ELANTAS
Electrical Insulation

Product Information

Electronic Protection System

Polyurethane Potting/Encapsulation Resin

Bectron® PU 4515

Hardener Bectron PH 4912

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Product description

Bectron® PU 4515 is a two-component liquid polyurethane system modified with polybutadiene providing high flexibility and rubber-like properties down to low temperature.
Curing is carried out with the Hardener Bectron® PH 4912.
The system meets the requirements of ROHS.

Areas of application

Bectron® PU 4515 has excellent flexibility down to low temperatures and is suitable for use in devices operating in a wide temperature range -60 to +150°C. It is suitable for potting sensitive components and PCBs for outdoor applications. The high chemical resistance will give protection from humid, alkaline and acidic environments.

Properties

A resilient elastic casting compound for mechanically sensitive electronic components and PCBs

Potting Compound with rubber like properties

High temperature resistance to 150°C

Flexible down to -60°C

Low shrinkage

Good dielectric properties

Good Adhesion

ROHS Compliant

Storage

Containers filled with Bectron® PU 4515 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 stirring of the containers prior to filling storage or service tanks.

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 form crystals at temperatures below 0 °C. Heating the entire contents of the drum for a short time 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 4515 polyurethane component contains filler materials which tend to settle, depending on storage temperatures. Very thorough stirring is necessary prior to the mixing process.

Mixing: Bectron® PU 4515 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 14 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 casting using two-component metering equipment but manual casting is possible.

Curing: Recommended curing conditions are:

- At RT 6-8 hours
- 40-60°C 1-2 hours

Transition to solid at room temperature takes 40 minutes.

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 development of cured properties.

Table 1 - Properties of materials as supplied

Property	PU 4515	PH 4912	Units
Colour	Natural (beige)	Brown transparent	
Viscosity @ 25°C DIN 53019	6500 ± 1000	110 ± 30	mPa.s
Spec. gravity 20°C DIN EN ISO 2811-1	1.12 ± 0.05	1.23 ± 0.03	g/cm^3
Shelf Life	6	6	months

Table 2 - Properties of mixture

Property			
Mix Ratio: PU 4515 : PH 4912	5.0 5.3	1 1	Parts by weight Parts by volume@20°C
Viscosity DIN 53019	25°C	4500 ± 500	mPas
Process time	25°C 200g	14	min

Table 3 – Thermal Properties of cured compound

Property	Condition	Value	Units
Thermal Conductivity DIN 52613		0,2	W/mK
Glass transition temperature IEC 61006		< -75	°C
Thermal index IEC 216	flexural strength	150	°C
Linear coefficient of expansion Beck Test M 56	above tg	$(160 \pm 20)x10^{-6}$	K^{-1}

Table 4 - Mechanical properties of cured compound

Property	Condition	Value	Units
Specific Gravity DIN 16945	20°C	1.16 ± 0.02	g/cm^3
Hardness ISO 868		75 ± 5	Shore A
Tensile Modulus DIN EN ISO 527-1	23 °C	7,76	MPa
Tensile Strength DIN EN ISO 527-1	23 °C	3,24	MPa
Tensile Stress at break DIN EN ISO 527-1	23 °C	3,24	MPa
Elongation at break DIN EN ISO 527-1	23 °C	71	%

Table 5 – Dielectric properties of cured compound

Property	Condition	Value	Units
Volume resistivity IEC 60455 Part 2	23 °C 53°, 7 days in water	2.2 x 10^{14} 1.6 x10^{14}	Ω • cm
Dielectric Constant ε_r IEC 60250	23 °C/50 Hz 23°C/ 1K Hz	3.16 2.92	
Dielectric Strength IEC 60250	23°C 50% rh 23°C 7 d water	33 22.3	kV/mm kV/mm
Dissipation factor tan-δ IEC 60250	50Hz, 23°C, 50% rh 1 KHz 23°C, 50% rh 1MHz,23°C 50 % rh	0.0298 0.0247 0.0254	
Dissipation factor 7 d. storage in water, tan-δ IEC 60250	50Hz, 23°C, 50% rh 1 KHz 23°C, 50% rh 1MHz,23°C 50 % rh	0.0314 0.0254 0.0283	
Tracking resistance IEC 60112		600	CTI

Table 6 - Chemical properties of cured compound

Property	Condition	Value	Units
Water absorption ISO 62	24h RT	0.35	%

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