

Thick film coating **ELPEGUARD**[®] **Twin-Cure**[®] DSL 1707 FLZ

The thick film coating **ELPEGUARD**[®] **Twin-Cure**[®] **DSL 1707 FLZ** is used to protect and insulate assembled pcbs so that they can fulfil higher requirements regarding reliability and service life. Owing to their very good resistance against moisture and condensation, an excellent protection against corrosion (such as electro corrosion and migration) is possible even under harsh climatic conditions.

- Base: silicone (SR)
- solvent-free / VOC-free
- powerful protection by electrical insulation properties ensured immediately after UV curing
- chemical cross-linking reaction in shadow zones (condensation cross-linking)
- excellent chemical resistance
- UL approval according to UL 746E (UL file no. E80315)
- temperature range from -65 to +200 °C [-85 to + 392 °F]*
- high thermal shock resistance from -40 to +180 °C [-40 to 356 °F] even when applied in thick layers
- stress-compensating under thermal shocks and vibrations
- enables the micro-encapsulation of small components
- resistant against weathering and UV radiation
- high transparency and yellowing resistance, thus especially suitable for lighting electronics/LED technology
- highly elastic, thus suitable for coating flexible circuits
- good adhesion on all substrates; no self-priming agent required
- can be mechanically removed and reapplied after repair on the cleaned substrate.

* Both at the lower and upper ends of this range the performance and reliability of the material can be negatively affected in some applications. In these cases, additional pre-trials and tests are required.

Characteristics

Colour/aspect	colourless, fluorescent (maybe slightly cloudy when liquid)
Solids content	100 %
Viscosity* at 20 °C [68 °F], DIN EN ISO 3219	3500 ± 1500 mPas
Density at 20 °C [68 °F], DIN EN ISO 2811-1	0.98 ± 0.05 g/cm ³

* measured with Haake RS 600, C 1/1°, 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: DSL = thick film coating, FLZ = fluorescent

Physical and mechanical properties

These values are achieved after UV curing and 7 days' storage at room temperature.

Property	Test method	Result
Flexibility	IPC-CC-830B, 3.5.5	passed
Glass transition temperature Tg	TMA	< -50 °C
Coefficient of thermal expansion (CTE)	TMA	≈ 275 ppm/°C > Tg

Electrical properties


These values are achieved after UV curing and 7 days' storage at room temperature.

Property	Test method	Result
Dielectric strength	IPC-TM-650, 2.5.6.1 DIN EN 60243-1	70 kV/mm
	IPC-CC-830B, 3.6.1	passed
Specific volume resistivity	VDE 0303, Teil 30/DIN IEC 60093 IPC-TM-650, 2.5.17.1	8 x 10 ¹² Ohm x cm
Surface resistance	VDE 0303, Teil 30/DIN IEC 60093 IPC-TM-650, 2.5.17.1	1 x 10 ¹³ Ohm
Moisture and insulation resistance	IPC-CC-830B, 3.7.1 (65 °C [149 °F]/90 % R.H.)	passed
	85/85 test; ramp formed storage at high air humidity and high tem- perature, including 3 days at 85 °C [185 °F] and 85 % R.H.	1 x 10 ¹⁰ Ohm
Resistance to condensation	based on DIN EN ISO 6270-2 (BIAS 12 V, 40 °C, 100% R.H.)	1,6 x 10 ⁹ Ohm
Thermal shock	IPC-CC-830B, 3.7.2 -65 bis +125 °C [-85 to +257 °F]	passed
Comparative tracking index (CTI)	DIN EN 60112 on base material with CTI of 250	CTI > 600

Electrical properties immediately after UV curing

After UV curing, electrically insulating properties are already present; however, they may not yet reach the values stated above. Please consider this when performing functional tests directly after UV curing. The final properties are only achieved after about 7 days.

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.
AI	Application information AI 1/2 "Processing instructions for the thick film coatings of the series ELPEGUARD® Twin-Cure®"
TI	Technical information TI 15/3 "Protective measures when using chemicals including lacquers, casting compounds, thinners, cleaning agents"
TI	Technical information TI 15/18 "Handling of silicones"

The thick film coating of the series **ELPEGUARD® Twin-Cure® DSL 1707 FLZ** can be applied by automatic selective coating units, by brushing or by means of dispensing.



Protect from UV light



Protect against humidity

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.

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.

Auxiliary products recommended

- **Cleaning agent R 5817**
for the manual cleaning of screens and tools
- **Cleaning agent R 5807**
for cleaning equipment

Drying/curing

The curing process is based on two complementary chemical cross-linking mechanisms of different time lengths: UV curing and humidity curing.

UV curing

Curing can be effected in standard UV curing units.

→ Cure the thick film coating **ELPEGUARD® Twin-Cure® DSL 1707 FLZ** by applying a UV radiation energy of at least **3000 mJ/cm²** (given for a pure mercury lamp).

UV curing with suitable UV lamps is mandatory. It is impossible to achieve the final properties specified by means of humidity curing alone.

After UV curing a strong odour may develop. When cured at 80 °C for 30 min the coating will turn odourless.

The UV cured assemblies can be packed directly after UV curing has been completed, or after they have cooled down to room temperature.

→ The coated components may only be encapsulated/mounted into housings after humidity curing is completed since **DSL 1707 FLZ** needs air humidity for the curing process and splits off alcohol.

Humidity curing

In shadow zones, the coating will cure by reacting with atmospheric humidity. Depending on the layout and assembly of the printed circuit board, this reaction is completed after 7 days. Only after this time the final properties are achieved.

Standard packaging

10 cartridges of 0.3 kg = 3 kg. Partial lots of the selling unit available against surcharge.

Shelf life and storage conditions



Shelf life: In sealed original containers at least 3 months



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



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Protect against humidity

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.

Disclaimer

All descriptions and images of our goods and products contained in our technical literature, catalogues, flyers, circular letters, advertisements, price lists, websites, data sheets and brochures, and in particular the information given in this literature are non-binding unless expressly stated otherwise in the Agreement. This shall also include the property rights of third parties if applicable.

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 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.

ATTENTION!

For new products, according to preliminary technical reports, adequate practical results are not always available which would permit a comprehensive assessment of such a product. It is therefore imperative to exercise particular care in the testing of such products with regard to the application intended!

Any questions?

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

Lackwerke Peters GmbH & Co. KG
Hooghe Weg 13, 47906 Kempen, Germany

Internet: www.peters.de
E-Mail: peters@peters.de

Phone +49 2152 2009-0
Fax +49 2152 2009-70

peters
Coating Innovations
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