

## Biresin® CR81 Composite resin system

### Areas of Application

- For infusion and injection processing
- Specially for applications for which resins with extremely low viscosity are necessary because of the processing temperature or geometry of the components

### Product Benefits

- **Biresin® CR81** resin with hardener **Biresin® CH81-6** approved by Germanischer Lloyd for the production of components
- One resin with three hardeners with different reactivity
- Uniform mixing ratio of 100 : 30
- Because of very low mixed viscosity fast infiltration of dry fabrics and nonwovens also at low temperatures
- Glass transition temperatures up to 80°C with **Biresin® CH81-6** hardener dependent on curing conditions

### Description

- Basis Two-component-epoxy-system
- Resin (A) **Biresin® CR81**, epoxy resin, translucent, unfilled
- Hardener (B) **Biresin® CH80-1**, amine, colourless to yellowish
- Hardener (B) **Biresin® CH81-6**, amine, colourless to yellowish
- Hardener (B) **Biresin® CH80-10**, amine, colourless to yellowish

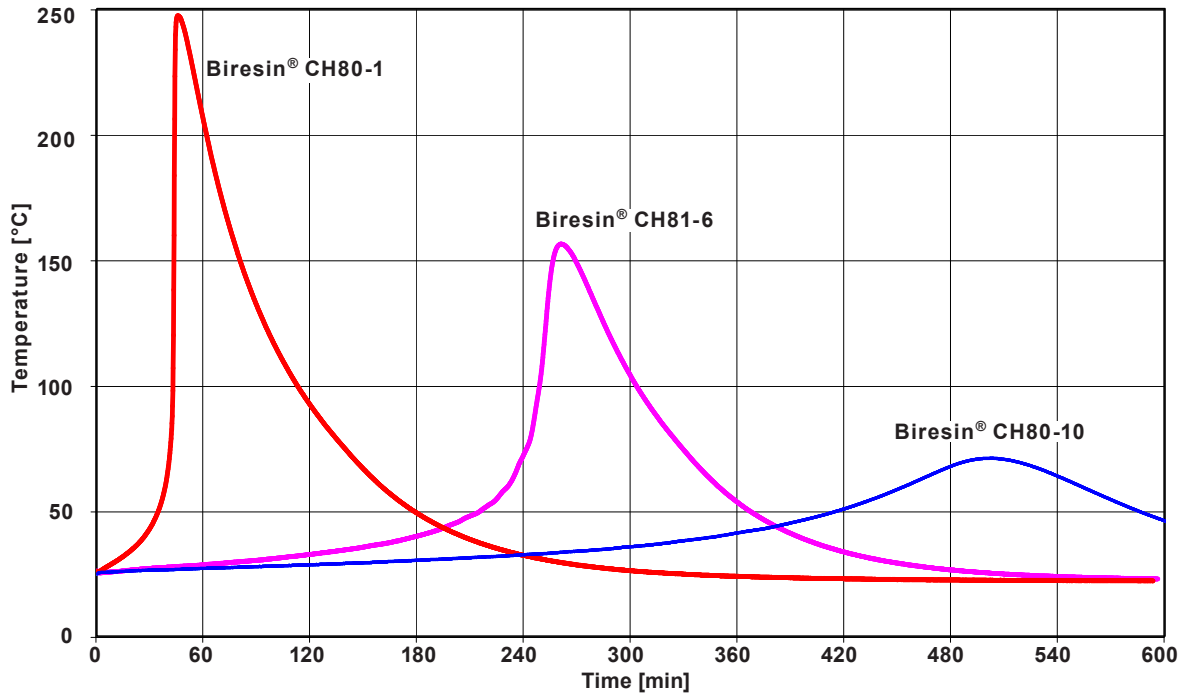
Physical Data		Resin (A)		Hardener (B)	
Individual Components		<b>Biresin® CR81</b>	<b>Biresin® CH80-1</b>	<b>Biresin® CH81-6</b>	<b>Biresin® CH80-10</b>
Viscosity, 25°C	mPas	440	50	10	< 10
Density, 25°C	g/ml	1.12	1.00	0.94	0.95
Mixing ratio	in parts by weight	100	30		
		<b>Mixture</b>			
Potlife, 100 g / RT, approx. values	min		45	260	500
Mixed viscosity, 25°C, approx. values	mPas		180	150	130

