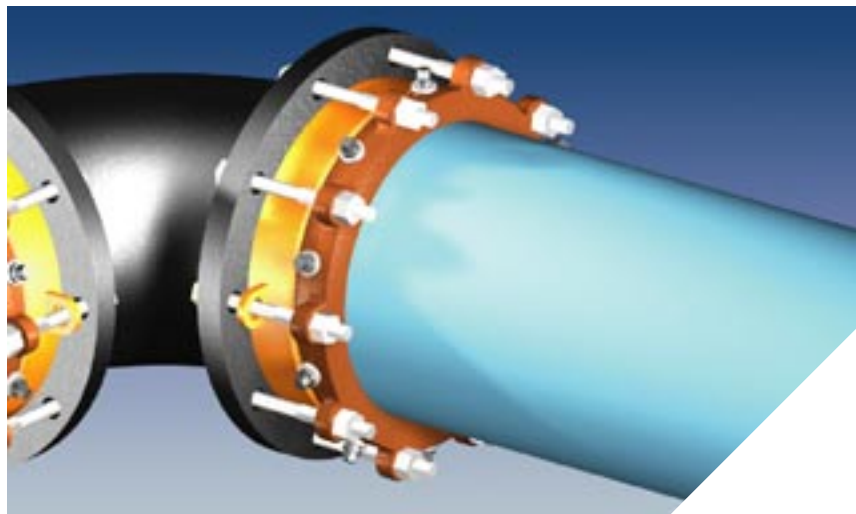
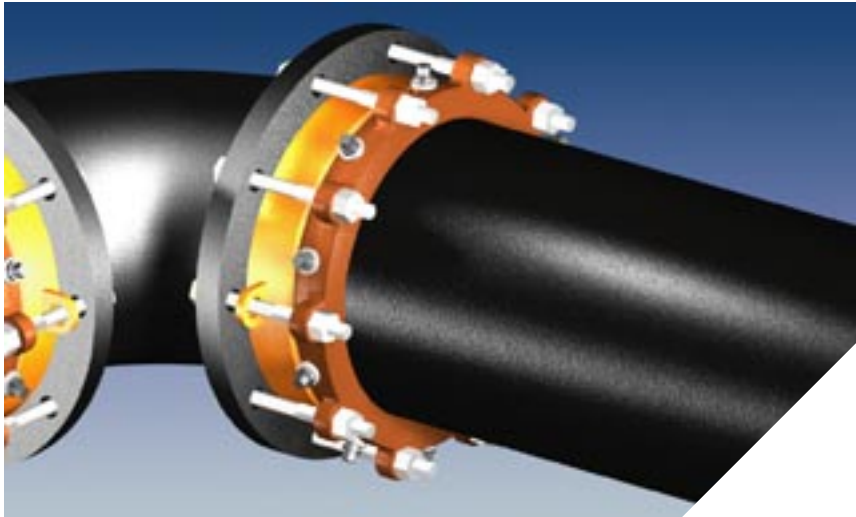




SERIES 2100

Megaflange[®]
Restrained Flange Adapter
U.S. Patent Nos. 4627774 and 5071175

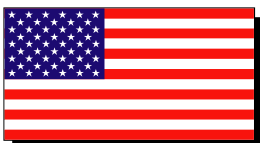


Features and Application:

- For use on Ductile Iron Pipe, PVC, Steel, and HDPE (with insert).
- Minimum 2 to 1 Safety Factor.
- Fully restrained.
- Time Saving and field adaptable.
- Constructed of ASTM A536, 65-45-12 Ductile Iron.
- UL listed on sizes 3" through 12".
- FM approved on sizes 4" through 12" on C900 Class 150 and Class 200 PVC pipe.
- Pipe can be cut to length in the field.
- Joint deflection up to 5°.
- Easy dismantling allows fast removal of valves, meters or fittings for replacement or repair.
- For use on water or wastewater pipelines subject to hydrostatic pressure and tested in accordance with either AWWA C600 or ASTM D2774.
- For use on Plain End Pipe.
NOT for use on Plain End Fittings.

