405-DA-24-(I or U)	200	14	101.0	34.4	32.1	26.90	3.20	25.94	30.00	16
30"	32.00	UFR1405-DA-30-(I or U)	200	18	181.0	40.6	38.6	33.29	3.55	32.17	36.88	20
36"	38.30	UFR1405-DA-36-(I or U)	200	22	325.0	46.9	44.9	39.59	3.76	38.47	43.75	24

* Maximum O.D. of gland on pipe before break-away heads have been removed (as received).

** Maximum O.D. of gland on pipe after wedges have been activated and break-away heads have been removed.

Note: The Series UFR1405 can be reused or reinstalled after the Auto-Tork screw heads have been twisted off.

In this case, tighten the hex head of the wedge actuating screw to 75 - 110 ft. lb. A torque wrench is required to ensure proper torque.

Note: 4" - 12" oversized split retainer glands are available for gray cast iron pipe by adding "-XL" to the end of the catalog number.

Contact factory for details.

I = Import Casting U = Domestic Casting

Uni-Flange® Series 1450 Wedge Action Restrainer

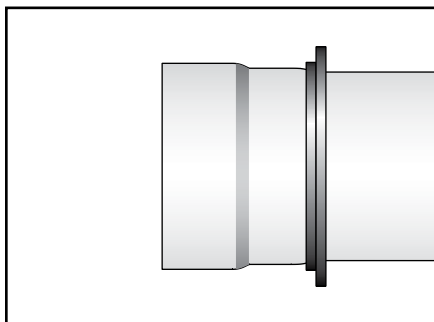
for Push-on Joints of Ductile Iron Pipe (New Installations Only)

The 1450 consists of a Series 1400 wedge action retainer gland installed on the pipe spigot, connected with high strength, low alloy rods to a ductile iron backup ring that seats behind the pipe bell. It offers the following advantages:

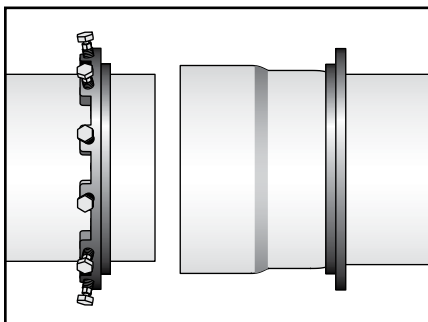
- Fast, economical restraint of push-on pipe bells. There is no need for special (and expensive) "factory restrained joint" pipe.
- High pressure capabilities. Rated at 350 PSI in 3" through 16" sizes, and 250 PSI in 18" through 48" sizes. Minimum 2:1 safety factor at full rated pressure. For higher pressure rating applications, see Series 2800.
- Recommended for any thickness class or pressure class of ductile iron pipe. The contoured wedges of the 1400 component fit the pipe properly. They spread the restraining force around the circumference of the pipe and maximize performance. There is no point loading of the pipe.

Installation Instructions

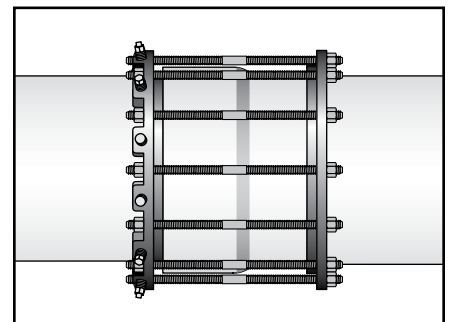
1. Install the ductile iron backup ring behind the bell, with the lip extension of the gland facing the back of the pipe bell.
2. Place the Series 1400 wedge action retainer gland on the pipe spigot with the lip extension toward the bell.
3. Assemble the push-on joint of pipe per the pipe manufacturer's instructions.
4. Using a connecting rod (supplied) as a measuring tool, position the 1400 on the pipe spigot so that several threads of the connecting rod will extend through the bolt holes of the 1400 when it is connected to the backup ring.
5. Align the gland and 1400 and install the rods and nuts in each of the bolt holes.
6. Activate the 1400 restraint by tightening the Auto-Tork wedge actuating screws in a clockwise manner until they are all in contact with the pipe surface. Continue tightening in an alternating manner until all of the Auto-Tork heads twist off.
7. Tighten the nuts on the connecting rods until the mechanical joint gland is seated firmly against the back of the pipe bell.



Install the ductile iron backup ring behind the bell with the lip extension of the gland facing the bell.



Place the Series 1400 wedge action retainer gland on the spigot with the lip extension toward the bell. Assemble the push-on joint per the pipe manufacturer's instructions.



Align the gland and 1400 and install the rods and nuts in each of the bolt holes. Tighten the Auto-Tork wedge actuating screws in an alternating manner until the heads twist off. Tighten the connecting rod nuts until the backup ring seats against the bell.

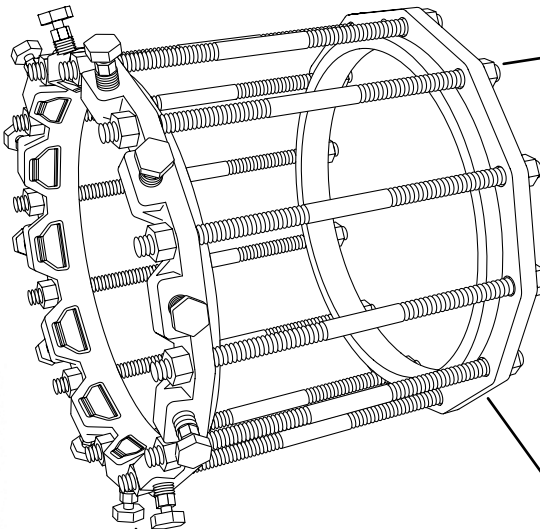
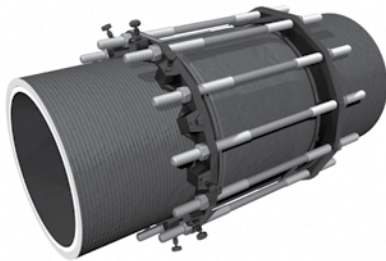
Consult the Ford Meter Box website for the most current installation instructions.

Uni-Flange® Series 1450 Wedge Action Restrainer

for Push-on Joints of Ductile Iron Pipe (New Installations Only)

Series 1450 wedge action restrainer installed on spigot with lip facing the spigot end of pipe. ASTM A536, AWWA C111. All ductile iron components are black e-coat epoxy.

Series 1450 Installed



High strength, low alloy connecting rods and nuts. AWWA C111

Ductile iron Auto-Tork twist-off heads.

Ductile iron backup ring installed with lip facing back of pipe bell. ASTM A536, AWWA C111 or A36 carbon steel

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	PRESSURE RATING (PSI)	No. OF RODS	ROD LENGTH	ROD DIAMETER	*MAX. BELL DIAMETER	APPROX. WEIGHT (LBS)
3"	3.96	UFR1450-D-3-(I or U)	350	4	14"	5/8"	5.50	12.0
4"	4.80	UFR1450-D-4-(I or U)	350	4	17"	3/4"	6.62	19.5
6"	6.90	UFR1450-D-6-(I or U)	350	6	17"	3/4"	8.62	29.0
8"	9.05	UFR1450-D-8-(I or U)	350	6	17"	3/4"	10.88	34.5
10"	11.10	UFR1450-D-10-(I or U)	350	8	24"	3/4"	13.12	56.0
12"	13.20	UFR1450-D-12-(I or U)	350	8	24"	3/4"	15.38	62.0
14"	15.30	UFR1450-D-14-(I or U)	350	10	24"	3/4"	17.88	87.0
16"	17.40	UFR1450-D-16-(I or U)	350	12	24"	3/4"	20.12	107.0
18"	19.50	UFR1450-D-18-(I or U)	250	12	24"	3/4"	22.38	122.0
20"	21.60	UFR1450-D-20-(I or U)	250	14	24"	3/4"	24.62	140.0
24"	25.80	UFR1450-D-24-(I or U)	250	16	24"	3/4"	29.12	159.0
30"	32.00	UFR1450-D-30-(I or U)	250	20	24"	1"	35.80	362.0
36"	38.30	UFR1450-D-36-(I or U)	250	24	24"	1"	42.60	430.0
42"	44.50	UFR1450-D-42-(I or U)	250	28	52"	1-1/4"	49-1/4"	1350
48"	50.80	UFR1450-D-48-(I or U)	250	32	52"	1-1/4"	56-1/8"	1570

I = Import Casting U = Domestic Casting

All dimensions in inches unless otherwise stated.

* NOTE: Connecting rods **WILL NOT CLEAR** a pipe bell with a maximum diameter larger than the listed measurement. These maximum diameters do not include joint deflection. Confirm pipe bell diameter before ordering.

Sample Specification - Series 1450

Restraint for push-on bells of ductile iron pipe shall consist of a wedge action retainer gland installed on the pipe spigot, connected to a ductile iron backup ring installed behind the pipe bell. The wedge action restrainer shall be manufactured of high strength ductile iron, ASTM A536, grade 65-45-12. Wedges shall be heat treated to a minimum BHN 370 and shall be contoured to properly fit the pipe. The heads of the wedge actuating screws shall twist off at the recommended torque, ensuring correct installation. Connecting rods and nuts shall be of high strength, low alloy material meeting ANSI / AWWA C111 / A21.11 standard. The backup ring shall be of high strength ductile iron, ASTM A536, grade 65-45-12. Restrainers for push-on joints of ductile iron pipe shall carry a water working pressure rating of 350 PSI in 3" through 16" sizes, 250 PSI in 14" through 48" sizes, and shall be Uni-Flange® Series 1450 or approved equal.

Uni-Flange® Series 1455

Joint Restraint with Split Back-up Ring for Ductile Iron

Working Pressure: 3" - 12" = 350 psi
 14" - 16" = 300 psi
 18" - 36" = 200 psi

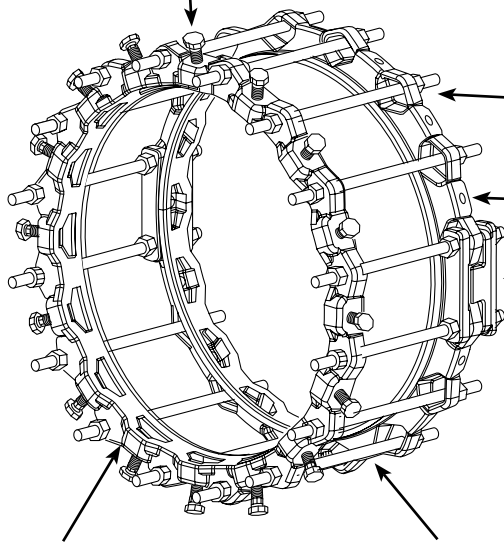
Safety Factor: 2:1 safety factor at rated working pressure

Actuating Screws

Ductile iron wedge actuating screw, with the Auto-Tork break-away head design, ensures proper torque during installation

Color Code

All ductile iron components are black e-coat epoxy



Heavy Hex Nuts

High strength, low alloy steel per ASTM A242, ANSI/AWWA C111/A21.11

Split Back-Up Ring

Ductile iron per ASTM A536, Grade 65-45-12 ANSI/AWWA C111/A21.11 (assembled on bell end)

Connector Plates/Rings

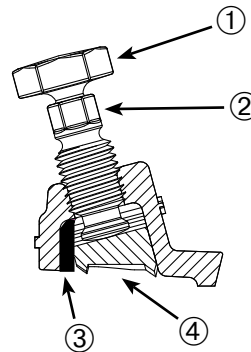
High strength ductile iron per ASTM A536, Grade 65-45-12
 3" - 8" uses connector ring
 10" - 36" uses connector plate

Gland Body

High strength ductile iron per ASTM A536, Grade 65-45-12. Compatible with all pipe bell joints conforming to ANSI/AWWA C111/A21.11

Threaded Rods

High strength, low alloy steel ANSI/AWWA C111/A21.11



Wedges

Ductile iron wedges are heat-treated to a hardness of 370 BHN minimum

1. Auto-Tork break-away head, 1-1/4" across the flat (same as 3/4" heavy hex nut)
2. 5/8" hex head, operating screw
3. Rubber spacer (positions wedge during assembly)
4. Wedge

NOM. PIPE SIZE	PIPE O.D.	CATALOG NUMBER	RODS			PRESSURE RATING (PSI)	*MAX. BELL DIA.	APPROX. WT. LBS.
			No.	LENGTH	DIA.			
3"	3.96	UFR1455-D-3-(I)	4	14"	5/8"	350	5.50	12.0
4"	4.80	UFR1455-D-4-(I)	4	17"	3/4"	350	6.62	20.0
6"	6.90	UFR1455-D-6-(I)	6	17"	3/4"	350	8.62	29.0
8"	9.05	UFR1455-D-8-(I)	6	17"	3/4"	350	10.88	35.0
10"	11.10	UFR1455-D-10-(I)	8	24"	3/4"	350	13.12	56.0
12"	13.20	UFR1455-D-12-(I)	8	24"	3/4"	350	15.38	62.0
14"	15.30	UFR1455-D-14-(I or U)	10	24"	3/4"	300	17.88	120.3
16"	17.40	UFR1455-D-16-(I or U)	12	24"	3/4"	300	20.12	134.4
18"	19.50	UFR1455-D-18-(I or U)	12	24"	3/4"	200	22.38	158.3
20"	21.60	UFR1455-D-20-(I or U)	14	24"	3/4"	200	24.62	178.7
24"	25.80	UFR1455-D-24-(I or U)	16	24"	3/4"	200	29.12	218.8
30"	32.00	UFR1455-D-30-(I or U)	20	24"	1"	200	35.80	455.0
36"	38.30	UFR1455-D-36-(I or U)	24	24"	1"	200	42.60	564.6

* Note: Connecting rods **WILL NOT CLEAR** a pipe bell with a maximum diameter larger than the listed measurement. These maximum diameters do not include joint deflection. Confirm pipe bell diameter before ordering.

