

Peelable solder masks of the series **SD 2950**



- peelable solder masks for the partial covering of printed circuit boards, to protect them from direct contact with the solder or in plating processes
- application by screen printing, no drying in the screen
- solvent-free/VOC-free (VOC = Volatile Organic Compounds)
- high thermal stability, partly multiple temperature loads possible even in lead-free soldering processes
- very high elasticity and tear resistance
- easy removal before and/or after the soldering process

This technical report is valid for the following adjustments:

- | | |
|-------------------------------------|-------------------------------|
| • SD 2950 , blue | • SD 2955 , blue-green |
| • SD 2950 T , blue | • SD 2958 , blue |
| • SD 2952 , blue | • SD 2962 P , green |
| • SD 2953 , blue | • SD 2990 T , white |
| • SD 2954 , blue transparent | |

Indices: **SD** = screen printing
T = thixotropic
P = pigmented

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Please read this technical report, the corresponding material safety data sheet, the Technical Information sheet TI 15/3 and the Application Information sheet AI 2/29 (see Item 4 and 7) carefully before using the product.



1. General information

The peelable solder masks of the series **SD 2950** are thermally cured, solder bath-resistant 1-pack screen printing inks that can be peeled off easily like a foil before and/or after the soldering process.

All symbols that are used in this technical data sheet and on our containers, such as **DIL**, are explained on our website www.peters.de in the section "Service – Technical publications – Label symbols".

2. Application

The peelable solder masks of the series **SD 2950** cover those parts of the printed circuit board that should not be tinned in the various processes or that should be protected during plating processes, e. g. gold contacts, edge connectors, plated-through holes and areas printed with carbon-conductive ink.

Utilising our longstanding experience in the peelable solder mask sector, Table 1 gives an overview of the possible fields of application of the various peelable solder masks of the series **SD 2950**.

→ Still perform preliminary trials to verify the suitability for your intended application.

Table 1: Possible fields of application for the peelable solder masks of the series SD 2950

		SD 2950	SD 2950 T	SD 2952	SD 2953	SD 2954	SD 2955	SD 2958	SD 2962 P	SD 2990 T
Lead solder:	wave soldering	++	++	++	++	++	++	++	++	++
	reflow soldering	-	-	-	-	++	++	-	-	+
	HAL processes (vertical)	+	+	-	-	-	-	+	-	-
Lead-free solder:	wave soldering	+	+	+	+	++	++	+	+	+
	reflow soldering	-	-	-	-	-	++	-	-	-
	HAL processes (vertical)	-	-	-	-	-	-	+	-	-
Multiple temperature stress, e.g. multiple soldering		+	+	+	+	++	++	+	+	+
Chemical/electroplated finish processes		+	+	-	-	-	-	-	++	+
Printing over carbon-conductive inks		+	+	-	-	+	+	+	-	+
Coverage of edge connectors		++	++	++	++	++	++	++	++	++
Peelable from plated-through holes		+	+	++	++	++	++	+	++	++
Peelable prior to soldering		-	-	++	++	++	++	+	++	++

++ = suitable + = conditionally suitable - = unsuitable

3. Special notes



Please note that the recommendations in the table in Section 2 "Application" are non-binding. Many different parameters, such as layer thickness, layout of the printed circuit board, substrate quality, curing/soldering conditions, process chemistry, etc., can influence the suitability of a peelable solder mask for a specific process so that - contrary to the table - a different peelable solder mask may prove better. Please see our Application Information sheet AI 2/29 "Selection criteria and processing advice for our peelable solder resists (solder masks) of the series SD 2950" for further information.

However, our wide range of materials includes a suitable product for many applications. Our application technology department (ATD) would be happy to give appropriate recommendations. On our website, you will find the **Application Information sheet AI 2/29** in the section "Service – Technical publications".

4. Safety recommendations

- Please read the corresponding material safety data sheet where you will find detailed specifications of safety precautions, environmental protection, waste disposal, storage, handling, transport as well as other characteristics.
- When using chemicals, the common precautions should be carefully noted.
- Please read our **Technical Information sheet TI 15/3 "Protective measures when using chemicals including lacquers, casting compounds, thinners, cleaning agents"**. On our website, the technical information sheets can be accessed in the section "Service – Technical publications".

