PLIDCO®+FLANGE and PLIDCO®WELD+ENDS® Installation Requirements

EG 3-7-1-16

Revision 0

December 2023

Scope

1) This Engineering Guide (EG), previously a Baytown Drafting Practice (BTDP), provides guidelines and instructions for the use and installation of PLIDCO®+FLANGE and PLIDCO® WELD+ENDS® in the Baytown complex when requested and/or approved by the Owner's Engineer.
2) An example where the use of a PLIDCO®+FLANGE may be necessary would be for hot work downstream of a stopple in hydrocarbon service, when it is not possible to isolate (blind flange or slip blind) upstream of a stopple.
3) An example where the use of a PLIDCO® WELD+ENDS® coupling might be considered would be where replacement of a section of pipe is required in a line that can not be cleared or can not be cleared without considerable expense or delay and the use of flanges in the system are not allowed without engineering approval. Note: PLIDCO® WELD+ENDS® couplings may be cut in half and welded to a new section of pipe to allow installation to an existing section of pipe.
4) **An asterisk** ([*]) indicates that a decision by the Owner's Engineer is required, that additional information is to be furnished by the Owner's Engineer, or that information for Owner's Engineer approval is to be supplied by Vendor or Contractor.

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1. Concerns and Restrictions

1) [*] Use of a PLIDCO®+FLANGE or PLIDCO® WELD+ENDS® installation requires that the following items be addressed:
   a) Use has been approved by the Area LME.
   b) Seal/gasket material is compatible with the line contents and suitable for the design conditions.
   c) If the fitting will be welded out prior to being placed into service, then the seal material may not need to meet the design conditions, if approved by the Area LME.
   d) Clamp screw torque values shall be obtained from the manufacturer based piping wall thickness.
   e) Unanchored and anchored temperature/pressure ratings for the fitting shall be obtained from the manufacturer based on operating/design conditions and piping wall thickness. The unanchored rating at ambient temperature is also dependant on the gasket material specified for the fitting. Note: All installations are considered to be unanchored until fully back-welded.
   f) Specific installation and back welding requirements shall be specified.
   g) The fitting shall be welded after being placed into service. Note: In some instances, because of the unanchored rating of the fitting, it may be required to perform the welding prior to subjecting it to line conditions.
   h) Fittings are for use with carbon steel piping systems only.
   i) For use behind a stopple or stopples, the unanchored fitting rating shall at least equal the maximum long term (MLTC) pressure at ambient temperature, unless otherwise approved by the Area LME. Where it is proposed to use a fitting with an unanchored rating less than the normal operating pressure of the line, SOC approval is required.
2) [*] All PLIDCO®+FLANGE and PLIDCO® WELD+ENDS® assemblies require a special gasket that needs to be specified when ordering to insure compatibility with the service and operating temperature of the piping system. The vendor's standard material such as 'Buna-N' or 'Viton' may not be adequate.
3) [*] Each PLIDCO®+FLANGE and PLIDCO® WELD+ENDS® coupling installation must follow the vendor's specific installation and welding requirements. These should be specified on the engineering drawings and must be carefully followed during field installation.

2. Engineering Data

1) [*] The maximum working pressure of a PLIDCO®+FLANGE or PLIDCO® WELD+ENDS® coupling is reduced (i.e., unanchored) until it has been successfully back-welded (i.e., anchored).
2) **Figure 1** is a typical cross section of a PLIDCO®+FLANGE and its' components. Values for dimensions shown in Figure 1 are provided in **Table 1**.
3) **Figure 2** is a typical cross section of a PLIDCO® WELD+ENDS® and its' components. Values for dimensions shown in Figure 2 are provided in **Table 2**.
4) **Figure 3** provides an example of the required detail for the cutting and welding of the 'clamp' and 'thrust' screws of PLIDCO®+FLANGE or PLIDCO® WELD+ENDS® couplings after installation.

3. Required Documentation

1) A simplified step-by-step listing of the procedures, including reference to the requirements for PLIDCO®+FLANGE or PLIDCO® WELD+ENDS® coupling installation, shall be provided on the engineering drawings.
2) Thrust screw torques for PLIDCO®+FLANGE and PLIDCO® WELD+ENDS® are pipe size dependent but not wall thickness dependent. The following torque values shall be provided on the drawings as required for the applicable size of the installation:
   a) Pipe 1-1/2” thru 6” NPS – 3/8” Dia. thrust screws: **20-25 ft-lbs of torque**.
   b) Pipe 8” thru 16” NPS – 1/2” Dia. thrust screws: **30-40 ft-lbs of torque**.
   c) Pipe 18” NPS and larger – 5/8” Dia. thrust screws: **70-80 ft-lbs of torque**.
3) Clamp screw torque values obtained from the vendor shall be shown on the drawings.
4) The anchored and unanchored temperature/pressure ratings for the selected fitting obtained from the vendor shall be shown on the drawings.
5) The gasket material of the selected fitting shall also be provided on the drawings.
6) A detail providing welding instructions similar to **Figure 3** shall be provided on the engineering drawings or sketches as required.

