


*Composites.  
The High-performance Programme.*

*tooling resins   blocks   auxiliaries   silicones*

**ebalta**  
solution takes shape

## *Epoxy resin systems are our world. And composites the future.*

*30 years of experience in the production of high-quality tooling resins – this was the driving motivation for **ebalta** to devote itself to the development of first-class epoxy resin systems for composites. The result: a portfolio of innovative, high-quality materials and products for high-performance composites – accompanied by unparalleled know-how in mould making and first-class support. The **ebalta** epoxy resin systems are ideal for the manufacture of composite components and mould making.*



### *The innovation factor: high-tech materials for composite parts*

High-tech products require high-tech materials. Whether boatbuilding, aviation, automotive or space flight – products at the limits of what is technically possible demand much more than simply efficient materials. Regardless of the processing method you use to manufacture composite components – vacuum technology, hand laminating or RTM – high-quality epoxy resins from **ebalta** guarantee composite parts that perfectly meet the highest requirements.

The intensive support and local presence that **ebalta** provides is an important element in guaranteeing successful results. **ebalta** is your one-stop supplier – from materials for mould making and vacuum processing and the necessary know-how right through to high-quality epoxy resin systems. You can rely on experienced specialists to provide intensive support and advice from the first contact through to the end of the project.

# Customers are people. Not a balance sheet.

*What counts is your satisfaction. Our specialists are there at your side from the first intensive consultation on the choice of materials and manufacturing methods through to continuous on-the-spot support.*

## *Vacuum infusion – the method of the future*

Vacuum infusion offers great advantages over all other common composite methods in terms of efficiency, emission loads, fibre volume content and pot lives. Our specialists are highly experienced in vacuum infusion and will be pleased to assist your project with intensive customer training. Should you have any specific questions on products or the manufacturing process, just contact your local sales agent.

## *High quality and efficient: our composite resin systems and materials for composites*

- Epoxy resin systems with GL-approval (laminating and infusion resins)
- Resin systems for mould making (laminating and infusion resins) for job lots and series
- Consumables for vacuum bagging and vacuum infusion processes
- Reinforcing fibres (fabric, mat)
- Core materials for sandwich laminates
- Lay-up pastes
- Block and board materials
- Auxiliaries and additional products

## *Fast, guaranteed: worldwide distribution network*

No matter what your request might be: **ebalta** will deliver your product quickly and reliably – including customer support, order assembly and shipping – so that you can concentrate on what's important to you: composite parts.

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**ebalta** *composite resins.*  
*For your strongest ideas.*





# Epoxy resin systems for composites

**ebalta** epoxy resin systems for composites have been specially developed for the manufacturing of high-strength components reinforced with glass and carbon fibres. They are used, for example, in high-tech fields such as racing, boatbuilding, the automotive industry, rail vehicle construction and wind turbines.

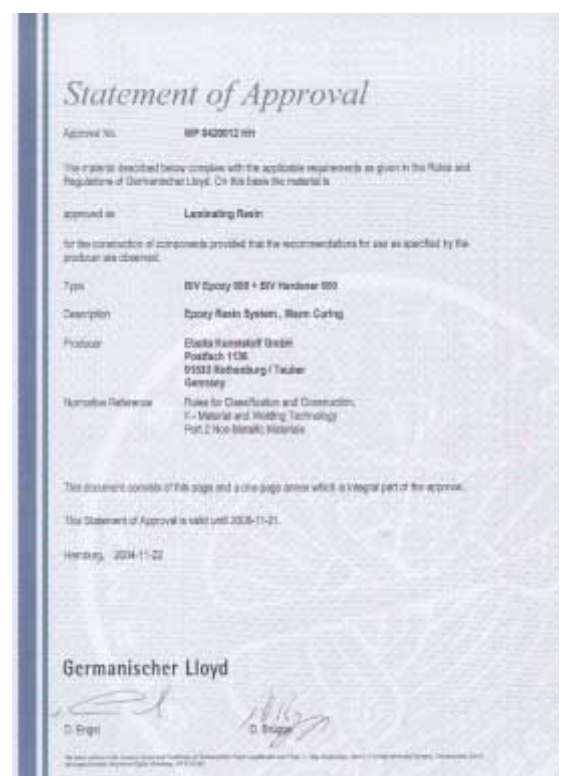
Temperature range T <sub>g</sub>	80-90 °C					
Resin	BIV Epoxy 800		BLH Epoxy 200			LH 25
Hardener	K 25	BIV Hardener 800	K 25	K 30	W 400	LH 25 Hardener
Mixing ratio (p.b.w.)	100:30		100:30			100:15
Pot life approx. [min] 200 g (20 °C)	25	290	20	30	250	50 / 80
Mixing viscosity [mPas] (25 °C)	550	190	650	380	250	950
Glass transition temperature T <sub>g</sub> approx. [°C] after curing	79	82	85	81	80	89
Curing [h / °C]	4-6 / 80	4-6 / 80	12-15 / 50-80	12-15 / 50-80	10-12 / 70	12-16 / 80
Properties and applications	<ul style="list-style-type: none"> <li>• Very low viscosity system for vacuum infusion and RTM</li> <li>• With BIV hardener 800 GL-approval for boatbuilding applications</li> <li>• The system can be accelerated by mixing the BIV hardener 800 (transparent) with K 25 (green)</li> </ul>		<ul style="list-style-type: none"> <li>• Low viscosity system for hand laminating and vacuum bagging</li> <li>• With hardener K 25 and W 400 GL-approval for boatbuilding applications</li> <li>• The system can be accelerated by mixing the hardener W 400 with K 30 (transparent) or K 25 (green)</li> </ul>			<ul style="list-style-type: none"> <li>• Flameproof laminating resin for precision components</li> <li>• Combustibility class S 4, smoke development class SR-2</li> <li>• 2 hardener variants with various pot lives</li> <li>• Colour: white</li> </ul>

