TECHNICAL DATA SHEET
ELECTRAMASK
EM75

1-COMPONENT THERMAL CURING HOLE PLUGGING RESIST

PRODUCT DESCRIPTION

EM75 has been formulated for use as a hole plugging resist, this is primarily in conjunction with liquid photoimageable soldermasks. It is particularly suitable for use with curtain coated boards. The maximum recommended hole size, which can be blocked is 0.8mm. However, this is dependent on circuit geometry and some experimentation may be necessary to determine precise capability.

FEATURES & ADVANTAGES

- **Single-component.**
- **High solids. EM75** has a solids content of over 99%. This reduces the risk of gassing and shrinkage in the via hole during curing.
- **EM75** is designed for printing application.
- **Fast curing. EM75** is based on latent epoxy curing technology allowing cure times as low as 5 minutes.
- **NO aromatic amines.** Contains no DDM/MDA

PRODUCT CODE	**COLOUR**
EM75	Green

PROCESSING

EM75 is solvent-free material supplied ready to print. Adjustment of the viscosity will impair the filling characteristics of the material and increase shrinkage of the hole plug during curing.

Board surface preparation:

Copper surfaces should be chemically cleaned to give a waterbreak-free surface, this should ensure the barrel of the hole is free of oxidisation and contamination. If the surface of the copper pads are heavily oxidised, they should be mechanically brushed or pumiced prior to chemical clean.

PRINTING:

EM75 can be applied by conventional screen printing methods or by using a stencil made from thin sheet such as Aluminium drill entry material. The latter method provides better registration and allows for easier transfer of the hole plug material into the holes.

1. Using polyester mesh

Mesh count 43 - 49T polyester

Squeegee: 60 - 70 Shore. Using a rounded squeegee blade will increase filling efficiency.

The via holes should be approx. 80% to 100% full after printing, the balance of the via will be filled during soldermask application.

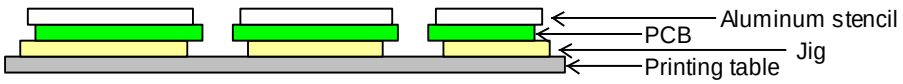
Print speed: The print speed should be kept to a minimum to allow enough resist to flow into the vias. A double print stroke should be utilised if the holes are not sufficiently filled on the first pass.

Snap-off: Minimum snap-off should be used as this will reduce screen distortion and any ink smudge. Alternatively a drilled template can be used which is glued to the screen and used with zero snap-off (see below).

2. Using aluminium stencil

Drilling entry aluminium stencil can be efficiently used instead of polyester mesh for printing.

Aluminium stencil should be attached with the glue on top of the polyester mesh and then the mesh underneath should be cut out to expose the stencil. Jig with drilled holes should be placed under the board whose vias should be plugged. This will allow the air from the holes to escape from the vias during the plugging. *See cross-section diagram below.*



This method can be more efficient than printing through polyester mesh because drilled holes in aluminium stencil are fully open and the holes in polyester mash are partially blocked by the treads of the mesh it self.

Other printing parameters should be the same as for polyester mesh.

For more details and recommendations on the above parameters please contact Electra Technical Service Department.

CURING **Typical Cure Schedules**

Convection oven:	30 mins at 120-150°C
Infra red oven:	3 - 5 mins at 160-180°C

Important: All stated cure cycles are **time at board temperature**. Oven checks should be carried out to determine the time taken for boards to reach the desired temperature.

SHELF LIFE 3 months from date of manufacture when stored in cool dry conditions. This may be extended to 6 months if refrigerated.

CLEANING Screens and equipment should be cleaned using Universal Screenwash SW100

FINAL PROPERTIES

Physical properties

Pencil Hardness:	5-6H
Solder resistance:	>20s @ 260°C
(IPC SM840A III)	>30s @ 274°C
Flux resistance:	No degradation
Solvent resistance: against CFCs/ alcohols.	No degradation (IPC SM840A III)

Electrical properties

Dielectric strength:	45kVmm^{-1}
Dielectric loss factor:	0.02 @ 1MHz
Surface resistivity:	$10^{14}\Omega$
Volume resistivity:	$10^{16}\Omega cm^{-1}$ (IPC SM840A III)
Moisture & insulation resistance (IPC SM840A):	$>10^{10}\ \Omega$
Dielectric constant:	3.4 @ 1MHz

Glass Transition (T_g): 123°C (DSC)

CTE (IPC-TM-650):	Below T_g	77 ppm/°C
	Above T_g	209 ppm/°C

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