Section U

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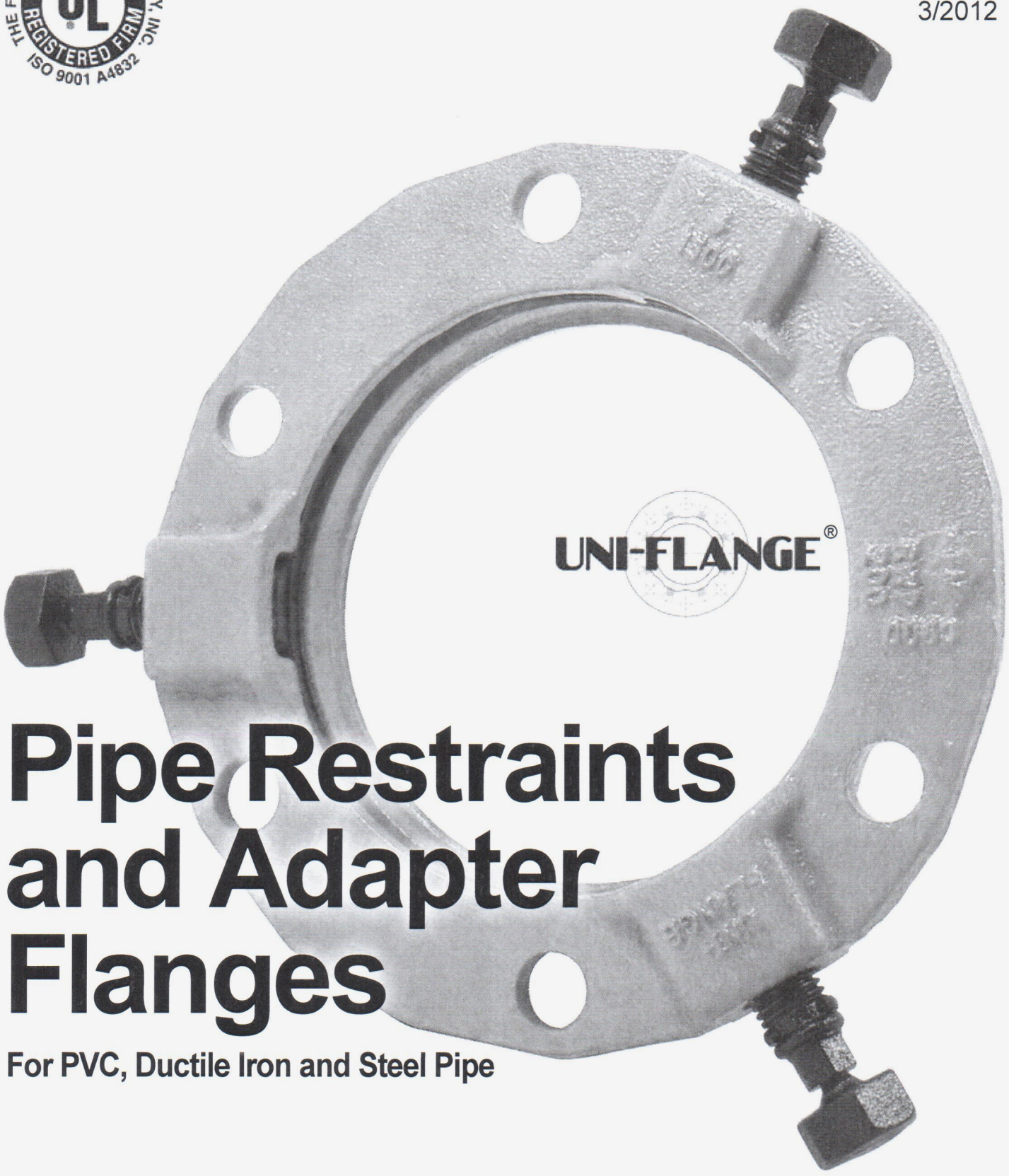


Pipe Restraints and Adapter Flanges

For PVC, Ductile Iron and Steel Pipe

The Ford Meter Box Company, Inc.
775 Manchester Avenue, P.O. Box 443, Wabash, Indiana, USA 46992-0443
Telephone: 260-563-3171 FAX: 1-800-826-3487 Overseas FAX: 260-563-0167
http://www.fordmeterbox.com

This catalog supersedes all previous revisions.

