

Technical Data Sheet

SHIMOKOTE 9 (...) + Hardener 61 / Hardener 43

Room Temperature Curing, Filled, Epoxy Resin System for Casting & Potting

January 2022

ELANTAS Beck India Ltd.
Marketing HO
147, Mumbai Pune Road,
Pimpri, Pune 411018
India
Tel +91 20 67190 600
Fax +91 20 67190 792
www.elantas.com/beck-india

Description

SHIMOKOTE 9 (...) is medium viscosity, filled, liquid epoxy-based compound, suitable for the electrical and electronics industry. It has been specially formulated to offer customer a system, which does not require any further preparation at their end. It is filled with pre-dried inorganic fillers, thoroughly blended and entrapped air completely removed under high vacuum.

In combination with polyamines (Hardener 61) or with polyamide amine (Hardener 43) it offers the following advantages:

- Pore and void free encapsulation
- Pourable consistency
- Good adhesion to various material
- Excellent mechanical and electrical properties
- Good resistance to water and chemicals
- Low shrinkage
- Easy to machine.

Areas of Application

Ideal for potting sealing and casting of small and medium size electrical and electronic components such as:

- Coils
- Instrument transformer
- Switchgear
- Capacitors
- Filters
- Flashers
- PCB assemblies

Properties of cured material

The cured mass of SHIMOKOTE 9 (...) + Hardener 61 or Hardener 43 shows good mechanical, electrical & chemical properties. Because of special type of fillers in SHIMOKOTE 9, the cured mass shows good thermal shock resistance, reduced shrinkage, low coefficient of thermal expansion & increased thermal conductivity.

The combination of SHIMOKOTE 9 (...) + Hardener 61 or Hardener 43 is used in thermal class 120 (class E) electrical components.

Application Method

- SHIMOKOTE 9 (...) is filled system & needs gentle & thorough stirring before use, ensure homogeneity and to avoid formation of air bubbles. Depending upon the end use, additional amounts of dried fillers, e.g. quartz powder, silica flour etc. may be used.
- SHIMOKOTE 9 (...) / Hardener 61 and SHIMOKOTE 9 (...) / Hardener 43 are room temperature curing systems.

Properties of SHIMOKOTE 9 (...) as supplied:

Colour & Appearance [*] [***]	DBI 1001 [**]	Unit	Plain / Black bubble free slurry liquid
Viscosity at 25 °C by (Brookfield) [*]	DBI 3005 [**]	mPa.s	8000-14000
Density at 25 °C [*]	DBI 3047A [**]	g/ml	1.48 -1.68
Flash point (Open cup)	DIN 51584	°C	>100
Storage stability [*]	When stored in original sealed container at R.T.	months	06
[*] These properties form our sales specification			
[**] DBI are our internal test methods and are available on request			
[***] Available in plain and black colours			

Properties of Hardener 61 and Hardener 43 as supplied:

		Unit	Hardener 61	Hardener 43
Type of compound			Aliphatic polyamine	Polyamide amine
Colour & Appearance [*]	DBI 1001 [**]		Colourless to pale yellow liquid	Dark brown to Orange liquid
Viscosity at 25 °C by (Brookfield) [*]	DBI 3005 [**]	mPa.s	28 - 40	300 - 700
Density at 25 °C	DBI 3047 [**]	g / ml	0.972- 0.982	0.97 ± 0.1
Amine value [*]	DBI 1012[**]	mg KOH/g	1300 - 1400	340 - 460
Flash point	DIN 51584 (Open cup)	°C	>100	>100
Storage stability [*]	When stored in original sealed container at R.T.	months	12	12

Mixing Proportion & Pot Life:

			SHIMOKOTE 9 (...): Hardener 61	SHIMOKOTE 9 (...): Hardener 43
Mixing Ratio (Resin: Hardener)	-	Parts by wt.	100:5±0.5	100:25±1.5
Initial Viscosity of mixture at 25 °C	DBI 3005[**]	mPa.s	3800	2400
Pot life 25 °C	DBI 1019[**]	min	45	160 - 200
Gel time 25 °C	-	min	55	190 - 230

