

## Technical data

# Silver Copper Phosphorus Brazing Filler Metal

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

### Product description

Sil-fos™ is a 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™ 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™ is not suitable for use in sulphurous atmospheres at elevated service temperatures.

Sil-fos™ is the most ductile of the silver-copper-phosphorus brazing filler metals and is specified where a self-fluxing alloy must be used and joint ductility is a factor. It should be noted however that conventional silver brazing filler metals are considerably more ductile than Sil-fos™. Due to its ductility Sil-fos™ is the only filler metal of its type that can be fabricated into foil, tape, strip and fine wire. Consequently it is used to manufacture a wide range brazing filler metal pre-forms, rings and punched or pressed parts such as discs, washers and clips.

The optimum joint gap for brazing is normally 0.05-0.2mm.

**Composition:** 15%Ag, 80%Cu, 5%P

**Conforms to:** EN 1044 1999 CP102, AWS A5.8 BCuP-5, ISO 17672 CuP 284

**Melting range:** 644-800 °C\*

\*The flow point for this filler metal is approximately 700 °C

### Uses for this product

Sil-fos™ finds extensive use in electrical engineering applications where it is used to make electrically conductive joints. The brazing of rotor bars to end rings in electric motors, the fabrication of bus bars and lightning conductors are common applications. The electrical conductivity of Sil-fos™ is approximately 11% I.A.C.S. It also finds use in heating and ventilation and refrigeration applications where it is used to join copper pipes.

### Conditions for use

Resistance or flame heating methods are suitable for brazing with Sil-fos™. 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™ is self-fluxing in this case. When copper alloys, brass, bronze etc. are to be brazed a separate flux is required and while Easy-flo™ Flux is generally suitable, in applications where protracted heating to the brazing temperature is likely to occur the use of Tenacity™ No. 4A Flux or Tenacity™ No. 5 Flux may be necessary.

### Product availability

Rod	1.5 mm, 2 mm, 2.5 mm, 3 mm
Strips	5 x 1 mm, 3 x 1.2 mm
Wire	Various sizes upon request
Foil	Widths from 2 mm to 100 mm, 0.12 mm to 0.5 mm thick
Other	Rings, preformed shapes, braze-pastes, upon request

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