

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 SBR (Buna-S).

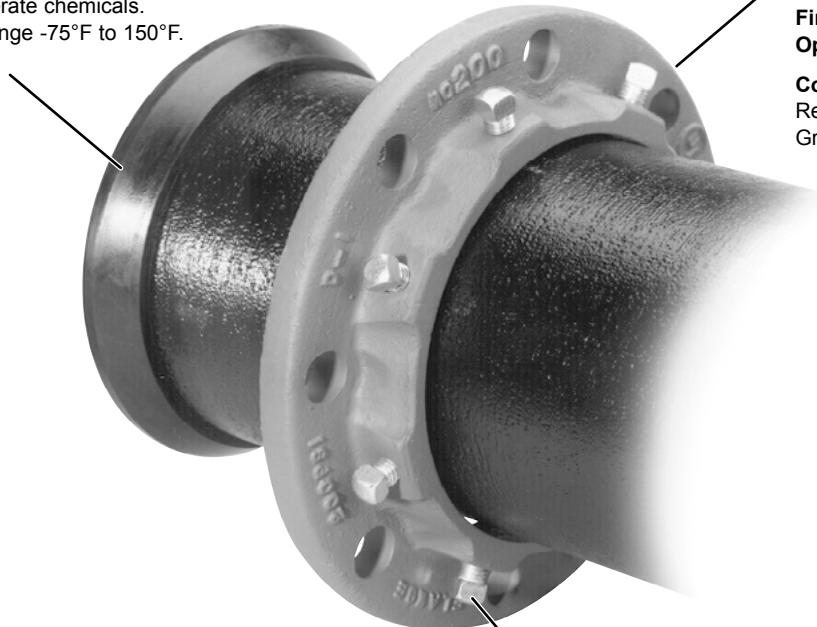
The RESTRAINT is provided by a set screw locking device similar to that used in mechanical joint restraints. This principle has been in use throughout the world in lieu of concrete thrust blocks and other restraining devices.

Gasket - SBR (Buna-S) supplied with the Uni-Flange Adapter Flange. Suitable for water and wastewater, and most moderate chemicals. Temperature range -75°F to 150°F.

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

Finish - Shop coat
Optional - Fusion bonded epoxy

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



Gasket Options

EPDM (Ethylene Propylene) - Suitable for -75°F to 300°F.

NBR (Buna-N) - Suitable for -40°F to 220°F.

Set Screw - AISI 4140 Steel. Heat treated to 35-39 Rockwell C and zinc plated for corrosion resistance.

Options: Uni-Torque set screws see page U-8
Type 410 Stainless Steel heat treated to 35-40 Rockwell C.

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

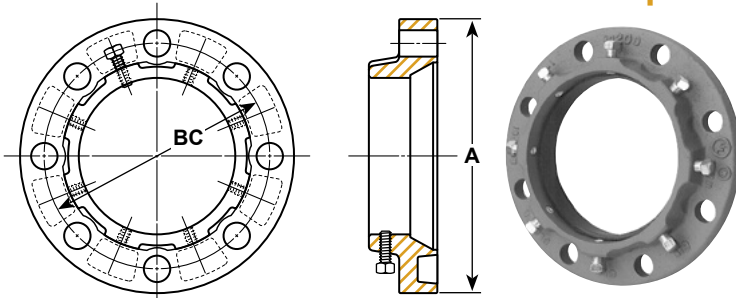
Series 420 - 250 lb. / 300 lb. Drilling

2 inch - 12 inch: 400 PSI

Flange Drilling: 125 lb., ANSI B16.1 for class 125 cast iron flanges
150 lb., ANSI B16.5, AWWA C207 class D & E steel flanges
250 lb., ANSI B16.1 for class 250 cast iron flanges
300 lb., ANSI B16.5, AWWA C207 class F steel flanges

Uni-Flange® Series 200

Adapter Flange for Steel and Ductile Iron Pipe

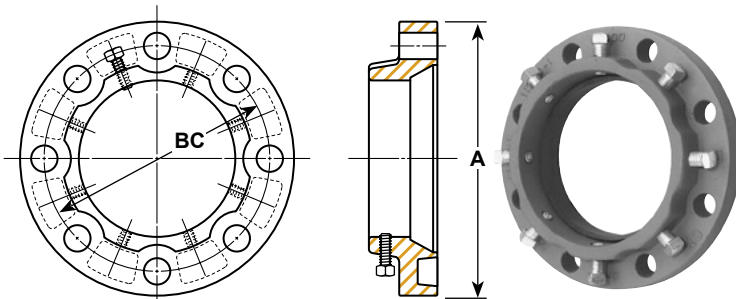


Flange Drilling ANSI B16.1 125 lb. /
ANSI B16.5 150 lb.
(matches Class D flange)
Working Pressure - 2" Through 8" **200 PSI**
10" Through 12" **175 PSI**