Sample Specification

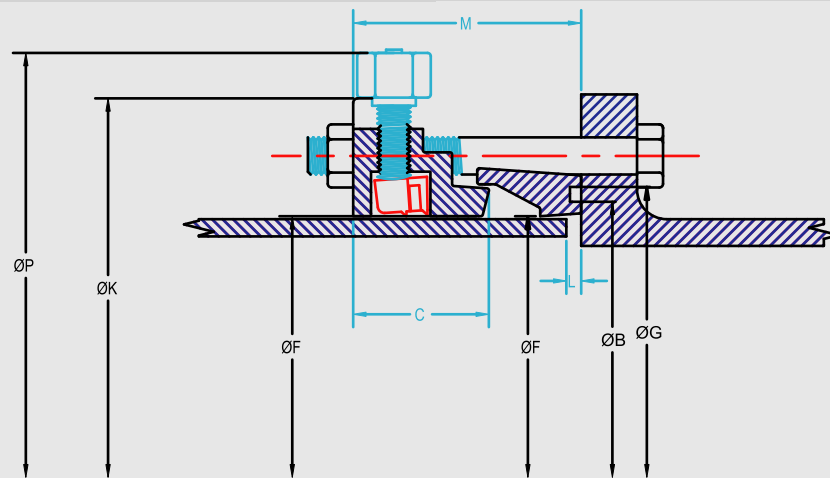
1. Restrained flange adapters shall be used in lieu of threaded or welded flanged spool pieces. Flange adapters shall be made of ductile iron conforming to ASTM A536 and have flange bolt circles that are compatible with ANSI/AWWA C115.15.
2. Restraint for the flange adapter shall consist of a plurality of individual actuated gripping wedges to maximize restraint capability. Torque limiting actuating screws shall be used to insure proper initial set of gripping wedges.
3. The flange adapters shall be capable of deflection during assembly or permit lengths of pipe to be field cut to allow a minimum 0.6" gap between the end of the pipe and the mating flange without affecting the integrity of the seal.
4. For PVC pipe, the flange adapter will have a pressure rating equal to the pipe.
5. For Ductile Iron pipe, the flange adapter shall have a safety factor of 2:1 minimum.
6. The flange adapter shall be the SERIES 2100 MEGAFLANGE adapter as produced by EBAA Iron, Inc. or approved equal.



