

## Technical data

### Active brazing filler metal

Active-braze™ No.10 Brazing Paste Grade B420P 75

#### Product description

Active-braze™ No.10 Brazing Paste Grade B420P 75 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 to either themselves or to 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 miss match in dimensions), or a soft material like copper that can deform without imposing undue stresses on the non-metallic material.

Active-braze™ No.10 brazing paste is formulated around a silver, copper 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 or spread significantly like most brazing filler metals and need to be placed within the joint. Active-braze™ No.10 has a brazing temperature range of 780 to 950°C.

**Nominal Filler Metal Composition:** 70%Ag, 28%Cu, 2%Ti

**Conforms to:** Proprietary specification

**Melting range:** 780-800 °C

#### Uses for this product

Active-braze™ No.10 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 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.10 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:**  $1 \times 10^{-4}$  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", i.e. heating to a temperature of 750°C under full vacuum and then back filling the furnace with a partial pressure ( $1 \times 10^{-2}$  torr) of high purity, low dew point inert gas can also be used to prevent the vaporisation of silver out of the filler metal.

**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 spitting of the paste. The recommended brazing temperature for Active-braze™ No.10 is between 850 and 950 °C depending on the materials being brazed. 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.

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 0.5kgs, 1kgs 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 it is supplied in:

6 weeks in cartridges 10cc & 30cc

3 months in cartridges 180cc & 360cc

6 months in pots

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