EN

Technical Data Sheet

Bectron®

PK 4340 Schwarz

Electronic Protection System

Modified Polyurethane - One Component - Heat Cure
Thick Film Conformal Coating - Elastic

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Description

Bectron® PK 4340 SCHWARZ is a one-component black resin system which cures to form a soft polyurethane duroplastic. The product is phtalate free. It comprises a liquid polyol system with a dispersed solid encapsulated polyisocyanate and a pigment combination selected to provide controlled rheology including excellent thixotropic properties.

Heating the resin releases the encapsulated polyisocyanate resulting in a polyaddition reaction to give a resistant duroplastic cured material.
In contrast to the usual 2 component resin systems Bectron® PK 4340 SCHWARZ is ready to use and distinguished by excellent properties and especially good environmental compatibility.

Areas of application

The cured Bectron® PK 4340 SCHWARZ is a soft duroplastic suitable for vibration protection of delicate components.

Bectron® PK 4340 SCHWARZ is therefore well suited for the partial or selective coating of SMD and other components groups on printed circuit boards and ceramic substrates. The rapid increase of viscosity at low shear allows small areas of components to be protected individually.

Bectron® PK 4340 SCHWARZ can be applied as a dam around an area requiring thicker coating to be filled by a lower viscosity grade such as Bectron® PK 4342.

Properties of cured product

The cured material displays high elasticity and strength producing excellent temperature cycling behaviour within the range of -60°C to +125°C as well as resistance to vibrations. This ensures minimal crazing even in thick layered applications.

Bectron® PK 4340 SCHWARZ has excellent chemical resistance to a wide range of aggressive liquids common in automotive applications.

Bectron® PK 4340 SCHWARZ has good adhesion on almost all materials used in the field of electronics. Even after several temperature cycles there is no loss of adhesion mechanical and electrical properties.

- Satisfies ROHS Directive
- Phtalate free (satisfies California Proposition 65)

Storage and stability

Containers filled with Bectron® PK 4340 SCHWARZ should be stored at a temperature of -10°C to 25°C and kept closed to protect the resin against humidity.
During longer storage periods of the containers, some settling of the pigments can occur and it is advisable to homogenise the resin by rotation of the container prior to filling storage or service tanks.

Preparation

Prior to processing the resin compound in a storage tank should again be stirred well, e.g. 10 minutes at 20 rpm. Vacuum is not needed, but a nitrogen atmosphere is advisable to protect from humidity.
To ensure satisfactory adhesion on the PCB surface the following should be checked:

- Use of residue-free flux
- Ensure dry surfaces
- Check compatibility of the coating resin with the solder resist and solder paste.

Processing methods

Bectron® PK 4340 SCHWARZ should be applied via a dispenser or similar equipment. During dispensing, the shear applied to the resin, governed by the diameter, length and applied pressure on the dispensing needle, substantially reduces the viscosity allowing fast processing and blister-free casting. On contact with the object the viscosity increases rapidly and enables precise coating of the designated areas. The resulting coating maintains its form and size even during subsequent curing.

Curing/Post-curing

Recommended temperature for curing is:

- 60 minutes at 80°C or
- 30 minutes at 90°C

For volume production the application of infrared (IR) radiation leads to a considerable reduction of curing times, e.g. values of <5 minute are attainable.

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 - Z3, D=15/s	DIN 53019 (Internal Test V18/b/c)	8000 ÷ 11000	mPa·s
Hardness Shore A/1	23 °C	ISO 868 (Internal Test M30b)	60 ÷ 80	Shore A
Gel time	80 °C	DIN 16945 (Internal Test H17B1)	3 ÷ 7	min

Gel-time, curing conditions

Properties	Conditions	Test Method	Value	M/U
Curing	80 °C	Internal Test	60 ÷ 70	min
	90 °C		25 ÷ 35	min

Typical system properties

Properties	Conditions	Test Method	Value	M/U
Shelf life	-10 °C to 25 °C	Internal Test	6	months
Density	20 °C	ISO 2811-2 (Internal Test S11)	1,26 ÷ 1,30	g/cm³

Typical thermal properties of the cured product

Properties	Conditions	Test Method	Value	M/U
Glass transition temperature (Tg)		IEC 61006	-45 ÷ -50	°C
Thermal conductivity	23 °C	DIN 52616 (Internal test M98a)	0,22 ÷ 0,28	W/(m·K)
Coefficient of thermal expansion	-50 °C to 100 °C	TMA (Internal Test M56)	150 ÷ 170	ppm/K

Typical dielectric properties of the cured product

Properties	Conditions	Test Method	Value	M/U
Tracking Index		IEC 60112	> 600 M	CTI
Dielectric Strength	23 °C	IEC 60455-2 (Internal Test M31)	20 ÷ 24	kV/mm
Volume resistivity	Initial Value, RT	IEC 60455 Part 2	$> 10^{13}$	Ω·cm
	after 7 days water storage, RT		$> 10^{11}$	Ω·cm

Typical chemical properties of cured compound

Properties	Conditions	Test Method	Value	M/U
Water Absorption	24 h / 23 °C	DIN EN ISO 62 (Internal Test M09a/b)	0,9 ÷ 1,2	%

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