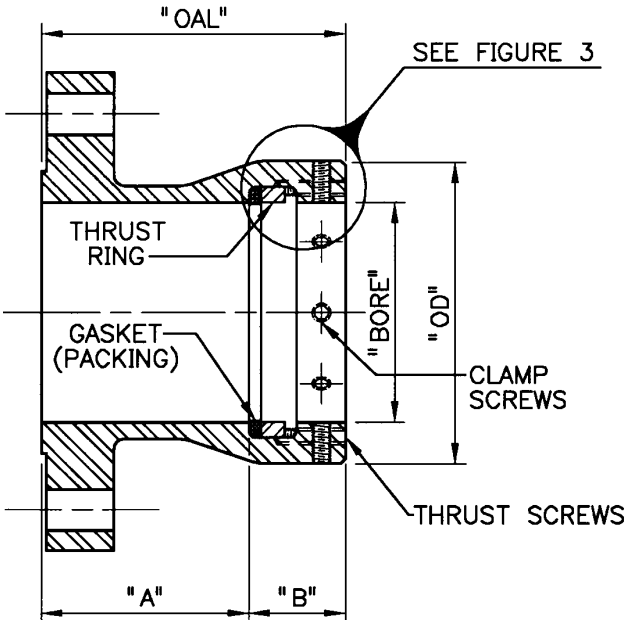


Figure 1: Typical PLIDCO®+FLANGE Cross Section
NOTE: (See Table 1 for dimensional data)

Table 1: PLIDCO®+FLANGE Dimensions

Nominal Pipe Size	OD (2) Dim.	Bore Dim.	OAL Dimensions			A Dimensions			B Dim	Screws (Ø-#)	
			150#	300#	600#	150#	300#	600#		Clamp	Thrust
1-1/2”	3-1/4	1.968	5-9/32	5-19/32	5-29/32	2-7/8	3-3/16	3-1/2	2-13/32	5/8”-11	3/8”-16
2”	3-3/4	2.438	5-13/32	5-23/32	6-3/32	3	3-5/16	3-11/16	2-13/32	5/8”-11	3/8”-16
3”	5	3.563	5-15/32	5-31/32	6-11/32	3-3/16	3-11/16	4-1/16	2-9/32	5/8”-11	3/8”-16
4”	6	4.578	5-5/16	5-7/8	6-3/8	2-5/8	3-3/16	3-11/16	2-11/16	5/8”-11	3/8”-16
6”	8-1/4	6.719	5-13/16	6-5/16	7-1/8	3-13/16	3-5/8	4-7/16	2-11/16	5/8”-11	3/8”-16
8”	10-3/4	8.734	6-1/2	7-3/16	8	3-3/8	4-9/16	4-7/8	3-1/8	5/8”-11	1/2”-13
10”	12-3/4	10.981	6-15/16	7-5/8	8-5/8	3-3/4	4-7/16	5-7/16	3-3/16	5/8”-11	1/2”-13
12”	15	12.906	7-3/16	7-7/8	8-7/8	4	4-11/16	5-11/16	3-3/16	5/8”-11	1/2”-13
14”	16-1/2	14.188	9	9-3/4	10-11/16	4-5/16	5-1/16	6	4-11/16	5/8”-11	1/2”-13
16”	18-1/2	16.188	9-1/4	10	11-3/16	4-9/16	5-5/16	6-1/2	4-11/16	5/8”-11	1/2”-13
18”	21	18.188	10-7/16	11-1/4	12-5/8	5-7/32	6-1/32	7-13/32	5-7/32	3/4”-10	5/8”-11
20”	25-1/2	20.188	10-5/8	11-1/2	13	5-13/32	6-9/32	7-25/32	5-7/32	3/4”-10	5/8”-11
24”	27-1/2	24.188	11	11-15/16	13-1/2	5-25/32	6-23/32	8-9/32	5-7/32	3/4”-10	5/8”-11

NOTES:

1) All dimensions are in inches and fractions of an inch (except bore is in decimal form). See **Figure 1**.
2) ‘OD’ dimensions, for 600# assemblies are as follows: 12” NPS = 15-1/4”; 14” NPS = 16-3/4”; 16” NPS = 19”.
3) All dimensions, except ‘OD’ as specified in note 2 above, and ‘OAL’ and ‘A’ dimensions are typical for all three ratings.
4) All flange dimensions, e.g., OD, raised face, BC, etc., are per ASME B16.5 for the applicable rating.

