

## Conformal/permanent coatings for assembled printed circuit boards / flat packs

- excellent corrosion protection of high-quality electronics, also for flexible pcbs
- very high tracking resistance and very good dielectric properties
- best humidity resistance and insulation resistance according to IPC-CC-830B
- temperature application range from -40 °C [104 °F] up to the maximum value indicated in the temperature index (TI) column in the table below
- extremely low risk of dissolving components and marking inks
- the thick-film lacquers are solvent-free 1-pack systems
- for processing in selective coating units selected special viscosity adjustments are available
- the colourless adjustments are absolutely transparent
- owing to their strong contrast to the substrate the red and green transparent adjustments enable easy control of the completeness of the coating
- coatings with the fluorescent (Index **FLZ**) adjustments can be easily controlled under UV light (black light with a UV-A impulse at 350-375 nm)
- the silicone lacquers can be removed mechanically; all other lacquers exhibit a good surface hardness
- can be soldered-through for repair purposes with the exception of the ELPEGUARD® thick-film lacquers of the series TWIN-CURE® DSL 1600 E-FLZ
- do not contain substances listed in the RoHS directive 2002/95/EC, the EU Vehicle End-of-Life directive 2000/53/EC and the WEEE directive 2002/96/EC

### ELPEGUARD® PETERS thick-film lacquers

	Product description	Colour, appearance	Dielectric strength [KV/mm] EN 60243-1	Volume resistivity [Ohm x cm] IEC 60093	Temperature index (TI) acc. to IEC 60216	Best flame class acc. to UL 94	Correspond to the requirements of IPC-CC-830B	Possible application procedures	Curing time until packaging (strongly depends upon coating thickness)
<b>ELPEGUARD® thick-film lacquers of the series TWIN-CURE® DSL 1600 E-FLZ</b> Base: Copolymerisate of polyurethane (PUR) and polyacrylate (AY) <ul style="list-style-type: none"> <li>• DSL 1600 E-FLZ and DSL 1600 E for thick-film application up to <b>500 µm</b>, DSL 1600 FLZ up to <b>200 µm</b></li> <li>• Short processing times in spite of high layers owing to optimally synchronised curing mechanisms: fast UV curing and chemical cross-linking reaction with air humidity in shadow areas</li> <li>• Excellent mechanical, chemical and climatic resistance</li> </ul>	<b>DSL 1600 E-FLZ</b> <b>DSL 1600 FLZ</b> <b>DSL 1600 E</b>	colourless	44 55 44	$> 1.0 \times 10^{12}$	130 °C [266 °F]	–	very good**	Brushing, dispensing, selective coating procedures	1-3 h after UV curing
<b>Silicone thick-film lacquer ELPEGUARD® DSL 1705 FLZ</b> Base: Polyorganosiloxane <ul style="list-style-type: none"> <li>• For thick-film application up to <b>3000 µm</b></li> <li>• Thermo addition cross-linking, thus also suitable for application in encapsulated surroundings</li> <li>• <b>UL approval as conformal/permanent coating according to UL 746E**</b></li> </ul>	<b>DSL 1705 FLZ</b>	colourless	57	$2.1 \times 10^{14}$	180 °C [356 °F]	V-1**	very good	Brushing, dipping, selective coating procedures	15 min at 110 °C [230 °F], cooling down onto RT
<b>Silicone thick-film lacquers of the series ELPEGUARD® DSL 1706 FLZ</b> Base: Polyorganosiloxane <ul style="list-style-type: none"> <li>• For thick-film application up to <b>300 µm</b></li> <li>• Condensation cross-linking at room temperature</li> </ul>	<b>DSL 1706 FLZ*</b>	colourless	63	$6.3 \times 10^{15}$	180 °C [356 °F]	V-0	very good	Brushing, spraying, selective coating procedures	min 24 h

\* These conformal/permanent coatings are available in various viscosity adjustments.

