

EPIKOTE™ Resin MGS™ LR285
EPIKURE™ Curing Agent MGS™ LH285-287

CHARACTERISTICS

Approval	German Federal Aviation Authority
Application	selection of gliders, motor gliders and motor planes, boat and dinghies, sports equipment, model airplanes, models and toys
Operational temperature	<p>0°C up to +55 °C without heat treatment</p> <p>+55 °C up to +80 °C after heat treatment</p>
Humidity	operating humidity: 10% and 90%, all relevant processing methods
Features	good mechanical properties
Features	best life of approx. 30 min to approx. 3-5 hours at 25°C
Features	good life of approx. 30 min to approx. 3-5 hours at 25°C

APPLICATION

Lamination resin system approved by the GERMAN FEDERAL AVIATION AUTHORITY for use with different net types for reinforcement of glass, carbon and aramide fibres, featuring high static and dynamic loadability.

After heat treatment at 50 – 55 °C, the system 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), heat treatment at 80 °C is necessary.

The mixing viscosity guarantees fast and complete incorporation of the reinforcement fibres; however, the resin will not spill out of the fabrics on vertical surfaces. In order to obtain special properties, it is also possible to add fillers to the mixture of resin/hardener, such as Aerosil, microballoons, cotton flakes, metal powder, etc.

If high heat resistance or aircraft approval are not necessary, curing agent LH265 can also be used without heat treatment afterwards. However, the indicated properties will only be obtained after heat treatment at temperatures over 50 °C.

Epoxy resins are super cooled liquids, therefore crystallisation is imminently possible. In an early stage, crystallisation is visible as a clouding, and can progress to a stage, where the resin becomes a wax-like solid. This physical phenomenon is reversible and is no restriction to quality after its reversion. In fact a high purity of material will increase a tendency for crystallisation.

Since the approval of laminating resin LR305 in 1985, it has been used by nearly all manufacturers of planes and gliders and - especially because of the extremely good physiological compatibility - it is the most commonly used system in the aircraft industry today. It often happens that workers who have experienced problems with some epoxy resins concerning allergies or skin irritation are able to process laminating resin LR305.

SPECIFICATIONS

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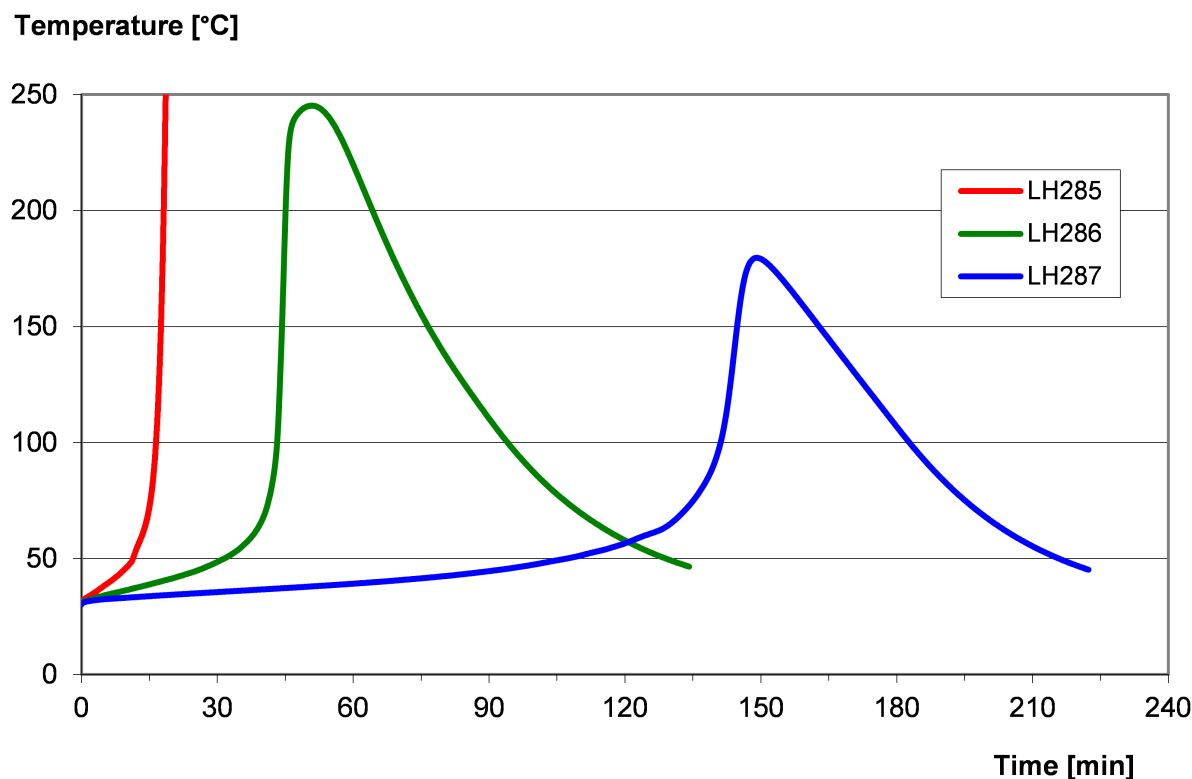
1. *Journal of the American Medical Association*, 2000; 284: 2689-2695.

