

MUELLER[®] GAS

Line Stopper Fittings for Steel Gas Mains

⚠ WARNING:

1. Read and follow instructions carefully. Proper training and periodic review regarding the use of this equipment is essential to prevent possible serious injury and/or property damage. The instructions contained herein were developed for using this equipment on fittings of Mueller manufacturer only, and may not be applicable for any other use.
2. DO NOT exceed the pressure ratings of any components or equipment. Exceeding the rated pressure may result in serious injury and/or property damage.
3. Safety goggles and other appropriate protective gear should be used. Failure to do so could result in serious injury.
4. Pressure test, check for and repair leaks in all fittings and components each time one is installed or any joint or connection is broken. Failure to find and repair a leak from any source in the fittings, by-pass lines or equipment could result in an explosion and subsequent serious injury and/or property damage.
5. MUELLER[®] Drilling Machines and Equipment have been carefully designed and engineered to work together as a unit. The use of equipment manufactured by someone other than Mueller Co. may cause excessive wear or a malfunction of the Mueller machines.

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Reliable Connections[™]

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All warranties, expressed or implied, for Mueller Drilling Machines are rendered null and void if the machines are used with shell cutters or equipment manufactured by someone other than Mueller Co.

Line Stopper Fittings for Steel Gas Mains

Preparation Procedures

Before Use

The following procedures should be reviewed and approved by each company for its specific application and need in the context of pipe chemistry, pipe condition, operating pressures, and secondary stresses.

Before welding, welders should be qualified using low hydrogen electrodes in accordance with pipeline company approved procedures.

Mueller fittings are manufactured in accordance with ASTM A105 material specification, resulting in a low carbon content material with a carbon equivalent of 0.43% or below. Based upon the excellent weldability of this material, the welding of Mueller fittings may be successfully undertaken using a number of approved procedures or processes.

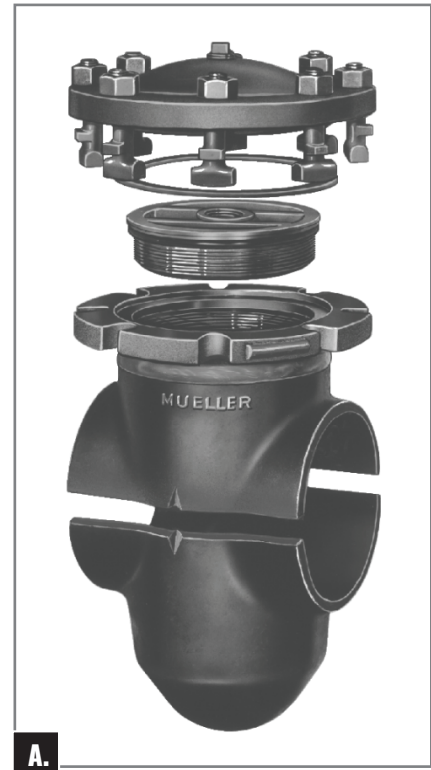
Pipe Cleaning And Preparation

Prior to installing the fitting on the pipe, the areas to be welded on both the pipe and fitting should be mechanically cleaned or power brushed thoroughly to remove all traces of rust, dirt, oil or other foreign material that might affect the quality of the finished welds.

Cleaning should be done on the carrier pipe at least three inches to either side of both circumferential weld locations. The pipe should be visually checked for pitting so that any surface defects which might affect the weld quality or serviceability of the pipeline or piping system will be identified, and appropriate action taken to eliminate the defective areas.

Upon visual acceptance, the areas which are to be welded circumferentially should be inspected by ultrasonic wall thickness testing techniques. The ultrasonic testing should be done to verify the pipe has adequate wall thickness, is free of laminations, and there is no internal pitting or corrosion that might affect the integrity of the circumferential welds or safety of the welder during the welding operation.

Once the pipe has been cleaned and inspected, the fitting halves should be cleaned of all machining oil or other material that might affect the quality of the welds. At this point, remove the completion cap and plug from the fitting (See **Figure A**). Because pipe tolerances vary, a trial fit-up is recommended after cleaning, in the event minor grinding of the fitting is needed to assure proper fit.



Line Stopper Fittings for Steel Gas Mains

Installation

Installation / Welding Procedures

Proper Alignment And Weld Joint Designs

Mueller line stopper fittings (4", 6" and 8") are machined on all surfaces which will contact the pipe, as well as the weld joint design surfaces. Close tolerance machining using numerically controlled milling machines provides concentric alignment of the fitting to the pipe and consistent weld joint designs. The longitudinal weld joint has a machined land (root face) of $\frac{1}{16}$ ", $\pm\frac{1}{32}$ ", and a bevel of $37\frac{1}{2}^\circ$ (See **Figure B**).

The ends of the fittings are prepared for circumferential fillet welds with a land of 0.375" and relief taper of 45° back to the fitting body. This land dimension on the ends of the fitting will allow for making fillet welds of proper leg size for pipes having wall thicknesses of 0.188" through 0.250". For pipe with wall thickness greater than 0.250", the lands on the ends may be ground in the field to match the wall thickness of the pipe. This field preparation, if necessary, will help to assure fillet welds with leg sizes equivalent to the pipe wall thickness are achieved.

