ELANTAS
Electrical Insulation

Product Information

Electronic Protection System

Thick Film Coating, thermal cure

Bectron® PK 5542

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Product description

Bectron® PK 5542 is a one component resin system which cures to form a soft polyurethane duroplastic with high thermal resistance. It comprises a liquid polyol system with a dispersed solid encapsulated polyisocyanate and a pigment combination selected to provide controlled rheology including some thixotropic character while maintaining superior temperature resistance & stability.

Heating the resin releases the encapsulated polyisocyanate resulting in a polyaddition reaction to give a soft duroplastic cured material.

Areas of application

The cured Bectron® PK 5542 is a soft duroplastic suitable for chemical, shock and vibration protection of delicate components exposed to high temperature conditions.

Bectron® PK 5542 is used for the partial or selective coating of SMDs and other components groups on printed circuit boards and ceramic substrates. It can also be applied as a casting/potting resin for electronic components and sensors, automotive electronics, plugs etc, up to temperature of 150°C

The viscosity is moderate with slight thixotropic properties for selective thick coating of components or potting of PCB's or hybrids in housings.

Properties of cured material

The cured material displays high elasticity and strength. Bectron® PK 5542 is suitable up to 150°C. The material shows very good temperature cycling behaviour within the range of -50°C to +140°C as well as resistance to vibration. The result is minimal crazing even on thick layered applications.

Bectron® PK 5542 has excellent chemical resistance to a wide range of aggressive liquids common in automotive applications.

Bectron® PK 5542 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

Storage

Containers filled with Bectron® PK 5542 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 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 compound in a storage tank should again be stirred well, e.g. 10 minutes at 20 rpm. Vacuum is not necessary, but a nitrogen atmosphere is advisable to protect from humidity.

Bectron® PK 5542 can be applied with a dispenser or similar dispensing equipment. The lower viscosity of Bectron® PK 5542 allows coating of large areas of a PCB by with suitable nozzles or potting of electronic components and sensors..

Rapid selective coating of PCBs with a thick film can be achieved with suitable proprietary nozzles in a robot controlled applicator.

Recommended curing temperature is:

- 30 minutes at 90°C

For volume production the application of infrared (IR) radiation on thick coating leads to a considerable reduction of curing times, e.g. values of <10 minutes 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	5,000 ± 1,000	mPas
Density, DIN EN ISO 2811-2	23°C	1.40 ± 0.05	g/cm³
Shelf life	23°C	6	months

Table 2 - Curing

Property	Value	Value	Unit
Temperature	80	90	°C
Gel-time, DIN 16945	5 ± 2		min
Curing		30 ± 5	min

Table 3 - Thermal properties of cured compound

Property	Condition	Value	Unit
Coefficient of thermal expansion, Beck Test M 56	-20°C to + 90°C	150 x 10^{-6}	K^{-1}
Thermal conductivity, DIN 52616	23°C	0,35	W/mK

Table 4 - Mechanical properties of cured compound

Property	Condition	Value	Unit
Glass transition temperature, IEC 61006	-	Not measureable	°C
Shore hardness, ISO 868	23°C	70 ± 10	Shore A

Table 5 - Dielectric properties of cured compound

Property	Condition	Value	Unit
Volume resistivity, IEC 60455 Part 2 After water immersion	Initial value 7d 155 °C	1.0 x 10^{13} 1.6 x 10^{10} 5.0 x 10^{10}	Ω • cm Ω • cm Ω • cm
Dielectric strength, IEC 60455 Part 2	23°C	9	kV/mm
Tracking, IEC 60112	Solution B	CTI>600 M	
Dielectric dissipation tanδ, IEC 60250	10 kHz, 23°C	0.033	-
Relative permittivity tanδ, IEC 60250	1 kHz, 23°C	5.9	-

Table 6 - Chemical properties of cured compound

Property	Condition	Value	Unit
Water absorption, ISO 62 Method 1+2 and Method 3+4	24h / 23°C 0.5h/100°C	168 235	mg mg

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