



# Pipe Restainers series 1000

1000C Restainers for AWWA C900/C905 PVC Pipe and MJ or Push-On Fittings

1000S Restraint for IPS PVC and MJ or Push-On Fittings



Series 1000C for DI OD PVC Pipe

### INFORMATION

PVC Restainers for restraining mechanical joint, push-on and PVC pressure fittings with PVC pipe and PVC pipe bell joints. These restraints work in any type of soil for a guaranteed joint restraint with rated pressure as listed below.

PVC restrainers can be installed on new or existing systems, totally eliminating the use of thrust blocks. These restrainers have internal serrations that lock onto the pipe and give 360° contact and support the pipe wall. Restraint devices may be used with any type of PVC piping system.

## Can be Installed on New or Existing Systems

### FEATURES & ADVANTAGES

- 360° Contact, No Pipe Distortion or Point Loading and Supports the Wall of the Pipe
- Made of Ductile Iron - ASTM Grade A536, Grade 65-45-12
- Restainers work with Mechanical Joint or Push-On Fittings.
- All Restainers are Machined to Exact Tolerances.
- Rated Pressures carry a 2:1 Safety Factor.
- Can Be Installed Outside the Trench, to Ease Installation
- Maintains Full Deflection on Mechanical Joint and Push-On Fittings
- T-Bolts/Rods/Hex Nuts: Low Alloy Steel Per ANSI/AWWA C111/A21.11
- Clamping Bolts: SAE J429 Grade 5
- Series 1000C is approved by Factory Mutual Research in sizes 4" - 8" for use on C900 PVC DR18 for 150 PSI.
- Standard color is Graphite Black (RAL 9011).
- Casting halves for IPS PVC pipe color is Moss Green (RAL 6005).



1000C with MJ Fitting

### STANDARDIZED PRESSURE RATINGS\*\*

ANSI/AWWA C900 CI OD		ANSI/AWWA C905 CI OD		ASTMD2241 IPS OD	
DR 14	200 PSI	DR 18	235 PSI	SDR 17	250 PSI
DR 18	150 PSI	DR 21	200 PSI	SDR 21	200 PSI
DR 25	100 PSI	DR 25	165 PSI	SDR 26	160 PSI
		DR 32.5	125 PSI		

\*\*For ordinary water works with transient surges only. Ratings are for PVC pipes with SERIES 1000 Restraint.

### SAMPLE SPECIFICATIONS

PVC restraint devices shall be manufactured of high strength ductile iron in accordance to ASTM A536 Grade 65-45-12 for all sizes. Internal serrations will be machined to provide exact tolerances to provide 360° contact and support of the pipe wall. PVC Restraint devices shall have a safety factor of 2:1 over the pressure rating.



STAR® PIPE PRODUCTS

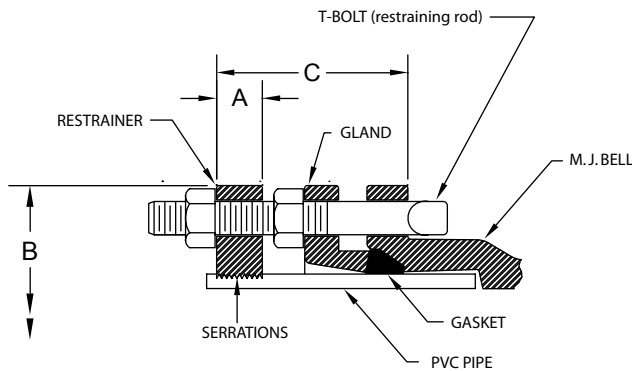


# Pipe Restrainers series 1000

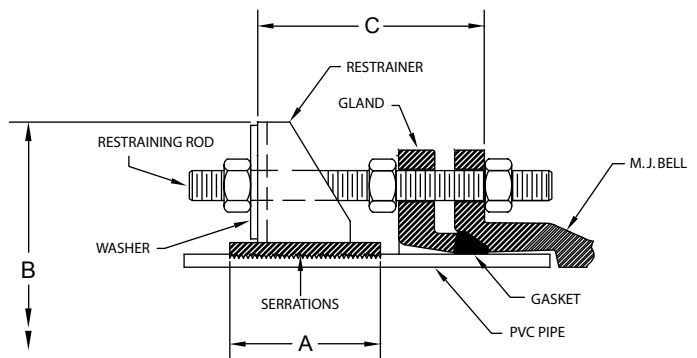
1000C Restrainers for AWWA C900/C905 PVC Pipe and MJ or Push-On Fittings

