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Technical Data Sheet

Bectron®

PB 3251/PH 4918

100:33

Polyurethane - Two Components Filled
Potting Application

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Product description

Bectron® PB 3251 with Hardener Bectron® PH 4918 is a 2 component system to produce a resilient compound suitable for potting and casting. It is based on polybutadiene with polyurethane & filled to provide strength with flexibility at low temperature and superior resistance properties. It is resistant to organic and inorganic solvents with good adhesion. It is solvent free and does not damage components on the board.

Areas of application

Bectron® PB 3251 is suitable for many potting applications needing stability to thermal shock. It is ideal for casting whole PCB to give where good protection against humidity aggressive chemicals shock and vibration are required.

Processing methods

The system is a high viscosity system which can be applied in a continuous process with conventional mixing and dispensing equipment. For manual batch application thorough mixing of the two components is essential and care is needed to avoid air bubbles. Recommended curing should be above 20 °C - At Room Temperature 48 hours - At 50-60 °C 60 minutes with some days for full curing. To ensure satisfactory adhesion on the PCB surface the following should be checked:

- Use of residue-free flux
- Ensure dry surfaces
- Check compatibility of the coating resin with the solder
- Resist and solder paste

Curing/Post-curing

For a room temperature curing system, post-curing allows fast stabilization of the material and attainment of the best electrical and mechanical properties. During curing process it is advisable to avoid thermal variations higher than 10°C/hour.

Storage and stability

Refer to the safety data sheet regarding conditions for safe storage. Polyol and the isocyanate based hardener must be stored in the original sealed containers stored in a cool, dry place. The resin and hardener are chemically stable. Avoid storage outside. The hardener may increase its viscosity over storage time without changing final cured system properties. Long storage may cause filler settling. Mix each component before use. Both components are moisture sensitive therefore it is good practice to close the vessels immediately after each use. Moisture absorption may cause the expansion of the product during application and/or may cause the hardener to form solid residues. Hardener can crystallize if exposed at low temperatures. To restore the original conditions, heat the material at 70-80°C avoiding local overheating. Before use, the product must be homogenized and cooled down at room temperature.

Handling precautions

Refer to the safety data sheet and comply with regulations relating to industrial health and waste disposal.

Sales specifications

PB 3251

Properties	Conditions	Test Method	Value	M/U
Viscosity	25 °C	IO-10-50 (ISO 3219)	9000 ÷ 15000	mPa·s
Density	25 °C	IO-10-51 (ASTM D 1475)	1,25 ÷ 1,31	g/ml

PH 4918

Properties	Conditions	Test Method	Value	M/U
Viscosity	20 °C	IO-10-50 (ISO 3219)	900 ÷ 1500	mPa·s

Typical product properties

PB 3251

Properties	Conditions	Test Method	Value	M/U
Colour		--	Black	

PH 4918

Properties	Conditions	Test Method	Value	M/U
Colour		--	Colorless	
Density	25 °C	IO-10-51 (ASTM D 1475)	1,13 ÷ 1,17	g/ml

Typical system properties

Properties	Conditions	Test Method	Value	M/U
Mix Ratio by weight		--	100 : 33	g
Mix Ratio by volume		--	100 : 31	ml
Initial mixture viscosity	25 °C	IO-10-50 (ISO 3219)	15000 ÷ 25000	mPa·s
	40 °C		8000 ÷ 12000	mPa·s
	60 °C		5000 ÷ 7000	mPa·s
Pot life (doubled initial viscosity)	25 °C	IO-10-50 (ISO 3219) (*)	20 - 30	min
	40 °C		15 ÷ 20	min
	60 °C		5 ÷ 10	min
Gel time	25 °C - 100 ml	IO-10-52a	73 ÷ 86	min
Gel time (manual test)	25 °C - 15 ml - 6 mm	IO-10-73 (*)	3,5 ÷ 4,5	hrs
Demoulding time	25 °C - 15 ml - 6 mm	(*)	6 ÷ 7	hrs
Suggested curing cycles		(**)	24 h RT + 15 h 60 °C	

Typical cured system properties

Properties	Conditions	Test Method	Value	M/U
Density (solid)	25 °C	IO-10-54 (ASTM D 792)	1,25 ÷ 1,31	g/ml
Hardness	25 °C	IO-10-58 (ASTM D 2240)	82 ÷ 88	Shore A/15
Glass Transition (Tg)		IO-10-69 (ASTM D 3418)	<-50	°C
Water absorption (24 h RT)		IO-10-70 (ASTM D 570)	0,20 ÷ 0,30	%
Linear thermal exp. (Tg +10 °C)		IO-10-71 (ASTM E 831)	180 ÷ 220	ppm/°C
Thermal conductivity	25 °C	IO-10-87 (ASTM C 518)	0,27 ÷ 0,37	W/(m·K)

Typical mechanical properties in cured condition

Properties	Conditions	Test Method	Value	M/U
Tensile strength	25 °C	IO-10-63 (ASTM D 638)	3 ÷ 4	MN/m ²
Nominal strain at break	25 °C	IO-10-63 (ASTM D 638)	35 ÷ 55	%

Typical dielectric properties in cured condition

Properties	Conditions	Test Method	Value	M/U
Dielectric constant	25 °C	IO-10-59 (ASTM D 150)	3,5 ÷ 4,5	
Loss factor	25 °C	IO-10-59 (ASTM D 150)	50 ÷ 80	x10 ⁻³
Volume resistivity	25 °C	IO-10-60 (ASTM D 257)	1,0 x10 ¹³ ÷ 1,0 x10 ¹⁴	Ω·cm
Dielectric strength	25 °C - 2 mm	IO-10-61 (ASTM D 149)	21 ÷ 25	kV/mm

Specimens curing cycle = 24 h RT + 15 h 60 °C

IO-00-00 = Elantas Europe internal test method. The correspondent international method is indicated whenever possible; nd = not determined; na = not applicable; RT = TA = laboratory room temperature (23±2°C); conversion units: 1 mPas = 1 cPs 1MN/m² = 10 kg/cm² = 1 MPa

(*) for larger quantities pot life is shorter and exothermic peak increases; (**) the brackets mean optionality; (***) 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. For further possible information see post-curing paragraph.

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