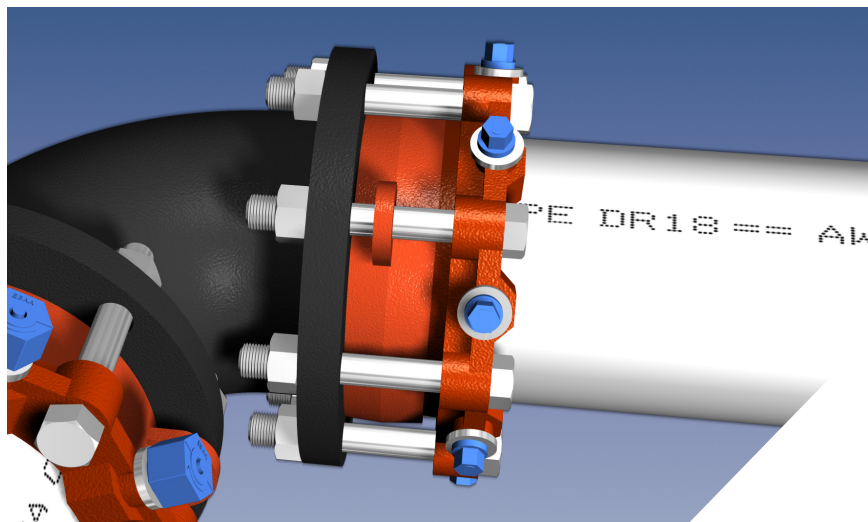


Series 2106 on Ductile Iron Pipe



Series 2106 on C900 PVC Pipe

#### Features and Applications:

- MEGAFLANGE adapts and restrains plain end Ductile Iron, PVC, Carbon Steel and HDPE pipe to flanged pipe or fittings, where the flange conforms to ANSI/AWWA C111/A21.11 with flange surface facing in accordance with ANSI/AWWA C207 of the latest revision.
- Meets ANSI B16.5 Class 150/125 drilling pattern.
- Flange Bolts are zinc coated, fastener class coated bolts or stainless steel bolts are available
- Not for use on plain end fittings
- **MEGA-BOND®** Restraint Coating System
- For more information regarding MEGA-BOND, refer to our web site @ [www.ebaa.com](http://www.ebaa.com)
- Minimum 2 to 1 Safety Factor
- Fully Restrained
- Constructed of ASTM A536 Ductile Iron
- Gasket Elastomers
  - O-RING is EPDM
  - EBAA-Seal® Improved Mechanical Joint Gasket is SBR
- **UL** listed on sizes 3 inch through 12 inch
- **FM** approved on sizes 4 inch through 12 inch 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, C605 or ASTM D2774.

#### Sample Specification

Restrained flange adapters shall be used in lieu of threaded or welded flanged spool pieces. Flanged adapters shall be made of ductile iron conforming to ASTM A536 and have flange bolt circles that are compatible with ANSI/AWWA C110/A21.10 (125#/Class 150 Bolt Pattern).

Restraint for 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.

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 inch gap between the end of the pipe and the mating flange without affecting the integrity of the seal.

All internal surfaces of the gasket ring (wetted parts) shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213. The coating shall meet ANSI/NSF-61. Exterior surfaces of the gasket ring shall be coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16.

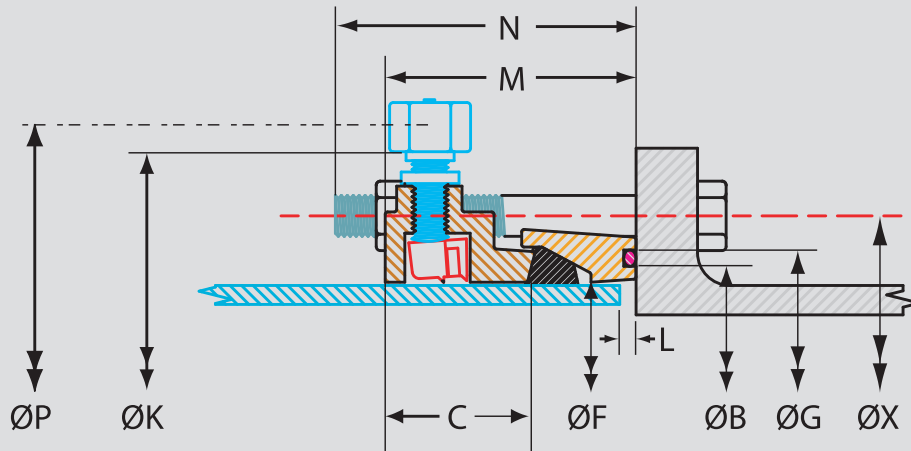
Restraint Ring coated with MEGA-BOND® Restraint Coating System, More information regarding MEGA-BOND can be found at [www.ebaa.com](http://www.ebaa.com).