- Measuring conditions:
1) measured at 25°C
2) measured in 30°C water bath, 100g sample
3) conditioned at 40 °C / 90% r.H.

MIXING RATIO

		LR205 - All cycling agents
Parts by weight		100 - 40 x 2
Parts by volume		100 - 51 x 2

TEMPERATURE DEVELOPMENT



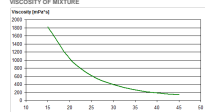
Measuring conditions: 100 minutes at 30°C in a water bath.

Get Time

		Curing agent	
	LX056	LX058	LX057
20 - 22°C	Abs. 2 - 3 s	Abs. 2 - 3 s	Abs. 2 - 3 s
20 - 25°C	Abs. 20 - 30 mm	Abs. 20 - 30 mm	Abs. 20 - 30 mm

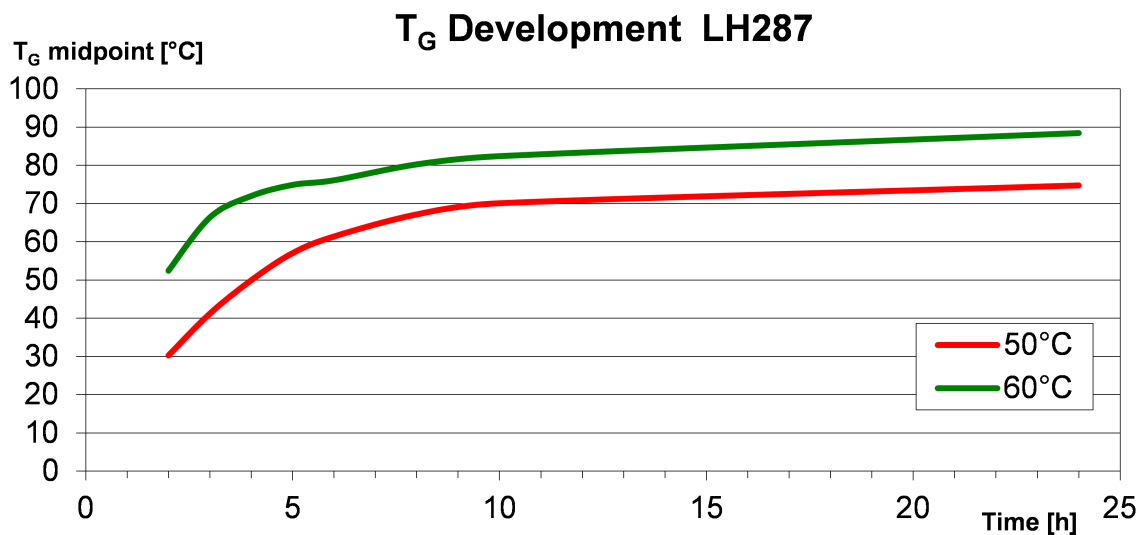
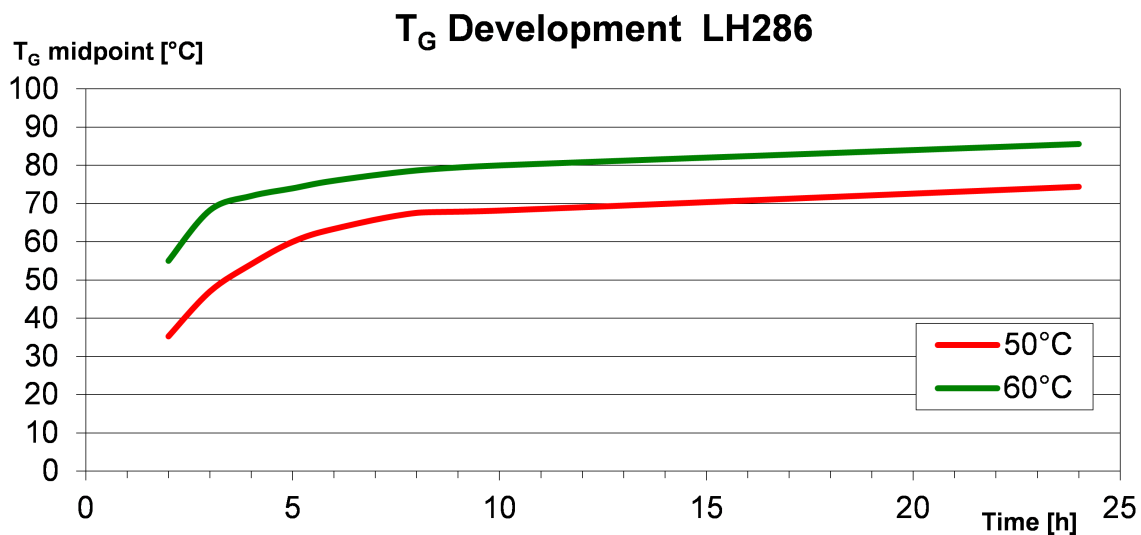
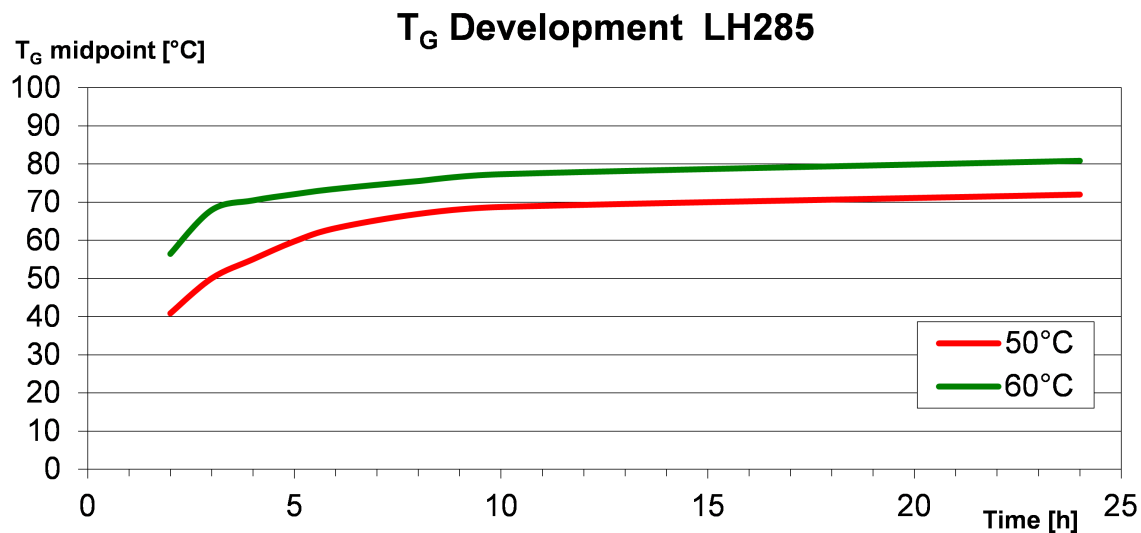
Measuring conditions: Film thickness 1 mm at different temperatures

