

S2 SURVEY REPORT

Group 2

Circuit printing lacquers



This survey report gives a comprehensive overview of product group 2. For further information please refer to the technical reports (TR) and application information sheets (AI), in which the mentioned products are described in detail.

For more extensive advice, our application technology department (ATD) is at your disposal at any time.

The first column of this survey corresponds to the order in which our technical reports (TR) are filed in the report manual and/or supplements and new technical reports are to be added. Thus this survey also serves as a table of contents of product group 2.

The products mentioned in this survey do not contain substances listed in the RoHS directive 2002/95/EC, the EU End-of-Life Vehicle directive 2000/53/EC (“lead-free regulation”) and the WEEE directive 2002/96/EC. Detailed information on these directives that restrict or prohibit the use of certain hazardous substances can be accessed in the “Service” section on our website www.peters.de – “Directives/restrictions of substances“.



= registered trademark of Lackwerke Peters GmbH + Co KG for photoimageable lacquers



characterises products that are particularly suitable for application in optoelectronics



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1. Application information sheets

Application Information sheets (AI) apply to various lacquers/lacquer series' and supplement the Technical Reports on these lacquers by giving detailed explanations of possible application procedures and individual process steps plus offering numerous practical tips and advice to safeguard the optimum processing of our products.

The associated Technical Reports provide - in a concise and clear manner - numerous characteristics and processing data in transparent diagrams, graphics and tables.

Currently the following application information sheets for group 2 are available:

AI 2/1 "Processing information for photoimageable **ELPEMER**[®] solder resists".

AI 2/29 "Selection criteria and processing advice for our peelable solder resists (solder masks) of the series **SD 2950**".

2. Etch and plating resists

2.1 General characteristics



- high definition enables the representation of fine conductors
- UV and thermal curing
- excellent adhesion and high surface hardness
- the flake strippable etch and plating resists (index FS) offer the advantage that the flakes can be removed from the stripper medium by means of filters so that the waste water contamination is reduced and the service life of the stripping solution increased.

2.2 Special characteristics of the liquid **ELPEMER**[®] photoresists

- owing to their outstanding resolution, even ultra-fine conductors < 50 µm can be represented with the photoimageable resists of the series **ELPEMER**[®]
- particularly suited for the production of multilayer inner layers.

2.3 Product-specific characteristics

Product (series)	Special properties
Etch and plating resist SD 2050 UV , blue	<ul style="list-style-type: none"> • application by screen printing • UV curing (index UV) • suited for 150 µm technology • resistant up to pH 9 • very easily stripped in alkaline media
Etch and plating resist SD 2051 UV-AL-FS , blue	<ul style="list-style-type: none"> • application by screen printing • UV curing (index UV) • suited for 150 µm technology • can be used to etch 400 µm copper • resistant to acid etching and plating baths • very easily stripped in alkaline media (index AL) • index FS = flake strippable
Etch resists of the series SD 2052 AL SD 2042 AL, black SD 2052 AL, blue	<ul style="list-style-type: none"> • application by screen printing • air and oven drying • resistant up to pH 9 • easily stripped in alkaline media (index AL)

Product (series)	Special properties
Etch and plating resist SD 2053 UV-AL , blue	<ul style="list-style-type: none"> • application by screen printing • UV curing (index UV) • suited for 150 µm technology • resistant to acid etching and plating baths • very easily stripped in alkaline media (index AL)
1-pack photoresist  RC 2054 HR , colourless transparent/blue- violet transparent	<ul style="list-style-type: none"> • application by roller coating (index RC), curtain coating, dipping • photoimageable etch resist • no fillers and pigments, thus high productivity and no disturbing sediment in developer, thus little cleaning work required • fast drying and very low exposure energy • significant colour change during exposure from colourless transparent to blue-violet transparent ensures good visual control • excellent resolution (< 50 µm, index HR = high resolution) • aqueous-alkaline developable • resistant to acid etching baths • strippable in small, easily filtered flakes
1-pack photoresist  SD 2054 , blue transparent	<ul style="list-style-type: none"> • application by screen printing • photoimageable etch and plating resist • similar to RC 2054 HR, but applied by screen printing
Etch resist SD 2058 UV-FS , blue	<ul style="list-style-type: none"> • application by screen printing • UV curing (index UV) • suited for 150 µm technology • resistant to acid etching baths • fast curing and strippability • strippable in alkaline media • index FS = flake strippable
Etch and plating resist SD 2059 UV-AL-T , blue	<ul style="list-style-type: none"> • application by screen printing • UV curing (index UV) • suited for 150 µm technology • resistant to pH 9 • very easily stripped in alkaline media (index AL) • index T = thixotropic
Plating resists of the series SD 2149 SIT , black SD 2149 SIT SD 2149 SIT-HS	<ul style="list-style-type: none"> • application by screen printing • oven curing • for use in Secondary Imaging Technology (SIT) • protects metal surfaces during the electroless Ni/Au process (ENiG) and thus enables an additional finish to Ni/Au (as a rule OSP surfaces, OSP = Organic Solderability Preservative) • pleasant odour • broad process window • SD 2149 SIT-HS has a particularly long screen open time (Index HS = high boiling solvent) • good adhesion to copper and solder resists • strippable in alkaline media or ethylene diglycol