Note: The Series UFR1455 can be reused or reinstalled after the Auto-Tork screw heads have been twisted off.

In this case, tighten the hex head of the wedge actuating screw to 75 - 110 ft. lb. A torque wrench is required to ensure proper torque.

I = Import Casting U = Domestic Casting

Uni-Flange® Series 1490

Split Joint Restraint with Split Back-up Ring for Ductile Iron

Working Pressure: 3" - 12" = 350 PSI
 14" - 16" = 300 PSI
 18" - 36" = 200 PSI

Safety Factor: 2:1 safety factor at rated working pressure

Actuating Screws

Ductile iron wedge actuating screw, with the Auto-Tork break-away head design, ensures proper torque during installation

Color Code

All ductile iron components are black e-coat epoxy



Heavy Hex Nuts

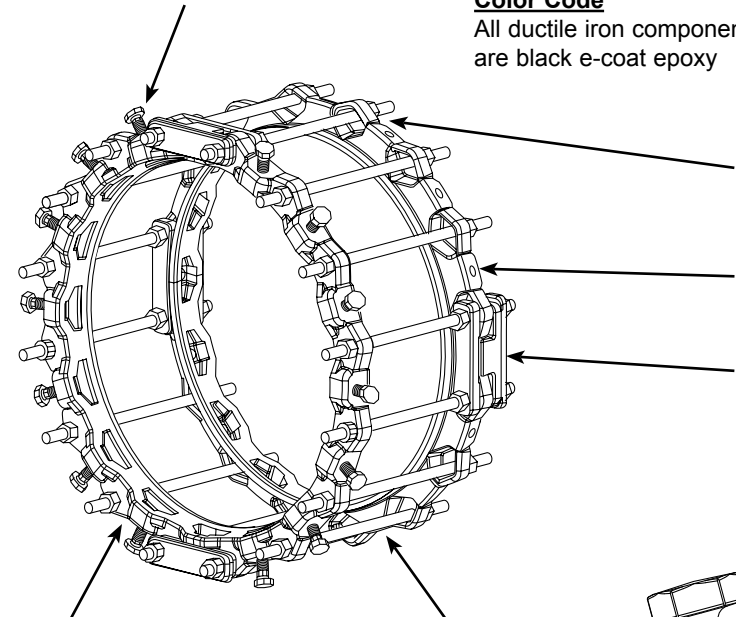
High strength, low alloy steel per ASTM A242, ANSI/AWWA C111/A21.11

Split Back-Up Ring

Ductile iron per ASTM A536, Grade 65-45-12 ANSI/AWWA C111/A21.11 (assembled on bell end)

Connector Plates/Rings

High strength ductile iron per ASTM A536, Grade 65-45-12
 3" - 8" uses connector ring
 10" - 36" uses connector plate

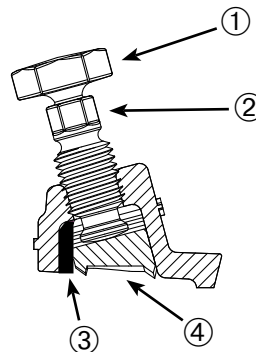


Split Gland Body

High strength ductile iron per ASTM A536, Grade 65-45-12. Compatible with all pipe bell joints conforming to ANSI/AWWA C111/A21.11

Threaded Rods

High strength, low alloy steel ANSI/AWWA C111/A21.11



Wedges

Ductile iron wedges are heat-treated to a hardness of 370 BHN minimum

1. Auto-Tork break-away head, 1-1/4" across the flat (same as 3/4" heavy hex nut)
2. 5/8" hex-head, operating screw
3. Rubber spacer (positions wedge during assembly)
4. Wedge

NOM. PIPE SIZE	PIPE O.D.	CATALOG NUMBER	RODS			PRESSURE RATING (PSI)	*MAX. BELL DIA.	APPROX. WT. LBS.
			No.	LENGTH	DIA.			
3"	3.96	UFR1490-D-3-(I)	4	14"	5/8"	350	5.50	12.0
4"	4.80	UFR1490-D-4-(I)	4	17"	5/8"	350	6.62	20.0
6"	6.90	UFR1490-D-6-(I)	6	17"	3/4"	350	8.62	29.0
8"	9.05	UFR1490-D-8-(I)	6	17"	3/4"	350	10.88	35.0
10"	11.10	UFR1490-D-10-(I)	8	24"	3/4"	350	13.12	56.0
12"	13.20	UFR1490-D-12-(I)	8	24"	3/4"	350	16.38	62.0
14"	15.30	UFR1490-D-14-(I or U)	10	24"	3/4"	300	17.88	117.4
16"	17.40	UFR1490-D-16-(I or U)	12	24"	3/4"	300	20.12	135.0
18"	19.50	UFR1490-D-18-(I or U)	12	24"	3/4"	200	22.38	151.6
20"	21.60	UFR1490-D-20-(I or U)	14	24"	3/4"	200	24.62	169.6
24"	25.80	UFR1490-D-24-(I or U)	16	24"	3/4"	200	29.12	187.8
30"	32.00	UFR1490-D-30-(I or U)	20	24"	1"	200	35.80	481.0
36"	38.30	UFR1490-D-36-(I or U)	24	24"	1"	200	42.60	603.0

* Note: Connecting rods **WILL NOT CLEAR** a pipe bell with a maximum diameter larger than the listed measurement. These maximum diameters do not include joint deflection. Confirm pipe bell diameter before ordering.

Note: The Series UFR1490 can be reused or reinstalled after the Auto-Tork screw heads have been twisted off.

In this case, tighten the hex head of the wedge actuating screw to 75 - 110 ft. lb. A torque wrench is required to ensure proper torque.

I = Import Casting U = Domestic Casting

Uni-Flange® Series 1495

Mid-Span Split Restraints for Ductile Iron

Working Pressure: 3" - 12" = 350 PSI
 14" - 16" = 300 PSI
 18" - 36" = 200 PSI

Safety Factor: 2:1 safety factor at rated working pressure

Color Code

All ductile iron components are black e-coat epoxy

Actuating Screws

Ductile iron wedge actuating screw, with the Auto-Tork break-away head design, ensures proper torque during installation

Split Gland Body

High strength ductile iron per ASTM A536, Grade 65-45-12. Compatible with all pipe bell joints conforming to ANSI/AWWA C111/A21.11

Tee Bolts

High strength low alloy steel per ASTM A242 and ANSI/AWWA C11

Heavy Hex Nuts

High strength, low alloy steel per ASTM A242, ANSI/AWWA C111/A21.11

Connector Plates/Rings

High strength ductile iron per ASTM A536, Grade 65-45-12
 3" - 8" uses connector ring
 10" - 36" uses connector plate

Wedges

Ductile iron wedges are heat-treated to a hardness of 370 BHN minimum

1. Auto-Tork break-away head, 1-1/4" across the flat (same as 3/4" heavy hex nut)
2. 5/8" hex head, operating screw
3. Rubber spacer (positions wedge during assembly)
4. Wedge

NOM. PIPE SIZE	PRESSURE RATING (PSI)	CATALOG NUMBER	*MAX. BELL DIA.	APPROX. WT. LBS.
3"	350	UFR1495-D-3-(I)	5.50	7.0
4"	350	UFR1495-D-4-(I)	6.62	8.5
6"	350	UFR1495-D-6-(I)	8.62	12.0
8"	350	UFR1495-D-8-(I)	10.88	15.5
10"	350	UFR1495-D-10-(I)	13.12	41.0
12"	350	UFR1495-D-12-(I)	16.38	50.0
14"	300	UFR1495-D-14-(I or U)	17.88	57.0
16"	300	UFR1495-D-16-(I or U)	20.12	63.6
18"	200	UFR1495-D-18-(I or U)	22.38	78.2
20"	200	UFR1495-D-20-(I or U)	24.62	89.0
24"	200	UFR1495-D-24-(I or U)	29.12	105.0
30"	200	UFR1495-D-30-(I or U)	35.80	185.0
36"	200	UFR1495-D-36-(I or U)	42.60	329.0

I = Import Casting U = Domestic Casting

* Note: Connecting rods **WILL NOT CLEAR** a pipe bell with a maximum diameter larger than the listed measurement. These maximum diameters do not include joint deflection. Confirm pipe bell diameter before ordering.

Uni-Flange® Series 2800

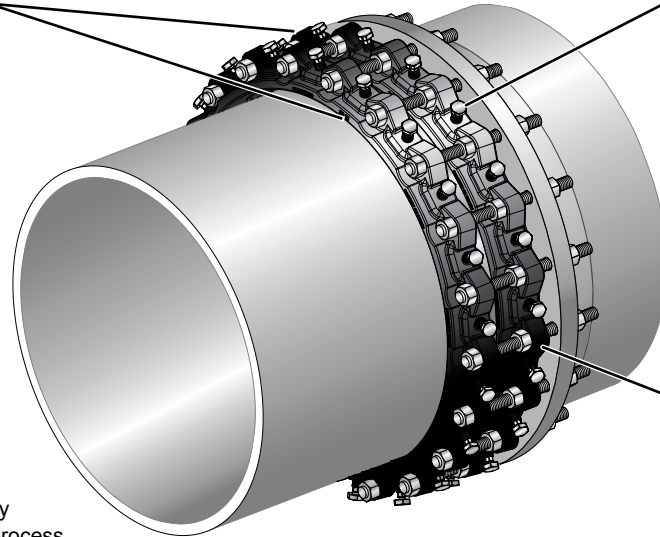
Information - Tandem Restraints for Ductile Iron Pipe for High Pressure Applications

Used in tandem, the UFR2800 allows two UFR1400 Restraints to work in unison to hold higher pressures.

Wedges and ductile iron are heat treated to a hardness of 370 BHN minimum.

Actuating Screws -
Ductile iron wedge actuating screw with the Auto-Tork break-away head design, ensures proper torque during installation.

Color Code:
All components are black epoxy coated, applied by the e-coat process.



Gland -
Gland body is of high strength ductile iron per ASTM A536, Grade 65-45-12. Compatible with all mechanical joints conforming to ANSI / AWWA C111 / A21.11.

