



The Pipe Line Development Company

870 Canterbury Road • Cleveland, Ohio 44145

Phone: (440) 871-5700 • Fax: (440) 871-9577

Toll Free: 1-800-848-3333

www.plidco.com • E-mail: pipeline@plidco.com

PLIDCO® WELD+ENDS INSTALLATION INSTRUCTIONS

!! WARNING !!

IMPROPER SELECTION OR USE OF THIS PRODUCT CAN RESULT IN EXPLOSION, FIRE, DEATH, PERSONAL INJURY, PROPERTY DAMAGE AND/OR HARM TO THE ENVIRONMENT.

Do not use or select a Plidco Weld+Ends until all aspects of the application are thoroughly analyzed. Do not use the Plidco Weld+Ends until you read and understand these installation instructions.

Every effort has been made to securely package this product prior to shipment. Thoroughly inspect for any damage that may have occurred during shipment. If you have any questions or encounter any difficulties using this product please contact:

PLIDCO "DEPARTMENT 100" at 440-871-5700
toll free U.S. & Canada 800-848-3333

READ CAREFULLY

The person in charge of the installation must be familiar with these instructions and communicate them to all personnel involved.

SAFETY CHECK LIST

- ☐ Read and follow these instructions carefully. Follow your company's safety policy and applicable codes and standards.
- ☐ Be absolutely certain that the correct seal material has been selected for the intended use.
- ☐ Determine the type of joint that the Plidco Weld+Ends coupling is expected to connect. See (a) and (b) below and determine the appropriate rating from the ratings listed on the label of the Plidco Weld+Ends coupling.
- ☐ (a) Pipe Not Anchored

A joint in which the pipe ends could move when subjected to internal or external forces, such as internal pressure, temperature expansion and contraction, underwater currents, ground movement or any

combination thereof. The assigned Plidco Weld+Ends Pipe Not Anchored rating considers only the end force created by the internal pressure. It does not consider any additional external forces such as temperature expansion and contraction, underwater currents, ground movement or any combination thereof. These additional external forces must be determined by the customer. If any of these forces cannot be restrained by customer proven techniques, a Plidco Clamp+Ring should be used.

(b) Anchored Pipe

A joint in which the pipe ends would not move when subjected to these same forces. The Plidco Weld+Ends Anchored Pipe rating is the maximum pressure at which the pipeline can be operated. It assumes that the pipeline is suitably anchored by welding, by the use of an appropriately rated Plidco Clamp+Ring or by other customer proven techniques.

Observe the pressure and temperature ratings on the label of the Plidco Weld+Ends coupling. Do not exceed the maximum appropriate pressure indicated on the unit.

Minimum Pipe Wall Thickness for a Plidco Weld+Ends	
Nominal Pipe Size (inches)	Wall Thickness (inches)
1½	0.200
2	0.218
2½	0.276
3	0.237
4	0.237
6	0.280
8	0.322
10	0.365
12	0.409
14	0.438
16 & larger	0.500

Pipe wall thickness less than those listed may be pushed inward by the force of the clamp screws. Contact Plidco for recommended maximum working pressure and revised clamp screw torque on thin wall pipe.

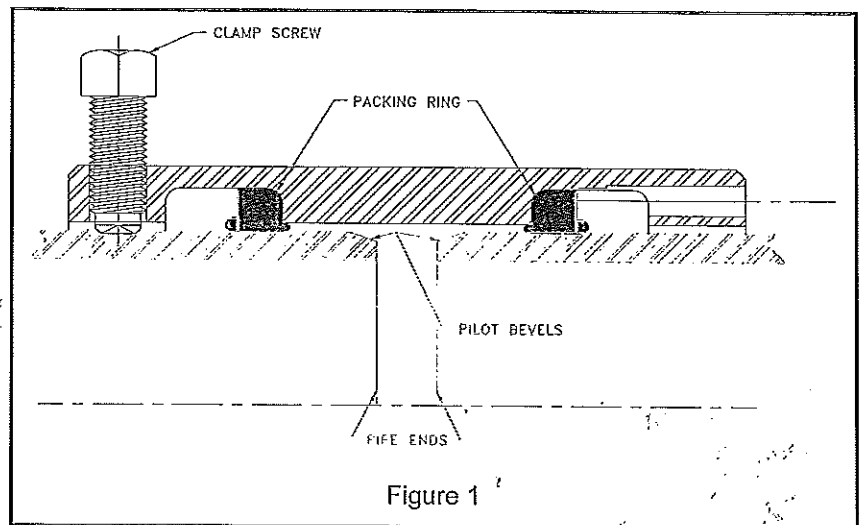
A Plidco Clamp+Ring should be considered whenever the wall thickness is less than those listed. A Plidco Clamp+Ring should also be considered where high external forces (such as underwater currents or thermal contractions) are anticipated, even if the pipe has an adequate wall thickness.

Pipelines should be carefully blocked at elbows and bends to prevent pullouts caused by internal and external forces; or a Plidco Clamp+Ring should be used. The pipeline should be evenly supported before repressuring. Follow applicable B31 codes during repressuring.

