

Lesson 5: Welding Out of Position

Making a Downhill Fillet Weld

Objective: Students will make a downhill fillet weld using a shielded metal arc welder.

Directions: Students will use an arc welder to make a downhill fillet weld in a tee joint.

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. Inspect equipment, materials, and work area to ensure safe and correct operation.
2. Wear appropriate face and eye protection and protective clothing.
3. Set up and turn on the machine following assigned procedure.
4. Cover up and remind those in the area to do so as well.
5. Tack weld the pieces together at a 90-degree angle, leaving approximately a 1/16-in. gap between the pieces. Refer to Figure 1.
6. Clean slag from the tack welds.
7. Secure the pieces in the vertical position.
8. Strike an arc and weld the joint.
 - a. Hold the electrode approximately 10 to 15 degrees below a right angle, so that it is pointed up at the work, and about 45 degrees from each side. Refer to Figures 2 and 3.
 - b. Generally, the arc length used for vertical welds is shorter than that used for flat welds.

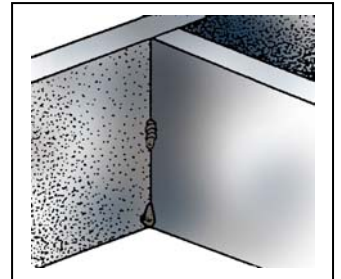


Figure 1

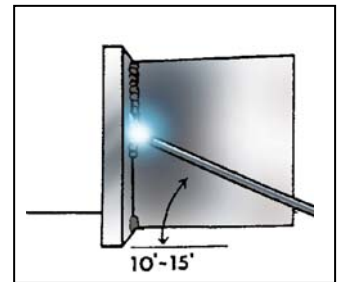


Figure 2

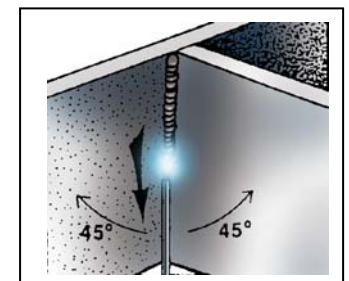


Figure 3

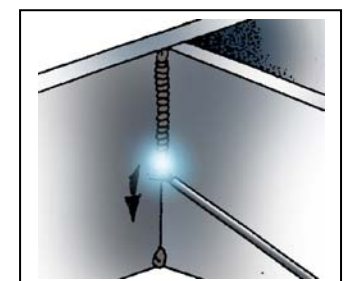


Figure 4

- c. A stringer bead is generally recommended for the root pass.
Refer to Figure 4.
- 9. Remove the slag from the weld.
- 10. 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.
- 11. Clean the final pass and inspect the weld.
- 12. Remove the electrode from the holder and observe safety, shutdown, and cleanup procedures.
- 13. Turn in work to be graded by the instructor.