

VYLON® PVC GRAVITY SEWER PIPE INSTALLATION GUIDE



Vylon Pipe

VYLON PIPE UNLOADING/HANDLING AND ASSEMBLY CHECKLIST

- Count and inspect each pipe shipment upon arrival. Discrepancies and/or damage should be noted on the shipping Bill of Lading.
- In cases of damage, notify the carrier and file the claim per the carrier's procedures.
- It is recommended to use 8 ft. long extended forks to unload Vylon Pipe pallets. Maximum fork thickness should not exceed 2 in. Bundles of 21 in. and 24 in. pipe contain four pipes, 27 in. and 30 in. contain three pipes, and larger diameters have two pipes.
- To avoid damage, do not drop the pipe or roll it off the truck. Unload the pipe with care.
- Use only nylon straps when handling Vylon Pipe.
- Do not drag the pipe on the bell or spigot.
- Handle the pipe with care.
- Inspect the barrel for damage.
- Prior to assembly, clean and lubricate the gasket and spigot.

- Assembly methods:
 - Pull joint together with nylon straps.
 - Block the bell to push the spigot “home” with a backhoe bucket
 - Internal pipe pullers
 - Dual come-alongs
 - Bar and block assembly
- The joint is fully assembled or “home” when the second homing mark (farthest from the spigot end) aligns with the gasketed bell but is still visible.
- Do not drop the specified embedment on the pipe from heights greater than 5 ft.
- Shovel slice or consolidate embedment in haunches to springline as specified.
- Follow safe trenching practices.

Call a local Vylon Pipe sales engineer or agent for further assistance.

INTRODUCTION

This guide is written specifically for installers and those who supervise the unloading, handling, installation and testing of Vylon Pipe PVC sewer pipe. Vylon Pipe is a large diameter flexible pipe with a closed hollow-core profile. The pipe must be handled and backfilled in accordance with project specifications and the suggestions of this guide. Careful attention to the project specifications and Vylon Pipe's installation recommendations will aid the installer in completing a successful project.

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1. ONE YEAR LIMITED WARRANTY

Vylon Pipe warrants that our products are manufactured in accordance with the applicable material specifications and are free from defects using our specifications as a standard. The limit of our liability for failure of any of our products to meet the foregoing warranty or for any breach of any other warranty, expressed or implied, shall be to supply an equivalent amount of products returned to us and found to be defective by us. Every claim under this warranty shall be deemed waived unless received in writing by Vylon Pipe within thirty (30) days of the date the defect was discovered or should have been discovered and within one year of the date of shipment from our factory. Defective goods may be returned to the seller only upon permission and definite instructions from the seller. **Vylon Pipe shall not be liable for any incidental or consequential damages caused by breach of this warranty. This exclusion shall be applied whether such damages are sought based on breach of warranty, breach of contract, negligence, strict liability in tort, or any other legal theory. This warranty does not apply to claims for personal injury by a third party. This warranty does not cover damages in shipment. Claims for damage in shipment should be made to the carrier in accordance with the terms of the shipping agreement. The physical properties of Vylon Pipe products represent typical average values obtained in accordance with ASTM testing methods and are subject to normal manufacturing tolerances. This warranty is in lieu of all other warranties, whether expressed, implied or oral, including the**

implied warranty of merchantability, and implied warranty of fitness for a particular purpose, and any implied warranties otherwise arising from a course of dealing or trade.

The technical data presented herein is reliable, however no guarantee is made or liability assumed.

2. INSPECTION WHEN RECEIVED

Each pipe shipment should be inspected with care upon arrival by the contractor, distributor or field representative. **It is the responsibility of the consignee to make certain that there has been no loss or damage in transit.** The shipment should be checked against the tally sheet. Any discrepancy or damage should be reported to the carrier with appropriate notations made on the delivery receipt. File a claim with the carrier as Vylon Pipe is not responsible for damage in transit.