- If the Plidco Weld+Ends coupling is welded according to our instructions, or a suitable Plidco Clamp+Ring is used, it can be considered an anchored joint.

PIPE PREPARATION

1. The pipe surface in the area of the repair should be clean, free of coating and burrs and lubricated to prevent abrasion to the seals.
2. For badly misaligned or out-of-round pipe, it is helpful to grind a pilot bevel with a generous taper on the pipe. This would eliminate the risk of damage to the seals while slipping the Plidco Weld+Ends coupling over the end of the pipe. (See Figure 1).



INSTALLATION

The seals can be damaged by careless handling. Lifting devices such as chains, cables or lift truck forks should not contact the seals. Failure to do so can result in the seals being damaged or pulled from their grooves.

1. Measure and record dimension "D", as shown in Figure 3. This will be needed later if the Plidco Weld+Ends is welded to the pipe.
2. Coat all exposed surfaces of the seal material with a lubricant. The following chart indicates the lubricants that are recommended for the various seal materials. The customer must determine if the lubricant is compatible with the product in the pipeline.

Buna-N	A, B, C	225°F
Viton	A, B, C	250°F
Silicone	C	450°F
Neoprene	B, C	250°F
Aflas	A, B, C	250°F
Teflon	A, B, C	500°F
Kevlar	A, B, C	750°F
Petroleum based lubricant	= A	
Silicone based lubricant	= B	
Glycerin based lubricant	= C	

Slide the Plidco Weld+Ends coupling completely over one end of the pipe. Mark on the pipe one-half the Plidco Weld+Ends coupling's length from the middle of gap (recommended gap not to exceed 3/4 inch). Slide the Weld+Ends coupling back to the mark to divide the coupling equally over the joint. (See Figure 2)

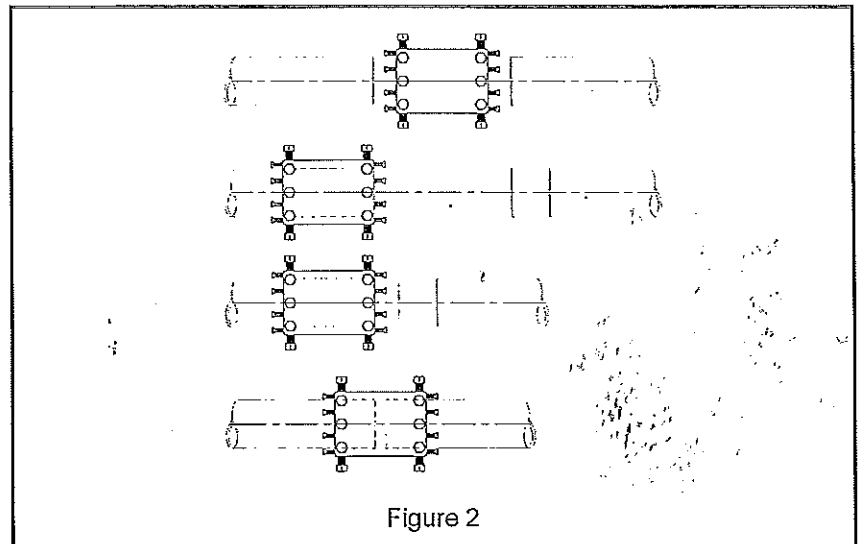


Figure 2

Clamp screws have case hardened cup points which are used to secure the coupling to the pipe. The shanks are mild steel and fully weldable. Clamp screws should be tightened evenly, maintaining an equal space between the pipe and the coupling using the recommended torque values. Clamp screws are designed for the assigned Plidco Weld+Ends Not Anchored rating which considers only the end force created by the internal pressure. Clamp screws do not consider any additional external forces or stresses imposed on the pipeline. (See Safety Check List, (a) *Pipe Not Anchored*)

5. Accurate clamp screw torque values are very important when the Plidco Weld+Ends coupling is used on a pipeline joint that is NOT ANCHORED. Do not exceed the Pipe Not Anchored Rating listed on the label of the Plidco Weld+Ends until subsequent welding has been completed. FAILURE TO DO SO CAN RESULT IN EXPLOSION, FIRE, DEATH, PERSONAL INJURY, PROPERTY DAMAGE AND/OR HARM TO THE ENVIRONMENT.
6. Check all clamp screws to make certain each has received at least the minimum torque specified in the chart below.

Cup Point Clamp Screws	Minimum Torque	
	(ft-lbf)	(Nm)
5/8-11	100	136
3/4-10	150	240

7. Thrust screws activate the seals. They are made of mild carbon steel and are fully weldable. They should be tightened gradually and uniformly around the circumference. First, snug all the thrust screws firmly. Then advance each thrust screw about 1/8 of a turn before proceeding to an adjacent thrust screw. It will be necessary to make many circuits around the coupling before completing the thrust screw torque operation. Use recommended torque values in the chart below.

