



ELECTRA

TECHNICAL DATA SHEET

ELECTRAJET® EMJ110

INKJET SOLDERMASK PRODUCTS
Suitable for Rigid & Flexible Substrates

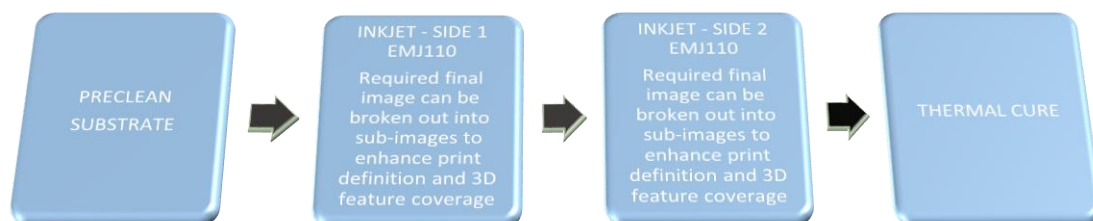
Description

ELECTRAJET® EMJ110 is the next generation of soldermask for application by Inkjet printing using industrial inkjet printers with piezo drop on demand heads.

Using over 35 years of soldermask experience, EMJ110 is formulated to give high levels of performance that meet or exceed industry standards and PCB manufacturing expectations.

Inkjet coating of ELECTRAJET® EMJ110 Series is a fully additive process with zero VOC emissions.

The elimination of process steps and material usage compared to traditional photoimaging processes offers large reductions in energy consumption, water usage and waste treatment.



Product Features:

- Products suitable for Rigid and Flex applications
- Low bleed or spreading – good edge definition
- High chemical resistance to ENIG and immersion tin
- Passes IPC-SM840 E
- Exceeds Bosch TC8 Thermal Shock automotive requirement (-40°C, 160°C, 1000 cycles)
- Passes Hella G3 Thermal Shock requirement (-40°C, 170°C, 1000 cycles)
- Exceeds TC7 Thermal Storage automotive requirement (1000h at 150°C)
- UL 94 V-0 rated
- Fully compatible with Pb-free, high temperature processes
- RoHS, REACH and Halogen-Free compliant
- Low dielectric constant (2.99 at 10GHz)
- Low modulus
- No VOC content



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PRECLEAN

It is recommended that all freshly cleaned substrate is coated within 2-4 hours. The actual maximum time will vary depending upon ambient temperature and humidity.

Mechanical pre-cleaning:

Brush

320 to 400 grit silicon carbide brushes with a recommended footprint on the copper of 10-15mm. (0.4-0.6 inches).

Brushes should be regularly checked and dressed to ensure optimum preclean is retained.

Pumice Slurry Scrub

Pumice concentration between 18 - 22% (v/v) is recommended (3F or 4F virgin grade).

Slurry should be changed between 500-1000 panels

Aluminium Oxide Slurry Scrub

Aluminium oxide concentration between 18 - 22% (v/v) is recommended (400 grit).

Slurry should be changed between at least 20,000-30,000 panels

Aluminium Oxide Jet Slurry Spray

Aluminium oxide concentration between 18 - 22% (v/v) is recommended (220 grit virgin grade).

Jet spray pressure 20-24 PSI ensuring the jet nozzle patterns fully overlap

Slurry should be changed between at least 10,000-20,000 panels

Substrate must be fully rinsed such that any slurry particles are completely removed. Failure to remove particles can result in poor cosmetics and adhesion loss.

If substrate is heavily oxidised and tarnished then a micro-etch prior to mechanical pre-cleaning is strongly recommended.

Recommended Surface roughness figures are Ra 0.2-0.4µm.

Chemical pre-cleaning:

For details of recommended chemistries, please contact your Electra representative.

Note that simple microtech solutions such as sodium persulphate are not recommended as the sole method of preclean.

Substrate Surface Energy

Surface energy will influence inkjet definition and risk of edge-bleed. Depending on the surface to be coated and/or the type of preclean used, it may be advantageous to use an additional anti-bleed stage as part of the pre-treatment process. Please contact Electra Technical Department for advice and recommendation.

Ink Properties

Viscosity at 25°C:	15-19 cP (mPa-s)
Jetting viscosity:	9-11 cP (mPa-s)
Jetting temperature:	35 – 37°C (Konica Minolta 1024 head)
	50°C (FUJIFILM Dimatix™ Samba™ GL3 head)



INKJETTING

EMJ110 PRODUCTS are single component materials supplied ready to use. No mixing or viscosity reduction is required.

EMJ110 PRODUCTS are designed for use with piezo drop on demand print heads combined with a LED “pin” cure lamp. Recommended wavelength is 395nm.

The pin-cure will harden the coating for subsequent careful handling. EMJ110 PRODUCTS are 100% solids so no solvent evaporation is required.

Typical print parameters using KM1024i S HE head:

Left A:	5.1V
Right A:	5.4V
Left B:	5.1V
Right B:	5.3V
Left High:	9.3V
Right High:	9.3V
Drop Speed:	6.0 – 6.5 m/s
Drop volume:	5.7 – 6.3 pl
DPI:	1440
UV cure (395nm LED at 10%):	45mJ/pass
Vacuum/Ink pressure:	-21 mBar (-17 – 25mBar)
Waveform:	Square
High:	4.0 μ s (3.5 – 5.0)
Low:	8.0 μ s (6.0 – 12.0)
Zero:	8.0 μ s (3.0 – 12.0)
Head height:	0.5mm (0.3 – 1.5mm)

THERMAL CURE Convection cure: 60 mins at 150°C (time at substrate temperature)

FLUSHING Ink delivery system and print heads should be flushed using **ECJ1**.

SHELF-LIFE Minimum 6 months from date of manufacture when stored between 10 and 25°C (50 to 77°F), away from sources of heat and direct sunlight.

PRODUCT PERFORMANCE

Industry Standards/Qualifications

STANDARD	REQUIREMENT	RESULT
IPC SM-840 E	CLASS T & H	PASS
UL94	V-0	PASS



Additional Final Properties

TEST	REQUIREMENT	RESULT
LEAD-FREE SOLDER RESISTANCE	3 x 10s at 288°C – tape test	PASS
SOLVENT RESISTANCE	30 seconds methylene chloride	PASS
ENIG PLATING RESISTANCE	Ni 5-10 microns, Au <0.1 microns – tape test	PASS
ACID RESISTANCE	10% HCl, 30 min dip at 20°C – tape test	PASS
ALKALI RESISTANCE	10% NaOH, 30 min dip at 20°C – tape test	PASS
ADHESION TO GOLD	Cross-hatch & tape test	PASS
THERMAL STORAGE DIN IEC 60068-2-2	TC7 1000h at 150°C	PASS
THERMAL SHOCK HELLA G3	-40°C, 170°C, 1000 cycles	PASS
THERMAL SHOCK IPC-TM-650 Method 2.6.7.3	-65°C, 125°C, 100 cycles	PASS
DIELECTRIC CONSTANT	Measured at 10GHz, 22°C	2.99
DISSIPATION FACTOR	Measured at 10GHz, 22°C	0.0228
PRESSURE COOKER (PCT)	100 min at 121°C (2 atm) – no removal on tape test	PASS
FLEX TEST POLYIMIDE SUBSTRATE	180° crease – tape test (formulation specific)	PASS



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