



Joint Restraint System For IPS, DPS & DIN Plastic Pipe



PIPE TO FITTING

LH-Series... 2" - 12" IPS Pipe Sizes
LHD-Series... 4" - 24" DPS Pipe Sizes
DLH-Series... 63 - 400MM DIN Pipe Sizes



PIPE TO PIPE

LB-Series... 2" - 12" IPS Pipe Sizes
LBD-Series... 4" - 24" DPS Pipe Sizes
DLB-Series... 63 - 400MM DIN Pipe Sizes



PIPE TO PIPE

LPP-Series... 2" - 12" IPS Pipe Sizes



PIPE TO FITTING - For Gate Valves

LGK-Series... 2" - 12" IPS Pipe Sizes
LGKD-Series... 4" - 12" DPS Pipe Sizes
DLGK-Series... 63 - 400MM DIN Pipe Sizes



PIPE TO PIPE - For Gate Valves

LG-Series... 2" - 12" IPS Pipe Sizes
LGD-Series... 4" - 12" DPS Pipe Sizes
DLG-Series... 63 - 400MM DIN Pipe Sizes



PIPE TO PIPE - For MJ Gate Valves

LMJ-Series... 2" - 12" IPS Pipe Sizes
LMJD-Series... 4" - 12" DPS Pipe Sizes
DLMJ-Series... 63 - 400MM DIN Pipe Sizes

Solving pipe joint problems...

Traditionally concrete thrust blocks have been poured behind fittings and around valves to prevent pipe separation from fittings and valves. This method has proven ineffective. For a thrust block system to work, it must be poured against undisturbed soil, sized and formed precisely for each type of fitting and valve.

In the real world, some and often none of the above criteria's are met. Designers provide suggestive construction details and soils are almost always unstable due to grading. Pouring the correct size and shape thrust blocks are often left to the field personnel. This inexactness and guess work can range from throwing a pre-mix concrete bag atop a fitting, to a yard of concrete on top of a valve, which makes future repairs a very difficult task. All it takes for a joint to separate is 4-6 inches of thrust block movement.

With the Leemco Joint Restraint System, the pipeline becomes its own thrust block...

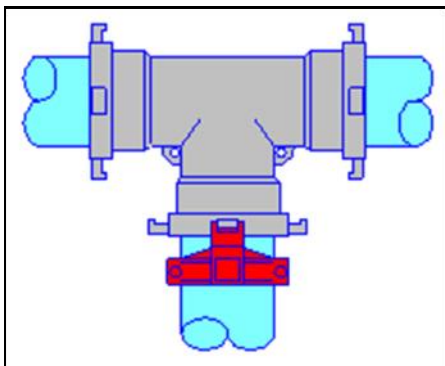
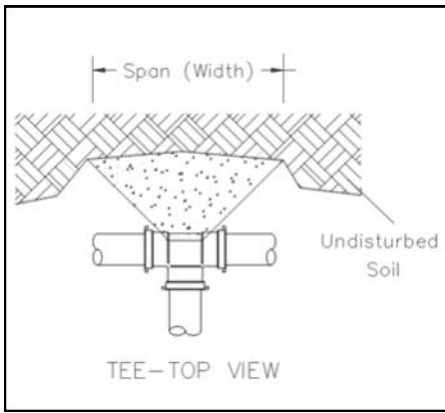
By restraining joints, the thrust force is confined to the pipeline which is no longer dependent on soil composition, compactness and saturation. All data to install a trouble free system is contained in this brochure... no guess work... no surprises... no disappointments.

With the Leemco system, joint connections can be made in the shortest possible time. There is no need to wait for concrete trucks to arrive or long waits for concrete to cure. The system can be pressurized as soon as the joints are tightened. Repairs can be made with the trench soaked. The Leemco Joint Restraints are designed to get a system in operation in the least amount of time and effort.

Superior Design Features...

