

Micromax™ QM44

Microcircuit and Component Materials

Dielectric

Micromax™ QM44 is a filled, crystallizable screen printed thick film dielectric composition and is an integral element of the Micromax™ QM44 multilayer system. It is a versatile dielectric for use in both high reliability and low cost MCM (Multi-Chip Module) and hybrid interconnect applications.

Product benefits

- Broad conductor compatibility (gold, silver, and mixed metal)
- Thin, 2 print, hermetic dielectric film.
- High resistance to E.M.F. (electro-motive force) blistering and shorting.
- Robust electrical and mechanical properties.
- Compatible co-fire conductors.

Product information

Solvent or thinner

Micromax™ 4553

Rheological properties

Viscosity

80 - 120^[1] Pa.s

[1]: Brookfield HBT, UC&SP, 50rpm, 25 °C

Application technique

Mask mesh

230 - 280

Drying time

10 - 15 min

Drying temperature

150 °C

Theoretical coverage

110 - 130^[2] cm²/g

Recommended film thickness, fired

28 - 32 μm

Via, diameter resolution

250 - 300 μm

Leveling time

5 - 10 min

[2]: based on a fired thickness of 14 μm

Electrical properties

Dielectric Constant

8 - 10^[3]

Dissipation Factor

≤0.2^[3] %

Insulation Resistance, DC

≥1E12 Ohm

Surface Leakage Current

≥1 μA/cm²

Breakdown Voltage

≥1000 V

[3]: at 1 KHZ

[4]: at 100VDC

[5]: Standard measurements made after 5 min at 10 VDC.

[6]: at 30μm

Micromax™ QM44

Microcircuit and Component Materials

Storage and stability

Shelf life

6^[7] months

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

Additional information

How to use

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.
- **Printing**
 - Printing should be carried out in a clean and well ventilated area. The combined fired thickness of the dielectric should be 30±2 µm. This can generally be obtained by printing the individual layers with a 230-280 mesh stainless steel screen at speeds of 6 ips.
- **Drying**
 - Allow prints to level at room temperature, then dried.
- **Firing**
 - Fire each dielectric print separately in well ventilated moving conveyor furnace, in air. A 30-minute cycle with a peak temperature of 850°C held for 10 minutes should be used.

Properties

Typical Fired & Electrical Properties

| Test | Properties |
|--|------------|
| Max.no.circuit layers | < 8 |
| Camber* ¹ (mil/in) | < 2 |
| EMF Blister Resistance* ² (firings) | > 30 |

*1 Measured deflection of 5"x1" substrate with 5 circuit layers. Single-sided.

*2 Maximum no. of firings performed without blisters observed with Substrate/gold/dielectric/silver configuration.

Information in this datasheet shows anticipated typical physical properties for Micromax™ QM44 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

Micromax™ QM44

Microcircuit and Component Materials

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 six 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).

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, processing 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. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been 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 manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.

© 2023 Celanese or its affiliates. All rights reserved. Celanese®, registered C-ball design and all other trademarks identified herein with ®, TM, SM, unless otherwise noted, are trademarks of Celanese or its affiliates. Fortron is a registered trademark of Fortron Industries LLC. KEPITAL is a registered trademark of Korea Engineering Plastics Company, Ltd.