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PLIDCO® SOLE+MATE INSTALLATION GUIDELINES

PLIDCO Sole+Mates, typically called full-encirclement welded split sleeves, are referenced in many pipeline codes. As such, most pipeline companies and contractors have already written their own installation procedures. The installation guidelines herein are not intended to override already established procedures, but are intended as a guide to those unfamiliar with Sole+Mates. Any helpful hints or recommendations are always appreciated from the end user so that we may incorporate them into these guidelines. 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 at 800-848-3333

Installation

PLIDCO Sole+Mates are typically used for two applications; pressure containing and non-pressure containing.

The application is pressure containing when the Sole+Mate is installed over a known leak. For a pressure containing application, the wall thickness of the Sole+Mate and all welds must be able to contain the full operating pressure of the pipeline. The longitudinal weld joint formed by the two halves of the Sole+Mate must be a full thickness butt weld. The circumferential joint formed by the Sole+Mate welded to the pipeline must be a full thickness fillet weld.

The application is non-pressure containing if the Sole+Mates is not installed over a known leak and the intended use is only to reinforce a damaged area of the pipe. The longitudinal weld joint formed by the two halves of the Sole+Mate may be a full thickness butt weld. The circumferential joint does not have to be welded, but should be sealed with a coating to prevent ground water from penetrating the crevice between the sleeve and the pipe. If the circumferential joint is welded, the application should be assumed to be pressure containing and all the requirements of a pressure containing application now apply.

To properly reinforce the pipe for a non-pressure containing application, the Sole+Mate halves should fit snugly around the pipeline. Consideration should be given to filling and re-contouring dents, flat spots, etc., with a hard setting grout. If injection of a grout is required, vents can be added to the Sole+Mate on request.

It is helpful to tack weld the backing strips into the bottom half of the sleeve before installing the top half as shown in Figure 1. Various chain clamps with jackscrew or hydraulic rams are available commercially and can provide assistance in achieving a tight, uniform fit. It may be helpful to use guide shims (not provided) or other tools such as screwdrivers, as shown in Figure 1, to guide the second half over the backing strips.

The temporary use of gap blocks, as shown in Figure 2, may be helpful in maintaining an equal gap on both sides of the sleeve while the sleeve halves are drawn together. The gap blocks may be tack welded in place, but must be removed before the sleeve halves are welded. Due to the diameter tolerance of the pipe, the exact size of the gap block is difficult to predict. A 0.25 inch (6 mm) block is a reasonable starting size.

Field Welding Instructions

Make certain there is not a combustible mixture inside the pipeline prior to welding. Completely welding the longitudinal joints first will assist in pulling the two halves of the sleeve tightly around the pipe. Mild steel backup strips are provided for the longitudinal welds. If the circumferential ends are to be welded, they should be welded last.

For the longitudinal welds, use weld material that meets or exceeds the tensile strength of the Sole+Mate. For the circumferential welds, use weld materials that meets or exceeds the tensile strength of the Sole+Mate or pipe, which ever is greater.

Carefully control the size and shape of the circumferential fillet welds. For a pressure containing application the circumferential fillet welds must be full thickness fillet welds. 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 an explosion with attendant serious consequences.

Welders and weld procedures should be qualified in accordance with API Standard 1104, *Welding of Pipelines and Related Facilities*, Appendix B, *In-Service Welding*. We strongly recommend the use of a low hydrogen welding process such as GMAW or SMAW using low hydrogen electrodes (E-XX18) because of their high resistance to moisture pick-up and hydrogen cracking. SMAW electrodes must be absolutely dry.

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 mechanical tests performed for the procedure qualification.

To avoid severe thermal strains and produce a ductile circumferential weld, some companies use an overlapping back-stepping procedure. Even though the general weld progression may be from right to left, short bead segments, 4 to 8 inches (10 cm to 20 cm) long, are deposited left to right, overlapping half the previous welded bead. Another procedure used for the circumferential weld is buttering or surfacing of the pipe with weld metal prior to welding the fillet root pass.

