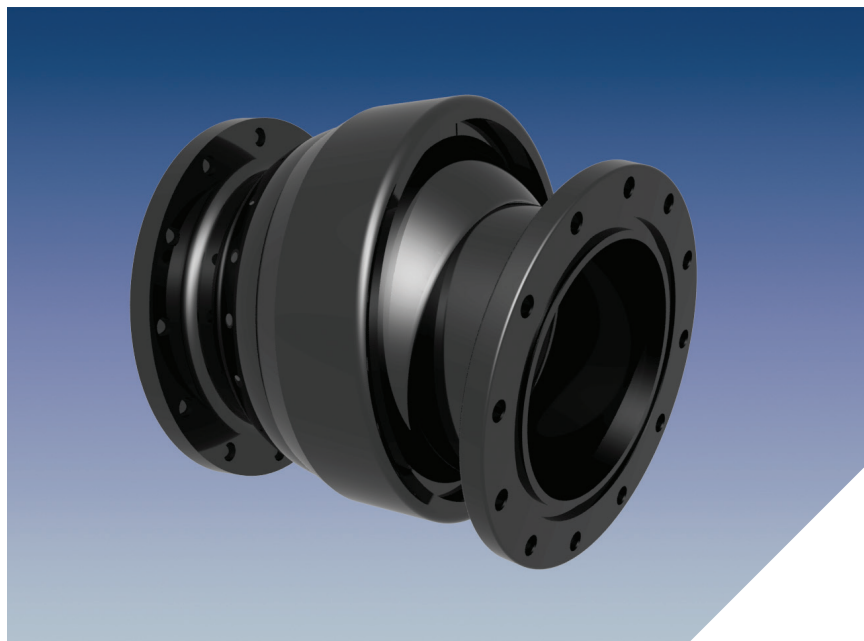


## Flexible Ball Joints for Water and Wastewater Pipelines



FLEX-912 (912FF0) for 12 inch Flanged fittings or pipe.

### Features and Applications:

- Sizes 3 in through 48 in and 72 in  
- For use on: Ductile Iron Pipe, Carbon Steel Pipe or C900 PVC Pipe
- Hydrostatically tested prior to shipment
- Rated at 350 PSI on sizes 3 in through 24 in, 250 PSI on sizes 30 in through 48 in and 200 PSI on 72 in
- Constructed of A536 Ductile Iron
- No Periodic Maintenance is Required
- 15 mils of Fusion Bonded Epoxy coating of all 'wetted' parts
- 12° to 20° of deflection depending upon size
- Seals conform to the applicable requirements of ANSI/AWWA C111/A21.11

For use on water or wastewater pipelines subject to hydrostatic pressure and tested in accordance with either AWWA C600 or ASTM D2774.

EBAA Iron products are not designed, intended, or approved for use with compressed air or any gas service. All entrapped air must be completely removed from the pipeline prior to pressurization, testing, or placing the line into service. Failure to eliminate air pockets may result in improper product performance or hazardous conditions.

### Sample Specification

Flexible ball joints shall be installed in the locations indicated on the drawings and shall be manufactured of ductile iron conforming to the material properties of ANSI/AWWA C153/A21.53. Flexible joints shall consist of a ball and socket type joint capable of 12° - 15° minimum deflection. Each flexible ball joint shall be pressure tested against its own restraint to 350 PSI for sizes 3 inch through 24 inch and 250 PSI for sizes 30 inch to 48 inch and 200 PSI on 72 inch. MEGALUG® joint restraint shall be provided with each mechanical joint connection. All internal surfaces (wetted parts) shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213. Sealing gaskets shall be constructed of EPDM. The coating shall meet ANSI/NSF-61. Exterior surfaces shall be coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16. All flexible ball joints shall be FLEX-900 as manufactured by EBAA Iron, Inc. or approved equal.

| Nominal<br>Pipe Size | Series Number         |                                             | Pressure Rating |
|----------------------|-----------------------|---------------------------------------------|-----------------|
|                      | Flange by<br>Flange   | Mechanical Joint by<br>Restrained Plain End | PSI             |
| 3                    | 903FF0                | -                                           | 350             |
| 4                    | 904FF0                | 904MP0                                      | 350             |
| 6                    | 906FF0                | 906MP0                                      | 350             |
| 8                    | 908FF0                | 908MP0                                      | 350             |
| 10                   | 910FF0                | 910MP0                                      | 350             |
| 12                   | 912FF0                | 912MP0                                      | 350             |
| 14                   | 914FF0                | 914MP0                                      | 350             |
| 16                   | 916FF0                | 916MP0                                      | 350             |
| 18                   | 918FF0                | 918MP0                                      | 350             |
| 20                   | 920FF0                | 920MP0                                      | 350             |
| 24                   | 924FF0                | 924MP0                                      | 350             |
| 30                   | -                     | 930MP0                                      | 250             |
| 36                   | 936FF0                | -                                           | 250             |
| 42                   | Call for Availability |                                             |                 |
| 48                   | 948FF0                | -                                           | 250             |
| 72                   | Call for Availability |                                             |                 |

For applications, end combinations, or pressures other than those shown, please contact EBAA for assistance.

