

Lesson 5: Welding Out of Position

Welding a Butt Joint in the Horizontal Position

Objective: Students will weld a butt joint in the horizontal position using a shielded metal arc welder.

Directions: Students will use an arc welder to weld a butt joint in the horizontal position.

Materials and Equipment:

SMAW machine and accessories
Chipping hammer
Wire brush
Helmet*

Safety glasses or goggles
Leather gloves and any other protective clothing recommended by instructor
SMAW electrode(s), selected by instructor
Mild steel plates, selected by instructor

* Everyone participating in or observing the demonstration should wear appropriate protective eyewear.

Procedure:

1. Before beginning to weld out of position, it may be useful to review procedures for welding in the flat position. If instructed to do so, practice running beads, weld butt or fillet joints in flat position, or review any material on arc welding safety and procedures as needed.
2. Inspect equipment, materials, and work area to ensure safe and correct operation.
3. If necessary, bevel plates to be welded.
4. Wear appropriate face and eye protection and protective clothing.
5. Set up and turn on the machine following assigned procedure.
6. Cover up and remind those in the area to do so as well.
7. Tack weld the pieces together, leaving approximately a 1/16-in. gap between them.
8. Clean slag from the tack welds.
9. Secure the pieces in the horizontal position. If beveling was necessary, the beveled or more beveled piece should be on top. Refer to Figure 1.

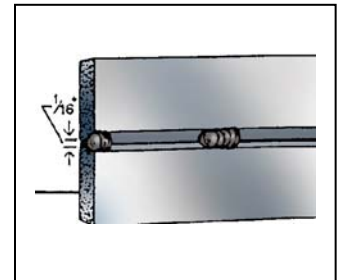


Figure 1

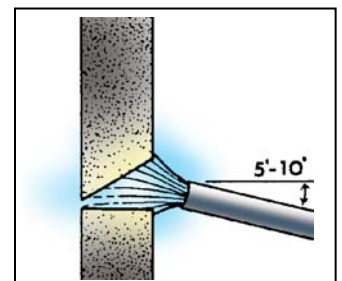


Figure 2

10. Strike an arc and weld the joint.
 - a. Hold the electrode 5 to 10 degrees below a right angle to the work and tilted approximately 20 degrees in the direction of travel. Refer to Figures 2 and 3.
 - b. Generally, the arc length used for horizontal welds is shorter than that used for flat welds.
 - c. A stringer bead is generally recommended for the initial (root) pass.
 - d. Remove the slag from the weld.
11. Run additional passes if needed to complete the weld, cleaning the weld between each pass. A weaving pattern can be used to distribute heat if needed.
12. Clean the final pass and inspect the weld.
13. Remove the electrode from the holder and observe safety, shutdown, and cleanup procedures.
14. Turn in work to be graded by the instructor.

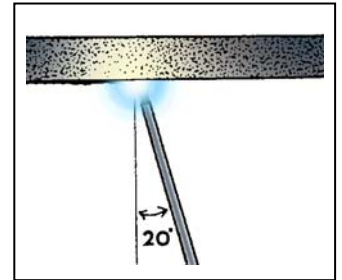


Figure 3