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	PRESSURE RATING (PSI)	APPROX. WEIGHT (LBS.)	CATALOG NUMBER	APPROX. WEIGHT (LBS.)	No. OF BOLTS	BOLT SIZE AND LENGTH
3"	3.96	UFR2800-D-3-(I or U)	500	12.0	UFR2800-DA-3-(I or U)	16.0	4	5/8" x 9"
4"	4.80	UFR2800-D-4-(I or U)	500	15.0	UFR2800-DA-4-(I or U)	21.0	4	3/4" x 7"
6"	6.90	UFR2800-D-6-(I or U)	500	22.0	UFR2800-DA-6-(I or U)	31.0	6	3/4" x 7"
8"	9.05	UFR2800-D-8-(I or U)	500	29.0	UFR2800-DA-8-(I or U)	39.0	6	3/4" x 7"
10"	11.10	UFR2800-D-10-(I or U)	500	44.0	UFR2800-DA-10-(I or U)	59.0	8	3/4" x 7"
12"	13.20	UFR2800-D-12-(I or U)	500	56.0	UFR2800-DA-12-(I or U)	70.0	8	3/4" x 9"
14"	15.30	UFR2800-D-14-(I or U)	450	84.0	UFR2800-DA-14-(I or U)	104.0	10	3/4" x 9"
16"	17.40	UFR2800-D-16-(I or U)	450	100.0	UFR2800-DA-16-(I or U)	124.0	12	3/4" x 9"
18"	19.50	UFR2800-D-18-(I or U)	350	134.0	UFR2800-DA-18-(I or U)	158.0	12	3/4" x 9"
20"	21.60	UFR2800-D-20-(I or U)	350	150.0	UFR2800-DA-20-(I or U)	176.0	14	3/4" x 9"
24"	25.80	UFR2800-D-24-(I or U)	350	170.0	UFR2800-DA-24-(I or U)	202.0	16	3/4" x 9"
*30"	32.00	UFR2800-D-30-(I or U)	350	442.0	UFR2800-DA-30-(I or U)	524.0	20	1" x 12"
*36"	38.30	UFR2800-D-36-(I or U)	350	512.0	UFR2800-DA-36-(I or U)	612.0	24	1" x 12"

I = Import Casting U = Domestic Casting

All dimensions in inches unless otherwise stated.

* 30" and 36" have threaded rods.

Note: Not to be used on plain end fittings.

Sample Specification – Series 2800

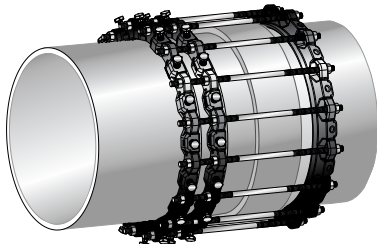
Tandem restraint for standardized mechanical joints shall be incorporated in the design of the follower gland and shall impart multiple points of wedge action against the pipe, increasing its resistance as the pressure increases. The assembled joint shall maintain its flexibility after burial and shall maintain its integrity by a controlled and limited expansion of each joint during the wedging action. Restraining glands shall be manufactured of high strength ductile iron conforming to the requirements of ASTM A536. Wedges shall be contoured to properly fit on the pipe and shall be manufactured of ductile iron, and heat treated to a minimum hardness of 370 BHN. Dimensions of the glands shall be such that they can be used with the standardized mechanical joint bell and tee head bolts conforming to the requirements of ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of latest revision. Twist-off heads shall be incorporated in the design of the wedge actuating screws to ensure proper torque. All ductile iron components shall be phosphate washed and coated with an electrostatically applied, heat cured epoxy coating. The restraining device shall have a water working pressure rating of 500 PSI in sizes 3" through 12" and 450 PSI in sizes 14" through 16" and 350 PSI in sizes 18" through 36" with a safety factor of at least 2:1 against separation when tested in a dead-end situation. Restraint device shall be Uni-Flange Series 2800 or approved equal.

Uni-Flange® Series 2850 Wedge Action Restrainer

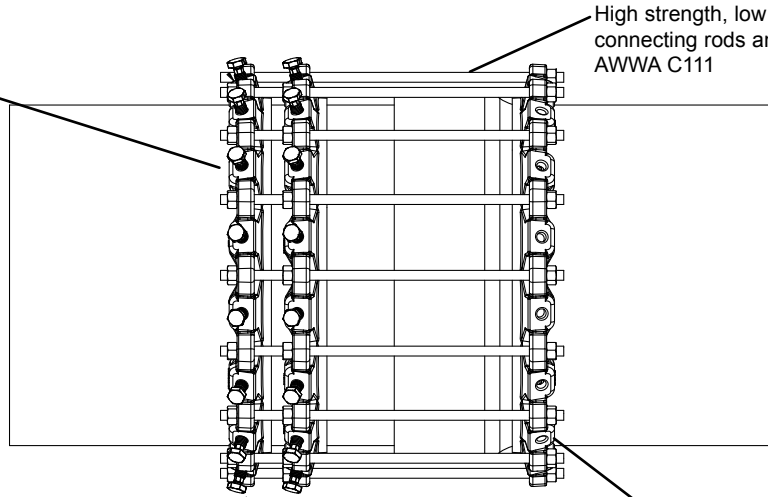
for Push-On Joints of Ductile Iron Pipe (new installations only)
for Higher Pressure Applications

Series 2850 wedge action tandem restrainer installed on spigot with lip facing the spigot end of pipe. ASTM A536, AWWA C111. All ductile iron components are black e-coat epoxy.

Series 2850 Installed



Bell and Spigot Connection



Ductile iron Auto-Tork twist-off heads.

High strength, low alloy connecting rods and nuts. AWWA C111

Ductile iron backup ring installed with lip facing back of pipe bell. ASTM A536, AWWA C111 or A36 carbon steel

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	PRESSURE RATING (PSI)	No. OF RODS	ROD LENGTH	ROD DIAMETER	*MAX BELL DIAMETER	APPROX. WEIGHT (LBS.)
3"	3.96	UFR2850-D-3-(I or U)	500	4	14"	5/8"	5.50	18.0
4"	4.80	UFR2850-D-4-(I or U)	500	4	17"	3/4"	6.62	27.0
6"	6.90	UFR2850-D-6-(I or U)	500	6	17"	3/4"	8.62	40.0
8"	9.05	UFR2850-D-8-(I or U)	500	6	17"	3/4"	10.88	49.0
10"	11.10	UFR2850-D-10-(I or U)	500	8	17"	3/4"	13.12	78.0
12"	13.20	UFR2850-D-12-(I or U)	500	8	17"	3/4"	15.38	90.0
14"	15.30	UFR2850-D-14-(I or U)	450	10	24"	3/4"	17.88	129.0
16"	17.40	UFR2850-D-16-(I or U)	450	12	24"	3/4"	20.12	157.0
18"	19.50	UFR2850-D-18-(I or U)	350	12	24"	3/4"	22.38	189.0
20"	21.60	UFR2850-D-20-(I or U)	350	14	24"	3/4"	24.62	215.0
24"	25.80	UFR2850-D-24-(I or U)	350	16	24"	3/4"	29.12	244.0
30"	32.00	UFR2850-D-30-(I or U)	350	20	24"	3/4"	35.80	583.0
36"	38.30	UFR2850-D-36-(I or U)	350	24	24"	3/4"	42.60	686.0

I = Import Casting U = Domestic Casting

All dimensions in inches unless otherwise stated.

* **Note:** Connecting rods **WILL NOT CLEAR** a pipe bell with a maximum diameter larger than the listed measurement. These maximum diameters do not include joint deflection. Confirm pipe bell diameter before ordering.

Sample Specification - Series 2850

Tandem restraint for push-on bells of ductile iron pipe shall consist of a wedge action retainer gland installed on the pipe spigot, connected to a ductile iron backup ring installed behind the pipe bell. The wedge action restrainer shall be manufactured of high strength ductile iron, ASTM A536, Grade 65-45-12. Wedges shall be heat treated to a minimum BHN 370 and shall be contoured to properly fit the pipe. The heads of the wedge actuating screws shall twist off at the recommended torque, ensuring correct installation. Connecting rods and nuts shall be of high strength, low alloy material meeting ANSI / AWWA C111 / A21.11 standard. The backup ring shall be of high strength ductile iron, ASTM A536, Grade 65-45-12. Restrainers for push-on joints of ductile iron pipe shall carry a water working pressure rating of 500 PSI in 3" through 12" sizes, 450 PSI in 14" through 16" sizes, and 350 PSI in 18" through 36" sizes, and shall be Uni-Flange® Series 2850 or approved equal.

Uni-Flange® Series 1500 “Circle Lock”

MJ Retainer Gland Joint Restraint for PVC Pipe

Actuating Screws -

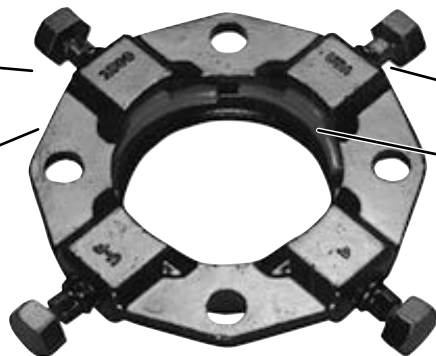
Ductile iron per ASTM A536, Grade 65-45-12, with the Auto-Tork break-away head design, ensures proper torque during installation.

Gland -

High strength ductile iron per ASTM A536, Grade 65-45-12. Compatible with all mechanical joints conforming to ANSI / AWWA C111 / A21.11.

Finish -

Black e-coat epoxy with red top coat.



A supplemental plastic stop ring will be provided on sizes 4" - 8". Remove for use on IPS PVC or steel pipe.

Safety stop ensures ring segments can never be over-tightened.

Ring Segments -
Ductile iron per ASTM A536.

The Uni-Flange® Series 1500 offers a minimum 2:1 safety factor at the full rated pressure of the PVC pipe on which it is installed, in all sizes, when tested in dead-end situations.

Sample Specification - Series 1500

Restraint for PVC pipe joined with standardized mechanical joint fittings shall be incorporated in the design of the follower gland and shall provide full circle contact and support of the pipe wall. Restraint shall be accomplished by a series of ring segments mechanically retained inside the gland housing and designed to grip the pipe wall in an even and uniform manner. Restraining ring segments shall be actuated by bolts featuring “Auto-Tork” twist off heads to ensure proper installation torque is applied. A safety stop on the Auto-Tork bolt shall limit the force applied to the ring segment against the pipe. All components of the restrainer, including the gland, bolts, and restraint segments shall be of high strength ductile iron, ASTM A536. Restraining devices shall be UL Listed / FM Approved on AWWA C900 PVC pipe and shall be certified by a third party testing laboratory as meeting or exceeding ASTM F1674-96 “Standard Test Method for Joint Restraint Devices for PVC Pipe.” Restraining devices shall be manufactured by a facility independently certified to ISO 9001 quality standard and shall be Ford / Uni-Flange® Series 1500 or approved equal.

Installation Instructions - 3" with Transition Gasket and 4" through 36" with MJ Gasket



1. Clean the socket and plain end. Lubricate socket, gasket and plain end with approved pipe lubricant meeting AWWA C111. Place the gland on the plain end with the lip extension toward the plain end, followed by the lubricated gasket with the narrow edge of the gasket toward the plain end.



2. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly.



3. Push the gland toward the socket and center it around the pipe with the gland lip against the gasket. Insert T-bolts and hand tighten nuts. Make deflection after joint assembly but before tightening bolts. (max. deflection is 5°)



4. Tighten the T-bolt nuts to the torque recommended in AWWA C111 (45-60 ft-lb for 3" size, 75-90 ft-lb in 4"-24" sizes; 100-120 ft-lb in 30"-36" sizes). Tighten in an alternating manner (6 o'clock, 12 o'clock, 9 o'clock, 3 o'clock), maintaining the same gap between the gland and the MJ bell face at all points around the socket. Repeat the process until all bolts are within the recommended torque range. Use of a torque wrench is strongly recommended.



5. After correct assembly of the mechanical joint, bring all restraint segments in contact with the pipe surface by turning the “Auto-Tork” actuating screws in a clockwise direction.



6. Tighten the “Auto-Tork” screws in an alternating manner among screws until all the heads have twisted off. Although it is not a requirement, it is always good practice to recheck the T-bolt torque prior to backfilling and/or applying water pressure.

Note: To reinstall gland after twist-off heads are removed, use a torque wrench to tighten remaining hex head to 60 ft-lb. Consult the Ford Meter Box website for the most current installation instructions.

Information - Uni-Flange® Series 1500 “Circle Lock”

Features of Uni-Flange® Series 1500

Ford Meter Box / Uni-Flange® has the most technically advanced, high performance joint restraint device for PVC pipe available in the water works industry: the Series 1500 “Circle-Lock.”

