

DEPEND--LOK[®]
mechanical coupling system



Depend-O-Lok Couplings

Since 1981 Depend-O-Lok has offered engineers, contractors, OEM's and system owners an improved pipeline coupling system. Depend-O-Lok products offer strength, long-term reliability, speed of installation and ease of maintenance.

The Depend-O-Lok coupling system represents the new generation of technologically advanced couplings. These couplings are designed, manufactured and tested to meet or exceed the design, materials, manufacture, and performance requirements set forth in AWWA C-219.

The design features and benefits of these couplings allow the piping industry versatility in design and application not found with other coupling systems. D-O-L offers savings in both cost of components and man-hours for installation; Depend-O-Lok also eliminates the problems of "out of round" pipe often incurred with other types of coupled or welded joints. In most cases, pipe ends that are visibly out of round can be sealed easily and securely with D-O-L couplings. Pipe that may become out-of-round due to earth loading will remain sealed when D-O-L couplings are used.

Depend-O-Lok coupling systems are able to provide for expansion and contraction at the pipe joint and full joint restraint without supplemental joint harnesses.

Type 1 couplings are standard Depend-O-Lok bolted, split-sleeve couplings and are an ideal substitute for bolted sleeve-type couplings in every application where such a coupling is desired.

Type 2 couplings are the same as Type 1 units, except that shoulders have been added to allow for additional flexibility, angular deflection, pipe movement or strength at the pipe joint, depending on model chosen.

Common Features & Benefits

Closure Plates simplify installation by enabling the coupling to seal with fewer bolts and allowing the coupling to be oriented to a position where the bolts are easily accessible. The closure plates also allow the coupling to be provided in multiple segments, for ease of shipping, field handling and installation.

Low Profile permits the coupling to pass through restricted openings, and allows for easy assembly in tight quarters.

Gaskets a simple "O" ring design assures uniform compression on the entire circumference, eliminating the need for spacers.



Sealing Pad enables the coupling to fit each joint perfectly, ensuring a leakproof seal, even when pipe end diameters vary significantly.

Bolts and Nuts are sized to provide yield strength greater than the cross section of the coupling body, and only need to be tightened once to secure the joint. Optional stainless steel, or hot dipped galvanized bolts are available.

Sleeve (body) designed for maximum pipe protection, and installation on out of round pipe. The "double arch" shape of the sleeve provides high section modulus and strengthens the pipe joint. Design enables installation without the need for jacks, or shims.

Coupling shown is a Type 1, but features and benefits described are common to all ExE, FxE and FxF couplings.

Depend-O-Lok Coupling Modifications & Options

RC is a modification which provides reinforcement at the closure plates. When rigid pipe, such as ductile iron or cement mortar lined steel, is out of round the D-O-L coupling undergoes additional stress at the closure plates due to the force required to round out the pipe. For these applications the ExE, FxE or the FxF Type 2-RC coupling is recommended. ExE, FxE and FxF Type1-RC are good choices to couple large diameter, standard wall, steel pipe that is likely to be out of round. The RC modification is generally not required for large diameter, light wall, pipe that may be out of round.

HP identifies the high pressure modification of either an ExE, FxE or FxF Type 1, or Type 2 coupling. It features reinforced, offset closure plates. This modification enables the coupling to operate at extreme pressures. If the coupling you require will be operating at high pressure the HP modification is recommended.

Table 1 - ExE, FxE and FxF Dimensional Data

Nominal Pipe Size	Dimensions (T1)		Popular widths (w)			
	D-1max.	D-2 max.	5"	7.5"	10"	12"
2	3.40	4.50	●	●		
3	4.52	5.60	●	●		
4	5.70	6.90	●	●	●	
5	6.70	8.00	●	●	●	
6	7.90	9.10	●	●	●	
8	10.13	11.25	●	●	●	●
10	12.25	13.75	●	●	●	●
12	14.38	16.25	●	●	●	●
14	16.00	17.75	●	●	●	●
16	18.00	19.75		●	●	●
18	20.00	21.75		●	●	●
20	22.00	24.50		●	●	●
24	26.50	29.00		●	●	●
30	32.50	35.00		●	●	●
36	38.50	41.00		●	●	●
42	44.75	47.00		●	●	●
48	50.75	53.13		●	●	●
54	57.00	59.25			●	●
60	63.00	65.25			●	●
66	69.75	71.38			●	●
72	76.00	77.75			●	●
84	88.13	89.81			●	●
96	100.12	102.06			●	●
108	112.12	114.06			●	●
120	124.50	126.63			●	●
132	137.25	139.38			●	●
144	149.25	151.63			●	●

Units of measure

All dimensions shown are in inches. For specific metric sizes please contact Victaulic Depend-O-Lok, Inc.



