

Lesson 3: Brazing on Mild Steel

Running a Bead With Brazing Rod

Objective: Students will observe how to run a bead on a steel plate using brazing rod and the oxyacetylene outfit.

Directions: Use an oxyacetylene outfit to run a bead using brazing rod.

Materials and Equipment:

Oxyacetylene outfit and accessories

Welding goggles with appropriate shaded lens*

Safety glasses if needed to supplement goggles

Leather gloves and any other protective clothing recommended by instructor

Spark lighter

Soapstone or chalk

Straightedge

Wire brush, emery cloth, or other cleaners recommended by instructor

Pliers

Flux suitable for brazing mild steel

Steel plate(s), selected by instructor

Uncoated brazing rod(s), selected by instructor. Use the pliers to bend the back end of the rod into a hook to distinguish it from the end that could be hot.

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

Procedure:

1. Wear appropriate face and eye protection and protective clothing.
2. Inspect equipment, materials, and work area to ensure safe and correct operation.
3. Demonstrate the correct procedure for cleaning the metal for brazing.
4. Position the plate on the worktable and mark a line using the soapstone and straightedge. More lines can be laid out for additional demonstrations, if desired.
5. Set up the oxyacetylene outfit.
6. Light the torch using the spark lighter.
7. Adjust the torch to the correct flame. If a flame other than a neutral flame is used, demonstrate the correct method of adjusting the torch and explain why this flame is appropriate for the procedure.

8. Heat the end of the brazing rod and the point on the plate where the bead is to begin.
 - a. Hold the torch at a 45-degree angle, with the inner flame cone approximately 1/8 in. from the work.
 - b. Hold the brazing rod at a 15- to 45-degree angle to the work.
 - c. Heat the rod until it is hot enough to melt the flux.
9. Dip the heated end of the brazing rod into the flux.
 - a. This will melt the flux and a small amount will stick to the brazing rod.
 - b. Repeat this step as often as necessary to keep the hot end of the rod coated with flux.
10. Touch the rod to the heated spot on the plate. The plate is hot enough when the rod begins to melt.
11. Once the rod starts to melt, move it into and out of the flame as needed to form a bead.
 - a. When running a bead with brazing rod, the torch should be moved in a circular pattern, as it was in the oxyacetylene welding procedures.
 - b. The flux should flow ahead of the filler material being added.
12. Continue moving the torch in the circular pattern and move the torch and rod forward at a speed that will keep the braze pool a uniform size and shape. If the pool becomes too large it can be controlled by moving the inner flame cone away from the work, by changing the angle of the flame, by moving at a faster rate, or by flashing the flame off the braze pool.
13. Continue until the bead is complete.
14. If desired, other beads could be run, varying factors such as the amount of time the base metal is heated and the amount of flux that is used.
15. Shut off the outfit.
16. If desired, when it is safe to do so, have students inspect the bead or beads. Explain that the ripples of the bead should be of a uniform height and width. There should be no white residue on the weld. Such residue indicates overheating.
17. If work is to be suspended, shut down the outfit.
18. Assign the student version of AS 1 to be performed by students.