Contents

Note: Consult pipe manufacturer for specific installation requirements.

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

Uni-Flange® Pipe Restraint and Adapter Flanges Numbering System

PRODUCT TYPE

RFAP = Restrained Flange Adapter for C905 PVC, C900, C909, SDR35, 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 SDR35 pipe
RCPP = Restrained Coupling for for C905 PVC, C900, IPS PVC, Steel, C909 and SDR35 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
UFR1309 = Restraint Device for C909 PVC and MJ/Push-On Fittings
UFR1350 = Restraint Device for PVC Pipe Bell Joints
UFR1360 = Restraint Device for PVC Pressure Fittings
UFR1390 = Restraint Device for PVC Pipe Bell Joints
UFR1399 = Restraint Device for C909 Pipe Bell Joints
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 back up Ring for Ductile Iron
UFR1490 = Split Joint Restraint with split back up Ring for Ductile Iron
UFR1500 = Retainer Gland Joint Restraint for PVC Pipe
UFR1599 = Retainer Gland Joint Restraint for C909 PVC
UFRCS1300 = Casing Spacer for Support of Pipe Barrel
UFRCS1390 = Casing Spacer for Support/Restraint of Bell Joints

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

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. The 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. The Uni-Flange® keeps the project moving... DOWN TIME SAVINGS are considerable.

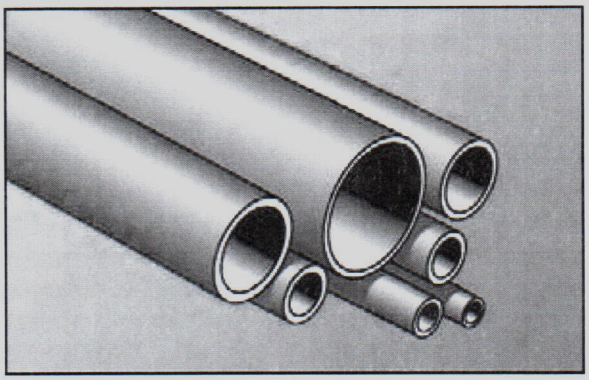


Figure 1

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, the 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.

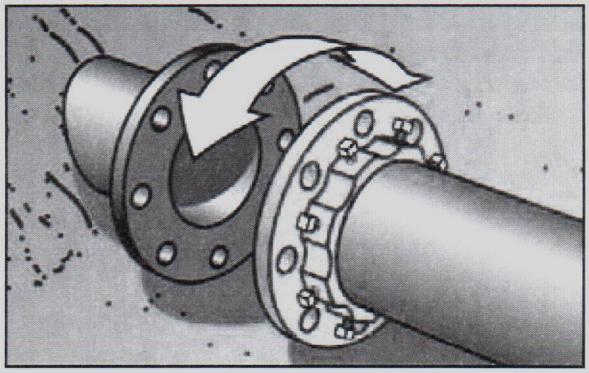


Figure 2

Built-In End Restraint

The 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, the Uni-Flange® can be easily dis-assembled 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 re-install 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). The Uni-Flange® offers significant safety factors at its full rated pressure.

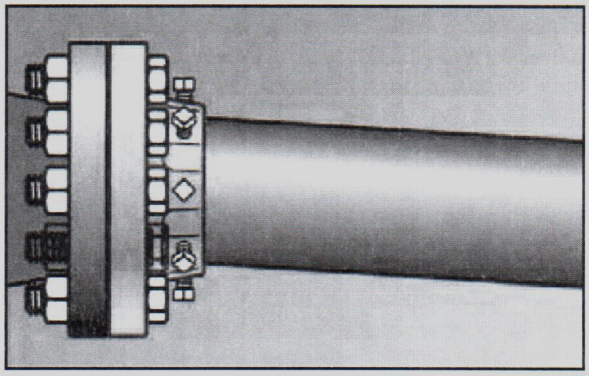


Figure 3

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. Having been 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® Series 900 Adapter Flange

