HPB-160
Effective 12/30/10

HARVEL®

PLASTICS, INC.

PVC Gasket Pipe

The QUALITY Line

PVC Gasket Pipe

- *Fast, Leak-Free Installation*
- *Low Assembly Force*
- *Positive Seal*
- *Integral Gasket Design Prevents Gasket Dislocation*

GASKET DESIGN

Harvel gasketed pipe utilizes gaskets that are locked in place at the factory as part of the manufacturing process. Two styles of factory-installed gaskets are used. Pipe sizes 2" through 8" incorporate the **Rieber style gasket;** 10" through 24" diameter pipes utilize the **Retained Ring style gasket.** Both gasket styles are locked in place, and eliminate the need to install gaskets in the field. This technique also prevents fish mouthing or dislocation of the seal during assembly. The standard gasket material used for both factory-installed gasket systems is Styrene Butadiene Rubber (SBR) which offers excellent physical properties and good chemical resistance. Other gasket materials are available when necessary to meet demanding chemical resistance requirements.

Harvel gasketed pipe offers low assembly force; flexibility to allow for variations in line pressure and changing working conditions; compensation for movement due to thermal expansion and contraction; a certain amount of allowable joint deflection; and positive, leak-free seals for both high- and low-pressure applications as well as vacuum service.

INSTALLATION

Low assembly force enables fast and simple field installation without the risk of gasket dislocation. Each spigot end of Harvel gasket pipe contains a 15° bevel for easy insertion, as well as a factory-placed reference mark to indicate proper insertion depth. The reference marks also provide a visual means to verify proper insertion if lines are assembled above ground, and lowered into the trench after assembly. Field-cut lengths must be cut square, beveled to the same 15° taper, and marked to the proper insertion depth (see Table I).

Deflection

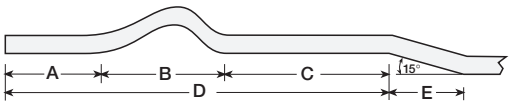
Harvel gasketed joints permit an angular deflection of 2° at the joint. Adequate deflection can usually be achieved for gentle curves by using the inherent flexibility of the pipe itself, without using joint deflection.

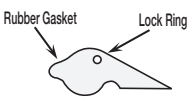
Thrust Blocking

All gasket-joint piping requires adequate thrust restraints to prevent movement from forces generated by changes in direction, valve operation, dead ends, reduction in pipe size, and other areas where thrusts can be developed. The size and type of thrust restraint depends on the pipe size, type of fitting, soil properties, and water-hammer possibilities. Keeping flow velocities at or below 5 ft/sec will help minimize surge pressures. Fittings and valves used to make vertical changes in direction should be anchored to the thrust restraint to prevent outward and upward thrusts at the fitting junctures. In pressure lines, valves 3" in diameter and larger should be anchored to

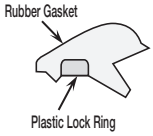
TABLE I:
Gasket Pipe Dimensions

	IPS (in.)	A	B	C	D	E (approx.)
*	2	0.590	1.329	2.820	4.739	0.474
*	2 1/2	0.670	1.489	2.860	5.019	0.566
*	3	0.708	1.587	2.940	5.235	0.688
*	4	0.867	1.723	3.020	5.610	0.874
*	6	1.063	2.076	3.200	6.339	1.274
*	8	1.260	2.073	3.500	6.833	1.500
**	10	1.875	2.417	4.750	9.042	1.500
**	12	2.000	2.619	5.500	10.119	1.500
**	14	2.125	3.375	6.000	11.500	1.500
**	16	2.250	2.875	6.500	11.625	1.500
**	18	2.500	3.062	7.000	12.562	1.500
**	20	2.750	3.375	7.375	13.500	1.500
**	24	2.203	3.781	8.000	13.984	1.500





*2" – 8"
Rieber gasket
Laying length, 19'6" ± 2"



**10" – 24"
Retained Ring gasket
Laying length, 19' ± 2"

TABLE II:
Thrust in lb. @ 100 PSI Operating Pressure

Size (in.)	90° Bend	45° Bend	22 1/2° Bend	Tee, Cap Plug, 60° Bend
2	645	350	180	455
2 1/2	935	510	260	660
3	1,395	755	385	985
4	2,295	1,245	635	1,620
6	4,950	2,680	1,370	3,500
8	8,375	4,540	2,320	5,930
10	13,040	7,060	3,600	9,230
12	18,340	10,000	5,240	13,000
14	21,780	11,770	6,010	15,400
16	28,440	15,370	7,850	20,110
18	35,990	19,450	9,930	25,450
20	44,430	24,010	12,260	31,420
24	63,970	34,570	17,650	45,240

