

Electronic Inks and Pastes

Palladium Silver Conductor

Silver/Palladium Conductor Composition MicromaxTM 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 MicromaxTM 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 MicromaxTM 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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 MicromaxTM 6177T is optimised for screen printing and thinning is not normally required. MicromaxTM 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.
 - $\circ\,$ Printing : 325-mesh stainless steel screen, 12-14 μm emulsion thickness.
 - Firing: 2 x 30 minutes cycle to a peak temperature of 850°C for 10 minutes/1 x 500°C 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 MicromaxTM 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: MicromaxTM 6177T has a shelf life of 6 months from date of shipment, for factorysealed (unopened) containers, stored under room temperature conditions.

Safety and handling

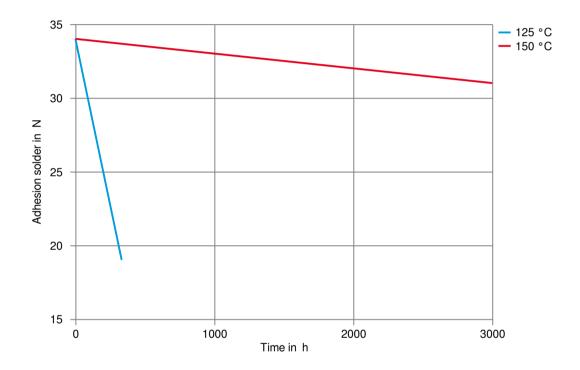
For safety and handling information pertaining to this product, read Safety Data Sheet (SDS).

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Adhesion solder after heat ageing 0



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

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colourants or other additives may cause significant variations in data values. Properties of moulded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design conditions and environmental exposure. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufac

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