FILLER METALS FOR BRAZING

USEFUL INFORMATION

WHAT IS BRAZING?

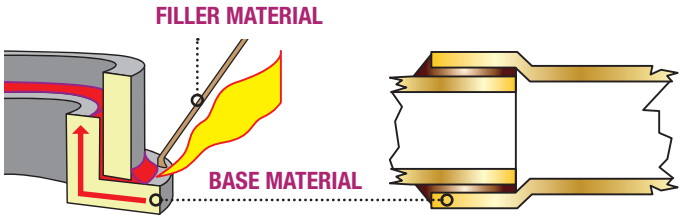
Brazing is the oldest procedure used by man for joining or fusing two metal parts. It was already known to the Phoenicians and the Etruscans. It is currently a process used in industry and by craftsmen.

HOW DOES IT WORK?

Brazing is a process in which the join is made by melting only the filler material (commonly called rod). The base materials (the parts to be joined) are heated to temperatures below their melting temperature. Brazing makes use of capillarity and the wettability characteristics of the filler material, which allow the melted filler metal to spread over the surface of the base metal and penetrate inside the joint.

THE ADVANTAGES OF BRAZING

- Does not require mechanical finishing operations.
- Negligible workpiece deformation
- Joins pieces of dissimilar thicknesses
- Joins different and otherwise unweldable metals
- Excellent aesthetic appearance



HOW MANY TYPES OF BRAZING ARE THERE?

1. Low-temperature brazing: when the melting temperature of the filler material is <450°.
2. High-temperature brazing: when the melting temperature of the filler material is >450°.
3. Braze welding: is like high-temperature brazing but with joints typical of welding.

WHEN IS HIGH-TEMPERATURE BRAZING USED?

When you want to combine the advantages of brazing with high tensile strength of the joint.

FIELDS OF APPLICATION OF HIGH-TEMPERATURE BRAZING

- Maintenance
- Repairs
- Cold and air conditioning industry.
- Sanitary plumbing

WHAT ALLOYS ARE USED FOR HIGH-TEMPERATURE BRAZING?

- Brass alloys with a high silver content for brazing all ferrous and non-ferrous metals (except aluminium).
- Copper alloys for joining base metals which contain copper.

HOW IS BRAZING DONE?

1. Thoroughly clean the joint surfaces, removing oils and fats.
2. Apply the deoxidising flux (powder, paste or coated rods) to the joint.
3. Heat the joint evenly using the plume of the oxygas torch flame.
4. When the temperature has been reached, place the rod in contact with the workpiece and spread the melted filler metal on the joint.
5. Finally clean the joint with very hot water to prevent deoxidiser residues from damaging the joint.

WHAT IS THE DEOXIDISING FLUX (POWDER OR PASTE) FOR?

It dissolves the surface oxides present on the joint, so assisting the fluidity of the liquefied filler material on the base metal of the joint.

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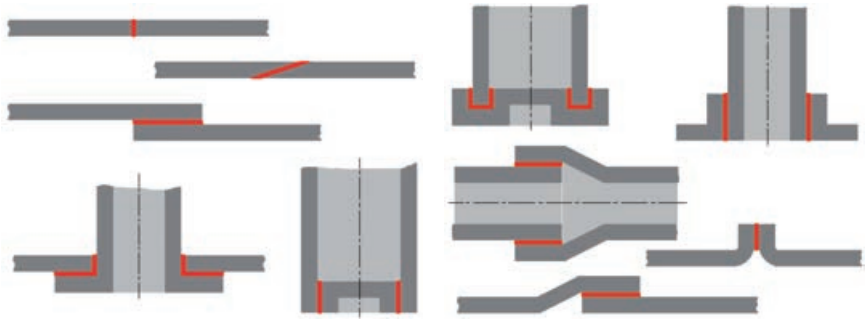
TYPES OF JOINT RECOMMENDED FOR BRAZING



WHY DO CADMIUM-FREE ALLOYS NEED TO BE USED?

The element CADMIUM (CE: 231-152-8) and its derivatives, in particular Cadmium Oxide (CE: 231-146-2) have now been classified as category 2 carcinogenic materials, according to the European Directive 2005/90/EC of 18 January 2006 amending, for the 29th time, the Directive 76/769/EEC.

The Directive became compulsory on 24 August 2007.

SAF-FRO chose user safety by creating a dedicated line of CADIUM-FREE silver brazing rods: that is how the SAFAR line came about.

FEATURES OF THE SAFAR LINE

SAF-FRO silver alloys for high-temperature brazing are distinguished by the following features:

- Wide range of up to 56% silver to fulfil the most diverse operating requirements;
- Distinctive coating colour for easy identification;
- RC flexible coating and RFC extra-flexible optimised coating for greater ease of use and less material wastage;
- Special hard case (250 g pack, rod length 500 mm) to ensure rod coating quality;
- Labelling already complying with the European REACH regulation, ensuring that the professional user is fully and safely informed.

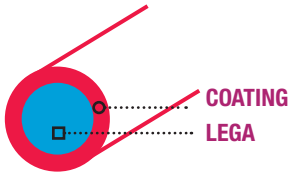
IF I USED TO USE RODS WITH CADMIUM, WHAT CAN I USE NOW?

You can choose in two ways:

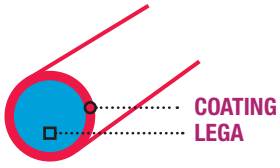
- By choosing rods with the same silver percentage (the most common case);
- By choosing rods with a silver percentage that is 5% to10% higher (special cases).

ADVANTAGES OF THE EXTRA-FLEXIBLE THIN RFC COATING

- Higher coating strength.
- Less fumes.
- Less brazing residues.



CROSS-SECTION OF RC ROD
FLEXIBLE COATING



CROSS-SECTION OF RFC ROD
EXTRA-FLEXIBLE THIN COATING