ADVANTAGES OF THE SERIES 1500

- **Full support of the pipe wall.** The Series 1500 can be used on any thickness class of AWWA C900 PVC pipe without point loading.
- **UL / FM / ASTM / ISO 9001.** The Series 1500 is UL listed and Factory Mutual Research Corporation approved for PVC pipe. It has also been tested to and exceeds the requirements of ASTM F1674 “Standard Test Method for Joint Restraint Products for Use with PVC Pipe.” It is manufactured by Ford Meter Box, certified by UL to ISO 9001 quality standard.
- **Versatility.** 3" - 12" sizes can be used on C909 PVC, C900 PVC and IPS PVC per ASTM A2241, and can also be used on DR35 as long as a SO-EZ gasket is used.
- **Correct installation every time.** The Series 1500 features Auto-Tork actuating screws with heads specially designed to twist off at the correct installation torque, leaving a hex head in case future system maintenance or removal is required. This feature offers a visual indicator of correct installation. A special “assurance stop” is built into the bolt. After the Auto-Tork feature has been engaged, the bolt cannot be tightened further so there is never any danger of pipe damage.
- **Restraining segments are mechanically retained in pockets,** they cannot fall out. All parts show up on the job site.
- **Eliminates the need for concrete thrust blocks.** When you use the Series 1500, there is no need to pour expensive and time consuming concrete thrust blocks. The Series 1500 offers guaranteed joint restraint, in any soil condition, in a matter of minutes.
- **E-coat epoxy coating** standard on all sizes.



HOW IT WORKS

The Series 1500 is a mechanical joint restraining gland. It performs two functions during installation; gasket sealing and thrust restraint.

GASKETED SEAL

As with a standard mechanical joint, the gasket seal is made first. This is accomplished by tightening the T-head bolts / nuts that connect the Series 1500 to the mechanical joint fitting. The Series 1500 can be used with any mechanical joint bell conforming to ANSI / AWWA C110 / A21.10, ANSI / AWWA C111/ A21.11, or ANSI / AWWA C153 / A21.53.

THRUST RESTRAINT

The Series 1500 incorporates a series of ductile iron restraint segments that fit in pockets around the inner surface of the specially designed gland housing. These segments are contoured to fit each pipe size and have integrally cast restraint edges along their bottom surface. After the seal is made, the Auto-Tork segment actuating screws are tightened. This locks the restraint segments onto the pipe surface, providing complete and total thrust restraint for the joint.

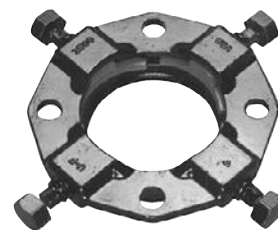
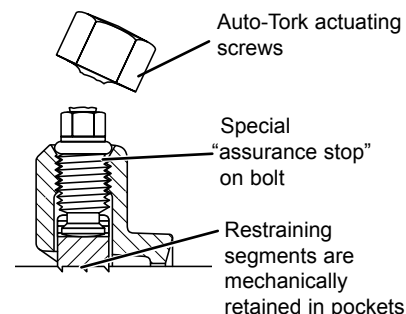
The restraint segments of the 1500 are the key to the design. They spread the restraining force, offering even distribution and support of the pipe. This is important with PVC pipe, especially for thinner wall classes. The restraint segments are designed with a “slot” at the top, which accepts the channeled foot of the activating bolt, so they cannot fall out of their pockets. The Series 1500 meets or exceeds the capabilities of “factory restrained joint pipe” at a fraction of the cost.

TESTING

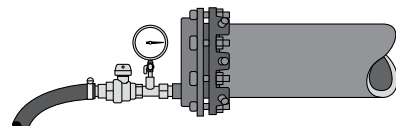
The Series 1500 has successfully passed the rigorous quality assurance and pressure tests required by UL, Factory Mutual Research Corporation, and ASTM F-1674. These include the following tests conducted on AWWA C900 PVC pipe, DR18:

- All sizes tested to a minimum of 755 PSI
- 1,000 hours at 500 PSI
- Over 1,000,000 cycles oscillating between 94 PSI to 188 PSI

All of these tests were against exposed end caps, the most severe test of a restraining device. Contact The Ford Meter Box Company, Inc. for copies of these tests.



The unique design of the Series 1500 offers even distribution and support of the pipe wall. This design utilizes **Ring Segments** and is an exclusive feature of the Series 1500.

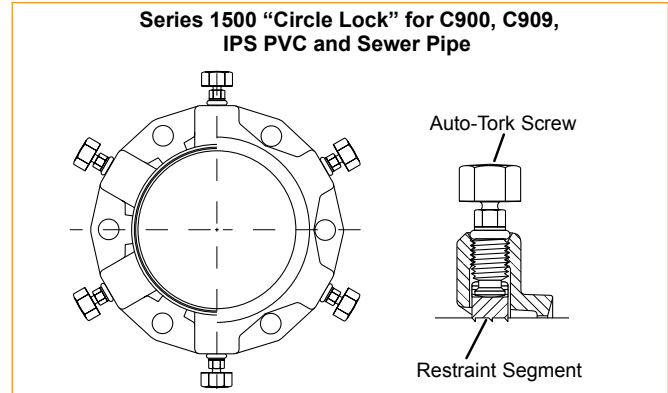
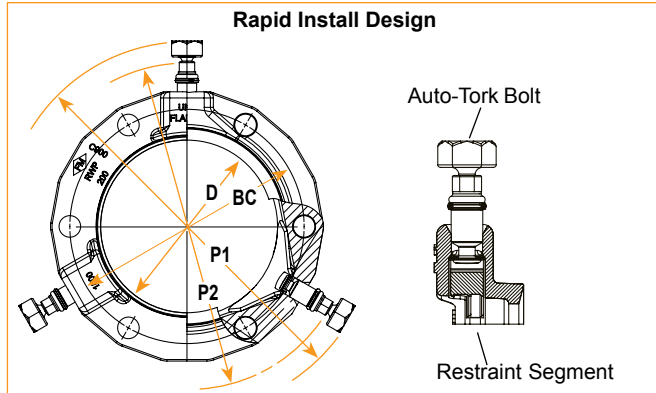


Uni-Flange® Series 1500 and 1500R “Circle Lock”

MJ Retainer Gland Joint Restraint for PVC Pipe

MATERIAL SPECIFICATIONS:

- Gland Body:** High strength ductile iron, ASTM A536, Grade 65-45-12. May be used with all mechanical joint bells conforming to ANSI / AWWA C111 standard.
- Auto-Tork Screws:** High strength ductile iron, ASTM A536, Grade 65-45-12. Designed to twist off at approximately 60 ft-lb.
- Restraint Segments:** Ductile iron, ASTM A536.



P1 - Maximum O.D. of gland on pipe before Auto-Tork heads are removed (as shipped).
P2 - Maximum O.D. of gland installed on pipe after Auto-Tork heads are removed.

Rapid Install Design - C900 and ASTM D2241 IPS PVC Only

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NO. OF RESTRAINT SEGMENTS	APPROX. WEIGHT (LBS.)	P1	P2		BC	D	PRESSURE RATING			
						C900	IPS			C900		ASTM D2241	
										DR18	DR14	SDR26	SDR21
3"	3.50	UFR1500R-3-(IorU)	2	7.00	11.50"	-	9.00"	6.19"	4.06"	-	-	160 PSI	200 PSI
4"	4.50-4.80	UFR1500R-4-(IorU)	2	8.06	13.00"	10.25"	9.25"	7.50"	4.90"	235 PSI	305 PSI	160 PSI	200 PSI
6"	6.63-6.90	UFR1500R-6-(IorU)	3	11.37	15.13"	12.17"	11.90"	9.50"	7.00"	235 PSI	305 PSI	160 PSI	200 PSI

Series 1500 “Circle Lock” for C900, C909, IPS PVC and *Sewer Pipe 3" - 12"

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NO. OF RESTRAINT SEGMENTS	APPROX. WEIGHT (LBS.)	P1	P2		BC	D
						C909	IPS		
3"	3.50	UFR1500-3-(IorU)	4	8.3	11.50	-	9.11	6.19	4.06
*4"	4.22 - 4.80	UFR1500-4-(IorU)	4	11.0	13.00	10.25	9.95	7.50	4.90
*6"	6.28 - 6.90	UFR1500-6-(IorU)	6	15.0	15.13	12.17	11.90	9.50	7.00
*8"	8.40 - 9.05	UFR1500-8-(IorU)	6	18.0	17.25	14.15	13.73	11.75	9.15
*10"	10.50 - 11.10	UFR1500-10-(IorU)	8	26.0	19.38	16.40	16.08	14.00	11.20
*12"	12.50 - 13.20	UFR1500-12-(IorU)	8	29.0	21.50	18.28	17.83	16.25	13.30

* Sewer applications require Buna-N gaskets. See UFR1500-ZA listing on page U-59 or SO-EZ gasket listing on Page U-61.

I = Import Casting U = Domestic Casting

Pipe Pressure Rating for C900, IPS PVC, C909 and *DR35 Pipe Sizes 3" - 12"

C900			ASTM D2241		C909	*SDR35
DR25	DR18	DR14	SDR26	SDR21	PC150	
165 PSI	235 PSI	305 PSI	160 PSI	200 PSI	150 PSI	PS ≥ 46 PSI

*Note: UFR1500s with a SO-EZ Gasket can be used on DR35 sewer pipe.

See UFR1500-ZA listing on page U-59 or SO-EZ gasket listing on Page U-61.

Series 1500-C “Circle-Lock” for C905 PVC Pipe 14" - 36"

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER AWWA C905 PVC PIPE	NO. OF RESTRAINT SEGMENTS	APPROX. WEIGHT (LBS.)	P1	P2	BC	D	PIPE PRESSURE RATING AWWA C905		PIPE PRESSURE RATING AWWA C909 PC165
									DR18	DR25	
14"	15.30	UFR1500-C-14-(IorU)	10	47.0	23.6	22.7	18.75	15.44	235 PSI	165 PSI	-
16"	17.40	UFR1500-C-16-(IorU)	12	62.0	26.2	25.3	21.00	17.54	235 PSI	165 PSI	165 PSI
18"	19.50	UFR1500-C-18-(IorU)	12	78.0	28.3	27.4	23.25	19.64	235 PSI	165 PSI	-
20"	21.60	UFR1500-C-20-(IorU)	14	95.0	30.4	29.5	25.50	21.74	235 PSI	165 PSI	-
24"	25.80	UFR1500-C-24-(IorU)	16	125.0	34.6	33.7	30.00	25.94	235 PSI	165 PSI	-
30"	32.00	UFR1500-C-30-(IorU)	20	140.0	40.79	38.06	36.88	32.30	235 PSI	165 PSI	-
36"	38.30	UFR1500-C-36-(IorU)	24	198.0	46.84	44.40	43.75	38.62	235 PSI	165 PSI	-

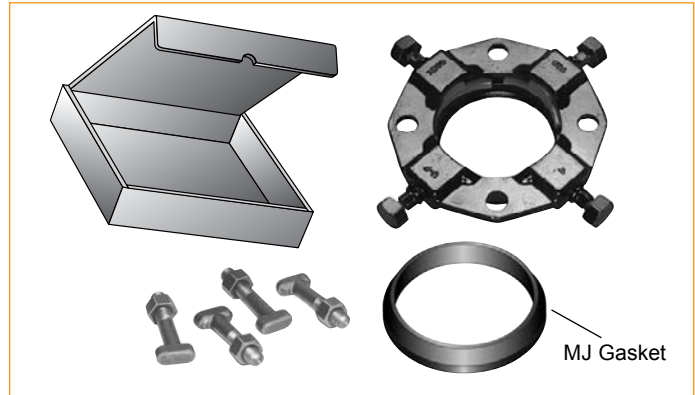
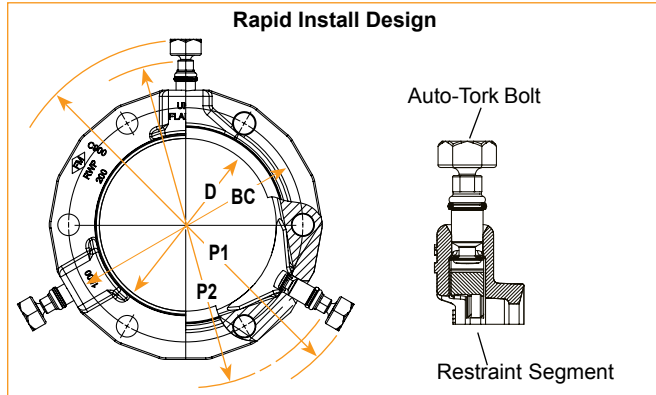
I = Import Casting U = Domestic Casting

Uni-Flange® Series 1500 and 1500R “Circle Lock”

MJ Retainer Gland Joint Restraint for PVC Pipe

Series 1500 Packaged with Accessories

The Uni-Flange® Series 1500 packaged with accessories is a convenient way to deliver all the components required to install a Series 1500 restraint. Sizes 4" through 12" are shipped shrink wrapped in a weather resistant carton. 14" through 36" sizes are bulk packaged.



