

EPIKOTE™ Resin MGS® LR 418
EPIKURE™ Curing Agent MGS® LH418

CHARACTERISTICS

Approval	German Federal Aviation Authority
Application	Production of gliders, motor gliders, motor planes and helicopters, boat- and shipbuilding, sport equipment, model airplanes, automotive parts, molds and tools
Operational temperature	-60°C to +100°C depending on applied post-cure
Processing	Temperatures between 15°C and 50°C, preferably 25°C - 35°C All usual processing methods
Features	High heat resistance Excellent mechanical properties
Storage	Shelf life of 24 months in originally sealed containers

APPLICATION

Laminating resin EPIKOTE™ MGS LR418 is an epoxy-based laminating resin system approved by the former German Federal Aviation Authority for processing of glass, carbon and aramid fibers.

After initial curing at room temperature, LR418 stays brittle. Before further processing or demolding, postcuring in the mold for several hours at min. 50°C is advised.

After postcure at 50°C – 55°C, LR418 meets the standards for gliders and motor gliders (operational temperatures -60°C to +54°C). In order to meet the standards for motor planes (operational temperatures -60°C to +72°C, post cure at minimum 80°C is required).

The mixed viscosity eases fast and complete impregnation of the reinforcement fibers without drain out of the fabrics on vertical surfaces.

Due to the chemical characteristics of this system, we do not expect any problems concerning compatibility (e. g. blistering, tearing or changes in color), when it is processed with gelcoats. However, comprehensive tests are indispensable.

For epoxy resins crystallization is immanently possible. In an early stage, crystallization is visible as a clouding, and can progress to a stage, where the resin becomes a wax- like solid. Crystallization can be reversed by slow heating of the product to approx. 40 - 60 °C without restriction to quality after removal, in fact a high purity of material will increase a tendency for crystallization. Although LR418 is very unlikely to crystallize at low temperatures, storage conditions of 15-30 °C are recommended.

After dispensing material, the containers must again be closed carefully, to avoid contamination or absorption of water. All amine hardeners show a chemical reaction when exposed to air, known as „blushing“. This reaction is visible as white carbamide crystals, which could make the materials unusable.

The materials have a shelf life of minimum 2 years, when stored in their originally sealed containers.

The relevant industrial safety regulations for the handling of epoxy resins and curing agents for safe processing are to be observed.

TYPICAL PROPERTIES

Property	Unit	Resin LR418	Curing agent LH418
Density ¹⁾	g/cm ³	1,15	0,95
Viscosity ¹⁾	mPa·s	1400	100
Pot life ²⁾	h	6	
Ultimate T _G ³⁾	°C	120	

These are typical values and should not be construed as specifications.

Measuring conditions:

- 1) measured at 25°C
- 2) 100g mixture in water bath at 30°C
Pot life is a standardized lab test under fixed conditions which does not necessarily reflect real process conditions. The usage or working time varies depending on real processing conditions (environmental temperature, quantities, etc.)
- 3) DSC midpoint, 20K/min, after full cure