Product (series)	Special properties
Etch and plating resist SD 2150 UV-AL-FS , blue	<ul style="list-style-type: none"> • application by screen printing • UV curing (index UV) • enables representation of fine conductors up to 250 µm • perfectly suited for flexible circuits and for roll-to-roll application • resistant to acid etching and plating baths • very easily stripped in alkaline media (index AL) • index FS = flake strippable
Wepelan plating resist SD 2154 E , blue	<ul style="list-style-type: none"> • application by screen printing • air or oven drying • outstanding resistance over the entire pH range • very good resistance to cyanide baths • index E = elastic • strippable in esters and ketones

3. 1- and 2-pack ELPELECT® dielectrics

3.1 General characteristics

- insulating layer in the sequential fabrication of multilayer circuits (SBU = sequential build-up technology)
- suited for laser ablation with CO₂, Nd-YAG and Eximer lasers
- finest structures can be represented without any problems
- very good adhesion of the subsequent metal plating (> 10 N/cm).

3.2 Product-specific characteristics

Product (series)	Special properties
1-pack dielectric ELPELECT® GL 2230 LA , dark-red transparent	<ul style="list-style-type: none"> • application by curtain coating • laser-ablatable (index LA) • free of halogenated flame retardants • corresponds to best flame class V-0 acc. to UL 94
2-pack dielectric ELPELECT® SD 2230 LA , dark-red transparent	<ul style="list-style-type: none"> • same as GL 2230 LA, but applied by screen printing




4. Via hole fillers

4.1 General characteristics

- securely close via holes
- prevent the penetration of solder to the component side and the settling of flux residues in the holes
- ensure the sealing of via holes for vacuum adaption during in-circuit testing.

See also section 10 "Plugging pastes".

4.2 Product-specific characteristics


Product (series)	Special properties
Via hole fillers of the series SD 2361 SD 2361, green transparent SD 2361 T, green transparent	<ul style="list-style-type: none"> • application by screen printing • 100 % solids content means practically no volume shrinkage • 1-pack system • the thixotropic adjustment (index T) is suited for larger holes (from approx. 0.5 mm to approx. 1 mm) •  approval: best flame class V-0 acc. to UL 94, UL File No. E80315
2-pack via hole filler  VF 2467 DG	<ul style="list-style-type: none"> • application by screen printing • photoimageable via hole filler (index VF = via hole filler) • compatible with the solder resists of the series 2467 (see item 6) • aqueous-alkaline developable •  approval: best flame class V-0 acc. to UL 94 • index: DG = dark-green • transparent
2-pack via hole filler SD 2768 NB , green transparent	<ul style="list-style-type: none"> • application by screen printing • low volume shrinkage owing to high solids content • absolutely no bleeding onto gold or other metal surfaces, thus particularly suitable for via-in-pad applications • corresponds to the best flame class V-0 according to UL 94

5. 1-pack solder resists

5.1 General characteristics

- UV curing, high curing speed
- 100 % solids content, thus no drying on screen
- easy to print; can thus be processed at high squeegee/printing speeds
- low odour.