Thrust Screws	Torque Range	
	(ft-lbf)	(Nm)
3/8-16	20 - 25	28 - 34
1/2-13	30 - 40	41 - 55
5/8-11	70 - 80	95 - 109

8. A final torque range, shown in the chart above, will be adequate to complete the assembly.
9. Repressuring after the repair should be done with extreme caution; slowly and steadily without surges which could vibrate the pipeline and fitting. Industry codes and standards are a good source of information on this subject. Operating pressure must not exceed the maximum appropriate Pipe Anchored or Pipe Not Anchored Rating. Personnel should not be allowed near the installation until the seal has been proven.

FIELD WELDING INSTRUCTIONS

PIPELINE SHOULD BE FULL AND UNDER FLOW

Use absolutely dry electrodes which are of equal or greater tensile strength than the pipe. Carefully control the size and shape of the circumferential fillet weld. The weld is required to anchor the joint and give longitudinal stability to the pipeline.

The size of the fillet weld should be at least 1.4 times the wall thickness of the pipe. This assumes a 1.0 joint efficiency. You may need to select a different joint efficiency based on your level of inspection or your company's welding policy. Strive for a concave faced fillet weld with streamlined blending into both members; avoid notches and undercuts.

The smoother and more streamlined the weld, the greater the resistance to fatigue failure. The worst possible shape would be a heavy reinforced convex weld with an undercut. Improper weld shape can lead to rapid fatigue failure which can cause leakage, rupture or explosion with serious consequences.

Welders and weld procedures should be qualified in accordance with API Standard 1104, *"Welding of Pipelines and Related Facilities"*, or RP 1107, *"Recommended Pipeline Maintenance Welding Practices"*, latest edition. API 1104 and 1107 have easy to follow directions for procedure qualification.

We encourage the use of low hydrogen electrodes (E-XX18) because of their high resistance to moisture pick-up and hydrogen cracking. Shielded metal arc welding (SMAW) filler metals listed in API 1104 and 1107 include the cellulose coated electrodes (E-XX10 series) which are often preferred because of the excellent downhill welding characteristics. These are acceptable filler metals, provided they are proven by procedure qualification.

It is very important that the field welding procedure closely follow the essential variables of the qualified procedure so that the quality of the field weld is represented by the physical tests performed on the procedure qualification test specimen.

Dimension "D", as measured during the initial installation, may now be used to mark off locations "A" and "B", as shown in Figure 3. These locations are the same distance from the weld as the seal location "C". To prevent damage to the seals, monitor the heat generated by welding or preheating, particularly at location "A" and "B", by using temperature crayons or probe thermometers. If the heat generated approaches the temperature limit of the seal material which is indicated on the label and in the seal lubrication chart, welding should be discontinued or sequenced to another part of the fitting so that the affected area has a chance to cool.

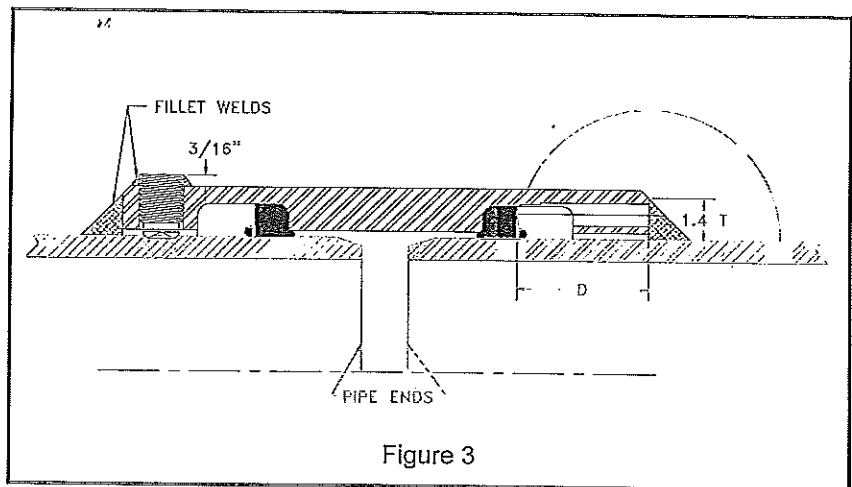


Figure 3

WELDING SEQUENCE

1. Caution should be observed so that welding or preheating does not overheat the seals. Sequence the welding so that the heat is not concentrated in one area.
2. Thrust screws should be cut or burned off flush. Start with the fillet weld to the pipe around circumference and include seal welding the thrust screws. (See Figure 3)
3. Cut or burn off clamp screws approximately 3/16" above the outside surface of the coupling and seal weld. One clamp screw near the top may be removed to serve as a vent while welding and also as a final test point for leakage. (See Figure 3)

FIELD TESTING

The Plidco Weld+Ends coupling can be field tested up to 1½ times the appropriate Pipe Anchored or Pipe Not Anchored Rating.

STORAGE INSTRUCTIONS

Plidco Weld+Ends couplings should be stored in a dry environment to prevent the unpainted surfaces from rusting. Storage temperatures should not exceed 120°F (49°C). Cover with a dark polyethylene to keep the direct sunlight from the seals. It is best to exclude contamination, light, ozone and radiation. Improperly stored Plidco Weld+Ends couplings can cause the gasket material to become cracked and brittle and lose its ability to seal.