EN

Technical Data Sheet

Bectron®

PT 4600

Electronic Protection System - UL 94 V-0 listed

Modified Polyurethane - One Component - UV + Moisture Cure
Thick Film Conformal Coating - Elastic

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Description

Bectron® PT 4600 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 4600 provides excellent insulation properties after severe wet storage conditions.

- Satisfies the requirements of ROHS.

Areas of application

Bectron® PT 4600 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 of cured product

Bectron® PT 4600 has following properties in cured conditions:

- Thermal cycling over -40°C to +125°C
- Temperature resistance -40 to +125°C
- MIL-I-46058C listed
- Good flexibility to -40°C
- Good Adhesion
- Good dielectric properties
- Solvent free
- UL V0 File No. E211569

Storage and stability

In closed original containers shelf life of 6 months. Containers should be sealed as the product is moisture sensitive. Storage temperature is depending on the used packaging:

- cartridges: 5-10°C
- 5kg bladder bag: 5-10°C
- 5kg steel pail: -10-25°C

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 methods

Bectron® PT 4600 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 4600 and clean the equipment.

Curing/Post-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 ± 50µm and 3000 mJ/cm2 , 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.

Handling precautions

Refer to the safety data sheet and comply with regulations relating to industrial health and waste disposal.

Sales specifications

Properties	Conditions	Test Method	Value	M/U
Viscosity	23 °C	DIN 53229	400 ÷ 900	mPa·s
Density	23 °C	ISO 2811-2 (Internal Test S11)	1,06 ÷ 1,16	g/cm³
Shelf Life	+5÷+10 °C - (cartridges and bladder bag)	Intern	6	months
	-10÷+25 °C - (steel pail)		6	months

Typical system properties

Properties	Conditions	Test Method	Value	M/U
Temperature range		Internal Test	- 40 ÷ + 125	°C
UV-curing	2500 - 3500 mJ / cm² (UVA)	Intern	3 ÷ 7	s

Typical mechanical properties of the cured product

Properties	Conditions	Test Method	Value	M/U
Mandrel Bend Test	3 mm - 0,06 mm	IEC 60464-2 (Internal Test M4)	180	°
Hardness Shore A/1	23 °C	ISO 868 (Internal Test M30b)	60 ÷ 70	Shore A

Typical thermal properties of the cured product

Properties	Conditions	Test Method	Value	M/U
Glass transition temperature (Tg)		IEC 61006	-15 ÷ -20	°C
Linear expansions coefficient	above Tg	TMA (Internal Test M56)	180 ÷ 220	ppm/K
Flammability UL 94 classification	Min Thk 10 mic, Max Thk 55 mic	File No. E211569	V - 0	

Typical dielectric properties of the cured product

Properties	Conditions	Test Method	Value	M/U
Volume resistivity	23 °C	IEC 60464 -2 (Internal Test M5)	$> 10^{14}$	Ω·cm
Dielectric Strength	23 °C	IEC 60464-2 (Internal Test M6)	70 ÷ 80	kV/mm
	23 °C - 24 h in deionized Water		60 ÷ 70	kV/mm
Volume ressistivity after 7 days water storage	23 °C	IEC 60464-2	$> 10^{13}$	Ω·cm
Surface Isolation Resistance (SIR)		according IPC TM 650 2.6.3.7	$> 10^{11}$	Ω

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