Pressure ratings shall be a minimum of those shown in the table within current brochure.

The flange adapter shall be the Series 2100 MEGAFLANGE® Restrained Flange Adapter as produced by EBAA Iron, Inc. or approved equal.

All EBAA restraint products intended for installation on ductile iron pipe are designed for and limited to use on ductile iron pipes that comply with the requirements of ANSI/AWWA C151/A21.51 and have a Brinell Hardness or equivalent measurement value that does not exceed 230BHN. These requirements apply to the entire pipe wall profile at all restraining wedge engagement points and to the full penetration depth of each restraining wedge.

## Series 2100 Submittal Reference Drawing



		Restraint Ring			Gasket Ring			Bolts				Assembly Deflection				Ship Weight
Nominal Pipe Size	Series Number	K	F	C	F	B	G	No.	Dia.	Length	X	L MAX.	Degrees	M	P*	(lbs.)
3	2103	7.5	4.1	2.2	4.1	4.3	4.9	4	5⁄8	5½	6.00	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	5½	7.50	0.6	5.0	4.0	10.0	20
6	2106	11.0	7.0	2.3	7.0	7.5	8.1	8	¾	6	9.50	0.8	5.0	4.3	12.1	32
8	2108	13.5	9.2	2.4	9.2	9.8	10.4	8	¾	6	11.75	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	7½	14.25	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	7½	17.00	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	18.75	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	21.25	1.3	2.0	5.0	22.6	109
18	2118	25.0	19.7	2.6	19.7	20.2	21.0	16	1⅛	8½	22.75	1.3	1.5	5.1	24.7	134
20	2120	27.3	21.8	2.6	21.8	22.4	23.2	20	1⅛	8½	25.00	1.3	1.5	5.1	26.8	157
24	2124	32.0	26.0	2.6	26.0	26.7	27.5	20	1¼	9½	29.50	1.3	1.0	5.1	31.0	192
30	2130	38.5	32.2	3.3	32.2	32.9	34.1	28	1¼	11	36.00	2.0	1.0	6.0	38.8	296
36	2136	45.5	38.5	3.3	38.5	39.2	40.4	32	1½	11	42.75	2.0	1.0	6.0	44.6	426
42	2142	52.3	44.7	4.1	44.7	45.8	47.0	36	1½	14**	49.50	2.0	1.0	8.0	50.8	642
48	2148	58.8	51.0	4.1	51.0	52.1	53.3	44	1½	14**	56.00	2.0	1.0	8.0	57.1	797

\* The "P" dimensions is measured with torque-limiting nuts twisted off.  
 \*\* Double ended rod in lieu of bolt

Nominal Pipe Size	Minimal Distance Required To Install N
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3	4.75
4	4.56
6	5.00
8	4.88
10	6.31
12	6.25
14	6.62
16	6.56
18	6.94
20	6.81
24	7.62
30	8.88
36	8.63
42	11.25
48	11.38

## MEGAFLANGE TESTING RESULTS

### PVC TESTING

- Quick Burst Test
- DR18 tested to 755 PSI
- DR14 tested to 985 PSI
- Long Term Pressure Test
- On DR18 PVC pipe at 615 PSI for 1000 hours without failure
- Cyclic Pressure Test
- DR18 tested from 94 to 188 PSI for over 1,000,000 cycles

### DUCTILE IRON AND CARBON STEEL TESTING

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



APPROVED



Note: Dimensions are in inches and are subject to change without notice. All Dimensions are  $\pm 1\%$ .