5.2 Product-specific characteristics


Product (series)	Special properties
1-pack solder resists of the series SD 2368 UV SD 2348 UV-SM, black transparent SD 2368 UV-HF, green transparent SD 2368 UV-SM, green transparent SD 2368 UV-SM-DG, dark-green transparent	<ul style="list-style-type: none"> • application by screen printing • UV curing (index UV) • perfect curing even in thicker layers • suited for the Hot-Air Levelling process • SD 2348 UV-SM and SD 2368 UV-HF are halogen-free according to JPCA-ES01-2003 / IEC 61249-2-21 •  approval for the green adjustments: best flame class V-0 acc. to UL 94, UL File No. E80315 • indices: SM = silk-mat; HF = halogen-free, DG = dark-green
1-pack touch-up lacquer SD 2369 UV-ABL , yellow-green transparent	<ul style="list-style-type: none"> • application by screen printing or brush • UV curing (index UV) • transparent lacquer for eliminating minor mechanical defects (index ABL = touch-up lacquer) • especially suited for all yellow-green solder resists

6. Conventional solder resists and ELPEMER® photoimageable 2-pack solder resists

6.1 General characteristics



- excellent printing properties, even in the case of high conductors
- enable so called mass soldering and selective soldering at the same time
- absolutely non-bleeding
- for rigid and flexible circuits
- low solvent content (low VOC; VOC = Volatile Organic Compound), high solids content
- excellent adhesive strength.







6.2 Special characteristics of the ELPEMER® photoimageable solder resists






- virtually vertical sidewalls enable the representation of finest structures, for instance 50 µm solder dams between SMD pads
- very short processing times
- very high processing reliability
- very low exposure energy
- aqueous-alkaline or polyalcohol developable
- good thermal cycling resistance and high temperature resistance
- compatible with lead-free soldering processes
- best resistance to electroless and electro plating finish processes
-  approval: best flame class V-0 acc. to UL 94, UL File No. E80315
- meet IPC-SM-840D specification
- mould-resistant in accordance with IPC-SM-840, item 3.4.6, and DIN IEC 60068-2-10.










Please read the advice in our Application Information sheet AI 2/1 (see section 1).

6.3 Product-specific characteristics

Product (series)	Special properties
2-pack solder resist SD 2444 NB-M , black 	<ul style="list-style-type: none"> • application by screen printing • excellent adhesive strength and resistance to soldering processes • especially suited for coating substrates in optoelectronics to avoid light reflection • index NB = no bleeding; M = mat
2-pack solder resists of the series SD 2460 FLEX SD 2420 FLEX, amber transp. SD 2460 FLEX, green transp.	<ul style="list-style-type: none"> • application by screen printing • can already be cured from 80 °C [176 °F] • excellent adhesion to polyimide and polyester films (index FLEX = for flexible circuits) •  approval for SD 2460 FLEX: best flame class V-0 acc. to UL 94, UL File No. E80315 • particularly suited as “top coats” in thick-copper technology (e.g. 400 µm technology, see also section 8 “Thick film fillers”)

Product (series)	Special properties
<p>2-pack solder resists of the series SD 2460/201 UV-FLEX</p> <p>SD 2430/201 UV-FLEX, red transparent SD 2450/201 UV-FLEX, blue transparent SD 2460/201 UV-FLEX, green transparent SD 2460/201 UV-FLEX-HF, green transparent SD 2490/201 UV-FLEX, white transparent</p> 	<ul style="list-style-type: none"> • application by screen printing • UV curing (index UV) • resistant to Hot-Air Levelling and lead-free reflow soldering • excellent adhesion to polyimide, polycarbonate and polyester films (index FLEX = for flexible circuits) • suited for Cross-Over Technology • SD 2490/201 UV-FLEX is particularly suitable as a reflective background for LED applications on flexible substrates • SD 2430/201 UV-FLEX, SD 2450/201 UV-FLEX, SD 2460/201 UV-FLEX-HF and SD 2490/201 UV-FLEX are halogen-free according to JPCA-ES01-2003 and IEC 61249-2-21 •  approval for SD 2460/201 UV-FLEX: best flame class V-0 acc. to UL 94, UL File No. E80315
<p>2-pack solder resists of the series SD 2462 NB and SD 2462 NB-M</p> <p>SD 2462 NB, green transparent SD 2432 NB-M, red transparent SD 2442 NB-M, black SD 2452 NB-M, blue transparent SD 2462 NB-M, green transparent SD 2462 NB-M-YG, yellow-green transparent SD 2462 NB-M/550, green transparent</p> 	<ul style="list-style-type: none"> • application by screen printing • outstanding definition and excellent conductor edge coverage • outstandingly high adhesive strength • SD 2442 NB-M is especially suited for coating substrates in optoelectronics to avoid light reflection • SD 2462 NB-M is particularly suitable as a “top coat” in thick-copper technology (e.g. 400 µm technology, see also section 8 “Thick film fillers”) • excellent chemical resistance • partially  approval: best flame class V-0 acc. to UL 94, UL File No. E80315 • indices: NB = no bleeding; M = mat; YG = yellow-green; 550 = viscosity 550 dPas (highly viscous)
<p>2-pack solder resists of the series  SD 2463 FLEX-HF (VSD)</p> <p>SD 2423 FLEX-HF (VSD), amber transparent SD 2463 FLEX-HF (VSD), green transparent</p>	<ul style="list-style-type: none"> • application by screen printing • highly flexible, thus particularly suitable for printing on flexible base materials (Index FLEX = for “static flex” circuits) • also suitable for vertical screen printing (Index VSD) • photoimageable • excellent resolution up to 30 µm • aqueous-alkaline developable • halogen-free per JPCA-ES01-2003 / IEC 61249-2-21 (Index HF = halogen-free) •  approval: best best flame class V-0 acc. to UL 94

