

BEXAR METROPOLITAN WATER DISTRICT MATERIALS SPECIFICATIONS

Section 009

Pipe Joint Restraint Systems

009.1 Scope of Work/Description

This specification covers pipe joint restraint systems to be used on domestic water mains for PVC C-900 pipe sizes 4-inch through 12-inch diameter and PVC C-905 pipe sizes 16-inch through 24-inch diameter, and for Ductile Iron pipe sizes from 4-inch through 24 inch diameter. Joint restraint systems are classified as "compression joint" or "mechanical joint" for the specific type of pipe joint to be restrained.

009.2 General Requirements

1. Underwriter Laboratories (U.L.) and Factory Mutual (FM) certifications are required on all restraint systems.
2. Unless otherwise noted, restraint systems to be used on PVC C-900 and C-905 pipe shall meet or exceed A.S.T.M. Standard F1674-96, "Standard Test Methods for Joint Restraint Products for Use with PVC Pipe," or the latest revision thereof. Restraint systems used on ductile pipe shall meet or exceed U.L. Standard 194.
3. Each restraint system shall be packaged individually and include installation instructions.

009.3 Specific Requirements

1. **Restrainer for PVC C-900/C-905 & Ductile Iron Push-on Type Connections:**
 - A. Pipe restraints shall be utilized to prevent movement for push-on D.I. or P.V.C. (C900&C905) (compression type) bell and spigot pipe connections or where a Dresser style (flexible) coupling has been used to join two sections of plain-end pipe D.I. or P.V.C. (C900&C905). The restrainer may be adapted to connect a plain end D.I. or P.V.C. pipe to a ductile iron mechanical joint (MJ) bell fitting. The restrainer must not be directionally sensitive.
 - B. The pipe shall be restrained by a split retainer band. The band shall be cast ductile iron, meeting or exceeding ASTM A536-80, Grade 65-45-12. The inside face or contact surface of the band shall be of sufficient width to incorporate cast or machined non-directionally sensitive serrations to grip the outside circumference of the pipe. The serrations shall provide full (360 degrees) contact and maintain pipe roundness and avoid any localized points of stress. The split band casting shall be designed to "bottom-out" before clamping bolt forces (110 ft-lb minimum torque) can over-stress the pipe, but will provide full non-directionally sensitive restraint at the rated pressures.
 - C. Bolts and nuts used to attach the split retainer ring shall comply with ANSI B

18.2.1/18.2.2, SAE Grade 5. Tee-bolts, nuts and restraining rods shall be fabricated from high-strength, low-alloy steel per AWWA C111-90.

- D. The split ring type non-directionally sensitive restrainer system shall be capable of a test pressure twice the maximum sustained working pressure listed in section D and be for both D.I. and/or P.V.C. (C900) sizes six thru twelve inch.
- E. Restrain systems sizes six thru twelve inches shall be capable of use for both ductile iron and/or P.V.C. C900.
- F. The restraint system may consist of two types: the two split retainer rings and for new construction use only the one split and one solid cast backup ring.

2. Compression Ring Fitting Restrainer for Ductile Iron Pipe & PVC C-900:

- A. Compression ring with follower gland type of restrainer may be utilized in conjunction with Mechanical Joint (MJ) bell end ductile iron pipe fittings for restraining PVC C-900 and ductile iron pipe.
- B. The system shall utilize a standard MJ gasket with a color-coded compression ring and replacement gland conforming to ASTM A 536-80, Grade 65-45-12.
- C. Standard MJ fitting Tee-bolts and nuts shall be fabricated from high strength steel conforming to AWWA C111/A21.11-90 and AWWA C153/A21.53-88.
- D. Standard MJ gasket shall be virgin SBR meeting ASTM D-2000 3 BA 715 or 3 BA 515.
- E. The restraint system shall be capable of a test pressure twice the maximum sustained working pressure listed in section D.

3. Retainer Gland for Ductile Iron Pipe (Only):

- A. Radial bolt type restrainer systems shall be limited to ductile iron pipe in conjunction with Mechanical Joint (MJ) bell end pipe or fittings. The system shall utilize a standard MJ gasket with a ductile iron replacement gland conforming to ASTM A 536-80. The gland dimensions shall conform with standard MJ bolt circle criteria.
- B. Individual wedge restrainers shall be ductile iron heat treated to a minimum hardness of 370 BHN. The wedges screws shall be compressed to the outside wall of the pipe using a shoulder bolt and twist-off nuts to insure proper actuating of the restraining system.
- C. Standard MJ fitting Tee-bolts and nuts shall be high strength steel conforming to AWWA C111/A21.11-90 and C153/A21.53-88.
- D. Standard MJ gasket shall be virgin SBR meeting ASTM D-2000 3 BA 715 or 3 BA 515.

- E. The retainer gland system shall be capable of a test pressure of twice the maximum sustained working pressure listed in section D.

4. Maximum Sustained Working Pressure Requirements:

Nominal Diameter	PVC C-900	Ductile Iron	C-905
4 & 6 inch	200 p.s.i	350 p.s.i.	
8 inch	200 p.s.i	250 p.s.i.	
10 & 12 inch	200 p.s.i	200 p.s.i	
14 & 16 inch	200 p.s.i	200 p.s.i	235 p.s.i.
20 & 24 inch	200 p.s.i	200 p.s.i	235 p.s.i.

009.4 Tests

The Bexar Metropolitan Water District may, at no cost to the manufacturer, subject random joint restraint system products to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be ground for rejecting the entire order.

009.5 Product List

The attached qualified products list identifies specified manufacturers models approved for installation in BexarMet water distribution systems.

Approved Manufacturers and Models:

Slip on Joint Restraint Systems				
	PVC C-900	Ductile Iron	D. I.	C-905
			16" Above	
Uni-Flange Corporation	1300C Series	Series 1300C	1450	1300C
EBBA Iron Sales, Inc.			1700	2800

Retainer Gland (MJ)		
	PVC C-900	Ductile Iron
EBBA Iron Sales, Inc.	Not Approved	MEGALUG 1100
Ford/UniFlange	Series 1500	Series 1400

END OF SECTION