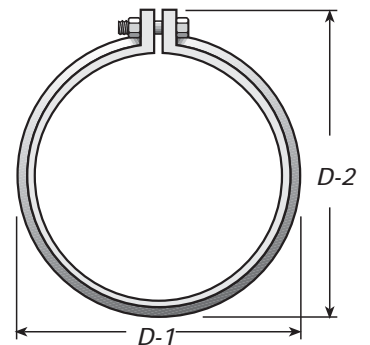
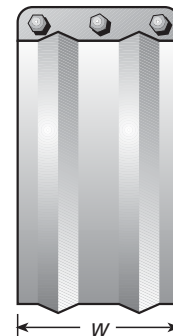
RC modification



HP modification

Width key

Standard width ●
Optional widths ●



ExE Flexible, Air-Tight Couplings

ExE Flexible Couplings are designed for vibration reduction and allow for angular deflection at the pipe joint while still maintaining the full integrity of the seal.



72" ExE T1 on steel pipe.



54" ExE T2 RC on HDPE pipe.

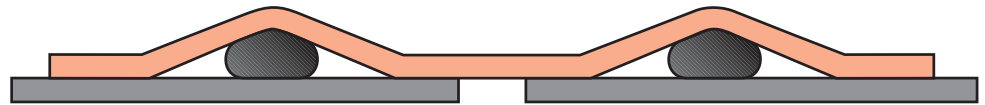
Depend-O-Lok ExE couplings are bolted, split-sleeve, single-point closure units that meet or exceed the design, materials, manufacture*, and performance requirements set forth in AWWA C-219. Features and Benefits include:

- Angular deflection at the pipe joint - while still maintaining the full integrity of the coupling seal.
- Vibration reduction
- Fewer Bolts - that only need to be tightened once to secure the joint. Bolted sleeve type couplings need to be star tightened and re-torqued 3 times to achieve cold flow on the wedge shaped gasket.
- Multiple Segments - reduce shipping and handling cost while allowing for easier installation in confined quarters. Multiple segments allow a D-O-L coupling to be removed without moving the pipe.

AWWA C219 for bolted, Sleeve-Type Couplings for Plain-end Pipe states "... it is normal to expect to use jacks, wedges, shims, or other means to facilitate assembly of the (bolted, sleeve-type) coupling on the pipe ends." The Depend-O-Lok coupling virtually *eliminates* that and the damage those means can do to the pipe. Pipe ends that are visibly out-of-round, as the 72" pictured on the left, can be coupled easily, and securely, with D-O-L couplings. In fact, the 72" coupling on the left was installed by two men in just under 30 minutes.

ExE Couplings are Engineered to Match Users Needs

Depend-O-Lok couplings are designed for use with all types of pipe, including: carbon steel, stainless steel, special alloys, ductile iron, concrete, fiberglass/FRP, asbestos cement, and plastic including PVC and HDPE. Depend-O-Lok couplings have features that benefit Engineers, Fabricators, OEM'S, Contractors and System Owners. D-O-L couplings on permanent plant and line piping install quickly, and can be taken apart quickly, which reduces down time for maintenance. Depend-O-Lok couplings are also an excellent choice for all temporary pipelines, high pressure or low. Dredge piping, piping in tunnels, mine and slurry pipelines will all benefit from the use of Depend-O-Lok couplings.



ExE Type 1 is the basic Depend-O-Lok bolted, split-sleeve coupling, that provides flexibility at the pipe joint. The Depend-O-Lok ExE coupling is an ideal substitute for a bolted sleeve-type coupling in every application where such a coupling is desired.

* Note: Body of the split sleeve Depend-O-Lok coupling is not cold expanded.