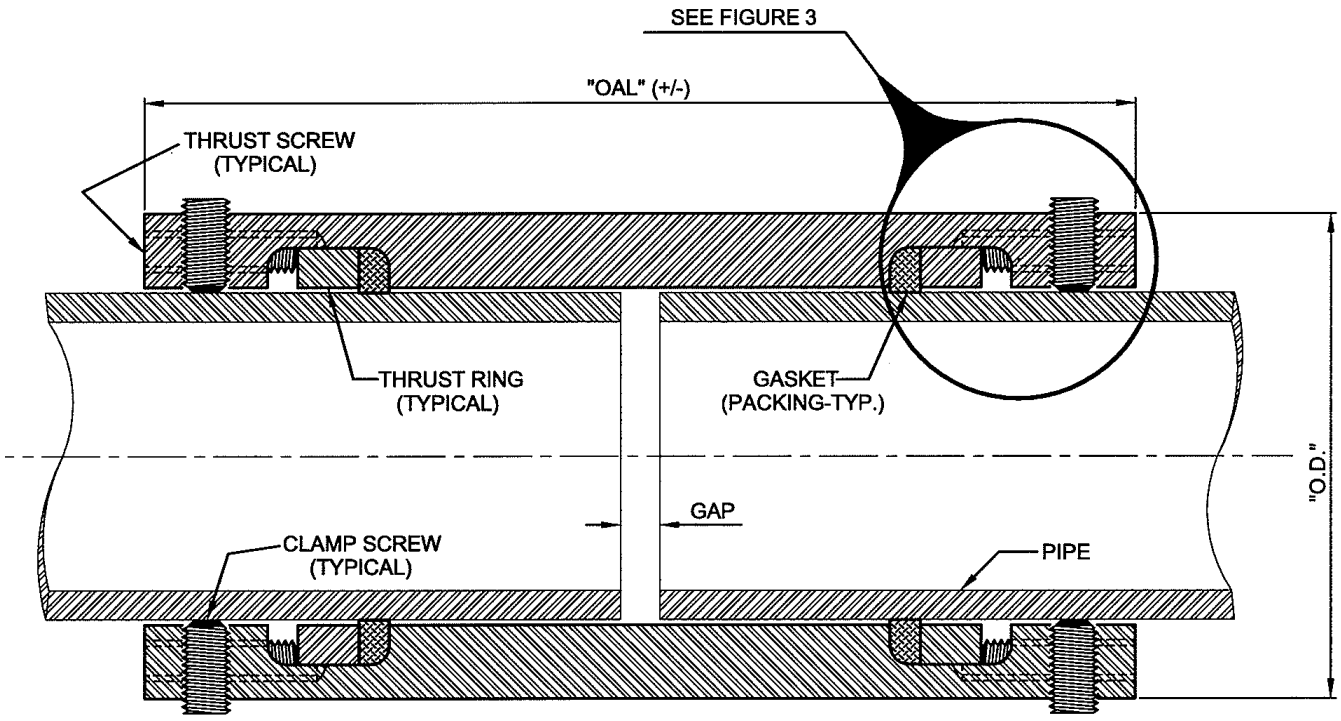


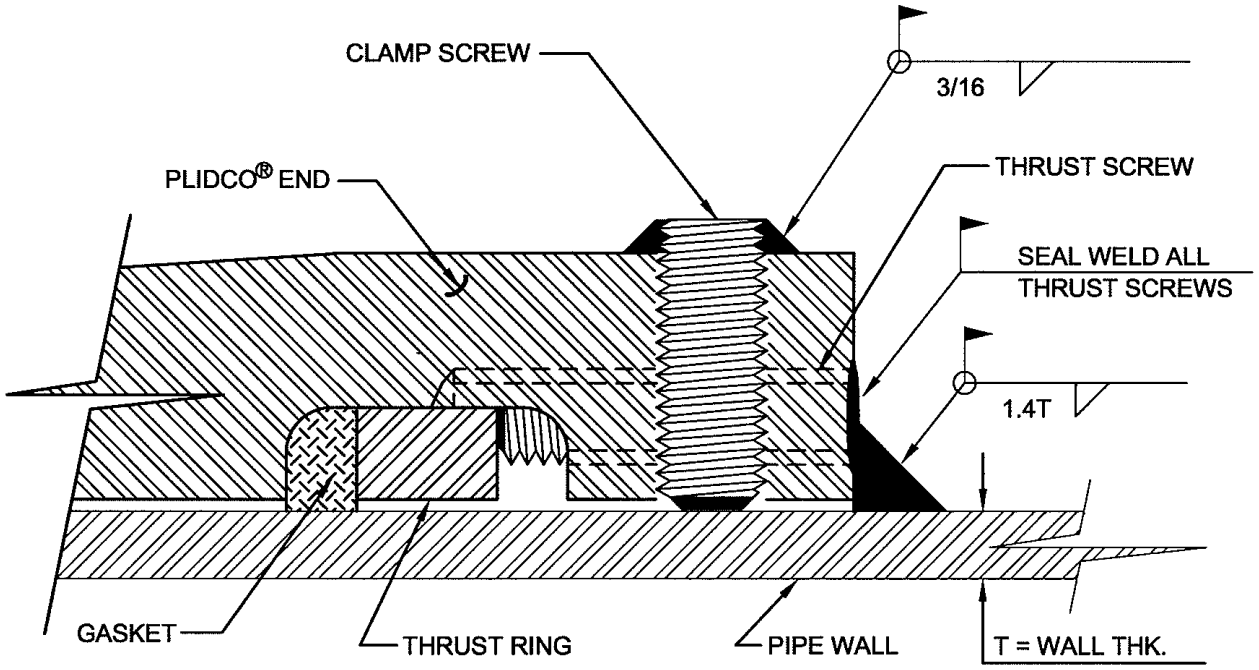
Figure 2: Typical PLIDCO®WELD+ENDS® Cross Section

Table 2: PLIDCO®WELD+ENDS® Data

DIMENSIONS AND APPROXIMATE WEIGHTS (1)				
NPS	**O.D.**	**Length Between Packing**	**Approx. Overall Length**	**Approx. Weight in Lbs.**
1-1/2	3-1/4	2	6-13/16	10
2	3-3/4	2	6-13/16	12
3	5	2	6-9/16	19
4	6	3-1/8	8-1/2	27
6	8-1/4	3-5/8	9	45
8	10-3/4	3-3/4	10	85
10	12-3/4	4-1/8	10-1/2	101
12	15	4-1/8	10-1/2	136
14	16-1/2	4-5/8	14	212
16	18-1/2	4-5/8	14	243
18	21	5-9/16	16	376
20	23-1/2	5-9/16	16	490
24	27-1/2	5-9/16	16	605
30	34	5-9/16	16	865
36	40	5-9/16	16	1020
— See Vendor Catalog for other size applications — — Contact Vendor for pressure/temperature ratings —				

NOTE:

1) All dimensions are in inches; weights in pounds.



NOTES:

