

# Photo resist Elpemer® SD 2054

Due to its very high resolution, the photo resist **Elpemer® SD 2054** is used in fine line and very fine line technology in inner and outer layers; even lines and spaces of 50 µm or less can be represented.

- Photoimageable etch and plating resist (negative resist)
- application by screen printing
- excellent wetting and flow properties when applied in layers of 10-12 µm which hide all surface imperfections of the copper and thus avoid adhesion problems and etching defects
- very low exposure energy
- fast drying
- absolutely tack-free surface when dried, thus easily stackable
- aqueous-alkaline developable
- resistant to acid and alkaline etch and plating baths up to approx. pH 9
- excellent adhesion and high surface hardness
- alkaline strippable
- decomposes in filterable flakes when stripped, in view of reducing waste water pollution and extending the stand time of the stripper solution

## Characteristics

| Colour/appearance   | blue               |
|---|--------------------|
| Solids content, DIN EN ISO 3251<br>1 h, 125 °C [257 °F], 1 g weighed quantity | 69 ± 2 %           |
| Viscosity* at 20 °C [68 °F], DIN EN ISO 3219                                  | 9 000 ± 2 000 mPas |
| Density at 20 °C [68 °F], DIN EN ISO 2811-1                                   | 1.30 ± 0.05 g/cm³  |

\* measured with Haake RS 600, C 20/1°, D = 100 s<sup>-1</sup>, viscosity measuring unit supplied by:  
Thermo Fisher Scientific, Dieselstraße 4, 76227 Karlsruhe, Germany  
Phone +49 721 4094-444, Fax +49 721 4094-300, [www.thermo.com](http://www.thermo.com)

Index: SD = screen printing

## Processing

|   |  |
|---|--|
|  | Please read this technical report and the publications listed below carefully before using the product. These sheets are enclosed with the first shipment of product or sample.                  |
| <b>MSDS</b>   | The corresponding material safety data sheet contains detailed information and characteristics on safety precautions, environmental protection, transport, storage, handling and waste disposal. |
| <b>AI</b>   | Application information AI 2/1 "Processing instructions for photoimageable Elpemer® solder resists" – here you find basic information on the processing of photoimageable systems.               |
| <b>TI</b>   | Technical information TI 15/3 "Protective measures when using chemicals including lacquers, casting compounds, thinners, cleaning agents"  |
| <b>TI</b>   | Technical information TI 15/13 "Pretreatment in the pcb fabrication process"   |

The photo resist **Elpemer® SD 2054** is applied by means of screen printing. The processing parameters below serve as a guideline and must be adjusted depending on the processing unit and type of application. The optimised parameters should be determined based on close tolerances and should be observed in series production.



Protect from UV light

Since the many different permutations make it impossible to evaluate the whole spectrum (parameters, reactions with materials used, chemical processes and machines) of processes and subsequent processes in all their variations, the parameters we recommend are to be viewed as guidelines only that were determined in laboratory conditions. We advise you to determine the exact process limitations within your production environment, in particular as regards compatibility with your specific follow-up processes, in order to ensure a stable fabrication process and products of the highest possible quality.

The specified product data is based upon standard processing conditions/test conditions of the mentioned norms and must be verified observing suitable test conditions on processed printed circuit boards.

Feel free to contact our application technology department (ATD) if you have any questions or for a consultation.

### Safety recommendations

- When using chemicals, the common precautions should be carefully noted.
- Ensure that extractor units of workplace ventilation arrangements are positioned at solvent source level.
- Please also pay attention to national guidelines or directives concerning operating safety such as the German TRBS (technical rules for operating safety) and those concerning the handling of flammable liquids as for example the German TRbF (technical rules for flammable liquids) or European directives.

### Viscosity adjustment



Stir before use

The **Elpemer®** photo resist **SD 2054** has been adjusted in such a manner that it can normally be processed in the condition supplied. To reduce its viscosity for processing purposes

**DIL** dilute with thinner **V 2054 SD**

## Auxiliary products recommended

- **Screen opener HP 5200**  
highly active spray for dissolving dried screen printing inks from the screen; silicone- and grease-free, thus no surface defect/dewettings or smearing effects to be expected
- **Anti-static spray HP 5500**  
prevents and eliminates electrostatic discharge occurring during screen printing; silicone- and grease-free
- **Defoamant HP 5911**  
for the defoaming of aqueous-alkaline developing media, silicone-free, biodegradable
- **Cleaning agent R 5899**  
for screen washing equipment, simply and safely to handle, no labelling in accordance with the German dangerous goods regulations required, extremely high flash point (> 100 °C [> 212 °F]), low vapour pressure < 0.1 hPa at 20 °C [68 °F], thus not affected by the EU-VOC regulation 1999/13/CE
- **Cleaning agent R 5821**  
for the cleaning of equipment and work tools, high flash point (+32 °C [89.6 °F])
- **Cleaning agent R 5817**  
for the cleaning of tools

## Screen printing

→ Ensure that the surface to be coated is clean, dry and grease-/oxide-free and that copper surfaces preferably have an average surface roughness of 2 µm.

