Poxy-Systems

Technical data

Epoxy resin L

+ Hardener S, L, EPH 161 and EPH 500

Description

- **Low viscosity, free of solvents and fillers**
- **Fast impregnation of glass, aramid, and carbon fibres**
- **High static and dynamic strength**

The R&G epoxy resin L is a bisphenol A/F resin. The bisphenol F component reduces the viscosity and prevents the resin from forming crystals at low storage temperatures (less than +5 °C).

The resin is diluted with a difunctional compound and is generally regarded as having a good physiological tolerance.
Owing to its low surface tension the system exhibits good filler absorption properties. And it has excellent wetting properties with respect to reinforcing fibres of glass, aramid, and carbon.

Application

Fibre composites (GRP, SRP, CRP) in (ultralight) aircraft construction, model construction, design of sports equipment, mould construction, and motor sports.

Processing

The resin is suitable for all processing methods, e.g. hand lay-up operations, winding, casting, and press moulding (also in vacuum).
Metal, wood, plastics, ceramics, etc., can be joined with high-strength bonds without the application of contact pressure.
Curing takes place virtually free of shrinkage.

The **hardeners S, L, EPH 161 and EPH 500** are formulations of aliphatic and cycloaliphatic amines. They define the properties of the moulded materials.

Single component: 2,5 kg - 200 kg order no. 100 135-X, set of two components: (look hardener)

Hardeners

The hardeners exhibit different processing times so that you can select the one best suited to your needs:

Hardener S	Hardener L	Hardener EPH 161	Hardener EPH 500
Fast hardener for small components and glued bonds. Free of nonylphenol and benzyl alcohol **Curing temperatures from 5 °C**	Medium pot life of 40 minutes. Type L is the **most commonly used hardener**. Free of nonylphenol **Curing temperatures from 12 °C**	This is ideal for **heatproof** components up to about 120 °C and for casts up to 10 mm thick in one working cycle. Cold-curing, annealing needed before applications in aircraft construction (with resin L 20) or in boat building (with resin L). **Curing temperatures from 18 °C**	Hardener with medium pot life for many applications in model- and sports equipment construction. Absolute **stick-free surfaces,** extensively light resistant and color fast. **Curing temperatures from 10 °C**

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Epoxy resin L	Unit	Value
Delivered state	-	liquid
Colour	-	yellowish
Density	g/cm³/20 °C	1,15
Viscosity	mPa*s/25 °C	700
Epoxy value	100/equivalent	0,56
Epoxy equivalent	g/equivalent	179
Chlorine content total	%	< 1
Chlorine content hydrolysable	ppm	< 500
Vapour pressure	mbar/ 25 °C	< 1
Refractive index	n_D 25	1,547
Flash point (DIN 51584)	°C	>120
Storage (sealed, at 15 °C)	months	36

Hardener S

Description

- **Hardener for epoxy resin L**
- **Processing time 15 minutes**
- **Free of nonylphenol and benzyl alcohol**
- **Curing temperatures from 10 °C**

Application

Modified cycloaliphatic polyamine hardener for small laminates, glued joints, and repairs.
Good static and dynamic strength. Fast curing in the thinnest layers as well.

Owing to the high reactivity and the resulting reaction heat, laminates may not be manufactured with a thickness exceeding 5 mm in one working cycle.

Single components: 1 kg - 25 kg order no. 100 140-X, sets of two components: 280 g package order no. 100 105-1, 1 kg package order no. 100 100-1

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Hardener L

Description

- **Hardener for epoxy resin L**
- **Processing time 40 minutes**
- **Free of nonylphenol and benzyl alcohol**
- **Curing temperatures from 12 °C**

Application

Modified cycloaliphatic polyamine hardener for larger laminates, glued joints, and mould construction.
Good static and dynamic strength, fast curing in the thinnest layers as well.

Hardener L is the most frequently used hardener for epoxy resin L.
Owing to the high reactivity and the resulting reaction heat, laminates may not be manufactured with a thickness exceeding 8 mm in one working cycle.

Single components: 1 kg - 10 kg order no. 100 145-X, sets of two components: 140 g package order no. 100 113-1, 280 g package order no. 100 115-1, 1 kg package order no. 100 110-1

Hardener EPH 500

Description

- **Hardener for epoxy resin L**
- **Processing time 60 minutes**
- **Curing temperatures from 10 °C**
- **Absolute stick-free surfaces**

Application

Hardener with medium pot life for many applications in model- and sports equipment construction. Absolute stick-free surfaces, extensively light resistant and color fast.

