

DuPont QQ550

CADMIUM-FREE* LOW TEMPERATURE GLASS ENCAPSULANT

Technical Data Sheet

Product Description

DuPont QQ550 is a low temperature cadmium-free glass encapsulant composition intended to form an insulating and protective layer over thick film circuits. It is applied to ceramic substrates by screen printing and fired in a conveyor furnace in an air (oxidizing) atmosphere. DuPont QQ550 is the low temperature glass encapsulant part of QSIL and QM Systems.

Product Benefits

- Cadmium-free* product.
- Protection against environmental conditions.
- Protection against potting compounds.
- Easy burn-out of organic vehicle.
- Low firing temperature gives predictable changes in resistor values of 1-5% after encapsulation.
- Smooth surface.

*Cadmium "free" as used herein means that these are not intentionally added to the referenced product. Trace amounts however may be present.

Compatibility

Encapsulant composition DuPont QQ550 is compatible with DuPont Resistor Compositions.

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.

Drying

Prints should be allowed to level at room temperature for 5-10 minutes and then dried for 10 minutes at 150°C.

Composition Properties

Test	Properties
Viscosity (Pa.S) [Brookfield HBT, UC&S, 10rpm, 25°C]	90 - 130
Thinner	DuPont 8250
Coverage (cm ² /gm) [based on 20µm fired thickness]	130

This table shows anticipated typical physical properties for DuPont QQ550 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

Printing

Printing should be carried out in a clean, well ventilated area. Screen print with a 325-mesh stainless steel screen yields a fired thickness of about 11µm optimum for obtaining a continuous, pinhole-free film that can be readily laser trimmed. Print speed up to 20 cm/s may be used.

Firing

Fire through a belt furnace to a peak temperature of 510 -525°C with dwell at peak temperature (1 - 2 minutes) with a total firing cycle of 20 to 25 minutes. To avoid entrapment of organics in the fired file it is advisable to allow adequate time (5-10min) during heating from 300° C to 400°C. Predictable changes in resistance values will occur during encapsulation, typically 1 to 5% - depending on the resistor composition and firing temperature.

Laser Trimming of Encapsulated Resistors

Laser trimming of resistors encapsulated with DuPont QQ550 is generally similar to that of un-encapsulated resistors. As long as the encapsulant thickness is 10 - 12µm, only a modest increase in laser beam power or change in order operating parameters may be required. Clean, continuous cuts with a minimum heat-affected area adjacent to the cut show the best resistor stability. Optimum settings will vary with the laser trimming systems used and production rate desired. Generally, beam power, pulse frequency and trimming speed should be set to maximize peak power while minimizing average power.

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 the Material Safety Data Sheet (MSDS).

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