1000S Restrainer for IPS PVC and MJ or Push-On Fittings

## TECHNICAL INFORMATION



4" - 12" Sizes



14" - 48" Sizes

### PIPE RESTRAINERS 1000 SPECIFICATIONS\*

NOM. SIZE	PVC PIPE WITH DUCTILE IRON PIPE O.D. STYLE 1000C	PVC PIPE WITH STEEL PIPE O.D. STYLE 1000S	A	B APPROX.	C MAX.	RESTRAINT BOLTS/RODS		CLAMPING BOLTS		APPROX WT. (LBS)
	O.D.	O.D.				QTY	SIZE	QTY	SIZE	
4	4.80	4.50	1.12	9.12	6.00	2	3/4 x 7	2	5/8 x 3 1/2	8
6	6.90	6.63	1.15	11.12	6.00	2	3/4 x 7	2	5/8 x 3 1/2	10
8	9.05	8.63	1.47	14.75	6.00	2	3/4 x 7	2	3/4 x 4	15
10	11.10	10.75	1.38	16.82	6.00	4	3/4 x 7	2	7/8 x 5	25
12	13.20	12.75	1.42	19.46	6.00	4	3/4 x 7	2	7/8 x 5	27
14	15.30	N/A	4.00	22.68	15.00	6	3/4 x 17	4	7/8 x 7	68
16	17.40	N/A	3.75	24.65	15.00	6	3/4 x 17	4	7/8 x 6 1/2	62
18	19.50	N/A	4.25	26.65	15.00	8	3/4 x 17	4	7/8 x 6 1/2	78
20	21.60	N/A	5.00	28.88	22.00	8	3/4 x 24	4	1 1/8 x 8 1/2	113
24	25.80	N/A	5.00	33.98	22.00	12	3/4 x 24	4	1 1/8 x 8 1/2	145
30	32.00	N/A	7.00	42.48	22.00	12	1 x 24	6	1 1/8 x 6	247
36	38.30	N/A	7.00	48.61	22.00	12	1 x 24	6	1 1/8 x 6	304
42	44.50	N/A	11.00	57.00	26.00	16	1-1/4 x 30	6	1 1/2 x 10	1003
48	50.80	N/A	11.00	63.88	26.00	16	1-1/4 x 30	6	1 1/2 x 10	1166

\*All dimensions in inches except where indicated.





# Pipe Restrainers series 1000

1000C Restrainers for AWWA C900/C905 PVC Pipe and MJ or Push-On Fittings

1000S Restrainer for IPS PVC and MJ or Push-On Fittings

## INSTALLATION INSTRUCTIONS (SERIES 1000 4"-12")



STEP 1

Insert pipe into the MJ fitting bell. Then insert one of the provided long T-bolts/ restraint rods through one of the flange holes to mark a line about 1" away from the end of the bolt and towards the MJ socket as shown.



STEP 2

Assemble the MJ joint using the gland, gasket and T-bolts to AWWA standards. Assemble the restrainer on the pipe so that it is even with the marked line on the pipe while making sure restrainer ears line up with the bolt holes of the MJ gland. Evenly tighten the restrainer clamping bolts to recommended torque (see Table B).



STEP 3

Insert one of the long T-bolts/rods provided, installing one nut each between the gland and the restrainer as shown. Follow the same procedure for remaining long T-bolts/rods. Tighten nuts against MJ Gland to AWWA standards (See table A). T-bolts should be tightened alternately on opposite sides (Star Pattern).



STEP 4

Snug tighten the second nut on each long T-Bolt/Rod against the restrainer as shown.

**Caution: Do not over-tighten the restrainer nuts. Turn nut to hand tight plus half turn.**

## INSTALLATION INSTRUCTIONS (SERIES 1000 14"- 48")



STEP 1

Insert pipe into the MJ fitting bell. Then insert one of the provided long T-bolts/ restraint rods through one of the flange holes to mark a line about 1" away from the end of the bolt and towards the MJ socket as shown.



