ELANTAS
Electrical Insulation

Product Information

Electronic Protection System

Thick Film Coating, thermal cure

Bectron® PK 4344

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Product description

Bectron® PK 4344 is a one-component resin system which cures to form a soft polyurethane duroplastic. 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 4344 is ready to use and distinguished by excellent properties and especially good environmental compatibility.

Areas of application

The cured Bectron® PK 4344 is a soft duroplastic suitable for vibration protection of delicate components.

Bectron® PK 4344 suitable for the partial or selective coating of SMD and other components groups on printed circuit boards and ceramic substrates. It has low viscosity suited to rapid coating to form a thinner layer than the higher viscosity grades. This low viscosity is ideal for complex potting applications to minimise trapped air bubbles. As a potting resin it suitable for sensors, automotive electronics, plugs etc.

Properties of the cured material

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 4344 has excellent chemical resistance to a wide range of aggressive liquids common in automotive applications.

Furthermore Bectron® PK 4344 has good adhesion to 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

Storage

Containers filled with Bectron® PK 4344 should be stored at a temperature ≤ 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, particularly with low viscosity of Bectron® PK 4344 and it is advisable to homogenise the resin by rotation of the containers prior to filling storage or service tanks.

Processing suggestions

Prior to processing the resin 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 the material from humidity.

Bectron® PK 4344 is normally applied with a dispenser or similar equipment. The low viscosity simplifies dispensing but still enables convenient control of the flow rate and application for fast processing and blister-free casting. It is very suitable for potting of electronic components and sensors.

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 <1 minute are attainable.

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.

Table 1 - Properties of component as supplied

Property	Condition	Value	Unit
Viscosity, DIN 53019	D=15 s^{-1}, 23°C	2.000 ± 500	mPas
Density, DIN EN ISO 2811-2	23°C	1,28 ± 0,01	g/cm³
Shelf life	23°C	6	months

Table 2 - Pot-life, gel-time, curing conditions

Property	Value	Value	Unit
Temperature	80	90	°C
Gel-time	5 ± 2		min
Curing	65 ± 10	30 ± 5	min

Table 3 - Thermal properties in cured condition

Property	Condition	Value	Unit
Coefficient of thermal expansion	-20°C to + 90°C	$200 \cdot 10^{-6}$	K^{-1}
Thermal conductivity, DIN 52616	23°C	0,18 ± 0,02	W/mK
Glow-wire test, DIN IEC 695, part 21	30 s	850	°C

Table 4 - Mechanical properties in cured condition

Property	Condition	Value	Unit
Glass transition temperature, IEC 61006	-	n.d.	°C
Shore hardness, ISO 868	23°C	70 ± 10	Shore A
Compressive strength, ISO 604, DIN 57291	30%, 23°C	5	N/mm²
Residual deformation	23°C	0,6	%

Table 5 - Dielectric properties of cured compound

Property	Condition	Value	Unit
Volume resistivity, IEC 60455 Part 2 After water immersion	Initial value 7d	10^{13} 10^{11}	Ω • cm Ω • cm
Dielectric strength, IEC 60455 Part 2	23°C 80°C	22 24	kV/mm kV/mm
Tracking IEC 60112	Solution B	CTI>600 M	
Dielectric dissipation tanδ, IEC 60250	1 kHz, 23°C	0,030	-
Relative permittivity tanδ, IEC 60250	1 kHz, 23°C	5	-

Table 6 - Chemical properties in cured condition

Property	Condition	Value	Unit
Water absorption, ISO 62, Method 1	24h / 23°C	130	mg

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