INSPECTION CHECKLIST

- Upon arrival of each pipe shipment, walk around the entire shipment to inspect that it has arrived intact and undamaged.
- If the shipment has shifted, check to see that the gasketed bells have not been damaged from “rubbing” against the adjacent bundle of pipe. Carefully inspect each piece as it is unloaded.
- Check the total quantities of each item delivered against the Bill of Lading (diameter and quantity of pipe, lubricant, etc.).
- Any damaged or missing items must be noted on the shipping Bill of Lading.
- **Notify the carrier immediately and file the claim in accordance with the carrier’s procedures.**
- Retain the damaged material. Please follow the carrier’s procedures for replacement.

(**Note:** An advantage to smooth outer Vylon Pipe wall is that slightly damaged joints can be easily field cut and used as “short lengths” where needed.)

- Damaged material and shortages are not automatically re-shipped. Please re-order through a local Vylon Pipe sales engineer, representative or distributor.

3. UNLOADING

Pipe should be removed in units using mechanical equipment. Remove restraints that bind the units to the truck. **Do not cut the bands that hold each unit together.** Unload the units by rows using a forklift or front-end-loader equipped with fork arms long enough to reach beyond the last pipe in the unit. Maximum fork thickness should not exceed 2". If a forklift is not available, a spreader bar may be used if it is combined with nylon straps capable of handling the load and spaced 8 ft. apart and looped under the unit. **Do not roll the pipe off the truck. Do not handle units with cables or chains or attach cables to unit frames for lifting.** Units should be stored on level ground. Vylon Pipe dimensions, weights, and shipping quantities can be found in Tables 1 - 3 in the Appendix.

4. COLD WEATHER HANDLING

As the temperature approaches and drops below freezing, the flexibility and impact resistance of any plastic pipe is reduced. **Extra care should be used in handling Vylon Pipe during cold weather.** Regardless of the temperature, handle Vylon Pipe with nylon slings.

5. STORAGE

Pipe should be stored in units on a flat base. Pipe that has been stored for more than twelve months may have reduced impact strength. Other physical properties such as tensile and flexural strength are unaffected by the prolonged storage. If the pipe is to be stored exposed to sunlight for more than twelve months, it should be covered with canvas or other material opaque to ultraviolet light. Prior to using pipe that has been stored outdoors for extended periods, the rubber gaskets at the end of the bell should be inspected for cracking. Surface cracking is cosmetic and does not impair the performance of the gaskets.



6. INSTALLATION

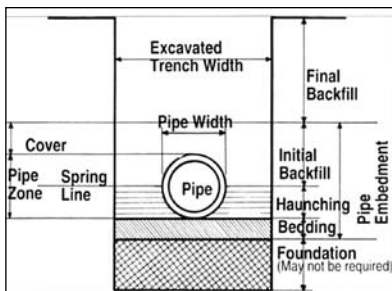
A. AT THE TRENCH SITE

Vylon Pipe should be handled with nylon straps rather than chains or cables. The pipe bedding should be prepared prior to pipe placement. If there is any discrepancy between the contract documents and the manufacturer's recommended installation procedures, the contract administrator or officer should be contacted and the discrepancy resolved.

B. FOUNDATION AND BEDDING

Foundation materials are based on site conditions and specified by the project engineer in contract documents to stabilize otherwise unstable conditions. Pipe **bedding** is used to bring the pipe to grade and provide uniform longitudinal support. **Haunching** material is most critical in controlling deflection and should be placed so as to eliminate voids and obtain densities required in contract specifications. Care must be taken to choose foundation, bedding, and haunching materials that are compatible to minimize migration or loss of bedding or haunching support.

Figure 1
Trench
Terminology



C. ASSEMBLY OF PIPE

Make certain that both the bell and the spigot are clean and contain no foreign matter that could prevent an effective seal between the gasket and the spigot surfaces. Gaskets are glued in place at the factory to prevent "fishmouth". The gasket and spigot surface should be lubricated with the pipe lubricant specifically suited for this purpose available from Vylon Pipe. Do not use lubricants that contain petroleum oils or vegetable oils, as they may harm the gasket materials. The entire circumference of the joint should be thoroughly lubricated. Be careful not to let the lubricated section touch the dirt or backfill as foreign material could adhere to the surface and compromise joint integrity. Insert the spigot into the bell entrance so that the two pipes are in alignment and form a straight line. For convenience of the manufacturing and testing process, the gasket is manufactured with an external "J-Lip", which extends over the end and onto the exterior surface of the pipe. This "J-Lip" does not serve any sealing function. Joint tightness is not affected by non-adhered areas along the "J-Lip".