Recommended Curing Cycle:

Curing time	SHIMOKOTE 9 (...) + Hardener 61	SHIMOKOTE 9 (...) + Hardener 43
	24 h at RT	12-16 h at RT + 4-6 h at 80-100°C <u>OR</u> 1-2 h at 60 - 65°C + 12 h at RT (20 - 40°C) <u>OR</u> 48 -72 h at RT <i>Note - Optimum properties will achieve after 7 days at RT (20 - 40°C)</i>

Cured Film Mechanical Properties :(Typical)

Specimen Curing –16 h at RT + 4 h at 80°C

	Test Method	Unit	SHIMOKOTE 9 + Hardener 61 (100:5)	SHIMOKOTE 9 + Hardener 43 (100: 25)
Tensile strength	ISO 527	MPa	40	26
Compressive strength	ISO 604	MPa	110	90
Flexural strength	ISO 178	MPa	48	42.5
Water absorption	ISO 62	%	0.45	0.42
Heat distortion temp. Marten's value	DIN 53458	°C	62	48
Thermal conductivity	ASTM C 518	W/mK	NT	0.496
Hardness	ISO 868	Shore D	85 ± 10	80 ± 10
Density of cured mass	IEC 60455	g /cm ³	1.55 ± 0.1	1.54 ± 0.1
Glass transition temperature	ASTM D 3418	°C	NT	40 – 50
Linear thermal expansion	ASTM E 831			
Below Tg		x 10 ⁻⁶ /°C	NT	60 - 90
Above Tg		x 10 ⁻⁶ /°C	NT	140 - 200

Dielectric Properties:

Specimen Curing - 16h at R.T +4h at 80°C

Dielectric strength IEC 60243 with 3 mm specimen	at RT	kV/mm	18	17
Volume resistivity at 500 V DC as per IEC 60455-2	at RT	ohm.cm	10 ¹⁵	10 ¹⁵
Dielectric constant at 30 V/1 kHz as per IEC 60455-2	at RT at 155 ⁰ C	-	NT	NT
Dielectric loss factor 30 V/1 kHz as per IEC 60455-2	at RT at 155 ⁰ C	-	0.022 0.780	0.022 0.780
Track resistance by IEC 60112	at RT	Volts	> 600	> 600

Resistance against solvents & chemicals:

Solvent resistance as per IEC 60455-2	25% H ₂ SO ₄	No change in colour
	5% NaOH	No change in colour

Packaging:

SHIMOKOTE 9 : 25 kg in open mouth bucket.
 Hardeners : 25 kg in poly containers.

Safe Handling:

SHIMOKOTE 9 (...) has hardly any effect on skin & mucous membrane. Hardener 61 and Hardener-43 are caustic & will affect skin. For detailed information on safe handling, kindly refer to our Technical Information "Safe Processing with Resins and Hardener" & material safety data sheets of SHIMOKOTE-9(...), Hardener 61 & Hardener 43.

Disclaimer

This information is intended only for general guidance in the application of our product. It has been obtained by careful investigation and represents the present state of our knowledge and experience. Because of the large number of possible methods of application and processing we are not able to assume responsibility in any one particular case for either the technical results or the patent rights situation applicable to the country under consideration.

Technical Services Department

147, Mumbai-Pune Road,
 Pimpri,
 Pune 411018
 India
 Tel +91 20 6719 0731 / 0732
 Fax +91 20 6719 0792

Regional Sales Offices:

- Bengaluru: Tel: (080) 6792 0871, 6792 0872
- New Delhi: Tel: (011) 2341 1664, 2341 2940
 Fax: 2341 3408
- Pune: Tel: (020) 6719 0800, 6719 0672
 Fax: 6719 0792
- Kolkata: Tel: (033) 4400 0500 / 9339343445