## Advantages of **ebalta** epoxy resins

High-quality **ebalta** epoxy resins have numerous advantages compared to polyester resins:

- Lower component weight with identical strength
- Better mechanical properties:
  - tensile strength, flexural strength and elongation at break much higher
  - shrinkage much lower
- Parts are of a higher quality and have a longer service life
- High osmosis resistance
- No unpleasant smells

GL-approval as boatbuilding resins  
for BIV Epoxy 800 and BLH Epoxy 200



up to 100 °C				up to 120 °C			up to 150 °C	up to 175 °C	up to 200 °C
<b>AH 110</b>				<b>AH 140</b>			<b>LH 27</b>	<b>LH 28-1</b>	<b>LH 30</b>
SR	TGS	TGL	TL	TC 30	TC 60	TC 180	LH 27 Hardener	TM	LH 30 Hardener
100:22			100:24	100:30			100:32	100:40	100:42
10	25	60	90	30	60	180	240	150	180
1850	1300	1000	1400	550	600	550	500	750	2200
100	97	102	110	111	114	118	150	175	200
12 / 80	12 / 80	12 / 80	12 / 80	4-6 / 60 + 5-6 / 80	4-6 / 60 + 5-6 / 80	4-6 / 60 + 5-6 / 80	2 / 75 + 4 / 160	Chute approx. 10 °C/h + 4 / 135	Chute approx. 10 °C/h + 4 / 180
<ul style="list-style-type: none"> <li>• High-strength laminating resin</li> <li>• Bonding resin for fillers</li> <li>• Temperature-resistant, high-viscosity system</li> <li>• Hardener SR, TGL and TGS also cure well at room temperature</li> </ul>				<ul style="list-style-type: none"> <li>• Temperature-resistant, low-viscosity system for carbon fibre visible parts</li> <li>• Hardener TC 30 and TC 60 also cure well at room temperature</li> </ul>			<ul style="list-style-type: none"> <li>• High-temperature resistant, low-viscosity system for components and moulds</li> </ul>	<ul style="list-style-type: none"> <li>• High-temperature resistant system for components and moulds</li> </ul>	<ul style="list-style-type: none"> <li>• High-temperature resistant laminating and bonding resin for moulds</li> </ul>

