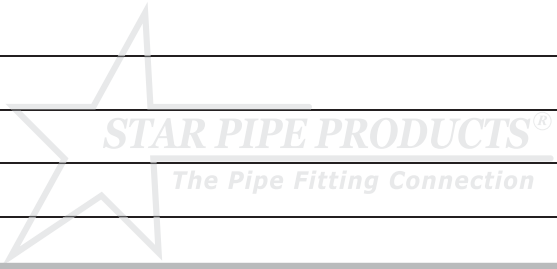
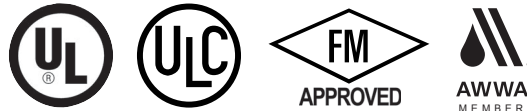
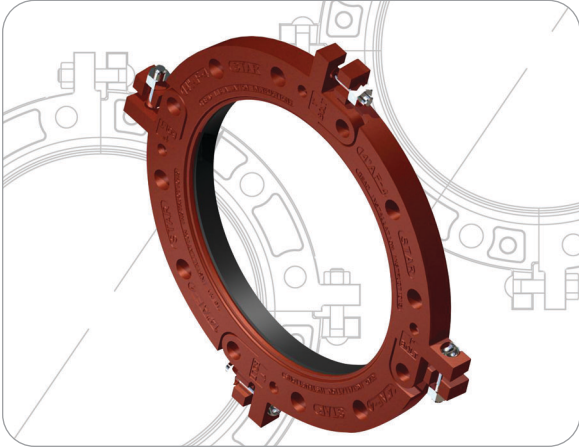


Star Pipe Products
 AWWA Grooved Submittal Form

Project Name _____
 Engineer _____
 Contractor _____
 Spec Section _____



AF-4 AWWA Grooved Flange Adapter



- Designed for connecting ANSI/AWWA C110/A21.10 and ASME/ANSI B16.1 Class 125/150 flanged end components to grooved end ductile iron piping systems per ANSI/AWWA C606.
- 3"-12" Sizes are UL, ULC Listed

Material Specifications

Housing: Ductile Iron per ASTM A536 Grade 65-45-12.

Finish: Rust inhibiting primer

Latch Bolt/Nut: Oval neck track bolt and heavy hex nut per ANSI/ASME B 18.10 and B 18.2.2.

Optional (Please check)

Stainless steel hex head bolts per ASTM A 193, grade B8M, class 2, type 316 & stainless steel heavy hex nut per ASTM A194, grade 8M, type 316.

Gasket Options Per ASTM D2000:

(Please check)

Halogenated Butyl

Temperature range -20°F to +200°F
 -29°C to +93°C

Recommended for water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. Not Recommended for petroleum services.

Nitrile

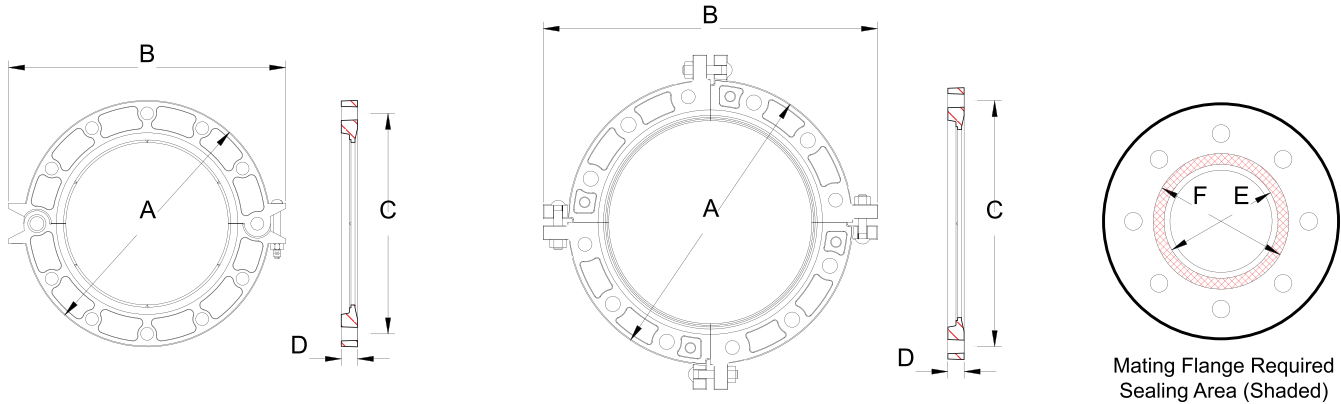
Temperature range -20°F to +180°F
 -29°C to +82°C

Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range, not recommended for hot dry air over +140° F and water over +150° F



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Dimensions



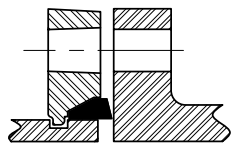
3" - 12" Size

14" - 24" Size

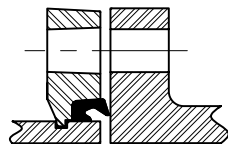
Mating Flange Required
Sealing Area (Shaded)

AF-4 AWWA GROOVED FLANGE ADAPTER

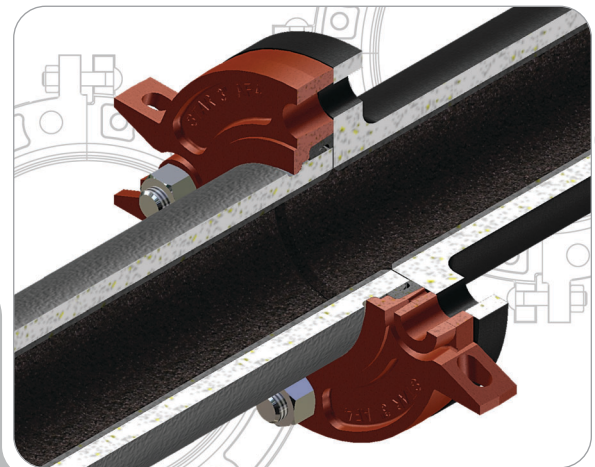
NOMINAL SIZE IN. (mm)	ACTUAL PIPE SIZE IN. (mm)	MAX WORKING P.S.I. (kPa)	MAX END LOAD Lbs. (N)	ASSEMBLY BOLTS		LATCH BOLTS		DIMENSIONS - Inches (mm)						APPROX. WEIGHT EACH Lbs. (kg)
				QTY.	SIZE IN.	QTY.	SIZE IN.	A	B	C	D	Max. Bore E	Min. Surface F	
3	3.96	250	3079	4	5/8 X 3	1	3/8 X 3 1/4	7.50	9.47	6.00	0.94	3.96	4.94	6
80	100.6	1724	13696					191	241	152	24	101	125	2.7
4	4.80	250	4524	8	5/8 x 3	1	3/8 X 3 1/4	9.00	11.01	7.50	0.94	4.80	5.88	8
100	121.9	1724	20124					229	280	191	24	122	149	3.6
6	6.90	250	9348	8	3/4 X 3 1/2	1	3/8 X 3 1/4	11.00	13.04	9.50	1.03	6.90	8.00	10
150	175.3	1724	41582					279	331	241	26	175	203	4.5
8	9.05	250	16082	8	3/4 X 3 1/2	1	3/8 X 3 1/4	13.50	15.49	11.75	1.13	9.05	10.13	15
200	229.9	1724	71536					343	393	298	29	230	257	6.8
10	11.10	250	24192	12	7/8 X 4	1	1/2 X 4	16.00	18.49	14.25	1.19	11.10	12.50	19
250	281.9	1724	107611					406	470	352	30	282	318	8.6
12	13.20	250	34212	12	7/8 X 4	1	1/2 X 4	19.00	21.52	17.00	1.25	13.20	14.75	28
300	335.3	1724	152183					483	547	432	32	335	375	12.7
14	15.30	200	36771	12	1 x 4 1/4	4	5/8 x 3 1/2	21.00	24.63	18.75	1.50	15.30	16.54	46
350	388.6	1379	163566					533	626	476	38	389	420	20.9
16	17.40	150	35668	16	1 x 4 3/4	4	5/8 X 3 1/2	23.50	27.26	21.25	1.88	17.40	18.64	67
400	442.0	1034	158659					597	692	540	48	442	473	30.4
18	19.50	150	44797	16	1 1/8 x 5 1/2	4	3/4 X 4 1/4	25.00	29.14	22.75	2.25	19.50	20.74	84
450	495.3	1034	199267					635	740	578	57	495	527	38.1
20	21.60	150	54965	20	1 1/8 x 5 3/4	4	3/4 X 4 1/4	27.50	31.64	25.00	2.38	21.60	22.84	105
500	548.6	1034	244497					699	804	635	61	549	580	47.6
24	25.80	150	78419	20	1 1/4 x 6 1/4	4	3/4 X 5	32.00	36.14	29.50	2.50	25.80	27.04	132
600	655.3	1034	348825					813	918	749	64	655	687	59.9