### Processing

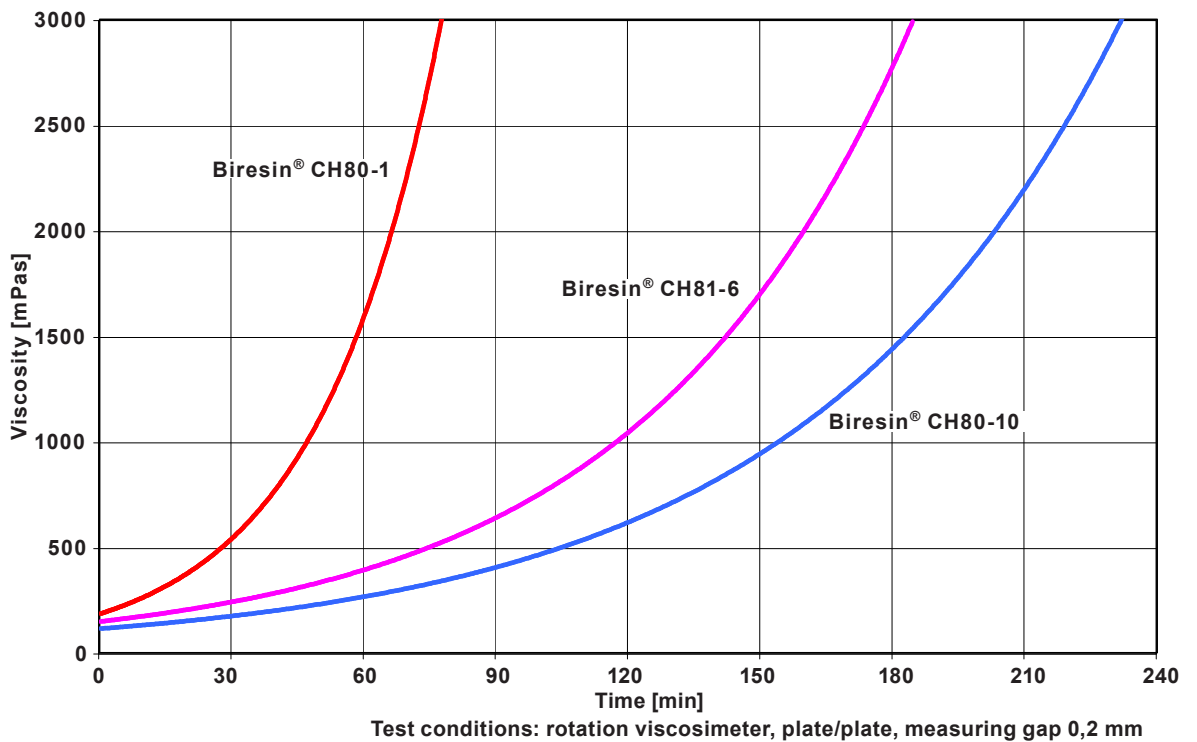
- The material and processing temperatures should be 15 - 35°C.
- With the hardener **Biresin® CH80-1** demoulding after room temperature curing is possible.
- With the hardeners **Biresin® CH81-6** and **Biresin® CH80-10** curing at 45°C before demoulding is required dependent on components.
- To clean brushes or tools immediately Sika Reinigungsmittel 5 is recommended.
- Additional informations are available in "Processing Instructions for Composite Resins".