ExE Type 2 is the same as the Depend-O-Lok ExE Type 1 coupling, except that shoulders have been added to allow for more angular deflection within the pipe joint. When angular deflection exceeds the values listed in Table 1, order the Depend-O-Lok couplings in two segments, mitered to the proper degree (up to 22.5°).



86" ExE T2 on steel pipe.



74" ExE T1 RC on steel pipe.



54" ExE T1 on FRP pipe.

Nominal Pipe Size	Deflection	
	Type1	Type 2
2	5.00°	–
3	5.00°	–
4	5.00°	–
5	4.50°	–
6	4.50°	–
8	4.50°	8.50°
10	4.50°	8.00°
12	4.50°	7.50°
14	4.50°	7.17°
16	4.00°	5.50°
18	4.00°	4.83°
20	4.00°	4.50°
24	4.00°	7.20°*
30	3.00°	5.83°*
36	3.00°	4.83°*
42	2.00°	4.00°*
48	2.00°	3.50°*
54	2.00°	3.17°*
60	1.75°	3.00°*
66	1.50°	2.67°*
72	1.50°	2.30°*
84	1.00°	2.17°*
96	1.00°	1.83°
108	1.00°	1.67°
120	1.00°	1.50°
132	1.00°	1.33°
144	1.00°	1.17°

Units of measure

All dimensions shown are in inches. For specific metric sizes please contact Victaulic Depend-O-Lok, Inc.

*Deflection per joint
Chart measurements are in degrees. If more angular deflection is desired please contact your sales representative for details.*

** Deflection values marked with an asterisk are based on a 12" wide coupling.*

For almost twenty years, Depend-O-Lok FxE Couplings have been providing an economical, effective method of dealing with pipeline thermal expansion and contraction.



10" & 16" FxE T1 on stainless steel pipe.

Units of measure

All dimensions are in inches

Table Glossary

L - Distance from end of pipe to near edge of End Ring.

R - Diameter of End Ring.

R1 - Diameter of inner End Ring.

R2 - Diameter of outer End Ring.

G - Gap, at installation, between pipe ends.

C/E - Total of Contraction & Expansion.

SR - Distance between End Rings for FxE type 2.

FxE Fixed x Expansion Coupling

Thermal expansion and contraction is a reality that engineers must deal with in their design of structures and piping systems. Depend-O-Lok couplings use "O" rings to accomplish the radial seal. When pipe ends move under Depend-O-Lok, the "O" rings, unlike the wedge shaped gaskets used with the bolted, sleeve-type couplings, do not distort and lose their seal against the pipe. This feature enables the Depend-O-Lok FxE coupling to allow significant axial expansion and contraction of the pipe joint.

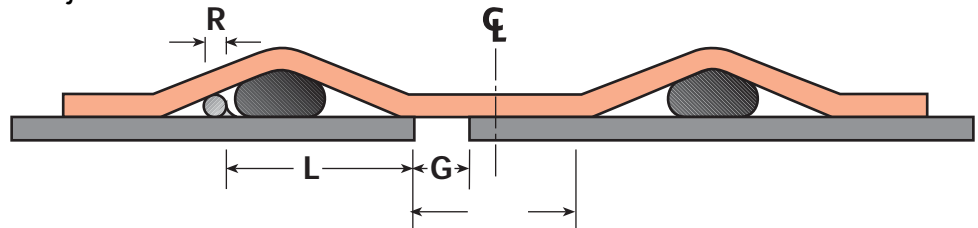
Features and Benefits of the FxE coupling include:

- Up to 6" of Axial movement - provides greater expansion/contraction than the 3/8" movement of a bolted, sleeve-type coupling as set forth in AWWA C219.
- Closure Plates - allow the coupling to be ordered in multiple segments for ease in shipping, field handling and installation. Closure plates can be oriented so that bolts are easily accessible for easy assembly.
- Sealing Pads and Sealing Plates - enable the coupling to fit each pipe joint perfectly.
- Double Arched Body - provides high section modulus, making it easy to install on out of round pipe and strengthens the joint.
- Ease of Adaptation - FxE couplings can be lined with various compounds or manufactured using hybrid alloys to accommodate most piping applications.

