Johnson Matthey
Inspiring science, enhancing life

Technical data

Silver Copper Phosphorus Brazing Filler Metal

Sil-fos™ 6 – Silver Copper Phosphorus Brazing Filler Metal

Product description

Sil-fos™ 6 is a 6% silver-copper-phosphorus brazing filler metal, which is used to braze copper and copper alloys. When brazing copper the phosphorus within the alloy imparts a metallurgical based self-fluxing capability. When Sil-fos™ 6 is used to join copper alloys (such as brass, bronze or gun metal) a separate flux will be required because the self-fluxing action only occurs on copper (see below for details). This filler metal should not be used to braze iron containing materials like carbon or stainless steels or nickel containing materials as the phosphorus within the filler metal will form brittle, intermetallic, phosphide compounds at the joint interface. Sil-fos™ 6 is not suitable for use in sulphurous atmospheres at elevated service temperatures. When selecting a brazing filler metal from the Sil-fos™ range it is necessary to understand about the flow and ductility of the different products. Phosphorus is the key element, the higher this is the more free flowing the filler metal, but the lower its ductility. Silver is used to improve the filler metal's ductility, but reduces its flow properties.

Sil-fos™ 6 is one of the most free flowing filler metals from the Sil-fos™ range. However, due to its high phosphorus content it is one of the least ductile. The low ductility of the alloy imparts it with glass like properties, making it both 'notch' sensitive and sensitive to impact type loadings. This filler metal should therefore not be used in applications involving exposure to strong vibration, impact loads or where some deformation of the joint might be expected in service. In such circumstances the use of Sil-fos™ 5 or Sil-fos™ should be considered. Sil-fos™ 6 is best suited for making copper joints that are of the true capillary type and where tight joint clearances of 0.025-0.075 mm are used. When used in such joints, the poor mechanical properties of the filler metal are exposed and satisfactory joints, suitable for use in all but the most extreme conditions can generally be produced.

Composition: 6%Ag, 86.75%Cu, 7.25%P

Conforms to: AWS A5.8 BCuP-4, ISO 17672:2010 CuP 283

Melting range: 644-718˚C

Uses for this product

Sil-fos™ 6 is extensively used in refrigeration and air conditioning applications for flux-free brazing of copper pipes and tubes. It is also used for joining copper in electrical engineering applications.

Conditions for use

Flame heating methods are most often used for brazing with Sil-fos™ 6. When used as a pre-form rapid heating to the brazing temperature is required to avoid liquation (separation of low and high melting phases in the alloy).

For brazing copper to copper no flux is needed, as Sil-fos™ 6 is self-fluxing in this case.

For use on copper alloys a separate flux is required and Easy-flo™ Flux is suitable. For prolonged heating cycles on larger components Tenacity™ No.4A Flux or Tenacity™ No.5 Flux may be required.

Product availability

Brazing rods	1.5 mm, 2 mm, 2.5 mm, 3 mm
Wire	1 mm to 3 mm
Other	Braze-pastes on request

Johnson Matthey PLC, Platinum Group Metal Services, Orchard Road, Royston, Herts, SG8 5HE, UK Rev.27/01/25.

UKAS MANAGEMENT SYSTEMS