The following are recommended assembly procedures:

- Pulling the joint together with a nylon sling.
- Blocking the bell to push the spigot "home" with a backhoe bucket.

The pipe should be assembled so that the second circular assembly mark is just visible at the edge of the bell entrance. **Do not over assemble the pipe beyond the second assembly mark.** Such overassembly could prohibit expansion of the pipe due to temperature changes, cause an obstruction as the spigot necks down into the bottom of the bell, or compromise joint integrity. Assembly will require greater effort during cold weather.

D. TAMPING AND BACKFILL

Trench bedding or bottom shall be of uniform thickness and density. Once the pipe is joined together, pipe bedding material should be placed in the haunching and pipe zone areas as called for in the engineering specifications. Uniform stable support is provided by placing the specified material in small quantities to eliminate voids and make firm contact with the pipe. Bedding shall be placed in 6" - 8" lifts on alternate sides of the pipe and compacted so as not to disturb pipe grade or alignment. A tamping bar or shovel slicing can facilitate compaction in the lower quadrant of the pipe (haunches). Mechanical tampers may be specified in some instances and care should be taken to avoid contact directly with the pipe. Hydrohammers should not be used within three feet on top of the pipe and only then when the pipe zone material has been previously compacted to a minimum of 85% of Standard Proctor Density.

The initial backfill extends from the springline of the pipe to a specified height of cover above the pipe. Prime embedment materials and select backfill are determined by the project specifications.

Flooding or water tamping should only be used when trenches incorporate soils that are naturally selfdraining. Required pipe zone densities must be achieved prior to placement of the overburden load. Water jetting should not be used to consolidate the embedment material in the pipe zone. When jetting is used to consolidate the backfill for the roadway, etc., care should be taken not to lower the jet probe to the point of disturbing the pipe zone support materials.

Initial backfill is placed over the pipe to protect it from other objects and should be free from large rocks (more than 3" in diameter), frozen lumps or debris. Final backfilling should begin after a final inspection of the trench. Refer to Figure 1 for definition of bedding, haunches, pipe zone, initial and final backfill.

7. FIELD CUTTING AND SEALING

Vylon Pipe PVC sewer pipe has a uniform outside diameter that provides a sealing surface at any point along its length. Open channels of the honeycomb cross section have been factory sealed at both the spigot and bell end to prevent water entry and facilitate air testing. Each length of the pipe has been air tested in the factory to verify the integrity of the seams, end seals and gasketed joints.

Pipe is easier to cut to length before it is placed in the trench. A builder's saw with an abrasive disc blade or a circular saw are best suited for cutting the pipe into special lengths. Mark off the length required from the spigot or bell end with a marking pen. **Do not follow the spiral barrel weld as a cutting guide.** This process should be repeated until marks are made around the circumference of the pipe at intervals not more than two feet apart. A pipe wrap or straight edge can then be used to connect the marks into a continuous line for cutting.

NOTE:

Field Sealing, as described on pages 14 and 15, is no longer required as long as the factory bell or spigot exists on the cut piece of pipe. If both the bell and spigot are removed, sealing is required and field sealing kits can be ordered from Vylon Pipe.

Field cut lengths expose the internal honeycomb structure of Vylon Pipe. The number of exposed channels and cartridges of DP-605 needed to seal each cut end is shown below:

Diameter	No. of Channels	Cartridges, (50 ml.) Needed to Seal
21" - 30"	7	1.0
36"	6	1.5
42"	5	2.0
48"	4	2.0
54"	4	3.0

Follow the 3M Scotch Guard™ directions for kit assembly and use. The DP-605 cartridges should be kept in a warm location (heated office or truck cab). DP-605 is very temperature sensitive and damage may occur to the applicator or the plunger by forcing "cold" DP-605 through the mixing nozzle.