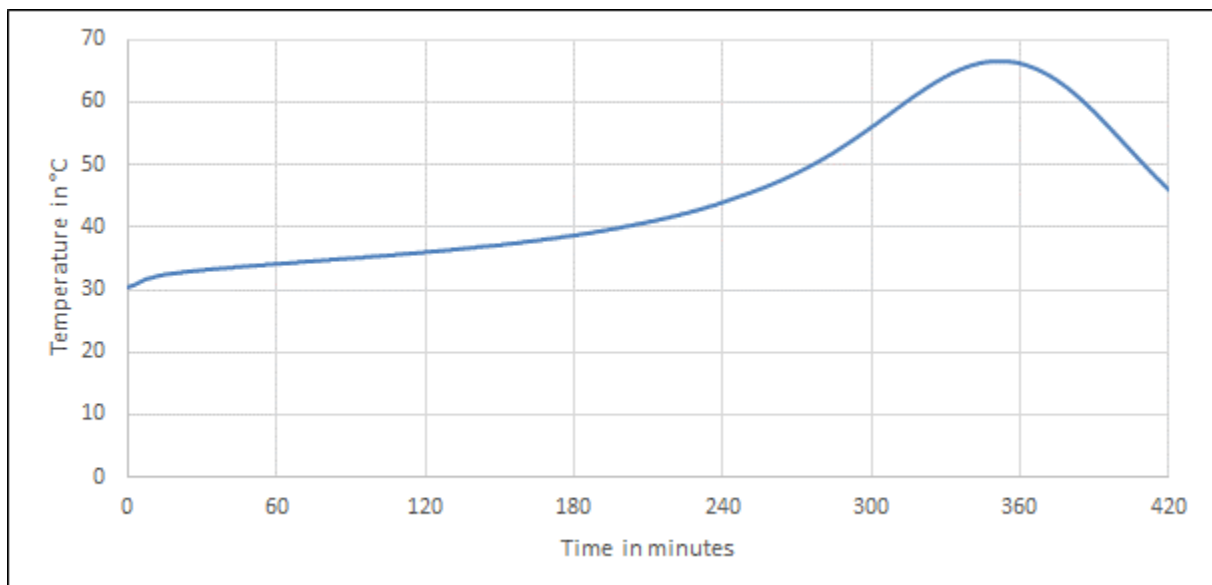
MIXING RATIO

	Parts curing agent per 100 parts resin LR418
Parts by weight	37 ± 2
Parts by volume	45 ± 2

The mixing ratio stated must be observed very carefully. Adding more or less curing agent will not result in a faster or slower reaction, but in incomplete curing which can't be corrected in any way. Resin and curing agent must be mixed very thoroughly. Pay special attention to the walls and bottom of the mixing container.

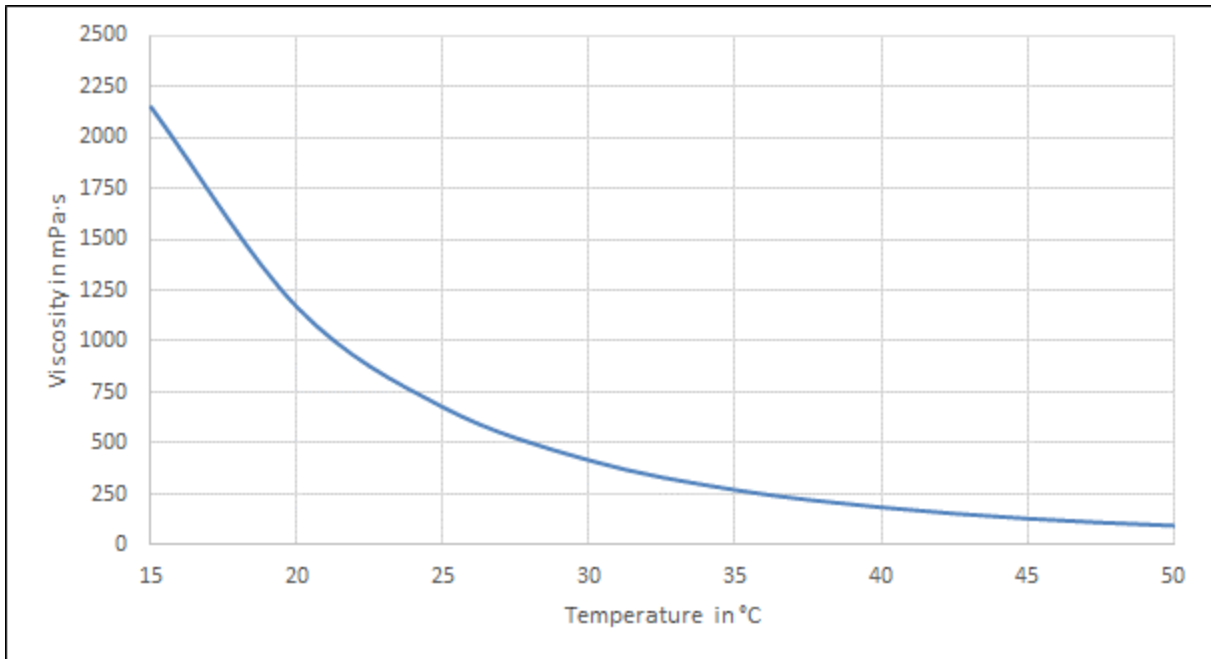
LH418 has blue color to ease identification of a correct mixing process. Slight deviations in color are possible (e.g. due to batch variation or UV radiation after longer exposure to sun light), but have no effect on the processing and final properties of the product.