Series 2100 Submittal Reference Drawing

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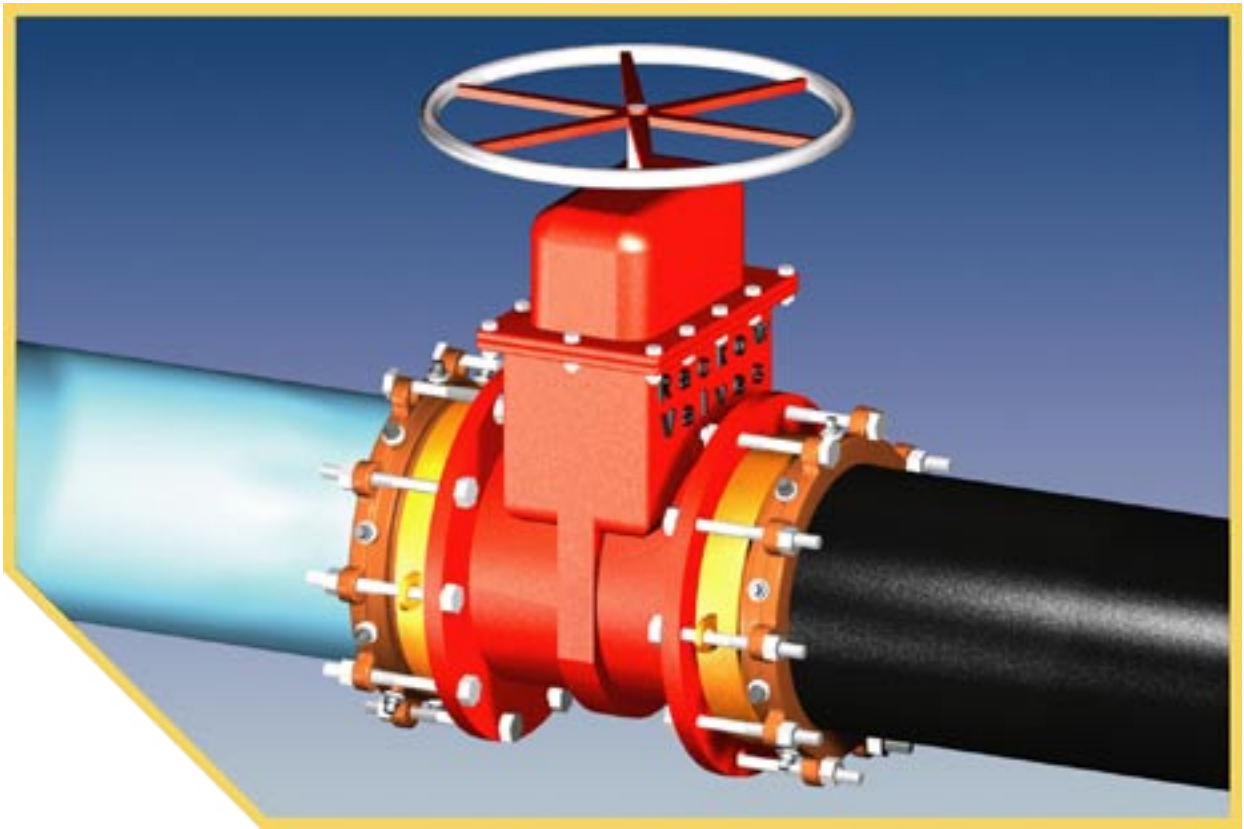
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Nominal Pipe Size	Series Number	Restraint Ring			Gasket Ring			Bolts			"L" MAX	Assembly Deflection	M	P*	Shipping Weight
		K	F	C	F	B	G	No.	Dia.	Length					
3	2103	7.5	4.1	2.2	4.1	4.3	4.9	4	5/8	5-1/2	0.7	5.0	4.0	9.2	14
4	2104	9.0	4.9	2.2	4.9	5.4	6.0	8	5/8	5-1/2	0.6	5.0	4.0	10.0	20
6	2106	11.0	7.0	2.3	7.0	7.5	8.1	8	3/4	6	0.8	5.0	4.3	12.1	32
8	2108	13.5	9.2	2.4	9.2	9.8	10.4	8	3/4	6	0.9	5.0	4.5	14.3	38
10	2110	16.0	11.2	2.5	11.2	11.8	12.4	12	7/8	7-1/2	1.0	3.0	4.7	16.3	65
12	2112	19.0	13.3	2.5	13.3	13.8	14.4	12	7/8	7-1/2	1.0	3.0	4.8	18.4	73
14	2114	21.0	15.5	2.5	15.5	16.1	16.9	12	1	8	1.3	2.0	5.0	20.6	89
16	2116	23.5	17.6	2.5	17.6	18.2	19.0	16	1	8	1.3	2.0	5.0	22.6	109
18	2118	25.0	19.7	2.6	19.7	20.2	21.0	16	1-1/8	8-1/2	1.3	1.5	5.1	24.7	134
20	2120	27.3	21.8	2.6	21.8	22.4	23.2	20	1-1/8	8-1/2	1.3	1.5	5.1	26.8	157
24	2124	32.0	26.0	2.6	26.0	26.7	27.5	20	1-1/4	8-1/2	1.3	1.0	5.1	31.0	192
30	2130	38.5	32.2	3.3	32.2	32.9	34.1	28	1-1/4	10	2.0	3.0	6.0	38.8	296
36	2136	45.5	38.5	3.3	38.5	39.2	40.4	32	1-1/2	10-1/2	2.0	3.0	6.0	44.6	426
42	2142	52.3	44.7	4.1	44.7	45.8	47.0	36	1-1/2	12	2.0	1.0	8.0	50.8	642
48	2148	58.8	51.0	4.1	51.0	52.1	53.3	44	1-1/2	12	2.0	1.0	8.0	57.1	797
60	2160	72.6	61.8	4.6	61.8	62.9	64.1	52	1-3/4	14	2.0	0.5	8.6	67.9	1419

* The "P" dimension is measured with the torque-limiting nuts twisted off.
Note: Dimensions are in inches and are subject to change without notice.

MEGAFLANGE ADVANTAGES

- Fully restrained
- Time saving and field adaptable
- Pipe can be cut to length at the job site
- Joint deflection to 5°
- Can be used on Ductile Iron, PVC, and Steel (See Pressure Ratings chart for details)
- Wedges securely grip the pipe much better than set screws
- Easy disassembly allows fast removal of valves, meters or fittings for replacement or repair

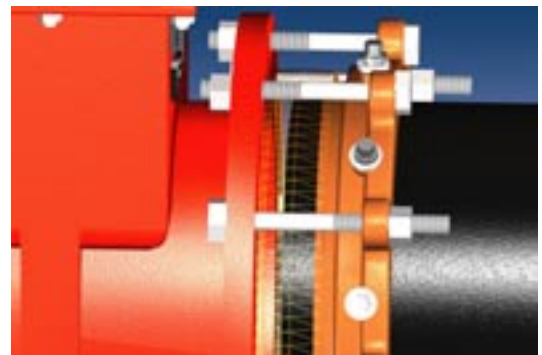


Two, Series 2112 connecting DI pipe to a Gate Valve

Some flange adapters use a standard mechanical joint gasket for both the pipe and the flange seal and are prone to leaks.

