

Biresin® CR80 Composite resin system

Product Description

Biresin® CR80 is a low viscosity epoxy resin system suitable for the production of high performance fibre reinforced composites parts and moulds with thermal properties up to 80°C

Application Areas

Biresin® CR80 is especially suited to the infusion and injection processes due to its low viscosity range. It can be used in the marine, wind turbine and general industrial composite areas

Features / Advantages

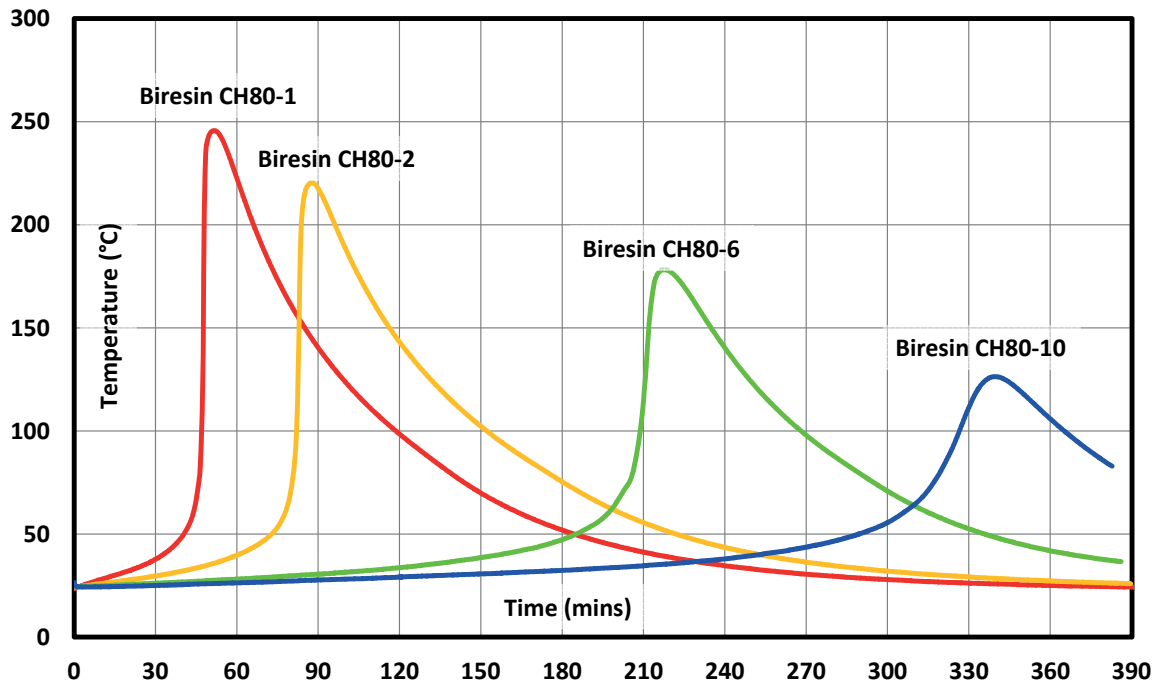
- 4 hardeners (B) give a wide range of processing times
- Uniform mixing ratio of 100:30 by weight gives even more processing flexibility
- Fast infusion and good wet-out of fabrics and non-wovens due to low viscosity and good wetting characteristics
- All systems are Germanischer Lloyd approved. Certificate No. WP 1620019 HH (attached)
- Particularly good for applications where curing temperatures cannot be >75°C
- Hardeners (B) Biresin® CH80-1 and CH80-2 can also be used for the manufacture of smaller parts in hand lay-up processing
- Hardeners (B) Biresin® CH 80-2 and CH 80-6 are also available in blue

Physical Data		Resin (A)		Hardener (B)		
Individual Components		Biresin® CR80	Biresin® CH80-1	Biresin® CH80-2	Biresin® CH80-6	Biresin® CH80-10
Mixing Ratio, parts by	Weight	100	30			
Mixing Ratio, parts by	Volume	100	34	34	36	36
Colour		translucent	colourless to yellow	colourless to yellow or blue		colourless to yellow
Viscosity, 25°C	mPa.s	~900	~50	~45	< 10	< 10
Density, 25°C	g/ml	1.13	1.00	0.99	0.95	0.95
		Mixture				
Potlife, 100 g / RT, approx. values	min	45	80	190	330	
Mixed viscosity, 25°C, approx. values	mPa.s	400	350	230	210	