TEMPERATURE DEVELOPMENT



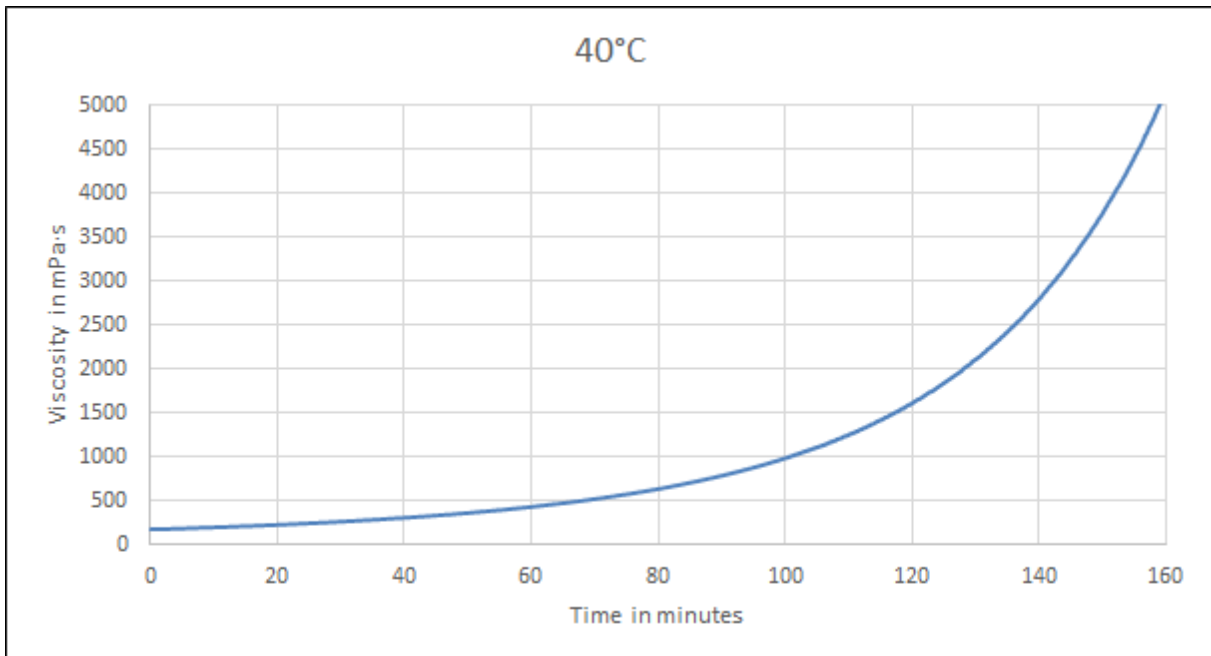
Measuring conditions: 100g mixture at 30°C in a water bath

VISCOSITY OF MIXTURE



Measuring conditions: Viscometer, cone-plate 50 mm, measuring gap 0.1 mm

VISCOSITY DEVELOPMENT



Measuring conditions: Viscometer, cone-plate 50 mm, measuring gap 0.1 mm

PHYSICAL AND MECHANICAL DATA

Cured density DIN EN ISO 1183-1	Density [g/cm³]	1,15
Tensile test DIN EN ISO 527-2	Tensile strength [MPa]	80
	Tensile modulus [GPa]	2,8
	Tensile strain at break¹⁾ [%]	8
Flexural test DIN EN ISO 178	Flexural strength [MPa]	130
	Flexural modulus [GPa]	2,9

¹⁾ Tensile strain at break results strongly depends on specimen quality, especially void content
 All tests accomplished at standard climate; specimens cured 16h 23°C + 10h 100°C

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