Other flanged coupling adapters separate the pipe seal from the flange seal but are not restrained, and require separate restraining devices.

Still some devices use "set screws" to try to achieve restraint; but set screw restraints are ineffective when compared to the pull-out strength of the standard flanged joint.



Depicting possible gap and deflection capabilities.

THE SERIES 2100 MEGAFLANGE RESTRAINED FLANGE ADAPTER IS TOTALLY DIFFERENT!



Series 2100 comes with all the necessary seals and bolts, for a complete and total install.

Pipe Size	Ductile Iron Pipe			Steel Pipe*			C900 PVC Pipe								IPS PVC Pipe*					
							DR 14		DR 18		DR 25		DR 32.5		SDR 17		SDR 21		SDR 26	
	Pressure	SF		Pressure	SF		Pressure	SF	Pressure	SF	Pressure	SF	Pressure	SF	Pressure	SF	Pressure	SF	Pressure	SF
3	350	5:1		350	5:1		-	-	-	-	-	-	-	-	250	Full	200	Full	160	Full
4	350	5:1		350	5:1		200	Full**	150	Full	100	Full	-	-	250	Full	200	Full	160	Full
6	350	5:1		350	5:1		200	Full	150	Full	100	Full	-	-	250	Full	200	Full	160	Full
8	350	4:1		350	4:1		200	Full	150	Full	100	Full	-	-	250	Full	200	Full	160	Full
10	300	4:1		350	4:1		200	Full	150	Full	100	Full	-	-	250	Full	200	Full	160	Full
12	350	3:1		350	3:1		200	Full	150	Full	100	Full	-	-	250	Full	200	Full	160	Full
14	350	2:1		-	-		-	-	235	Full	165	Full	125	Full	-	-	-	-	-	-
16	350	2:1		-	-		-	-	235	Full	165	Full	125	Full	-	-	-	-	-	-
18	300	2:1		-	-		-	-	235	2.5:1	165	Full	125	Full	-	-	-	-	-	-
20	250	2:1		-	-		-	-	235	2.5:1	165	Full	125	Full	-	-	-	-	-	-
24	200	2:1		-	-		-	-	-	-	165	2.5:1	125	Full	-	-	-	-	-	-
30	150	2:1		-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	150	2:1		-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	150	2:1		-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	-	-		-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	100	2:1		-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: Dimensions are in inches and are subject to change without notice.

* Transition gasket required

** A Full safety factor is when the restraint and the pipe have been tested to the same requirements of the pipe. (See Megaflange Testing Results: PVC Testing.)



MEGAFLANGE TESTING RESULTS

PVC TESTING

- Quick Burst Test
- DR 18 tested to 755 psi
- DR 14 tested to 985 psi
- Long Term Pressure Test
- On DR 18 PVC pipe at 615 psi for 1000 hours without failure
- Cyclic Pressure Test
- DR 18 tested from 94 to 188 psi for over 1,000,000 cycles

DUCTILE IRON AND STEEL TESTING

- Leakage Test (one minute required)
- Tested to twice rated pressure without leaking
- Hydrostatic Test (one minute required)
- 3" to 6" sizes tested to 5 times rated pressure
- 8" & 10" sizes tested to 4 times rated pressure
- 12" size tested to 3 times rated pressure
- Flexural Test
- Tested to withstand a bending moment based on requirements of NFPA 13-1991 "Standard for Installation of Sprinkler Systems"



The Series **2100 MEGAFLANGE** restrained flange adapter is comprised of two rings. The first is the restraint ring which incorporates wedges around the circumference of the ring to grip the pipe firmly and securely. The wedge style of restraint offers enormous pullout strength when compared to set screw restraints. The resiliency of the wedge style restraint allows the Series 2100 to withstand severe moment loads.

The second ring is the gasket ring which separates the seals dedicated to each sealing surface. This ring allows pipe to be cut to lengths in the field at a tolerance of 0.6 inch or more. And, the gasket ring also enables the joint to deflect during assembly.

