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## TECHNICAL DATASHEET

### Durashield™ V42 Mask

#### HEAVY COPPER SOLDERMASK

#### PRODUCT DESCRIPTION

**Durashield V 42 Mask** is a low VOC, thermally-curable soldermask. It is designed to act as the soldermask finish for thick copper circuitry leveled with **Durashield V42 Filler**.

Two pack epoxy chemistry is employed to give excellent adhesion to bare copper & epoxy-based surfaces. Durashield V42 Mask exhibits good hot hardness and resistance to surface damage, and excellent resistance to all multiple soldering processes including lead free soldering. These features are combined with outstanding flexibility.

In use, Durashield V42 Mask has a pot life of at least 48 hours at 20°C, enabling extended production to be achieved from a single mixing.

Good definition prints may be achieved with a wide variety of screen meshes.

Coatings may be cured using a thermal convection or infrared heat source. Finished coating appearance is dark green, matte

The Durashield V42 Filler / Mask combination has passed the IEC 68-2-38 Z/AD composite temperature/humidity cyclic test on 400um copper circuitry.

#### RECOMMENDED PROCESS SEQUENCE

1. Durashield V42 Mono Filler application
2. UV cure
3. Panel cooling
4. Planarisation (panel abrasion)
5. Cleaning & cooling
6. Soldermask surface preparation
7. Durashield V42 Mask application
8. Joint Filler & Mask thermal cure

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Durashield V42 Mask Rev1



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## **PRODUCT PREPARATION**

*Durashield V42 Mask Pt A - dark green, opaque viscous liquid*

*Durashield V42 Mask Pt B - cream-coloured, opaque viscous liquid*

### Mixing:

The Mask should be mixed in the ratio 100 parts paste (Pt A) to 5 parts hardener (Pt B) by weight. Stir well to ensure complete mixing.

Durashield V42 Mask A	100 parts
Durashield V42 Mask B	5 parts

The components are supplied together in the correct proportion. No additional solvent should be added for standard screen print application.

Thorough, low shear mixing is essential to ensure uniform dispersion. High shear mixing will cause air entrainment and is not recommended. Allow the mixed ink to stand for at least 15 minutes before printing.

**The mixed ink has a pot life of at least 48 hours at 20°C.**

## **BOARD PREPARATION**

Panels should be clean, dry and free from residues and surface oxides, prior to V42 Mask application. Copper surfaces may be chemically cleaned, abrasive wet brushed or pumice scrubbed. If brushes are used, they must be maintained in a clean condition, free from accumulations of debris. Panels should be water rinsed and hot air dried immediately after treatment.

The soldermask should be applied to copper as soon as possible after surface preparation, and always within four hours.

## **APPLICATION**

Durashield V42 Mask should screen print easily using standard settings for snap-height, pressure and speed. Additional information is given below:

### **Screens**

Best results will normally be achieved using a polyester screen with "T" filaments.

Mesh should be applied at an angle to the frame sides to assist in filling between tracks. Ideally, the angle should be between 12-22°.

To maintain good registration and print quality the mesh should be tensioned to at least 18-25N/cm<sup>2</sup>.

The selection of mesh count is dependent on the thickness of ink deposit required. Achieving adequate coverage is crucial for proper functioning of the soldermask.

Typical mesh sizes are in the range 43-71T/cm<sup>2</sup>



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### **Squeegee**

Polyurethane squeegee blades of between 65-85 (recommended 75) Shore hardness will give satisfactory results. The softer the blade the more deposit is applied; soft blades are recommended to be strengthened with laminate to preserve their rigidity. If the squeegee blade bends excessively under printing pressure, smearing and poor definition prints will occur. For good definition the squeegee must be kept sharp at all times

### **CURING**

Durashield V42 Mask is cured by thermal energy alone. Recommended cure conditions are as below.

Conventional hot air oven: 30 to 60 minutes at 145-150°C (panel surface temperature)

Infra-red oven: 8 minutes at 160-165°C

Double-sided panels maybe processed by partially curing the first side for 20-30 minutes at 120°C, then printing the second side and curing for the full 30 to 60 minutes at 145-150°C (panel surface temperature).

Compensation may be necessary for the thermal capacity of thicker panels, or when processing large batches of closely stacked panels.

Some volatile matter is released during the drying/curing process and the curing oven should be connected to an adequate exhaust ventilation system. Retention of organic vapours in the oven may adversely affect surface finish and cross-linking

### **CLEANING**

Equipment should be cleaned of residual soldermask using **SW100** or **Dowanol PMA**.

### **STORAGE & SHELF-LIFE**

Both Mask components should be stored cool (5-15°C recommended) in their sealed, original containers. Extended storage above 30°C may cause product thickening or separation, and is not recommended.

The mixed ink has a pot life of at least 48 hours at 20°C.



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## TECHNICAL DATA

UL Flammability rating: 94V-0 (certificate E 80180)

### IPC SM-840C Test Report

IPC SM-840C TEST PROCEDURE	TEST CONDITIONS	DURASHIELD V42 MASK
<b>Hydrolytic Stability</b>	90 – 98% RH / 28 Days	PASS
<b>Solvent Resistance</b> IPA 75% IPA, 25% H2O D-Limonene 10% Alk. Detergent / 90% H2O Monoethanolamine Deionised Water	Ambient : 2 mins 46 +/- 2C : 15mins Ambient : 2mins 57 +/- 2C : 2mins 57 +/- 2C : 2mins 60 +/- 2C : 5 mins	PASS PASS PASS PASS PASS PASS
<b>Class H Moisture &amp; Insulation Resist.</b>	18 Cycles: 65C/90%RH Non Soldered – Soldered -	PASS – 1.49E10 PASS – 8.20E09
<b>Class H Electromigration</b>	7Days - 85C/90% RH Non Soldered – Soldered -	PASS – 5.34E08 PASS – 1.55E08
<b>Thermal Shock</b>	100 Cycles : -65C to 125C	PASS
<b>Ionic Cleanliness</b> (75% IPA) ug NaCl per sq.in.	Non Soldered Soldered	PASS – 0.08 PASS – 0.80



# ELECTRA

For further information, contact:

Electra  
Roughway Mill  
Dunk's Green  
Tonbridge  
Kent TN11 9SG  
ENGLAND

Tel: +44 (0)1732 811 118  
[info@electrapolymers.com](mailto:info@electrapolymers.com)

Or visit our Website for details of local offices and Distributors

[www.electrapolymers.com](http://www.electrapolymers.com)

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