ELANTAS
Electrical Insulation

Product Information

Electronic Protection System

Polyurethane Potting/Encapsulation Resin

Bectron® PU 4522

Hardener Bectron® PH 4912

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Product description

Bectron® PU 4522 polyurethane is a two-component liquid polyurethane system.
After curing with the Hardener Bectron® PH 4912 it produces a tough elastic moulding compound which meets UL 94 V0 standard of flame resistance.

Areas of application

Bectron® PU 4522 is suitable for potting and sealing many types of electronic components such as assembled PCBs.

Bectron® PU 4522 is flame-retardant to meet the standard UL 94 V0.

The elastic properties and relatively high thermal resistance make it very suitable also for electronics subject to shock and vibration (e.g. impact drills and automotive electronics) and for sensor technology.
Temperature range of application – 40 °C to 125 °C.

Bectron® PU 4522 satisfies the requirements of the ROHS directive.

Properties

A resilient elastic potting compound for mechanically sensitive electric/electronic components and assembled PCBs

Flame Retardant to UL94 V0

Room Temperature Cured

Tough elastic cured compound

Favourable processing viscosity

ROHS compliant

Storage

Containers filled with Bectron® PU 4522 should be 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 or effective stirring.

Opened containers of Hardener Bectron® PH 4912 should be used up as soon as possible because moisture in air reduces reactivity.
The Hardener Bectron® PH 4912 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.

Processing

Pretreatment: The components to be potted should be clean dry and free from grease. Compatibility between the resin and all materials on a PCB should be checked prior to use.

Preparation: Bectron® PU 4522 contains filler materials which tend to settle, depending on storage temperatures. Therefore, thorough stirring is necessary prior to the mixing with the Hardener.

Mixing Bectron® PU 4522 and the Hardener Bectron® PH 4912 require the specified mixing ratio. After intensive mixing, the compound is ready for use immediately. During the mixing process make sure stirring introduces as little air as possible.

Application: The processing time is about 20 minutes. Within this time, viscosity will increase; therefore, the prepared volume should be just enough to permit processing in this time. The compound is best processed by potting using two-component metering equipment but manual potting is possible.
Shrinkage on curing is about 1%.

Curing: Recommended curing conditions are:

- Room Temperature 6-8 hours
- accelerated @ 90°C 0.5 hours

Curing does not require pressure assistance
PU compounds cured at Room temperature should not be subjected to mechanical and electrical loads before 3-4 days.

Table 1 - Properties of materials as supplied

Property	PU 4522	PH 4912	Units
Colour	Natural, Beige	Brown transparent	
Viscosity 25°C DIN 53019	3500 ± 300	100 ± 30	mPa.s
Spec. gravity 20°C DIN EN ISO 2811-1	1.50 ± 0.05	1.22 ± 0.03	g/cm^3
Shelf Life	6	6	Months

Table 2 - Properties of mixture

Property Mix Ratio: PU 4522 : PH 4912	 100 5.4	 15 1	 Parts by weight Parts by volume @20°C
Viscosity DIN 53019	25°C	1800 ± 300	mPa.s
Process time	25°C	15-20	Min

Table 3 – Thermal Properties of cured compound

Property	Condition	Value	Units
Flammability		UL 94 V0	
Glass transition temperature IEC 61006		-22	°C
Linear coefficient of expansion Beck Test M 56	above tg	140 x 10^{-6}	K^{-1}
Thermal Conductivity DIN 52613		0.50	W/mK

Table 4 - Mechanical properties of cured compound

Property	Condition	Value	Units
Specific Gravity DIN 16945	20°C	1.46 ± 0.02	g/cm^3
Hardness ISO 868		85 ± 5	Shore A
Tensile Modulus DIN EN ISO 527-1	23 °C	22,7	MPa
Tensile Strength DIN EN ISO 527-1	23 °C	2,3	MPa
Tensile Stress at break DIN EN ISO 527-1	23 °C	3,8	MPa
Elongation at break DIN EN ISO 527-1	23 °C	22	%

Table 5 – Dielectric properties of cured compound

Property	Condition	Value	Units
Volume resistivity IEC 60455 Part 2	20 °C	3.1 x 10^{13}	Ω • cm
Dielectric Constant ε_r IEC 60250	20 °C/50 Hz	5.3	
Dielectric loss factor tan-δ IEC 60250	25°C, 50 Hz	0.061	
Dielectric Strength IEC 60455 Part 2	20 °C	18	kV/mm
Tracking resistance IEC 60112		600	CTI

Table 6 - Chemical properties of cured compound

Property	Condition	Value	Units
Water absorption ISO 62	24 hours, 23°C 7 days, 23°C	0.4 1.1	% %

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