TECHNICAL DATA SHEET
ELECTRAMASK
EM60

2-COMPONENT EPOXY SOLDERMASK RANGE

PRODUCT DESCRIPTION

EM60 Series is a high definition, 2-component soldermask based on modern epoxy technology noted for it's extremely fast cure speed and superior chemical/electrical resistance. It is formulated for use on copper and tin-lead substrates and is designed to withstand the hardest environmental conditions.

FEATURES & ADVANTAGES:

- **Long pot life.** 2-component mixture remains useable for at least 48 hrs at room temperature.
- **Increased screen stability.** No mid-shift wash-ups or staining of screen mesh.
- **High solids.** EM60 Series has a solids content of 85% enabling thick,coatings of up to 25µm to be produced with 1 layer.
- **Thixotropic.** EM60 Series is extremely thixotropic, allowing excellent print definition with no bleed.
- **No bleed.** Resin systems have been carefully selected to give no bleed, even during racking of panels.
- **Fast curing.** EM-60 Series cures to give an exceptionally hard surface which is resistant to scratching during all subsequent processes.
- **NO aromatic amines.** Contains no DDM/MDA

EM60 PRODUCT RANGE

PRODUCT CODE	COLOUR	SURFACE APPEARANCE		REDUCER
		finish	lay	
EM60-80/01D	Lt yellow/Green	gloss	smooth	ER1
EM60-80/01DS	Lt yellow/Green	satin	smooth	ER1
EM60-80/02	Dk green	gloss	smooth	ER1
EM60-80/02S	Dk green	satin	smooth	ER1
EM60-80/02M	Dk green	matt	smooth	ER1
EM60-80/04	Dk yellow/Green	gloss	smooth	ER1
EM60-80/04S	Dk yellow/Green	satin	smooth	ER1
EM60-80 NM	Black	matt	smooth	ER1

The EM60-80 range is available in blue, red and yellow with a gloss, satin or matt finish.

EM60-80 HARDENER: **H-1413**

EM60-75/01D	Lt yellow/Green	gloss	rippled	ER1
EM60-75/02	Dk green	gloss	rippled	ER1
EM60-75/04	Dk yellow/green	gloss	rippled	ER1

EM60-75 HARDENER: **EM60-75 PtB**

Important: The EM60-75 range is suitable for copper and laminate substrates only.

PROCESSING

Mixing:
EM60 is supplied pre-weighed in 5Kg packs for safe and easy mixing. If smaller quantities are required EM60 should be mixed in the ratio 9:1, paste:hardener, by weight.

Important: Mix paste and hardener until homogenous. Incomplete mixing will impair performance.E.g. Poor adhesion to substrate, Poor chemical resistance, Patchy colour/finish.

Pot-life: EM60-75 72 hrs after mixing.
EM60-80 +H-1413 48 hrs after mixing.

Viscosity adjustment:
Viscosity may be adjusted using Electrareducer ER1. No more than 5% reducer should be added or deterioration of printing and curing properties may occur.

Board surface preparation:
Copper boards should be brushed or micro etched to give a water-break free surface.
Tin/lead Boards should be thoroughly degreased using detergent/water or solvent cleaning methods.

Printing: Mesh: 43 - 77T polyester Squeegee: 65- 75 Shore

EM60 should be printed using a 43-55T polyester mesh when printing over tin/lead boards. When printing over copper, finer meshes are normally recommended, typically 55-77T, depending on film weight required.
When printing over high-tracks, use a soft squeegee of 65 Shore hardness made of polyurethane or rubber. Best results are obtained by setting the squeegee blade at an angle of 10 - 20 degrees to the vertical, variable according to desired paste deposit on the board against decline in definition sharpness.
Capillary stencils and emulsions have been found to give best results both for durability and definition, when printing the uneven profile of plated boards.

Both definition sharpness and desired heavy filmweight may be achieved by supporting the back of the squeegee with a strip of rigid metal or plastic to prevent the squeegee blade bending during the print stroke.
Using as slow a squeegee speed as is practicable and turning the board under the screen so that the majority of the tracks are at an angle of 10 - 20 degrees to the direction of printing will enable the soldermask to flow into the track edges and corners avoiding air entrapment, and ensuring encapsulation of the tracks.
If the printing machine has a scoop option it should be used in favour of a flood stroke as this will aid filling between tracks.

Curing:

(1) EM60-75 range **(1.1) EM60-75 PtB hardener**

Convection oven:	5 mins at 150ºC 10 mins at 120ºC
Infra red oven:	1 - 2 mins at 160-180ºC

(2) EM60-80 range **(2.1) H-1413 hardener**

Convection oven:	10 mins at 150ºC
Infra red oven	1 - 2 mins at 160-180ºC

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.**

Tin/lead boards may require longer cure times under IR to ensure complete cure on FR4 substrate.

Infra red: IR drying is dependent on coating deposit, IR wavelength and IR intensity. Please contact Electra Technical Service Department for recommendations.

SHELF LIFE:

Minimum 12 months from date of manufacture, when stored in cool dry conditions

CLEAN-UP:

After printing the screen and stencil should be cleaned of residual soldermask using Universal Screenwash SW100.

STORAGE:

Store between 10ºC - 25ºC in a dry store. Avoid subjecting containers to temperatures below 5ºC because of risk of splitting.

FINAL PROPERTIES

Physical properties		**Electrical properties**	
Pencil Hardness:	5-6H	Dielectric strength:	45kvmm^{-1}
Solder resistance:	>20s @ 260°C	Dielectric loss factor:	0.02 @ 1MHz
(IPC SM840A III)	>30s @ 274°C	Surface resistivity:	10^{14} Ω
		Volume resistivity:	10^{16} Ωcm^{-1}
Flux resistance:	No degradation	Moisture & insulation	
(IPC SM840A III)		resistance (IPC SM840A):	>10^{10} Ω
Solvent resistance:	No degradation against CFCs & alcohols. (IPC SM840A III)	Dielectric constant:	3.4 @ 1MHz
Flammability:	E95722	UL 94 V0	

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