The following are sealing instructions:

1. Clean and dry the exposed channels. DP-605 will not cure under water or in continuously wet conditions.
2. Pre-plug the Vylon Pipe channels to be sealed with foam-rubber plugs or cotton balls. The plug material should be inserted at least 1-1/2" deep into the channel.
3. Trim the tips of the mixing nozzles to maximize flowability.
4. Attach the nozzle to the DP-605 cartridge.

(Note: Be certain the brown resins and white catalysts flow from the DP-605 duo-pack into the mixing nozzle. If the orifices under the removable cap are plugged, clear the blockage with a straight edge.)

5. Seal the channels with a solid 1-1/2" long injection of DP-605 to completely seal off the channel opening. Slowly withdraw the mixing tube while injecting DP-605. It is not necessary for the sealant to be flush with the end of the pipe.

DP-605 urethane sealant will set tack free in 15 minutes at 75° F. Colder temperatures will prolong the required set time.

DP-605 adheres easily to clean and dry Vylon Pipe surfaces.

Vylon Pipe also recommends DP-605 for minor field repairs.

8. MANHOLE CONNECTIONS

Manhole construction may vary regionally; however, the smooth outer wall of Vylon Pipe can be used directly as a sealing surface. Therefore, methods that apply to solid wall pipe can also be used with Vylon Pipe. **To assure compatibility use only Vylon approved and tested gaskets or boots.**

Manhole connections are generally made by one of the following methods:

- A. Vylon Pipe manhole tee with standard Vylon Pipe bell by spigot joint connections.
- B. Precast concrete manhole base with elastomeric gasket, boot or other flexible seal sized for Vylon Pipe minimum outside diameter. Please refer to Table 1 in the Appendix. A-LOK and PRESS SEAL (PSX) Systems have been tested and approved for use with Vylon Pipe. Other connection systems must be tested prior to approval.
- C. Poured in place manhole with Vylon Pipe water-stop gasket placed firmly around the pipe. Concrete will not bond directly to PVC. A water-tight system requires a flexible seal or waterstop gasket between Vylon Pipe and the manhole structure.
- D. Fiberglass or polyethylene manhole stubs connected to Vylon Pipe with a properly sized flexible rubber coupling or full circle metal coupling. The couplings must be sized for the minimum pipe diameters.

The manhole foundation and bedding material should be compacted to 95% Proctor Density. The pipe bedding through the haunches at the manhole connection

is critical in controlling deflection at the connection. Consult the manhole gasket manufacturer A-LOK, PRESS SEAL (PSX) for the following:

1. The maximum amount of pipe deflection the gasket sealing system can tolerate at the manhole connection.
2. The ability to seal across the Vylon Pipe profile weld seam. The pipe now has the external weld seam removed at the factory; this eliminates field grinding.

9. FIELD SERVICE TAPS AND RISERS

Field service taps can be performed for all Vylon Pipe diameters by using one of the following recommended products.

A. INSERTA TEE®

Inserta Tee is a three piece service connection that is compression-fit into the cored wall of the Vylon Pipe interceptor. Inserta Tee consists of a PVC hub, rubber sleeve, and stainless steel band. Inserta Tee connections are available for 4", 6", 8", 10", 12" and 15" sizes. The rubber sleeve has a self-fitting/sealing insert ring that aligns with the specified Vylon Pipe diameter profile height. A sharp hole saw should be used to obtain a precise hole. Exposed interior channels do not have to be sealed with DP-605. The Inserta Tee can be installed precisely where needed without disturbing the bedding. Follow the recommended Inserta Tee installation instructions. (For more information, please contact Inserta Fittings Co. at 503/357-2110.)

