

ALUMINIUM



Years ago aluminium was considered a difficult material to weld. When using oxy-acetylene there was no colour change to indicate the metal's temperature so suddenly it could melt and collapse! With the introduction of TIG and MIG welding processes, these welder fears have been put to one side, providing that the properties of aluminium are understood. This article is intended to give a general overview. Aluminium and its alloys have special properties of lightness, strength, conductivity and malleability making it a particularly useful material in a variety of industries. The metal can be either in cast form or extruded (wrought), which then

divides into non-heat treatable and heat treatable. Generally, aluminium is weldable, but it is important to understand some of its characteristics:

OXIDATION

In air, aluminium immediately forms an oxide layer on its surface, which will increase in thickness with time. This oxide layer must be controlled during the welding process, by chemically and mechanically cleaning the metal, using an aggressive flux or ensure the arc has reverse polarity (electrode positive). Correct gas shielding (argon) will prevent oxides reforming in the weld.

THERMAL CONDUCTIVITY

As aluminium is a very good thermal conductor, it will rapidly disperse heat. Care must be taken to avoid distortion and possibly cracking.

COLOUR

Unlike steel, there is no change in colour in aluminium as it is being heated. Look out for a 'wet' appearance. For gas brazing, melting of flux powder is a temperature indicator.

PREPARATION

Smooth all edges of workpiece to minimise trapped dirt. Use a commercial degreaser and stainless steel brush to remove dirt, oil, paint. Dry surface thoroughly. If TIG welding, wipe filler rod clean of any surface oil.

APPLICATION

Support the joint to be welded, preferably with a jig, but spot tacking can be used. Keep the arc travelling at the right speed to build up a bead of the right proportions. Do not stop/start on one weld, as this can lead to oxidation/porosity. Carry out the weld quickly to minimise distortion. ●



sif tips



Technical advice in the original SifTips style was started in 1932. 'Sifbronzing' is an almost universally recognised way of describing the low temperature bronze welding of sheet steel, cast iron and other metals. This explains why Sifbronze, the company which first developed and promoted the technique, is generally considered to be a supplier of high quality welding rods, wires, fluxes and equipment.

'Will the Welder' was a SifTips magazine that was produced in the early 1930s. The aim was to provide users with ideas and tips on how to get the most out of their welding equipment.

Sif is renowned for its UK manufacturing heritage as well as its complete range of quality welding consumables used globally for almost a century.

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PHONE : (+44) 0845 130 7757 FAX : (+44) 01462 482202
Email: info@weldability-sif.com Website: www.weldability-sif.com