ELANTAS
Electrical Insulation

Preliminary Product Information

Electronic Protection System

Thick Film Coating, UV / moisture cure

Bectron® PT 4700 N

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Product description

Bectron® PT 4700 N 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 4700 N provides excellent insulation properties after severe wet storage conditions.

Bectron® PT 4700 N satisfies the requirements of REACh and ROHS.

Bectron® PT 4700 N can survive temperature shock and temperature cycling resistance such as -40 to +125°C (e.g. IPC Test 2.6.7.1 Class 2) for more than 500 cycles.

Areas of application

Bectron® PT 4700 N is versatile 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
- Temp-Shock (-40°C/125°C) > 500 cycles
- SIR 85 / 85: > 500 MΩ / 500h
- Good flexibility to -40°C
- Good Adhesion
- Good dielectric properties
- Solvent free
- Low viscosity
- ROHS and REACh compliant
- UL V-0 compliant

Storage

In closed original containers storage for 6 months at 23°C. For longer storage, Bectron® PT 4700 N should be stored at 5 to 8°C (12 months). After longer storage, a viscosity check is recommended.

Containers should be sealed as the product is Sensitive to UV-light and moisture.

Preparation

The components to be coated should be clean, dry and free from grease. 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 4700 N 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. Thinner Bectron 300 can be used to remove liquid Bectron PT 4700 N and clean the equipment.

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 approximately 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 50 ± 150µm, UV curing takes approx. 5 seconds at 2500 mJ/cm^2. 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	Condition	Value	Unit
Appearance		Slightly blue, transparent	
Viscosity DIN 53019	23°C	200 ± 100	mPa.s
Density DIN EN ISO 2811-2	21°C	1.02	g/cm^3
Shelf Life	23°C	6	months

Table 2 – Curing Conditions

Property	Condition	Value	Unit
UVA	2500 ± 500mJ/cm^2	5 ± 2	sec
Humidity	30 – 70 %	2 - 4	days

Table 3 – Thermal Properties of cured compound

Property	Condition	Value	Unit
Temperature Resistance (IEC 60216)		120	°C
Flammability	UL 94	V0	Internal test

Table 4 - Mechanical properties of cured coating

Property	Condition	Value	Units
Mandrel Bend Test (IEC 60464-2)	3 mm, 0.06 mm film	>180	°
Hardness (ISO 868)	23°C		Shore A
Glass transition temperature Tg IEC 61006	penetration mode		°C
Linear expansions coefficient Beck M56	above Tg		°K^{-1}
Temperature Range		-40 to +125	°C

Table 5 – Dielectric properties of cured compound

Property	Condition	Value	Unit
Dielectric Strength IEC 60464 Part 2	20°C	116	KV/mm
Dielectric Constant IEC 60250	23°C 1KHz,	5.5	
Dielectric Dissipation, tan δ IEC 60250	23°C 1KHz,	0.08	
Volume resistivity IEC 60464 Part 2 after 7 days water storage	20°C	4 x 10^{11} 6 x 10^{10}	ϑ • cm ϑ • cm
Surface resistance VDE 0303 Part 3	20°C		ϑ

Table 6 - Chemical properties of cured compound

Property	Condition	Value	Unit
Water absorption ISO 62 Method 1			%

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