

Plugging pastes of the series SD 2361

The plugging pastes of the series **SD 2361** are applied to seal via holes for vacuum adaption during incircuit testing, thus preventing solder from seeping through to the component side and flux agents from settling in the holes.

- Application by screen printing
- thixotropic adjustment suitable for large vias (approx. 0.5–1 mm)
- solvent-free 1-pack system
- practically no volume shrinkage and no solvent inclusions, thus better process reliability compared to solvent-containing 2-pack systems
- joint curing with solder resists possible
- excellent solder bath resistance, even in lead-free solder processes
- resistant in electroless tin baths
- excellent E-corrosion resistance
- UL Recognised Component: best flame class V-0 acc. to UL94, UL file no. E80315
- tested according to ASTM E595 (outgassing test recognised by NASA)

Characteristics

	SD 2361	SD 2361 T
Colour, appearance	green	green
Solids content	100 %	100 %
Viscosity* at 20 °C ISO 3219	26 000 ± 8 000 mPas	37 000 ± 10 000 mPas
Density at 20 °C ISO 2811-1	1.14 ± 0.05 g/cm ³	1.14 ± 0.05 g/cm ³

* measured with Haake RS 600, C 20/1°, D = 50 s⁻¹,
viscosity measuring unit supplied by Thermo Fisher Scientific, www.thermofisher.com

Indices: SD = Screen printing, T = Thixotropic

List of possible physical and mechanical properties

Lackwerke Peters largely verifies its own production range with regard to the products' physical and mechanical properties. Please note that the values may slightly vary depending on the adjustment

Property	Test method	Result
Adhesion	IPC-SM-840E, item 3.5.2.1	class H and T
Solvent resistance	30 min in methylene chloride (dichloromethane) at room temperature	passed (> 120 min)
Solder bath resistance	IPC-SM-840E, item 3.7.2 IPC-TM-650, 2.6.8 UL 94	passed: 20 s at 265 °C [509 °F] passed: 10 s at 288 °C [550.4 °F] passed: 20 s at 290 °C [554 °F]*
Glass transition temperature Tg	TMA	≈ 120 °C [185 °F]
Coefficient of thermal expansion (CTE)	TMA	≈ 100 ppm/°C < Tg ≈ 255 ppm/°C > Tg
Outgassing	ASTM E595 (limits: TML < 1.00 %, CVCM < 0.10 %)	TML = 0.649 % CVCM = 0.00 %

* With a solder bath resistance of 20 s at 290 °C [554 °F], the plugging pastes of the series **SD 2361** fulfil the required temperature resistance during the soldering process with lead-free solder.

List of possible electrical properties

Lackwerke Peters largely verifies its own production range with regard to the products' electrical properties. Please note that the values may slightly vary depending on the adjustment.

Properties	Test method	Result
Dielectric strength	IPC-TM-650, 2.5.6.1 DIN EN 60243-1	≥ 70 kV/mm
Surface resistance	VDE 0303, part 30/DIN IEC 60093 IPC-TM-650, 2.5.17.1	≥ 2 x 10 ¹⁴ Ohm
Specific volume resistivity	VDE 0303, part 30/DIN IEC 60093 IPC-TM-650, 2.5.17.1	≥ 5 x 10 ¹⁵ Ohm x cm
Comparative tracking Index (CTI)	DIN EN 60112 base material with CTI 200	CTI > 250

* The CTI value of the coating depends, among others, on the tracking resistance values of the base material. The CTI value of the base material is at least maintained.

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](#) "Pretreatment in the pcb fabrication process"

The plugging pastes of the series **SD 2361** shall be processed in the condition supplied.

If the plugging pastes of the series **SD 2361** come into contact with gold or other metal surfaces, bleeding may occur when exposed to heat which impacts the solderability. For this reason, the holes filled with the plugging pastes of the series **SD 2361** must be separated from the solder pads by means of a solder resist barrier (e. g. a simple solder resist tab), or these areas must be sufficiently far away from each other.

The plugging pastes of the series **SD 2361** are not suitable for plugging tinned via holes, as in case of resoldering the melted tin may cause the plugging paste to sag.

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 recommendation

→ When using chemicals, the common precautions should be carefully noted.

Auxiliary products recommended

- [ELPESPEC® anti-static spray HP 5500](#)
prevents and eliminates electrostatic discharge occurring during screen printing; silicone- and grease-free
- [ELPESPEC® 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
- [ELPESPEC® cleaning agent R 5821](#)
for the cleaning of equipment and work tools, high flash point (+32 °C [89.6 °F])
- [ELPESPEC® 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.