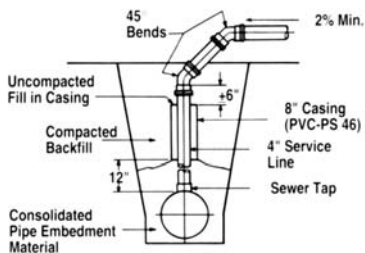
B. FABRICATED SERVICE TEES

Fabricated service tees may be specified by the owner or design engineer. The fabricated tee is a one piece unit with a reducing service tap or hub "heat fused" to the Vylon Pipe barrel section.

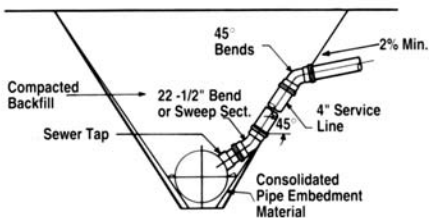
C. RISERS

After the field tap is made, a vertical or angular riser is specified to complete the service connection. Service lines are generally 4" - 6" in diameter for single house leads whereas industrial or multi-use laterals may be larger.

Deep vertical risers generate high loads on the mainline pipe and fitting. For vertical risers exceeding 10 ft., an outer casing pipe should be used around the riser to accommodate the vertical settlement and frictional forces. The casing pipe should be filled with loose fill and supported above the tap with a Class I embedment material (crushed stone) pad. Please refer to the vertical riser illustration at right. Operating equipment and concentrated loads must be kept off the vertical riser until a minimum 4 ft. of cover has been consolidated above the riser. The service lines for angular risers should be placed against the undisturbed trench wall.



VERTICAL RISER



ANGULAR RISER

10. TUNNEL CASINGS AND GROUTING

All Vylon Pipe pipe inserted into a tunnel casing should be blocked in place and backfilled to prevent floatation when the pipe is under the water table. Vylon Pipe has a strong 46 psi wall stiffness that will withstand an external hydrostatic pressure of more than 50 ft. of water without structural duress or leaking joints. The backfill specified by the design engineer (coarse sand, sand-cement mixture or light-weight cellular grout) must be carefully placed to avoid damaging, floating or collapsing the pipe.

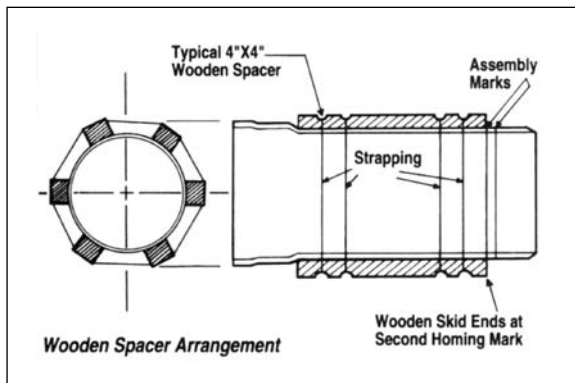
A. VYLON PIPE BELL OUTSIDE DIAMETER MINIMUM CASING PIPE SIZING

Pipe Size	Bell O.D. (in.)	Minimum Casing (in.)
21"	23.38	33
24"	27.63	36
27"	31.00	42
30"	34.38	48
36"	41.13	54
42"	48.50	60
48"	54.63	66
54"	60.99	72

B. SKID BOARDS AND CASING SPACERS

Vylon Pipe should not rest on the gasketed bell while being pushed or pulled into the casing. Skid boards or casing spacers should be used to raise, support and place the pipe lengths in the casing. The 4" x 4" skid boards should extend the full length of the pipe from the bell flare to the second homing mark on the spigot end. This full skid length will prevent over-belling during the insertion process. The skid boards should be treated with a preservative if no annular backfill is required. Six skid boards should be equally spaced and securely strapped to the pipe with bands placed in notches in the skids.

Casing spacers can be used in lieu of skid boards. Two or three spacers should be used per pipe length. Please follow the casing spacer manufacturers' recommendation. One of the spacers must be secured to Vylon Pipe at the second homing mark; the others should be equally spaced.