## Gel coats for parts and moulds

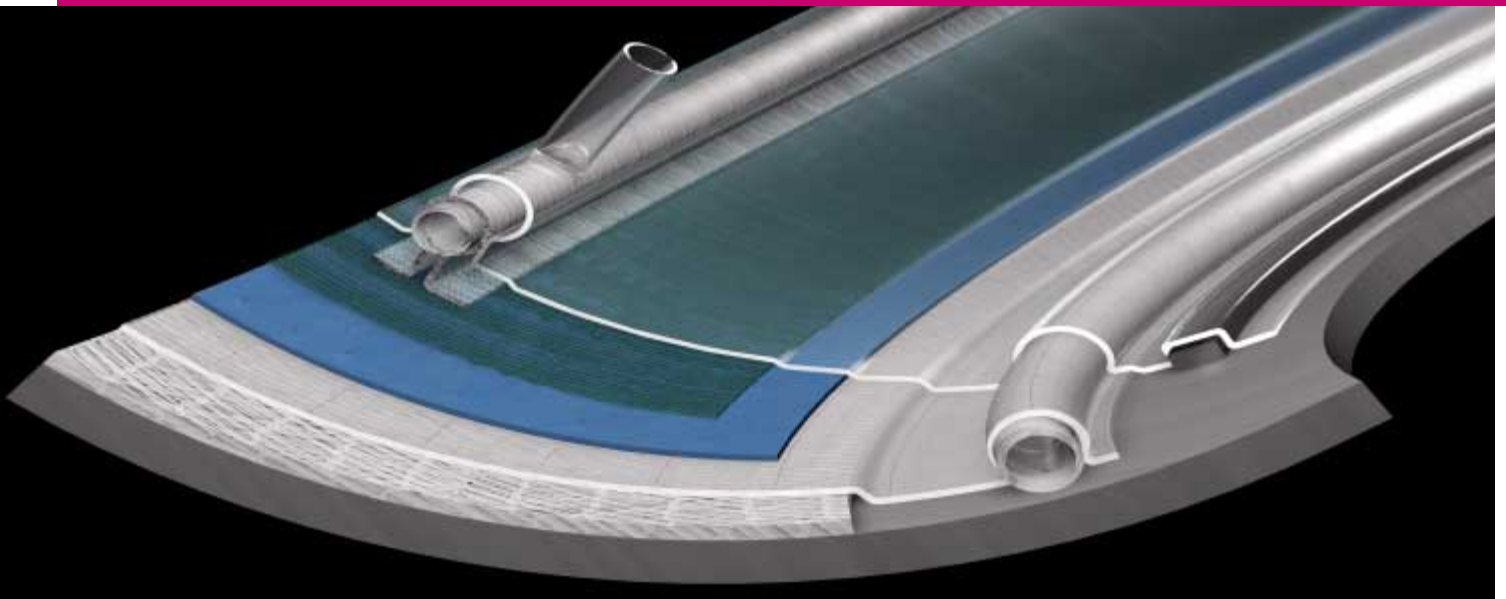
These gel coats are used in boatbuilding as well as for prepreg and laminating tools. **ebalta** gel coats are easy to process and have good mechanical properties. Individual resin-hardener combinations are available depending on requirements.

Temperature range T <sub>g</sub>	up to 80 °C		up to 100 °C	up to 120 °C	up to 175 °C
Resin	<b>OH 24</b>		<b>OH 35</b>	<b>OH 35</b>	<b>OH 82</b>
Hardener	K 25	W 400	CH-1	HM	TM
Mixing ratio (p.b.w.)	100:12		100:16	100:14	100:31
Pot life approx. [min] 200 g (20 °C)	25-30	400-480	20-30	20-30	240
Glass transition temperature T <sub>g</sub> approx. [°C] after curing	72	75	108	122	175
Curing [h / °C]	12-15 / 50-80	10-12 / 70	10-12 / 60-80	6 / 60 + 4 / 80 + 4 / 120	Chute approx. 10 °C/h + 4 / 135
Properties and applications	<ul style="list-style-type: none"> <li>• Gel coat for components, particularly in boatbuilding</li> </ul>		<ul style="list-style-type: none"> <li>• Gel coat for moulds</li> <li>• Polishable</li> <li>• Grinding possible</li> </ul>	<ul style="list-style-type: none"> <li>• Gel coat for moulds, prepreg and laminating tools</li> <li>• Polishable</li> <li>• Grinding possible</li> </ul>	<ul style="list-style-type: none"> <li>• High-temperature resistant gel coat for moulds</li> </ul>

All data are for information only and contain no guarantee for certain features or properties of the products.