STEP 2

Assemble the MJ joint using the gland, gasket and T-bolts to AWWA standards. Assemble the restrainer on the pipe so that it is even with the marked line on the pipe while making sure restrainer ears line up with the bolt holes of the MJ gland. Evenly tighten the restrainer clamping bolts to recommended torque (see Table B).



STEP 3

Insert one of the long T-bolts/rods provided, installing one nut each between the gland and the restrainer as shown. Follow the same procedure for remaining long T-bolts/rods. Tighten nuts against MJ Gland to AWWA standards (see table A). T-bolts should be tightened alternately on opposite sides (Star Pattern).



STEP 4

Snug tighten the second nut on each rod against the restrainer as shown.

**Caution: Do not over-tighten the restrainer nuts. Turn nut to hand tight plus half turn.**

(TABLE A) T-HEAD BOLT & NUT DETAILS		
PIPE SIZE (IN)	BOLT SIZE (IN)	RANGE <sup>1</sup> OF TORQUE (FT-LBS)
4-24	3/4	75-90
30-36	1	100-120
42-48	1 1/4	120-150

<sup>1</sup>These torque ranges are requirements of AWWA C600

(TABLE B) CLAMPING BOLTS RECOMMENDED TORQUE	
PIPE SIZE (IN)	RANGE OF TORQUE (FT-LBS)
4-12	90-110
14-16	150-200
18	175-225
20	200-250
24-36	225-275
42-48	300-350



STAR® PIPE PRODUCTS





# Pipe Restrainers series 1100

1100C Bell Restrainers for AWWA C900/C905 PVC Pipe and 1100S Bell Joint for IPS PVC Pipe



Series 1100C for C900/C905 PVC Pipe

### INFORMATION

PVC Restrainers for restraining pipe and PVC pipe bell joints. These restraints work in any type of soil for a guaranteed joint restraint with rated pressure as listed below.

PVC restrainers can be installed on new or existing systems, totally eliminating the use of thrust blocks. These restrainers have internal serrations that lock onto the pipe and give 360° contact and support the pipe wall. Restraint devices may be used with any type of PVC piping system.

## Can be Installed on New or Existing Systems

### FEATURES & ADVANTAGES

- 360° contact, no pipe distortion or point loading
- Made of Ductile Iron - ASTM Grade 536, Grade 65-45-12
- Restrainers work with Push-On Pipe Bells.
- All restrainers are machined to exact tolerances.
- Rated pressures carry a 2:1 safety factor.
- Can be installed outside the trench, to ease installation
- T-Bolts/Rods/Hex Nuts: low alloy steel per ANSI/AWWA C111/A21.11
- Clamping Bolts: SAE J429 Grade 5
- Series 1100C is approved by Factory Mutual Research in sizes 4"-8" for use on C900 PVC DR18, for 150 PSI.
- Available in sizes 4"-48"
- Standard color is Graphite Black (RAL 9011).
- Casting halves for IPS PVC pipe color is Moss Green (RAL 6005).



1100C on pipe bell

### STANDARDIZED PRESSURE RATINGS\*\*

ANSI/AWWA C900 CI OD		ANSI/AWWA C905 CI OD		ASTMD2241 IPS OD	
DR 14	200 PSI	DR 18	235 PSI	SDR 17	250 PSI
DR 18	150 PSI	DR 21	200 PSI	SDR 21	200 PSI
DR 25	100 PSI	DR 25	165 PSI	SDR 26	160 PSI
		DR 32.5	125 PSI		

\*\*For ordinary water works with transient surges only. Ratings are for PVC pipes with SERIES 1000 Restrainer.

### SAMPLE SPECIFICATIONS

PVC restraint devices shall be manufactured of high strength ductile iron in accordance to ASTM A536 Grade 65-45-12 for all sizes. Internal serrations will be machined to provide exact tolerances to provide 360° contact and support of the pipe wall. PVC Restraint devices shall have a safety factor of 2:1 over the pressure rating.



