Lesson 5: Welding Out of Position

Welding a Butt Joint in the Overhead Position

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

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

Materials and Equipment:

SMAW machine and accessories	Safety glasses or goggles
Chipping hammer	Leather gloves and any other protective clothing
Wire brush	recommended by instructor
Helmet*	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, including any additional protective clothing needed for welding in the overhead position.
3. Set up and turn on the machine following assigned procedures.
4. Cover up and remind those in the area to do so as well.
5. Tack weld the pieces together, leaving approximately a 1/16-in. gap between them.
6. Clean slag from the tack welds.
7. Secure the pieces in the overhead position.
8. Strike an arc and weld the joint.
   a. Hold the electrode approximately perpendicular to the base metal and tilted 15 to 20 degrees in the direction of travel. Refer to Figures 1 and 2.
   b. The electrode can be moved ahead, out, and back to the weld pool to help control the temperature of the pool. The arc is not broken in this movement. Refer to Figure 3.

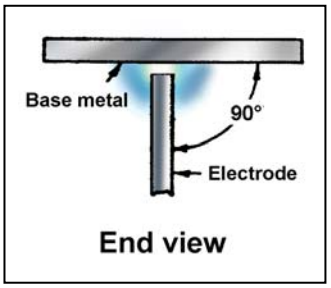

Figure 1

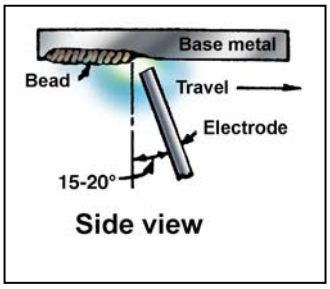

Figure 2

Figure 3

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.