DuPont 548X

POLYMER SERIES COMPOSITION

Technical Data Sheet

Product Description

DuPont 548X polymer compositions are intended for encapsulation on hybrid circuits, resistor networks and chip components. The polymers are intended to be applied to ceramic substrates by screen printing, then cured at 180-200ºC.

Product Benefits

- Smooth surface with excellent hardness
- Non-flammable single component epoxy type
- Thermoset process (180-200ºC, 20-30 min)
- High adhesion
- Good Printability
- Good solvent and environmental resistance

Design Note

For optimum smoothness, printing with a double pass squeegee is recommended.

Processing

Substrates

Substrates of different compositions and from various manufacturers may result in variations in performance properties.

Printing

12-14µm cured thickness, this is best achieved using a 200 mesh stainless steel screen with a 20µm emulsion thickness and squeegee of 70 durometer.

Drying

Allow prints to level for 5 -10 minutes at room temperature, then dry for 10 minutes at 150ºC

Composition Properties

Test	Properties
Viscosity (Pa.s) 5480 [1] 5487 5483	 40 - 70 50 - 110 85 - 150
Coverage [cm²/g] (Based on a cured film thickness of 13µm)	~240
Thinner	5490A
Clean Up Solvent	5490A
Shelf life	3 months
1 Brookfield HAT, Utility cup & spindle (SC4-14/6R), 10 rpm, 25ºC ± 0.5ºC	

This table shows anticipated typical physical properties for DuPont 548X based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

Thinner

The compositions are optimized for screen printing, thinning is not normally required. When necessary, use the DuPont recommended thinner for slight adjustments to viscosity or to replace evaporation losses. The use of too much thinner or the use of a non recommended thinner may affect the rheological behavior of the material and its printing characteristics.

Typical Cured Properties[1]

	Encapsulant 5480 (White) 5487 (Green)
Bulk resistivity (Ωºcm)	
Initial	> 1 x 10^{15}
After PCT[2]	> 1 x 10^{12}
Insulation resistivity (Ωºcm)	
Initial	> 1 x 10^{15}
After PCT[2]	> 3 x 10^{12}
Solvent resistance [3]	
Acetone	No appearance change
MEK	No appearance change
Alkali resistance [3]	
(10 wt %/NaOH)	No appearance change
Acid resistance [3]	
(10 vol % / HCl)	No appearance change
Adhesion[4]	
On glass substrate	
Initial	OK
After PCT [2]	OK
On alumina substrate	
Initial	OK
After PCT [2]	OK

Test Procedure
1) Curing conditions are 180ºC, 30 minutes profile single curing cycle
2) PCT: Pressure cooker test at 125ºC, 2 atmospheres, for 3 hours
3) 5 hours Immersion at 25ºC
4) Crosscut Scotch tape peel test (100 pads)

Curing
180 - 200ºC for 20 - 30 minutes. A darkening of the polymer film will occur with higher curing temperatures. Fast curing can be achieved with an infrared dryer. Conditions need to be optimized for type of dryer and color of paste.

Printing
The composition should be thoroughly mixed before use. This is best achieved by slow, gentle hand stirring with a clean burr-free spatula (flexible plastic)for 1-2 minutes. Care must be taken to avoid air entrapment. Printing should be performed in a clean and well ventilated area.
Note: optimum printing characteristics are generally achieved in the room temperature range of 20ºC - 23ºC. It is therefore important that the material, in its container, is at this temperature prior to commencement of printing.

Storage and Shelf Life
Containers should be stored, tightly sealed, in a clean, stable environment at 0 - 5ºC. Shelf life of material in unopened containers is three 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).

DUPONT®
The miracles of science™

Caution: Do not use in medical applications involving implantation in the human body or contact with internal body fluids or tissue unless the product is provided by DuPont under a formal written contract consistent with the DuPont Policy Regarding Medical Applications of DuPont Materials H-50103-2 ("Medical Applications Policy") and which expressly acknowledges the contemplated use. For additional information, please request a copy of DuPont Medical Caution Statement H-50102-2 and the DuPont Medical Applications Policy.

The information provided herein is offered for the product user's consideration and examination. While the information is based on data believed to be reliable, DuPont makes no warranties, expressed or implied as to the data's accuracy or reliability and assumes no liability arising out of its use. The data shown are the result of DuPont laboratory experiments and are intended to illustrate potential product performance within a given experimental design under specific, controlled laboratory conditions. While the data provided herein falls within anticipated normal range of product properties based on such experiments, it should not be used to establish specification limits or used alone as the basis of design. It is the product user's responsibility to satisfy itself that the product is suitable for the user's intended use. Because DuPont neither controls nor can anticipate the many different end-uses and end-use and processing conditions under which this information and/or the product described herein may be used, DuPont does not guarantee the usefulness of the information or the suitability of its products in any given application. Users should conduct their own tests to determine the appropriateness of the products for their particular purpose.

The product user must decide what measures are necessary to safely use the product, either alone or in combination with other products, also taking into consideration the conditions of its facilities, processes, operations, and its environmental, health and safety compliance obligations under any applicable laws.

This information may be subject to revision as new knowledge and experience become available. This publication is not to be taken as a license to operate under, or recommendation to infringe any patent.

For more information on DuPont 548X or other DuPont Microcircuit Materials products, please contact your local representative:

Americas

DuPont Microcircuit Materials
14 T.W. Alexander Drive
Research Triangle Park, NC 27709
Tel.: 800-284-3382

Europe

Du Pont (U.K.) Limited
Coldharbour Lane
Bristol BS16 1QD
U.K.
Tel.: 44-117-931-3191

Asia

DuPont Kabushiki Kaisha
MCM Technical Lab
DuPont Electronics Center
KSP R&D B213
2-1, Sakado 3-chom, Takatsu-ku,
Kawasaki-shi, Kanagawa, 213-0012
Japan
Tel +81 44 820 7575

DuPont Taiwan Ltd
45, Hsing-Pont Road,
Taoyuan, Taiwan 330
Tel.: 886-3-377-3616

DuPont China Holding Co. Ltd
Bldg 11, 399 Keyuan Rd., Zhangji Hi-Tech Park,
Pudong New District, Shanghai 201203, China
Tel.: 86-21-6386-6366 ext.2202

DuPont Korea Inc.
3~5th Floor, Asia tower #726,
Yeoksam-dong, Gangnam-gu
Seoul 135-719, Korea
Tel.: 82-10-6385-5399

E. I. DuPont India Private Limited
7th Floor, Tower C, DLF Cyber Greens,
Sector-25A, DLF City, Phase-III,
Gurgaon 122 002 Haryana, India
Tel.: 91-124-4091818

Du Pont Company (Singapore) Pte Ltd
1 HarbourFront Place, #11-01
HarbourFrong Tower One,
Singapore 098633
Tel.: 65-6586-3022

http://mcm.dupont.com