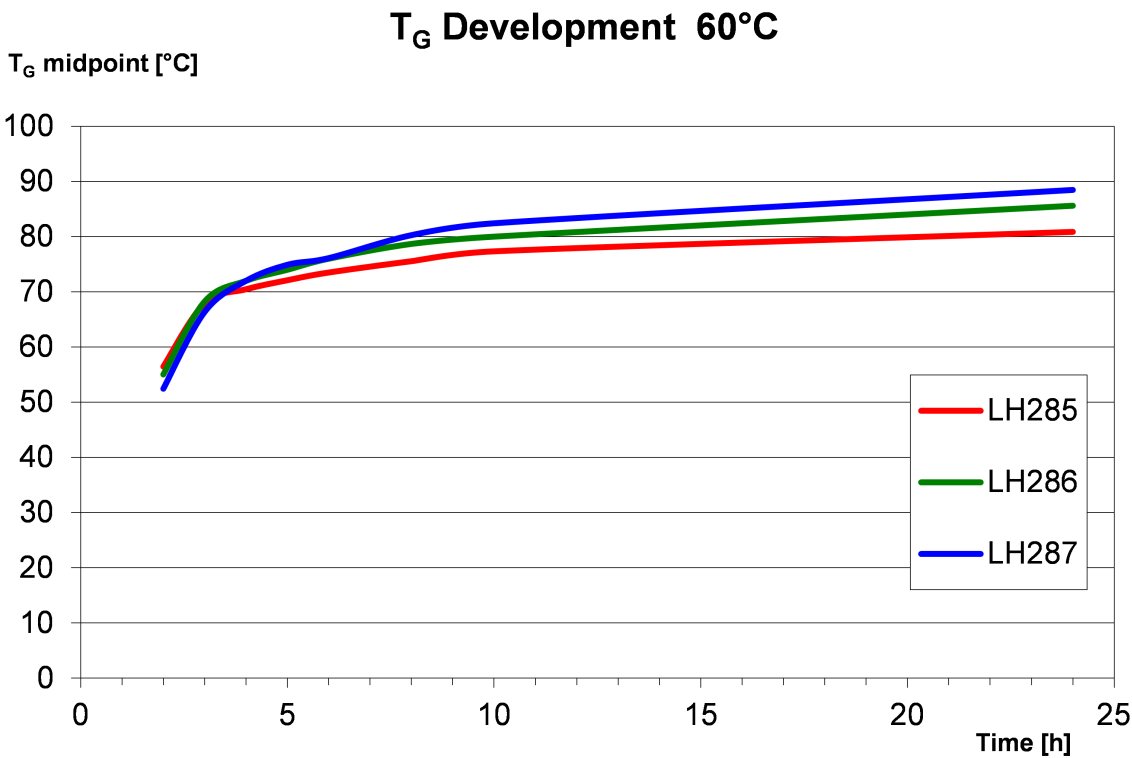
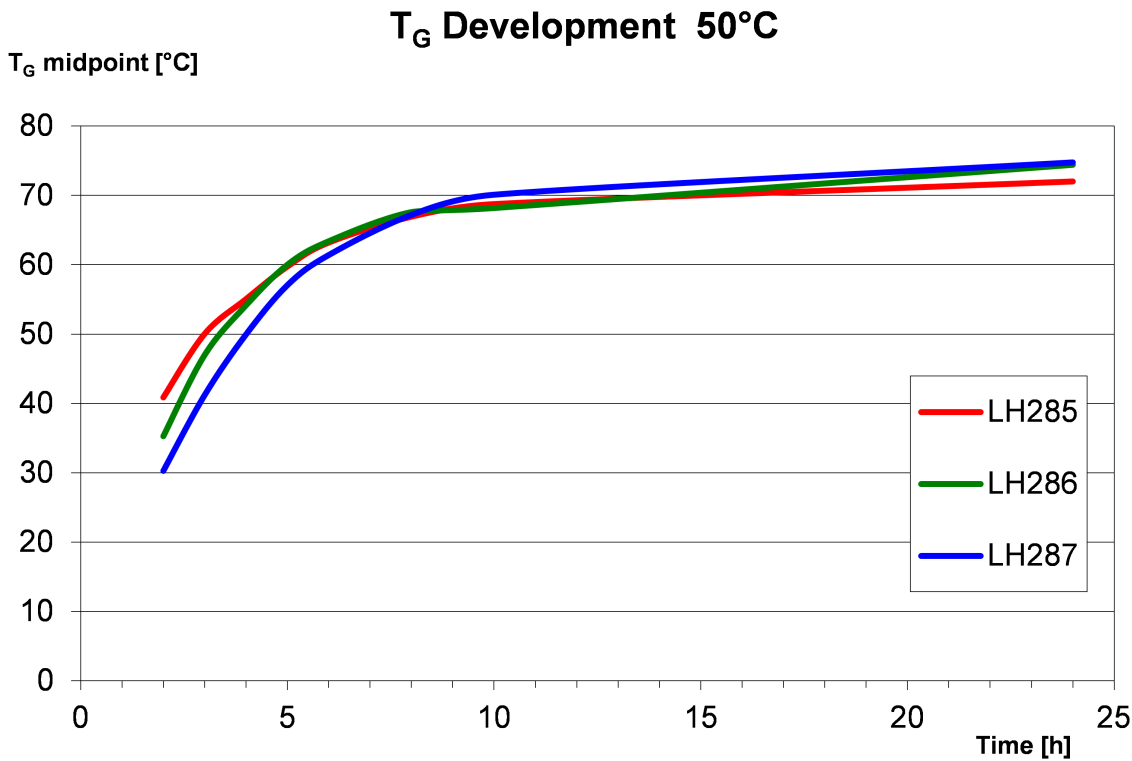
VELOCITY OF MIXTURE



