

Plating resist SD 2149 SIT-HS

The plating resist **SD 2149 SIT-HS** is used in Secondary Imaging Technology (SIT) if ENiG and OSP surface finish is required on one PCB. It is applied on metal surfaces which require the OSP finish and therefore have to be protected in the electroless Ni/Au (ENiG) process.

- Liquid, thermal drying resist
- high definition application in screen printing
- enables the representation of 150 µm structures
- good adhesion to copper and solder resists
- easily stripped in alkaline media

Characteristics

Colour/appearance	black, mat
Solids content, ISO 3251, 1 h, 125 °C [257 °F], 1 g	75 ± 2 g/cm ³
Viscosity* at 20 °C [68 °F], ISO 3219	30 000 ± 2 000 mPas
Density at 20 °C [68 °F], ISO 2811-1	1.50 ± 0.05 g/cm ³

* measured with Haake RS 600, C 20/1°, D = 100 s⁻¹, 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

Indices: SD = screen printing, SIT = Secondary Imaging Technology, HS = high boiling solvent for extra long screen open time

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.
MSDS	The corresponding material safety data sheet contains detailed information and characteristics on safety precautions, environmental protection, transport, storage, handling and waste disposal.
TI	Technical information TI 15/3 "Protective measures when using chemicals including lacquers, casting compounds, thinners, cleaning agents"
TI	Technical information TI 15/13 "Prcleaning in the pcb fabrication process"

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.

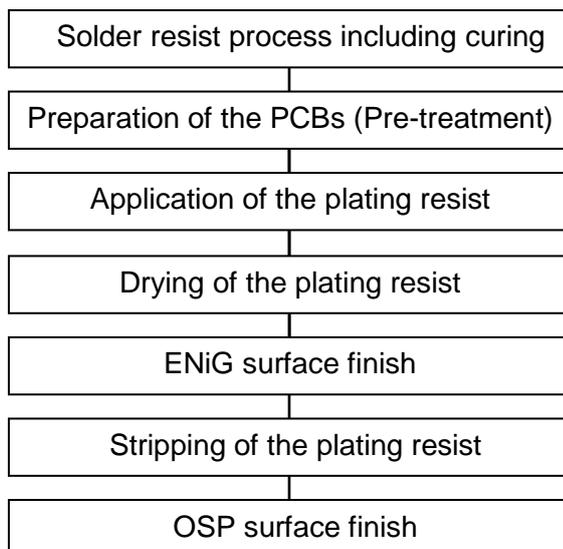
The specified product data is based upon standard processing conditions/test conditions of the mentioned norms and must be verified if necessary while observing suitable test conditions on processed products.

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.

Schematic process flow



Pre-treatment (Cleaner and Micro Etch)

Pre-treatment of the panels is required to ensure best possible adhesion of the plating resist **SD 2149 SIT-HS** in the ENiG process.

Degrease	Chemistry	H ₂ SO ₄ -based
	Auto dosing	Yes
	Concentration	3–5 %
	Temperature	40–50 °C
	Nozzle type*	Fan
	Pressure	1.5 ± 0.3 bar
	Dwell time (effective)	> 30 s
Rinse I	min. 3 cascades**	
	Dwell time (effective)	> 20 s
	Rinse Flow	> 350 l/h, city water
	Nozzle type*	Fan / Cone
	Temperature	Room temperature (> 20 °C)
Micro Etch	Chemistry	SPS (sodium persulfate) or H ₂ SO ₄ / H ₂ O ₂
	Auto dosing	Yes
	Cu concentration	≤ 12 g/l
	Temperature	Variable, 30–40 °C
	Etch rate	0.15–0.6 µm
	Nozzle type*	Fan
	Pressure	1.5 ± 0.3 bar
	Dwell time (effective)	> 30 s
Rinse II	min. 3 cascades**	
	Dwell time (effective)	> 30 s
	Rinse flow	> 350 l/h
	Last rinse cascade	DI-Water
	Nozzle type*	Fan
	Water pH	~ Neutral
	Temperature	Room temperature (> 20 °C)
Drying	Hot air knife	
	Dwell time (effective)	~30 s
	Exit temperature	45–55°C, cool down pcbs prior to screen printing
	No water droplets or stain after drying	

* Manifold and nozzles should be set to provide optimum spray coverage and minimised puddling effect on topside.

** An acid dip (H₂SO₄ ~3.5%) prior to rinse will solubilise inorganic salts and improve rinse.

Adjustment of viscosity

The plating resist **SD 2149 SIT-HS** is adjusted in such a manner that it can normally be processed in the condition supplied. To reduce viscosity for processing purposes:

DIL dilute with max. 3 % of retarder VZ 5104

Recommended auxiliary products

- [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

- [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 manual cleaning of screens and 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.

	Recommended parameters	Notes
Screen mesh	Polyester 77-55 up to 120-34 (lines/cm) or corresponding steel fabric	Coarser fabric (77-55) will result in higher printing thickness, finer fabric (120-34) to lower printing thickness and higher definition. Use of steel fabric is recommended for large panels with high demand on printing accuracy.
Screen tension	approx. 30 N/cm	Or in accordance with the screen fabric manufacturer's instructions
Squeegee	75-85 Shore A	Right angled squeegee profile.
Printing angle	75°	
Stencil build up	Standard	Printing thickness is determined by the choice of screen fabric, therefore no additional stencil build up necessary. Sufficient stencil thickness on the printing side of the screen is mandatory to achieve best possible printing definition.

Drying

The plating resist **SD 2149 SIT-HS** is dried under the following conditions:

45 min* at 80°C [176 °F] or

30 min* at 120°C [248 °F]

* Object holding time: The drying time is measured from the point when the panels reach the curing temperature.

Longer drying time or higher drying temperatures will reduce the flexibility of the plating resist.

The plating resist must be cured at a temperature of 120 °C [248 °F] if a higher resistance of the resist layer is required, however this will also prolong the stripping times.

In case of double side application, dry 1st side 15 min at 80°C and apply standard parameters for the 2nd side. If panel cleaners (tacky rollers) are used prior to application, standard drying conditions are mandatory also for the first side to ensure highest flexibility and prevent peel off by the panel cleaner when coating the second side.

Resist thickness after drying is 10–20 µm; it can vary with selection of the screen mesh and the printing parameters.

ENiG (Electroless Nickel/Gold)

The plating resist **SD 2149 SIT-HS** has a high chemical resistance in ENiG baths and an optimized leach out behaviour. Leaching tests were performed for Aurotech CNN and HP.

Other surface finish processes are possible but pre-trials are recommended to check the suitability and compatibility of the baths.

→ Process according to the individual technical documentation. Do not use alkaline cleaners.

Stripping

Chemistry	3–5% NaOH or KOH solution (Amine based stripping chemistry not suitable)
Temperature	40–50°C
Defoamer	Concentration as recommended by the supplier.
Auto Dosing	Recommended
Nozzle Type*	Fan
Pressure (T/B)	2.0 ± 0.3 bar
Dwell Time (Effective)	> 60sec

The plating resist **SD 2149 SIT-HS** decomposes completely in the stripping medium; therefore the solution will turn black with increased loading.

Effluent Treatment

The plating resist **SD 2149 SIT-HS** consists mainly of a binder and inorganic fillers. The binder dissolves in the stripping solution and will precipitate during neutralization. The fillers can be removed by filtration. Interaction with other components of the wastewater (e.g. complexation of metal ions) is not known.

Standard packaging

	Packaging	Selling unit
SD 2149 SIT-HS	4 tins of 2 kg	8 kg
VZ 5104	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 12 months



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

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.

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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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