LAPOX® L-12 | K-12 | K-13

Technical Data Sheet | Polymers Business

Hot cure epoxy system

Lapox L-12	100	pbw
Lapox K-12	100	pbw
Lapox K-13	0.1 - 2.0	pbw

Description

Lapox L-12 is a liquid, unmodified epoxy resin of medium viscosity which can be used with various hardeners for making fiber reinforced composites. Epoxy curing agent hardener Lapox K-12 is a specially formulated liquid anhydride hardener which confers an excellent thermal stability to the system, making the cured system suitable for use at continuous operating temperature at 150°C. Accelerator Lapox K-13 is used to speed up the curing process, as otherwise prolonged cured times are required.

Applications

Parts for electrical insulation application
Pipes
Rods
Tubes

Processing

Pultrusion
Filament winding
RTM

Typical specifications

Lapox L-12

Properties	Unit	Test method	Values
Appearance	-	Visual	Clear, viscous liquid
Colour	GS	ASTM D1544	Max 1
Viscosity at 25°C	m Pas	ASTM D2196	9,000 - 12,000
Epoxy content	Eq/kg	ASTM D1652	5.26 - 5.55
Specific gravity at 25°C	-	ASTM D792	1.1 - 1.2

Lapox K-12

Properties	Unit	Test method	Values
Appearance	-	Visual	Clear, brown liquid
Colour	GS	ASTM D1544	Max 8
Viscosity at 25°C	m Pas	ASTM D2196	150 - 230
Specific gravity at 25°C	-	ASTM D792	1.15 - 1.25
Shelf-life	Years	-	2

Lapox K-13

Properties	Unit	Test method	Values
Appearance	-	Visual	Clear liquid
Colour	GS	ASTM D1544	Max 2
Viscosity at 25°C	m Pas	ASTM D2196	< 10
Specific gravity at 25°C	-	ASTM D792	0.88 - 0.92
Shelf-life	Years	-	2

Processing properties

Properties	Unit	Test method	Values
Mixing ratio (by weight)	-	Visual	Resin: 100 Hardener: 100 Accelerator: 0.1 - 2.0
Initial mix viscosity	m Pas	ASTM D2196	450 / 40°C
Pot life at 80°C (< 5 kg)	Minutes	ASTM D2471	60
Gel time at 80°C	Minutes	DIN 16945 / 6.3.1	150
Drying time of prepreg	°C / hours	-	100°C / 2 hours + 140°C / 2 hours

Typical properties of neat cured system

Composition:
Curing schedule: 100°C / 2 hours + 140°C / 2 hours
Determined on standard test specimen at 25°C

Properties	Unit	Test method	Values
Tensile strength	m Pa	ISO 527	70 - 90
Elongation at break	%	ISO 527	2 - 4
Elastic modulus in tension	g Pa	ISO 527	3.2 - 3.5
Flexural strength	m Pa	ISO 178	130 - 140
Flexural elongation at break	%	ISO 178	4 - 7
Elastic modulus in flexural	g Pa	ISO 178	3.2 - 3.5
Compressive strength	m Pa	ISO 604	125 - 135
Glass transition temperature (DSC)	°C	ISO 11357 - 2	85 - 95
Co-efficient of linear thermal expansion (mean value for temperature. Range 20°C to 60°C)	K^{-1}	DIN 53752	28 - 32 X 10^{-6}
Thermal conductivity	k Cal / m hours °C	ISO 8894 - 1	0.25
Water absorption 25°C / 24 hours	% w/w	ISO - 62	Max 0.2

Typical electrical properties of cured system

Cured at:

Properties	Unit	Test method	Values
Breakdown strength (50 Hz, 25°C)	kV/cm	IEC 60243	20 - 22
Loss factor (50 Hz)	%	IEC 60250	4.5 - 4.8 at 25°C (~15 at 90°C)
Dielectric constant (50 Hz)	-	IEC 60250	5.1 - 5.3 at 25°C 6.0 - 6.4 at 90°C
Volume resistivity at 1,000 V, 25°C	ohm.cm	IEC 60093 / DIN 53482	0.3 - 0.4 X 10^{15} at 25°C 0.02 - 0.03 X 10^{15} at 90°C
Arc resistance	Seconds	IEC 61621 ASTM D495	180
Tracking resistance	V	IEC 60112	600

Packaging

Lapox L-12 is available in 30 kg, 110 kg and 240 kg carboys. Lapox K-12 and Lapox K-13 are available in 1 kg HDPE bottles. Other packaging may be considered on request.

Storage and handling

Resin Lapox L-12 and hardener Lapox K-12 and accelerator Lapox K-13 have shelf-life of 2 years if stored in their original sealed containers. Resin may crystallise if stored below 15°C. Crystallisation may be reversed completely by heating the material to 60°C to 70°C. It is recommended to use resin and hardener only when they are clear and free from cloudiness. Hardener is sensitive to moisture. Container must be closed properly immediately after use. Both resin and hardener may cause irritation to sensitive skins. If contact does occur to such operators then the resin and hardener should be washed off immediately with soap and warm water, consult doctor immediately. Please refer to the Safety Data Sheet (SDS) for detailed instructions on storage and handling.

Safety

Wear personal protective equipment (PPE). Avoid contact with the eyes and skin. In case of direct contact and irritation, the resin should be washed off immediately with soap and warm water. Avoid breathing vapours, mist or gas. Please refer to the SDS for detailed safety instructions.

Spills and disposal

In case of spills, sweep up and shovel the spilled material. Keep spilled material in suitable, closed containers for disposal. Soak up with an absorbent such as clay, sand or other suitable material. Flush area with water to remove trace residue. Do not allow the product to reach the sewage system. Waste must be disposed of in accordance with federal, state or local regulations, as applicable.

Contact

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Note

Lapox® is a registered trademark of Atul Ltd.

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