Leemco restraints have blunt cast serrations which are specifically designed for PVC or HDPE plastic pipe. These non-machined serrations will not damage the plastic pipe surface and have a fused epoxy finish to protect against corrosive soil conditions. Installers prefer our proven 2-bolt, 4-bolt and 6-bolt restraint system, which are easy to install and save precious time and labor costs. Restraints are available in IPS, DPS & DIN Pipe Sizes.

There are over 100 ways to pour thrust blocks... and only one way to install joint restraints.



Blunt cast serrations won't damage plastic pipe surface and have a fused epoxy finish for corrosive soil conditions.



Easy to install...

2-bolt system for 2 - 6" models,
4-bolts for 8 - 16" models and
6-bolts for 18 - 24" models



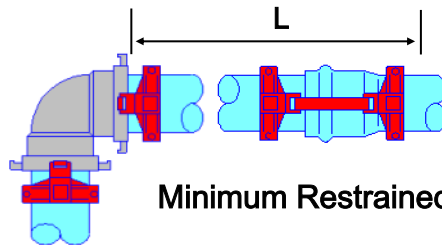
Stackable Restraints...

For HDPE applications or
line pressures that exceed 125psi

Design Criteria

All tees, Bends, Reducers and End Caps should be restrained using LH-Series restraints. A certain number of joints before and after a restrained fitting may also require joint restraints as set forth in Tables below.

Below Tables establish values for the minimum length of pipe ("L") within which other joints must be restrained. Values (in feet/meters) are based on 125 PSI line pressure, 24" cover, Sandy-Clay type soil and a safety factor of 2. For other line pressures, multiply the "L" values by the actual pressure and divide by 125.



Minimum Restrained Length (L) in feet or meters

Pipe-Pipe Restraints for IPS & DPS pipe... minimum restrained length ("L") in feet											
Pipe Size	Pipe OD IPS	Pipe OD DPS	Bends				Step Reduction			Dead End	Gate Valve
			11	22	45	90	1	2	3		
2"	2.38		1	1	2	6				19	10
2.5"	2.88		1	2	4	9	4			23	12
3"	3.50		2	3	6	11	8	10		30	15
4"	4.50	4.80	2	4	9	20	14	20	31	45	23
6"	6.63	6.90	3	6	13	29	30	40	53	63	31
8"	8.63	9.05	4	8	15	38	33	55	63	75	38
10"	10.75	11.10	5	9	19	45	36	56	75	96	48
12"	12.75	13.20	5	10	21	53	38	60	83	112	56
14"		15.30	6	11	24	58	40	62	86	130	62
16"		17.40	6	13	27	65	42	64	88	146	73
18"		19.50	7	14	29	69	44	70	90	162	81
20"		21.60	8	15	32	76	46	80	92	178	89
24"		25.80	9	18	37	88	63	90	114	209	105

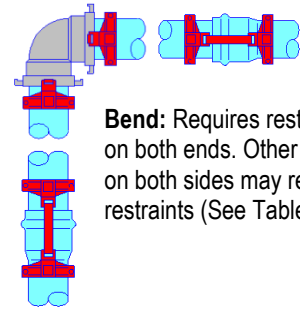
Pipe-Pipe Restraints for DIN pipe... minimum restrained length ("L") in meters											
Pipe Size	Pipe OD Max MM	Pipe OD Inches	Bends				Step Reduction			Dead End	Gate Valve
			11	22	45	90	1	2	3		
63	64	2.48	0.3	0.3	0.6	1.8				5.8	3.0
75	76	2.95	0.3	0.6	1.2	2.7	1.2			7.0	3.7
90	91	3.54	0.6	0.9	1.8	3.4	2.4	3.0		9.1	4.6
110	111	4.33	0.6	1.2	2.7	6.1	4.3	6.0	9.4	13.7	7.0
160	162	6.30	0.9	1.8	3.7	8.7	8.9	12.0	15.0	18.9	9.5
200	202	7.87	1.0	2.0	3.9	9.5	9.0	13.7	15.7	20.7	10.5
225	228	8.86	1.5	2.4	4.6	11.6	10.1	16.8	19.2	22.9	11.6
250	253	9.84	1.6	3.0	6.2	14.8	10.2	17.4	24.6	31.5	15.8
280	283	11.02	1.8	3.3	7.2	17.4	10.5	18.0	26.2	35.4	17.4
312	319	12.28	1.8	3.5	8.1	19.5	10.7	18.5	27.0	39.0	19.5
400	406	15.75	2.1	3.6	8.7	20.7	10.9	18.9	28.4	48.6	24.3