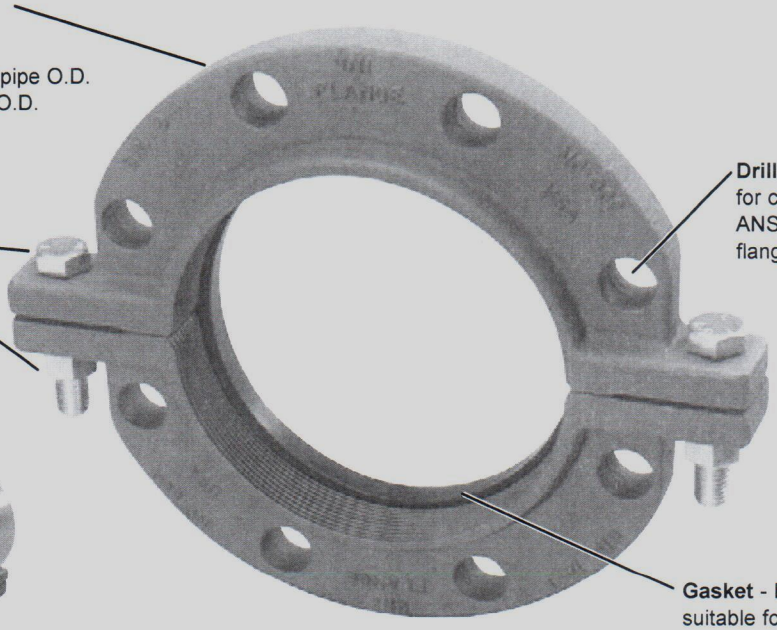
The Series 900 Adapter Flange joins plain-end PVC pipe to valves, pumps, meters - virtually all types of liquid and process equipment. The flange provides a power-tight, rigid flanged connection; it eliminates solvent welding, tie rodding, harnessing and other forms of restraint. The 900 Adapter Flange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

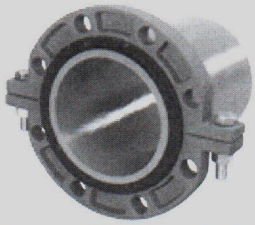
Color Code:
Red for PVC with ductile iron pipe O.D.
Gray for PVC with steel pipe O.D.

Clamping Bolts and Nuts



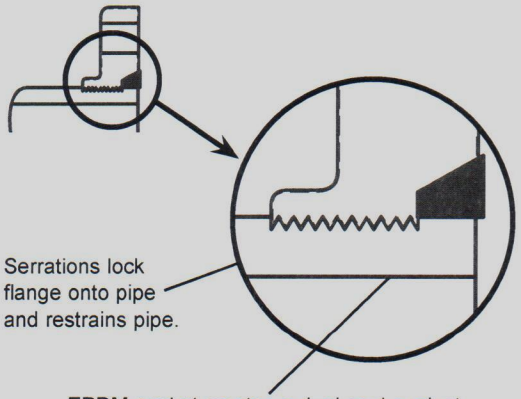
Drilling - ANSI B16.1 - 125 lb. for cast iron flanges.
ANSI B16.5 - 150 lb. for steel flanges.

Gasket - EPDM (-65° to 250°F) suitable for water and wastewater, ozone and strong oxidizing chemicals