**Development of Exotherm of Biresin® CR81-Resin(A)-Hardener(B)-Mixtures, 100g / RT, insulated,**



**Development of Viscosity of Biresin® CR81-Resin(A)-Hardener(B)-Mixtures, 25°C**



**Mechanical Data, neat resin specimen at different post curing conditions**

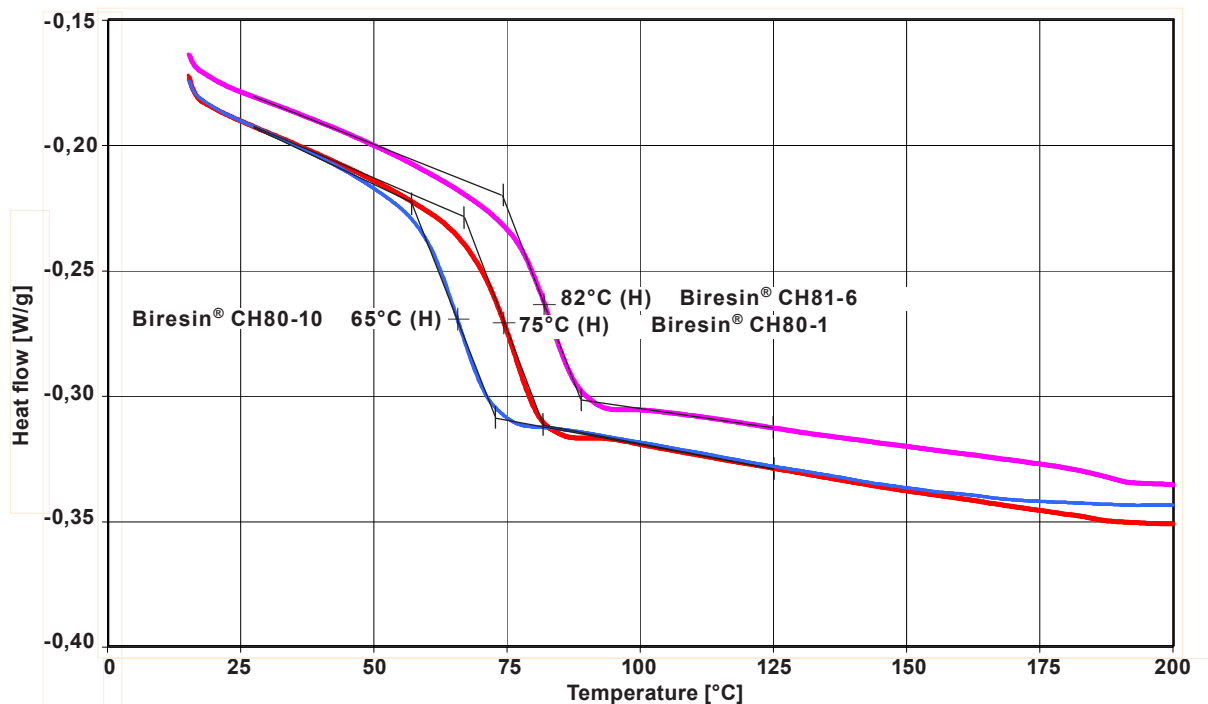
**Part 1: approx. values after 12 h / 55°C + 8 h / 70°C (source: accredited testing institute)**

Biresin® CR81 resin (A)	with hardener (B) Biresin®		CH80-1	CH81-6	CH80-10
Density	ISO 1183	g/cm <sup>3</sup>	-	1.15	-
Flexural E-Modulus	ISO 178	MPa	-	3,200	-
Tensile E-Modulus	ISO 527	MPa	-	3,200	-
Flexural strength	ISO 178	MPa	-	117	-
Elongation at maximum flexural strength	ISO 527	%	-	5.3	-
Tensile strength	ISO 527	MPa	-	67	-
Elongation at maximum tensile strength	ISO 527	%	-	4.0	-
Water absorption	ISO 175	%	-	0.4	-