P1 - Maximum O.D. of gland on pipe before Auto-Tork heads are removed (as shipped).
P2 - Maximum O.D. of gland installed on pipe after Auto-Tork heads are removed.

Rapid Install Design - C900 PVC Only

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NO. OF RESTRAINT SEGMENTS	APPROX. WEIGHT (LBS.)	P1	P2	BC	D	PRESSURE RATING	
						C900			C900	
									DR18	DR14
4"	4.80	UFR1500R-CA-4-(IorU)	2	12.50	13.00"	10.25"	7.50"	4.90"	235 PSI	305 PSI
6"	6.90	UFR1500R-CA-6-(IorU)	3	18.00	15.13	12.17"	9.50"	7.00"	235 PSI	305 PSI

Series 1500-CA “Circle Lock” Packaged with Accessories 4"-12"

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER AWWA C905 PVC PIPE	NO. OF RESTRAINT SEGMENTS	APPROX. WEIGHT (LBS.)	PRESSURE RATING			
					AWWA C900 AND C905			C909
					DR14	DR18	DR25	PC235
4"	4.80	UFR1500-CA-4-(IorU)	4	14.20	305 PSI	235 PSI	165 PSI	
6"	6.90	UFR1500-CA-6-(IorU)	6	20.10	305 PSI	235 PSI	165 PSI	235 PSI
8"	9.02	UFR1500-CA-8-(IorU)	6	25.00	305 PSI	235 PSI	165 PSI	235 PSI
10"	11.10	UFR1500-CA-10-(IorU)	8	33.00	305 PSI	235 PSI	165 PSI	235 PSI
12"	13.20	UFR1500-CA-12-(IorU)	8	38.00	305 PSI	235 PSI	165 PSI	235 PSI

PACKAGE CONTAINS

- 1 - Series 1500 retainer gland
- 1 - Set of high strength, low alloy T-bolts & nuts (AWWA C111)
- 1 - MJ Gasket

Series 1500-CA “Circle Lock” Packaged with Accessories 14" - 36"

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER AWWA C905 PVC PIPE	NO. OF RESTRAINT SEGMENTS	APPROX. WEIGHT (LBS.)	PIPE PRESSURE RATING AWWA C905	
					DR18	DR25
14"	15.30	UFR1500-CA-14-(IorU)	10	59.0	235 PSI	165 PSI
16"	17.40	UFR1500-CA-16-(IorU)	12	74.0	235 PSI	165 PSI
18"	19.50	UFR1500-CA-18-(IorU)	12	90.0	235 PSI	165 PSI
20"	21.60	UFR1500-CA-20-(IorU)	14	108.0	235 PSI	165 PSI
24"	25.80	UFR1500-CA-24-(IorU)	16	141.0	235 PSI	165 PSI
30"	32.00	UFR1500-CA-30-(IorU)	20	180.00	—	165 PSI
36"	38.30	UFR1500-CA-36-(IorU)	24	240.00	—	165 PSI

14" - 36" sizes include a Mechanical Joint gasket

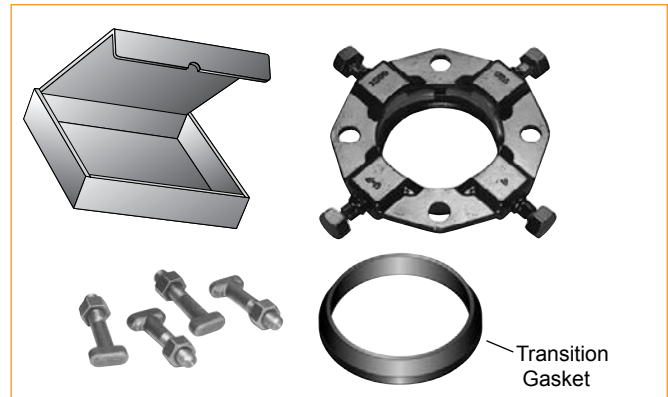
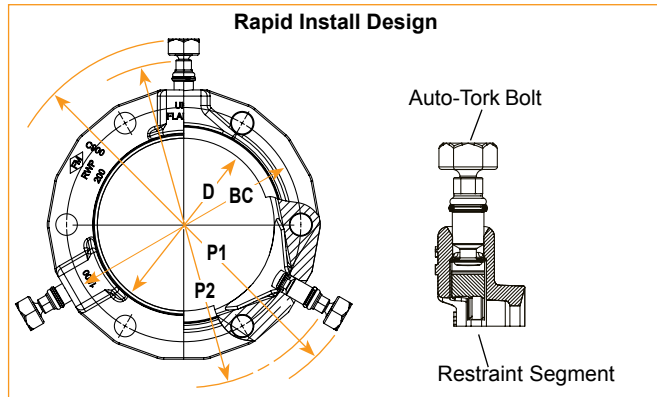
I = Import Casting **U** = Domestic Casting

Uni-Flange® Series 1500 and 1500R “Circle Lock”

MJ Retainer Gland Joint Restraint for PVC Pipe

Series 1500-S Packaged with Accessories

The Uni-Flange® Series 1500 packaged with accessories is a convenient way to deliver all the components required to install a Series 1500 restraint. Sizes 3" through 12" are shipped shrink wrapped in a weather resistant carton.



P1 - Maximum O.D. of gland on pipe before Auto-Tork heads are removed (as shipped).

P2 - Maximum O.D. of gland installed on pipe after Auto-Tork heads are removed.

Rapid Install Design - ASTM D2241 IPS PVC Only

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NO. OF RESTRAINT SEGMENTS	APPROX. WEIGHT (LBS.)	P1	P2	BC	D	PRESSURE RATING	
						IPS			ASTM D2241	
									SDR26	SDR21
3"	3.50	UFR1500R-SA-3-(IorU)	2	10.70	11.50"	9.00"	6.19"	4.06"	160 PSI	200 PSI
4"	4.50	UFR1500R-SA-4-(IorU)	2	12.50	13.00"	9.25"	7.50"	4.90"	160 PSI	200 PSI
6"	6.63	UFR1500R-SA-6-(IorU)	3	18.00	15.13"	11.90"	9.50"	7.00"	160 PSI	200 PSI

Series 1500-SA “Circle Lock” Packaged with Accessories 3"-12"

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NO. OF RESTRAINT SEGMENTS	APPROX. WEIGHT (LBS.)	PRESSURE RATING		
					ASTM D2241		PALLET QTY.
					DR14	DR18	
3"	3.50	UFR1500-SA-3-(IorU)	4	12.00	200	160	27
4"	4.50	UFR1500-SA-4-(IorU)	4	14.20	200	160	27
6"	6.63	UFR1500-SA-6-(IorU)	6	20.10	200	160	40
8"	8.63	UFR1500-SA-8-(IorU)	6	25.00	200	160	40
10"	10.75	UFR1500-SA-10-(IorU)	8	33.00	200	160	40
12"	12.75	UFR1500-SA-12-(IorU)	8	38.00	200	160	40

I = Import Casting **U** = Domestic Casting

PACKAGE CONTAINS

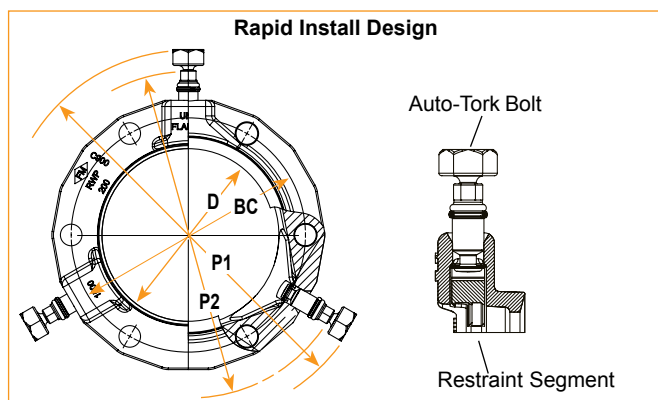
- 1 - Series 1500 retainer gland
- 1 - Set of high strength, low alloy T-bolts & nuts (AWWA C111)
- 1 - Transition Gasket

Uni-Flange® Series 1500 and 1500R “Circle Lock”

MJ Retainer Gland Joint Restraint for PVC Pipe

Series 1500 Packaged with Accessories

The Uni-Flange® Series 1500 packaged with accessories is a convenient way to deliver all the components required to install a Series 1500 restraint. Sizes 4" through 12" are shipped shrink wrapped in a weather resistant carton.



P1 - Maximum O.D. of gland on pipe before Auto-Tork heads are removed (as shipped).

P2 - Maximum O.D. of gland installed on pipe after Auto-Tork heads are removed.

Rapid Install Design - C900 and ASTM D2241 IPS PVC Only

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER	NO. OF RESTRAINT SEGMENTS	APPROX. WEIGHT (LBS.)	P1	P2		BC	D	PRESSURE RATING			
						C900	IPS			C900		ASTM D2241	
										DR18	DR14	SDR26	SDR21
3"	3.50	UFR1500R-ZA-3-(IorU)	2	10.70	11.50"	-	9.00"	6.19"	4.06"	-	-	160 PSI	200 PSI
4"	4.50-4.80	UFR1500R-ZA-4-(IorU)	2	12.50	13.00"	10.25"	9.25"	7.50"	4.90"	235 PSI	305 PSI	160 PSI	200 PSI
6"	6.63-6.90	UFR1500R-ZA-6-(IorU)	3	18.00	15.13"	12.17"	11.90"	9.50"	7.00"	235 PSI	305 PSI	160 PSI	200 PSI

Series 1500 “Circle Lock” for C900, C909, IPS PVC and *Sewer 4"-12" Packaged with Accessories

NOM. PIPE SIZE	PIPE O.D. (INCHES)	CATALOG NUMBER CI SIZE PVC, IPS PVC PIPE OR SDR35 SEWER PIPE	NO. OF RESTRAINT SEGMENTS	APPROX. WEIGHT (LBS.)
*4"	4.22 - 4.80	UFR1500-ZA-4-(IorU)	4	14.20
*6"	6.28 - 6.90	UFR1500-ZA-6-(IorU)	6	20.10
*8"	8.40 - 9.05	UFR1500-ZA-8-(IorU)	6	25.00
*10"	10.50 - 11.10	UFR1500-ZA-10-(IorU)	8	33.00
*12"	12.50 - 13.20	UFR1500-ZA-12-(IorU)	8	38.00

* Sewer applications require Buna-N gaskets. Insert “-N” into catalog number. Example: UFR1500-ZA-6-N-U. Contact factory for pricing.
4" - 12" sizes include a SO-EZ gasket for Mechanical Joint connections (see page U-61)

I = Import Casting **U** = Domestic Casting

PACKAGE CONTAINS

- 1 - Series 1500 retainer gland
- 1 - Set of high strength, low alloy T-bolts & nuts (AWWA C111)
- 1 - SO-EZ Gasket

Pipe Pressure Rating for C900, IPS PVC, C909 and *SDR35 Pipe Sizes 3" - 12"

C900			ASTM D2241		C909	*SDR35
DR25	DR18	DR14	SDR26	SDR21	PC150	
165 PSI	235 PSI	305 PSI	160 PSI	200 PSI	150 PSI	PS ≥ 46 PSI