C. INSERTION THROUGH THE TUNNEL CASING

The skid boards can be lubricated with soap or bentonite to ease insertion. Petroleum based products, such as oil or grease, should not be used. The casing spacers have a Teflon shoe that does not need lubrication.

Vylon Pipe can be pulled through the tunnel, assembled to previously installed joint and blocked in place. Use steady uniform pressure to insert and assemble the joint. Also, Vylon Pipe can be pushed through the tunnel casing using a backhoe or jacking machine in the bore pit. The maximum assembled lengths of Vylon Pipe to be pushed is as follows:

Diameter	Length
21"	1000 LF
24"	1000 LF
27"	750 LF
30"	750 LF
36"	500 LF
42"	500 LF
48"	400 LF
54"	400 LF

For greater lengths of Vylon Pipe to be pushed, use multiple jacking pits.

D. BACKFILLING THE ANNULAR SPACE

The need for backfilling the annular space between the casing and Vylon Pipe carrier pipe is determined by the project specifications. If the Vylon Pipe carrier pipe will be below ground water, Vylon Pipe should be backfilled or blocked in place to prevent floatation. The tunnel casing must be dewatered until after the backfill has been placed and allowed to set up.

Sand or sand-cement mixture can be blown into the annular space by using a hose or small pipe to slowly fill the void. Make certain the void is completely filled around the first pipe before moving on to the next.

If pressure grouting is specified, please take the following precautions:

1. Block the Vylon Pipe pipe in place with skid boards or casing spacers.
2. Fill the entire Vylon Pipe segment to be grouted with water.
3. Use a lightweight cellular grout mix or flowable fill.
4. Gravity flow or pump the grout into the annular space. Long runs may require pumping - **keep the pressure less than 5 psi in the annular space**. Extreme caution is advised in pumping grouts in this annular space.

A lightweight cellular grout minimizes floatation forces and can be gravity flowed or pumped at extremely low pressures without collapsing the Vylon Pipe carrier pipe. The grouting pressures must be closely monitored with a sensitive pressure gauge with 1 - 2 psi graduations. When not controlled, pressure grouting can collapse the PVC carrier pipe.

11. FIELD TESTING

A. JOINT INTEGRITY

Vylon Pipe joint gaskets are designed to meet the requirements of ASTM D-3212, the same tight joint requirement as smooth or solid wall PVC pipe. The joint and installation work may be tested by an exfiltration test, infiltration test, common air test or deflection test. There are no universal correlations between these various tests. Instructions for a particular test procedure shall be provided by the project engineer.

B. AIR TESTING

Air testing must be preceded by making certain all caps and plugs are securely blocked to prevent movement. Uni-Bell Specification Uni-B 6, "Recommended Practice for Low Pressure Air Testing of Installed Sewer Pipe," should be used as a guide. Recommended air leakage allowances for a 1.0 and 0.5 psi air pressure drop are shown in Tables 4A and 4B in the Appendix.

C. ALLOWABLE INFILTRATION

Allowable infiltration for pipe shall be 25 gallons per inch of pipe diameter per mile of length per day. Vylon and approved manhole connections will provide a system with a minimal leakage allowance of 50 gallons per inch of pipe diameter per mile of length per day.

D. ALLOWABLE EXFILTRATION

The allowed exfiltration for pipe shall not exceed 25 gallons per inch of diameter per mile of length per day. The average internal pipe pressure shall not exceed 5 psi (11.4' of water), and the peak pressure shall not exceed 10.8 psi (25' of water), without consulting with Vylon Pipe.

E. DEFLECTION TESTING

If there is a requirement for deflection testing, both designer and contractor should be aware of the following recommendations:

1. 7.5% is the recommended long-term deflection limit for pipe. Both designer and owner can be assured that 7.5% deflection affords a 4:1 minimum safety factor.
2. The least expensive method of deflection measurement is by a Go-No Go device (mandrel). The owner, engineer and/or contractor is responsible for supplying the measurement device and conducting the deflection test.
3. Table 5 in the Appendix lists the base inside diameter of Vylon Pipe and the mandrel outside diameter for 5% (short term) and 7-1/2% (long term) deflection test.