NOTE: Step Reduction Example: 1 Step (8x6), 2 Step (8x4), 3 Step (8x3)

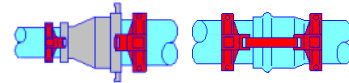
Quick Selection Guide

Based on 125 PSI pressure and 20 - foot length of pipe
(for shorter pipe lengths, use tables on previous page)

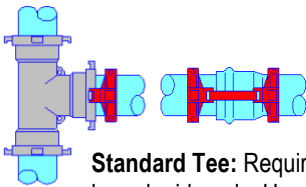
Pipe-Pipe Restraints											
Table below shows the number of adjacent joints to restrain...based on 20 foot length											
Pipe Size	Pipe OD IPS	Pipe OD DPS	Bends				Step Reduction			Dead End	Gate Valve
			11	22	45	90	1	2	3		
2"	2.38										
2.5"	2.88									1	
3"	3.50									1	
4"	4.50	4.80				1		1	1	2	1
6"	6.63	6.90				1	1	2	2	3	1
8"	8.63	9.05				1	1	2	3	3	2
10"	10.75	11.10			1	2	1	2	3	4	2
12"	12.75	13.20			1	2	2	3	4	5	2
14"		15.30			1	3	2	3	4	6	3
16"		17.40			1	3	2	3	4	7	3
18"		19.50			1	3	2	3	4	8	4
20"		21.60			1	3	2	4	4	9	4
24"		25.80			1	3	2	4	5	10	5



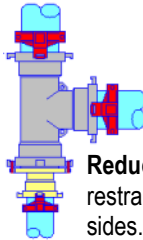
Bend: Requires restraints on both ends. Other joints on both sides may require restraints (See Tables).



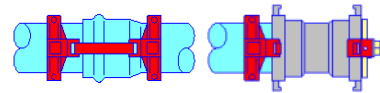
Reducers: Must be restrained on both ends. Additional joints on the larger end are required. (See Tables)



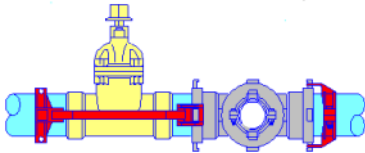
Standard Tee: Requires restraint on branch side only. Use 90-degree bend for additional joints. (See Tables)



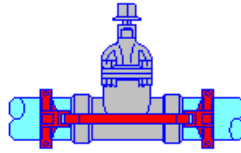
Reducing Tee: Requires restraints on all three sides. (See Tables)



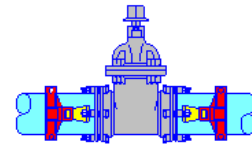
Dead End: Adjacent joint restraints are required on upstream joints. (See Tables)



LGK-Series: Additional joints require restraints. (See Tables)



LG-Series: Additional joints on both sides require restraints.



LMJ-Series: Additional joints on both sides require restraints.

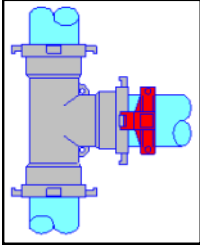
Leemco also offers a variety of Self-Restrained Fittings and Self-Restrained Resilient Wedge Mainline Gate Valves...