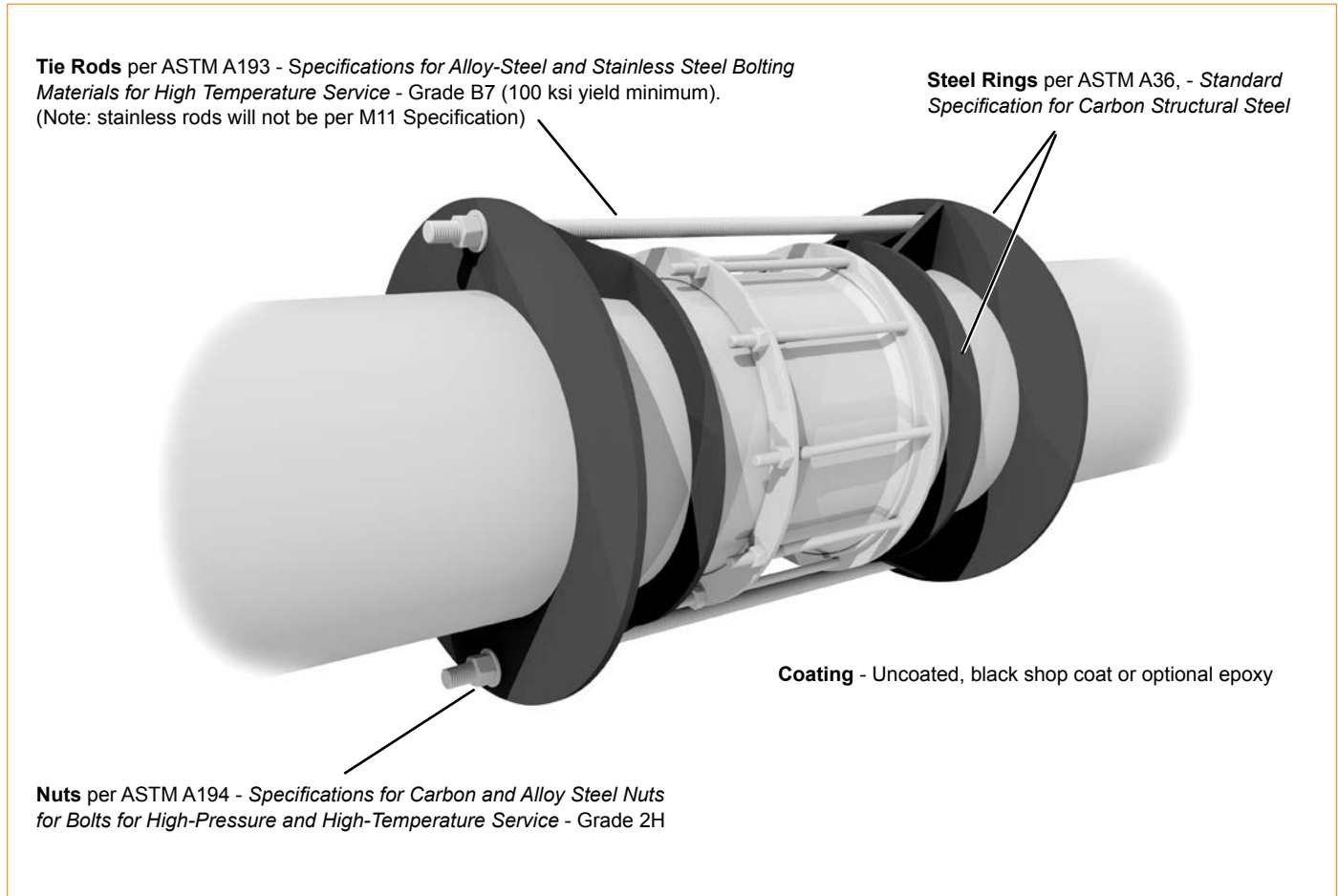
***Note:** DR35 sewer applications require Buna-N gasket, add “-N” to catalog number.

Example: UFR1500-ZA-6-N-U. Contact factory for pricing.

Uni-Flange® AWWA M11 Specifications - Joint Harness

Welded Joint Harness for Steel Pipes per AWWA M11

These joint harnesses, manufactured per AWWA M11 specifications, are diameter-specific rings designed to be field welded on steel pipe to provide restraint over a coupling.



Features:

- Carbon steel hardware. Also available in 304 and 316 stainless steel (stainless steel not per M11 specification)
- Sizes available in 14" through 96"
- Available as a single ring for attachment to other anchors
- Pressure ratings available through 250 psi. Please specify desired pressure to determine rod quantity and diameter
- Harness lugs and tie rod holes spaced evenly around the pipe
- Continuous rings on front and back plate (Type RR)
- Catalog part number format: M11 -xxxx (size) -x (options) -xxx (pressure)

SO-EZ Gasket

Gasket for Mechanical Joint Connections Sizes 4" - 12"

The SO-EZ Gasket simplifies mechanical joint installations and can be used on any mechanical joint gland meeting AWWA C111. The design and flexibility of the gasket permits compression to pipe ODs of IPS PVC, C900 PVC, ductile iron and *DR35 (must use Buna-N on DR35), all with just one gasket.

How it works:

The key to this amazing gasket is that it snaps onto the MJ gland, rather than having to be manually forced into the MJ socket. As the gland and gasket are engaged to the valve or fitting, the design of the gasket centers and maintains alignment of the pipe and the gland/gasket during assembly. Proper tightening of the tee-bolts and proper lubrication ensures excellent gasket compression within the MJ socket and against the pipe.

Features:

- Snaps to MJ Gland or MJ Restraint Gland
- Gasket maintains alignment of pipe and gland/gasket assembly
- For use with IPS PVC, C900 PVC and ductile iron pipe sizes 3" - 12"
- SBR rubber is NSF Standard 61 approved
- Gland/Gasket Assembly can be loosely pre-assembled to the MJ fitting above ground for a stab-fit insertion



CATALOG NUMBER	DESCRIPTION
SO-EZ-3	3" SO-EZ Gasket for Mechanical Joint Connection
SO-EZ-4	4" SO-EZ Gasket for Mechanical Joint Connection
SO-EZ-6	6" SO-EZ Gasket for Mechanical Joint Connection
SO-EZ-8	8" SO-EZ Gasket for Mechanical Joint Connection
SO-EZ-10	10" SO-EZ Gasket for Mechanical Joint Connection
SO-EZ-12	12" SO-EZ Gasket for Mechanical Joint Connection
SO-EZ-3-AK	3" SO-EZ Gasket Packaged with T-Bolts and Nuts
SO-EZ-4-AK	4" SO-EZ Gasket Packaged with T-Bolts and Nuts
SO-EZ-6-AK	6" SO-EZ Gasket Packaged with T-Bolts and Nuts
SO-EZ-8-AK	8" SO-EZ Gasket Packaged with T-Bolts and Nuts
SO-EZ-10-AK	10" SO-EZ Gasket Packaged with T-Bolts and Nuts
SO-EZ-12-AK	12" SO-EZ Gasket Packaged with T-Bolts and Nuts
SO-EZ-3-MJPACK	3" SO-EZ Gasket Packaged with T-Bolts/Nuts and Standard MJ Gland
SO-EZ-4-MJPACK	4" SO-EZ Gasket Packaged with T-Bolts/Nuts and Standard MJ Gland
SO-EZ-6-MJPACK	6" SO-EZ Gasket Packaged with T-Bolts/Nuts and Standard MJ Gland
SO-EZ-8-MJPACK	8" SO-EZ Gasket Packaged with T-Bolts/Nuts and Standard MJ Gland
SO-EZ-10-MJPACK	10" SO-EZ Gasket Packaged with T-Bolts/Nuts and Standard MJ Gland
SO-EZ-12-MJPACK	12" SO-EZ Gasket Packaged with T-Bolts/Nuts and Standard MJ Gland

* DR35 sewer applications require Buna-N gasket, add "-N" to end of catalog number. Example: SO-EZ-6-N

Installation Instructions

4" through 12" with SO-EZ Gasket



Before installation, be sure to clean the sealing surface areas of the pipe and the mechanical joint socket.

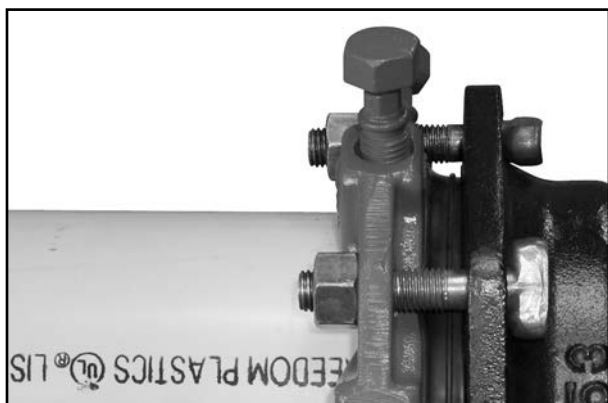
Step 1. Snap the SO-EZ Gasket onto the MJ gland lip. (NOTE: The Ford 4"-12" UFR1500 comes with the SO-EZ Gasket already attached to the gland lip.) Place MJ gland or MJ gland restraint on pipe. Insert the pipe into the MJ socket. Lubricate the SO-EZ Gasket, socket and pipe.

Step 2. Slide the MJ gland/SO-EZ Gasket assembly along the pipe and into the MJ socket.



Step 3. Tighten the T-bolts in an alternating manner to ANSI/AWWA C111 specifications. Use of a torque wrench is recommended.

Step 4. If used with an MJ Restraint Gland, tighten the actuating screws on the MJ gland to the manufacturer's specifications. Use of a torque wrench is recommended.



Note: The sole purpose of the snap-on lip of the SO-EZ Gasket is to maintain alignment of the gland/gasket assembly. The gasket lip will be visible after proper installation is complete, as shown in the picture to the left.

TGA Transition Gasket (Patent Pending)

Transition Gasket for IPS (Steel Size) Pipe and Steel Pipe Sizes 14" - 24"

The transition gasket fills the gap when used on IPS pipe connecting to mechanical joint fittings, to restrained or reducing couplings (transitioning from DI to IPS pipe) and to restrained flange adapters.

How it works:

The gasket snaps to the inside diameter compression lip of the MJ gland and can be installed on the pipe as one unit. The built-in lip on the gasket acts as a centering aid for the gland, to simplify installation.

Features:

- 250 PSI rated working pressure on steel pipe with a 2:1 safety factor. For PVC, full rating of the pipe with a 2:1 safety factor
- Snaps to compression lip I.D.
- Gasket maintains alignment of pipe and gland/gasket assembly
- For use with steel pipe and IPS (steel size) pipe 14" – 24"
- No backing ring required