AF-4 Flange
14"-24"



AF-4 Flange
3"-12"



AF-4 AWWA Grooved Flange Adapter

Star Pipe Products
4018 West hollow Pkwy.
Houston, TX 77082
Toll Free: (800) 999-3009



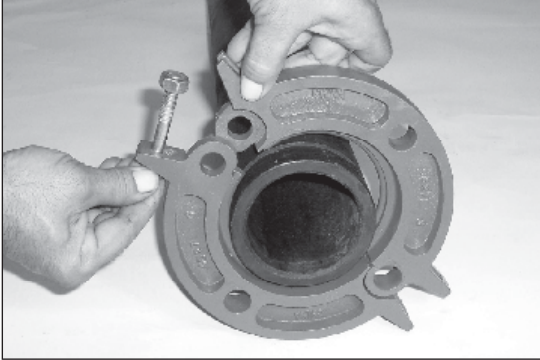
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AF-4 Grooved Flange Adapter Installation Instructions

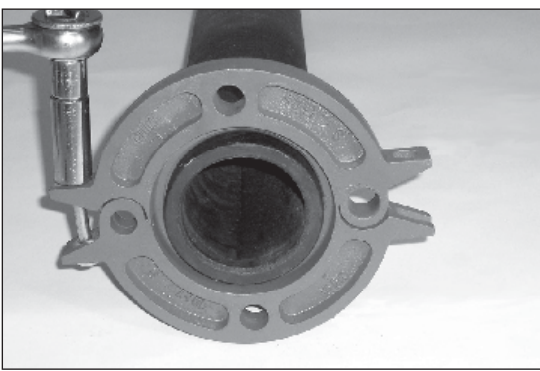
Installation Instructions for Sizes 3" - 12"

1. Check pipe end for proper groove dimensions and assure that pipe end is free of indentations and projections which would prevent proper sealing of the Grooved Flange Adapter gasket.

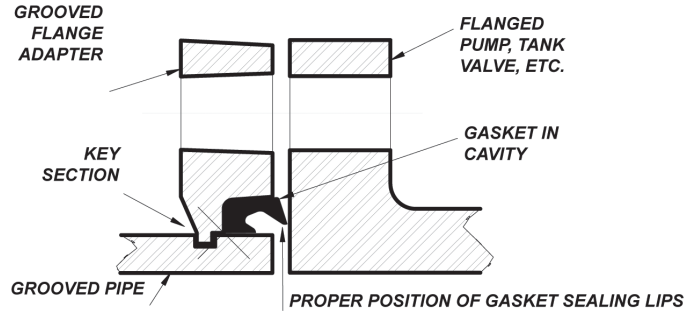
2. Loosen the nut on the end of the latch bolt (It should not be necessary to remove the nut completely). Swing the latch bolt out of the slot. Open Grooved Flange Adapter and place around the grooved pipe end with the key section fitting into the groove. The flange gasket cavity must face the pipe end.



3. Place the latch bolt back into the slotted hole. Tighten the nut until the flange halves make complete contact with each other. Alternately, the latch bolt nut may be left without fully tightening so as to provide more space for ease of gasket insertion. After the gasket is properly positioned in the cavity, tighten the nut for complete contact of flange halves making sure that there is no gasket pinch between the two halves.