**Part 2: approx. values after 12 h / 80 °C (source: Sika internal)**

Biresin® CR81 resin (A)	with hardener (B) Biresin®		CH80-1	CH81-6	CH80-10
Flexural E-Modulus	ISO 178	MPa	2,600	2,950	2,950
Tensile E-Modulus	ISO 527	MPa	2,900	3,000	3,050
Flexural strength	ISO 178	MPa	116	121	118
Tensile strength	ISO 527	MPa	79	81	79
Elongation at maximum tensile strength	ISO 527	%	6.4	6.0	5.4

**Neat resin specimen - DSC Measurement**



Thermal data of neat resin specimen						
Biresin® CR81 resin (A)		with hardener (B) Biresin®		CH80-1	CH81-6	CH80-10
Post curing conditions						
Heat distortion temperature	12 h/55°C + 8 h/70°C	ISO 75A	°C	-	67	-
	12 h/80°C	ISO 75B	°C	81	81	70
Glass transition temperature		ISO 11357	°C	75	82	65

### Packaging

Individual components	<b>Biresin® CR81 resin (A)</b>	200 kg; 10 kg net
	<b>Biresin® CH80-1 hardener (B)</b>	180 kg; 25 kg; 3.0 kg net
	<b>Biresin® CH80-10 hardener (B)</b>	180 kg; 25 kg; 3.0 kg net
	<b>Biresin® CH81-6 hardener (B)</b>	180 kg; 20 kg; 3.0 kg net

### Storage

- Minimum shelf life of Biresin® CR81 resin (A) is 24 month and of Biresin® CH80-1, CH81-6 and CH80-10 hardener (B) is 12 month under room conditions (18 - 25°C), when stored in original unopened containers.
- After prolonged storage at low temperature, crystallisation of resin may occur. This is easily removed by warming up for a sufficient time to 50-60°C.
- Containers must be closed tightly immediately after use. The residual material needs to be used up as soon as possible.

### Health and Safety Information

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Safety Data Sheet (SDS) containing physical, ecological, toxicological and other safetyrelated data.

### Disposal considerations

Product Recommendations: Must be disposed of in a special waste disposal unit in accordance with the corresponding regulations.

Packaging Recommendations: Completely emptied packagings can be given for recycling. Packaging that cannot be cleaned should be disposed of as product waste.

### Value Bases

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

### Legal Notice

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.



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# Statement of Approval



Approval No. **WP 1220045 HH**

The material described below complies with the applicable requirements as given in the Rules and Regulations of Germanischer Lloyd. On this basis the material is

approved as **Laminating Resin**

for the construction of components provided that the recommendations for use as specified by the producer are observed.

Type	<b>Biresin CR81</b>
Description	<b>Two Component Epoxy Resin</b>
Producer	<b>SIKA Deutschland GmbH Stuttgarter Str. 139 72574 Bad Urach</b>
Normative Reference	<b>Rules for Classification and Construction, II - Material and Welding Technology Part 2 Non-Metallic Materials</b>

This document consists of this page and a one-page annex which is integral part of the approval.

This Statement of Approval is valid until 2016-08-05.

Hamburg, 2012-08-06

## Germanischer Lloyd

  
Guido Michalek

  
Jan-Nicolas Johnsen

# Statement of Approval



## ANNEX

Date: 2012-08-06

Approval No. WP 1220045 HH

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Reference Documents Technical specifications deposited at Germanischer Lloyd Head Office.

Assessed Documents Technical Data Sheet: Version 07/2010  
Test Report No.: B096/08 dated 2008-05-09 issued by IMA GmbH Dresden

Fields of Application Construction of FRP laminates of components, on condition that the fibre reinforcements comply with the applicable requirements of the Germanischer Lloyd and are compatible to the resin.

Approved Variants Biresin CR81 with hardener Biresin CH81-6

Limitations Any significant changes in design and/or quality of the material will render the approval invalid.

Remarks This certificate supersedes the approval WP 0820029 HH.

End of Annex

Germanischer Lloyd

A handwritten signature in blue ink, appearing to be 'M. J. ...', is written over the printed name 'Germanischer Lloyd'.