



DESIGN-FLOW® High Density Polyethylene Pipe Butt Fusion Procedure & Qualification

PE3408 / PE3608 / PE4710 Butt Fusion Procedure for Pipe & Fittings

1. Clean inside and outside of each pipe end with a clean cloth.
2. Place pipe and/or butt fitting ends into the proper alignment device. Square (normally by facing) the end of each pipe to be fused.
3. Check alignments of pipe ends and adjust. Check for voids and gaps. Check heater plate using a pyrometer for proper surface temperature of 400° F- 425° F (-0°/+25°). Insure heater surface is clean using only a clean cotton cloth, avoid fabric materials that melt and stick to heater plates.
4. Insert heater plate between aligned ends and bring ends firmly in contact with plate, but **DO NOT APPLY PRESSURE** while achieving melt pattern. Watch for proper melt bead (see table below).
5. Remove heater plate after achieving proper melt bead.
6. Bring melted ends together rapidly. **DO NOT SLAM.** Apply enough pressure* to form a uniform, double rollback bead around entire circumference of the joint.
7. Allow the fusion joint to cool properly (until comfortable to the touch) while maintaining pressure.

Approximate Melt Bead Width **

Pipe OD Range (inches)	Nominal Melt Bead Width (inches) **
>1 to <3	1/16 to 1/8
>3 to <8	1/8 to 3/16
>8 to <12	3/16 to 5/16
>12 to <24	5/16 to 7/16
>24 to <36	7/16
>36 to <54	9/16

** As measured from the heater plate face

Additional Tips To Insure A Quality Butt Fusion

- A quality butt fusion joint has a double bead rolled back to the OD body of the pipe.
- Use caution when handling completed fusion joints until joint has cooled to ambient temperature.
- * Recommended interfacial pressure is 75-psi (+/- 5 psi). (PPI Report TR-33 cites 60 psi - 90 psi range)

Fusion Equipment & Operator Qualification

Qualification of operator and equipment occurs when the heat fusion operator has been trained in the proper steps of PPI's TR-33 Butt Fusion, and then demonstrates mastery of the fusion equipment and the IPPI endorsed fusion procedures consistently. If desired, the project specific fusion procedure(s) may be recorded and documented for each joint either manually, or, electronically by using available data logging type devices.

Fusion Joint Validation

Attempts at fusion joint validation testing have provided mixed results with today's modern materials. The only short term validation tests IPPI accepts are ASTM D-1599, Quick-Burst Hydro-testing, and ASTM D1598, Constant Pressure Testing at Elevated Temperature.