NOM PIPE SIZE	STEEL PIPE		DUCTILE IRON PIPE		APPROX. WT. LBS.	DIMENSIONS				
	O.D. (INCHES)	CATALOG NUMBER	O.D. (INCHES)	CATALOG NUMBER		A	BC	BOLT HOLE DIA.	SET SCREWS	
									No.	SIZE
2"	2.38	UFA200-S-2	2.50	UFA200-C-2	4.2	6"	4-3/4"	3/4"	4	1/2"x1"
2-1/2"	2.88	UFA200-S-25	-	-	6.0	7"	5-1/2"	3/4"	4	1/2"x1"
3"	3.50	UFA200-S-3	3.96	UFA200-C-3	6.5	7-1/2"	6"	3/4"	4	1/2"x1"
4"	4.50	UFA200-S-4	4.80	UFA200-C-4	8.0	9"	7-1/2"	3/4"	4	1/2"x1"
5"	5.56	UFA200-S-5	-	-	10.5	10"	8-1/2"	7/8"	8	1/2"x1"
6"	6.63	UFA200-S-6	6.90	UFA200-C-6	11.0	11"	9-1/2"	7/8"	8	1/2"x1"
8"	8.63	UFA200-S-8	9.05	UFA200-C-8	19.0	13-1/2"	11-3/4"	7/8"	8	5/8"x1-1/4"
10"	10.75	UFA200-S-10	11.10	UFA200-C-10	28.0	16"	14-1/4"	1"	12	5/8"x1-1/4"
12"	-	-	13.20	UFA200-C-12	33.2	19"	17"	1"	12	5/8"x1-1/4"

Uni-Flange® Series 400

Adapter Flange for Steel and Ductile Iron Pipe



Flange Drilling ANSI B16.1 125 lb. /
ANSI B16.5 150 lb.
(matches Class D and E flanges)
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	BC	BOLT HOLE DIA.	SET SCREWS	
									No.	SIZE
2"	2.38	UFA400-S-2	-	-	5.0	6"	4-3/4"	3/4"	2	1/2"x1"
2-1/2"	2.88	UFA400-S-25	-	-	7.0	7"	5-1/2"	3/4"	4	1/2"x1"
3"	3.50	UFA400-S-3	3.96	UFA400-C-3	8.0	7-1/2"	6"	3/4"	4	1/2"x1"
4"	4.50	UFA400-S-4	4.80	UFA400-C-4	11.0	9"	7-1/2"	3/4"	8	1/2"x1"
5"	5.56	UFA400-S-5	-	-	13.0	10"	8-1/2"	7/8"	8	5/8"x1-1/4"
6"	6.63	UFA400-S-6	6.90	UFA400-C-6	14.0	11"	9-1/2"	7/8"	8	5/8"x1-1/4"
8"	8.63	UFA400-S-8	9.05	UFA400-C-8	21.0	13-1/2"	11-3/4"	7/8"	8	5/8"x1-1/4"
10"	10.75	UFA400-S-10	11.10	UFA400-C-10	38.0	16"	14-1/4"	1"	12	5/8"x1-1/4"
12"	12.75	UFA400-S-12	13.20	UFA400-C-12	56.0	19"	17"	1"	12	5/8"x1-1/4"
14"	14.00	UFA400-S-14	15.30	UFA400-C-14	70.0	21"	18-3/4"	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"	21-1/4"	1-1/8"	16	5/8"x1-1/4"
18"	18.00	UFA400-S-18	19.50	UFA400-C-18	90.0	25"	22-3/4"	1-1/4"	16	3/4"x2"
20"	20.00	UFA400-S-20	21.60	UFA400-C-20	145.0	27-1/2"	25"	1-1/4"	20	3/4"x2"
24"	24.00	UFA400-S-24	25.80	UFA400-C-24	175.0	32"	29-1/2"	1-3/8"	20	3/4"x2"
30"	30.00	UFA400-S-30	32.00	UFA400-C-30	270.0	38-3/4"	36"	1-3/8"	28	1"x2-1/4"
36"	36.00	UFA400-S-36	38.30	UFA400-C-36	400.0	46"	42-3/4"	1-5/8"	32	1"x2-1/4"
42"	42.00	UFA400-S-42	44.50	UFA400-C-42	495.0	53"	49-1/2"	1-5/8"	36	1"x2-1/4"
48"	-	-	50.80	UFA400-C-48	660.0	59-1/2"	56"	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.

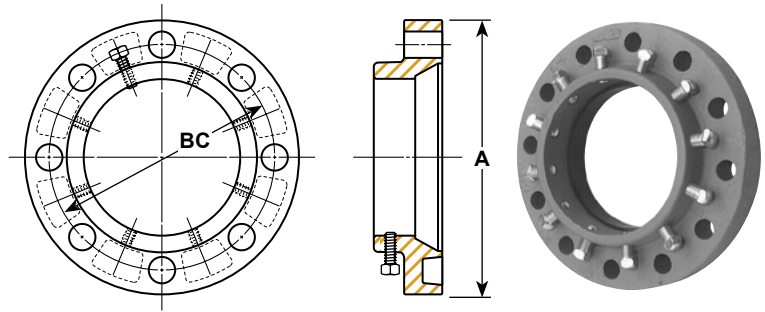
* **Caution:** Uni-Torque set screws should not be used on steel pipe thinner than schedule 40 or ductile iron pipe thinner than class 52.