The contractor is responsible for locating and repairing joints or pipe sections that fail the acceptance tests. After the repairs are made, the line shall be retested.

12. FIELD REPAIRS

Vylon Pipe recommends that only prime Vylon Pipe be installed on sewer projects. Vylon Pipe has a smooth PVC double wall that can be repaired for emergency field use.

A. DAMAGED PIPE (ABOVEGROUND PRIOR TO BACKFILL)

Pipe may be damaged during shipping, while unloading the trucks or by improper handling on the job site.

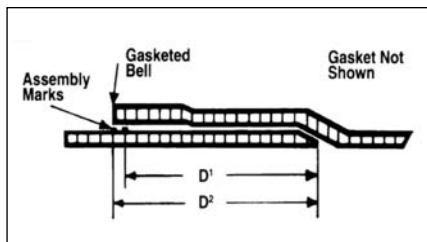
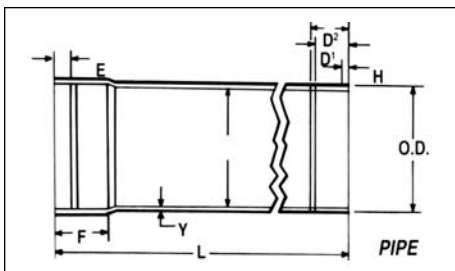
Do not install damaged pipe. Claims for damage in shipment should be made by the contractor to the carrier in accordance with the terms of the shipping agreement. Note the damage on the Bill of Lading. Vylon Pipe does not credit any accounts for damage caused by shipping.

Vylon Pipe damaged during unloading or installation handling should not be repaired and then installed. Rather, damaged Vylon Pipe should be identified, set aside and field cut for future use. Vylon Pipe should be field cut with a cut-off or circular saw three inches beyond the damaged barrel section. The field cut "short" can be used for manhole connections, stubouts or make-ups. The damaged segment should be discarded. Broken/split bells or spigots must not be installed. The bell or spigot can be sectioned from the pipe and the remaining 12 LF of barrel can be used on the project.

B. DAMAGED PIPE DURING POST CONSTRUCTION/OPERATION

Vylon Pipe may be damaged during wastewater operations by other utility work in the pipe zone. Damage/problems may also be encountered in the testing phase that can be easily repaired by following Vylon Pipe's repair procedures. Construction operations may dictate that minor wall penetration be repaired in place in the trench. Do this only after consulting a Vylon Pipe sales engineer or agent.

Vylon Pipe has a detailed manual available to guide installers through field repair procedures. Please contact a local sales engineer or agent.



Refer to Tables 1 & 2 on p.28 for dimensions

Gasketed Bell

13. APPENDIX OF TABLES

Table 1. Vylon Pipe Diameter Dimensions

Nominal Size	Nominal O.D.	Bell O.D.	Nominal I.D.	Minimum Inner Wall	Y Minimum Profile Height
21"	22.110	23.38	20.75	0.080	0.680
24"	25.115	27.63	23.50	0.100	0.770
27"	28.232	31.00	26.50	0.115	0.866
30"	31.415	34.38	29.50	0.125	0.965
36"	37.800	41.13	35.50	0.150	1.150
42"	44.200	48.50	41.50	0.180	1.350
48"	50.570	54.63	47.50	0.210	1.535
54"	56.960	60.99	53.50	0.250	1.730

Table 2. Vylon Pipe Joint Dimensions

Nominal Size	Spigot Homing Marks		E-Lip Minimum	F-Socket Depth	H-Level Length (mm)	L Length
	D1	D2				
21"	6.5	7.5	3.75	8.0	2.0	14' 9"
24"	6.5	7.5	3.75	8.0	2.0	14' 9"
27"	7.5	8.5	3.75	9.0	2.0	14' 10"
30"	7.5	8.5	3.75	9.0	2.0	14' 10"
36"	8.0	9.0	3.75	9.5	2.0	14' 10.5"
42"	8.5	9.5	3.75	9.75	2.0	14' 10.75"
48"	9.0	10.0	3.75	10.5	2.0	14' 11.5"
54"	9.5	10.5	3.75	11.0	2.5	15' 0"

