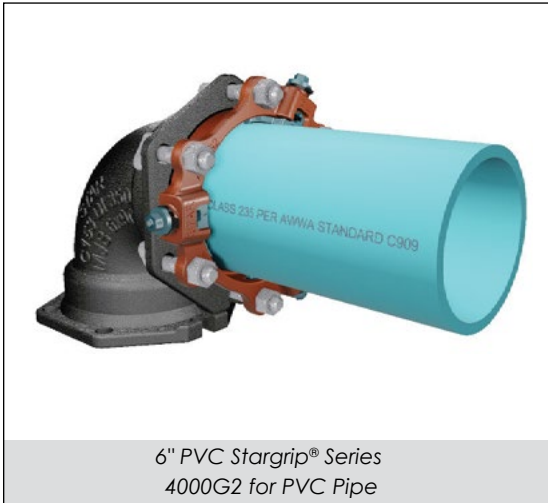




PVC Stargrip® series 4000G2

Mechanical Joint Wedge Action Restraint
for Plastic Pressure Pipe
U.S. Patent #9,822,910



6" PVC Stargrip® Series
4000G2 for PVC Pipe

INFORMATION

The PVC Stargrip® Second Generation (Gen 2) Mechanical Joint Restraint System has all the performance advantages as its predecessor. However, the Gen 2 design offers these advantages with an installation that is quicker and easier. Gen 2 provides an exceptional restraint system for mechanical joint fittings (AWWA C153 or C110), valves, fire hydrants on a variety of plastic pressure pipes.

**Increased performance
with quicker and easier installation.**



FEATURES & ADVANTAGES

- Can be used on 4" through 12" AWWA C900 and AWWA C909 PVC pipe, HDPE pipe or 3"-12" IPS PVC pipe*. (*A transition gasket is required on IPS Plastic Pipe).
- Tested to and meets the requirements of ASTM F1674.
- Listed with Underwriters Laboratories in sizes 4" to 12".
- Approved by Factory Mutual Research in sizes 4" to 12".
- The safety factor is twice (2:1) the standardized pressure rating listed on next page.
- Improved design (Gen 2) provides same performance with fewer wedges and lower wedge-bolt torque (45 to 60 ft-lbs).
- Fewer wedges and lower torque results in a quicker and easier installation.
- Gen 2 design uses a spacer that is easily removed when restraint is used on IPS Plastic pipe. Wedge bolts no longer need to be removed and reinstalled to remove spacer.
- Curved wedges reduce the amount of localized pipe deformation.
- Gen 2 offers five degrees of deflection on all sizes of AWWA C900 pipe.
- The gland's larger inside diameter allows Gen 2 to be installed on pipe with more ovality.
- Improved design of the wedge bolts prevents over torquing which can damage PVC pipe.
- Wedges are mechanically attached to wedge bolts, which eliminates the possibility of falling out during shipping and handling.
- Gland is made from high strength Ductile Iron per ASTM A536 Grade 65-45-12 and is compatible with all Mechanical Joints that conform to ANSI/AWWA C111/A21.11. Standard gland color is Coral Red (RAL 3016).
- Eliminates the need for tie rods and thrust blocks.
- US Patent# 9,822,910

SAMPLE SPECIFICATIONS

Restrainer mechanism shall be integrated into the design of the restraint gland. As the mechanism is activated, multiple wedge action shall be imparted against the pipe OD increasing its resistance as internal pressure increases. After burial of the restraining mechanism, joint flexibility shall be maintained.

The actuating bolt shall be threaded into the gland and have a 1-1/4" hex operating head. The actuating bolt system shall have a torque-limiting head designed to break off at preset torque levels, thus insuring proper action of the restraining device. After removal of the torque-limiting head, a secondary hex head shall remain to facilitate the removal and re-assembly of the gland. Glands, bolts and wedges shall be manufactured of high strength ductile iron in accordance with ASTM A536 Grade 65-45-12 requirements.

