ELANTAS
Electrical Insulation

Product Information

Electronic Protection System

Polyurethane Potting/Encapsulation Resin

Bectron® PU 4516

Hardener Bectron PH 4912

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Product description

Bectron® PU 4516 is a strong polyurethane with low shrinkage, with excellent insulation properties and provides good mechanical and chemical protection. It has excellent adhesion and superior thermal resistance. It is a low viscosity system for ease of potting.

It is cured with the Hardener Bectron PH 4912.

The system meets the requirement of ROHS.

Areas of application

The Bectron® PU 4516 system is used for potting electronic and electronic equipment against chemical and mechanical stress.

Properties

Higher temperature resistance 130°C

Good Adhesion

Good dielectric properties

Room temperature curing

Heat curing

Low shrinkage

ROHS compliant

Storage

Containers filled with Bectron® PU 4516 should be kept closed to protect the resin from humidity.
During longer storage periods some settling of the pigments can occur and stirring of the containers prior to filling storage or service tanks is needed.
Opened containers of the 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

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.

Preparation: The polyurethane potting compound contains filler materials that tend to settle to some degree. Very thorough stirring without introduction of air is recommended in machine storage tanks prior to the mixing process.

Mixing Bectron® PU 4516 and the Hardeners Bectron® PH 4912 require the specified mixing ratio to be accurate. During mixing any stirring should introduce as little air as possible. Excess hardener may lead to bubbles in the cured resin and possible out-gassing after curing. Excess resin will be incompletely cured.

Application: The processing time is about 40 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® PU 4516 system is produced in metering equipment, it is possible to shorten the setting time with accelerators.

Curing: Recommended curing conditions are:

- at RT 36 hours
- 90 °C 1 hours

Shrinkage on curing is 3-4%
Curing does not require pressure assistance
PU compounds cured at room temperature should not be subjected to mechanical or electrical loads for 3-4 days to allow full properties to develop.

Table 1 - Properties of materials as supplied

Property	PU 4516	PH 4912	Units
Colour	Black	Brown trans-parent	
Viscosity 25°C DIN 53019	450 ± 100	110 ± 30	mPa.s
Spec. gravity 20°C DIN EN ISO 2811-1	1.03 ± 0.05	1.23 ± 0.05	g/cm^3
Shelf Life	6	6	months

Table 2 - Properties of mixture

Property			
Mix Ratio: PU 4516 : PH 4912	2.0 2.4	1 1	Parts by weight Parts by volume @20°C
Viscosity DIN 53019	25°C	310 ± 90	mPa.s
Process time (200g mixture)	25°C	26	Min

Table 3 – Thermal Properties of cured compound

Property	Condition	Value	Units
Thermal Conductivity DIN 52613		0.215±0,015	W/m.K
Glass transition temperature IEC 61006		30	°C

Table 4 - Mechanical properties of cured compound

Property	Condition	Value	Units
Specific Gravity DIN 16945	20°C	1.09 ± 0.02	g/cm^3
Hardness ISO 868		70 ± 10	Shore D
Impact resistance DIN 53453		14	N/mm.mm^2

Table 5 – Dielectric properties of cured compound

Property	Condition	Value	Units
Volume resistivity IEC 60455 Part 2	20 °C	2,2 x 10^{15}	Ω • cm
Surface resistance DIN 53482	20 °C	2 x 10^{14}	Ω
Dielectric Constant ε_r IEC 60250	25 °C/50 Hz	3.16	
Dielectric Strength IEC 60250		23 ± 2	kV/mm

Table 6 - Chemical properties of cured compound

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

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