Table 3. Vylon Pipe Weights & Shipping Quantities

Size	Weight per (ft.)	Truckload # Joints/ Footage (if)	# Joints per Bundle	*Length of Extended Forks Recommended (ft.)
21"	14	48 / 672	4	8
24"	18	36 / 504	4	8
27"	24	27 / 378	3	8
30"	28	27 / 378	3	8
36"	42	12 / 168	2	8
42"	58	12 / 168	2	8
48"	82	10 / 140	2	8
54"	106	6 / 84	2	8

*Minimum for thickness should not exceed 2".

Table 4A. Nylon Pipe Air Leakage Allowances for Low Pressure Air Testing (1.0 PSIG Pressure Drop)

Pipe Diameter (in.)	Minimum Time (min./sec.)	Length for Minimum Time (ft.)	Time for Longer Length (sec.)	Specified Minimum for Length (L)							
				Show (min:sec)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
21"	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24"	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27"	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30"	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
36"	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46
42"	39:48	57	41.883 L	69:48	104:42	139:37	174:30	209:24	244:19	279:13	314:07
48"	45:34	50	54.705 L	91:10	136:45	182:21	227:55	273:31	319:06	364:42	410:17
54"	51:02	44	69.236 L	115:24	173:05	230:47	288:29	346:11	403:53	461:34	519:16

*Q is the allowable leakage rate in cu. ft./min./ft.² of inside surface area of pipe.

Table 4B. Nylon Pipe Air Leakage Allowances for Low Pressure Air Testing (0.5 PSIG Pressure Drop)

Pipe Diameter (in.)	Minimum Time (min./sec.)	Length for Minimum Time (ft.)	Time for Longer Length (sec.)	Specified Minimum for Length (L)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
21"	9:55	114	5.235 L	9:55	13:05	17:27	21:49	26:11	30:32	34:54	39:16
24"	11:20	99	6.837 L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17
27"	12:45	88	8.653 L	14:25	21:38	28:51	36:04	43:16	50:30	57:42	64:54
30"	14:10	80	10.683 L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07
36"	17:00	66	15.384 L	25:39	38:28	51:17	64:06	76:55	89:44	102:34	115:23
42"	19:54	57	20.942 L	34:54	52:21	69:49	87:15	104:42	122:10	139:37	157:04
48"	22:47	50	27.352 L	45:35	68:23	91:11	113:58	136:46	159:33	182:21	205:09
54"	25:31	44	34.618 L	57:42	86:33	115:24	144:15	173:05	201:56	230:47	259:38

*Q is the allowable leakage rate in cu. ft./min./ft.² of inside surface area of pipe.

Table 5. Vylon Pipe Deflection Dimensions

Base I.D. = (I.D. min) - Out-of-Roundness Tolerance

Short Term: 5% Deflection = .95 (Base I.D.)

Long Term: 7-12% Deflection = .925 (Base I.D.)

Nominal Diameter	Min. I.D. ASTM F-1803	Out-of-Roundness Tolerance	Base I.D.	5% Deflection	7-12% Deflection
21"	20.69"	0.57"	20.12"	19.11"	18.61"
24"	23.43"	0.64"	22.79"	21.65"	21.08"
27"	26.42"	0.72"	25.70"	24.41"	23.77"
30"	29.41"	0.80"	28.61"	27.18"	26.46"
36"	35.39"	0.96"	34.43"	32.71"	31.85"
42"	41.37"	1.13"	40.24"	38.23"	37.22"
48"	47.36"	1.45"	45.91"	43.61"	42.47"
54"	53.35"	1.94"	51.41"	48.84"	47.56"

Note: The base inside diameters have been developed for closed profile wall pipe manufactured in accordance with ASTM F-1803. The Out-of-Roundness Tolerance was derived statistically from field measurement data similar to ASTM F-679.

