

Fig. 6-23. Correct and incorrect bevels for good bead shape and adequate penetration.

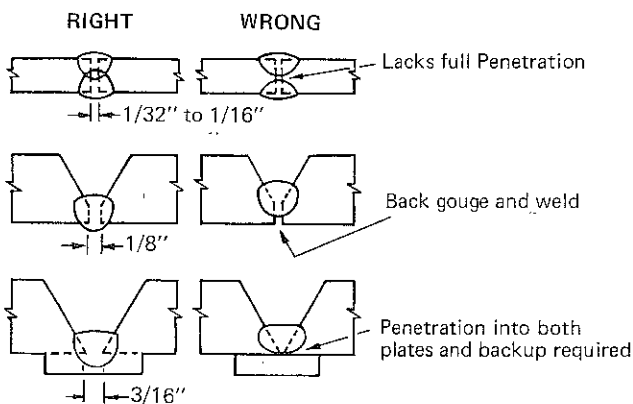


Fig. 6-24. Correct and incorrect gaps for proper penetration.

Sufficient bevel is required for good bead shape and adequate penetration (Fig. 6-23). Insufficient bevel prevents adequate entry of the electrode into the joint. A deep, narrow bead also has a tendency to crack. However, excess bevel wastes material. Sufficient gap is needed for full penetration (Fig. 6-24). Excessive gap wastes metal and slows welding speed. Either a 1/8-in. land or a backup strip is required for fast welding and good quality with thick plate (Fig. 6-25).

Feather-edge preparations require a slow costly seal bead. However, double-V butt joints without a land are practical when the seal bead cost is offset by easier edge preparation and the gap can be limited to about 3/32-in.

Weld seal beads on flat work with 3/16-in. E6010 electrodes at about 150 amp DCEP. Use 1/8-in. electrode at about 90 amp DCEP for vertical, overhead, and horizontal butt welds. Employ a combination whipping technique and circulating motion in the crater.

When low-hydrogen seal beads are required, use the appropriate EXX18 electrode. Weld with the

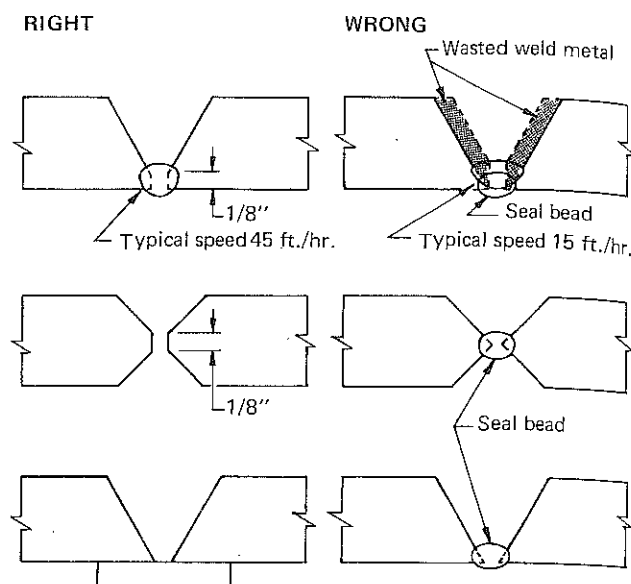


Fig. 6-25. Proper joint geometry for thick-plate welding.

same electrode sizes and about 20 amp higher current than recommended for E6010. Employ stringer bead technique with a slight weave when needed.

Back-gouging from the second side is needed: 1. For X-ray quality. 2. When irregular gap or poor technique produces a poor bead. 3. When a heavy bead is needed to prevent melt-through of semiautomatic fill beads.

Joint Cleanliness

To avoid porosity and attain the speeds indicated in the Procedure Tables, remove excessive scale, rust, moisture, paint, oil, and grease from the surface of the joints.

If paint, dirt, or rust cannot be removed — as is sometimes the case in maintenance welding — use E6010 or E6011 electrodes to penetrate through the contaminants deeply into the base metal. Slow the travel speed to allow time for gas bubbles to boil out of the molten weld before it freezes.

Electrode Size

Large electrodes permit welding at high currents and high deposition rates. Therefore, use the largest electrode practical consistent with good weld quality. Electrode size is limited by many factors, but the most important considerations usually are:

1. High currents increase penetration. Therefore, electrode size is limited on sheet metal and with root passes where melt-through can occur.