5. Characteristics

	Colour/ appearance	Solids content ISO 3251, 1 h, 125 °C [257 °F], 1 g	Viscosity* at 20 °C [68 °F] ISO 3219	Density at 20 °C [68 °F] ISO 2811-1
SD 2950	blue	97 ± 1 % by weight	22,000 ± 5,000 mPas	1.20 ± 0.05 g/cm ³
SD 2950 T	blue	97 ± 2 % by weight	50,000 ± 10,000 mPas	1.20 ± 0.05 g/cm ³
SD 2952	blue	95 ± 1 % by weight	38,000 ± 7,000 mPas	1.23 ± 0.05 g/cm ³
SD 2953	blue	96 ± 2 % by weight	38,000 ± 7,000 mPas	1.23 ± 0.05 g/cm ³
SD 2954	blue transp.	98 ± 1 % by weight	55,000 ± 15,000 mPas	1.12 ± 0.05 g/cm ³
SD 2955	blue-green	99 ± 1 % by weight	70,000 ± 20,000 mPas	1.12 ± 0.05 g/cm ³
SD 2958	blue	97 ± 2 % by weight	50,000 ± 10,000 mPas	1.20 ± 0.05 g/cm ³
SD 2962 P	green	96 ± 1 % by weight	47,000 ± 13,000 mPas	1.28 ± 0.05 g/cm ³
SD 2990 T	white	98 ± 1 % by weight	45,000 ± 10,000 mPas	1.17 ± 0.05 g/cm ³

* measured with Haake RS 600, C 20/1°, D = 50 s⁻¹, viscosity measuring unit supplied by:
 Thermo Electron (Karlsruhe) GmbH (formerly Haake-Messtechnik GmbH + Co)
 Dieselstraße 4, 76227 Karlsruhe, Germany
 Phone +49 (0) 721 - 40 94 - 0; Fax +49 (0) 721 - 40 94 - 300
 www.thermo.com

6. Properties

The peelable solder masks of the series **SD 2950** are distinguished by the following properties:

- do not contain substances listed in the RoHS directive 2011/65/EU, the EU End-Of-Life Vehicle directive 2000/53/EC and the WEEE directive 2002/96/EC
- solvent-free/VOC-free (VOC = Volatile Organic Compounds), thus no environmental pollution through solvents
- approx. 100% solids content, i.e. the achieved dry film thickness is virtually identical to the wet film thickness
- easy to apply by screen printing, no drying in the screen
- thixotropic to highly thixotropic adjustment enables high definition print, selected products are suitable for tenting over plated-through holes of up to 4 mm in diameter
- high economic efficiency

- blue, green or white colouration ensures a good contrast to numerous substrates
- short drying times
- excellent solder bath resistance in various soldering processes (see also Section 2 "Application")
- very high elasticity and tear resistance, partly also after multiple soldering processes and long soldering times
- good chemical resistance, partly also resistant to electroplating processes
- selected products can also be printed over carbon-conductive inks without changing the resistance (see also Section 2 "Application")
- risk of base material staining virtually excluded
- easy removal by peeling
- peelable before and/or after soldering.

7. Processing

→ Please read our **Application Information sheet AI 2/29 "Selection criteria and processing advice for our peelable solder resists (solder masks) of the series SD 2950"** where you will find detailed information on processing. On our website, you will find application information sheets in the section "Service – Technical publications".



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.

7.1 Adjustment of viscosity

The peelable solder masks of the series **SD 2950** are adjusted in such a manner that they can normally be processed in the condition supplied. A process relevant reduction in viscosity is only possible with reactive thinner **VR 2950**. The quantity to be added should not exceed 2%.

DIL

To be thinned with reactive thinner **VR 2950**



As the reactive thinner VR 2950 participates in the curing process it is impossible to use any other thinners or solvents.

Please consider that when a thinned peelable solder mask is printed thinner layers will be achieved and the solder resistance and/or peelability may be impaired. Perform pre-trials to ensure that the thinned peelable solder mask can be peeled off perfectly.

7.2 Auxiliary products

- **Cleaning agents R 5899, R 5821 and R 5817**

The cleaning agent **R 5899** does not have to be marked according to German dangerous goods regulations and can be handled simply and safely. Owing to its high flash point (> 100 °C [> 212 °F]) it is especially suitable for use in screen washing equipment. The cleaning agent **R 5899** is particularly distinguished by a low vapour pressure (< 0.1 hPa at 20 °C [68 °F]) and thus is not affected by the EU-VOC regulation 1999/13/EG which judges solvents by their percentage of volatile organic compounds (VOC = volatile organic compounds).