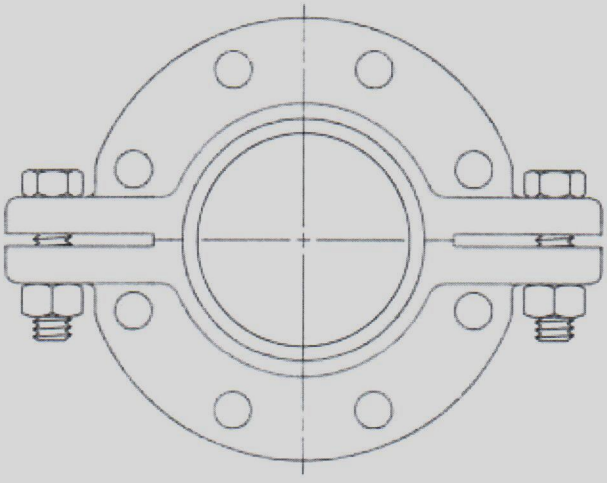


Series 900 Installed

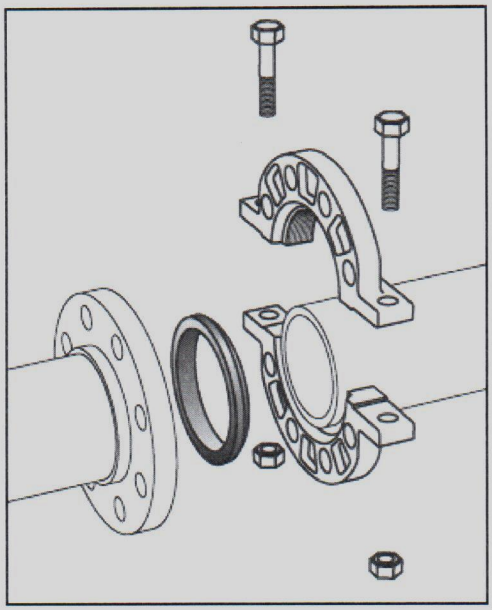
Lock and Seal features of Series 900



Symmetrical Force <u>Will Not</u> Point load Pipe



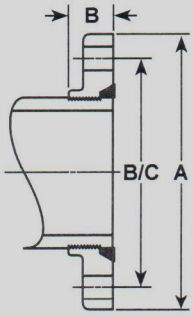
Uni-Flange® Series 900 Adapter Flange

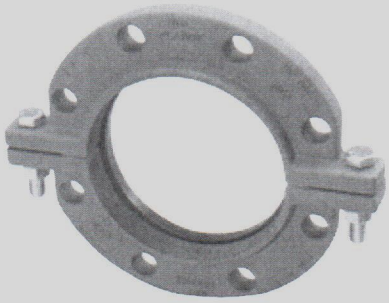


1. Cut PVC Pipe to the required length. Make sure the end is clean, cut square, and free from bevels, burrs or shavings.
2. It is important to first position flange halves on pipe so that the face of the flange is aligned evenly with the square cut end of the pipe. Insert and tighten side clamping bolts 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.

Note: 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.

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





Nom. Pipe Size	PVC Pipe with Steel Pipe OD		PVC Pipe with OD Ductile Iron Pipe		Approx. Wt. Lbs.	Dimensions			Flange Bolts		Clamping Bolts	
									No.	Bolt Hole Diameter		
	O.D.	Cat. No.	O.D.	Cat No.		A	B	BC			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 C-900	DR-14 DR-18 DR-25	305 235 165
Series 900-S	4" 6" 8"	ASTM D2241	SDR-21 SDR-26 SDR-32.5	200 160 125
	4" 6" 8"	ASTM 1785	Schedule 40	220 180 160
	4" 6" 8"	ASTM 1785	Schedule 80	320 280 250

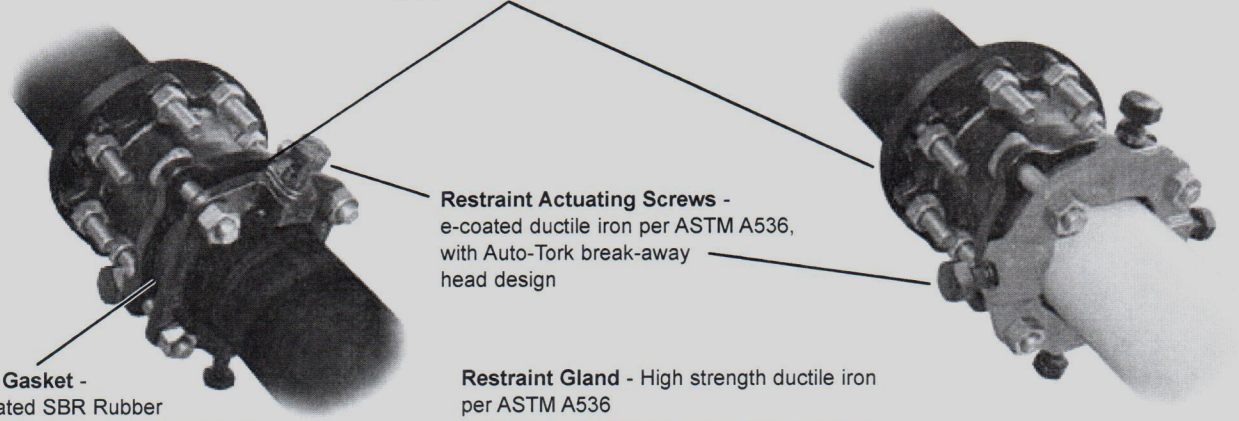
Specifications - Restrained Flange Adapter

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 dissassembly 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.