Product (series)	Special properties
<p>2-pack solder resists of the series  2467</p> <p>AS 2467 SM-XG AS 2467 XM-XG ES 2467 SM-DG GL 2467 SG-DG GL 2467 SG-GG GL 2467 SM-DG GL 2467 SM-GG SD 2467 SG-DG SD 2467 SG-GG SD 2467 SG-XG SD 2467 SM-DG SD 2467 SM-GG SD 2467 SM-YG SD 2467 XM-DG</p> <p>Special colour adjustments: SD 2407 SM, colourless transp. SD 2417 SG, yellow transparent SD 2427 SG, amber transparent SD 2437 SM, red transparent SD 2447 SG, black SD 2447 SM, black SD 2447 XM, black SD 2457 SM, blue transparent SD 2487 SM, violet transparent SD 2497 SM, white</p> 	<ul style="list-style-type: none"> • suitable for all common application purposes • photoimageable • aqueous-alkaline developable •  approval: best flame class V-0 acc. to UL 94 • many types available as halogen-free adjustments acc. to JPCA-ES01-2003 / IEC 61249-2-21 • the black adjustments are especially suited for coating substrates in optoelectronics to avoid light reflection • Indices: AS = air spray, ES = electrostatic spray, GL = curtain coating, SD = screen printing, SG = silk-glossy; SM = silk-mat; DG = dark green; GG = grass-green; YG = yellow-green, XM =extra mat; XG = extra dark-green (The green adjustments are all transparent.)
<p>2-pack touch-up lacquer AL 2468 YG</p>	<ul style="list-style-type: none"> • application by brush • yellow-green transparent lacquer for eliminating minor mechanical defects (index AL = touch-up lacquer) • based on the 2-pack solder resists of the series SD 2468 NB • index YG = yellow-green
<p>2-pack solder resists of the series SD 2468 NB and SD 2468 NB-M</p>	<ul style="list-style-type: none"> • application by screen printing • available in various colour adjustments • partially  approval: best flame class V-0 acc. to UL 94, UL File No. E80315 • SD 2468 NB-M-HV/50 is specially suited for coating backpanels • indices: NB = no bleeding; M = mat <p>We also draw your attention to the newer series SD 2462 NB and SD 2462 NB-M with a longer screen open time and pot life, good resistance to electroless and electroplating baths and without aromatic amines.</p>
<p>2-pack solder resists of the series SD 2468 NB-M/21</p>	<ul style="list-style-type: none"> • application by screen printing • very good adhesion to metals such as Sn, Pb/Sn and Ni • excellent printing properties, for instance over high conductors (70 µm) and in tight conductor spaces • available in various colour adjustments • partially  approval: best flame class V-0 acc. to UL 94, UL File No. E80315 • indices: NB = no bleeding; M = mat

