

Product Information

Electronic Protection System

Thick Film Coating, UV cure

Bectron[®] PT 4605

ELANTAS Beck GmbH

Grossmannstr. 105
20539 Hamburg
Germany
Tel +49 40 78946 0
Fax +49 40 78946 276
bectron.elantas.beck@altana.com
www.elantas.com

Product description

Bectron® PT 4605 is a solvent free one-component polyurethane based transparent thick film coating cured by UV irradiation and / or by moisture.

The cured product is elastic with flexibility down to low temperature (-40°C) and good adhesion to most substrates. Bectron® PT 4605 provides excellent insulation properties after severe wet storage conditions

Bectron PT 4605 satisfies UL 94 V0 and the requirements of ROHS.

Areas of application

Bectron® PT 4605 is an ideal VOC-free conformal coating with excellent electrical performance, particularly suitable for electronics such as surface mount devices and hybrids. It provides good protection against moisture, corrosion and migration as well as vibration.

Properties

Rapid UV curing

Moisture shadow-cure

Thermal cycling over -40°C to +120°C

Temperature resistance -40 to +120°C

Good flexibility to -40°C

Good Adhesion

Good dielectric properties

Solvent free

Low viscosity

Storage

In closed original containers storage 6 months at 5-10°C. Storage at maximum 5°C is recommended to prevent an increase in viscosity. For longer storage Bectron® PT 4605 should be stored at -18°C. Containers should be sealed as the product is moisture sensitive

Preparation

The components to be coated should be clean dry and free from grease and compatibility between the resin and all materials on a PCB should be checked prior to use. Residual water from washing the PCB can cause bubbles so low solids flux or alcohol based cleaning materials are recommended.

Processing

Bectron® PT 4605 can be applied by spray, dispensing, jetting and brushing. Complete dipping or selective flooding/dipping can be used in a machine with controlled atmosphere to exclude moisture

Curing

Curing in UV light requires 5 - 10 seconds, depending of the used type and power of the UV-lamp. A colour change from blue to green/yellow indicates the degree of UV-curing. Post-curing by moisture in shadow areas takes 2 to 3 days. Full polymerisation of the last <5 % will take place over 2 weeks achieving full properties of the material.

For a usual film thickness of $200 \pm 50\mu\text{m}$ and 3000 mJ/cm^2 , curing takes approx. 5 seconds. The conveyor speed should be 1-2.5 m/min to limit influence of heat

Caution

The UV reactivity is high so sunlight or UV inspection lamps will start pre-curing, preventing the full development of the properties of the coating.

Table 1 - Properties of materials as supplied

Property	Conditions	Value	Unit
Colour		Blue	
Viscosity (DIN 53019)	23°C	700 ± 400	mPas
Specific gravity (DIN EN ISO 2811-1)	20°C	1.11 ± 0.05	g/cm ³
Shelf Life @ max 5 °C		6	months

Table 2 – Curing Conditions

Property	Conditions	Value	Unit
UVA	3000±500 mJ/cm ²	5 ± 2	sec
Moisture Cure	≥ 20°C + ≥ 50% rel. Humidity	< 72	h

Table 3 – Thermal Properties of cured compound

Property	Conditions	Value	Unit
Glass transition temperature Tg (IEC 61006 penetration mode)		-17	°C
Linear expansions coefficient (Beck M56 above Tg)		2,0 x 10 ⁻⁴	K ⁻¹
Temperature Range		40 to +120	°C

Table 4 - Mechanical properties of cured coating

Property	Conditions	Value	Units
Specific Gravity (DIN 16945)	20°C	1.11 ± 0.05	g/cm ³
Hardness (ISO 868)	23°C	65 ± 5	Shore A

Table 5 – Dielectric properties of cured compound

Property	Conditions	Value	Unit
Dielectric Strength IEC 60464 Part 2		20	KV/mm
Dielectric Constant IEC 60250	23°C 1KHz,	4.2	
Dielectric Dissipation factor, tan δ IEC 60250	3°C 1KHz,	0.07	
Volume resistivity IEC 60464 Part 2	Initial Value	1 x 10 ¹¹	Ω • cm
after 7 days water storage	20°C	5 x 10 ¹⁰	Ω • cm
Surface resistance VDE 0303 Part 3		5 x 10 ¹¹	Ω

Table 6 - Chemical properties of cured compound

Property	Conditions	Value	Unit
Water absorption ISO 62 Method 1			%

Our advice in application technology given verbally, in writing and by testing corresponds to the best of our knowledge and belief, but is intended as information given without obligo, also with respect to any protective rights held by third parties. It does not relieve you from your own responsibility to check the products for their suitability to the purposes and processes intended. The application, usage and processing of the products are beyond our reasonable control and will completely fall into your scope of responsibility. Should there nevertheless be a case of liability from our side, this will be limited to any damage to the value of the merchandise delivered by us. Naturally, we assume responsibility for the unobjectionable quality of our products, as defined in our General Terms and Conditions