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Technical Data Sheet

Bectron®**EP 5504/EH 5909**

100:9

Epoxy - Two Components Filled - Room Temperature Curing
Self-extinguishing

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Product description

- Two components filled epoxy system
- Self-extinguishing
- Low viscosity
- Low shrinkage
- Long pot-life
- Low exothermic peak
- High thermal shock resistance
- Good adhesion to various substrates
- Good electrical and mechanical properties
- Solvent and self-extinguishing halogen derivatives free

Areas of application

Bectron® EP 5504 has been designed as a potting compound for electronics. The intention the development of Bectron® EP 5504 has been to support temperature ranges and environmental situation where classical polyurethane products cannot support. Its high mechanical strength and thermal resistance extend the use of this material to thermally and chemically highly demanding environments. The combination of excellent thermal conductivity and adhesion allow this material being used as a thermal transfer material. Bectron® is suited for small volume potting of electronic boards, individual coverage of electronic components, potting of sensors and creating adhesion between electronic boards and cooling components.

Processing methods

- Manual and/or automatic casting or potting
- Under vacuum casting or potting
- Room temperature curing

In pre-filled products, before each use, always check for presence of possible sediment. In case, re-homogenize thoroughly. Add the appropriate quantity of hardener to the resin and mix carefully. Avoid excessive air trapping when mixing components. It can be useful to pre-heat components and remove entrapped air from the mixture with a vacuum step before casting.

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

Filled epoxy resin and its amine based hardener can be stored respectively for one year and two years in the original sealed containers stored in a cool, dry place. If the material has been stored in anomalous conditions, a more evident sedimentation of fillers can occur. It is possible however to still use the material only after being re-homogenized. It is preferable the use of mechanical mixing. The hardener is moisture sensitive therefore it is good practice to close the container immediately after each use.

Handling precautions

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

Sales specifications

EP 5504

Properties	Conditions	Test Method	Value	M/U
Viscosity	25 °C	IO-10-50 (ISO 3219)	14000 ÷ 24000	mPa·s
Density	25 °C	IO-10-51 (ASTM D 1475)	1,69 ÷ 1,79	g/ml
Gel time	50 °C - 100 ml	IO-10-52b	55 ÷ 65	min

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Properties	Conditions	Test Method	Value	M/U
FT- IR (Correlation)	25 °C	IO-10-75	0,990 ÷ 1,000	

Typical product properties

EP 5504

Properties	Conditions	Test Method	Value	M/U
Colour		--	Beige	
Viscosity	25 °C	IO-10-50 (ISO 3219)	14000 ÷ 24000	mPa·s
Density	25 °C	IO-10-51 (ASTM D 1475)	1,69 ÷ 1,79	g/ml

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Properties	Conditions	Test Method	Value	M/U
Colour		--	Pale yellow	
Viscosity	25 °C	IO-10-50 (ISO 3219)	20 ÷ 40	mPa·s
Density	25 °C	IO-10-51 (ASTM D 1475)	0,90 ÷ 0,94	g/ml
FT- IR (Correlation)	25 °C	IO-10-75	0,990 ÷ 1,000	

Typical system properties

Properties	Conditions	Test Method	Value	M/U
Mix Ratio by weight		--	100 : 9	g
Mix Ratio by volume		--	100 : 17	ml
Initial mixture viscosity	25 °C	IO-10-50 (ISO 3219)	1600 ÷ 2800	mPa·s
	40 °C		600 ÷ 1200	mPa·s
	60 °C		500 ÷ 900	mPa·s
Pot life (doubled initial viscosity)	25 °C	IO-10-50 (ISO 3219) (*)	60 ÷ 80	min
Pot life	40 °C - 3000 mPa·s	IO-10-50 (ISO 3219)	40 ÷ 60	min
	60 °C - 3000 mPa·s		15 ÷ 30	min
Exothermic peak	25 °C - 80 mm - 500 ml	IO-10-53 (*)	50 ÷ 60	°C
Pot life	25 °C - 80 mm - 500 ml	IO-10-53 (*)	140 ÷ 170	min
Gel time	25 °C - 100 ml	IO-10-52a	nd	min
Gel time	50 °C - 100 ml	IO-10-52b	55 ÷ 65	min
Gel time (manual test)	25 °C - 15 ml - 6 mm	IO-10-73 (*)	4 ÷ 5	hrs
Demoulding time	25 °C - 15 ml - 6 mm	(*)	8 ÷ 12	hrs
Post-curing	80 °C	(**)	4 ÷ 6	hrs
	100 °C		1 ÷ 6	hrs
Suggested curing cycle		(**)	48 h RT + 6 h 80 - 100 °C	

Typical cured system properties

Properties	Conditions	Test Method	Value	M/U
Specimens curing cycle		--	48 h RT + 6 h 80 - 100 °C	
Density (solid)	25 °C	IO-10-54 (ASTM D 792)	1,63 ÷ 1,70	g/ml
Hardness	25 °C	IO-10-58 (ASTM D 2240)	85 ÷ 93	Shore D/15
Glass Transition (Tg)		IO-10-69 (ASTM D 3418)	90 ÷ 100	°C
Water absorption (24 h RT)		IO-10-70 (ASTM D 570)	0,15 ÷ 0,20	%
Water absorption (2 h 100 °C)		IO-10-70 (ASTM D 570)	0,95 ÷ 1,15	%
Linear thermal exp. (Tg -10 °C)		IO-10-71 (ASTM E 831)	30 ÷ 50	ppm/°C
Linear thermal exp. (Tg +10 °C)		IO-10-71 (ASTM E 831)	105 ÷ 135	ppm/°C
Flammability		IO-10-68 (UL 94 V-0)	2,95	mm
Thermal conductivity	25 °C	IO-10-87 (ASTM C 518)	0,85 ÷ 0,95	W/(m·K)
Max recommended operating temperature		IEC 60085 (***)	155	°C

Typical mechanical properties in cured condition

Properties	Conditions	Test Method	Value	M/U
Specimens curing cycle		--	48 h RT + 6 h 80 - 100 °C	
Flexural strength	25 °C	IO-10-66 (ASTM D 790)	70 ÷ 85	MN/m ²
Strain at break	25 °C	IO-10-66 (ASTM D 790)	0,8 ÷ 1,8	%
Flexural elastic modulus	25 °C	IO-10-66 (ASTM D 790)	7500 ÷ 9500	MN/m ²
Tensile strength	25 °C	IO-10-63 (ASTM D 638)	40 ÷ 55	MN/m ²
Nominal strain at break	25 °C	IO-10-63 (ASTM D 638)	1,0 ÷ 2,0	%
Compressive strength	25 °C	IO-10-72 (ASTM D 695)	90 ÷ 110	MN/m ²

Typical dielectric properties in cured condition

Properties	Conditions	Test Method	Value	M/U
Specimens curing cycle		--	48 h RT + 6 h 80 - 100 °C	
Tracking Index		IEC 60112	> 600	CTI
Dielectric constant	25 °C	IO-10-59 (ASTM D 150)	4,0 ÷ 5,0	
Loss factor	25 °C	IO-10-59 (ASTM D 150)	20 ÷ 50	x10 ⁻³
Volume resistivity	25 °C	IO-10-60 (ASTM D 257)	5,0 X10 ¹⁴ ÷ 5,0 X10 ¹⁵	Ω·cm
Dielectric strength	25 °C - 2 mm	IO-10-61 (ASTM D 149)	22 ÷ 25	kV/mm

IO-00-00/200-000-000 = 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 1 MN/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 based on 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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