## Vacuum infusion – modern manufacturing for high-quality composite parts

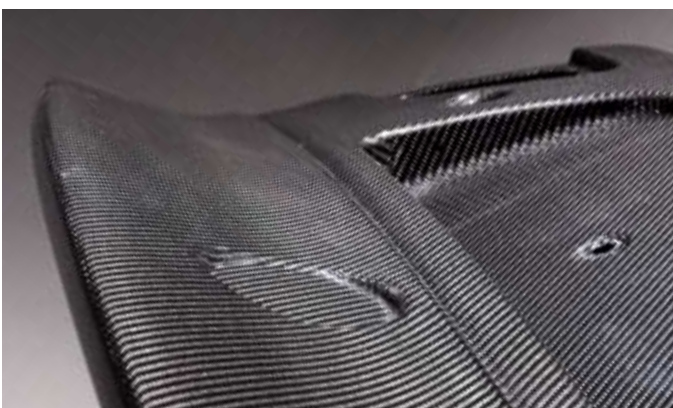
Special manufacturing methods are used for composite parts that have to provide a high level of strength and longevity. A higher fibre and lower resin share with an identical component weight is achieved by vacuum methods such as vacuum infusion.



During vacuum infusion, resin is sucked into the fibre material by applying a vacuum. The method works as follows:

1. The various fabrics are cut to size and placed in the tools or moulds in dry condition depending on the desired wall thickness and strength.
2. The peel ply is then placed on the glass or carbon fibre fabric followed by the perforated release film. Flow medium and hoses can be easily removed through

- the perforated release film after curing of the resin.
3. The flow medium is now placed in position and fixed.
4. The resin feed and vacuum hoses are attached and fixed with an adhesive tape.
5. The vacuum film is then applied and sealed with the aid of special sealing adhesive tapes.
6. The resin is now sucked in through the resin feed and is distributed over the entire component.

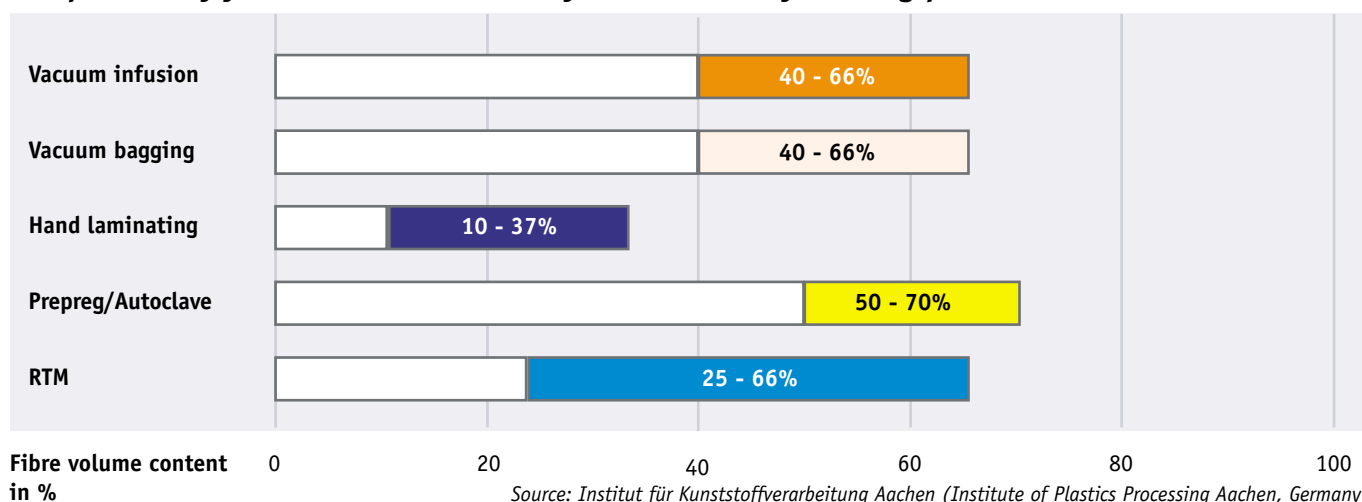




## High fibre volume content for the highest requirements

Wherever high quality is needed or large components are involved – vacuum infusion has crucial advantages compared to other manufacturing processes: an excellent cost-quality ratio, enormous strength and great progress towards occupational safety and efficiency. No matter which demanding manufacturing process you choose – **ebalta** offers the resin system that suits your needs.