TABLE III:
Safe Bearing Capacity

Soil	Capacity (lb./sq. ft.)
Muck, peat, etc.	0
Soft clay	1,000
Sand	2,000
Sand and gravel	3,000
Sand and gravel cemented with clay	4,000
Hard shale	10,000

Thrust Blocks

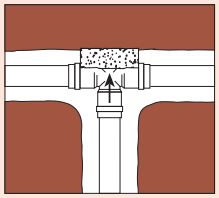


Figure 1
Thru line connection, tee

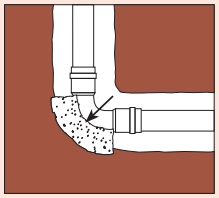


Figure 2
Direction change, elbow

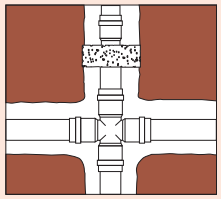


Figure 3
Change line size, reducer

Thrust Restrainers

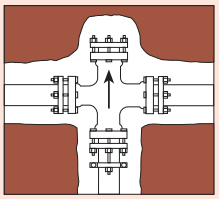


Figure 1
Thru line connection, cross used as tee

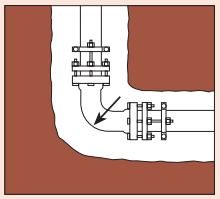


Figure 2
Direction change, elbow

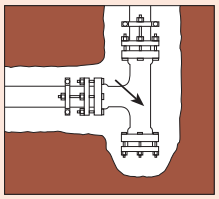


Figure 3
Direction change, tee used as elbow

Assembly Instructions:

1. Make certain pipe ends and gasket areas are free of dirt and debris. Support spigot end of pipe above ground to prevent dirt contamination when lubricant is applied.
2. Apply a light coating of recommended lubricant to spigot end and sealing section of gasket.
3. Align pipe ends. Push spigot end into gasket bell so that the reference mark is even with the entrance of the gasket bell.

the thrust restraint to prevent movement when operated. Consideration should also be given for the proper support, anchoring, and thrust restraint for lines installed on slopes. Refer to Table II for pounds of thrust developed for various fittings, and to Table III for safe bearing capacities of typical soils.

The size of thrust block required (in square feet) can be determined by dividing the total thrust developed (in psi) by the capacity of the soil (in pounds/square foot).

The most common method of thrust blocking involves the pouring of concrete (to the size of block required) between the pipe fitting and the bearing wall of the trench. Mechanical thrust restraint devices are also used, but must be of design for use with PVC pipe.

Trenching: Initial Backfill

Trench depth is determined by the intended service and local conditions. Harvel gasket pipe should be buried a minimum of 12" below frost line in areas subject to freezing, or a minimum depth of 18 to 24 inches where there is no frost. Permanent lines subjected to heavy traffic should have a minimum cover of 24". In areas not subject to freezing, a minimum cover of 12 to 18 inches is usually sufficient for small-diameter piping subjected to light traffic. Bearing stresses must be calculated to determine the amount of cover required. Reference to applicable local, state, or national codes is also recommended.

The trench bottom should be continuous, relatively smooth, and free of rocks and debris. Adequate backfill should be in place immediately after installation, prior to filling or testing the line, to help distribute the effects of expansion/contraction evenly over each pipe length. The initial backfill material should consist of particles of 1/2" in size or less, and properly tamped. Generally a minimum of 6 to 12 inches of backfill is desirable for the initial phase. Where hardpan, ledge rock, or large boulders are encountered, the trench bottom should be padded with sand or compacted fine-grain soils to provide adequate protection. Joints should be left exposed for visual inspection during testing.

Testing

If separate tests are to be conducted for pressure and leakage, pressure testing should be conducted first.

⚠ WARNING: Air must be completely vented from the line prior to pressure testing; entrapped air can generate excessive surge pressures that are potentially damaging and can cause bodily injury or death. Air relief valves should be provided. The use of compressed air or gases for testing is not recommended.

Harvel suggests testing sections of pipe as it is installed to verify proper installation and joint assembly.

Make certain the section of piping to be tested is backfilled sufficiently to prevent movement under test pressure. If concrete thrust blocks are utilized, allow sufficient time for concrete to set up prior to testing. Test ends must be capped and braced properly to withstand thrusts developed during testing. Table IV provides the water-volume requirements of various sizes of schedule and SDR series pipe.

