

# Welding Application

## Surfacing and Overlaying

Surfacing or overlaying with aluminum bronze or copper is extensively practiced to obtain corrosion resistance or to build up a bearing surface. Also known as weld cladding, this technique offers benefits in reducing materials costs and, in salvage applications, enables an expensive or difficult-to-replace part to be reclaimed and restored to operation with minimum of downtime.

Selection of a welding process is determined largely by the equipment available and the desired deposition rate. Gas metal-arc welding is the most widely selected process for surfacing with AMPCO-TRODE<sup>®</sup>. When the job dictates, gas tungsten-arc or shielded metal-arc welding may be used satisfactorily. The higher current densities associated with the inert-gas processes give deep penetration into the base metal. To reduce base metal pickup when overlaying iron or steel, apply the first layer with low amperage and use a weave technique. Excessive base metal dilution would result in difficult machinability and reduced service performance.

Experience has demonstrated that four weld layers to obtain a finish machined deposit of 1/4" (6.4 mm) provide the best performance and mechanical properties of the weldrod with the GMAW process. A finish thickness of 3/16" (4.8mm) would be considered a minimum satisfactory buildup. In cases where the dimensional geometry does not allow a 1/4" (6.4 mm) deposit to be added on, undercut the area to be overlaid and proceed to build up with weld metal.

Machine or grind base metal prior to first pass and wire brush or grind weld deposit between passes. Oil, cutting fluids, etc. must be removed before welding.

Apply first pass at low side of amperage range to minimize dilution.

Bearing surface overlays are often designed with preferential wear requirements. To do this with AMPCO-TRODE<sup>®</sup> alloys, select a filler metal and associated welding process that will result in a weld deposit of 50 to 75 points Brinell softer than the mating surface. This will assure a preferential wear system.

Careful application of the first layer is important to obtain a smooth, uniform contour without crevices. A weave bead or oscillated torch head produces the best results with consistent deposit thickness. Subsequent passes may be applied practicing the same technique. Welding in the flat position is recommended.