### Comparison of fibre volume contents of various manufacturing processes



#### Advantages of vacuum infusion compared to hand laminating

- Closed process and clean working conditions: fibres are inserted in dry condition (greater occupational safety: significant reduction of emission load)
- Lower resin content in component
- Lower weight with identical strength
- Constant quality of components (even and bubble-free saturation), resin content fluctuates by less than 0.5 %, almost no differences in thickness
- Time savings, decisive advantages above all for larger parts with core material

#### compared to vacuum bagging

- Lower resin requirement for larger parts
- Better surface quality of components
- Closed process and clean working conditions

#### compared to prepreg/autoclave

- No procurement costs for autoclave
- Thick laminates can be produced in one step (no debulking necessary)







#### compared to RTM (Resin Transfer Moulding)

- Lower tool costs
- No expensive injection system
- RTM only becomes economical as of around 100 pieces



## Vacuum consumables and accessories

High-quality laminates with an even resin distribution have to cure in a vacuum. **ebalta** offers not only a starter kit for vacuum infusion but also various accessories for vacuum technology.

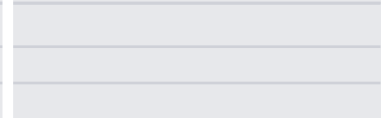
<i>Peel ply</i>	Leaves an even, rough and dust-free surface on the laminate after removal. Optimum adhesion of subsequent layers even without sanding.	
<i>Perforated release film</i>	Separates the flow medium from the peel ply. Resin enters the laminate through the perforations.	
<i>Flow medium</i>	For an even and rapid flow of resin during vacuum infusion.	
<i>Vacuum bagging film</i>	Encloses the mould in a vacuum. Is applied at the end and bonded with sealing tape.	
<i>Sealing tape for vacuum bagging film</i>	To stick and seal the vacuum bagging film.	
<i>Spiral hose</i>	To feed and distribute the resin and extract the air beneath the film.	
<i>Plastic hose</i>	To suck in the resin.	
<i>Connectors</i>	T-pieces to connect the hoses.	
<i>Adhesive spray for fabrics</i>	To fix the fabrics and vacuum materials.	
<i>Multipack vacuum infusion</i>	Starter kit with films, sealing and adhesive tapes, peel ply, flow medium, hoses, hose clips, T-connectors, bucket, catalogue, optionally with or without resin trap and resin.	

Are you looking for a specific product? Simply give us a call if you can't find what you are looking for. Phone: +49 9861 7007-0

## Additional products for model, mould and tool making

Our experts have compiled an extensive range of additional products for all stages of work with composites. From mould making to parts production and material processing, we can offer a comprehensive assortment of products.

<i>Epoxy resin boards for prepreg tooling moulds</i>	<i>Properties</i>	<i>Dimensions</i>		
		Thickness	Width	Length
<b>Aeroboard 70</b>	Low coefficient of thermal expansion	51 mm	610 mm	1524 mm
Working temperature 70 °C	High temperature resistance			
Density: 0.63 kg/dm <sup>3</sup>	No exhalation of the block material			
<b>Aeroboard 125</b>	Low coefficient of thermal expansion	102 mm	610 mm	1524 mm
Working temperature 125 °C	High temperature resistance			
Density: 0.76 kg/dm <sup>3</sup>	No exhalation of the block material			
<b>Paste systems</b>	Mechanically processable lay-up pastes for jointless model surfaces			
<b>P 24</b>   PU lay-up paste	Dense surface			
<b>P 26</b>   EP lay-up paste	Very good machinability			
<b>Boards and blocks</b>				
<b>ebablock®</b>	The tailor-made contour block for jointless models, moulds and tools			
<b>ebaboard</b>	Model, mould and tool making boards for various requirement profiles			
<b>ebazell</b>	Design model making boards in various densities			
<b>Polydur</b>	Produces very dimensionally accurate moulds			
Non-toxic laminating system for mould making	Very short production time			
	Low coefficient of thermal expansion			
	Hardly flammable (flammable material class DIN 4102-B1)			
<b>Mats and fabrics</b>	Various weaves and grammes			
Glass and carbon fibre				
<b>Core materials</b>	Various temperature resistances and densities			
Foams in various densities				



The little helpers from **ebalta** (brushes, mixing bowls, gloves etc.) make your work with our materials as simple as possible. Ask for our brochures!

*tooling resins   blocks   auxiliaries   silicones*

***Composites***

***Mould and tool making***

***Design model making***

***Foundry tooling***

***Rapid Prototyping***

***Sheet metal forming***

***Electrical encapsulation***

***Further applications***

*We are pleased to help if you have any questions  
on technology or products. Just call or make an  
appointment with your regional sales agent.  
We are looking forward to hearing from you!*

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