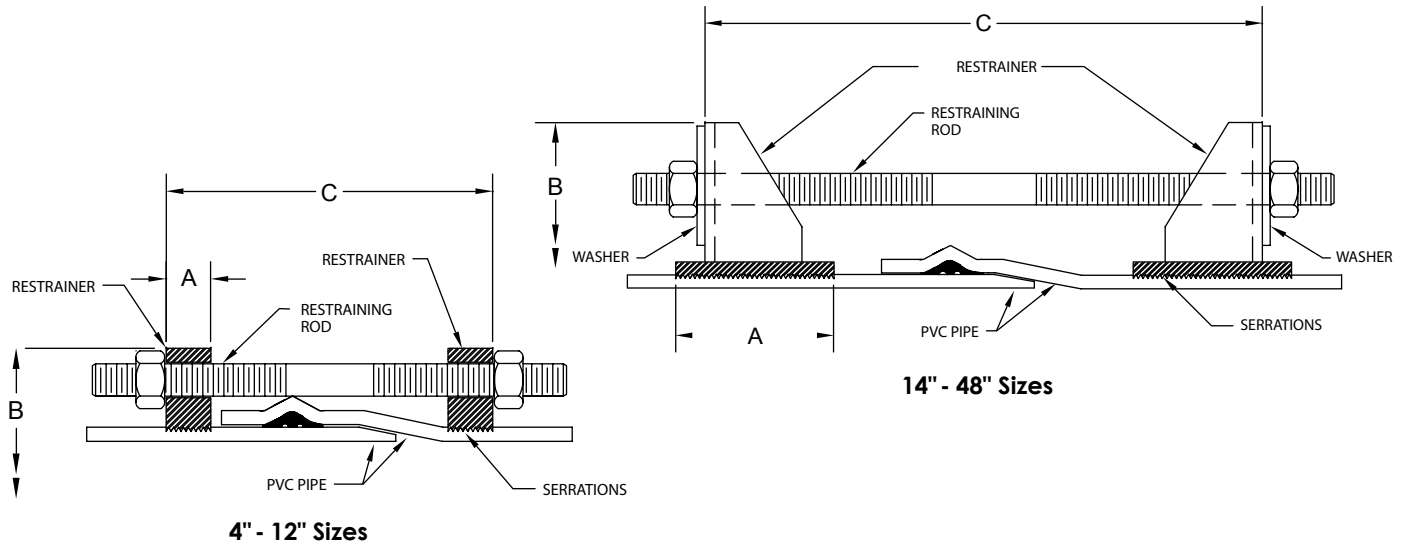
STAR® PIPE PRODUCTS



# Pipe Restrainers series 1100

1100C Bell Restrainers for AWWA C900/C905 PVC Pipe and 1100S Bell Joint for IPS PVC Pipe

## TECHNICAL INFORMATION



PIPE RESTRAINERS 1100 SPECIFICATIONS*										
NOM. SIZE	PVC PIPE WITH DUCTILE IRON PIPE O.D. STYLE 1100C	PVC PIPE WITH STEEL PIPE O.D. STYLE 1100S	A	B APPROX.	C MAX.	RESTRAINT BOLTS/RODS		CLAMPING BOLTS		APPROX WT. (LBS)
	O.D.	O.D.				QTY	SIZE	QTY	SIZE	
4	4.80	4.50	1.12	9.12	12.00	2	3/4 x 17	4	5/8 x 3 1/2	16
6	6.90	6.63	1.15	11.12	13.00	2	3/4 x 17	4	5/8 x 3 1/2	20
8	9.05	8.63	1.47	14.75	15.00	2	3/4 x 17	4	3/4 x 4	32
10	11.10	10.75	1.38	16.82	16.00	4	3/4 x 24	4	7/8 x 5	52
12	13.20	12.75	1.42	19.46	18.00	4	3/4 x 24	4	7/8 x 5	56
14	15.30	N/A	4.00	22.68	24.00	6	3/4 x 30	8	7/8 x 7	150
16	17.40	N/A	3.75	24.65	28.00	6	3/4 x 30	8	7/8 x 6 1/2	117
18	19.50	N/A	4.25	26.65	28.00	8	3/4 x 30	8	7/8 x 6 1/2	147
20	21.60	N/A	5.00	28.88	28.00	8	3/4 x 36	8	1 1/8 x 8 1/2	206
24	25.80	N/A	5.00	33.98	34.00	12	3/4 x 36	8	1 1/8 x 8 1/2	265
30	32.00	N/A	7.00	42.48	38.00	12	1 x 40	12	1 1/8 x 6	492
36	38.30	N/A	7.00	48.61	38.00	12	1 x 40	12	1 1/8 x 6	561
42	44.50	N/A	11.00	57.00	46.00	16	1 1/4 x 48	12	1 1/2 x 10	1916
48	50.80	N/A	11.00	63.88	46.00	16	1 1/4 x 48	12	1 1/2 x 10	2242

\*All dimensions in inches except where indicated.