DEFLECTION

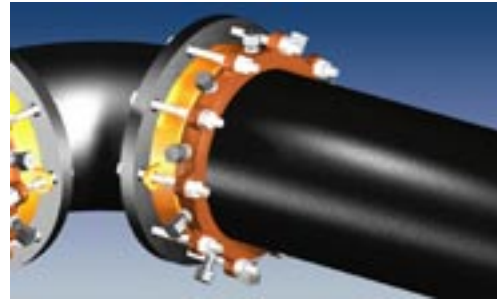
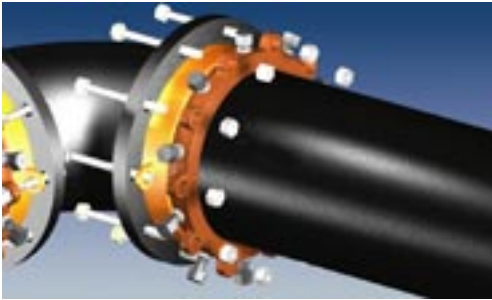
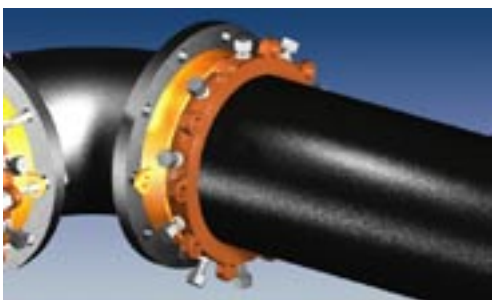
Traditional flanged joint connections require a tremendous amount of torque on the bolts to achieve a good seal. The pipe layout must be precisely planed to avoid misalignment errors due to deviations in appurtenances of pipe fabrication.

The Series 2100 MEGAFLANGE is a speedy, on-site fabrication tool which is generous in its deflection limits, from 0.5° to 5° depending on pipe size. The deflection capabilities provided by the gasket ring allow offset of almost nineteen inches of an eighteen foot length of pipe through the eight inch size.

1. **Identify the pipe.** The MEGAFLANGE 2100 Flange Adapter, sizes 4" through 12", is designed for use with ductile iron, PVC (C900 & IPS O.D. (ASTM D2241)) pipe, and steel pipe. Check to see if the spacers under the screws are in place. If the pipe is ductile iron or C.I. O.D. PVC (C900) **DO NOT REMOVE THE SPACERS**. If the pipe is steel or IPS O.D. PVC, **REMOVE THE SPACERS** (Sizes 4 through 12). The 3" size is designed for use on ductile iron, IPS O.D. PVC pipe. Sizes 30" and larger are designed for ductile iron pipe only. There are no spacers on the 3" and the 14" and larger sizes.



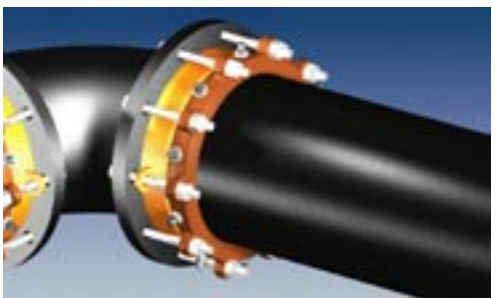
2. Cut the pipe to the required length. Clean the end of the pipe for a length of approximately one foot using a wire brush if needed, removing all excess paint and foreign material. Also clean the opposing flange to be connected to the 2100. Place the 2100 restraint ring on the clean pipe with the lip facing the plain end.
3. Lubricate and place the EBA-Seal Gasket on the clean pipe following the restraint ring. **(USE A TRANSITION GASKET IN PLACE OF THE EBA-SEAL GASKET FOR STEEL PIPE AND IPS O.D. PVC PIPE.)**
4. Place the O-ring into the groove of the 2100 gasket ring. (This step has already been completed in all sizes except 30" and larger.) Place the gasket ring on the pipe with the O-ring facing the pipe end and the gasket recess facing the EBA-Seal (or transition) Gasket and restraint ring.



5. Bring the pipe and flanges together within the maximum assembled deflection and maximum allowable gap "L" to the flange face. Slide the gasket ring, gasket and restraint ring until contact is made with opposing flange.
6. Insert and tighten all flange bolts. Torque all flange bolts in an alternate manner to the value listed in the Table 1.1. Be sure to make any necessary joint deflection before tightening the actuating screws. Joint deflection should not exceed the maximum allowable deflection. Be sure that deflection of the joint does not cause the end of the pipe to be separated from the opposing flange more than the maximum allowable gap "L".
7. Tighten the actuating screws in an alternating manner until all wedges touch the pipe. Continue tightening the nuts in an alternating pattern until all of the torque-limiting nuts have been twisted off.

Table 1.1

Nominal Pipe Size	Flange Bolt Torques	
		Bolt Torque (ft - lbs)
3		45 - 60
4 - 6		75 - 90
8 - 24		90 - 110
30 - 60		110 - 130



8. If removal is necessary, utilize the 5/8" hex head provided. For reinstallation, repeat steps 2 through 7, torquing the actuating screws to 70 ft-lbs or until the hex heads bottom out on the spacers or the gland.

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