

EN

Preliminary Technical Data Sheet

Bectron®

PT 4700 N

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 4700 N is a solvent free one-component polyurethane based transparent thick film coating cured by UV irradiation and / or by moisture.

The cured Bectron® PT 4700 N 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 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.

- Satisfies the requirements of ROHS.

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 of cured product

Bectron® PT 4700 N has following properties in cured conditions:

- Rapid UV curing
- Moisture shadow-cure
- Themp-Shock (-40°C/125°C) > 500 cycles
- SIR 85 / 85: > 500 M? / 500h
- Good flexibility to -40°C
- Good Adhesion
- Good dielectric properties
- Solvent free
- ROHS complied
- UL V0 complied

Storage and stability

In closed original containers the product can be stored for 6 months at 5 to 25 °C. For longer storage Bectron® PT 4700 N should be stored at -15 to -25°C. After longer storage a viscosity check is recommended. 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 methods

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/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 53019 (Internal Test V18/b/c)	100 ÷ 200	mPa·s

Curing conditions

Properties	Conditions	Test Method	Value	M/U
Humidity	30÷70 %	Moisture curing	2 ÷ 4	days
UV-curing	2500 - 3500 mJ / cm ² (UVA)	Intern	3 ÷ 7	s

Typical system properties

Properties	Conditions	Test Method	Value	M/U
Colour		--	Slightly, blue, transparent	
Shelf life	+5 °C to +25 °C	Internal Test	6	months

Typical mechanical properties of the cured product

Properties	Conditions	Test Method	Value	M/U
Mandrel Bend Test	0,06 mm - 3 mm	IEC 60464-2 (Internal Test M4)	> 180	°
Specific Gravity	21 °C	DIN EN ISO 2811-1	1,00 ÷ 1,04	g/ml

Typical thermal properties of the cured product

Properties	Conditions	Test Method	Value	M/U
Temperature range		Internal Test	- 40 ÷ + 125	°C
Glass transition temperature (Tg)		IEC 61006	-15 ÷ -20	°C
Flammability UL 94 classification	40 mic	File No. E211569	V-0	
Thermo analytical estimation of TI (loss of mass)	5 K/min, air	TGA (Internal Test M62)	>120	°C

Typical dielectric properties of the cured product

Properties	Conditions	Test Method	Value	M/U
Dielectric constant at 1000 Hz	21 °C	IEC 60250 (Internal Test M03b)	5,0 ÷ 6,0	
Volume resistivity	20 °C	IEC 60464 -2 (Internal Test M5)	$> 10^{11}$	$\Omega \cdot \text{cm}$
Dielectric Strength	20 °C	IEC 60464-2 (Internal Test M6)	110 ÷ 120	kV/mm
Volume resistivity after 7 days water storage	20 °C	IEC 60464-2	$> 10^{10}$	$\Omega \cdot \text{cm}$
Dielectric Dissipation	22 °C	IEC 60250 (Internal Test M03B)	0,07 ÷ 0,09	

Typical chemical properties of the cured product

Properties	Conditions	Test Method	Value	M/U
Water Absorption	24 h / 23 °C	DIN EN ISO 62 (Internal Test M09a/b)	1,0 ÷ 1,5	%

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