

EN

Technical Data Sheet

Bectron[®]

EP 5503/EH 5908

100:20

Epoxy - Two Component - Room Temperature Curing

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Product description

Bectron® EP 5503 represents slightly thixotropic, but flowable, solvent-free, two component formulation based on epoxy resin. The material is designed for room temperature cure. A more elaborated thermal cure scheme provides extended properties with respect to thermal resistance. Cured Bectron® EP 5503 is a dark blue, hard material with good dielectric properties for electronic applications and good adhesion to common substrates. Bectron® EP 5503 satisfies the requirements of RoHS.

Areas of application

The material has been designed to provide the electronic industry with a tough and chemical resistant potting material. It is intended for a use in small volume for the encapsulation of printed circuit boards (PCB) and/or for the potting of sensors. The material is fluent but comes with a distinct thixotropy to prevent the material from flowing through holes at the bottom of the PCB as much as possible. For the use under harsh conditions, Bectron® EP 5503 provides a high chemical resistance even under humid, alkaline, and acidic environments. Bectron® EP 5503 is capable keeping its mechanical and chemical properties also at elevated temperatures.

Processing methods

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

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

Unfilled epoxy resin and its amine based hardener can be stored for two years in the original sealed containers stored in a cool, dry place. 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 5503

Properties	Conditions	Test Method	Value	M/U
Viscosity	25 °C	IO-10-50 (ISO 3219)	15000 ÷ 30000	mPa·s

EH 5908

Properties	Conditions	Test Method	Value	M/U
Viscosity	25 °C	IO-10-50 (ISO 3219)	100 ÷ 200	mPa·s

Typical product properties

EP 5503

Properties	Conditions	Test Method	Value	M/U
Colour		--	Blue	
Density	25 °C	IO-10-51 (ASTM D 1475)	1,13 ÷ 1,23	g/ml

EH 5908

Properties	Conditions	Test Method	Value	M/U
Colour		--	Pale yellow	
Density	25 °C	IO-10-51 (ASTM D 1475)	0,99 ÷ 1,01	g/ml

Typical system properties

Properties	Conditions	Test Method	Value	M/U
Mix Ratio by weight		--	100 : 20	g
Mix Ratio by volume		--	100 : 24	ml
Initial mixture viscosity	25 °C	IO-10-50 (ISO 3219)	8000 ÷ 12000	mPa·s
	40 °C		5500 ÷ 8500	mPa·s
Pot life (doubled initial viscosity)	25 °C	IO-10-50 (ISO 3219) (*)	35 ÷ 45	min
	40 °C		20 ÷ 30	min
Gel time	25 °C - 100 ml	IO-10-52a	35 ÷ 45	min
Suggested curing cycle		(**)	4 h 25 °C + 2 h 100 °C	

Typical cured system properties

Properties	Conditions	Test Method	Value	M/U
Specimens curing cycle		--	4 h 25 °C + 2 h 100 °C	
Density (solid)	25 °C	IO-10-54 (ASTM D 792)	1,14 ÷ 1,20	g/ml
Hardness Shore D	25 °C	IO-10-58 (ASTM D 2240)	80 ÷ 90	Shore D
Glass Transition (Tg)	24 h 25 °C	IO-10-69 (ASTM D 3418)	45 ÷ 55	°C
	4 h 25 °C + 4 h 80 °C		100 ÷ 115	°C
	4 h 25 °C + 2 h 100 °C		120 ÷ 130	°C
Water absorption (24 h RT)		IO-10-70 (ASTM D 570)	0,05 ÷ 0,10	%
Water absorption (2 h 100 °C)		IO-10-70 (ASTM D 570)	0,10 ÷ 0,50	%
Linear thermal exp. (Tg -10 °C)		IO-10-71 (ASTM E 831)	65 ÷ 75	ppm/°C
Linear thermal exp. (Tg +10 °C)		IO-10-71 (ASTM E 831)	150 ÷ 170	ppm/°C

Typical mechanical properties in cured condition

Properties	Conditions	Test Method	Value	M/U
Specimens curing cycle		--	4 h 25 °C + 2 h 100 °C	
Flexural strength	25 °C	IO-10-66 (ASTM D 790)	15 ÷ 20	MN/m ²
Strain at maximum stress	25 °C	IO-10-66 (ASTM D 790)	280 ÷ 420	%
Strain at break	25 °C	IO-10-66 (ASTM D 790)	280 ÷ 420	%
Flexural elastic modulus	25 °C	IO-10-66 (ASTM D 790)	6 ÷ 8	MN/m ²
Tensile strength	25 °C	IO-10-63 (ASTM D 638)	45 ÷ 55	MN/m ²
Tensile elastic modulus	25 °C	IO-10-63 (ASTM D 638)	2500 ÷ 3500	MN/m ²
Elongation at break	25 °C	IO-10-63 (ASTM D 638)	1,50 ÷ 2,50	%

Typical dielectric properties in cured condition

Properties	Conditions	Test Method	Value	M/U
Specimens curing cycle		--	4 h 25 °C + 2 h 100 °C	
Dielectric constant	25 °C - 50 Hz	IO-10-59 (ASTM D 150)	3,5 ÷ 4,5	
	100 °C - 50 Hz		4,0 ÷ 5,0	
	25 °C - 5 kHz		3,0 ÷ 4,0	
	100 °C - 5 kHz		3,5 ÷ 4,5	
Loss factor	25 °C - 50 Hz	IO-10-59 (ASTM D 150)	8 ÷ 11	x10 ⁻³
	100 °C - 50 Hz		20 ÷ 30	x10 ⁻³
	25 °C - 5 kHz		25 ÷ 35	x10 ⁻³
	100 °C - 5 kHz		5 ÷ 10	x10 ⁻³
Volume resistivity	25 °C	IO-10-60 (ASTM D 257)	1,0 x10 ¹⁵ ÷ 1,0 x10 ¹⁶	Ω·cm
	100 °C		5,0 x10 ¹² ÷ 5,0 x10 ¹³	Ω·cm
Dielectric strength	25 °C - 2 mm	IO-10-61 (ASTM D 149)	21 ÷ 24	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 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 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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