\*\* You will find test reports on our website at [www.peters.de](http://www.peters.de) under "Service – Certificates".  
(The conformal/permanent coatings SL 1301 ECO-FLZ/&, SL 1307 FLZ/&, SL 1400 ECO-FLZ/& and DSL 1600 E-FLZ/& were tested according to IPC-CC-830B by the independent test institute Trace Laboratories-East, USA. /& stands for various viscosity adjustments.)

#### Explanation of indices:

DSL = thick-film lacquer      AQ = water-borne (aqua)      E = elastic      FE = fungicide adjustment      LF-D = lead-free directive      N = wetting agent      /22 = 22s flow time acc. to DIN 53211  
 SL = conformal/permanent coating      BA = butylacetate      ECO = ecological      FLZ = fluorescent      MS = moderate boiling solvent      S = spray can (CFC-free)



## conformal/permanent coatings

	Product description	Colour, appearance	Dielectric strength [KV/mm] EN 60243-1	Volume resistivity [Ohm x cm] IEC 60093	Temperature index (TI) acc. to IEC 60216	Best flame class acc. to UL 94	Correspond to the requirements of IPC-CC-830B	Possible application procedures	Curing time until packaging (strongly depends upon coating thickness)
<b>Conformal/permanent coatings of the series ELPEGUARD® SL 1301 ECO-FLZ</b> Base: Modified polyurethane resins (PUR) • Approved and used by leading suppliers of the automotive industry	SL 1301 ECO-FLZ*	colourless	80	1.0 x 10 <sup>15</sup>	140 °C [284 °F]	V-0**	very good**	Brushing, spraying, dipping, selective coating procedures	min 96 h at RT or 6 h at 80 °C [176 °F]
<b>Conformal/permanent coatings of the series ELPEGUARD® SL 1301 ECO-FLZ, adjustment BA</b> • As SL 1301 ECO-FLZ, only the special solvent composition promotes a particularly uncritical drying behaviour under components	SL 1301 ECO-FLZ, adjustment BA*	colourless	80	1.0 x 10 <sup>16</sup>	140 °C [284 °F]	V-0	very good**	Brushing, spraying, dipping, selective coating procedures	min 96 h at RT or 6 h at 80 °C [176 °F]
<b>Conformal/permanent coatings of the series ELPEGUARD® SL 1331 N-LF-D</b> Base: Modified polyurethane resins (PUR) • Lead-free alternative to SL 1331 N (Index LF-D = lead-free directive)	SL 1331 N-LF-D*	red transp.	85	1.6 x 10 <sup>13</sup>	140 °C [284 °F]	V-0	very good	Brushing, spraying, dipping, selective coating procedures	min 96 h at RT or 6 h at 80 °C [176 °F]
<b>Water-thinnable conformal/permanent coatings of the series ELPEGUARD® SL 1305 AQ</b> Base: Polyurethane resins (PUR) • UL approval for fluorescent adjustments as conformal coatings acc. to UL 746E • Can be dyed with dyestuff concentrates in red, green, blue or black	SL 1305 AQ* SL 1305 AQ-FLZ*	colourless colourless	85	1.0 x 10 <sup>15</sup>	will be determined soon	V-0 V-0**	very good	Brushing, spraying, dipping, selective coating procedures	approx. 2 h at RT
<b>Conformal/permanent coatings of the series ELPEGUARD® SL 1306 N</b> Base: Modified acrylic resins • For the protective coating of uncleaned assemblies when no-clean fluxes are used • Excellent resistance to condensation and climatic influences, including surface dewing	SL 1306 N SL 1306 N-FLZ* SL 1336 N SL 1366 N	colourless colourless red transp. green transp.	65	2.0 x 10 <sup>14</sup>	130 °C [266 °F]	V-0** V-0** V-0 V-0	very good	Brushing, spraying, dipping, selective coating procedures	min 96 h at RT or 6 h at 80 °C [176 °F]