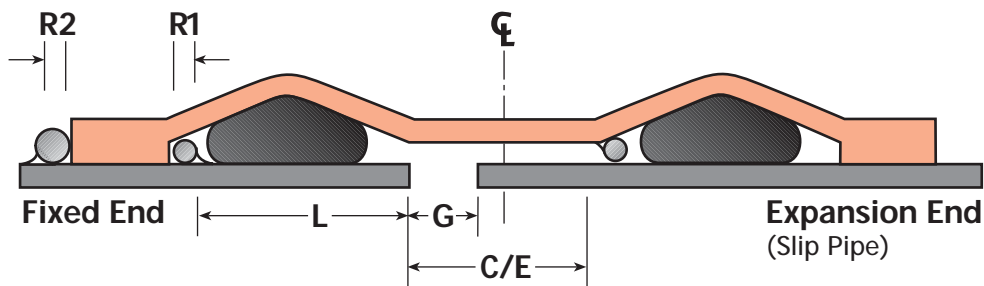
Depend-O-Lok expansion couplings used in conjunction with "fixed" and "sliding" supports make the most economical expansion system available. The whole system goes together quickly, requires little maintenance and will last a long, long time.

FxE Type 1 is the basic Depend-O-Lok bolted, split-sleeve coupling that allows for expansion and contraction at the pipe joint.

Please Note that D-O-L fixed x expansion couplings are designed for use where deflection at the joint is not a factor. If expansion and deflection occur at the same time, please ask Victaulic Depend-O-Lok, Inc. sales about OmniFlex expansion joints.

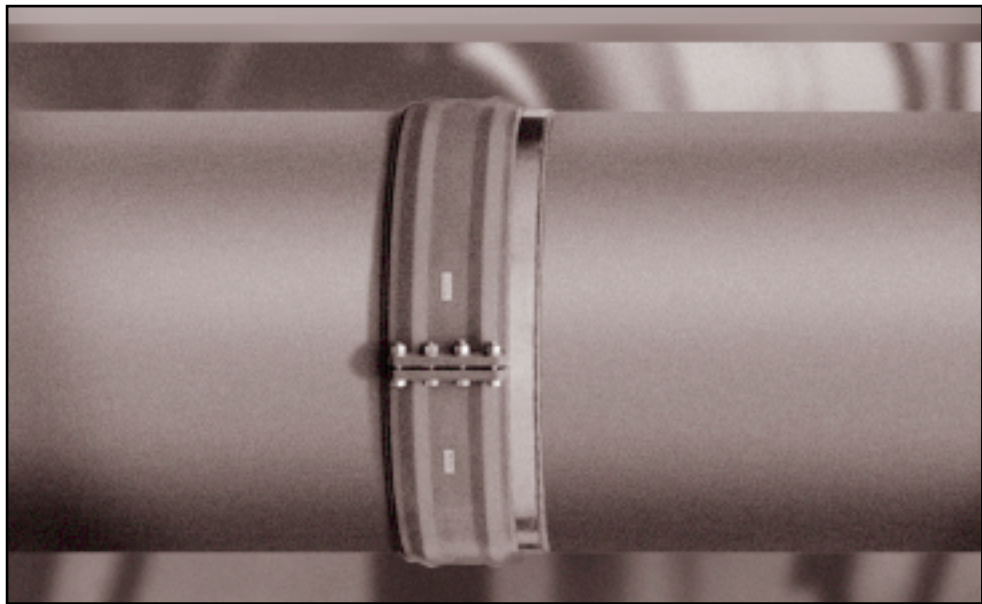


Nominal Pipe Size	"R"	"L"	"G"	Contraction / Expansion (C/E)		
				W=5"	W=7.5"	W=10"
2 - 4	0.125	1.125	0.375	0.750	-	-
5 - 6	0.188	1.750	0.375	0.750	1.250	-
8 - 14	0.250	2.000	0.625	0.750	1.250	1.750
16 - 20	0.250	2.000	0.625	-	-	1.500



Nominal Pipe Size	Contraction / Expansion (C/E)							
	"R1"	"R2"	"L"	"G"	W=12"	W=14"	W=16"	W=18"
24 - 48	0.312	0.375	3.250	Note 2	2.000	3.500	5.00	6.500
49 - 84	0.375	0.500	3.250	Note 2	2.000	3.500	5.00	6.500
85 - 108	0.438	0.625	3.250	Note 2	2.000	3.500	5.00	6.500
109 - 144	0.500	0.750	3.250	Note 2	2.000	3.500	5.00	6.500

FxE Type 2 is a shouldered expansion coupling, and should be considered when longer pipe movement is desired. A Teflon® shoulder provides for smooth movement of the pipe within the coupled joint. Two end rings on the pipe at the fixed end of the coupling keep the D-O-L in the proper location.



