ELANTAS
Electrical Insulation

Product Information

Electronic Protection System

High thermal resistance

2-component epoxy system

Bectron® EP 5502

Hardener Bectron EH 5908

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Product description

Bectron® EP 5502 is an unfilled, ambient temperature curing, solvent free, two-component epoxy resin developed for electronic applications.

Bectron® EP 5502 satisfies the requirements of the ROHS directive.

Areas of application

The Bectron® EP 5502 system is used for potting electronic components used in harsh environmental conditions. Its viscosity enables accurate dispensing and the mix ratio

The chemical properties and high thermal resistance make it very suitable also for electronics subject to shock and vibration (e.g. automotive electronics) and for sensor technology.

Properties of the cured material

-High hardness

-High young modulus

-High thermal resistance

-Good adhesion to heterogenous materials

-Very good chemical resistance to grease, lubricants and gasoline

- ROHS compliant

Storage

Containers filled with Bectron® EP 5502 should be kept closed to protect the resin from humidity and oxygen.
Opened containers of the Hardener Bectron® EH 5908 should be used up as soon as possible because carbon dioxide could generate precipitates and reduces reactivity.
The Bectron® EP 5502 might produce crystals at temperatures below 0 °C. Heating the entire contents of the drum for a short time up to 70°C will recover the complete liquid state.
The shelf life of components will be 6 month in original sealed containers

Processing suggestions

Pre-treatment: The components to be potted 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.

Mixing Bectron® EP 5502 and the Hardener Bectron® EH 5908 require the specified mixing ratio to be accurate. During mixing any stirring should introduce as little air as possible. Excess Hardener could possibly out-gassing after curing. Excess resin will be incompletely cured.

Application: The processing time is about 50 minutes. Within this time, viscosity will increase; the prepared volume for batch production should be just enough to permit processing in this time. If the Bectron® EP 5502 system is produced in metering equipment, it is possible to shorten the setting time with accelerators.

Curing: Recommended curing conditions are:

- at RT 18 hours
- 60 °C 15 hours

Curing does not require pressure assistance

Post curing is always advisable for RT curing systems in order to stabilize the component and to reach the best properties. It will be necessary if cured components work at a elevated temperatures. Post cure the component beginning at ambient temperature, increase gradually 10°C/hour. Cool down slowly. Users should evaluate the best conditions of curing or post-curing depending on the component size and shape. For big size components decrease the thermal gradient and increase the post-curing time. In the case of thin layer applications and composites, post cure on the jig.

Table 1 - Properties of materials as supplied

Property	EP 5502	EH 5908	Units
Colour	Pale yellow	Amber	
Viscosity 25°C DIN 53019	11000 ± 2000	140 ± 10	mPa.s
Spec. gravity 20°C DIN EN ISO 2811-1	1.16 ± 0.01	1.00 ± 0.02	g/cm^3
Shelf Life	6	6	months

Table 2 - Properties of mix-ture

Property			
Mix Ratio: EP 5502 : EH 5908	100.0 100.0	18-20 23	Parts by weight Parts by volume @25°C
Viscosity DIN 53019	25°C	3750 ± 750	mPa.s
Process time	25°C	30 ± 5	Min

Table 3 – Thermal Properties of cured compound

Property	Condition	Value	Units
Thermal Conductivity DIN 52613			W/m.K
Glass transition temperature ASTM D 3418	24h AT+15h60°C	70 ±10	°C
Thermal class IEC 60085**		155	°C
Linear coefficient of expansion (ASTM E 831)	below tg above tg	80 x 10^{-6} 185 x 10^{-6}	K^{-1}

Table 4 - Mechanical properties of cured compound

Property	Condition	Value	Units
Specific Gravity DIN 16945	25°C	1.10 ± 0.05	g/cm^3
Hardness ISO 868		87.5 ± 2.5	Shore D
Tensile Strength ASTM D 638		60 ± 10	MPa
E-Modulus ASTM D 790		4000 ± 500	MPa
Elongation at break ASTM D 638		6.5 ± 1.5	%

Table 5 – Dielectric properties of cured compound

Property	Condition	Value	Units
Volume resistivity ASTM D 257	25 °C	4.0 x 10^{15}	Ω • cm
Surface resistance DIN 53482	25 °C		Ω
Dielectric Constant ε_r ASTM D 150	20 °C/50 Hz	3.0	
Dielectric Strength ASTM D 149	25 °C	24 ± 2	kV/mm
Tracking resistance IEC 60112		600	CTI

Table 6 - Chemical properties of cured compound

Property	Condition	Value	Units
Water absorption ISO 62	24h RT	0.15	%

** = The maximum operating temperature is given on the basis of laboratory information available being it function of the curing conditions used and of the type of coupled materials

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