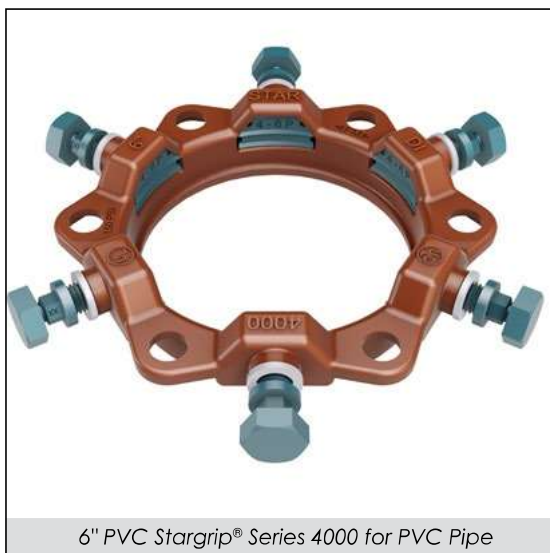




PVC Stargrip® series 4000

Mechanical Joint Wedge Action Restraint
for Plastic Pressure Pipe



6" PVC Stargrip® Series 4000 for PVC Pipe

INFORMATION

The PVC Stargrip® Mechanical Joint Restraint System is a unique product with a proven design that provides an exceptional restraining system for mechanical joint fittings (AWWA C153 or C110), valves, fire hydrants on a variety of plastic pressure pipes.

Unique Product with a Proven Design

FEATURES & ADVANTAGES

- The design has been proven in the market since 1992.
- Can be used on AWWA C900 PVC pipe, IPS PVC pipe, AWWA C909 PVCO pipe, and HDPE pipe. See pressure rating table for approved DRs and sizes. Plastic pressure pipes manufactured to an IPS diameter regimen will require a transition gasket. HDPE pipe requires use of stainless steel pipe stiffener.
- Gland is made from high strength Ductile Iron per ASTM A536 Grade 65-45-12 and is compatible with all Mechanical Joints conforming to ANSI/AWWA C111/A21.11.
- Eliminates the need for tie rods and thrust blocks
- Listed with Underwriters Laboratories and approved by Factory Mutual research in sizes 4"-12".
- Tested to and meets the requirements of ASTM F1674 through 14".
- The safety factor is twice (2:1) the standardized pressure rating listed on Page 19.
- Will fit any Mechanical Joint configuration, meaning compatibility with different types of installations.
- PVC Stargrip® offers 5° deflection through 12", 3° on 14"-24" and 2° on 30"-36".
- Larger ID allows easier installation on out-of-round pipe.
- Torque limiting bolts are designed to prevent over torquing.
- All sizes have curved wedges that do not flatten pipe.
- Standard gland color is Coral Red (RAL 3016).

SAMPLE SPECIFICATIONS

Restrainer mechanism shall be integrated into the design of the follower gland. As the mechanism is activated, multiple wedging action shall be imparted against the pipe 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 nut. 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 and 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 shall be Star® Pipe Products PVC Stargrip® Series 4000 or equal.

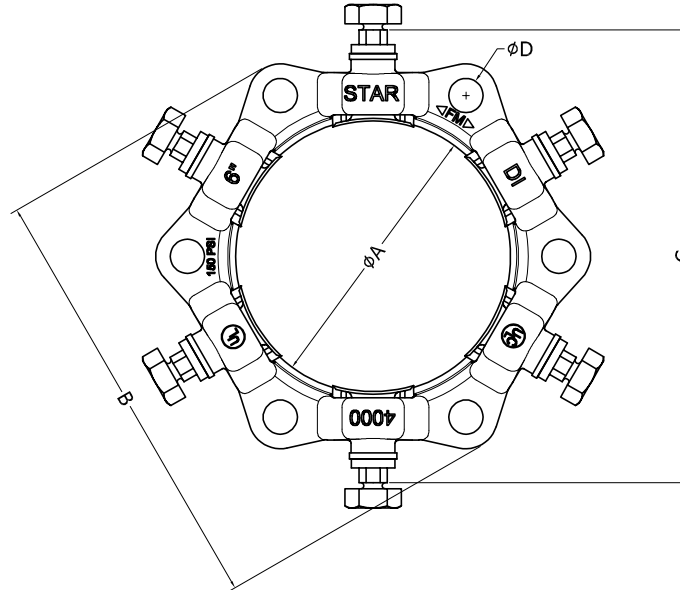
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TECHNICAL INFORMATION