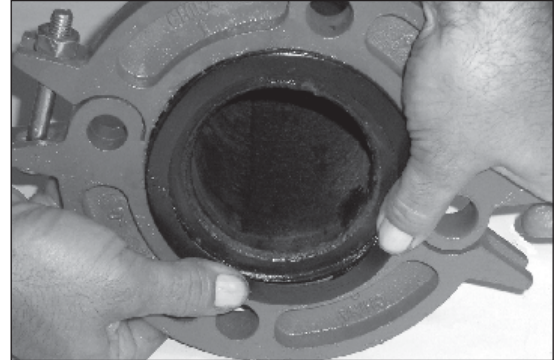


4. Check the gasket for any deformation or cuts then lubricate the entire surface of the gasket and the flange gasket cavity using a non-petroleum base, non-toxic gasket lubricant available from STAR PIPE PRODUCTS.



5. Stretch the gasket around the pipe end and press the gasket into the cavity between the pipe O.D. and flange. The gasket must be properly positioned as shown above.

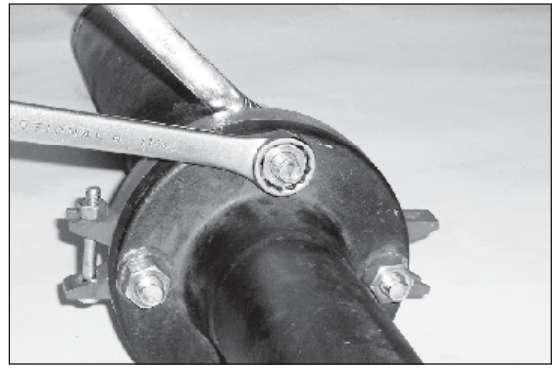
6. With gasket in place, apply lubricant to the exposed gasket lip which will seal against the mating flange.



7. Check to assure that the mating flange face is hard, flat and smooth. The effective sealing area of the mating flange (see table, page 4) must be free from gouges or deformities of any type to ensure proper sealing of the gasket. Align Grooved Flange Adapter holes with the mating flange, pump, tank, etc., bolt holes and insert standard flange bolts or studs (not supplied).

NOTE: Make sure that the gasket lip is not bent backwards or pinched between the two flanges.

8. Evenly tighten the nuts alternately on opposite sides until flange faces contact firmly and required torque is obtained.

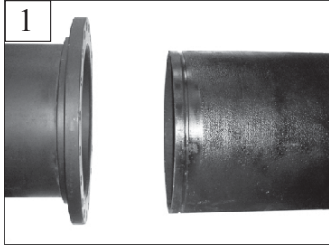


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AF-4 Grooved Flange Adapter Installation Instructions

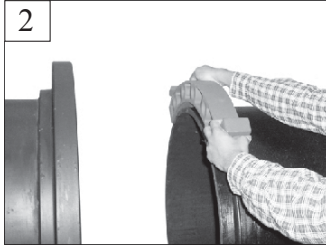
Installation Instructions for Sizes 14" - 24"

INSPECT PIPE



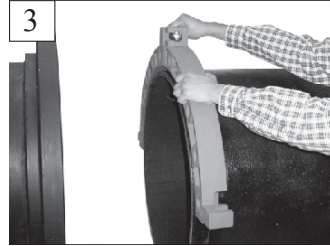
Inspect pipe end for proper groove dimensions and assure pipe end is free of indentations and projections which would prevent proper sealing of gasket. Also check mating flange sealing area making sure it is free from indentations and other deformities. Refer to table on page 4 for mating flange sealing area data.

LINE UP FLANGE



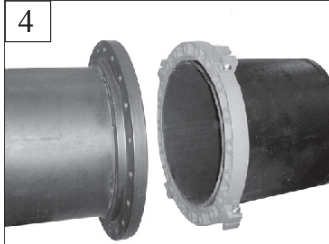
Place one segment onto the grooved pipe end being sure that key section engages the groove and gasket cavity faces towards mating flange.

ADD SEGMENTS



Add other segments sequentially with latch bolts loose enough to permit rotation for bolt hole alignment.

LINE UP HOLES



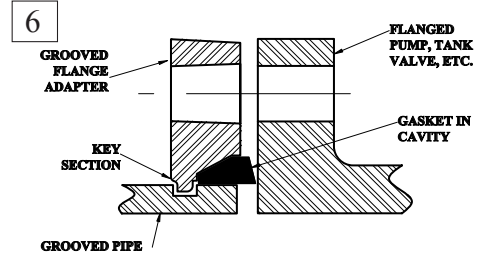
Rotate grooved flange adapter as required to line up with the holes in the mating flange.