Product (series)	Special properties
2-pack solder resists of the series  2469 SM , yellow-green transparent GL 2469 SM SD 2469 SM	<ul style="list-style-type: none"> • application by screen printing or curtain coating • photoimageable • extremely broad processing window • polyalcohol developable, preferably in butyl carbitol or carbitol • excellent resistances and electrical properties •  approval: best flame class V-0 acc. to UL 94 • approved by numerous leading electronics manufacturers • Indices: GL = curtain coating, SD = screen printing, SM = silk-mat
2-pack solder resists of the series  2469 SM-HF , green transparent AS 2469 SM-HF GL 2469 SM-HF SD 2469 SM-HF	<ul style="list-style-type: none"> • suitable for all common application purposes • photoimageable • extremely broad processing window • polyalcohol developable, preferably in butyl carbitol or carbitol • excellent resistances and electrical properties • outstanding thermomechanical properties regarding thermal shock resistance and permanent temperature resistance •  approval: best flame class V-0 acc. to UL 94 • approved by numerous leading electronics manufacturers • HF = halogen-free according to JPCA-ES01-2003 / IEC 61249-2-21 • Indices: AS = air spray, GL = curtain coating, SD = screen printing, SM = silk-mat
2-pack solder resist  SD 2491 SM-TSW , white opaque 	<ul style="list-style-type: none"> • application by screen printing • photoimageable • extremely broad processing window • aqueous-alkaline developable • excellent yellowing resistance even after reflow soldering and temper processes •  UL approval: best flame class V-0 acc. to UL 94, UL File No. E80315 • halogen-free acc. to JPCA-ES01-2003 / IEC 61249-2-21 • particularly suitable as a reflective background for LED applications on flexible substrates • Indices: SM = silk-mat, TSW = thermally stable white
2-pack solder resist SD 2494 NB-SM , white	<ul style="list-style-type: none"> • application by screen printing • excellent adhesive strength •  approval: best flame class V-0 acc. to UL 94, UL File No. E80315 • indices: NB = no bleeding; SM = silk-mat
2-pack solder resist SD 2496 , white 	<ul style="list-style-type: none"> • application by screen printing • excellent adhesive strength • good resistance in chemical finish processes • excellent resistance to yellowing in lead-free soldering processes • excellent resistance to yellowing and good light reflection, thus ideal for application in optoelectronics and automobile electronics

7. Marking inks

7.1 General characteristics

- excellent definition
- high solids content
- outstanding covering power
- very good adhesive strength
- solder resistant.




7.2 Special characteristics of the ELPEMER® photoimageable marking inks



- the excellent resolution of the ELPEMER® photoimageable marking inks enables the representation of finest details
- no time- and cost-consuming fabrication of screen stencils
- aqueous-alkaline developable
- excellent colour stability even after the soldering process.

7.3 Product-specific characteristics of the 1-pack marking inks

Product (series)	Special properties
1-pack marking inks of the series SD 2513 UV SD 2513 UV, yellow SD 2543 UV, black SD 2593 UV, white	<ul style="list-style-type: none"> • application by screen printing • UV curing (index UV) • 100 % solids content • short curing times • high colour stability

7.4 Product-specific characteristics of the 2-pack marking inks

Product (series)	Special properties
2-pack marking inks of the series SD 2615 SD 2615, yellow SD 2645, black SD 2695, white SD 2695 T, white	<ul style="list-style-type: none"> • application by screen printing • fast curing • excellent chemical resistance • very good adhesive strength
2-pack marking inks of the series SD 2617 SD 2617, yellow SD 2617 HV, yellow SD 2617 SF, reddish-yellow	<ul style="list-style-type: none"> • application by screen printing • long pot life / processing time (at least 1 month) • indices: HV = highly viscous; SF = stronger colour
2-pack marking inks  SD 2618 and SD 2698 SD 2618, yellow SD 2698, white	<ul style="list-style-type: none"> • application by screen printing • photoimageable • particularly suited for pilot and low-volume series' since no need for expensive screen stencils • representation of finest details (50 µm) • aqueous-alkaline developable
2-pack marking ink  SD 2691 TSW , white 	<ul style="list-style-type: none"> • application by screen printing • photoimageable • particularly suited for pilot and low-volume series' since no need for expensive screen stencils • aqueous-alkaline developable • excellent yellowing resistance even after reflow soldering and temper processes (index TSW = thermally stable white), thus particularly suitable as a reflective background for LED applications on flexible substrates