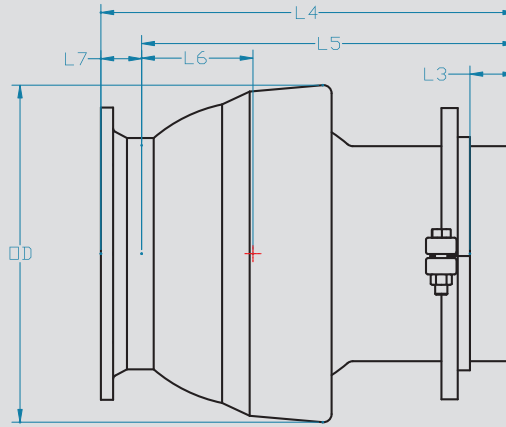
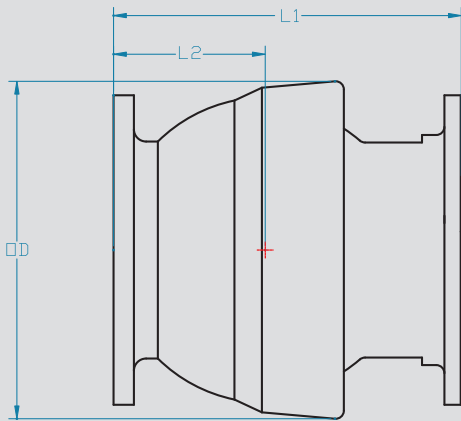
**Note Regarding Pressure Ratings:** The FLEX-900 has been hydro-tested to its listed rated pressure; however the end connections are subject to the pressure ratings of the applicable joint restraint and the material along with the wall thickness of the pipe.

# FLEX-900 Submittal Reference Drawing (3 inch - 12 inch)

FLANGE BY FLANGE

MECHANICAL JOINT BY RESTRAINED PLAIN END

EBAA IRON



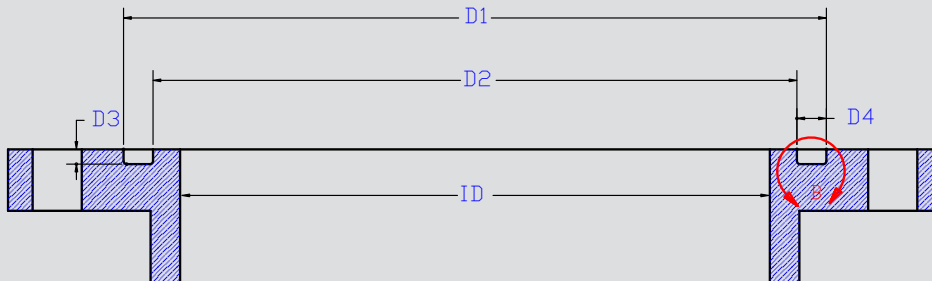
MADE IN USA

Dimensions for FLEX-900 (3 inch through 12 inch)

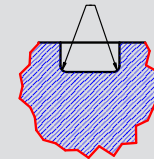
| Nominal Pipe Size | Deflection (Degrees) | L1   | L2  | L3  | L4   | L5   | L6  | L7  | ID   | OD   |
|-------------------|----------------------|------|-----|-----|------|------|-----|-----|------|------|
| 3                 | 20                   | 11.4 | 5.7 | -   | -    | -    | -   | -   | 3.2  | 9.2  |
| 4                 | 20                   | 15.0 | 5.6 | 1.8 | 18.1 | 15.6 | 3.6 | 2.5 | 4.1  | 10.9 |
| 6                 | 20                   | 16.2 | 6.2 | 1.7 | 19.2 | 16.7 | 4.2 | 2.5 | 6.2  | 12.3 |
| 8                 | 20                   | 16.8 | 6.9 | 1.6 | 20.9 | 18.4 | 4.9 | 2.5 | 8.3  | 14.8 |
| 10                | 20                   | 20.5 | 8.2 | 1.6 | 22.9 | 20.4 | 6.2 | 2.5 | 10.3 | 18.0 |
| 12                | 20                   | 21.6 | 9.3 | 1.6 | 24.3 | 21.8 | 6.8 | 2.5 | 12.3 | 20.7 |

NOTE: Dimensions are in inches ( $\pm 1\%$ ) and are subject to change with out notice.