# Pipe Restrainers series 1100

1100C Bell Restrainers for AWWA C900/C905 PVC Pipe and 1100S Bell Joint for IPS PVC Pipe

## INSTALLATION INSTRUCTIONS (SERIES 1100 4"-12")



STEP 1

Assemble the spigot end of first pipe into the pipe bell using standard procedure per pipe manufacturer.



STEP 2

Assemble one restrainer behind the bell of pipe and evenly tighten the restrainer clamping bolts to the recommended torque. Then insert one of the provided restraint rods through one of the restrainer holes. Mark a line about 1" away from the end of the rod and towards the end of the bell as shown. Assemble the second restrainer even with the mark on the spigot end of pipe. Use one of the provided restraining rods as a guide to align restraint holes. Tighten restrainer clamping bolts to the recommended torque on the second restrainer after it is aligned with the first one (see Table B).



STEP 3

Insert the restraining rods through the restrainers as shown. Snug tighten the remaining nuts behind each restraint so that the spigot end is secured into the bell end.

**Caution: Do not over-tighten the restrainer nuts. Turn nut to hand tight plus half turn.**

## INSTALLATION INSTRUCTIONS (SERIES 1100 14"- 48")



STEP 1

Assemble the spigot end of first pipe into the pipe bell using standard procedure per pipe manufacturer.



STEP 2

Assemble one restrainer behind the bell of pipe and evenly tighten the restrainer clamping bolts to the recommended torque. Then insert one of the provided restraint rods through one of the restrainer holes. Mark a line about 1" away from the end of the rod and towards the end of the spigot as shown. Assemble the second restrainer even with the mark on the spigot end of pipe. Use one of the provided restraining rods as a guide to align restraint holes. Tighten restrainer clamping bolts to the recommended torque on the second restrainer after it is aligned with the first one.



STEP 3

Assemble the second restrainer even with the mark on the spigot end of pipe. Use one of the provided restraining rods as a guide to align restraint holes. Tighten clamping bolts to the recommended torque (see Table B) on the second restrainer after it is aligned with the first one.



STEP 4

Insert the restraining rods through the restrainers as shown. Snug tighten the remaining nuts behind each restraint so that the spigot end is secured into the bell end.