INSPECT GASKET



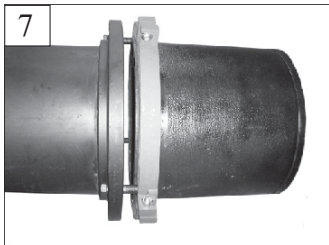
Check gasket supplied for any deformities or cuts, then apply a non-petroleum base, non-toxic gasket lubricant to inside and outside surface of gasket (Lubricant available from Star Pipe Products).

INSTALL GASKET



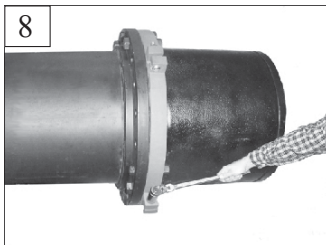
Stretch gasket around pipe end and press it into cavity between pipe O.D. and flange. The gasket must be properly positioned as shown above.

ADD BOLTS



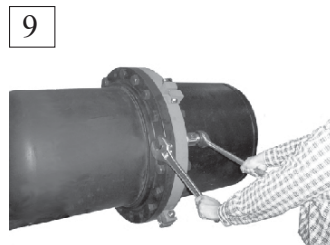
Insert four flange bolts (not supplied) at the segment's lap joints and direct them into adjoining flange and hand tighten nuts onto the four bolts.

TIGHTEN BOLTS



Tighten four latch bolts to approximately 150 LB-FT torque.

DO NOT OVER TIGHTEN



Add remaining flange bolts (not supplied) and evenly tighten all to the recommended torque as shown below.

14" & 16" - 250 to 300 lb-ft
 18" & 20" - 300 to 350 lb-ft
 24" - 350 to 400 lb-ft

Note: Do not over tighten the flange bolts. It is not necessary to bring the flange adapter face to face with mating flange. A gap of approximately 1/8" between is normal

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AF-4 Installation Notes

IMPORTANT INSTALLATION NOTES FOR AF-4 FLANGE ADAPTER

(please refer to the Installation Instructions for further detail)

- To confirm mating components are not obstructed, make sure Flange Adapters are assembled prior to installation.
- To make a proper seal, the pipe's gasket seating surface and the face of the mating flange must be clean and free from undulations, gouges and/or deformities.
- Make sure the lettering of the gaskets face towards the gasket pocket of the Flange Adapter. The lettering on the gasket will not be visible if installed correctly.
- Do not use Flange Adapters as anchor points for tie rods across joints that have not been restrained.
- When using wafer or lug-type valves to join fittings, verify disc dimensions to ensure accurate clearance.
- The hinge points/latch bolt locations must be staggered, and a flange washer (3" – 12") or transition ring (14" – 24") must be used when mating two Flange Adapters.
- It is required to use Flange Washers when mating Flange Adapters to rubber faced flanges, valves, etc. *See notes below on specific Mating Surface Requirements.*

Mating Surface Requirements:

A smooth, hard surface is required to properly seal the mating flange face of the Flange Adapters. If not, it is recommended to insert a metal Flange Washer between the Flange Adapter and the mating flange to correct the necessary sealing surface. Please specify size when ordering.

1. **A serrated flange** – a flange gasket should be used against the serrated flange and then place a Flange Washer between the Flange Gasket and the Flange Adapter.
2. **A rubber-lined and partially rubber-faced (smooth or not), wafer-type valve** – the Flange Washer should be placed between the valve and the Flange Adapter.
3. **A rubber-faced flange, valve, etc.** – insert the Flange Washer between the rubber-faced flange and the Flange Adapter.
4. **To components (strainers, valves, etc.) where the component flange face has an insert** – see number 1 above as if mating to a serrated flange.
5. **AWWA cast flanges to IPS flanges** – the Flange Transition ring is placed between the two Flange Adapters with the latch bolt locations staggered. If one flange is not a Flange Adapter (i.e. flanged valve), a Flange Gasket must be placed against that flange. The Flange Washer must then be inserted between the two Flange Gaskets. NOTE: Transition rings, rather than Flange Washers, must be used when mating IPS Flange Adapters to AWWA Grooved Flange Adapters in sizes 14 – 24" (350 – 600 mm).

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