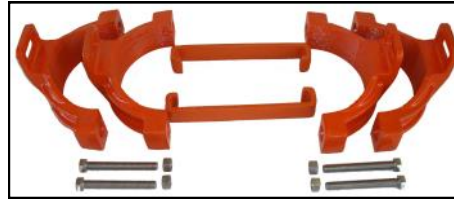
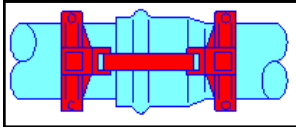
Please refer to our Self-Restrained Fitting & Mainline Gate Valve brochures for more information.

Note: 316-Series stainless steel hardware is available for an additional charge. Please contact your Leemco Representative for more information.

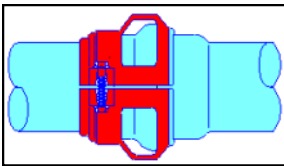
Product Information... Please refer to IPS, DPS & DIN Price Lists for Models & Sizes



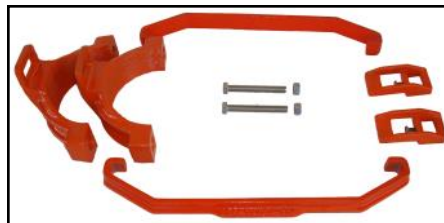
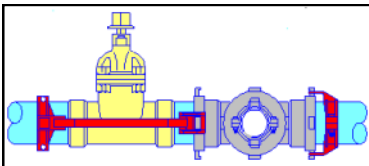
LH-Series... 2" - 12" IPS Sizes
LHD-Series... 4" - 24" DPS Sizes
DLH-Series... 63 - 400MM DIN Sizes
 Set consists of two half clamps and hardware that attaches PVC pipe to Leemco ductile iron fittings.



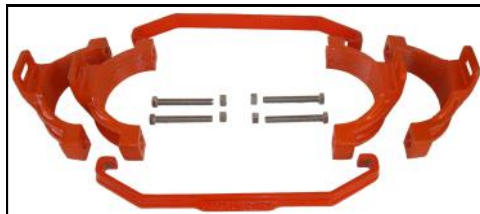
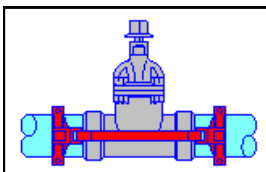
LB-Series... 2" - 12" IPS Sizes
LBD-Series... 4" - 24" DPS Sizes
DLB-Series... 63 - 400MM DIN Sizes
 Set consists of four half clamps, two tie-bars and hardware that restrains a bell-spigot PVC pipe connection.



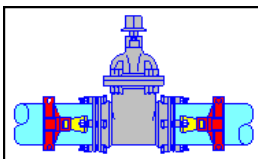
LPP-Series... 2" - 12" IPS Sizes
 Set consists of two half clamps and hardware that restrains a bell-spigot PVC pipe connection.



LGK-Series... 2" - 12" IPS Sizes
LGKD-Series... 4" - 12" DPS Sizes
DLGK-Series... 63 - 400MM DIN Sizes
 Set consists of two half clamps, two tie-bars and two SB-Links that attach to a Leemco fitting and on the opposite end to the PVC pipe to restrain a gate valve in between.



LG-Series... 2" - 12" IPS Sizes
LGD-Series... 4" - 12" DPS Sizes
DLG-Series... 63 - 400MM DIN Sizes
 Set consists of four half clamps, two tie-bars and hardware that attach to pipes on the opposite sides of a bell x bell gate valve.



LMJ-Series... 2" - 12" IPS Sizes
LMJD-Series... 4" - 12" DPS Sizes
DLMJ-Series... 63 - 400MM DIN Sizes
 Set consists of two half clamps, two LS-MJ links that attach the LH-Clamp to a flange or MJ style valve.