Fitting Alignment And Tack Welding

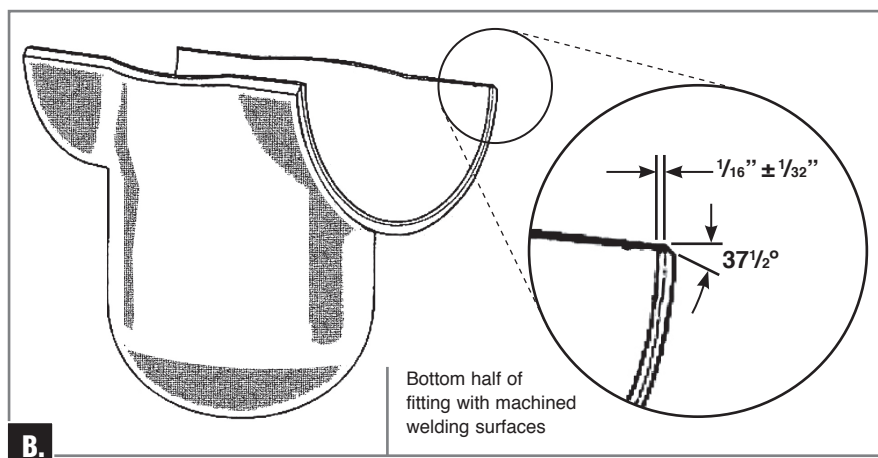
When placing the fitting halves over the pipe, check the alignment marks provided on the fitting halves to determine that the alignment is correct. When the fitting is installed in the vertical position, the longitudinal weld seams will be at the 3:00 and 9:00 positions.

NOTE: If the fitting is to be installed in other than the vertical position, welding of the longitudinal seams must be done with the fitting in the position selected for final installation.

Complete penetration of the weld joint may include fusion of the fitting to the pipe. As the pipe will subsequently be drilled and cut through the top and bottom portions, any weakening of the pipe by fusing the fitting to it is not structurally significant. Complete

weld penetration and fusion of the longitudinal seam of the fitting, followed by circumferential fillet welding on the fitting ends, results in the fitting being considered as a pressure containment vessel.

Position the fitting halves so the longitudinal joint space is approximately $\frac{1}{16}$ ". Joint spacing must be equal on both sides. Tack weld the fitting on the longitudinal seams at the point on the fitting where it begins to "bulge" using low hydrogen electrodes.



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Installation

NOTE: Figure C shows proper spacing of the halves of the fitting for welding, and the approximate positions for the tack-welds.

Welding Longitudinal Seams (Groove Welds)

After the fitting has been tack-welded, if necessary, rotate the fitting to the final installation position. The pipe and fitting should be preheated to within a temperature range of 150°F to 250°F to assure all moisture is removed from the area to be welded.

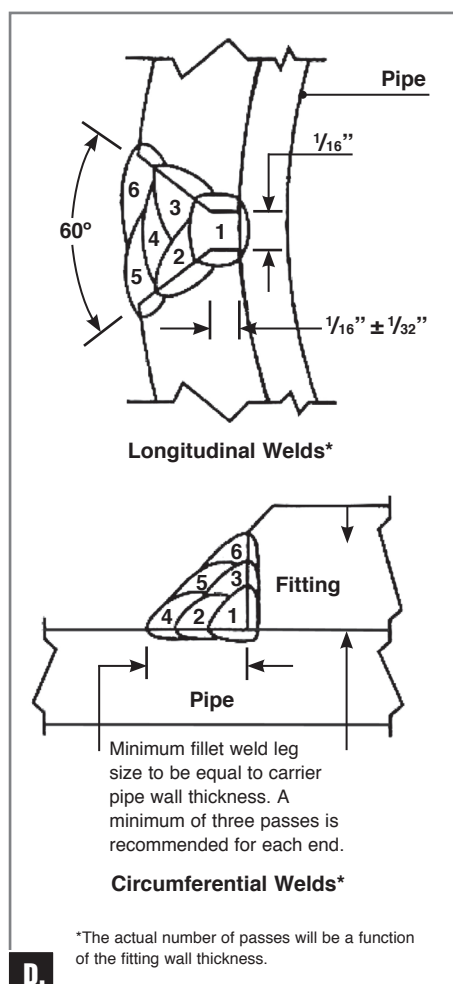
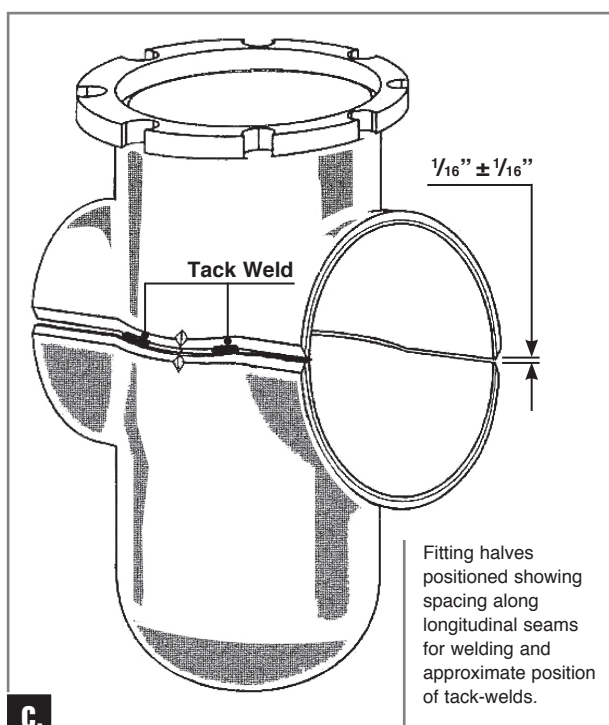
With the fitting and pipe within the preheat temperature range, weld the longitudinal seams (See **Figure C**) using low hydrogen electrodes.