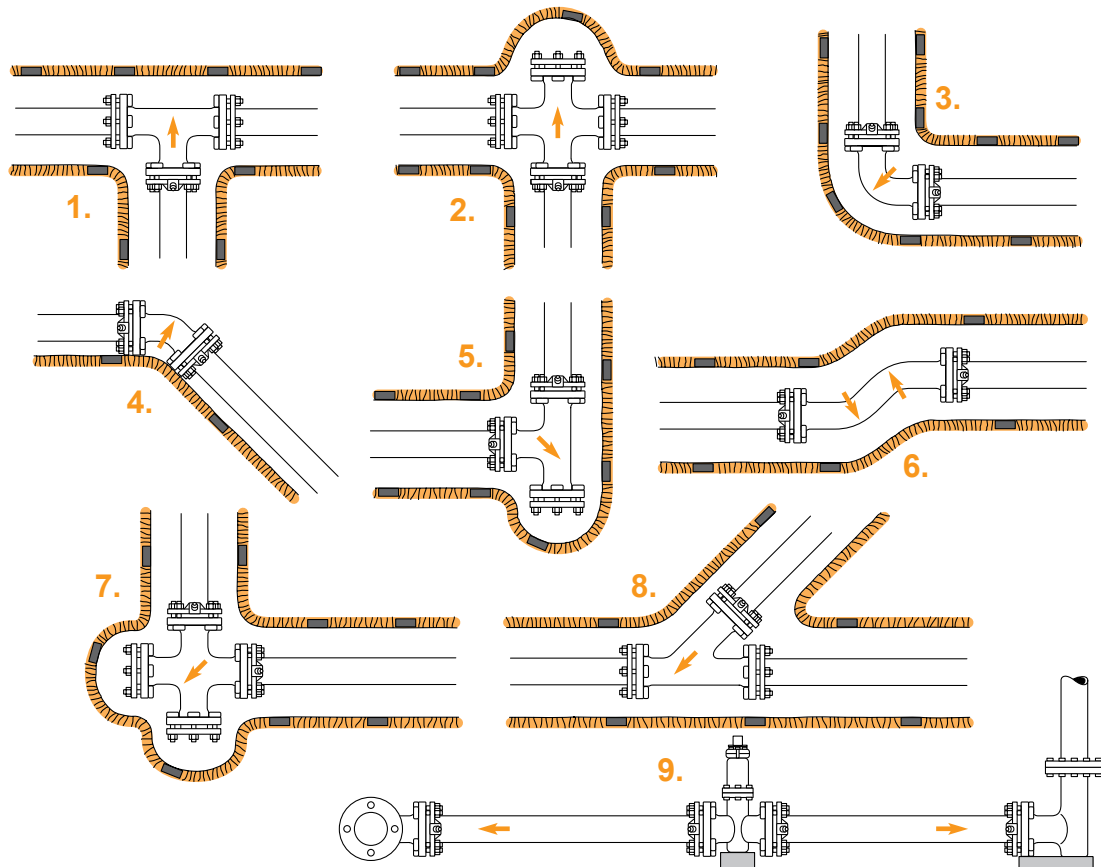
TGA Transition Gasket



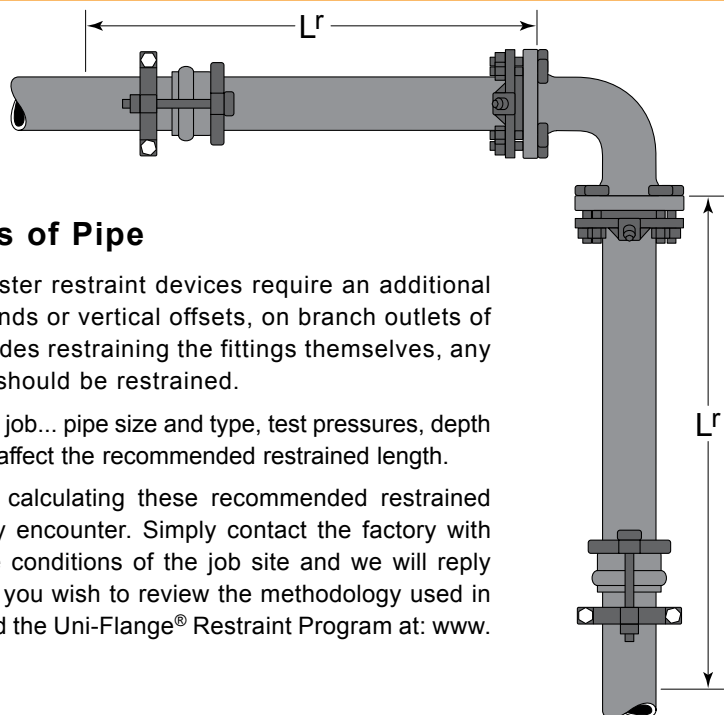
CATALOG NUMBER	DESCRIPTION
TGA-14	14" Transition MJ Gasket
TGA-16	16" Transition MJ Gasket
TGA-18	18" Transition MJ Gasket
TGA-20	20" Transition MJ Gasket
TGA-24	24" Transition MJ Gasket
TJAK-14	14" Transition Gasket Packaged with T-Bolts and Nuts
TJAK-16	16" Transition Gasket Packaged with T-Bolts and Nuts
TJAK-18	18" Transition Gasket Packaged with T-Bolts and Nuts
TJAK-20	20" Transition Gasket Packaged with T-Bolts and Nuts
TJAK-24	24" Transition Gasket Packaged with T-Bolts and Nuts
TJPACK-14	14" Transition Gasket Packaged with T-Bolts/Nuts and Standard MJ Gland
TJPACK-16	16" Transition Gasket Packaged with T-Bolts/Nuts and Standard MJ Gland
TJPACK-18	18" Transition Gasket Packaged with T-Bolts/Nuts and Standard MJ Gland
TJPACK-20	20" Transition Gasket Packaged with T-Bolts/Nuts and Standard MJ Gland
TJPACK-24	24" Transition Gasket Packaged with T-Bolts/Nuts and Standard MJ Gland

Gasket available in Buna-N, add "-N" to the end of the catalog number. Example: TGA-16-N

Applications Requiring Thrust Restraint



- | | | |
|--|--|--|
| 1. Thru line connection, tee | 4. Direction change, vertical bend | 7. Direction change, cross used as elbow |
| 2. Thru line connection, cross used as tee | 5. Direction change, tee used as elbow | 8. Thru line connection, wye |
| 3. Direction change, elbow | 6. Direction change | 9. Hydrant runout |



Recommended Restrained Lengths of Pipe

Many applications involving Uni-Flange® Block Buster restraint devices require an additional length of pipe to be restrained on each side of bends or vertical offsets, on branch outlets of tees, before reducers and before dead-ends. Besides restraining the fittings themselves, any pipe or fitting joints that fall within these lengths should be restrained.

These lengths vary according to the parameters of the job... pipe size and type, test pressures, depth of bury, soil conditions and trench preparation will all affect the recommended restrained length.

Uni-Flange® engineers are ready to assist you in calculating these recommended restrained lengths of pipe for any job-site conditions you may encounter. Simply contact the factory with information on the requirements of the job and the conditions of the job site and we will reply with our recommendations (see next page). Should you wish to review the methodology used in calculating these recommended lengths, you can find the Uni-Flange® Restraint Program at: www.fordmeterbox.com/uf/

FAX: 1-800-826-3487

Indiana or Overseas

FAX: 260-563-0167

Uni-Flange® Thrust Restraint Questionnaire

Copy this page, fill in the requested information and fax us for a reply.

Project Name and Address: _____

Engineering Firm: _____

(Name and Address) _____

Contact Name: _____

(Phone and FAX) _____

A Nominal pipe size and approximate total footage: _____

B Types of fittings to be used: (bends, tees, dead-ends, etc.) _____

C Pipe Material: D.I. _____ D.I./Poly _____ PVC _____ Outside Diameter: DI / CI (ductile iron) _____ IPS (steel) _____

D DR / Pressure Class: _____

E Soil Type: (Refer to ASTM D 2487 for complete description)

_____ GW & SW Well graded gravels and sands, gravel-sand mixtures, little or no fines.

_____ GP & SP Poorly graded gravels and sands, gravel-sand mixtures, little or no fines.

_____ GM & SM Silty gravels and silty sands, gravel-sand-silt mixtures, sand-silt mixtures.

_____ GC & SC Clayey gravels, clayey sands, gravel-sand-clay mixtures, sand-clay mixtures.

_____ CL Inorganic clays of medium to low plasticity, gravelly clays, sandy clays, silty clays, lean clay. **Assumed to be in arid or semi-arid regions above the water table**, i.e. little or no chance the soil will become saturated.

_____ ML Inorganic silts, very fine sands, rock flour, silty or clayey fine sands. **Assumed to be in arid or semi-arid regions above the water table**, i.e. little or no chance the soil will become saturated.

HIGHLY PLASTIC SOILS (Use GP or SP embedment soils, Type 4 or 5 trench is recommended)

_____ CL Inorganic clays of medium to low plasticity, gravelly clays, sandy clays, silty clays, lean clays, near saturation. Pipe should be surrounded with granular material, GP, SP or better.

_____ ML Inorganic silts, very fine sands, rock flour, silty or clayey fine sands, near saturation. Pipe should be surrounded with granular material, GP, SP or better.

_____ CH Inorganic clays of high plasticity, fat clays. Pipe should be surrounded with granular material, GP, SP or better.

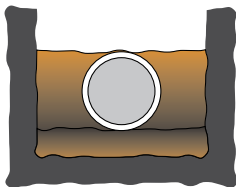
_____ MH Inorganic silts, micaceous or diatomaceous fine sands or silts, clastic silts. Pipe should be surrounded with granular material, GP, SP or better.

F Depth of cover (to top of pipe) _____ ft.

G Water working pressure _____ psi. Test pressure _____ psi. Desired Safety Factor _____

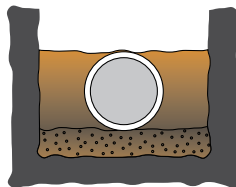
H Bedding Type:

Type 3



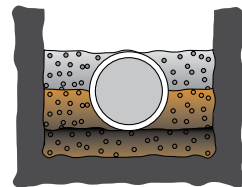
Pipe bedded in 4 inches minimum loose soil. Backfill lightly, consolidated to top of pipe.

Type 4



Pipe bedded in sand, gravel, or crushed stone to depth of 1/8 pipe diameter, 4 inches minimum. Backfill compacted to top of pipe.

Type 5



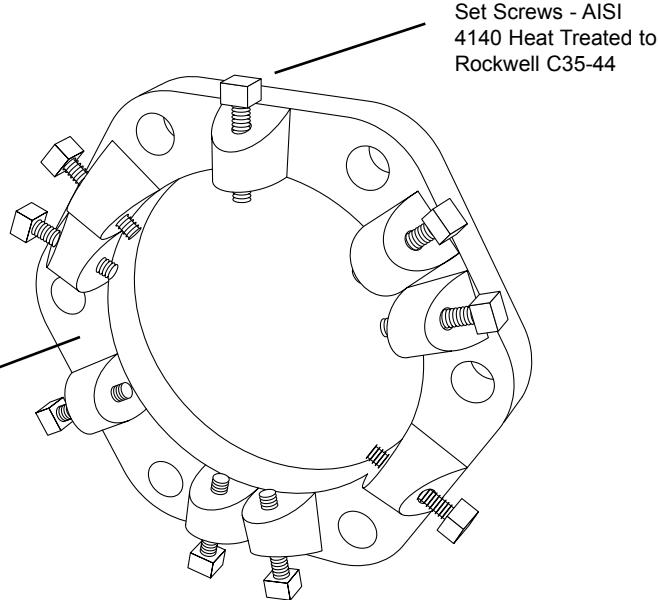
Pipe bedded in compacted granular material to the center line of pipe, 4 inches minimum under pipe. Compacted granular or select material to top of pipe.

Uni-Flange® Retainer Glands

For Ductile Iron Mechanical Joint

Model B Retainer Gland

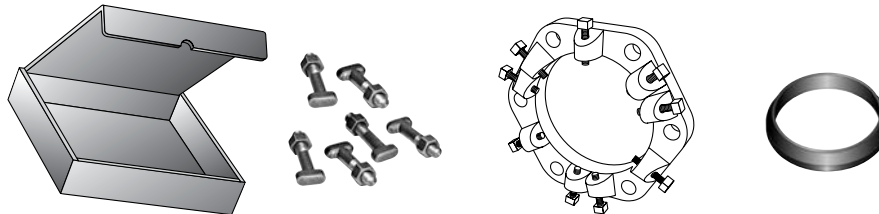
Gland body is of High Strength Ductile Iron per ASTM A536, Grade 65-45-12. Compatible with all mechanical joints conforming to ANSI / AWWA C111 / A21.11. Painted black.



8" Model B

NOM. PIPE SIZE	ACTUAL PIPE O.D. (IN.)	CATALOG NUMBER	WWP (PSI)	NO. OF SET SCREWS IN GLAND	SET SCREW TORQUE	NO. OF T-BOLTS	MAX. ALLOW DEFLECTION PER 18 FT. LGTH.	APPROX. WT. LBS.
3"	3.96	RGBS-3	350	4	80	4	31"	6.5
4"	4.80	RGBS-4	350	4	80	4	31"	10.0
6"	6.90	RGBS-6	350	6	80	6	27"	12.0
8"	9.05	RGBS-8	350	9	80	6	20"	17.0
10"	11.10	RGBS-10	300	12	80	8	20"	25.0
12"	13.20	RGBS-12	300	16	80	8	20"	29.0

MODEL B RETAINER GLAND PACKAGED WITH ACCESSORIES



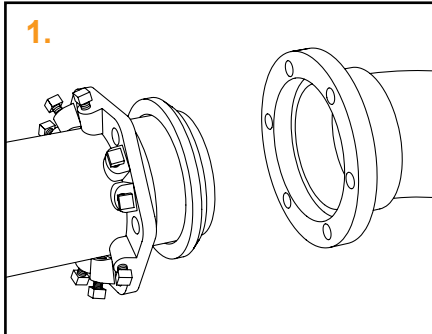
RGBAS PACKAGE CONTAINS (1) Model B heavy duty retainer gland (1) Set of high strength, low alloy T-bolts and nuts (AWWA C111), (1) Mechanical joint gasket (AWWA C111) shrink wrapped in a weather resistant carton.

NOMINAL PIPE SIZE	CATALOG NUMBER	APPROX. WEIGHT
3"	RGBAS-3	10.2
4"	RGBAS-4	13.8
6"	RGBAS-6	17.7
8"	RGBAS-8	25.3
10"	RGBAS-10	33.0
12"	RGBAS-12	39.3

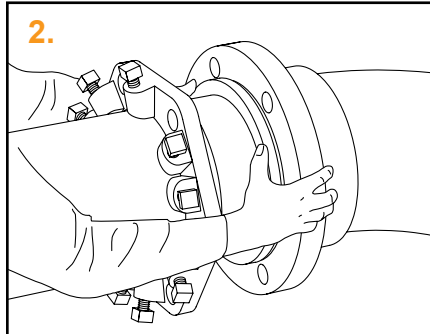
Uni-Flange® Retainer Glands

For Ductile Iron Mechanical Joint

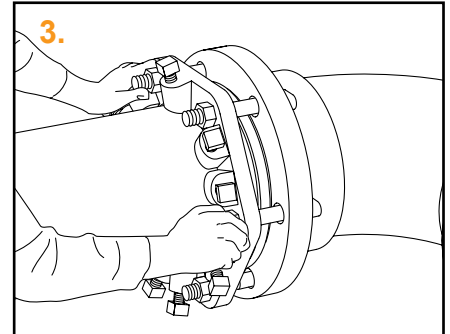
Installation Instructions for Model B



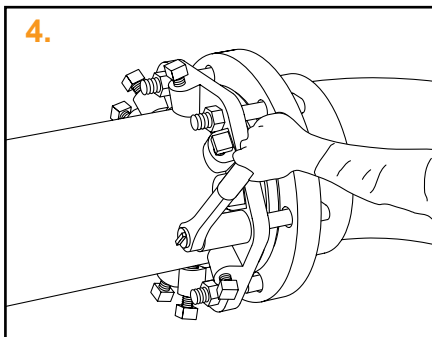
1. Wash socket and plain end pipe with soapy water. Slip gland and gasket over plain end pipe with small side of gasket and lip side of gland facing socket.