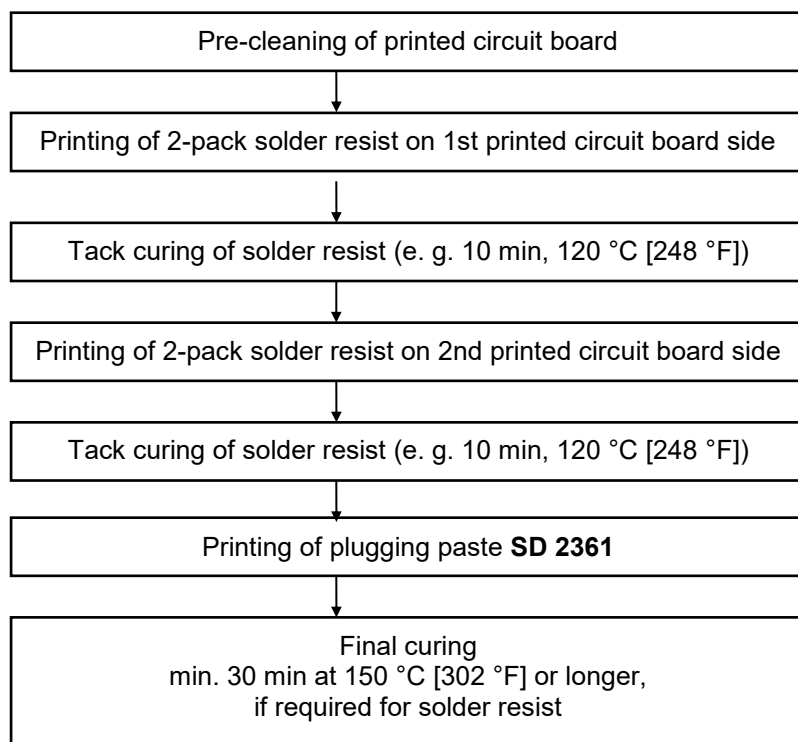
Screen printing parameters recommended

Screen mesh	Steel mesh: - 224/100 (80 mesh standard fabric) - 245/65 - 265/50 for preliminary tests: polyester of 36-90 to 43-80 (old nomenclature: 35-43 T)
Screen printing stencil	Free spaces in screen mesh > diameter of the holes (around 0.1–0.2 mm larger, depending on print format size) A high stencil build-up is not necessary, since the ink must only be printed into the holes. Generally, it is sufficient to close the screen mesh with a thin coat of emulsion or a thin capillary film.
Backing	Approx. 3 mm thick base material that was drilled with the same drill hole program, but where the diameters of the holes are five times larger than the via holes. (The backing enables the filling of the holes since there is no resistance caused by air pockets under the holes.) An undergrid would also be acceptable provided it does not permit the printing substrate to spring.
Snap-off-contact	As low as possible
Flooding	Rubber squeegee 75 Shore A, squeegee profile 90°, push stroke 70°
Printing	Rubber squeegee 75 Shore A, squeegee profile: 30-45°, printing angle 90° squeegee pressure as high as possible (4 bar), printing speed as low as possible

These printing parameters are meant for orientation purposes and, depending on the layout of the printed circuit board, must be optimised and adjusted to the prevailing production conditions.

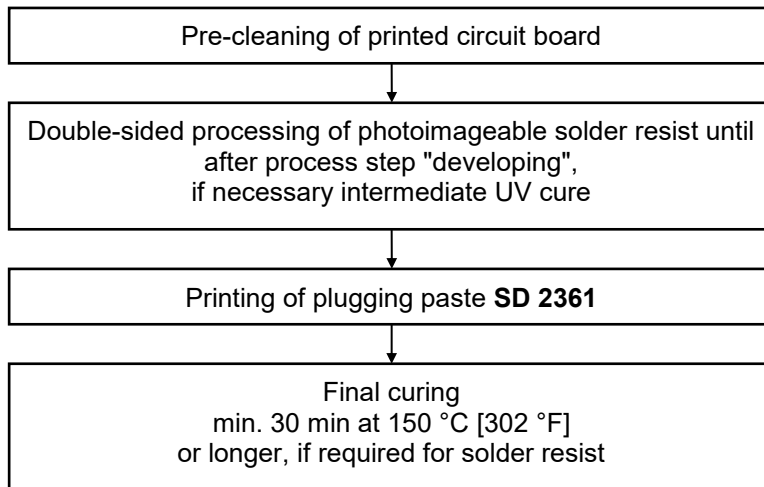
Model process

When using a conventional 2-pack solder resist, e. g. of the series **SD 2462 NB**, in combination



with the plugging pastes of the series **SD 2361**:

- When using a photoimageable **Elpemer® solder resist** in combination with the plugging pastes of the series **SD 2361**:



These process steps are non-binding recommendations.

→ Perform pre-trials to adapt the process to your individual production conditions and product characteristics.

Drying/Curing

The plugging pastes of the series **SD 2361** are cured for **30–45 min* at 150 °C [302 °F]**.

* Object holding time: Curing time is calculated from the point when the printed circuit boards reach the curing temperature.

Curing can also be carried out in a conveyerised IR dryer.

→ Perform pre-trials to ascertain the optimum temperature profile.

Packaging

The packing units available are indicated in our offer which we will send you upon request.

Shelf life and storage conditions



Shelf life: In sealed original containers at least 4 months



Storage conditions: +5 °C to +10 °C [+41 °F to +50 °F]



Protect against frost

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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