Micromax™ 6177T

Electronic Inks and Pastes

Palladium Silver Conductor

Silver/Palladium Conductor Composition Micromax™ 6177T is a general purpose microcircuit conductor offering excellent adhesion and fired density and wide processing latitude. It has been designed to give high yields and to be cost-effective in commercial microcircuit applications.

Product characteristics

- Excellent thermal cycle and long term aged adhesion
- Excellent through-hole printability
- Fine line resolution
- Good solderability
- Thick Al wire bondable
- Fireable on 30 or 60 minute 850°C profiles

Product information

Solvent or thinner	Micromax™ 4553

Rheological properties

Viscosity	100 - 180[1]	Pa.s

[1]: Brookfield HBT, Utility cup & spindle (SC4- 14/6R), 10rpm, 25°C ± 0.2°C.

Application technique

Mask mesh	325[2]	
Mask emulsion	12 - 14	µm
Drying time	10 - 15	min
Drying temperature	150	°C
Recommended film thickness, fired	13 - 17	µm
Print resolution, lines	≥150	µm
Leveling time	5 - 10	min

[2]: Screen Types: Stainless steel

Specific Application Suitability

Solder leach resistance	6 - 8[3]	cycles
Solder acceptance	≥90	%

[3]: 62 Sn/36 Pb/2 Ag at 230°C. Using Alpha 611 flux. Solder coverage measured after a 5 s. dip in solder. A leaching cycle is represented by a 10s. dip in solder. SLR data quoted above is tested at 230°C. See soldering test procedure for details (H-1.12).

[4]: Coverage, 62Sn/36Pb/2Ag at 220°C. Using Alpha 611 flux. Solder coverage measured after a 5 s. dip in solder. A leaching cycle is represented by a 10s. dip in solder. SLR data quoted above is tested at 230°C. See soldering test procedure for details (H-1.12).

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Storage and stability

Shelf life	6[5] months

[5]: in unopened containers, from date of shipment, at room temperature (<25°C)

Additional information

How to use

Design & compatibility

- Compatibility
  - Whilst Micromax™ has tested this composition with specified materials and under the recommended processing conditions, it is impossible or impractical to cover every combination of materials, customer processing conditions and circuit layout. It is therefore essential that customers thoroughly evaluate this material in their specific situations, in order to completely satisfy themselves as to the overall quality and suitability of the composition for its intended application(s).

Processing

- Substrates
  - Properties are based on tests on 96% alumina substrates. Substrates of other compositions and from various manufacturers may result in variations in performance properties, as may different lots of substrates, and any subsequent processing of substrates (e.g. laser scribing or drilling) prior to printing. It is the responsibility of users to determine the effects of any of the above variables in their particular situations.
- Printing
  - Composition Micromax™ 6177T should be thoroughly mixed before use. This is best achieved by slow, gentle hand stirring with a clean, burr-free spatula (flexible plastic or stainless steel) for 1-2 minutes. Printing should be carried out in a clean, well-ventilated area.
  - Note : Optimum printing characteristics of Micromax™ 6177T are generally achieved in the temperature range 20°C-23°C. It is therefore important that the material, in its container, is at this temperature prior to commencement of printing. 325 mesh stainless steel screen with a 12-14µm emulsion thickness can be used. Print speeds of up to 25cm/s may be used. At high printing speeds optimum results are obtained with a sharp squeegee, 30° or 45° angle of attack, a squeegee force of 10-20N and a snap-off of between 0.5mm and 1.0mm depending on pattern size.
- Thinning

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- Micromax™ 6177T is optimised for screen printing and thinning is not normally required. Micromax™ Electronics Composition Thinner 4553 may be used sparingly for slight adjustment to viscosity or to replace evaporation losses. However, the use of too much thinner or the use of a non-recommended thinner may affect the rheological behaviour of the material and its printing characteristics.

- Drying
  - Allow prints to level at room temperature in a clean, draught-free environment, followed by drying in a well ventilated oven or conveyor dryer.
- Firing
  - Fire in a well ventilated belt or conveyor furnace, in air with a 30-60 minute cycle to a peak temperature of 850°C for 10 minutes. Care must be taken to ensure that any gases/vapours from other chemicals/materials (e.g. halogenat solvents) do not enter the furnace muffle. It is also essential that the air supply to the furnace is clean, dry and free of contaminants. Air flows and extraction rates should be optimised to ensure that oxidising conditions exist within the muffle, and that no furnace exhaust gases enter the room.