Single components: 1,58 kg - 25,2 kg order no. 100 147-X, set of two components: 1,165 kg package order no. 100 106-2

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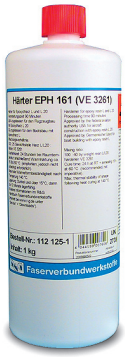
Hardener EPH 161



Description

- **Hardener for epoxy resin L and L 20**
- **Processing time 90 minutes**
- **LBA-approved for the construction of gliders with resin L 20**

Application

For heat-resisting laminates up to max. 120 °C in conjunction with epoxy resin L and L 20.
Components of this system are curing very good at room temperature and can be demoulded and processed without difficulty. The system yields a low-viscosity laminating resin that exhibits superior impregnating and wetting properties to glass, aramid, and carbon fibres.The static and dynamic stability is very good..

To increase the heat resistance and get ideal mechanical strength properties, the components must be post cured with higher temperature. As standard value a post-curing about 15 hours at approx. 60 °C is recommended. The Tg-forerun averages approx. 20 °C. That means:

Curing temperature (15 h)	approx. heat resistance
60 °C	80 °C
70 °C	90 °C
80 °C	100 °C
90 °C	110 °C
100 °C	120 °C

At a curing temperature of 100 ° C, the maximum heat resistance of about 120 ° C is achieved.

Single component: 1 kg - 25 kg order no.. 112 125-X, set of two components: 250 g package order no. 100 130-0, 895 g package order no. 100 130-1

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General data of the hardeners for epoxy resin L	Unit	Hardener S	Hardener L	Hardener EPH 161	Hardener EPH 500
Processing time 100 g - mixture	minutes /20 °C	15	40	90	60
Mixing ratio at 100 parts by weight epoxy resin L	weight (g)	40	40	25	63
Curing time (Laminate 1mm)	hours/20 °C	24	24	24 +15 at 60 °C	24
Heat resistance of components	°C (approx.)	60	60	120	60
Delivery state	-	liquid	liquid	liquid	liquid
Colour	-	light yellow	light yellow	light yellow	water clear
Density	g/cm³/20 °C	1,02	1,01	1,0	1,02
Viscosity	mPa*s/25 °C	370	320	200	500
Amine equivalent (mean)	g/equivalent	71	71	44,5	112
Refractive index	n_D 25	1,530	1,521	-	1,530
Storage (sealed, at 15 °C)	months	12	12	12	12

Data of the unreinforced cured resin (cured 7 days at RT)	Unit	Specifications	Hardener S	Hardener L	Hardener EPH 161 *1)	Hardener EPH 500
Flexural strength	MPa	90	98	98	112	k. A.*2)
Tensile strength	MPa	55	63	62	70	
Elongation at break	%	-	4,5	4,5	7	
Compressive strength	MPa	120	115	118	123	
Impact strength	kJ/m²	-	25	25	16,5	
Modulus of bending test	MPa	$2,8 \cdot 10^3$	$2,8 \cdot 10^3$	$2,8 \cdot 10^3$	$2,66 \cdot 10^3$	
Tensile modulus	MPa	-	-	$2,65 \cdot 10^3$	$2,96 \cdot 10^3$	
HDT	°C	-	-	65	91,9	
Water resumption	Gew.-%	-	-	0,166 (24 h, 23 °C) 0,433 (168 h, 23 °C)	0,166 (24 h, 23 °C) 0,433 (168 h, 23 °C)	

*1) Values after curing for 7 days at room temperature +15 h at 60 ° C

*2) No information

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Specifications of reinforced resin (cured 7 days at RT)	Unit	Specifications	Hardener S	Hardener L	Hardener EPH 161 *1)	Hardener EPH 500
Flexural strength	MPa	400	510	509	485	308
Tensile strength	MPa	350	450	440	-	407
Compressive strength	MPa	270	390	326	380	203
Impact strength	kJ/m²	-	238	223	-	-
Tensile modulus	MPa	$1{,}75 \cdot 10^4$	$2{,}7 \cdot 10^4$	$2{,}7 \cdot 10^4$	$2{,}2 \cdot 10^4$	$2{,}5 - 10^4$
Interlaminar shear strength	MPa	28	37	39	44	25

Specimens 4 mm plates of 16 layers Interglas 91745, US Style 181, 286 g/m², satin weave

*1) Values after curing for 7 days at room temperature +15 h at 60 ° C

*2) No information

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