48" FxE T2 Expansion Coupling on steel pipe.

14" FxE T1 Transition PVC to stainless steel pipe.



Notes:

1. The "L" dimension given for FxE Type 1 is for a 10" wide coupling, and FxE Type 2 is for a 12" wide coupling. This value may increase with the wider couplings.
2. "G" is the Gap at installation and is determined by the width (W) of the D-O-L Expansion Coupling and the temperature at the time of installation.
3. Submittal Details prepared by Victaulic Depend-O-Lok, Inc. for engineer approval will accurately detail each design application, showing all dimensions and should be considered as the latest information.

When FxE Type 2 coupling is used on Carbon Steel, or Ductile Iron pipe, the D-O-L coupling will be furnished with a Stainless Steel Cladding that is to be shop welded onto the expansion end of the pipe. This Cladding provides a smooth surface for long term, trouble free performance.

Expansion per joint
Total expansion is determined by the width of the coupling, and coupling type.

FxF Fixed x Fixed Couplings

The D-O-L FxF coupling is a split-sleeve coupling that is designed to provide a strong, leakproof seal and fully restrain the pipe joint without the cost and labor of outdated harness lugs and tie rods.



Hydraulic Closure Tool on FxF T2 on cement coated steel pipe.

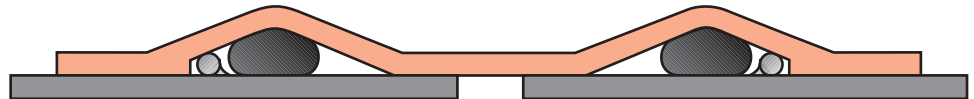
The desire of the system owner and the design engineer is to select the method of joining pipe that best suits their needs from a practical, economical and performance viewpoint. If you are looking for a pipe joint that is strong, fully restrained under pressure and can be taken apart and put back together quickly, please consider the Depend-O-Lok FxF. The D-O-L FxF is able to fully restrain a pipe joint under full test pressure.

Advantages of the FxF coupling include:

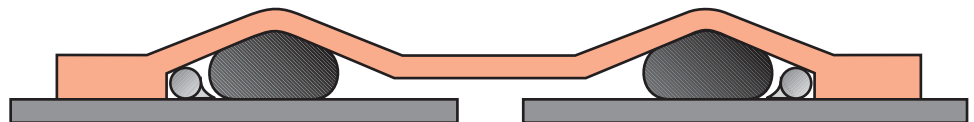
- Sealing Pads and Sealing Plates reinforce the O-Ring seal at the point of closure.
- Body design allows for installation without the need for jacks or wedges sometimes required for the installation of bolted sleeve type couplings.
- O-Rings assure uniform compression on the entire circumference, eliminating the need for spacers.
- Joint Customization - End Rings allow for joint to be customized to accommodate piping restraint requirements, minimizing project costs.
- End Rings are not exposed to material being transported, thus requiring only a structural weld for attachment to pipe ends, reducing fabrication costs.
- Space Saving - The restraining End Rings are internal to the coupling, requiring much less space to install this restrained joint.
- Far Fewer Bolts required to achieve a joint meeting the pressure requirements of the project, reducing time and costs.
- Subterranean Protection - Low profile coupling body and closure plates can easily be protected underground.



FxF Type 1 is the basic Depend-O-Lok bolted, split-sleeve coupling that fully restrains pipe. Generally for small diameter at low pressure.



FxF Type 1 SR is a Type 1 coupling with built in shoulders. This type is used for small to medium size pipe in low and medium operating pressures and where dimensional stability is desired. The built-in shoulder provides a hard stop for the End Ring on the pipe ends.