Properties

- Test Procedure
  - Typical fired properties are based on laboratory tests. Unless expressly noted elsewhere the following processing conditions have been used.
  - Printing : 325-mesh stainless steel screen, 12-14µm emulsion thickness.
  - Firing : 2 x 30 minutes cycle to a peak temperature of 850°C for 10 minutes/1 x 500ºC cycle.
  - All tests performed on 96% alumina substrates.
- All values reported here are results of experiments in our laboratories intended to illustrate product performance potential with a given experimental design. They are not intended to represent the product's specifications, details of which are available upon demand.

General

Yield and performances will depend to a large degree on the care exercised during processing, particularly in screen printing. Scrupulous care should be taken to keep the conductor composition, printing screens and other tools free of

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metal contamination. Dust, lint and other particulate matter may also contribute to poor yields.

Storage and shelf life

Storage : Containers of Micromax™ 6177T may be stored in a clean, stable environment at room temperature (<25°C), with their lids tightly sealed. Storage in freezers (temperature <0°C) is NOT recommended, as this could cause irreversible changes in the material. Jar rolling is unnecessary and is NOT recommended, as this could change the rheology of the material.
Shelf life : Micromax™ 6177T has a shelf life of 6 months from date of shipment, for factorysealed (unopened) containers, stored under room temperature conditions.

Safety and handling

For safety and handling information pertaining to this product, read Safety Data Sheet (SDS).

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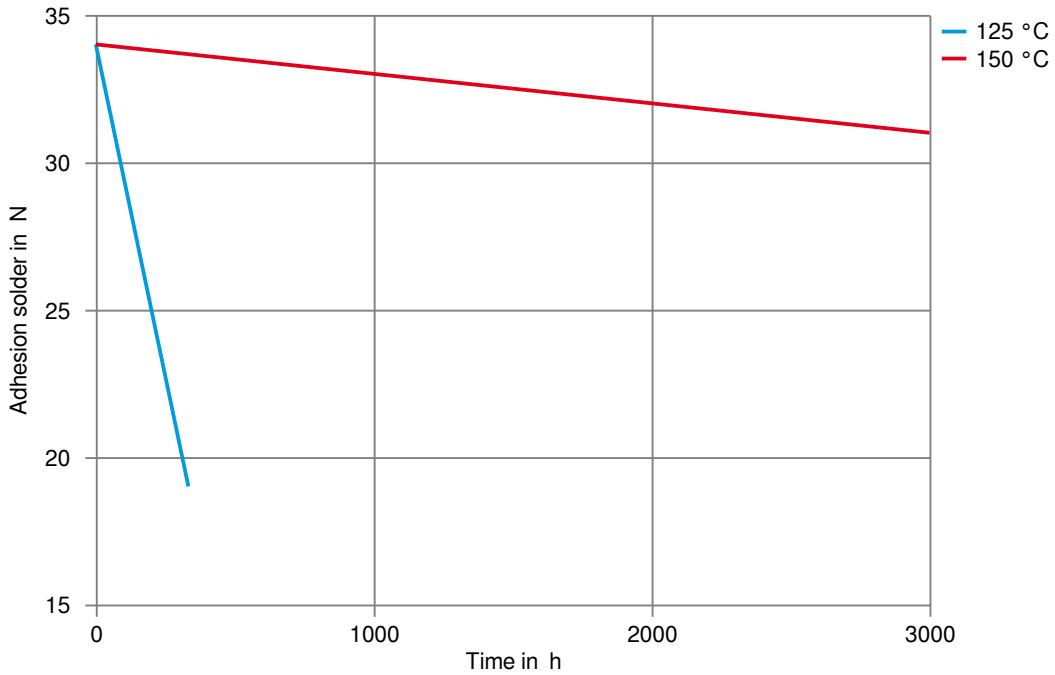
Adhesion solder after heat ageing 0



Revised: 2023-08-21 Source: Celanese Materials Database