RFAD
(Flange x Restraint for Ductile Iron Pipe)

Flanged Adapter Sleeve - Fusion bonded epoxy, ductile iron per ASTM A536, compatible with Class D or Class E flange, per AWWA C207

RFAP
(Flange x Restraint for PVC, Steel or DR35 Sewer Pipe)



Restraint Actuating Screws - e-coated ductile iron per ASTM A536, with Auto-Tork break-away head design

Restraint Gasket -
Pre-lubricated SBR Rubber
3"-12" (SO-EZ gasket patent pending)
Optional: Buna-N Rubber
(SO-EZ gasket patent pending)
14"-30" MJ gasket

Restraint Gland - High strength ductile iron per ASTM A536
- RFAD-x-I Restraint Gland: black e-coating
- RFAP-x-I Restraint Gland: black e-coating undercoat with red topcoat

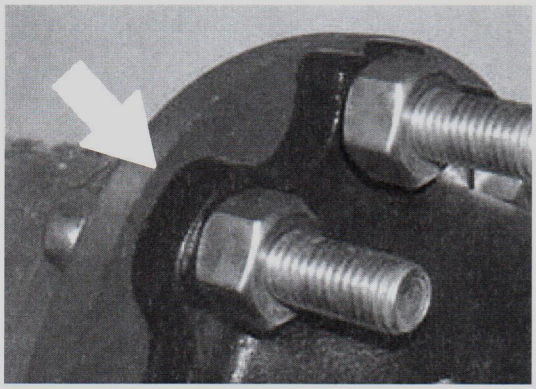
Tee-head Bolts and Nuts -
High strength low alloy steel per ASTM A242 and AWWA C111
Optional: Blue fluorocarbon coated or stainless steel

Flange O-ring -
NBR (ASTM D2000)

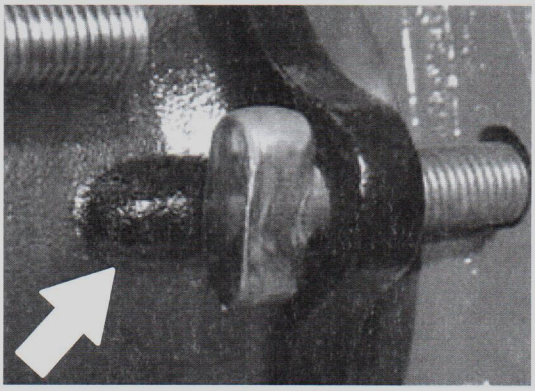
Restraint Ring Segments/Wedges -
e-coated ductile iron per ASTM A536

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

- 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.

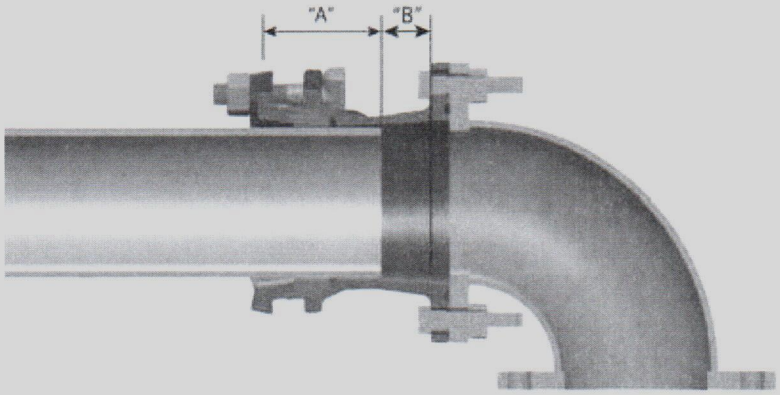


Bolt stop prevents tee-head bolts from turning during installation.

