

Technical data

Active brazing filler metal

Active-braze™ No.15 Brazing Paste Grade B420P75 and B420P80

Product description

Active-braze™ No.15 Brazing Paste is a specialised brazing paste for the active brazing of non-metallic materials. Employing an active brazing technique removes the need for prior metallisation of the non-metallic material such as the 'moly-manganese' metallisation commonly applied to alumina ceramics.

The product can be used to braze non-metallic materials either to a non-metallic or a metallic material. Brazing a non-metallic material to a metallic material invariably means the joining of two materials with widely differing coefficients of thermal expansion (CTE). When brazing a non-metallic to a metallic material it is therefore important to either select a metallic material that has a similar CTE to the non-metallic to be brazed (using a joint design that is compliant and can deform to accommodate the mismatch in dimensions), or a soft material, like copper, that can deform without imposing undue stresses on the non-metallic material.

Active-braze™ No.15 brazing paste is formulated around a silver-copper-indium filler metal with an addition of titanium as the active element. The paste binder system used in the product is a water soluble polymer type.

Active type brazing filler metals do not flow by capillary attraction or spread significantly like most brazing filler metals and need to be placed within the joint. Active-braze™ No.15 has a brazing temperature range of 720 to 860°C.

Nominal Filler Metal Composition: 60%Ag, 24%Cu, 14%In, 2%Ti

Conforms to: Proprietary specification

Melting range: 620 to 720 °C

Uses for this product

Active-braze™ No.15 is used for the brazing of ceramics like alumina and zirconia, diamond, natural, single crystal, or CVD (chemical vapour deposition) types, as well as graphite, sapphire, silicon carbide, PCD (polycrystalline diamond) and PCBN (polycrystalline cubic boron nitride) to themselves or to metallic substrates like low expansion nickel alloys, copper and tungsten carbide.

Conditions for use

Joints using Active-braze™ No.15 need to be brazed under vacuum or high purity, low dew point inert gas. Brazing can be carried out in furnaces with vacuum or inert gas atmospheres or using HF Induction heating under vacuum or inert gas.

Vacuum conditions: 1×10^{-4} torr or better with a leak rate of less than 5 microns an hour.

As the brazing filler metal within the paste contains silver, the use of a partial pressure brazing technique is necessary to prevent vaporisation of the silver out of the filler metal. This involves heating to a temperature of 570°C under full vacuum and then back-filling the furnace with a partial pressure (1×10^{-2} torr) of high-purity, low dew point inert gas.

Inert Gas Purity: High purity, low dew point <-70°C (argon preferably obtained from a liquid source). Where mesh belt furnace brazing is used the gas flow should be sufficient to maintain the atmosphere purity in the furnace.

During vacuum brazing a short dwell of 10 to 15 minutes at 450°C is recommended to allow dissipation of the paste binder system. When using HF induction, or when mesh belt furnace brazing, an initial slow rate of heating should be employed to allow the binder system to dry out. Heating too fast at this point may result in the paste spitting.

The recommended brazing temperature for Active-braze™ No.15 is between 720 and 860 °C, depending on the materials being brazed, with 750°C being typical. For PCBN or CVD a brazing temperature of between 900 and 950 °C is recommended.

After brazing, components should be cooled down slowly to room temperature. (contd overleaf)

As with all brazing operations, preparation and pre-cleaning of the components prior to brazing is an important consideration. In addition, the cleanliness of the brazing environment (the furnace chamber) and purity of the atmosphere used (vacuum or inert gas) are also important as these can affect the finished joint quality. (contd overleaf)

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Product availability

This product is supplied as a brazing paste and is made to special order only.

It can be supplied in syringes (10cc / 30gms or 30cc / 100gms), cartridges (30cc / 100gms, 180cc / 500gms, 360cc / 1kg) or in pots of 0.5kg, 1kg or greater.

The pots must be closed and stored in a ventilated and dry place between 15 and 25°C. The product should be used within the following timescales according to the packaging in which it is supplied:

6 weeks in 10cc & 30cc cartridges

3 months in 180cc & 360cc cartridges

6 months in pots.

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