FxF Type 2 is a shouldered coupling. The diameter of the End Rings on the pipe ends determine the thickness of the shoulders.



144" FxF T2 HP on steel pipe.



72" FxF T2 RC on cement coated steel pipe.



16" FxF T1 Outlet Coupling on spiral weld steel pipe.

Pipe End Preparation for Joints Restrained by D-O-L FxF

C.S., S.S. & D.I. Pipe - End Rings furnished with the D-O-L couplings are welded to the pipe ends.

FRP Pipe - A fiberglass rod is "welded" to the FRP pipe ends. Alternatively, the pipe ends can be built up thick enough to have a groove cut into the pipe that will accept the shoulder.

Polyethylene Pipe - D-O-L FxF Type2 couplings have a shoulder that sits in grooves that are cut into each pipe end. This method is strong and suggested for pressure or high stress applications. For gravity to very low pressure applications, the D-O-L couplings may be furnished with bosses around each edge. After installation, holes are drilled into the pipe through each boss and a set screw is threaded through the boss into the wall of the pipe.

Standard AirMaster Applications:

- Wastewater treatment aeration piping
- Low to medium Natural Gas transmission piping
- Odor control piping
- Duct and ventilation piping

Standard FluidMaster Applications:

- Water Plant piping
- Wastewater Plant piping
- Force main piping
- Slurry lines



Product Overview

In addition to the ExE, FxE and FxF Depend-O-Lok couplings, Victaulic Depend-O-Lok, Inc. manufactures a full line of products to meet your coupling and pipeline needs, including:

AirMaster / FluidMaster

AirMaster and FluidMaster couplings are designed to provide fully restrained joints for aeration piping and liquid piping respectively. These couplings meet or exceed the quality and performance requirements set forth in AWWA C-606 for grooved and shouldered pipe.

AirMaster is ideal for aeration piping and low to medium pressure gas pipelines. These couplings provide an economical alternative to flanges and field welding. Ideal for use with bellows type expansion joints such as the OmniFlex listed below. This pairing offers an economical means of providing for the thermal expansion and contraction that these lines are subject to due to extreme temperature changes that occur along the pipeline. The advantages of the AirMaster and FluidMaster couplings include:

- Unparalleled size range from 8" - 144"
- Allowance for some pipe diameter variation while fitting each joint perfectly.
- Fast, strong and economical pipe end preparation.
- Simpler pipe end preparation. End Ring attachment to pipe is a structural weld designed for full end thrust at test pressure.
- Lower profile, and couplings are lighter and stronger.

InnerSeal *Internal Repair Sleeves*

Repairing leaking pipelines in buried service has long been a complex, time consuming, and expensive process. You want high quality and cost effective solutions without the need for excavation. With Depend-O-Lok's InnerSeal and InnerFlex units, you get that ...and more.

The Depend-O-Lok InnerSeal Repair system gives you the assurance of a strong and lasting repair. With InnerSeal you can use your own labor force to make repairs quickly and easily. This results in savings of 75% or more over conventional repair methods and 35% over other internal seals. Workers, with access to the pipeline through manholes, can fix the leak and immediately test the repair.

Typical InnerSeal applications include repairing pipes that have:

- Leaking joints caused by pipe deflection
- Joints leaking due to pipe offset
- Leaks caused by corrosion
- Cracks or holes.
- Joint leaks due to out-of-round pipe.
- Leaded joints, to isolate the lead from potable water.

InnerSeal has the desirable low profile that assures maximum flow through the pipeline. Standard units are designed for pipes from 18" to 180" diameter with



internal working pressures up to 300 psi. Victaulic Depend-O-Lok, Inc. has furnished specially designed InnerSeals for 216" I.D. pipe. InnerSeal units may be manufactured for transition joints and are available in multiple segments, for ease of handling in confined spaces.



InnerSeal, Type II uses arched bands. These units are designed for installation where joint deflection and offset may exist and where spanning wider areas of damaged pipe is desired. The standard width for this unit is 12" and is available in 12" increments up to 48" wide. The standard installation test pressure is 5 psi.