Product (series)	Special properties
2-pack marking inks of the series SD 2692 T SD 2632 T, red SD 2642 T, black SD 2652 T, blue SD 2692 T, white SD 2612 T-K, yellow SD 2692 T-K, white SD 2692, white 	<ul style="list-style-type: none"> • application by screen printing • long pot life / processing time (at least 6 weeks) • the catalysed adjustments (index K) boast a shorter curing time, a considerably improved adhesive strength and have a pot life of one day • excellent definition owing to the high thixotropy (index T) • SD 2642 T is especially suited for coating substrates in optoelectronics to avoid light reflection • SD 2692 is less thixotropic and thus suited for overprinting closely spaced conductors • excellent chemical resistance
2-pack marking ink SD 2696 , white 	<ul style="list-style-type: none"> • application by screen printing • excellent adhesive strength • good resistance in chemical finish processes • excellent resistance to yellowing in lead-free soldering processes • excellent resistance to yellowing and good light reflection, thus ideal for application in optoelectronics and automobile electronics

8. Thick film fillers

8.1 General characteristics

- to fill the gaps between high traces in thick copper technology (for instance 400 µm technology)
- solvent-free
- ideal basis for the subsequent solder resist coating
- very good solder bath resistance
- also compatible with lead-free soldering processes
- **DSF 2706 UV** and **DSF 2701 UV-1** are flexible and therefore suited for use on so-called “static flex” circuit boards (printed circuit boards that are subjected to just one or very few bending stresses, for instance during installation).

8.2 Product-specific characteristics

Product (series)	Special properties
Thick film filler DSF 2706 UV , colourless transparent	<ul style="list-style-type: none"> • application by stencil printing • UV curing 2-pack system (index UV = UV curing) •  UL approval acc. to UL 94, UL File No. E80315 • free of halogenated flame retardants • halogen-free acc. to JPCA-ES01-2003 / IEC 61249-2-21 • forms a system in thick-copper technology in combination with the 2-pack solder resist SD 2462 NB-M or the UV pre-crosslinkable 2-pack solder resist FP 206-0310 UV as “top coats”
Thick film filler DSF 2707 UV-1 , colourless transparent	<ul style="list-style-type: none"> • application by stencil printing • UV curing 1-pack system (Index UV = UV curing) • free of halogenated flame retardants • halogen-free according to JPCA-ES01-2003 / IEC 61249-2-21 • forms a system in thick-copper technology in combination with the 2-pack solder resist SD 2462 NB-M or the UV pre-crosslinkable 2-pack solder resist FP 206-0310 UV as “top coats”



Product (series)	Special properties
Thick film filler DSF 2793 , light grey	<ul style="list-style-type: none"> • application by stencil printing • thermal curing 1-pack system • for the production of thick copper inner layers • free of halogenated flame retardants

9. Heatsink pastes

9.1 General characteristics

- highly thermally conductive systems for the thermal management of printed circuit boards and assemblies
- low-cost alternative to conventional bonded heatsinks
- problem-free application with existing screen printing technology
- enables the flexible configuration of varying heatsink geometries.

9.2 Product-specific characteristics

Product (series)	Special properties
Heatsink pastes HSP 2740 and HSP 2741 , black 	<ul style="list-style-type: none"> • 1-pack systems with 100 % solids content • HSP 2740: excellent printing properties, silk-mat surface and better chemical resistance • HSP 2741: higher flexibility, thus minimum influence on planarity of the pcb;  approval acc. to UL 94, UL File No. E80315 • increases the radiation efficiency and life span of LEDs

10. Flux stop lacquer

10.1 General properties

- restricts the coating of fluxing agents to defined areas and prevents inadvertent spreading of fluxing agents on the pcb, particularly in SMD areas
- avoids functional interferences caused by fluxing agents in sensitive areas of the pcb


10.2 Product-specific characteristics

Product (series)	Special properties
2-pack flux stop lacquer SD 2792 , white	<ul style="list-style-type: none"> • application by screen printing • long pot life • high definition print • is applied as a "frame" at a distance of 5 mm around solder joints • thermal curing

11. Plugging pastes

11.1 General characteristics

- suited for the creation of blister-free, smooth hole fillings in buried vias
- metallisable
- enable the application of smooth insulating layers in HDI/SBU technology
- 100 % solids content