◁FM▷Approved 4" - 12"

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

Uni-Flange® Restrained Flange Adapter



RFAD FOR DUCTILE IRON PIPE

Nominal Pipe Size	Catalog Number	Pipe O.D.	*Dimension "A" Min. Pipe Insertion	*Dimension "B" Pipe Adjustibility	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)	15.70	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°	-

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

RFAP FOR C900, IPS PVC, STEEL, C909 AND **SDR35 SEWER PIPE

Nominal Pipe Size	Catalog Number	Pipe O.D.	*Dimension "A" Min. Pipe Insertion	*Dimension "B" Pipe Adjustibility	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)	15.70	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°	-

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

PRESSURE RATING FOR C900, IPS PVC, C909 AND **SDR35 SEWER PIPE

C900			ASTM D2241		C909	SDR 35
DR-25	DR-18	DR-14	SDR-26	SDR-21	PC150	
156 PSI	235 PSI	305 PSI	160 PSI	200 PSI	150 PSI	PS≥ 46 PSI

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

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

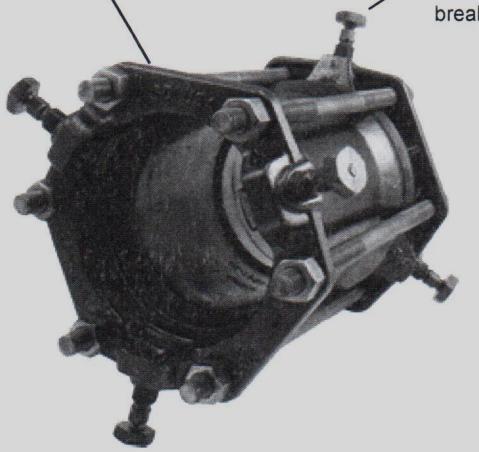
I = Import Casting U = Domestic Casting

Specifications - Restrained Couplings

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.

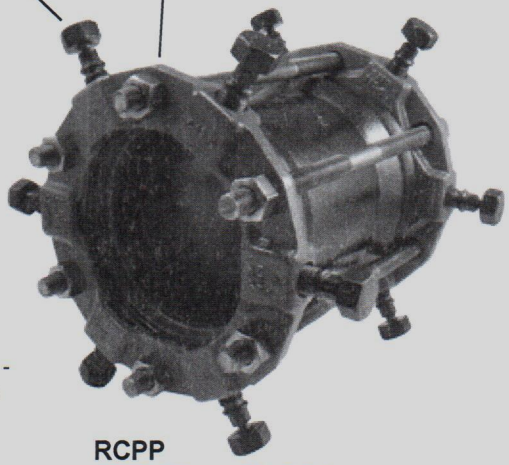
Restraint Gland - High strength ductile iron per ASTM A536
Black e-coat

Restraint Actuating Screws - e-coated ductile iron per ASTM A536, with Auto-Tork break-away head design



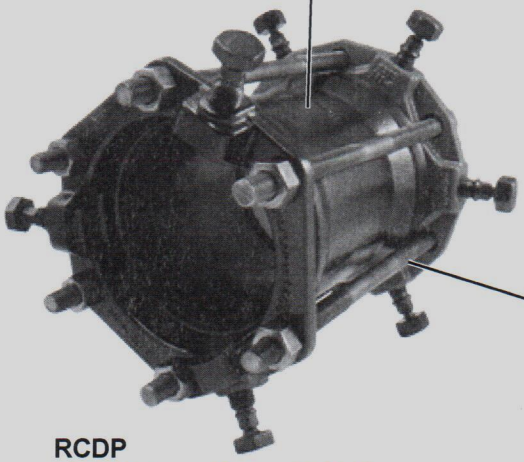
RCDD
(Ductile Iron Pipe x Ductile Iron Pipe)

Restraint Gland - High strength ductile iron per ASTM A536
Black e-coating undercoat with red topcoat



RCPP
(PVC Pipe x PVC Pipe)

MJ Coupling Sleeve - Fusion bonded epoxy ductile iron per ASTM A536



RCDP
(Ductile Iron Pipe x PVC Pipe)

Restraint Ring Segments/Wedges - e-coated ductile iron per ASTM A536

Restraint Gasket - 3"-12"
Pre-lubricated SBR Rubber
(SO-EZ gasket patent pending)
Optional: Buna-N Rubber
(SO-EZ gasket patent pending)
14"-36" MJ gasket

Double-ended Rods and Nuts - High strength low alloy steel per ASTM A242 and AWWA C111
Optional: blue fluorocarbon coated or stainless steel

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