



VACUUM-JACKETED PIPE FIELD WELD JOINT

Instructions



Crane ChemPharma & Energy



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Vacuum Jacketed Pipe Field Joint Instructions

To the right is a typical kit included with the field joint outer casing. Included might be:

- Insulation material
- Getter sealed in a plastic bag (2 types shown)
- Evacuation plug
- Vacuum grease
- Evacuation port cover
- Sealing tape & gloves. (one per system).

The actual materials included can vary depending the specific components used and the application.



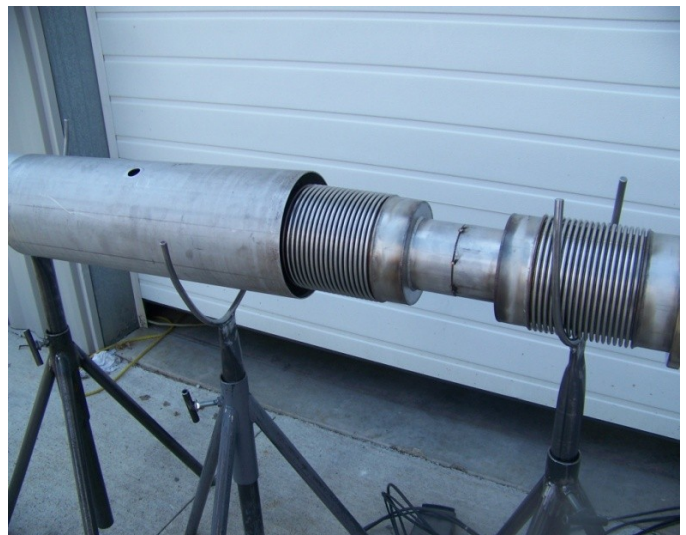
1. Slide the outer casing over one section of pipe.

There are two types of joints used to connect the sections of pipe. One type uses a butt weld and the other with a sleeve (pictured to the right) uses a fillet weld. If you have a sleeve installed on one end of your pipe, go on to step 6.



Note: ASME systems require an ASME certified welder and the weld wire manufacturer/ heat be recorded. Use your ASME weld protocol when assembling ASME systems.

2. Put the two sections of pipe together so they are level and square. Tack the sections together every 1 inch (3 cm). Purge with argon prior to any welds.



Vacuum Jacketed Pipe Field Joint Instructions (continued)

3. Make the root weld. This weld is a “chance weld” meaning this weld will not be pressure or leak checked until the system is installed completely.

Note: For ASME systems make sure you use the welding procedures detailed on the prints.



4. Wire brush the surface upon completing the root weld.

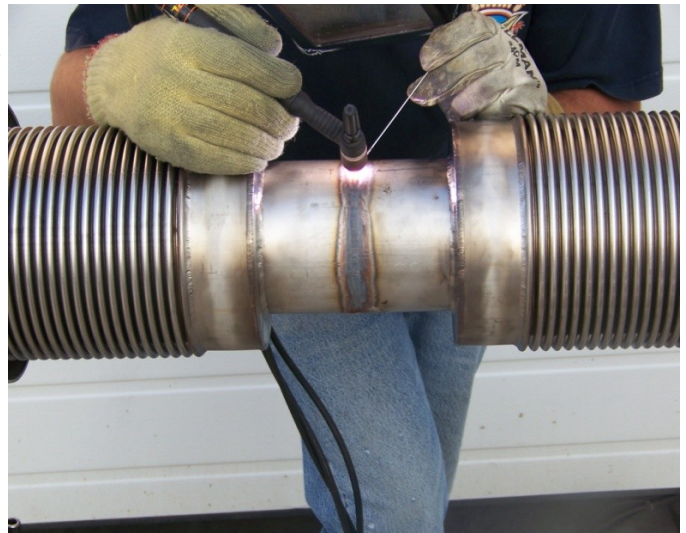


5. Make a cap weld after completing the root weld.

Note: Systems requiring a pressure test on the inner pipe (including ASME) should be tested at this point.

Once weld is finished, wire brush the weld. Wipe piping between the flanges with an acetone rag to clean any oil and residue.

To wrap the joint now go to step 8.

