ELANTAS
Electrical Insulation

Product Information

Electronic Protection System

Polyurethane Potting/Encapsulation Resin

Bectron® PU 4512

Hardener Bectron PH 4912

ELANTAS Beck GmbH
Grossmannstr. 105
20539 Hamburg
Germany
Tel +49 40 78946 0
Fax +49 40 78946 276
bectron.elantas.beck@altana.com
www.elantas.com

A member of ALTANA

Product description

Bectron® PU 4512 is a soft elastic polyurethane with low shrinkage, with excellent insulation properties and provides good mechanical and chemical protection, with enhanced adhesion for difficult surfaces.

It is cured with the Hardener Bectron® PH 4912.

The system meets the requirement of ROHS.

Areas of application

The Bectron® PU 4512 system is used for potting electronic components sensitive to mechanical or thermal stress.

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.

Properties

Bectron® PU 4512 is a soft, elastic potting polyurethane compound for the potting of sensitive electronic components and assembled PCBs

High sub-zero flexibility to -40 °C

Good Adhesion

Good dielectric properties

Room temperature curing

Heat curing

Low shrinkage

ROHS compliant

Storage

Containers filled with Bectron® PU 4512 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 4512 and the Hardener 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 4512 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

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 4512	PH 4912	Units
Colour	Brownish red	Brown trans-parent	
Viscosity 25°C DIN 53019	1450 ± 200	100 ± 30	mPa.s
Spec. gravity 20°C DIN EN ISO 2811-1	1.27 ± 0.05	1.22 ± 0.03	g/cm^3
Shelf Life	6	6	months

Table 2 - Properties of mixture

Property			
Mix Ratio: PU 4512 : PH 4912	100 4	24 1	Parts by weight Parts by volume @20°C
Viscosity DIN 53019	25°C	900 ± 150	mPa.s
Process time	25°C	40	Min

Table 3 – Thermal Properties of cured compound

Property	Condition	Value	Units
Thermal Conductivity DIN 52613		0.35	W/mK
Glass transition temperature IEC 61006		-5	°C
Temperature Index IEC 216	2.5 %	110	°C

Table 4 - Mechanical properties of cured compound

Property	Condition	Value	Units
Specific Gravity DIN 16945	20°C	1.26 ± 0.02	g/cm^3
Hardness ISO 868		70 ± 10	Shore A
Tensile Strength DIN 53455/457		4.5	MPa

Table 5 – Dielectric properties of cured compound

Property	Condition	Value	Units
Volume resistivity IEC 60455 Part 2	20 °C 50°C	2.2 x 10^{13} 1.6 x 10^{14}	Ω • cm Ω • cm
Surface resistance DIN 53482	20 °C	3.6 x 10^{12}	Ω
Dielectric Constant ε_r IEC 60250	20 °C/50 Hz 50°C/50 Hz	4.2 >6.0	
Dielectric Strength IEC 60250	20 °C 100 °C	20 18	kV/mm 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	0.8	%

Our advice in application technology given verbally, in writing and by testing corresponds to the best of our knowledge and belief, but is intended as information given without obligor, also with respect to any protective rights held by third parties. It does not relieve you from your own responsibility to check the products for their suitability to the purposes and processes intended. The application, usage and processing of the products are beyond our reasonable control and will completely fall into your scope of responsibility. Should there nevertheless be a case of liability from our side, this will be limited to any damage to the value of the merchandise delivered by us. Naturally, we assume responsibility for the unobjectionable quality of our products, as defined in our General Terms and Conditions