

LAPOX[®] ARL-159 | AH-619



Technical Data Sheet | Polymers Business

Hot cure epoxy system for high Tg application

Lapox ARL-159	100	pbw
Lapox AH-619	40	pbw

Description

Lapox ARL-159 is a modified high viscosity epoxy resin. Viscosity of this resin drops drastically when heated to processing temperature. Lapox AH-619 is amine based hardener in micronised powder form. This curing agent is suitable to cure epoxy at elevated temperature. Due to its high viscosity, mixing of ingredients and impregnation of resin with fiber to be done between 100°C and 120°C. The prepregs manufactured by this system are stable and has long shelf-life over 4 weeks if stored at 20°C. Shelf-life of prepregs can be increased up to 6 months if stored below 5°C. This system can also be used for impregnation after dilution of system with solvents. MEK, acetone, IPA, and xylene solvents should be used for this purpose. If this system is appropriately processed and cured, it provides excellent combination of mechanical, electrical, and thermal properties at wide range of temperature including very low to extremely high temperature.

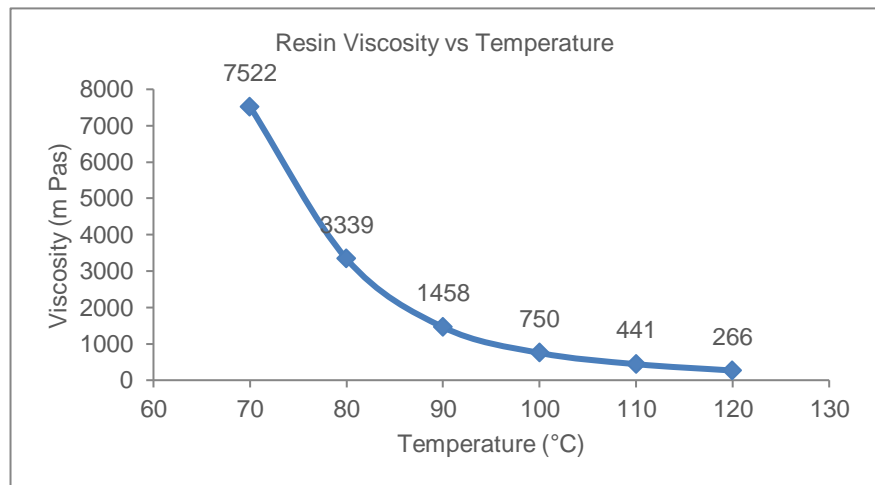
Applications

Fabrication of structural components meant for high temperature performance for various applications including recreation, defense, aerospace, infrastructure and general engineering.

Typical specifications

Lapox ARL-159

Properties	Unit	Test method	Values
Appearance	-	Visual	Yellowish to brown semi-solid
Colour	GS	ASTM D1544	Max 8
Viscosity at 25°C	m Pas	ASTM D2196	2,500 - 4,000
Epoxy content	Eq/kg	ASTM D1652	5.71 - 6.25



Lapox AH-619

Properties	Unit	Test method	Values
Appearance	-	Visual	White powder
Melting point	°C		175 - 181

Processing properties

Properties	Unit	Test method	Values
Mixing ratio (by weight)	-	Visual	Resin: 100 Hardener: 40
Initial mix viscosity	m Pas	ASTM D2196	11,025 at 80°C 2,055 at 100°C 540 at 120°C
Pot life	Minutes	ASTM D2471	2 - 3 days at 20°C 5 hours at 80°C
Gel time at 150°C	Minutes	DIN 16945 / 6.3.1	30
Curing shrinkage	%	-	1.5
Curing schedule	°C / hours	-	100°C / 2 hours + 160°C / 2 hours + 180°C / 2 hours

Heat the resin in original container and transfer hot resin into mixing vessel and maintain temperature between 80°C to 120°C (lower temperature is preferred to control rise in viscosity). Add recommended quantity of hardener Lapox AH-619 and mix for 3 minutes to 5 minutes till it becomes homogenous mass. Impregnation of reinforcement to be done at elevated temperature (100°C to 120°C) under pressure. Cooling of the prepregs to be done immediately to avoid cross linking of polymer at elevated temperature.

Prepreg parameters

Properties	UOM	Values
Resin content	%	35 - 40
Shelf life of prepreg at 20°C	Weeks	4 - 5
Pressure (vacuum) for moulding	torr	1 - 50
Curing temperature	Time / °C	2 hours / 150°C + 2 hours / 200°C

Typical properties of neat cured system

Curing schedule: 100°C / 2 hours + 160°C / 2 hours + 180°C / 2 hours
Determined on standard test specimen at 25°C

Properties	Unit	Test method	Values
Cured density	g/cm ³	DIN 55990	-
Tensile strength	m Pa	ISO 527	50 - 70
Elongation at break	%	ISO 527	2 - 5
Elastic modulus in tension	g Pa	ISO 527	3.0 - 3.5
Flexural strength	m Pa	ISO 178	100 - 120
Flexural elongation at break	%	ISO 178	6 - 10
Elastic modulus in flexural	g Pa	ISO 178	3.0 - 3.5
Compressive strength	m Pa	ISO 604	120 - 140
Glass transition temperature (DSC)	°C	ISO 11357 - 2	180 - 200
Water Absorption 25°C / 24 hours	% w/w	ISO 62	Max 0.5

LAPOX[®] ARL-159 | AH-619



Technical Data Sheet | Polymers Business

Typical electrical properties of filled cured system

Curing schedule: 100°C / 2 hours + 160°C / 2 hours + 180°C / 2 hours

Properties	Unit	Test method	Values
Breakdown strength (50 Hz, 25°C)	kV/mm	IEC 60243	20 - 22
Loss factor (50 Hz, 25°C)	%	IEC 60250	2.5 - 3.0
Dielectric constant (50 Hz, 25°C)	-	IEC 60250	4.5 - 5.2
Volume resistivity at 1,000 V, 25°C	ohm.cm	IEC 60093 / DIN 53482	10 ¹⁵
Arc resistance	Seconds	IEC 61621 / ASTM D495	> 180
Tracking resistance	V	IEC 60112	400

Packaging

Lapox ARL-159 is available in 30 kg, 110 kg and 240 kg carboys. Lapox AH-619 is available in 1 kg HDPE bottles. Other packing may be considered on request.

Storage and handling

Lapox ARL-159 and hardener Lapox AH-619 have shelf-life of 2 years if stored in their original sealed containers. Resin and hardener are sensitive to moisture, thus, 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 and take medical advice. 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

E-mail: polymers@atul.co.in
Website: www.atul.co.in

Note

Lapox[®] is a registered trademark of Atul Ltd.

Manufacturing site

Atul 396 020, Gujarat, India
Telephone: (+91 2632) 230000 | 233261
E-mail: contact@atul.co.in

Disclaimer: The information contained herein is for information purposes only. While enough care is taken in disclosing the information, users of this information are advised to cross-check the same depending upon use | application. Atul Ltd does not give any assurance or warranty or guarantee in regard to the accuracy or completeness of the information and no claim or liability will be accepted or entertained in regard thereto. Atul Ltd makes no warranty of any kind, expressed or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose or performance or usage of trade.