

Description

LB2 Epoxy Laminating Bio Resin is a medium viscosity clear twocomponent epoxy resin system with ~35% resin plant derived content, this offers a lower environmental impact without compromising on performance.

Key Features

- Easy to use
- Medium viscosity resin
- Outstanding wetting abilities
- Good mechanical properties
- Lower environmental impact

Description

LB2 Epoxy Laminating Bio Resin is medium viscosity and optimized for hand laminated applications, while it is compatible with all common fibre reinforcements it is particularly well paired with natural reinforcements to provide composite parts with a significantly reduced environmental impact.

LB2 bio resin is not compromised in performance but simply derives the same chemicals from plant-based sources. A key component of epoxy, epichlorohydrin, is manufactured using renewable plant-based Glycerol in place of petroleum based propylene. The raw materials going into our bio resins are co-products or waste products of other industrially important processes which means they do not compete with food sources or displace food-based agriculture.

Typical Uses

- Sports/recreational equipment skis, boards, canoes, archery
- Motorsport panels, aerodynamic elements, structural members
- Marine hulls, foils, masts
- Wind energy masts, blades, nacelles

Specification

The table below shows the typical uncured properties:

Property	Unit	Resin	Hardener	Combined
Material	-	Epoxy Resin	Formulated Amine	Ероху
Appearance	-	Clear Liquid	Light Yellow	Clear Liquid
Viscosity @20 °C	mPa.s.	3410	135	1575
Density @20 °C	g/cm³	1.16	1.00	1.12

How to Use

LB2 is a chemical product for professional use. It is essential to read and understand the safety and technical information before use.

Follow the guidelines for safe use outlined in the SDS which include the use of appropriate hand and eye protection during mixing and use.

Mix Ratio

Mix Ratio 100:27 by Weight

LB2 Epoxy Laminating Resin should be mixed with its Hardener at a ratio of 100 parts of resin to 27 parts of hardener by weight. Failure to do so will result in a poor or only partial cure of the resin, greatly reduced mechanical properties and possibly other adverse effects. Under no circumstances add 'extra hardener' in an attempt to speed up the cure time; epoxies do not work in this way.

Mixing Instructions

LB2 is a highly reactive (fast curing) resin system. Only weigh out and mix as much resin as you can use within the pot life.

Weigh or measure the exact correct ratio of resin and hardener into a straight sided container. Using a suitable mixing stick begin to mix the resin and hardener together to combine them completely.

Spend at least one minute mixing the resin and hardener together, paying particular attention to the sides and base of the container. Remember: Any resin that has not been thoroughly combined with hardener will not cure.

Once you have finished mixing in one container, it is good practice to transfer the mixed resin into a second container and undertake further mixing of the resin using a new mixing stick. Doing so will eliminate the risk of accidentally using unmixed resin from the bottom or sides of the container.



Pot-Life / Working Time / Cure Time

LB2 is a highly reactive resin system and once the resin has been mixed with the hardener, the reaction will start to give off heat (exotherm) which will further accelerate the cure of the resin, especially when the resin is in the mixing pot.

Transfer the resin from the mixing pot onto the part as soon as possible to extend the working time and avoid the risk of uncontrollable rapid cure in the mixing pot.

As with all epoxies, the pot-life/working time will vary significantly depending on the ambient temperature, the starting temperature of the resin and hardener and the amount of resin mixed.

IB2 can be used in ambient temperatures between 15°C (59°F) and 30°C (86°F). For best results, an ambient temperature of at least 20°C (68°F) is recommended. Ensure that both resin and hardener containers are within this temperature range before use.

For larger infusions, you can reduce the chance of the resin 'gelling' in the pot by mixing small quantities at a time and topping up the resin feed bucket as the resin is drawn into the laminate. Once the resin is in the laminate, it is much less likely to exotherm and gel before you want it to.

The table below gives an indication of pot-life and cure times:

	Pot Life 20°C	Gel Time 20°C	Demould time
	(500g)	(1mm)	20°C
Time	23mins	5hrs 4mins	17hr

Full Cure / Post-Cure

As with most epoxy systems, where parts cure in normal ambient temperatures, full cure is not reached for several days. Although parts will be handleable after the listed demould time (at 25°C), full mechanical properties will take at least 14 days to develop in (at 25°C). Where possible, avoid exposing the cured resin to full service rigours for at least this time.

Mechanical properties and temperature resistance can be improved with means of a post cure at elevated temperature once the initial cure is completed. For parts that will be used at or exposed to elevated operating temperatures (such as vehicle bonnets/hoods in direct sunlight, engine-bay parts, car interior parts etc.) a post cure is strongly recommended to prevent distortion of the parts when they are put into service and experience these higher temperatures.

Where possible, parts should be post-cured still inside the mould to reduce distortion and improve surface finish (i.e. reduce 'print-through'). When post-curing parts in the mould, it is important to post-cure them without demoulding at all (i.e. don't demould and then put them back into the mould) otherwise you can get some strange patterns on the surface where some areas are post cured in direct contact with the mould surface and others are not.

CYCLE #1 SUITABLE FOR MOST SITUATIONS

- 16hrs at room temperature
- 24hrs at 40°C

If encountering any surface finish issues (faint print-through) then placing the part into a cool oven and gently increasing the temperature reduces the amount that the resin will soften all in one go.

CYCLE #2 Maximal TG

- 16hrs at room temperature
- 4hrs at 40°C
- 4hrs at 60°C
- 4hrs at 80°C

This extended cycle, gradually ramping up between each temperature step will achieve the maximum TG of around 100°C.

Mechanical Properties

Cured Resin Properties

Property	Unit			
		Ambient + 24hrs 40 °C	Ambient + 8hrs 60 °C	Ambient + 4hrs 80 °C
Tensile Modulus	GPa	3.40	3.23	3.05
Tensile Stength	MPa	82.0	78.0	75.0
Elong. at Break	%	4.3	5.8	6.0
Flexural Moulus	GPa	3.40	3.20	2.90
Flexural Strength	MPa	127.0	127.0	125.0
Shear Strength	MPa	52.0	52.0	53.0
Compression Strength	MPa	110.0	107.0	104.0
Impact Resistance	KJ/m²	25.0	25.0	23.0
Tg Onset	°C	69.0	90.0	100.0

Transport and Storage

Resin and hardener should be kept in tightly seal containers during transport and storage. Both the resin and hardener should be stored in ambient conditions of between $10^{\circ}C$ ($50^{\circ}F$) and $25^{\circ}C$ ($77^{\circ}F$).

When stored correctly, the resin and hardener will have a shelflife of 24 months. Although it may be possible to use the resin after a longer period, a deterioration in the performance of the resin will occur, especially in relation to clarity and cure profile.

Pay particular attention to ensuring that containers are kept tightly sealed. Epoxy hardeners especially will deteriorate quickly when exposed to air.



Disclaimer

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