Uni-Flange® 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**

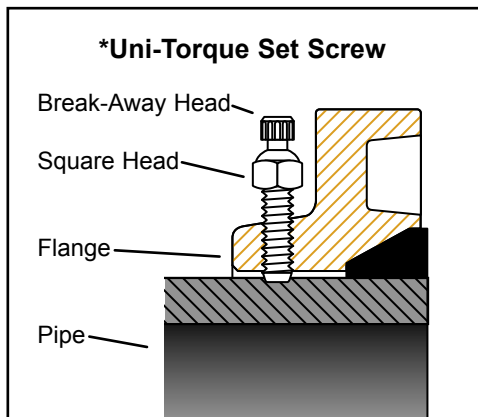


NOM. PIPE SIZE	STEEL PIPE		DUCTILE IRON PIPE		APPROX. WT. LBS.	DIMENSIONS				
	O.D. (INCHES)	CATALOG NUMBER	O.D. (INCHES)	CATALOG NUMBER		A	BC	BOLT HOLE DIA.	SET SCREWS	
									No.	SIZE
2"	2.38	UFA420-S-2	2.50	UFA420-C-2	9.0	6-1/2"	5"	3/4"	8	1/2" x 1"
3"	3.50	UFA420-S-3	3.96	UFA420-C-3	13.0	8-1/4"	6-5/8"	7/8"	8	1/2" x 1"
4"	4.50	UFA420-S-4	4.80	UFA420-C-4	21.0	10"	7-7/8"	7/8"	8	◆
5"	5.56	UFA420-S-5	-	-	25.0	11"	9-1/4"	7/8"	8	5/8" x 1-1/4"
6"	6.63	UFA420-S-6	6.90	UFA420-C-6	33.0	12-1/2"	10-5/8"	7/8"	12	5/8" x 1-1/4"
8"	8.63	UFA420-S-8	9.05	UFA420-C-8	49.0	15"	13"	1"	12	5/8" x 1-1/4"
10"	10.75	UFA420-S-10	11.10	UFA420-C-10	74.0	17-1/2"	15-1/4"	1-1/8"	16	5/8" x 1-1/4"
12"	12.75	UFA420-S-12	13.20	UFA420-C-12	95.0	20-1/2"	17-3/4"	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, 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	-	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 RATED 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.

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 or 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.

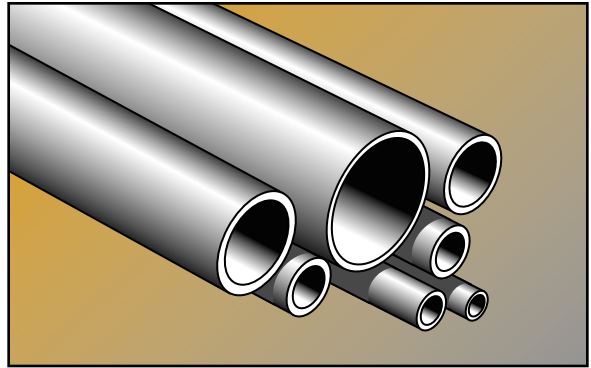


Figure 1

- **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 U-10.

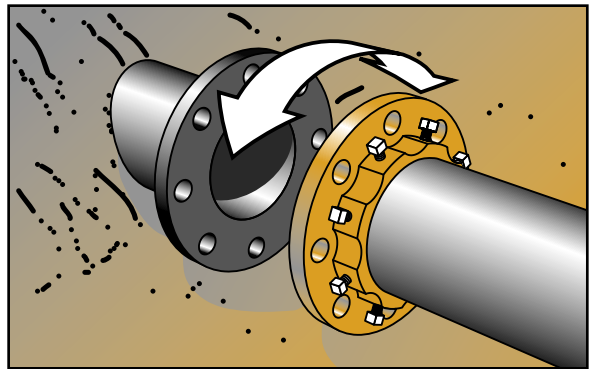


Figure 2

- **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.

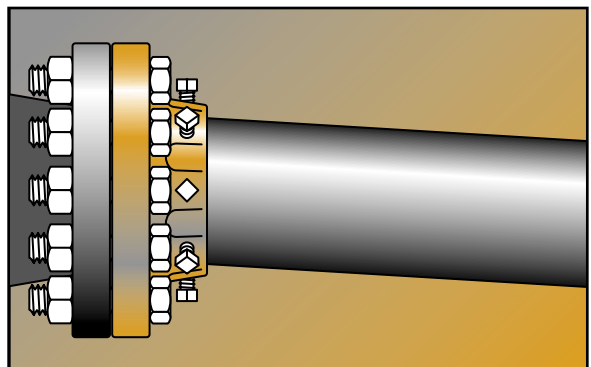


Figure 3

- **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.

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 80 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 U-9 for recommended torque.

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

Yes, 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 U-10. 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 NBR (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).