### Screen printing parameters recommended

|                   |  |
|-------------------|--|
| Screen mesh       | polyester 100–40 to 120-34 (old nomenclature: 100–120 T)         |
| Screen tension    | at least 25 N/cm or as specified by the screen mesh manufacturer |
| Squeegee hardness | 65–70 shore-A with angular cut                                   |
| Squeegee angle    | 75–80°   |

## Drying

**Elpemer® SD 2054** is dried in a convection oven. The sole purpose of the drying process is to remove solvents; thus removal of the solvents must be ensured by effective exhaust air equipment. The following parameters serve as a guideline:

|             |                      |
|-------------|----------------------|
| Temperature | 70–80 °C [158–176°F] |
| Time        | approx. 10 min       |

**If either the curing parameters are lower than mentioned above or exhaust air is insufficient, the resist will remain sticky. In case of excessive drying the strippability will be impaired.**

## Exposure

|                           |   |
|---------------------------|---|
| Type of burner            | Fe-doped mercury vapour lamps with an emission maximum of 365 nm  |
| Exposure energy           | approx. 100 mJ/cm <sup>2</sup> (measured through the photo tool at a transparent point with OLEC ACCUMETER UV radio meter*) |
| Stouffer step (on copper) | 6-8 (free developed)  |

\* Fabcon, 1800 East St. Andrew Place, Santa Ana, California 92705, USA  
phone: +1 714 881-2000, fax: +1 714 881-2001. [www.fabcon.com](http://www.fabcon.com), [sales@fabcon.com](mailto:sales@fabcon.com)

- Replace the UV lamps regularly acc. to the manufacturer's instructions as the emission spectrum of the lamps changes in the course of their life span.
- Install operating time counters to control the life span.

After exposure the development can be effected either immediately or after a holding time of no longer than 72 h.

## Development

### Aqueous-alkaline developing

|                            |  |
|----------------------------|--|
| Concentration of developer | 1 ± 0.1 % Na <sub>2</sub> CO <sub>3</sub> solution |
| Developing temperature     | 30–34 °C [86–93.2 °F]                              |
| Developing time            | approx. 50 s                                       |

## Rinsing

Immediately after the developing process, the developer residues must be rinsed off with water, if possible by means of a triple-cascade system.

## Etching/plating

Boards coated with the photo resist **Elpemer® SD 2054** can be etched directly after developing and rinsing. Acid and alkaline etch and plating baths up to pH 9 can be used.

- Check the general resistance of **Elpemer® SD 2054** in your process.

Besides on the thickness of the copper layer, the length of etch time depends on the type, the concentration and temperature of the etch medium. Long etch times may impair the etch resistance and the etch result.

When verifying the suitability of the plating baths special emphasis should be given to the pre-cleaning steps. The resistance to individual plating baths can be improved by increasing the exposure energy.

## Stripping

- Strip the photo resist **Elpemer® SD 2054** at approx. 50 °C [122 °F] in 3-5% NaOH or KOH solution or ready-to-use stripper.

The photo resist **Elpemer® SD 2054** decomposes into filterable flakes when stripped.

## Standard packaging

|           | Packaging       | Packing unit |
|-----------|-----------------|--------------|
| SD 2054   | 10 tins of 1 kg | 10 kg        |
| V 2054 SD | can of 15 kg    | 15 kg        |

Partial lots of the selling unit / smaller quantities available against surcharge.

## Shelf life and storage conditions



Shelf life: In sealed original containers at least 9 months



Storage conditions: +5 °C to +25 °C [+41 °F to +77 °F]



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For warehousing reasons, isolated cases may occur where the shelf life upon shipment is less than the shelf life indicated in this technical report. However, it is ensured that our products have **at least** two-thirds of their shelf life remaining when they leave our company. Labels on containers show shelf life and storage conditions.

## Disclaimer

All descriptions and images of our goods and products contained in our technical literature, catalogues, flyers, circular letters, advertisements, price lists, websites, data sheets and brochures, and in particular the information given in this literature are non-binding unless expressly stated otherwise in the Agreement. This shall also include the property rights of third parties if applicable.

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Any questions?

We would be pleased to offer you advice and assistance in solving your problems. Samples and technical literature are available upon request.

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