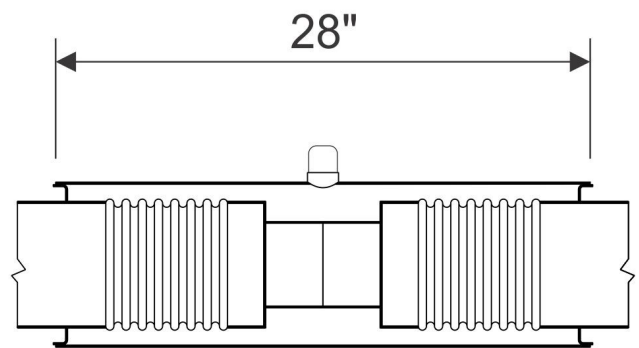


Vacuum Jacketed Pipe Field Joint Instructions (continued)

6. For sleeve joints you will use a fillet weld to connect the sections. Make sure the sections of pipe are level and square.



7. With a sleeve joint you should set the distance between the flanges with the spools (sections) to 28 inches (71 cm). See the diagram to the right. Purge the pipe joint with argon prior to welds.



8. Make a fillet weld between the first section sleeve and the inner pipe of the second section.

Once the weld is finished, wire brush the weld. Wipe piping between the flanges with an acetone rag to clean any oil and residue.



Vacuum Jacketed Pipe Field Joint Instructions (continued)

9. Next place the getter over the cooled weld joint. Be sure to wear gloves that will not transfer moisture, oil, or anything else to the wrapping materials. The getter, typically in a nylon bag and the larger package if two kinds are included, should be wrapped around the non-insulated joint. Remove the getter from the sealed plastic bag and spread the getter evenly as possible around the pipe, taping tightly to keep it in place.



Caution: Oxygen systems require a non-charcoal getter (zeolite) and Cryotherm Insulation.



10. Wrap joint with the supplied insulation still using the gloves. The insulation comes as two layers of material rolled together. The foil should have the dull side towards the pipe (not the casing) and will usually contact the pipe and getter material on the first layer. Wrap joint until the insulation is flush with the outside diameter of the expansion joint. Do not pull insulation tight.



11. If the kit included two different types of getter, add the second smaller packet just before putting the final wrap of the insulation. Remove the getter from the sealed plastic and insert the packet between the foil and the second layer of the insulation. Use a small piece of foil tape to keep the insulation from unwinding.

Wrap 2 more layers between the spool flanges and on top of the expansion joints. Tape down the end of the insulation with a small piece of foil tape.



Oxygen systems require fiberglass yarn to be wrapped over the insulation.

Vacuum Jacketed Pipe Field Joint Instructions (continued)

12. Slide casing over the flanges evenly and tack both sides.



13. Purge outer casing with argon gas and weld both ends of casing to the flanges.



14. If your field joint kits include provisions for DV6R vacuum gauge, proceed as follows:

1. Mix two part epoxy per instructions in box.
2. Apply epoxy to threads on DV6R. Do not apply so much as to clog port inside of DV6R.
3. Thread into coupling and tighten. Wipe off excess epoxy.

Once epoxy has cured you can proceed to the next step.

Vacuum Jacketed Pipe Field Joint Instructions (continued)

15. Install the evacuation plug. The evacuation plug will be pre-lubricated, but a light coat on the o-rings (do not remove) will not hurt. Screw the evacuation plug onto an “operator” (shown in the photo). Pull back the knob so the evacuation plug does not get inserted into the port. Install the operator onto the field joint casting evacuation port.

Note: Do not install the evacuation plug at this time.

 **Oxygen systems require Krytox grease to be used in and on the evacuation plugs.**



16. Check for leaks using a mass spectrometer/leak detector. Leak check to 2.0×10^{-8} , checking all welds (inner and outer) with helium. Bag entire field joint and fill with helium. Repair any leaks as needed.

16. Pump the joint for vacuum for 24 hours minimum and then install the evacuation plug. It is acceptable to go to the next field joint and start working on it while the prior joint is being evacuated.



17. Once the proper vacuum level has been achieved, the evacuation plug can be installed. Push the black knob on the operator in until fully seated. Unscrew the knob to leave the evacuation plug in the port. Then remove operator from the casing once the operator and the plug have been separated.

Vacuum Jacketed Pipe Field Joint Instructions (continued)

19. After the evacuation plugs are installed, fill the evacuation plug top with vacuum grease and install the plastic cap. Install the stainless top cap and tack weld in place four tacks 90 degrees from each other, being careful not to overheat the metal and evacuation plug o-rings.

 **Oxygen systems require Krytox grease to be used in the evacuation plugs.**



Support Information

Crane Cryogenics continuously seeks to improve its products. Customer feedback is an essential element of this process. Should any issue arise regarding this product's performance, please immediately notify:

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