**Caution: Do not over-tighten the restrainer nuts. Turn nut to hand tight plus half turn.**

(TABLE B) CLAMPING BOLTS RECOMMENDED TORQUE

PIPE SIZE (IN)	RANGE OF TORQUE (FT-LBS)
4-12	90-110
14-16	150-200
18	175-225
20	200-250
24-36	225-275
42-48	300-350



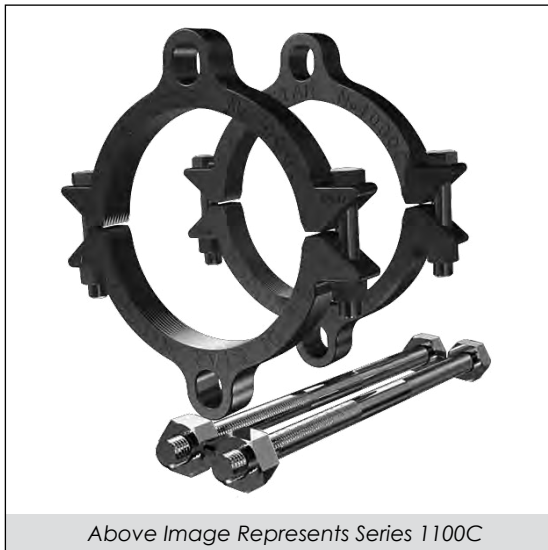
STAR® PIPE PRODUCTS





# Pipe Restrainers series 1000C & 1100C

1000C & 1100C For Use On Ductile Iron Pipe



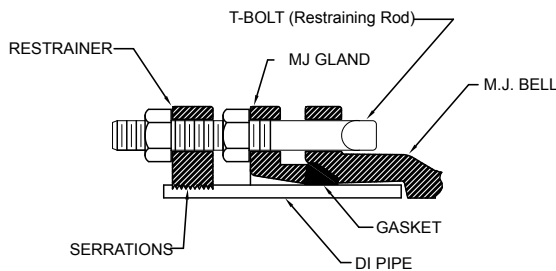
Above Image Represents Series 1100C

### INFORMATION

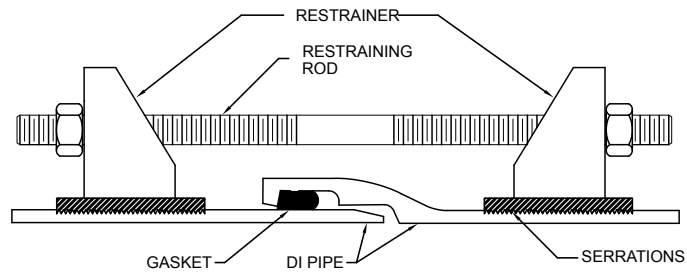
Pipe restrainers for restraining ductile iron pipe with mechanical joint or push-on fittings.

Pipe restrainers can be installed on new or existing systems, totally eliminating the use of thrust blocks. These restrainers have internal serrations that lock onto the pipe and give 360° contact and support the pipe wall.

## For Use on Ductile Iron Pipe



Series 1000C



Series 1100C

### FEATURES & ADVANTAGES

- Castings made of Ductile Iron - ASTM A536, Grade 65-45-12
- Restrainers work with Mechanical Joint or Push-On Fittings and with Ductile Iron Pipe manufactured per ANSI/AWWA C-151/A21.51-02
- All restrainers are machined to exact tolerances
- Maintains full deflection on Mechanical Joint and Push-On Fittings
- T-Bolts/Rods/Hex Nuts: Low alloy steel per ASTM/AWWA C111/A21.11
- Clamping Bolts: SAE J429 Grade 5

### Notes:

- *Not recommended for installations on machined end pipe or fittings*
- *Installation requires clamp bolt torque values be applied as indicated above.*
- *Installation and testing to be in accordance with the latest version of ANSI/AWWA C600*
- *For higher pressure requirements, please contact Star® Pipe Products*
- *Pipe hardness not to exceed 230 BHN.*

### SAMPLE SPECIFICATIONS

Pipe restraining devices shall be manufactured of high strength ductile iron in accordance to ASTM A536 Grade 65-45-12 for all sizes. Internal serrations will be machined to provide exact tolerance to provide 360° contact and support of the pipe well. Pipe restraining devices shall have a safety factor of 2:1 over the pressure rating.

NOMINAL SIZE	MAXIMUM PRESSURE RATINGS (PSI)	CLAMP BOLT TORQUE (FT-LBS)
4" - 8"	250	110 - 120
10" - 12"	200	110 - 120
14"	150	200 - 210
16"	100	200 - 210



STAR® PIPE PRODUCTS





# Pipe Restrainers series 1200

1200C Restrainers for PVC Pipe and PVC Pressure Fittings  
w/Ductile Iron Pipe OD



1200C Restrainers for C900/C905 PVC Pipe.

### INFORMATION

PVC Restrainers for restraining AWWA C900 PVC pipe and AWWA C907 PVC fitting bell joints. These restraints work in any type of soil for a guaranteed joint restraint pressure rating of 150 PSI.

PVC restrainers can be installed on new or existing systems, totally eliminating the use of thrust blocks. These restrainers have internal serrations that lock onto the pipe and give 360° contact and support the pipe wall.

## Can be Installed on New or Existing Systems

### FEATURES & ADVANTAGES

- 360° Contact, No Pipe Distortion or Point Loading
- Made of Ductile Iron - ASTM Grade 536, Grade 65-45-12
- Restrainers work with PVC Pressure Fittings per ANSI/AWWA C907.
- All Restrainers are Machined to Exact Tolerances.
- Rated at the Full Rated Pressure of PVC Pipe fittings per ANSI/AWWA C907 with a 2:1 Safety Factor
- Supports Wall of Pipe with 360 degree Contact
- Can Be Installed Outside the Trench, to Ease Installation
- T-Bolts/Rods/Hex Nuts: Low Alloy Steel Per ANSI/AWWA C111/A21.11
- Clamping Bolts: SAE J429 Grade5
- Standard gland color is Graphite Black (RAL 9011).