## FLEX-900 Flange O-ring Groove



D5 GROOVE RADIUS



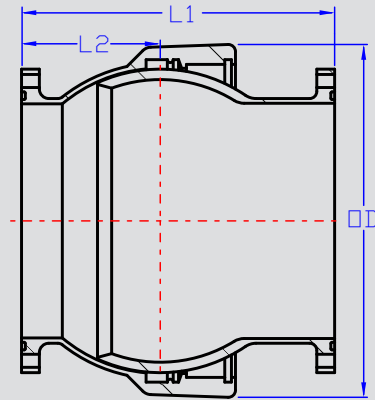
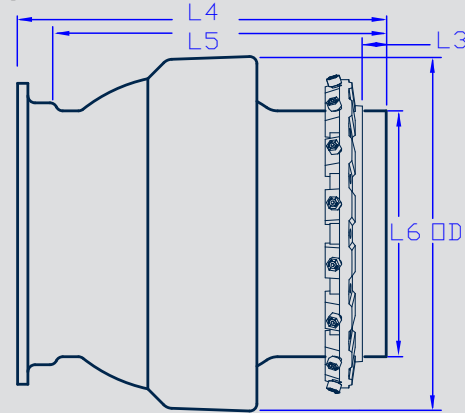
DETAIL B  
SCALE 1.25 : 1

| Size | ID*    | D1     | D2     | D3    | D4    | D5     | O-ring Diameter | O-ring Part Number |
|------|--------|--------|--------|-------|-------|--------|-----------------|--------------------|
| 3    | 3.280  | 4.885  | 4.185  | 0.175 | 0.350 | 0.0625 | 0.25            | 983003             |
| 4    | 4.060  | 5.900  | 4.700  | 0.300 | 0.600 | 0.0625 | 0.5             | 983004             |
| 6    | 6.160  | 8.00   | 6.800  | 0.300 | 0.600 | 0.0625 | 0.5             | 983006             |
| 8    | 8.270  | 10.100 | 8.900  | 0.300 | 0.600 | 0.0625 | 0.5             | 983008             |
| 10   | 10.160 | 12.200 | 11.000 | 0.300 | 0.600 | 0.0625 | 0.5             | 983010             |
| 12   | 12.340 | 14.300 | 13.100 | 0.300 | 0.600 | 0.0625 | 0.5             | 983012             |
| 14   | 14.260 | 16.200 | 15.00  | 0.300 | 0.600 | 0.0625 | 0.5             | 983014             |
| 16   | 16.480 | 18.500 | 16.900 | 0.400 | 0.800 | 0.1250 | 0.625           | 983016             |
| 18   | 18.560 | 20.700 | 19.100 | 0.400 | 0.800 | 0.1250 | 0.625           | 983018             |
| 20   | 20.520 | 23.000 | 21.400 | 0.400 | 0.800 | 0.1250 | 0.625           | 983020             |
| 24   | 24.680 | 27.200 | 25.600 | 0.400 | 0.800 | 0.1250 | 0.625           | 983024             |
| 30   | 30.900 | 33.500 | 31.700 | 0.400 | 0.900 | 0.1250 | 0.75            | 983030             |
| 36   | 37.040 | 40.000 | 38.300 | 0.400 | 0.850 | 0.1250 | 0.75            | 983036             |
| 48   | 49.220 | 52.720 | 50.220 | 0.650 | 1.250 | 0.1250 | 1.00            | 983048             |