Applicable dimensions conforming to ANSI/AWWA C111/A21.11, C110/A21.10 and C153/A21.53 shall be incorporated into the design so that the device facilitates use with standard mechanical joint sockets.

The restraining mechanism shall have a pressure rating as stated in most current catalog and shall have a safety factor of at least 2:1. The restraining device for C900 PVC, C909 PVC and IPS PVC Pipe shall be Star® Pipe Products second Generation PVC Stargrip® Series 4000G2 or equal.

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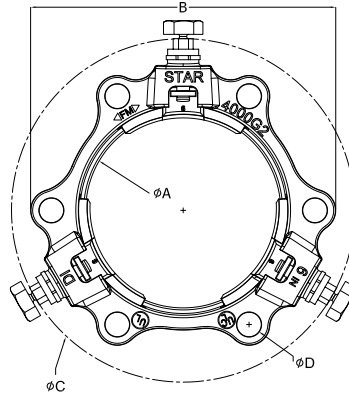
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TECHNICAL INFORMATION



6" PVC Stargrip® Series 4000G2 for PVC Pipe

PVC STARGRIP® 4000G2 SPECIFICATIONS*									
NOM. SIZE	C900/C909 PIPE CI OD	IPS PIPE OD (TRANSITION GASKET REQUIRED)	ØA	B	ØC ¹	ØD	T-BOLT SIZE (QTY)	WEDGE (QTY)	APPROX WT. (LBS)
3	N/A	3.50	4.09	7.57	9.01	3/4	5/8 x 3 (4)	2	6
4	4.80	4.50	4.93	9.00	10.29	7/8	3/4 x 3 1/2 (4)	2	7
6	6.90	6.63	7.03	11.00	12.39	7/8	3/4 x 3 1/2 (6)	3	10
8	9.05	8.63	9.18	13.25	14.44	7/8	3/4 x 4 (6)	4	15
10	11.10	10.75	11.23	15.62	16.59	7/8	3/4 x 4 (8)	6	21
12	13.20	12.75	13.33	17.87	18.54	7/8	3/4 x 4 (8)	6	25

*All dimensions in inches except where indicated.

¹ - dimension after assembly on pipe

Table A. Maximum Working Pressure Rating with Occasional or Recurring Surges in PSI for Plastic Pipes Made to a CIOD Diameter Regimen

NOM. SIZE (IN)	Actual Plastic Pipe OD	AWWA C900 PVC							AWWA C909 PVCO		AWWA C906 HDPE*					
									IPEX PVCO	JM EAGLE PVCO						
		DR14	DR17	DR18	DR21	DR25	DR27.5	PC235	PC235	DR 7.3	DR 9	DR 9.3	DR11	DR13.5	DR17	
4	4.80	305	250	235	200	165	-	235	-	254	200	193	160	130	100	
6	6.90	305	250	235	200	165	-	235	235	254	200	193	160	130	100	
8	9.05	305	250	235	200	165	-	235	235	254	200	193	160	130	100	
10	11.10	305	250	235	200	165	-	235	235	254	200	193	160	130	100	
12	13.20	305	250	235	200	165	-	235	235	254	200	193	160	130	100	

* A stainless steel pipe stiffener (provided by others) is required for the Series 4000G2 to be installed on HDPE pressure pipe. The stiffener must be installed in the HDPE pipe before installing the Series 4000G2. The stainless steel pipe stiffener must be of sufficient length to support the full bearing length of the restrainer.

Table B. Maximum Working Pressure Rating with Occasional or Recurring Surges in PSI for Plastic Pipes Made to an IPS Diameter Regimen

NOM. SIZE (IN)	Actual Plastic Pipe OD	ASTM D2241 PVC			AWWA C901 and AWWA C906 HDPE**					
		SDR17	SDR21	SDR26	DR 7.3	DR 9	DR 9.3	DR11	DR13.5	DR17
3	3.50	250	200	160	254	200	-	160	130	100
4	4.50	250	200	160	254	200	193	160	130	100
6	6.63	250	200	160	254	200	193	160	130	100
8	8.63	250	200	160	254	200	193	160	130	100
10	10.75	250	200	160	254	200	193	160	130	100
12	12.75	250	200	160	254	200	193	160	130	100

NOTE: A transition gasket is required for use with pipes made to an IPS diameter regimen.