1. AFTER ESTABLISHING FLOW IN THE LINE, THRUST SCREWS SHOULD BE CUT OR BURNED OFF FLUSH. START WITH FILLET WELD AROUND CIRCUMFERENCE, INCLUDING SEAL-WELDING OF THRUST SCREWS. THE THRUST SCREWS ARE MADE ESPECIALLY FOR USE WITH PLIDCO® PRODUCTS, OF A STEEL SELECTED FOR ITS GOOD WELDING QUALITIES.
2. CAUTION SHOULD BE OBSERVED SO THAT WELDING DOES NOT OVERHEAT THE SEALS. SEQUENCE THE WELDING SO THAT THE HEAT IS NOT CONCENTRATED IN ONE AREA.
3. CUT OR BURN OFF CLAMP SCREWS AND SEAL-WELD. ONE CLAMP SCREW MAY BE REMOVED AT TOP ON EACH END TO SERVE AS A VENT WHILE WELDING, AND ALSO AS A FINAL TEST POINT FOR LEAKAGE. USE SOAP-SUDS OR AN EXPLOSIMETER FOR TESTING. THESE CLAMP SCREWS WERE DEVELOPED ESPECIALLY FOR USE WITH PLIDCO® PRODUCTS. THE CUP POINTS ONLY ARE HARDENED; THE SHANKS ARE OF MILD CARBON STEEL OF GOOD WELDING QUALITIES.

Figure 3: PLIDCO® Welding Detail

Record of Change

Revision 0		Date: 12/23
Location	**Action**	**Description**
		Initial publication. This Engineering Guide (EG) was compiled from historical EXES, BTAES and BTDP documents