EBAA IRON

MADE IN USA

Flange by Flange

Mechanical Joint  
by Restrained Plain End

| Nominal<br>Pipe Size | Deflection<br>(Degrees) | Dimensions for FLEX-900 (14 inch through 48 inch) |      |     |      |      |      |      |      |
|----------------------|-------------------------|---------------------------------------------------|------|-----|------|------|------|------|------|
|                      |                         | L1                                                | L2   | L3  | L4   | L5   | L6   | ID   | OD   |
| 14                   | 15                      | 22.4                                              | 10.3 | 3.0 | 26.3 | 25.2 | 15.3 | 14.4 | 22.5 |
| 16                   | 15                      | 25.5                                              | 13.6 | 2.5 | 30.3 | 26.8 | 17.4 | 16.5 | 25.0 |
| 18                   | 15                      | 31.2                                              | 12.9 | 3.0 | 30.9 | 27.4 | 19.5 | 18.6 | 29.9 |
| 20                   | 15                      | 24.6                                              | 11.3 | 2.5 | 32.9 | 29.4 | 21.6 | 20.6 | 30.5 |
| 24                   | 15                      | 34.0                                              | 14.5 | 2.5 | 38.7 | 35.2 | 25.8 | 24.8 | 37.3 |
| 30                   |                         | Call for Availability                             |      |     |      |      |      |      |      |
| 36                   | 15                      | 39.3                                              | 17.1 | -   | -    | -    | -    | 37.0 | 50.3 |
| 42                   |                         | Call for Availability                             |      |     |      |      |      |      |      |
| 48                   | 12                      | 48.3                                              | 22.5 | -   | -    | -    | -    | 49.2 | 67.1 |
| 72                   |                         | Call for Availability                             |      |     |      |      |      |      |      |

NOTE: Dimensions are in inches ( $\pm 1\%$ ) and are subject to change without notice.  
Mechanical Joint by Restrained Plain End sizes are only available up to 24 inch.

## Weights (lbs)

| Nominal<br>Pipe Size | 900FF0<br>(FE x FE) | 900MP0<br>(MJ x RPE) |
|----------------------|---------------------|----------------------|
| 3                    | 57.89               | -                    |
| 4                    | 86.36               | 84.60                |
| 6                    | 121.04              | 119.84               |
| 8                    | 177.83              | 162.97               |
| 10                   | 267.52              | 244.82               |
| 12                   | 373.26              | 309.44               |
| 14                   | 554.70              | 621.77               |
| 16                   | 596.46              | 523.01               |
| 18                   | 895.46              | 916.82               |
| 20                   | 817.92              | 966.58               |
| 24                   | 1,542.18            | 1,652.18             |
| 30                   | -                   | 2,584.42             |
| 36                   | 3,801.00            | -                    |
| 42                   | Call                | -                    |
| 48                   | 7,600.00            | -                    |
| 72                   | Call                | -                    |

## Important Notes

In order for the FLEX-900 to protect pipeline connections, any load on the pipeline must be transferred to the FLEX-900 by restrained joints. Depending on the piping arrangement and expected movement of the pipeline, adjacent pipeline joints must be restrained to adequately transfer the loads to the FLEX-900.

The flanged outlets are dimensioned according to ANSI/AWWA C110/A21.10 with addition of the O-ring. An O-ring is provided with each flange to provide a proven water tight seal to a minimum of 350 PSI.

Mechanical joint connection conform to the dimensional requirements of either ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53 depending on the size.

When connecting a FLEX-900 to HDPE pipe, a flanged end connection is required. This is to be joined to a fused flange adapter on the HDPE pipe. A filler flange between the two gaskets is necessary to assure proper seal contact.

# Installation Instructions

1. Remove protective end covers.
2. Remove polyethylene sleeve and other materials.
3. Check interior, remove dirt and foreign material from interior and end connections.
4. For buried applications install polyethylene sleeve per ANSI/AWWA C105/A21.5 recommendations.
5. Assembly of flange joint:
  - a. Place O-ring in groove.
  - b. Place FLEX-900 flange against adjoining flange, install and hand tighten bolts.
  - c. Check O-ring for proper placement.
  - d. Tighten flange bolts.
6. Install mechanical joint FLEX-900 end connections using the EBAA Iron MEGALUG® Mechanical Joint Restraint suitable for adjacent pipe material. MEGALUG 1100 should be used on ductile iron pipe. MEGALUG 2000PV is to be used on PVC pipe. Assembly instructions for each of these restraints products are included with the restraint device.
7. Assembly of restrained plain end:
  - a. Lubricate and install EBAA-Seal™ Improved Mechanical Joint Gasket provided over plain end per ANSI/AWWA C600.
  - b. Insert plain end into adjacent mechanical joint bell.
  - c. Install and hand tighten T-bolts.
  - d. Tighten T-bolts per AWWA recommendations.
8. Touch up exterior coating as necessary.



| FLEX-TEND®<br>Family  | Shear<br>Plain | Bending Moments<br>w/Expansion | Protection From                 |                   |
|-----------------------|----------------|--------------------------------|---------------------------------|-------------------|
|                       |                |                                | Bending Moments<br>No Expansion | Expansion (Axial) |
| FLEX-TEND Double Ball | Yes            | Yes                            | Yes                             | Yes               |
| FLEX-TEND Single Ball | No             | Yes                            | Yes                             | Yes               |
| FLEX-900              | No             | No                             | Yes                             | No                |
| EX-TEND               | No             | No                             | No                              | Yes               |



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