Micromax™ 7886

Electronic Inks and Pastes

Heated Glass Compositions

Micromax™ 7886 is provided for use in the production of electrically heated glass by a direct-printing process. Micromax™ 7886 is compatible with many glass types and black enamels. Care has been given in the design of these pastes to provide a robust fired layer that is resistant to environmental and chemical influences. The technology embodied in Micromax™ 7886 exhibits very high adhesion to most glass/enamel systems, including lead containing enamels, and very high firing latitude. Micromax™ 7886 is designed for use where adhesion to enamel is critical, or where processing conditions are variable. Micromax™ 7886 can be blended with Micromax™ 788x series lead free defoggers to make a range of systems with different resistivities. It is not designed to be electroplated.

Product characteristics

- Cadmium, Lead, Nickel and Phthalate free*
- Very wide firing latitude
- Excellent soldered adhesion over glass and a wide range of unleaded black enamels
- Excellent soldered adhesion over leaded enamels at thickness >12µm
- Uniform intense color
- Excellent fired density giving good hiding power to clips soldered on to silver fired directly on glass (fired thickness >7µm)
- Fully blendable system
- Long screen life
- Robust printing performance

*Cadmium, Lead, Nickel and Phthalate 'free' as used herein means that cadmium, lead, nickel, and phthalate are not intentional ingredients in and are not intentionally added to the referenced product. Trace amount however may be present.

Product information

Solvent or thinner	Micromax™ 8250
Solid content	83.5 - 84.5[1] %

[1]: 750 °C Wt.

Rheological properties

Viscosity	28 - 35[2] Pa.s

[2]: Brookfield RVT, UC&S, 10 rpm

Application technique

Mask mesh	45 - 110[3]
Drying temperature	150 °C

[3]: Screen Types: Polyester, 45T-110T

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Electrical properties

Surface resistivity	4 - 6.2	mOhm per square

Storage and stability

Shelf life	12[4]	months

[4]: in unopened containers, from date of shipment, at temperature <25°C

Additional information

How to use

Design & compatibility

- Compatibility
  - Micromax™ 7886 compositions have been used with a wide variety of both infra-red and UV-curable enamels, with few incompatibilities. However, 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 these materials in their specific situations, in order to completely satisfy themselves as to the overall quality and suitability of the compositions for their intended application(s).

Processing

- Printing
  - Micromax™ 7886 can be printed with 45T-110T polyester screens having terpene-resistant emulsion. Printing should be carried out in a clean, well-ventilated area.
  - Note : Optimum printing characteristics of Micromax™ 7886 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.
  - Micromax™ 7886 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. Jar rolling paste is not appropriate for mixing and is not recommended.
  - In order to obtain a specific resistance value, the pastes can be blended with each other.
- Thinning
  - Micromax™ 7886 compositions are optimized for printing. Thinning is not normally required. Use the Micromax™ recommended thinner for slight adjustments to viscosity or to replace evaporation losses. The use of too much thinner or the use

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of a non recommended thinner may affect the rheological behaviour of the material and its printing characteristics.

- Drying
  - If needed dry with hot air at 150°C or with an infrared dryer to the required green strength.
- Firing
  - Fire between 640°C and 700°C surface temperature for 2 to 4 minutes, followed by cold-air tempering. To achieve the desired properties, the furnace atmosphere must be controlled to avoid both contamination (due to sulphur for example) and poor burnout of the organic species due to low oxygen availability. Firing is the critical step in achieving designed properties. Within the firing conditions quoted above, the resistance will generally decrease with increasing firing temperature. Furthermore, some properties such as adhesion over enamel will vary as a function of firing temperature.
- Soldering
  - Use 27Sn/70Pb/3Ag solder at 300-330°C and non-activated flux. To achieve good solder wetting, it is recommended that the surface of the fired silver be burnished with steel wool or fibreglass prior to soldering.

Properties

- Information in this datasheet shows anticipated typical physical properties for Micromax™ 7886 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

General

Defogger silver pastes are screen-printed onto glass or black enamel and fired in fast firing glass furnaces. The resistance of the heater at constant voltage determines the power output. The resistance target is achieved by printing the silver paste to achieve the correct fired geometry (conductor length and cross-sectional area). For a fixed conductor pattern, the resistance target can be achieved in 2 manners;
• Controlling the print thickness by changing printing conditions (for example screen mesh) or by changing the silver content in the printed paste (by blending the Micromax™ 7886)
• Controlling the specific resistance for a given print thickness by blending Micromax™ 7886 with the Micromax™ 788x family silver content analogue.
The performance of Micromax™ 7886 can be compromised by printing too thin

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(<7µm) or by firing at temperatures below 640°C, either or both of these actions will result in low adhesion over enamel or glass and possibly other reductions in performance versus expectation.
The yield and performance will depend to a large degree on the care exercised during processing, particularly in screen-printing. Scrupulous care should be taken to keep the Micromax™ 7886 paste, printing screens and other tools free of metal contaminants. Dust, lint and other particulate matter may also contribute to poor yield.

Storage and shelf life

Containers should be stored, tightly sealed, in a clean, stable environment at room temperature (<25°C). Shelf life of material in unopened containers is twelve months from date of shipment. Some settling of solids may occur and compositions should be thoroughly mixed prior to use.

Safety and handling

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

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