Final Backfill

Backfilling should be conducted in layers; each layer must be compacted sufficiently so that lateral soil forces are developed uniformly. Under certain conditions it may be desirable to pressurize line during the backfill operation. Vibratory methods are recommended when compacting sand or gravel. Sand and gravel containing a significant proportion of fine-grained materials (silt, clay, etc.) should be compacted by mechanical tampers. When water flooding is used, sufficient cover must be provided by the initial backfill to ensure complete coverage of the pipe; precautions must be taken to prevent "floating" the pipe in the trench. Additional layers of backfill should not be applied until the water-flooded backfill is firm enough to walk on.

In all cases, the backfill should be placed and spread in uniform layers to eliminate voids. Large rocks, frozen dirt clods, and other debris larger than 3" should be removed to prevent damage to the pipe. Rolling equipment or heavy tampers should only be used to consolidate the final backfill. Additional information pertaining to underground installation is contained in ASTM D2774 (Underground Installation of Thermoplastic Pressure Pipe), and ASTM D2321 (Underground Installation of Flexible Thermoplastic Sewer Pipe).

TABLE IV:
Water Volume Gallons/100'

Size (in.)	SCH 40	SCH 80	SCH 120	SDR 21	SDR 26	SDR 41
2	17	15	14	19	20	–
2 1/2	25	22	21	28	29	–
3	38	34	32	41	43	–
4	66	60	54	68	70	–
6	150	135	123	146	152	–
8	260	237	–	248	258	–
10	409	373	–	–	401	–
12	582	528	–	–	565	–
14	703	637	–	–	681	–
16	917	836	–	–	889	–
18	–	1060	–	–	1125	1195
20	–	–	–	–	1390	1475
24	–	–	–	–	2000	2125

Pounds of Force Required to Assemble Harvel Gasket Pipe

Rieber

Pipe Size (in.)	lbf
2	113
2 1/2	124
3	137
4	157
6	284
8	352

Retained Ring

Pipe Size (in.)	lbf
10	250
12	300
14	385
16	360
18	450
20	520
24	600

STORAGE AND HANDLING

Piping should be placed on a flat surface when stored on the job site to prevent distortion. When stacked, pipe ends should be alternated to prevent socket distortion by having socket ends overhang spigot ends. When stored outdoors, pipe must be covered with a non-transparent material to reduce the effects of exposure. Brief exposure to direct sunlight (U.V.R.) may result in a discoloration of the product but will not affect physical properties. Care should be taken to avoid exposure to heat-producing sources during storage and installation, as irreparable distortion may occur. Reasonable care should be exercised when handling thermoplastic pipe; it should not be dropped nor have objects dropped on it. Improper handling can result in deep scratches, splits, or gouges. Damaged sections must be cut out and discarded.

STANDARDS AND SPECIFICATIONS

All Harvel piping products are manufactured in strict compliance with applicable industry standards and specifications to ensure consistent quality; Harvel gasket pipe is no exception. Since integral gasket bells are available on a variety of pipe dimensions, applicable standards are dependent on the pipe dimension chosen. All Harvel PVC pipe is manufactured from a Type I, Grade I PVC material per ASTM D1784. All Harvel gasket pipe utilizes flexible elastomeric seals for pressure pipe which, when properly assembled, meet the requirements of push-on joints per ASTM D3139. The gaskets used are manufactured in strict compliance with ASTM F477 requirements. Harvel SDR Series gasketed pipe is manufactured in strict compliance with ASTM D2241. Harvel PVC Schedule 40, 80, and 120 gasketed pipe is manufactured in strict compliance with ASTM D1785.

SAMPLE SPECIFICATION

All gasket pipe shall be manufactured from Type I, Grade I Polyvinyl Chloride (PVC) material with a Cell Classification of 12454 per ASTM D1784. The pipe shall be manufactured in strict compliance with ASTM D1785 when Schedule 40, 80, or 120 dimensions are specified, or shall be manufactured in strict compliance with ASTM D2241 when SDR Series dimensions are specified. All pipe shall consistently meet the applicable quality-assurance test requirements of these standards with regard to material, workmanship, burst pressure, flattening, and extrusion quality. All gasket seals shall meet the requirements of ASTM D3139 for flexible joints for plastic pressure pipe, and the gasket material shall meet and/or exceed the requirements of ASTM F477 for elastomeric seals. All gasket pipe shall be produced in the USA using domestic materials, by an ISO 9001-certified manufacturer, and shall be stored indoors after production at the manufacturing site until shipped from the factory. This pipe shall carry the National Sanitation Foundation (NSF) seal of approval for potable water applications. All gasket pipe shall be manufactured by Harvel Plastics, Inc.

HARVEL® PLASTICS, INC.

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12/30/10(2.5M); REP10/30/00(10M); 3/15/97(7.5M)