

This information sheet is prepared as a typical example of the welding installation of Caproco access fitting bodies (buttweld, socketweld and flareweld styles).

Note: Caproco assumes no responsibility for adherence to this or any other welding procedure. It is the sole responsibility of the purchaser to ensure that all welding is undertaken according to applicable standards set by the recognized authorities in the jurisdiction of the purchaser.

The specific weld procedure contained within this sheet is for carbon steel (mild steel) bodies welded to similar materials only. Other welding parameters will be required for alloy steels and non-ferrous materials. The advice of our engineering department or a welding engineer should be obtained for joints involving materials other than low carbon steel.

PRELIMINARY PREPARATIONS

Weld Procedure

A qualified weld procedure developed in accordance with the applicable authorities and standard or code should be used. In the absence of such a procedure, the attached welding procedure developed by Caproco in accordance with ASME, Section IX may be used when approved by the applicable regulatory authorities. This procedure is for joining low carbon steel to low carbon steels only.

Welder

A welder qualified in the weld procedure to be used and in accordance with the applicable standard or code is required.

Location

The fitting must be mounted at a location and orientation where there is sufficient clearance to permit the installation and operation of the retriever tool. When making a hot tap, it is essential to determine that the integrity and thickness of the parent material is adequate. This can be readily done by nondestructive inspection using the ultrasonic thickness gauging technique. Where a standard weld procedure such as this one is being employed, a hot tap procedure is not recommended when:

- a) The wall thickness is less than 0.125" (3mm)
- b) Laminar nonmetallic inclusions are present

Safety

Considerations must be given to good safety practice before welding on an enclosed vessel. Factors to be considered are:

- a) vessel contents
- b) ambient environment
- c) fire precautions
- d) work permits and authorities

Hole Cutting

For un-pressurized and purged installations, the access hole can be torch-cut prior to access fitting installation. After-installation hole cutting is however preferred to reduce the possibility of hole cutting operations distorting the attachment wall and making the welding more difficult. After-installation hole cutting can be accomplished by drilling, hole sawing or using a hot tap tool. For pressurized installations, the access fitting is welded into place prior to cutting the access hole using a hot tap tool.

WELDING PROCEDURE

Welding Technique

Shielded metal arc welding (manual stick) is the recommended technique to employ, although satisfactory installations can be made using gas metal arc (MIG) or gas tungsten arc (TIG) procedures. A properly qualified procedure should be used in all instances.

Fitting Preparation

The Caproco access fitting must be stripped down to only the fitting body to reduce the effects of heat and weld spatter on the system components. Precautions, such as wrapping the threads and internal bore with flame-proof cloth, should be undertaken to reduce weld spatter damage.

Weld Procedure

Caproco has developed the following weld procedure, CS-1, for installing low carbon steel fitting bodies (1020 and A350LF2) to similar low carbon materials. This procedure was developed in accordance with ASME IX, ANSI B31.1 and ANSI B31.3 for P1 to P1 materials. Attachments to other material groupings should be done in accordance with tested and approved procedures. Contact our engineering department if further assistance is required.

Stress Relief

Stress relief, when required by code or company practice, should follow immediately after welding.

Inspection

The bore and threads should be inspected for weld spatter and if present, carefully removed by filing or reaming. A Caproco plug assembly should be screwed into the access fitting body. Failure of the plug to readily seal indicates that the fitting has warped and needs to have the threads rechecked or a new fitting properly installed. Visually inspect the final weld for profile acceptance and integrity. If so desired, the weld may be nondestructively inspected using magnetic particle or liquid penetrant techniques for surface cracks and ultrasonic or radiographic techniques for weld structural integrity.

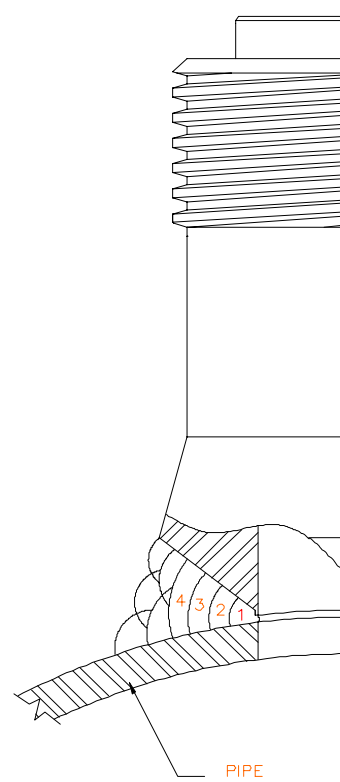
CS-1 WELD PROCEDURE

This weld procedure is designed for shielded metal arc welding (manual stick) of Caproco access fittings of type 1020 or A350LF2 in accordance with ASME IX, ANSI B31.1 or B31.3 to mild steel vessels.

- 1) **Material Type:**
P1 to P1 (Mild Steel to Mild Steel)
- 2) **Joint Preparation:**
Groove
- 3) **Filler Metals:**
Root E6010 (F3, A1)
Fill and Cap E7018 (F4, A1)
- 4) **Position:**
All (6G)
- 5) **Weld Progression:**
Uphill
- 6) **Preheat:**
200°F (93°C)
Interpass Min:
200°F (93°C)
- 7) **Electrical Characteristics:**
DC Reverse Polarity
110 - 140 Amps / 22 - 24 Volts
- 8) **Technique:**
Root Gap - 1/16" (1.5 mm)
Tack Position - 3 Equally Spaced
Root Weld - Stringer, 3 Back Steps
Fill - Weave
Cap - Weave To Final Full Throat Very Slight Convex Or Concave Shape With No Undercut Or Lap

Pass	Electrode	Size
1	E6010	1/8"
Others	E7018	3/16"

FLAREWELD



BUTTWELD