- low coefficient of thermal expansion, no cracking or delamination of the applied metallisation
- **PP 2795-SD** and the **PP 2795** series have been awarded the best flame class V-0 in accordance with  UL 94, UL File No. E80315
- the plugging pastes **PP 2795-SD** and **PP 2795** are suitable for space applications. These products are listed as approved materials in the NASA specification D-8208 "Spacecraft Design and Fabrication Requirements for Electronic Packaging and Cabling; Section 3.6, Printed Wiring Boards; Table 3.6-5: Acceptable Via Hole-Fill Material".
- the pluggable diameter depends on the "aspect ratio" of the plated-through holes to be filled
- long shelf life: 4 or 6 months at room temperature

11.2 Product-specific characteristics

Product (series)	Special properties
Plugging pastes of the series PP 2795 , white PP 2795 PP 2795 HV	<ul style="list-style-type: none"> • application by screen and stencil printing, vacuum screen printing and roller coating • with the highly viscous adjustment (index HV) higher "aspect ratios" are realisable
Plugging pastes of the series PP 2795-SD PP 2765-SD, green PP 2795-SD, light-grey	<ul style="list-style-type: none"> • application by screen printing (index SD = screen printing) or stencil printing • owing to its green adjustment PP 2765-SD offers a more uniform visual appearance if no subsequent metallisation is performed

12. Carbon-conductive inks

12.1 General characteristics

- excellent definition owing to high thixotropy
- very good adhesion to flexible base material, thus also suitable for "static flex" applications
- excellent adhesive strength and mechanical stability
- high chemical resistance
- stable electrical resistance even after temperature and moisture stress.

12.2 Product-specific characteristics

Product (series)	Special properties
1-pack carbon-conductive ink SD 2841 HAL-IR , black, mat, 14-20 Ω/□*	<ul style="list-style-type: none"> • application by screen printing • very smooth surface, thus suited for sliding contacts • particularly suited for IR curing (index IR = infrared-curable) • hot-air levelling resistant (index HAL) • can be mixed with 1-pack insulating paste SD 2801 HAL, grey, to increase resistance
1-pack carbon-conductive ink SD 2843 HAL , black, mat, 13-20 Ω/□*	<ul style="list-style-type: none"> • application by screen printing • hot-air levelling resistant (index HAL) • high chemical and thermal resistance • particularly long shelf life: 6 months

* resistance related to a square area at a layer thickness of about 25 µm

13. Peelable solder masks

13.1 General characteristics

- for the partial coverage of printed circuit boards as protection from direct contact with solder baths and as protection in plating processes
- very high elasticity and tear resistance
- easy removal before and/or after the soldering process.

Please observe the advice in our Application Information sheet **AI 2/29** (see section 1).

13.2 Product-specific characteristics

Product (series)	Special properties
Peelable solder masks of the series SD 2950 SD 2950, blue SD 2950 T, blue SD 2952, blue SD 2952 HV, blue SD 2953, blue SD 2954, blue transparent SD 2955, blue-green SD 2958, blue SD 2962 P, green SD 2962 P/350, green SD 2990 T, white	<ul style="list-style-type: none"> • application by screen printing • unlimited pot life • solvent-free • SD 2950/SD 2950 T: may be suited for lead Hot-Air Levelling; cannot be peeled until after soldering • SD 2952/SD 2952 HV: suitable for standard soldering processes, not suitable for printing over carbon-conductive inks • SD 2953: same as SD 2952 but more thixotropic • SD 2954: very high thermal stability, multiple soldering possible, particularly suitable for leaded reflow soldering (SMD technology) • SD 2955: very high thermal stability, multiple soldering possible, high resistance in lead-free soldering processes, particularly suitable for application in reflow soldering (SMD technology) • SD 2958: for application in leaded and lead-free vertical Hot-Air Levelling, only peelable after soldering • SD 2962 P; SD 2962 P/350: suited as masks in electroplating and other metallising processes • SD 2990 T: for covering carbon-conductive ink or tenting larger holes • indices: T = thixotropic; HV = highly viscous; 350 = viscosity of 350 dPas; P = pigmented

Any questions?

We would be pleased to offer you advice and assistance in choosing a suitable product as well as 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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