



**Recommended Field Welding Guidelines for Split Tee and Nozzle  
Type Fittings on Carbon Steel Waterlines Under Pressure and Flow**

**Model 416 Type 1 & Type 2  
Model 417 Type 1**

**Read instructions before starting installation\***

**Review of “Considerations for Installation” on the reverse will assist with installation.**

**For purposes other than water, contact JCM Industries for application and product assistance.**

Prior to welding, clean and scrape pipe. Remove any scale, pipe wrap, debris or dirt that may interfere with the welding of the fitting. Inspect pipe for type and integrity, size, outside diameter and surface irregularities. Ultrasound may be performed if pipe wall thickness is in question. Confirm the proper size of tapping sleeve. Inspect fitting to ensure all parts are included. See pipe flow considerations on reverse. Ensure system design, pressure, temperature and flow rate accommodates the application and welding process.

**For 416** - Position nozzle on pipe, making sure outlet is aligned with branch line to be connected. The gap for fit up should not exceed 1/16”

1. Field weld the nozzle to the host run pipe.
2. Allow the nozzle weld to cool and pressure test. Re-weld any areas as indicated by the pressure test.
3. Do not weld internally.
4. Place split reinforcing sections around the nozzle and weld together - not to host run pipe.
5. Weld reinforcement section at branch and let cool.
6. Weld around reinforcement sections to host run pipe.

Note: In some applications, the piping code requires a 1/8” or 1/4” threaded “weep hole” be drilled and tapped into one side of reinforcement pads for pressure test. If these are used, test and repair welds as required then cap off.

**For 417** - Position outlet half of body on pipe, making sure outlet is aligned with branch line to be connected. Position back half of body. The gap between sleeve halves should be no more than 1/8” between halves.

1. Field weld the longitudinal sides of the sleeve first. Do NOT weld the side seams to the pipe. Side seams are designed to be welded to the outlet and back halves of the fitting, NOT to the host run pipe. If needed, install a backing strip behind the side seams prior to field welding.
2. Weld first circumference end only
3. Allow the first circumference end to cool
4. After cooling time, weld the other end
5. After installation and cool down, fitting should be tested for leaks. Re-weld any areas as indicated by pressure test.

*Note: Welding both ends of the fitting at the same time can cause a stress riser in one or both ends of the connection and subsequent weld failure under pressure.*

Alignment and support of the tapping sleeve is the responsibility of the end user, per best engineering practice, industry standard practice, or local code. For water applications: if applicable, test assembly seals with water (per ANSI/AWWA C-223). When testing the assembly against the pipe to pressures greater than the internal pressure of the host pipe, application should be treated with caution to prevent imploding or damaging the pipe wall. No more than 10% above line pressure. For inquires, contact JCM Industries, Inc.

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\*Ensure fitting is suitable for application (confirm size, materials, pressure ratings, line content, meets local governing & association standards, etc.). Pipeline operation forces, including pressure fluctuations, thermal expansion/contraction, movement/shifting, etc. will influence the success of the application. Proper anchorage, restraint, harnessing, thrust blocks or other devices must be provided to prevent pipe movement (lateral, angular, axial) or pipe pullout from the bolt-on fitting. Inspection of the pipe integrity is the responsibility of the end user. JCM recommends the use of calibrated torque wrench. Failure to follow installation instructions will result in voided product warranty.

**For application review or questions contact JCM Industries at 1-800-527-8482, 903-832-2581**





## Considerations for Installation

### Model 416 Type 1 & Type 2 Model 417 Type 1

#### Pipe Flow Considerations

Flow of line content during field installation has direct impact on the quality of the weld process. High flow rates in the system at the time of field welding can cause weld "under bead" cracking of the weld to the pipe. Under bead weld cracks severely diminish the quality of the weld and lead to future weld failure. Flow rates should be at a minimum - 0 flow rate and maximum of 3 feet per second flow. With water application temperature below 70°F (21°C) and a flow rate beyond 3 feet per second, a special water backed weld procedure should be qualified and implemented in the field.

#### Fitting field welding test inspection process:

After the fitting has been welded to the host run, it should be tested for welding quality. This test is strictly a leak test, NOT a fitting design or structural test. This was determined by the fitting design criteria. Repair weld as required.

If the fitting is to be hydro- tested the test MUST NOT EXCEED pipeline operating pressure at the time of testing. This is to be certified by a pipeline pressure gauge. Exceeding the actual operating condition increases the possibility of "damaging the pipe" inside the split teed fitting. Testing weld quality by magnetic particle or dye penetrate process are acceptable methods.

#### Fitting support after installation and testing

All hot tap or line stop fittings should be properly supported under bottom of the fitting. Horizontal or off the side hot tap fittings should have support under the bottom of the fitting AND at the flanged outlet where the valve is to be mounted. All side outlet taps MUST have the tapping machine supported at the back of the tapping machine. This is to prevent additional bending moments being placed on the tapping branch outlet connections.

#### Field Welder Qualifications

The field welder should be qualified to an American Welding Society (AWS) procedure as a minimum.