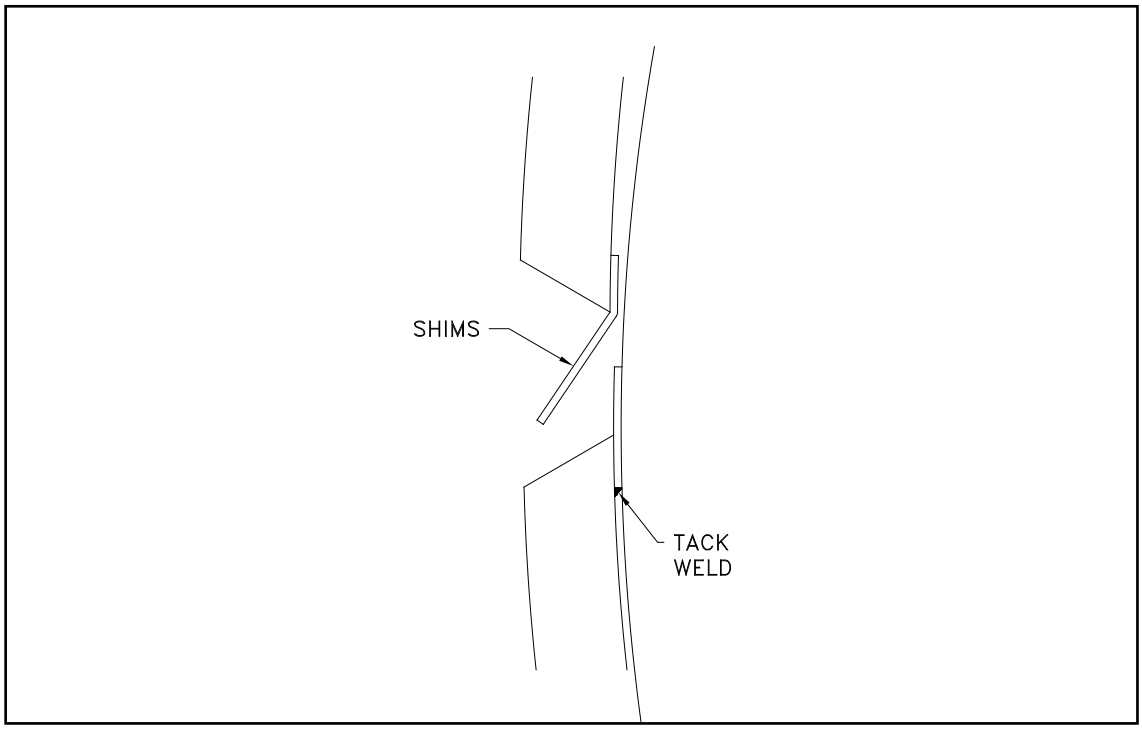

Figure 1

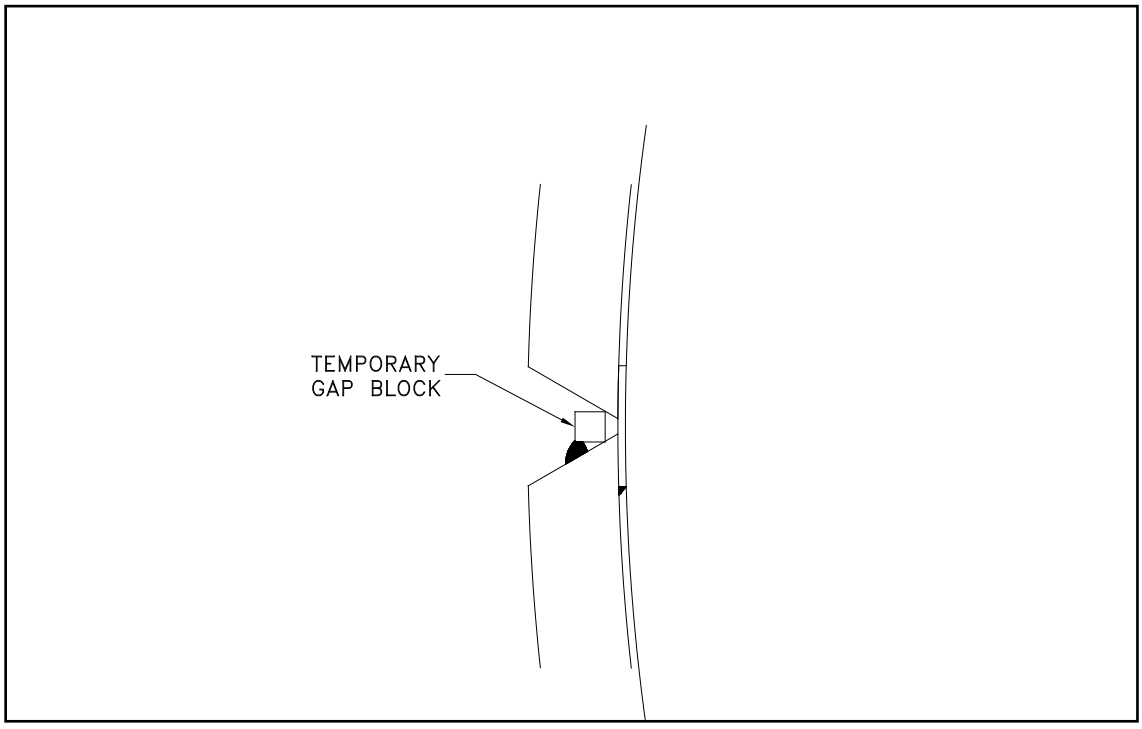

Figure 2