



ELECTRA

TECHNICAL DATA SHEET

ELP112

**Aqueous Developable
LIQUID PHOTOIMAGEABLE LEGEND PASTE**

PRODUCT DESCRIPTION

ELP112 is a high contrast, high resolution photoimageable legend ink formulated for use where the required print accuracy cannot be achieved with conventional screen-printed ink or where the number of panels in the batch does not warrant the cost of making a screen and stencil.

It is ideally suited for application by screen-printing (SP) and air-spray (AS) methods and is particularly recommended for use in conjunction with **Carapace® EMP110** and other photoimageable soldermasks (LPISM).

FEATURES & ADVANTAGES

- **50µm resolution capability.** Small numbers and letters are easily reproduced.
- **Reduced cost for small batch sizes.** **ELP112** can be blanket screened, eliminating the time consuming and costly exercise of stencil make-up.
- **No legend on pads.** Because **ELP112** is photoimageable, it only ends up on the pads if it is wanted there.
- **Legend before HASL.** Because **ELP112** will not finish up on pads it can be applied prior to Hot-air-solder-level (HASL), eliminating torn screens and allowing legend and LPISM to cured in a single stage.

ELP112 is available in white, yellow and black.

Please contact the Electra technical department for specific part numbers.



ELECTRA

Surface preparation:

Boards should be clean and free of grease and oil before applying **ELP112**. Particular care should be taken when applying after the HASL process, to ensure all flux residues have been removed.

If applying over copper, all surfaces should be mechanically (brush or pumice) or chemically cleaned to give a waterbreak-free surface.

Mixing:

ELP112 is supplied in pre-weighed packs comprising of Part A and Part B. The Part A and Part B should be mixed in the ratio as supplied Stir well to ensure complete mixing. Incomplete mixing can cause poor developing, stickiness during exposure and impaired final properties.

Viscosity adjustment:

SP formulations:

SP versions of **ELP112** are supplied screen ready. If viscosity adjustment is required prior to, or during printing, then this may be achieved using **Electra reducer ER1**. No more than 5% reducer should be added or deterioration of the printing and drying properties may occur, resulting in thin deposits or prolonged drying times.

AS formulations:

It is advisable to use a slow speed mechanical mixer when mixing in solvent for AS. Care should be taken to avoid incorporating air into the resist during mixing. Resist should be allowed to stand for 2 hours after mixing to allow air to escape.

AS: **ELP112** should be reduced with **Electra reducer ER10**. Where **ER10** is not available, an equivalent from an approved source may be used. The use of non-approved solvents is not recommended as they can cause contamination and other processing problems.

The addition level required is typically 35-45% (by weight) however may depend on spray system used.

Due to the fast viscosity readings using a Zahn₃ cup, air inclusion can give erratic readings. It is therefore recommended to use the Ford N^o4 or a cup giving similar values (e.g. Frikmar N^o4).

Screen-print parameters: Mesh count: 100-120T polyester.
Squeegee: 60 to 70 shore.

AS application: Refer to EMP110 technical datasheet for application parameters or contact Electra Technical Service Department for specific recommendations.

Tack-dry:

The aim of the pre-drying stage is to solely remove the solvents. It is important for the drying chamber (static or conveyerised) to have good air circulation with air supply and extraction facilities.

ELP112™ has a proven wide drying window allowing the use of higher temperatures.

Temperature range: 70 to 80°C
Time range: 25 to 60 minutes

(A)	<u>Double-side coating</u>	Optimum setting:	30 mins at 75°C
(B)	<u>Single-side coating</u>	Optimum setting:	Side 1 15 mins at 75°C Side 2 30 mins at 75°C

www.electrapolymers.com



ELECTRA

Owing to the much lower viscosity of **ELP112™** when applied by AS; drying should be carried out in a horizontal position to avoid sagging. If this is not possible, then initial drying should be carried out in a horizontal position using forced air, before racking for drying in a vertical position. The initial solvent evaporation may be carried out at room temperature, or at a slightly elevated temperature. When applied by screenprinting, horizontal drying is not necessary.

After drying it is recommended that boards should be processed within 24 hrs to avoid increasing the developing time.

Boards **must** be at room temperature before exposure.

Exposure:

Spectral output:	310-420 nm.
Energy requirement:	450-900 mJcm ⁻² (Depending on colour and thickness).
Step wedge:	9-11 clear (Stouffer 21 step)

Determination of the correct exposure should be carried out after setting the developing speed since this will affect the step wedge reading obtained.

The step wedge determination should be carried out on brushed copper with the step- wedge under the phototool.

It is important to recognize that the energy level should only be used as a guide for setting the correct exposure and the step wedge should be used for determining the actual exposure setting.

After determining the correct setting the energy level can be measured and monitored, using an industry recognised light-bug, as a means of checking for any decrease in output from the lamp with age.

It is not necessary to hold boards before developing. Boards should preferably be developed within 24 hrs of exposure.

Developing:

Solution:	1% soln sodium or potassium carbonate.
Spray pressure:	1.5-2.5 kgcm ⁻²
Spray time:	30-60s (in developing chambers).
Temperature:	30 - 35°C

Boards should be well rinsed with fresh water and fully dried after developing.

The optimum developing speed is set when an unexposed board develops off completely, 75% of the way through the machine. This speed should be ascertained by preliminary tests prior to making exposure tests.

Final cure: 60 mins* at 150°C ***TIME AT BOARD TEMPERATURE**

Stripping: 5% NaOH soln @ 40-50°C

Cleaning:

Screens and equipment should be cleaned using **Universal Cleaner SW100**

Storage:

Store between 10-25°C in a dry store.

Avoid subjecting containers to temperatures below 5°C because of risk of splitting.

Shelf-life: ELP112 pastes have a minimum 12 months from date of manufacture
All H-4090 products have a minimum of 24 months from date of manufacture

www.electrapolymers.com



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

Or visit our Website for details of local offices and Distributors

www.electrapolymers.com

The Laboratories at Electra Polymers Ltd. have taken all reasonable steps to ensure that the information set out above is accurate within the scope and limitations of our existing knowledge and experience. Since, however, we cannot anticipate or control the many interrelated conditions under which our products are used, all our products are offered for sale and trial on the basis that clients will satisfy themselves by tests or otherwise on these products, that they are fit, suitable and safe for the purpose for which they are required, within the parameters and conditions in which they will be used. In cases where our products are found to be defective in material and workmanship, our liability is limited to the purchase price of the products found to be defective. THIS WARRANTY IS TO THE EXCLUSION OF ALL OTHER WARRANTIES OR GUARANTEES, EXPRESS OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, DESCRIPTION PRODUCTIVENESS OR ANY OTHER MATTER. None of the above information may be construed as a recommendation that our products be used in violation of any patent rights. We accept your orders at our shipping points only on the basis of the above understanding, set out in our detailed "Standard Terms + Conditions of sale". E & OE.

www.electrapolymers.com