** A stainless steel pipe stiffener (provided by others) is required for the Series 4000G2 to be installed on HDPE pressure pipe. The stiffener must be installed in the HDPE pipe before installing the Series 4000G2. The stainless steel pipe stiffener must be of sufficient length to support the full bearing length of the restrainer.

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INSTALLATION INSTRUCTIONS - SIZES 3" - 12"



STEP 1

The rubber gasket seals more effectively if the surfaces with which it comes in contact are thoroughly cleaned just before assembly. Remove all foreign material while cleaning. Lubrication and additional cleaning should be provided by brushing both the gasket and the plain end with soapy water or pipe lubricant. Slide the SERIES 4000G2 on the plain end with lip facing the plain end, followed by the MJ gasket with tapered side facing the plain end.

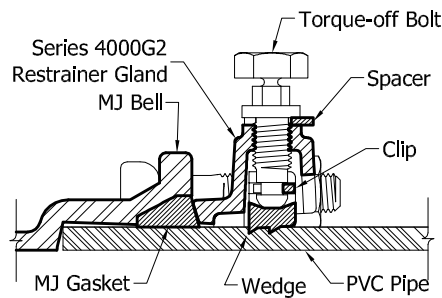
IMPORTANT: When installing sizes 4" through 12" on IPS PVC pipe, MJ Transition gasket must be used.

STEP 4

While tightening T-bolts, it is essential that the gland be brought up toward the bell flange evenly, maintaining approximately the same distance between the gland and the face of the flange at all points around the socket. In order to keep the spigot fully homed in the MJ bell, the joint will need to be kept in compression until the completion of Step 6. All T-bolts should be tightened until they are within the torque range as listed in table below. This process may require multiple rounds.

STEP 2

After insertion of the pipe into the bell of the fitting, firmly press the gasket into the gasket recess. During this process the joint should be kept straight.



STEP 5

Hand tighten the Torque-limiting twist-off bolts in a clockwise direction until all wedges are in firm contact with the pipe surface.

IMPORTANT: When installing sizes 4" through 12" on IPS PVC pipe, spacers must be removed from the torque-limiting bolts.

STEP 3

Slide the SERIES 4000G2 toward the MJ bell with the gland lip evenly pressed against the gasket. Insert T-bolts and hand tighten nuts.

IMPORTANT: Make deflection after joint is assembled but before tightening T-bolts to required torque range as listed in table below.



STEP 6

Continue tightening in an alternating manner until all of the Torque-limiting twist-off bolt heads have been twisted off. If removal is necessary, utilize the 5/8" hex head provided. If reassembly is required, assure that all of the Torque-off bolts, wedges, clips and spacers (if required) are in place. Assemble the joint in the same manner as above and tighten the wedge bolts to 45-60 ft.-lbs. using 5/8" hex head provided.

Table C. T-Head Bolt and Nut Details					
NOM. PIPE SIZE (IN)	BOLT SIZE (IN)	RANGE OF TORQUE (FT-LBS)			
		AWWA C900 (PVC)	ASTM D2241 (PVC)	AWWA C909 (PVC)	AWWA C901/AWWA C906 (HDPE)
3	5/8		45 - 60		75-90
4 to 12	3/4	75-90	75-90	55-65	75-90

*Deflection not allowed for C909.

Notes:

- If effective sealing is not attained at the maximum torque indicated, then the joint should be disassembled, thoroughly cleaned, and reassembled. **Overstressing the bolts to compensate for poor installation practice is not acceptable.**
- Not to be used on DI or steel pipe.
- PVC Stargrips must be adequately wrapped or protected if they are covered by concrete to ensure that concrete is not allowed to enter the wedge pocket.
- For applications with vertical offsets please contact Star Pipe Products for technical assistance.

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