Measuring conditions: rotation viscometer, plate-plate configuration, measuring gap 0.2 mm

T_g DEVELOPMENT





Measuring conditions for all T_G measurements: DSC, ISO 11357
MECHANICAL DATA OF NEAT RESIN

EPIKOTE™ Resin MGS™ LR285 and EPIKURE™ Curing Agent MGS™ LH285-287

Mechanical data			
Density	EN ISO 1020-1	[g/cm ³]	1.18 – 1.20
Tensile strength	EN ISO 178	[MPa]	110 – 120
Elongation at rupture	EN ISO 178	[%]	3.0 – 3.5
Bending strength	EN ISO 527-2	[MPa]	70 – 80
Compression strength	EN ISO 527-2	[MPa]	120 – 140
Impact strength	EN ISO 627-2	[J/m]	0.9 – 0.8
UL 94 V-1		[s/m]	40 – 55
Water absorption at 23°C	EN ISO 178	[%]	0.20 – 0.25
EN ISO 178		[%]	0.03 – 0.03

Advice:
Mechanical data are typical for the combination of laminating resin LR285 with curing agent LH287. Data can differ in other applications.

MECHANICAL DATA OF REINFORCED RESIN			
Mechanical data	Glass fibre	Carbon fibre	Aramid fibre
Tensile strength	510 ~ 560	720 ~ 770	800 ~ 850
Tensile strength	270 ~ 320	470 ~ 520	490 ~ 540
Compression strength	410 ~ 460	600 ~ 610	140 ~ 150
Compression shear strength	17 ~ 20	41 ~ 48	19 ~ 23
Modulus of Elasticity	20 ~ 25	40 ~ 50	10 ~ 15
Density: 600 at 23°C, 130 at 60°C			

Glass fibre laminate	
10 layers of glass fabric, 84 satin, 236 g/m ² , 4 mm thick	
Carbon fibre laminate	
6 layers of carbon fabric, plain weave, 250 g/m ² , 3 mm thick	
Aramid fibre laminate	
15 layers of aramid fabric, 84 satin, 170 g/m ² , 4 mm thick	
Flow content of sample during processing: 40 ~ 45 vol%	
Data calculated for flow content of 42 vol%	

Advice:
Mechanical data are typical for the combination of laminating resin LR285 with curing agent LHC357. Data can differ in other applications.

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