<b>Conformal/permanent coatings of the series ELPEGUARD® SL 1307</b> Base: Modified acrylic resins • Very fast physical drying at room temperature, thus <b>only SL 1307 MS</b> (Index <b>MS</b> = moderate boiling solvent: delayed drying with simultaneously increased flow) is unconditionally suitable for the dipping process • SL 1307 FLZ is mould resistant acc. to IPC-CC-830B, SL 1367 MS-FLZ-FE/22 is mould resistant acc. to MIL-STD-810 E • Can be removed completely for repair purposes by means of thinner V 1307	SL 1307 SL 1307 FLZ* SL 1307 MS SL 1337 SL 1367 SL 1367 MS-FLZ-FE/22	colourless colourless colourless red transp. green transp. green transp.	60	1.5 x 10 <sup>15</sup>	125 °C [257 °F]	V-0 V-0** V-0 V-0 V-0 V-0	excellent**	Brushing, spraying, selective coating procedures (SL 1307 MS: also dipping)	approx. 1 h at RT (SL 1307 MS 2 h)
<b>Conformal/permanent coatings of the series ELPEGUARD® SL 1308 FLZ</b> Base: Modified epoxy resins (EP) • Fungicidal adjustment acc. to MIL-V-173 C, protects from mould, suitable for tropical climates	SL 1308 FLZ	colourless	85	8 x 10 <sup>13</sup>	150 °C [302 °F]	V-0	very good	Brushing, spraying, dipping, selective coating procedures	min 96 h at RT or 6 h at 80 °C [176 °F]
<b>Conformal/permanent coatings of the series ELPEGUARD® SL 1309 N</b> Base: Modified acrylic resins • Also suitable as protective lacquers for uncleaned flat packs when no-clean fluxes are used • Excellent adhesion to nearly all substrates • SL 1309 N-FLZ is mould resistant acc. to MIL-STD-810 E	SL 1309 N* SL 1309 N-FLZ* SL 1339 N* SL 1369 N	colourless colourless red transp. green transp.	90	2.0 x 10 <sup>14</sup>	130 °C [266 °F]	V-0	very good	Brushing, spraying, dipping, selective coating procedures	min 96 h at RT or 6 h at 80 °C [176 °F]
<b>Insulating and encapsulating sprays of the series ELPEGUARD® SL 1309 N-S</b> • As SL 1309 N, but in spray cans (CFC-free) • Ideal for pilot and low-volume series' as well as for repair purposes	SL 1309 N-S SL 1339 N-S	colourless red transp.	90	5.0 x 10 <sup>13</sup>	130 °C [266 °F]	V-0	very good	Spray can	min 96 h at RT or 6 h at 80 °C [176 °F]
<b>Conformal/permanent coatings of the series ELPEGUARD® SL 1400 ECO-FLZ</b> Base: Humidity curing polyurethane resins (PUR) • Excellent protection against corrosion in case of high temperatures and air humidities	SL 1400 ECO-FLZ*	colourless	70	5 x 10 <sup>15</sup>	140 °C [284 °F]	V-0**	very good**	Brushing, spraying, dipping, selective coating procedures	24 – 48 h at RT
<b>Silicone conformal/permanent coating ELPEGUARD® SL 1700 FLZ</b> Base: Polyorganosiloxane • Condensation cross-linking at room temperature • UL approval as conformal coating acc. to UL 746E	SL 1700 FLZ	colourless	44	6 x 10 <sup>13</sup>	180 °C [356 °F]	V-0**	very good	Brushing, dipping, selective coating procedures	min 72 h at RT

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 SL = conformal/permanent coating      BA = butylacetate      ECO = ecological      FLZ = fluorescent      MS = moderate boiling solvent      S = spray can (CFC-free)      DIN 53211



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**Ask for further information! We will gladly provide free-of-charge samples and detailed technical data sheets.**

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