Pipe Size	Ductile Iron Pipe Pressure (PSI)	Carbon Steel Pipe* Pressure (PSI)	C900 PVC Pipe				IPS PVC Pipe*		
			DR14 Pressure (PSI)	DR18 Pressure (PSI)	DR25 Pressure (PSI)	DR32.5 Pressure (PSI)	SDR17 Pressure (PSI)	SDR21 Pressure (PSI)	SDR26 Pressure (PSI)
3	350	350	-	-	-	-	250	200	160
4	350	350	305	235	165	-	250	200	160
6	350	350	305	235	165	-	250	200	160
8	350	350	305	235	165	-	250	200	160
10	350	350	305	235	165	-	250	200	160
12	350	350	305	235	165	-	250	200	160
14	350	-	-	235	165	125	-	-	-
16	350	-	-	235	165	125	-	-	-
18	300	-	-	235	165	125	-	-	-
20	250	-	-	235	165	125	-	-	-
24	200	-	-	150	165	125	-	-	-
30	150	-	-	-	-	-	-	-	-
36	150	-	-	-	-	-	-	-	-
42	150	-	-	-	-	-	-	-	-
48	150	-	-	-	-	-	-	-	-

\*Transition Gasket Required

NOTE: For Application on HDPE pipe see EBAA's HDPE Restraint Catalog Sheet.

## MEGAFLANGE Components

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 restraint offers enormous pullout strength when compared to set screw restraints. The resiliency of the wedge style restraint allows the MEGAFLANGE to withstand severe moment loads. The restraint ring and it's sub-components are protected from corrosion by the MEGA-BOND® Restraint Coating System. For more information regarding MEGA-BOND see our MEGA-BOND Brochure found at [www.ebaa.com](http://www.ebaa.com).

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. In addition, the gasket ring also enables the joint to deflect during assembly. The gasket ring is coated with a NSF 61 approved Fusion Bonded Epoxy (FBE) so that it may be utilized on potable drinking water systems.

## 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 planned to avoid misalignment errors due to deviations in appurtenances of pipe fabrication.

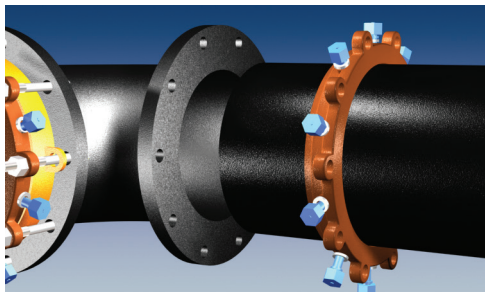
The Series 2100 MEGAFLANGE is a speedy, on-site fabrication tool which is generous in its deflection limits, from 0.5° to 5° depending on pipe size. The deflection capabilities provided by the gasket ring allow offset of almost nineteen inches of an eighteen foot length of pipe through the eight inch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

## Steel Pipe Application

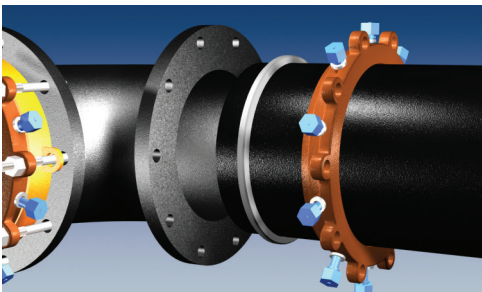
The 2100 Series MEGAFLANGE® can be used to restrain 3" - 12" SCH 40 or 80 steel pipe when joining to flanged pipe or fittings, where the flange conforms to ANSI/AWWA C111/A21.11 with flange surface facing in accordance with ANSI/AWWA C207 of the latest revision. It can also be used on steel pipe in all sizes when joining to flanged pipe or fittings, where the flange conforms to ANSI/AWWA C111/A21.11 with flange surface facing in accordance with ANSI/AWWA C207 of the latest revision, if the pipe's outside diameter is the same as ductile iron pipe and its thickness is equal to or greater than PC350 ductile iron pipe in sizes of 16 inches and below, and PC250 ductile iron pipe 18 inches and above.