Parts & Accessories



LTB-Bars

- LTB-100... used with 2" - 8" LB-Series (9"L x 1" H)
- LTB-200... used with 10" - 24" LB-Series (16"L x 1"H)
- LTB-224... used with 2" - 4" LGK/LG-Series (18"L x 3.5"H)
- LTB-228... used with 6" - 8" LGK/LG-Series (24"L x 3.5"H)
- LTB-1012... used with 10" - 12" LGK/LG-Series (32"L x 3.5"H)



SB-LK6 and SB-LK7

- SB-LK6... used with 2" - 8" LGK-Series
- SB-LK7... used with 10" - 12" LGK-Series



LS-MJ

- LS-MJ... used with 2" - 12" LMJ-Series

Joint Restraint - Hardware Size and Torque Requirements							LPP-Series Restraints Only			
Pipe Size	Pipe OD IPS	Pipe OD DPS	No. of Bolts	Bolt Size	Torque Ft-Lb	LB-Series OD (Inches)	LPP-Series OD (Inches)	LPP-Series No. of Bolts	LPP-Series Bolt Size	Torque Ft-Lb
2"	2.38		2	3/8 - 16 x 2.5	20	5.0	5.0	2	3/8 - 16 x 2.5	20
2.5"	2.88		2	3/8 - 16 x 2.5	20	5.5	5.5	2	3/8 - 16 x 2.5	20
3"	3.50		2	3/8 - 16 x 2.5	20	6.5	6.5	2	3/8 - 16 x 2.5	20
4"	4.50	4.80	2	1/2 - 13 x 3.5	50	7.5	7.5	2	1/2 - 13 x 3.5	50
6"	6.63	6.90	2	1/2 - 13 x 3.5	50	10.0	10.5	2	1/2 - 13 x 3.5	50
8"	8.63	9.05	4	1/2 - 13 x 4.0	50	12.5	15.0	2	1/2 - 13 x 4.0	50
10"	10.75	11.10	4	5/8 - 11 x 5.5	100	15.0	17.0	2	1/2 - 13 x 4.0	50
								2	5/8 - 11 x 5.5	100
12"	12.75	13.20	4	5/8 - 11 x 5.5	100	17.0	19.5	2	1/2 - 13 x 4.0	50
								4	5/8 - 11 x 5.5	100
14"		15.30	4	5/8 - 11 x 5.5	100	29.0				
16"		17.40	4	5/8 - 11 x 5.5	100	31.0				
18"		19.50	2	1/2 - 13 x 4.0	50					
			4	5/8 - 11 x 5.5	100					
20"		21.60	2	1/2 - 13 x 4.0	50					
			4	5/8 - 11 x 5.5	100					
24"		25.80	2	1/2 - 11 x 4.0	50					
			4	5/8 - 11 x 5.5	100					

SIZES:
MATERIAL:
PRESSURE RATING:
EPOXY COATING:
HARDWARE:
INSTALLATION:

2 - 12" IPS, 4 - 24" DPS & 63 - 400MM DIN
Class 350 Ductile Iron per ASTM A-536, Grade 65-45-12, AWWA C153
350 PSI
ANSI/AWWA C116/A21.16-09, NSF 61 & CSA Z245.20-98, 10-12 MIL
304-Series Stainless Steel, Optional 316-Series Stainless Steel
Per IPS, DPS & DIN Pipe Standards

Specification:

All changes of directions and reductions shall be mechanically restrained. Additional adjacent joints shall also be restrained as per manufactures recommendations. Joint Restraints shall be ductile iron and made in accordance with ASTM A-536, Grade 65-45-12 & AWWA C153. All Restraints shall have blunt cast serrations. Machine threaded restraints shall not be allowed. Optional Epoxy Coating shall be fusion bonded epoxy, 10-12 mil thickness. The epoxy coated restraints shall pass 90-Day immersion tests per CSA Z245.20-98. All Joint Restraints shall be manufactured by Leemco, Inc., U.S.A.



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