1200C on PVC Fitting

### SAMPLE SPECIFICATIONS

*PVC restraint devices shall be manufactured of high strength ductile iron in accordance to ASTM A536 Grade 65-45-12 for all sizes. Internal serrations will be machined to provide exact tolerances to provide 360° contact and support of the pipe wall. PVC Restraint devices shall possess a pressure rating equal that of the fitting on which it is used with a 2:1 safety factor.*

REV.11-1



® REGISTERED TRADEMARK OF STAR PIPE PRODUCTS

STAR® PIPE PRODUCTS  
HOUSTON CORPORATE | TOLL FREE 1-800-999-3009 | FAX 281-558-9000  
www.starpipeproducts.com

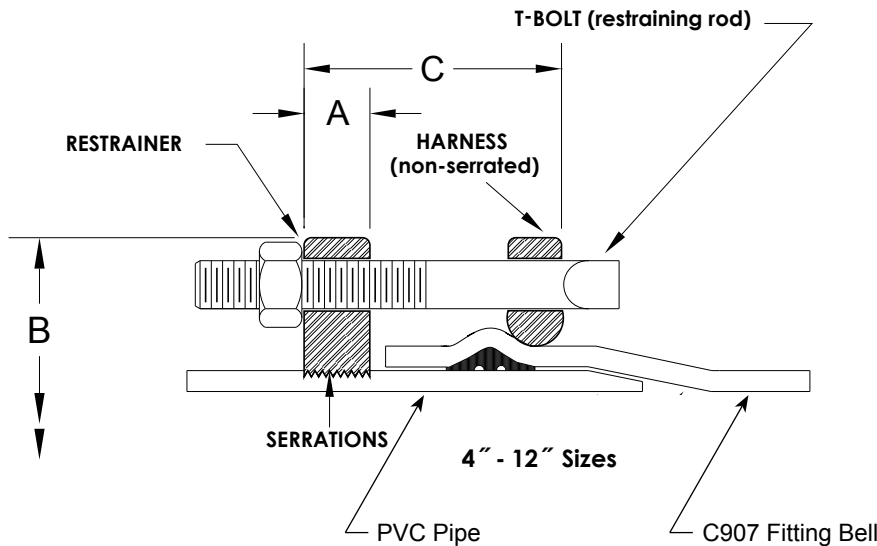
STAR® PIPE PRODUCTS



# Pipe Restrainers series 1200

1200C Restrainers for PVC Pipe and PVC Pressure Fittings w/Ductile Iron Pipe OD

## TECHNICAL INFORMATION



PIPE SIZE (IN)	RANGE OF TORQUE (FT-LBS)
4-12	90-110

### PIPE RESTRAINERS 1200 SPECIFICATIONS\*

NOM. SIZE <sup>1</sup>	PVC PIPE WITH DUCTILE IRON PIPE O.D. STYLE 1200C O.D.	A	B APPROX.	C MAX.	RESTRAINT BOLTS/RODS		CLAMPING BOLTS		APPROX WT. (LBS)
					QTY	SIZE	QTY	SIZE	
4	4.80	1.12	9.12	6.00	2	3/4 x 9	4	5/8 x 3-1/2	13.8
6	6.90	1.15	11.12	6.00	2	3/4 x 9	4	5/8 x 3-1/2	17.0
8	9.05	1.47	14.75	8.00	2	3/4 x 12	4	3/4 x 4	30.0
10	11.10	1.38	16.82	8.00	4	3/4 x 12	4	7/8 x 5	46.4
12	13.20	1.42	19.46	8.00	4	3/4 x 12	4	7/8 x 5	50.0

\*All dimensions in inches except where indicated.

## INSTALLATION INSTRUCTIONS (SERIES 1200 4" - 12")



STEP 1

Insert the pipe into the Push-On fitting according to standard procedure. Assemble serrated restrainer on pipe using the provided restraining rods (or T-Bolts if applicable) as a guide to position the restraint. Tighten restrainer clamp bolts to recommended torque (see Table B).



STEP 2

Assemble harness behind the bell of fitting (or pipe) and restrainer on spigot end of pipe using restraining T-Head bolt/rod as an alignment guide. Evenly tighten harness clamp bolts and nuts to recommended torque (see Table B).



STEP 3

Insert the restraining rods (or T-bolts) through the restrainers as shown. Snug tighten the remaining nuts so that the spigot end is secured into the bell end.

**Caution: Do not over-tighten the restrainer nuts. Turn nut to hand tight plus half turn.**