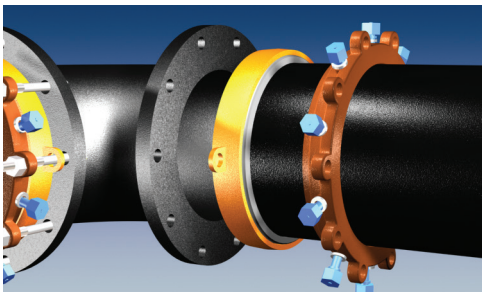
1. Identify the pipe. The MEGAFLANGE 2100 Flange Adapter, sizes 3 inch through 12 inch, is designed for use on ductile iron pipe, PVC (C900 & IPS O.D. (ASTM D2241)) pipe, HDPE pipe, and carbon steel pipe. Check to see if the spacers under the screws are in place. If the pipe is ductile iron or C.I. O.D.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



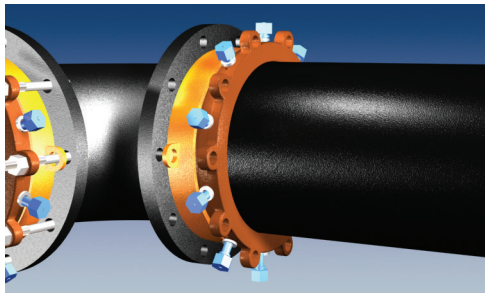
2. Cut the pipe to the required length. Clean the end of the pipe for a length approximately one foot using a wire brush if needed, removing all excess paint and foreign material. Also clean the opposing flange to be connected to the 2100. Place the 2100 restraint ring on the clean pipe with the lip facing the plain end.



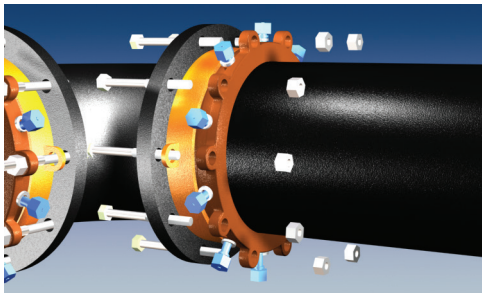
3. Lubricate and place the EBAA-Seal™ Gasket on the clean pipe following the restraint ring. (USE A TRANSITION GASKET IN PLACE OF THE EBAA-SEAL GASKET FOR CARBON STEEL AND IPS. O.D. PVC PIPE.)



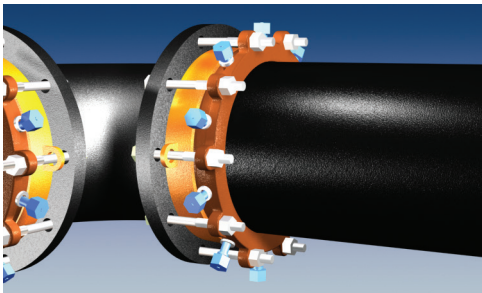
4. Place the O-ring into the groove of the 2100 Gasket Ring. (This step may have been completed at the factory, check Gasket Ring to see if O-ring is already in place.) Place the Gasket Ring on the pipe with the O-ring facing the pipe end and the gasket recess facing the EBAA-Seal (or transition) Gasket and restraint ring.



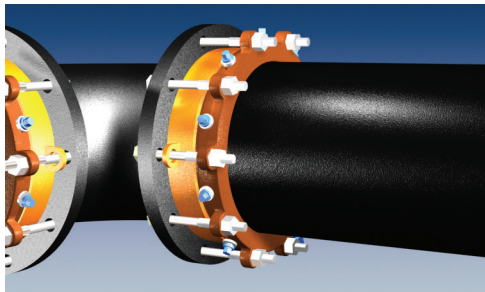
5. Bring the pipe and flanges together within the maximum assembled deflection and maximum allowable gap "L" to the flange face. Slide the gasket ring, gasket and restraint ring until contact is made with the opposing flange.



6. Insert and tighten all flange bolts. Torque all flange bolts an alternating manner to the value listed in 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 the torque-limiting nuts have been twisted off.



8. If removal is necessary, utilize the 5/8 inch hex head provided. For reinstallation, repeat steps 2 through 7, torquing the actuating screws to 70 ft.-lbs (120 ft.-lbs for 2124 through 2148). or until the hex heads bottom out on the spacers or gland.

**Table 1.1** Flange Bolt Torques

Nominal Pipe Size	Bolt Torque (ft.-lbs.)
3	45 - 60
4 - 6	75 - 90
8 - 24	90 - 110
30 - 48	110 - 130

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