Furthermore, the cleaning agent **R 5821** is available which, owing to its high flash point of +32 °C [89.6 °F], is also suitable for use in screen washing equipment as well as for cleaning work tools. For the manual cleaning of screens and tools we recommend our cleaning agent **R 5817** with its fast and thorough cleaning properties.



Do not use cleaning agent as a thinner or for washing hands since solvents remove the natural grease from skin.

Special technical reports for these products are available upon request. Further information regarding the content and consequences of the EU-VOC regulation can be found in our **technical information sheet TI 15/110 E “EU-VOC regulations – Content and consequences for the PCB industry”**. On our website, you will find technical reports in the “Products” section and application information sheets in the section “Service – Technical publications”.

7.3 Screen printing

The peelable solder masks of the series **SD 2950** are applied by screen printing. To ensure optimum peeling, the printed coating must be bubble-free and at least 300 µm thick. This can be achieved in one print by using extremely coarse screen fabrics combined with a very high stencil build-up.

Recommended screen printing parameters

Screen fabric	Polyester 12–140 up to 18–250 (per old nomenclature polyester 12–18 T or S [lines/cm]) or corresponding steel mesh
Screen tension	at least 25 N/cm or as specified by the screen mesh manufacturer
Snap-off	as low as possible
Screen coating/ stencil build-up	with thick-film stencils (direct/indirect photopolymer films)
Squeegee	60–65 Shore A, if necessary with rounded blade
Squeegee angle	approx. 75°
Squeegee pressure	as low as possible
Squeegee speed	as low as possible

To achieve a satisfactory coating thickness in one print as far as possible, the screen fabric must be very well filled before commencing printing. If this is not achievable with standard metal pre-squeegees, the use of an elastomeric pre-squeegee is recommended.

NOTE:

To make it easier to subsequently peel off the solder mask, we recommend also printing a pull tab. Where possible, neighbouring masked areas should be linked by strips of peelable.

8. Drying/curing

The peelable solder masks of the series **SD 2950** are cured for 5–60 min at 120–160 °C [248–320 °F]. Taking into consideration the type of peelable solder mask, application and required properties, appropriate drying conditions must be determined and observed for the peelable solder masks of the series **SD 2950**.

→ Please pay attention to the curing parameters and detailed advice on curing in our **Application Information sheet AI 2/29** "Selection criteria and processing advice for our peelable solder resists (solder masks) of the series SD 2950".

9. Standard packaging

The peelable solder masks of the series **SD 2950** are packed for delivery as follows:

1 bucket of 6 kg = 1 selling unit

The reactive thinner **VR 2950** is available in cans of 1 kg.

Smaller quantities may be ordered but will entail surcharges to cover repackaging costs.

10. Shelf life and storage conditions

Labels on containers show shelf life and storage conditions.

Shelf life and storage conditions of the solder masks of the series **SD 2950**:



Shelf life: In sealed original containers at least 6 months, for SD 2954 9 months



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

Shelf life and storage conditions of the reactive thinner **VR 2950**:



Shelf life: In sealed original containers at least 18 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.

11. Further literature/Technical publications

.In addition to the recommendations given in this technical report, we can provide technical papers and information sheets written and compiled by members of our staff. Visit our website <http://www.peters.de> and see the section "Service – Technical publications".

We also recommend for further reading:

Dr. Manfred Suppa, Publisher Werner Peters: "Conformal Coatings for Electronics Applications", 1st edition 2012, Lackwerke Peters GmbH + Co KG, ISBN 978-3-00-039856-8

Any questions?

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

The above information as well as advice given by our Application Technology Department whether in verbal or written form or during product evaluations is provided to the best of our knowledge, but must be regarded as non-binding recommendations, also with respect to possible third-party proprietary rights.

The products are exclusively intended for the applications indicated in the corresponding technical data sheets.

The advisory service does not exempt you from performing your own assessments, in particular of our material safety data sheets and technical information sheets, and of our products as regards their suitability for the applications intended. The application, use and processing of our products and of the products manufactured by you based on the advice given by our Application Technology Department are beyond our control and thus entirely your responsibility. The sale of our products is effected in accordance with our current terms of sale and delivery.

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