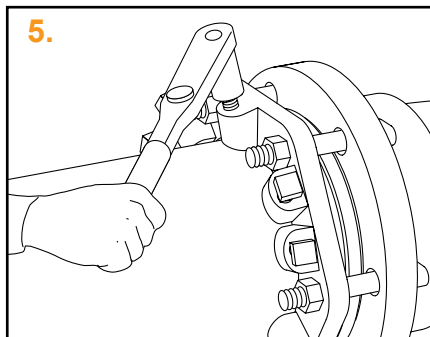
2. Slip plain end pipe into socket. Lubricate gasket with soapy water to allow it to slip easily into place. Push gasket into socket, making sure it is evenly seated.



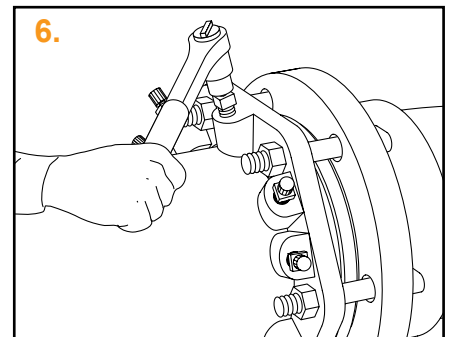
3. Slide gland into position against gasket. Align bolt holes and insert T-bolts. Tighten nuts by hand. Note: deflection of joint must be made prior to tightening of T-bolts and set screws (see table for below max. deflection).



4. Tighten all T-bolts with a wrench, alternating from left to right, top to bottom, to the torque recommended by AWWA, and hand tighten set screws until tips evenly touch pipe, assuring concentricity.



5. Then tighten set screws alternately on opposite sides to approximately 50 ft-lb of torque. Finally, in same sequence, tighten set screws to recommended torque (see table below). DO NOT RE-TORQUE.



6. For Uni-Torque screws simply use a 7/16" 12-point socket wrench. Use the same sequential tightening as in step 4. Tighten until caps shear off.

Nominal Size (Inches)	Deflection					
	3, 4	6	8-12	14, 16	18, 20	24
Maximum allowable deflection (in./18 ft. lgth.)	31	27	20	13.5	11	9

Consult the Ford Meter Box website for the most current installation instructions.

Suggested Specification - Model B

Mechanical Joint retainer glands shall be of heavy duty design, manufactured of high strength ductile iron, ASTM A536, Grade 65-45-12. Set screws are to be of high strength low alloy steel, AISI 4140, heat treated to Rockwell C35-44, with cup points. Drilling for set screws is to be on a 10° angle.

Stainless Steel Inserts

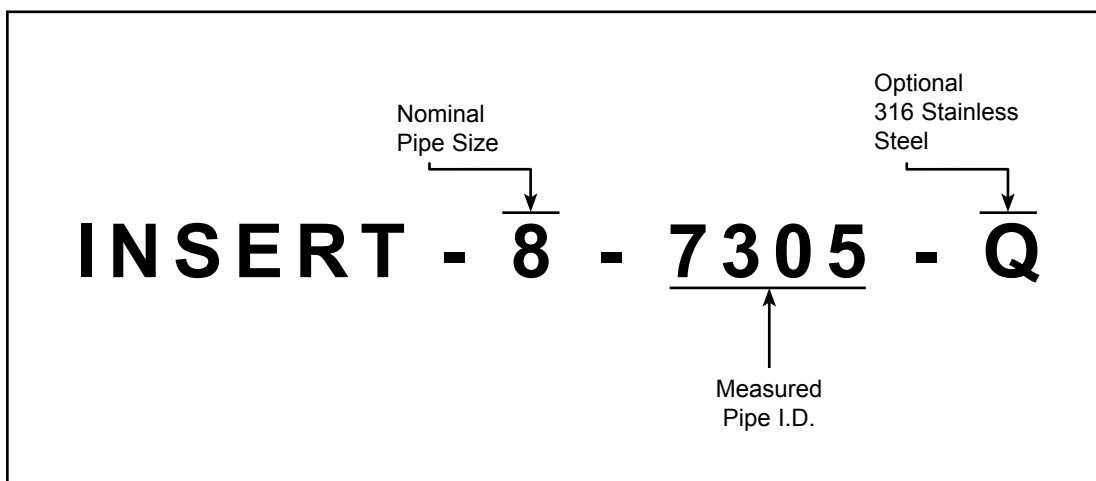
For HDPE Pipe



Ford stainless steel inserts prevent HDPE pipe from losing rigidity on the end while also keeping the gasket or restraint functioning properly on the pipe. With one end tapered and a lip on the other, the solid design is easy to install and can't be over-inserted.

Features:

- Solid design on 6" and larger sizes (3" and 4" are wedge design)
- 18 GA Type 304 stainless steel per ASTM A240 (with optional 316 stainless steel)
- Chemically passivated to restore natural corrosion-resistant state
- Durable, ergonomic design allows for a simple installation and long-lasting life



NOM. PIPE SIZE	*CATALOG NUMBER	LENGTH	APPROX. WT. LBS.
3"	INSERT-3-xxx	6"	1.2
4"	INSERT-4-xxx		1.5
6"	INSERT-6-xxx	7-3/8"	2.1
8"	INSERT-8-xxx		2.8
10"	INSERT-10-xxxx		3.5
12"	INSERT-12-xxxx		4.1
14"	INSERT-14-xxxx		4.8
16"	INSERT-16-xxxx		5.5
18"	INSERT-18-xxxx		6.1
20"	INSERT-20-xxxx		6.8
24"	INSERT-24-xxxx		8.1
30"	INSERT-30-xxxx		10.1
36"	INSERT-36-xxxx		11.5

*When ordering, the pipe inside diameter is required. For example, when ordering for an 8" pipe with an I.D. of 7.305", the part number is INSERT-8-7305.

O.D. Chart

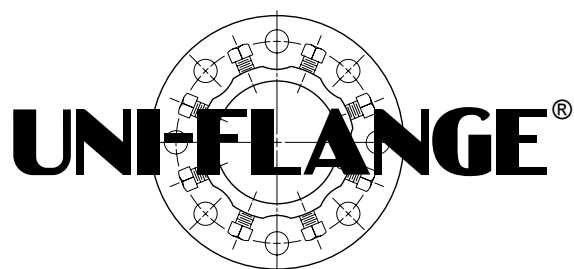
PIPE SIZE	PVC/HDPE (Steel Size)	PVC/HDPE C900/C905	DUCTILE / CAST IRON			ASBESTOS-CEMENT			STEEL		COPPER
	O.D.	O.D.	Classes		O.D.	Class	Machined End O.D.	Rough Barrel O.D. Min - Max	Type	O.D.	O.D.
			Pit	Spun							
1/2"	.84								STD.	.84	.625
3/4"	1.05								STD.	1.05	.875
1"	1.32								STD.	1.32	1.125
1-1/4"	1.66								STD.	1.66	1.375
1-1/2"	1.90								STD.	1.90	1.625
2"	2.38				2.50				STD.	2.38	2.125
2-1/2"	2.88								STD.	2.88	2.625
3"	3.50		A		3.80	100	3.74	4.00	O.D.	3.00	3.125
			B, C, D	50 - 350	3.96	150	3.84	4.10			
						200	3.84	4.29	STD.	3.50	
3-1/2"									STD.	4.00	3.625
4"	4.50	4.80	A	50 - 350	4.80	100	4.64	4.79 - 5.14	O.D.	4.00	4.125
			B, C, D		5.00	150	4.81	4.97 - 5.27			
						200	4.81	5.22 - 5.57	STD.	4.50	
4-1/2"									STD.	5.00	
5"									STD.	5.56	5.125
6"	6.63	6.90	A	50 - 350	6.90	100	6.91	7.05 - 7.40	O.D.	6.00	6.125
			B, C, D,		7.10	150	6.91	7.07 - 7.37			
			E, F		7.22	200	6.91	7.26 - 7.56	STD.	6.63	
7"									STD.	7.63	
8"	8.63	9.05	A, B,	50 - 300	9.05	100	9.11	9.22 - 9.57	O.D.	8.00	
			C, D,	350	9.30	150	9.11	9.27 - 9.57			
			E, F		9.42	200	9.11	9.39 - 9.74	STD.	8.63	
9"									STD.	9.63	
10"	10.75	11.10	A, B,	50 - 200	11.10	100	11.24	11.42 - 11.77	O.D.	10.00	
			C, D,	250 - 350	11.40	150	11.66	11.82 - 12.12			
			E, F		11.60	200	11.66	11.77 - 12.12	STD.	10.75	
12"	12.75	13.20	A, B,	50 - 200	13.20	100	13.44	13.69 - 14.04	O.D.	12.00	
			C, D,	250 - 350	13.50	150	13.92	14.08 - 14.38			
			E, F		13.76	200	13.92	14.03 - 14.38	STD.	12.75	
14"	14.00	15.30	A, B,	50 - 100	15.30	100	15.07	15.40 - 15.80	STD.	14.00	
			C, D,	150 - 300	15.65	150	16.22	16.38 - 16.73			
			E, F		15.98	200	16.22	16.48 - 16.88			
16"	16.00	17.40	A, B,	50 - 100	17.40	100	17.14	17.54 - 17.94	STD.	16.00	
			C, D,	150 - 300	17.80	150	18.46	18.62 - 18.97			
			E, F		18.16	200	18.46	18.79 - 19.19			
18"	18.00	19.50	A, B	50 - 100	19.50	100	19.90	20.44	STD.	18.00	
			C, D	150 - 250	19.92	150	20.94	21.20			
						200	22.18				
20"	20.00	21.60	A, B,	50 - 100	21.60	100	22.12	22.50	STD.	20.00	
			C, D	150 - 250	22.06	150	23.28	23.54			
						200	24.66				
22"									STD.	22.00	
24"	24.00	25.80	A, B,	50 - 100	25.80	100	26.48	27.17	STD.	24.00	
			C, D	150 - 250	26.32	150	27.96	28.22			
						200	29.62				
30"	30.00	32.00	A		31.74				STD.	30.00	
			B	50 - 350	32.00						
			C		32.40						
			D		32.74						
36"	36.00	38.30	A		37.96				STD.	36.00	
			B	50 - 350	38.30						
			C		38.70						
			D		39.16						
42"		44.50	A		44.20				STD.	42.00	
			B	50 - 350	44.50						
			C		45.10						
			D		45.58						
48"		50.80	A		50.50				STD.	48.00	
			B	50 - 350	50.80						
			C		51.40						
			D		51.98						
54"			A		56.66				STD.	54.00	
			B		57.10						
				50 - 350	57.56						
			C		57.80						
60"					58.40				STD.	60.00	
				50 - 350	61.61						
			A		62.80						
			B		63.40						
			C		64.20						
			D		64.82						

Note: Due to variations in outside diameters and specifications, dimensions listed above are approximate. For this reason, determine the pipe O.D. before ordering.

Notes

Notes

Section U



Pipe Restraints and Adapter Flanges

For PVC and Ductile Iron Pipe

Warranty

All merchandise is warranted to be free from defects in material and factory workmanship for one year from date of shipment from our factory. We will provide, free of charge, new products in equal quantities for any that prove defective within one year from date of shipment from our factory. Manufacturer shall not be liable for any loss, damage, or injury, direct or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for user's intended use and user assumes all risk and liability whatever in connection therewith. No claims for labor or consequential damage will be allowed. The foregoing may not be changed except by agreement signed by an officer of the manufacturer.

No other warranties are applicable or may be implied, including the implied warranty of merchantability and the implied warranty of fitness for particular purpose and any warranty relating to infringement or the like, all of which are disclaimed.

Please Note:

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