

ALUMINIUM SOLDERING AND BRAZING

SOLDERING ALUMINIUM

Historically, engineers have considered that welding aluminium presents a range of problems, due to its surface oxide and that it does not change colour when heated. With the advent of MIG and TIG welding, it is now regularly welded with great success.

Certain alloys can be gas welded or brazed, but the removal of flux residue is most important, as its corrosive action will continue after the joint has been completed.

There is another 'low temperature' process, which is called soldering, although the workpiece is melted. The parts to be joined are heated (even by a small propane burner) and the rod rubbed on the work surface. At the correct temperature (370 C), the rod is seen to melt and creates an exothermic reaction generating sufficient heat to locally melt the aluminium. An advantage of this process is that flux is NOT required. We refer to the material as SIF 555 Aluminium Solder. The product gives high strength deposits that do not have the problem of galvanic corrosion between base metal and solder. The low working temperature keeps distortion and discoloration of the work to a minimum.

This process is commonly used by manufacturers of aluminium windows and doors. It is ideal for repairing and sealing defects in aluminium boats, gutters, engine parts, castings and sheets, being especially recommended for applications where flux residue removal is a problem.

The correct procedure is as follows; cracks and joints should be bevelled to a 60 to 90 Vee. Remove all dirt, grease and foreign material from the surface to be bonded. For a higher strength bond, roughen the surface before applying the alloy. Using a carburizing flame, heat the part broadly. As the temperature approaches 370 C, rub the rod on the surface to be soldered. Continue heating base metal until enough heat is present to cause the rod to melt off when it is rubbed on the joint. Do not overheat, but

be sure the entire joint surface is tinned before adding additional alloy to make a build-up. Tinning action may be improved by using a clean, stainless steel wire brush to brush through the molten metal to the base metal surface. Allow part to cool slowly.

BRAZING ALUMINIUM

Traditionally Sifbronze referred to the technique as "Process 36", but recently Sifalumin No 36 and Aluminium No 36 flux have been replaced by Sifalumin No 16 which melts approx. 80 C lower than pure aluminium and Aluminium Flux.

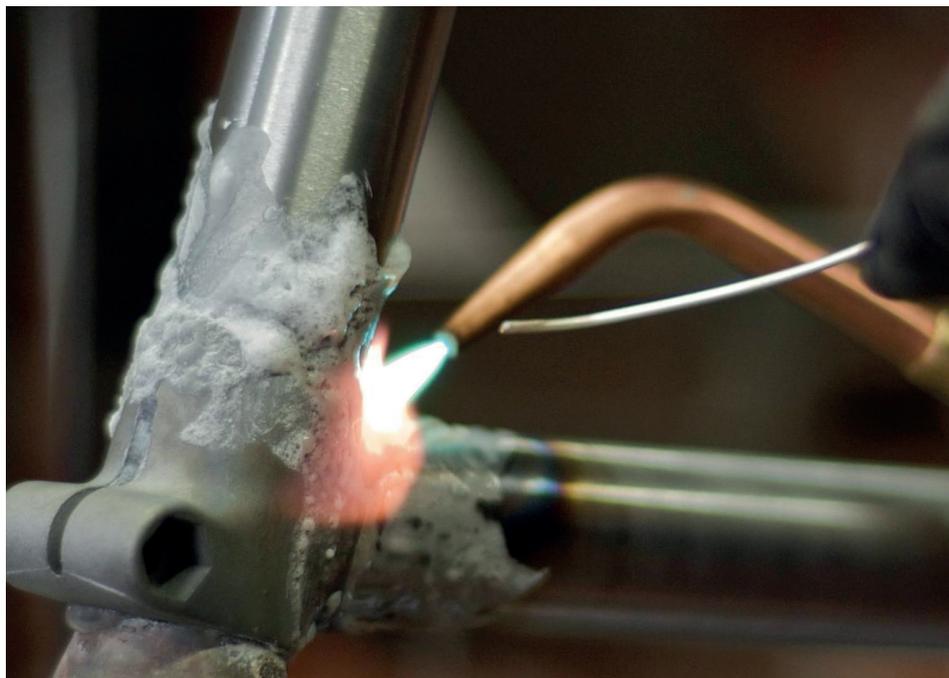
The process is applicable to pure aluminium and alloys with up to 2% magnesium. Other alloys will prove difficult, especially if containing high % of silicon. The joint design should be lap type with a good mechanical fit. Parts must be thoroughly cleaned and if magnesium bearing wire brushing is essential. The brazing operation should be carried out as soon as possible after cleaning

The SIF Aluminium flux is used as a temperature indicator and can be applied via the rod or applied direct to the workpiece as a paste, made by mixing the flux with water. The whole workpiece should be pre-heated with the blowpipe moving backwards and forwards along the joint line. As the flux melts, the rod is applied to flow freely along and through the joint. It is important to avoid overheating which can destroy the properties of Sifalumin No 16.

Aluminium flux is highly corrosive and the residue must be removed within 30 minutes of the brazing operation. Where joints are accessible, wire brush with very hot water or even a steam jet, alternatively treatment with 5% nitric acid solution may be required.

Preparation Is Key

All brazing and soldering applications require components to be clean and oil free to facilitate capillary action. Thorough degrease and clean all component before attending to start the process.



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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