NOTE: Low hydrogen electrodes, when removed from their original container, should be maintained in a holding oven at 250°F minimum, 350°F maximum.

To balance weld shrinkage, no more than two passes should be made on a seam without welding the opposite seam an equal number of passes.

If the fitting is to be installed in other than the vertical position, welding of the longitudinal seams must be done in the selected position, since the fitting may be fused to the pipe.

Welding and electrical parameters are recommended for both the longitudinal and circumferential welds. Weld pass sequences are shown in **Figure D**. The actual number of weld passes for the longitudinal welds is a function of the fitting wall thickness. The number of weld passes for the circumferential fillet welds is a function of the pipe wall thickness, and the fillet weld leg size must be at least equal to this thickness.



Line Stopper Fittings for Steel Gas Mains

Installation

Welding Fitting Ends (Fillet Welds)

When the longitudinal weld seams have been completed, the fitting ends should be power brushed and cleaned. If necessary, the pipe and fitting shall again be preheated to the temperature range specified for the longitudinal welds. The gas flow rate in the carrier pipe must be considered and adjustments (to the amount and duration of heat applied during the welding process) made, if necessary, to assure rapid cooling of the circumferential welds and corresponding heat-affected zones (HAZ) does not occur. Preheating should be done as necessary to maintain the preheat temperature using on oxyacetylene or propane torch with a rosebud heating tip.

With the preheat complete and all moisture removed, weld one end of the fitting to the pipe using $\frac{3}{32}$ " diameter low hydrogen electrodes for the first three passes, and $\frac{1}{8}$ " diameter electrodes for the remaining passes. The stringer bead technique should be used and a minimum of three passes should be made on each end, as shown in Figure 4. Weaving of the electrode for these circumferential welds is not recommended.

NOTE: Travel speed of 3-6 IPM for the fillet welds is intended to provide high heat input, which is beneficial in obtaining lower weld and HAZ hardness properties.

Only one end of the fitting should be welded on at one time. If more than one welder is involved, they should be working simultaneously on the same end. After the first end is completely welded, the other end may be welded in the same manner as the first end.

Inspection

Upon completion of all welding, visual inspection should be conducted to assure that the welds meet specified company acceptance criteria.

Additional inspection, such as Liquid Dye Penetrant or Magnetic Particle Inspection, is recommended. These methods supplement visual inspection and are excellent for finding minute surface defects that may be undetectable by visual inspection. This inspection should be conducted after the fitting has cooled and at a later time, perhaps 24 hours after if possible.

With inspection complete and the welds found to be acceptable, the fitting is ready for pressure testing. (The welded fitting must be pressure tested before proceeding to the next stage of putting the fitting into service.)

These procedures for installing Mueller Line Stopper Fittings are not intended to exclude or preclude the use of other procedures, which have been found to provide acceptable results. The procedures in this manual are intended to provide a common guideline which may be followed.

Side-Out Fitting Installation

The Mueller® Side-Out Line Stopper Fittings are designed to accommodate same plain lateral connections to existing piping (**Figure E.**). To properly install the side-out fitting, follow the general procedures for installing Mueller Line Stopper Fittings (pages 2–4) and the following supplemental instructions.

1. After welding the side-out fitting to the pipe, but before making the final inspection and performing the pressure test as described on page 3 of form 11909, do the following.

2. Clean the area of the fitting where the lateral connection will be made. Take care to remove any debris or slag resulting from welding the fitting to the pipe. Grind the lateral weld seam of the fitting in the two areas where it will intersect the lateral connection weld to assure there will be no slag inclusion at the weld junctions.

3. Insert the pup or lateral connection pipe into the fitting opening until it contacts the machined stops.

4. Weld the pup or lateral pipe to the fitting using the recommendations of form 11909, filling the area between the fitting and the pup or lateral pipe.

5. Upon completion of all welding, conduct the inspection and pressure testing as recommended on page 5.



E.

Line Stopper Fittings for Steel Gas Mains

Notes



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