The narrower, lighter bands of the InnerSeal II are easy to handle, making it the ideal choice for pipeline rehabilitation or for repairing leaks at difficult to reach pipeline locations. Type II are the easiest to install, resulting in the most economical solution to your joint problems.



InnerFlex features heavier arched bands than that of the InnerSeal II unit, paired with a unique flexible sleeve. The InnerFlex is the ideal solution for joints in a dynamic state where additional joint deflection, offset and expansion may occur. InnerFlex standard width is 18" and is available in widths up to 54". Standard installation test pressure for these units is 7 psi.

Encapsulating Couplings

The Depend-O-Lok Encapsulating coupling is a bolted, split-sleeve, two-segment unit that is designed to enclose failing pipeline joints, without the need to remove the failed coupling, move the pipe or take the system off line. It meets or exceeds the guidelines set forth in AWWA C-219, concerning design, materials, manufacture, and performance requirements. They are designed specifically to encapsulate and seal :

- Leaking Bell & Spigot push joints
- Leaking coupling joints
- Most other failed and leaking joints

The traditional method of repair of leaking bell & spigot joints or joints with leaking couplings is to drain the line, move or remove sections of pipe and replace the leaking joints or couplings with new pipe and/or couplings. If it is a potable water line it must be disinfected before service is returned to the customer. All this takes time and is expensive.

The Depend-O-Lok Encapsulating coupling is the result of D-O-L technology developed by Victaulic Depend-O-Lok, Inc. This proven method of sealing air and water lines has allowed Victaulic Depend-O-Lok, Inc. to create a coupling that can fully encase failing pipe joints providing a new, air tight, high pressure seal. It is fast, economical and provides a long-term solution to the problem of leaking or failing joints.

If you would like a complete binder detailing the Depend-O-Lok line of products, please contact your local Victaulic Depend-O-Lok sales representative: (800) 841-6624.



InnerSeal Hydraulic Spreader Tool



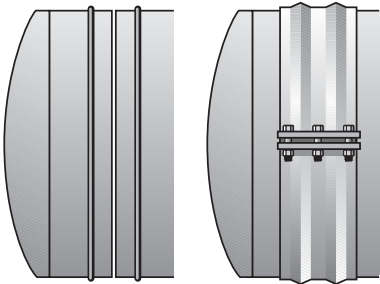


Depend-O-Lok FxE Flanged Adapter Coupling

Depend-O-Lok FxE Flanged Adapter Couplings provide:

- field dimensional adjustment that is so useful when piping up to pumps, valves and equipment that is set with anchor bolts.
- room for the pipeline to expand and contract.
- easy to install in tight quarters.
- easy access to service equipment - downtime is minimized.

Most other Flanged Adapter Couplings on the market will allow only 3/8" of pipe movement. The Depend-O-Lok Flange Adapter Coupling allows for up to 5.75" of movement. A Flanged Adapter Coupling that provides pipe restraint is also available.



Dished Head by D-O-L End Spool Piece

An effective, economical method of:

- Ending a pipeline for future addition.
- Closing of a section of pipeline for air or hydro test.
- Sealing a pipeline under construction at the end of the day to prevent unauthorized entry. For this purpose the D-O-L End Ring may be "tacked" on.
- Manway entry.

The D-O-L End is prepared for Depend-O-Lok FxF Type 1 SR or Type 2 Couplings. The thickness of the Dished Head is determined by the test pressure. This method is useful for Steel, Stainless Steel, Ductile Iron, Polyethylene and Fiberglass pipe.

PRODUCT WARRANTY

DEPEND-O-LOK product lines are manufactured by Victaulic Depend-O-Lok, Inc. and are warranted to be free from defects in material and workmanship, provided they are used for the purpose, and under the conditions recommended by Victaulic Depend-O-Lok, Inc., and are installed in accordance with the best practices of the trade. Victaulic Depend-O-Lok, Inc. company's obligation under this warranty is limited to the replacement at its factory, of any product which, within one year after the date of shipment by Victaulic Depend-O-Lok, Inc. to the original purchaser, shall be returned to Victaulic Depend-O-Lok, Inc. and which Victaulic Depend-O-Lok, Inc. company's examination shows to have been defective.

This warranty is in lieu of all other warranties, express or implied.



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