

EPIKOTE™ Resin L 1100 - set

Features

- Certified by German Lloyd
- Low viscosity
- Various adjustable pot life

Applications

EPIKOTE™ Resin L 1100 epoxy resin with the hardeners EPIKURE™ Curing Agent 294 until EPIKURE™ Curing Agent 297 produces a low viscosity laminating mixture with outstanding wetting and adhesion characteristics on glass, carbon and aramid fibres. The pot life of these systems are various adjustable.

These systems fulfil the German Lloyd approval and find particular applications in glider and boat building.

Product Physical Properties: (at time of Manufacturing)				
Property	Unit	EPIKOTE™ Resin L 1100	EPIKURE™ Curing Agent 293	EPIKURE™ Curing Agent 294
Viscosity at 25 °C	mPa·s	1600 ± 200	25 ± 10	10 ± 5
Epoxy equivalent	g/equiv.	192 ± 4		
Amine equivalent	g/equiv			56 ± 2
Density at 20 °C	g/cm ³	1.15 ± 0.01		0.934 ± 0.020
Mixing viscosity at 25°C	mPa·s		~ 250	~ 290
Pot life	min		330	400

Product Physical Properties: (at time of Manufacturing)				
Property	Unit	EPIKURE™ Curing Agent 295	EPIKURE™ Curing Agent 296	EPIKURE™ Curing Agent 297
Viscosity at 25 °C	mPa·s	30 ± 10	400 ± 100	30 ± 20
Amine equivalent	g/equiv.	55 ± 2	58 ± 2	58
Density at 20 °C	g/cm ³	0.974 ± 0.020	1,07 ± 0,02	0.95 ± 0.01
Mixing viscosity at 25°C	mPa·s	~ 380	650 ± 200	~ 380
Pot life	min	15	25	500

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Processing Details

Mixing ratio

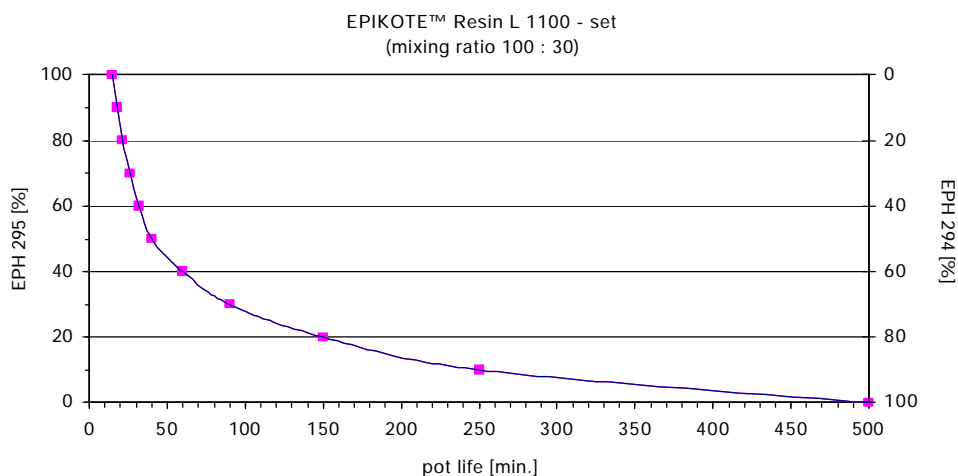
EPIKOTE™ Resin L1100 + EPIKURE™ Curing Agent 293 – 297 100 : 30

Mixing tolerance

The maximum allowable mixing tolerance is ± 2 pbw, but it is particularly important to observe the recommend mixing ratio as exactly as possible. Adding more or less Hardener will not effect a faster or slower reaction - but an incomplete curing which cannot correct in any way. Resin and Hardener must be mixed very thoroughly. Mix until no clouding is visible in the mixing container. Pay special attention to the walls and the bottom of the mixing container.

Processing Temperature

A good processing temperature is in the range between 25°C and 35°C. Higher processing temperatures are possible but will shorten the pot life. A rise in temperature of 10°C reduces the pot life by approx. 50%. Different temperatures during processing have no significant effect on the strength of the hardened product.