6" PVC Stargrip® Series 4000

PVC STARGRIP® 4000 SPECIFICATIONS*

NOM. SIZE	ØA	B	C ¹	ØD	T-BOLTS SIZE (QTY)	WEDGES (QTY)	APPROX WT. (LBS)
3	4.09	7.69	8.50	3/4	5/8 (4)	4	7
4	4.93	9.12	9.53	7/8	3/4 (4)	4	9
6	7.03	11.12	11.63	7/8	3/4 (6)	6	13
8	9.18	13.37	13.97	7/8	3/4 (6)	6	17
10	11.23	15.62	16.18	7/8	3/4 (8)	8	23
12	13.33	17.87	18.18	7/8	3/4 (8)	8	28
14	15.45	20.75	20.36	7/8	3/4 (10)	10	50
16	17.55	23.00	22.46	7/8	3/4 (12)	12	60
18	19.65	25.25	24.56	7/8	3/4 (12)	12	65
20	21.75	27.50	26.66	7/8	3/4 (14)	14	76
24	25.95	32.00	30.86	7/8	3/4 (16)	16	98
30	32.18	39.38	36.82	1-1/8	1 (20)	20	173
36	38.48	46.25	43.12	1-1/8	1 (24)	24	219

*All dimensions in inches except where indicated.

¹ - dimension after assembly on pipe



PVC Stargrip® series 4000

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TECHNICAL INFORMATION

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	DR32.5	DR41	DR51	PC235	PC235	PC165	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
14	15.30	305	250	235	200	165	150	125	-	-	235	-	-	-	200	193	160	-	-
16	17.40	305	250	235	200	165	150	125	-	-	235	-	165	-	-	-	160	-	-
18	19.50	-	250	235	200	165	150	125	-	-	200	-	-	-	-	-	160	-	-
20	21.60	-	250	235	200	165	150	125	-	-	-	-	-	-	-	-	-	-	-
24	25.80	-	250	235	200	165	150	125	-	-	-	-	-	-	-	-	-	-	-
30	32.00	-	-	235	200	165	150	125	-	-	-	-	-	-	-	-	-	-	-
36	38.30	-	-	235	200	165	150	125	-	-	-	-	-	-	-	-	-	-	-

* A stainless steel pipe stiffener (provided by others) is required for the Series 4000 to be installed on HDPE pressure pipe. The stiffener must be installed in the HDPE pipe before installing the Series 4000. 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 4000 to be installed on HDPE pressure pipe. The stiffener must be installed in the HDPE pipe before installing the Series 4000. 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" - 36"



STEP 1

The rubber gasket seals more effectively if the surfaces with which it comes in contact are thoroughly cleaned just before assembly to remove all loose rust or foreign material. 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 4000 on the plain end, followed by the MJ gasket.

IMPORTANT: When used on IPS plastic pressure pipe, a transition MJ gasket must be used.

NOTE: If installing the Series 4000 on HDPE pressure pipe, a stainless steel pipe stiffener (provided by others) is required. The stiffener must be installed in the HDPE pipe before installing the Series 4000. The stainless steel pipe stiffener must be of sufficient length to support the full bearing length of the restrainer.



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 C. This may require multiple rounds.

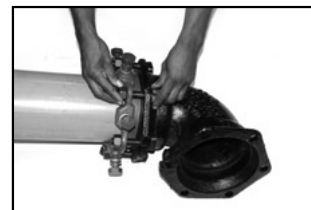
Notes:

- 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.
- 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.



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 3

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

IMPORTANT: Make deflection after joint is assembled but before tightening T-bolts.



STEP 5

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 plastic pipe, the spacer washers must be removed from the torque limiting bolts.



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, assemble the joint in the same manner as above and tighten the wedge bolt to 90 ft-lbs.

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 C900 (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
14 to 18	3/4			75-90	75-90	75-90
20 to 24	3/4				75-90	
30 to 36	1				100 -120	