

Conformal coatings of the series ELPEGUARD® SL 9407 FLZ

The conformal coatings of the series **ELPEGUARD® SL 9407 FLZ** are used to protect and insulate electronic assemblies 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 electrochemical corrosion and migration) is possible.

- Base: polyurethane resin (UR)
- excellent climatic resistance
- very good adhesion on many substrates
- suitable for coating flexible circuits („flex-to-install“)
- compliant with China standard GB 30981-2020
- best resistance class GX against noxious gases according to ISA 71.04-2013
- temperature range -65 to + 130 °C [-85 to 266 °F]

Characteristics

		SL 9407 FLZ/730	SL 9407 FLZ/45
Colour/appearance		colourless, fluorescent	
Solids content of mixture		approx. 95 %	approx. 75 %
Viscosity* at 20 °C [68 °F] DIN EN ISO 3219	Component A Hardener (Comp. B) Mixture	730 ± 50 mPas 500 ± 100 mPas 670 ± 75 mPas	45 ± 15 mPas 500 ± 100 mPas 90 ± 30 mPas**
Density at 20 °C [68 °F] DIN EN ISO 2811-1	Component A Hardener (Comp. B) Mixture	0,95 ± 0.05 g/cm ³ 1.10 ± 0.02 g/cm ³ 1.00 ± 0.05 g/cm ³	0,93 ± 0.05 g/cm ³ 1.10 ± 0.02 g/cm ³ 0.99 ± 0.05 g/cm ³
Refractive Index n _D ²⁰ at 20°C [68 °F] DIN 51423	Component A Hardener (Comp. B) Mixture	1.4780 ± 0.0015 1.4970 ± 0.0015 1.4860 ± 0.0030	1.4550 ± 0.0015 1.4970 ± 0.0015 1.4690 ± 0.0030
Pot life of mixture at 19-21 °C [66.2-69.8 °F], in acc. with DIN EN 14022, approx. 170 g, double viscosity		approx. 20 min	approx. 20 min

* measured with Haake RS 600, C 35/1°, D = 100 s⁻¹
viscosity measuring unit supplied by Thermo Fisher Scientific, www.thermofisher.com

** corresponds to a viscosity of 23 s, measured with a 4 mm DIN flow cup, DIN 53211

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	Results
Thermal Shock Test	1000 cycles, -65 to +125 °C [-85 to 257 °F], dwell time 30 min, shift time < 10 s	No cracks or delamination
Glass transition temperature Tg	Thermo mechanical analysis (TMA)	No Tg between -50 °C and 150 °C [-58 °F and 302 °F]
Coefficient of thermal expansion (CTE)	Thermo mechanical analysis (TMA)	≈ 240 ppm/°C > Tg (-50 °C bis 150 °C) [-58 °F to 302 °F]


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.

Property	Test method	Results
Dielectric strength	IPC-TM-650, 2.5.6.1	≥ 65 kV/mm
	IPC-CC-830B, 3.6.1	passed
Specific volume resistivity	DIN EN 62631-3-1	≥ 3 x 10 ¹³ Ohm x cm
Surface resistance	DIN EN 62631-3-2	≥ 1.0 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 (3 d, 85 °C [185 °F], 85 % R. H.)	≥ 1 x 10 ⁹ Ohm
	1000 h, 85 °C [185 °F], 85 % R.H.	≥ 1 x 10 ⁸ Ohm
Resistance to condensation	based on DIN EN ISO 6270-2 (BIAS 12 V, 40 °C, 100% R.H.)	≥ 2 x 10 ⁹ Ohm
Comparative tracking index (CTI, tracking resistance)	DIN EN 60112, on FR4 base material with CTI 300	CTI ≥ 600
Permittivity ε _r	Determination with a Balanced Circular Disk Resonator	65 GHz: ≈ 2.825
	VDE 0303, part 4	100 kHz: ≈ 4.8 1 MHz: ≈ 4.4 1 GHz: ≈ 3.6
Dielectric loss factor tan δ	Determination with a Balanced Circular Disk Resonator	65 GHz: ≈ 0.014
	VDE 0303, part 4	100 kHz: ≈ 0.114 1 MHz: ≈ 0.079 1 GHz: ≈ 0.043
TI (temperature index)	DIN EN 60216 (IEC 60216) issue 2001	131 °C [267.8 F] (20 000 h)* 149 °C [300.2 F] (5 000 h)

* can be used in a temperature range of **-65 to at least +130 °C [-85 to at least 266 °F]**. 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 such cases, additional pre-trials and tests are required. Limit values for classification were a 50 % loss in mass and/or 25 % dielectric strength in comparison to the appropriate reference values.

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 1/1 "Processing instructions for ELPEGUARD® conformal coatings (thin film coatings)"
TI	Technical information TI 15/3 "Protective measures when using chemicals including lacquers, casting compounds, thinners, cleaning agents"
TI	Technical information TI 15/10 "Processing of 2-pack systems"

The conformal coatings of the series **ELPEGUARD® SL 9407 FLZ** can be applied by means of automatic selective coating units, brushing or spraying.


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.

Viscosity adjustment

→ Adjust the processing viscosity for each application process (see also "Adjustment of the processing viscosity" in the Application information sheet **AI 1/1**).

 to be thinned with thinner **V 9407**

Mixing

	Parts by weight Component A : Component B	Parts by volume Component A : Component B
SL 9407 FLZ/730	100 : 78	≈ 3 : 2
SL 9407 FLZ/45	100 : 56	≈ 2 : 1

Auxiliary products recommended

- [ELPESPEC® cleaning agent R 5817](#)
for the cleaning of work place and tools/equipment

Drying/curing

Curing can be effected at room temperature or in circulating hot-air units with exhaust air. Curing time prior to packaging is 4–5 h at room temperature; the final properties are reached after 7 days' storage at room temperature.

Curing can be accelerated by heat, e.g. 30–45 min at 60 °C [140 °F] (object holding time: The curing time starts when the panels reach the curing temperature.).

Packaging

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

Shelf life and storage conditions



Preliminary shelf life: In sealed original containers at least 6 months



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



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.