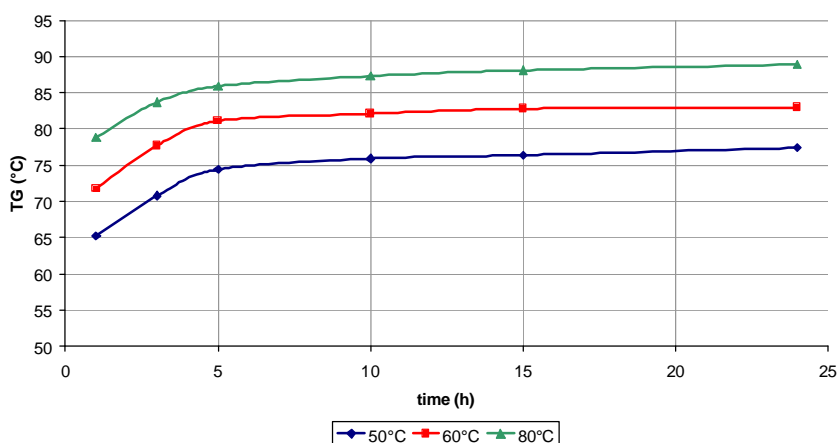
Do not mix large quantities at elevated processing temperatures. The mixture will heat up fast because of the dissipating reaction heat (exothermic reaction). This can result in temperatures of more than 200°C in the mixing container.

The different pot lives are measured on mixtures each of 100 g starting at 20 - 25 °C. Larger batches should be prepared only, if a quick consumption is possible within the operational life.

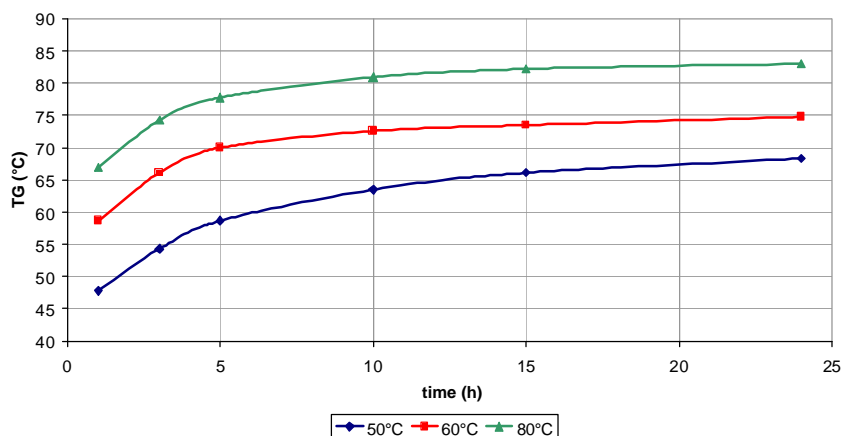
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Exemplify Curing Cycle		
System	Precuring	Postcuring
EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 293		
EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 294	10-15h RT or 3h 50 – 60°C	10h 70°C
EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 295	10h RT	15h 50 – 80°C
EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 297	24h RT or 3h 50 - 60°C	15h 50 - 80°

increase of glass transition temperature at different curing conditions with the hardeners EPH 295 and EPH 296



increase of glass transition temperature at different curing conditions with the hardeners EPH 294 and EPH 297



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EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 293 Properties of the cured, reinforced Resin System Curing: 5h at 50°C		
Property	Unit	Value
Flexural strength	MPa	912
Modulus in flexure	MPa	36630
ILSS short beam	MPa	54
T _G	°C	80

The values are measured on 3mm laminates (3 layers of Saertex V95892-01200 [glass fabric UD 0°/0°/0°]).

EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 293 Properties of the cured, non-reinforced Resin System Curing: 15 h RT + 2 h 60 °C + 2 h 70 °C			
Property	Methods	Unit	Value
Density at 20 °C	DIN 53479	g/cm ³	1,14
Tensile strength	DIN 53455	MPa	66,4
Elongation at break	DIN 53455	%	4,3
Modulus in tensile	DIN 53457	MPa	2980
Flexural strength	DIN 53452	MPa	112,7
Modulus in flexure	DIN 53457	MPa	2448
T _G (TMA)	DIN 53461	°C	75,7
Water absorption	DIN 53495 process 1 L	weight %	24 h, 23 °C 0,127
			168 h, 23 °C 0,237

EPIKOTE™ Resin L 1100 - set

EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 294 Properties of the cured, reinforced Resin System Curing: 5h at 50°C		
Property	Unit	Value
Flexural strength	MPa	910
Modulus in flexure	MPa	34220
ILSS short beam	MPa	54
T _G	°C	80

The values are measured on 3mm laminates (3 layers of Saertex V95892-01200 [glass fabric UD 0°/0°/0°]).

EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 294 Properties of the cured, non-reinforced Resin System Curing: 15 h RT + 2 h 60 °C + 2 h 70 °C			
Property	Methods	Unit	Value
Density at 20 °C	DIN 53479	g/cm ³	1.135
Tensile strength	DIN 53455	MPa	65.4
Elongation at break	DIN 53455	%	9.0
Modulus in tensile	DIN 53457	MPa	3160
Flexural strength	DIN 53452	MPa	110
Modulus in flexure	DIN 53457	MPa	2.730
Barcol - Hardness			28 ± 2
T _G (TMA)	DIN 53461	°C	80
Water absorption	DIN 53495 process 1 L	weight %	24 h, 23 °C 0,13
			168 h, 23 °C 0,34

EPIKOTE™ Resin L 1100 - set

EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 295 Properties of the cured, reinforced Resin System Curing: 5h at 50°C		
Property	Unit	Value
Flexural strength	MPa	
Modulus in flexure	MPa	
ILSS short beam	MPa	
T _G	°C	

The values are measured on 3mm laminates (3 layers of Saertex V95892-01200 [glass fabric UD 0°/0°/0°]).

EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 295 Properties of the cured, non-reinforced Resin System Curing: 15 h RT + 2 h 60 °C + 2 h 70 °C			
Property	Methods	Unit	Value
Tensile strength	DIN 53455	MPa	72.3
Elongation at break	DIN 53455	%	4.0
Modulus in tensile	DIN 53457	MPa	3779
Flexural strength	DIN 53452	MPa	109
Modulus in flexure	DIN 53457	MPa	3120
Barcol - Hardness			28 ± 2
T _G (TMA)	DIN 53461	°C	83

EPIKOTE™ Resin L 1100 - set

EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 296 Properties of the cured, reinforced Resin System Curing: 5h at 50°C		
Property	Unit	Value
Flexural strength	MPa	
Modulus in flexure	MPa	
ILSS short beam	MPa	
T _G	°C	

The values are measured on 3mm laminates (3 layers of Saertex V95892-01200 [glass fabric UD 0°/0°/0°]).

EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 296 Properties of the cured, non-reinforced Resin System Curing: 15 h RT + 2 h 60 °C + 2 h 70 °C			
Property	Methods	Unit	Value
Density at 20 °C	DIN 53479	g/cm ³	1,1837
Tensile strength	DIN 53455	MPa	83,0
Elongation at break	DIN 53455	%	5,3
Modulus in tensile	DIN 53457	MPa	3455
Flexural strength	DIN 53452	MPa	130,9
Modulus in flexure	DIN 53457	MPa	3097
T _G (TMA)	DIN 53461	°C	85,5
Water absorption	DIN 53495 process 1 L	weight %	24 h, 23 °C 0,114
			168 h, 23 °C 0,287

EPIKOTE™ Resin L 1100 - set

EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 297 Properties of the cured, reinforced Resin System Curing: 5h at 50°C		
Property	Unit	Value
Flexural strength	MPa	
Modulus in flexure	MPa	
ILSS short beam	MPa	
T _G	°C	

The values are measured on 3mm laminates (3 layers of Saertex V95892-01200 [glass fabric UD 0°/0°/0°]).

EPIKOTE™ Resin L 1100 – EPIKURE™ Curing Agent 297 Properties of the cured, non-reinforced Resin System Curing: 15 h RT + 2 h 60 °C + 2 h 70 °C			
Property	Methods	Unit	Value
Density at 20 °C	DIN 53479	g/cm ³	1.1369
Tensile strength	DIN 53455	MPa	72.2
Elongation at break	DIN 53455	%	3.7
Modulus in tensile	DIN 53457	MPa	3315
Flexural strength	DIN 53452	MPa	110.2
Modulus in flexure	DIN 53457	MPa	3076
T _G (TMA)	DIN 53461	°C	89.0
Water absorption	DIN 53495 process 1 L	weight %	24 h, 23 °C 0,107
			168 h, 23 °C 0,285

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Shelf Life

The Resin and Hardener can be stored at 20- 25°C for at least 36 months for the curing agent and for the resin in their carefully sealed original containers.

It is rarely possible that the resin or the hardener crystallize at temperatures below 15°C. The crystallisation is visible as a clouding or solidification of the content of the container. Before processing, the crystallisation must be removed by warming up. Slow warming up to 50- 60°C in a water bath or oven and stirring or shaking will clarify the contents in the container without any loss of quality. Use only completely clarify products. Before warming up, open containers slightly to permit equalization of pressure. Caution during warm up! Do not warm up over open flame!

Precautions

For information about safe handling of EPIKOTE epoxy resins and EPIKURE Curing Agents, please note the corresponding Safety Data Sheet.