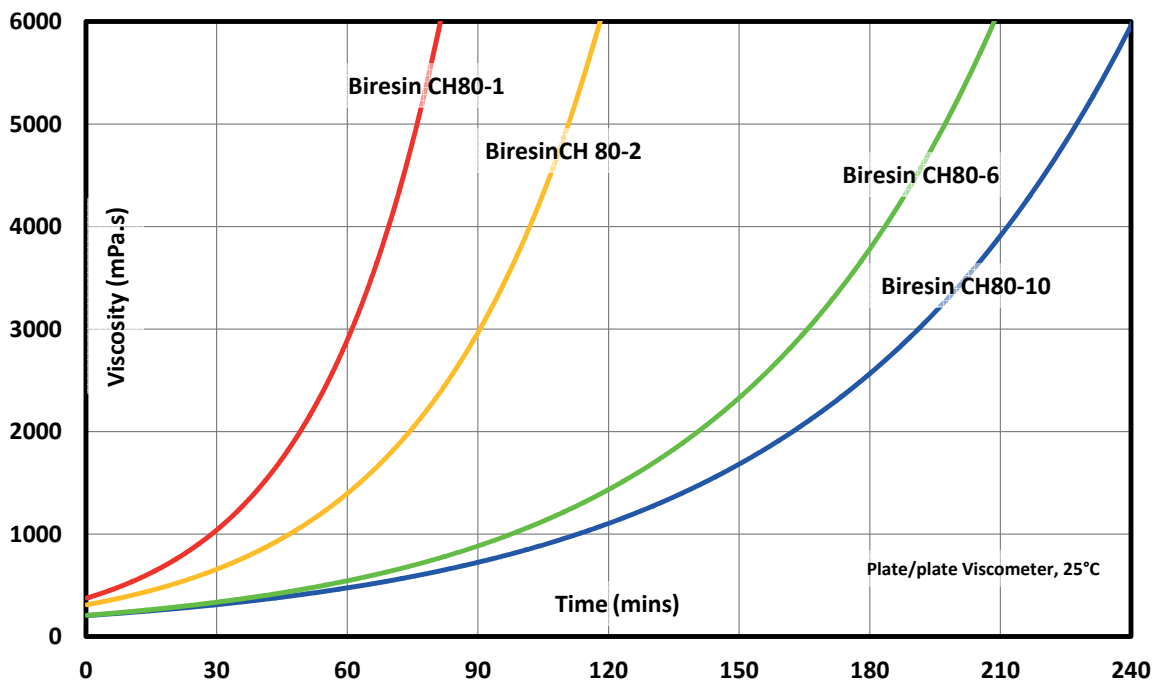
Processing

- The material and processing temperatures should be from 18 to 35°C.
- The mixing ratio must be followed accurately to obtain best results. Deviating from the correct mix ratio will lead to lower performance.
- The final mechanical and thermal values are dependent on the applied postcuring cycles.
- To clean brushes or tools immediately Sika Reinigungsmittel 5 is recommended.
- Additional information is available in "Processing Instructions for Composite Resins".

Development of Exotherm of Biresin® CR80-Resin(A)-Hardener(B)-Mixtures, 100g / RT, insulated



Development of Viscosity of Biresin® CR80-Resin(A)-Hardener(B)-Mixtures, 25°C



Postcuring

The suitable cure cycle and the attainable mechanical and thermal values depend on various factors, such as laminate thickness, fibre volume, reactivity of the resin system etc.

An appropriate cure cycle could look as follows:

- Heat-up rate of ca. 0.2°C/Minute until approx. 10°C below the required glass transition temperature (T_g)
- Followed by a dwell at that temperature of between 2 and 12 hours.
- Part(s) should then be cooled at ~0.5°C per minute

The specific postcure should be adapted to the required technical and economic requirements.

- With hardeners (B) Biresin® CH80-1 and CH80-2 demoulding after room temperature cure is possible.
- With hardeners (B) Biresin® CH80-6 and CH80-10 curing at 45°C before demoulding is required dependent on components.

To measure the mechanical performance of the resin system a SikaAxson standard cycle is used to ensure that the full T_g potential of the system in question is reached.

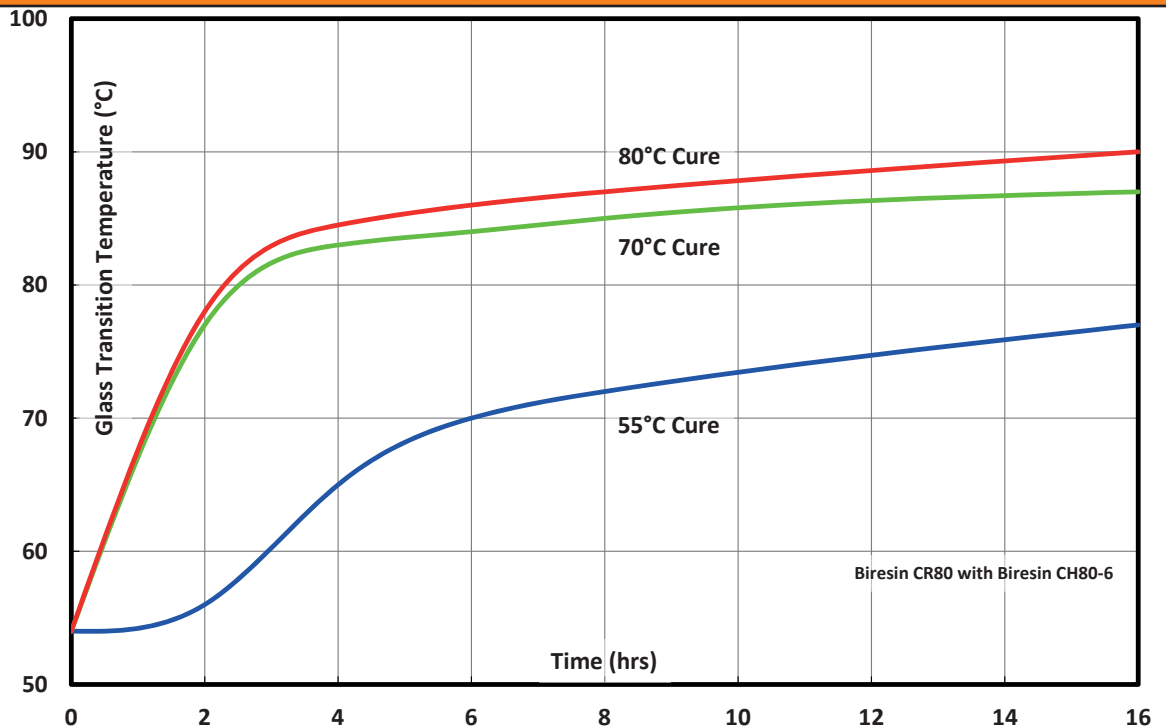
Typical Mechanical Properties of Fully Cured Neat Resin

Biresin® CR80 resin (A)	with hardener (B) Biresin®		CH80-1	CH80-2	CH80-6	CH80-10
Tensile strength	ISO 527	MPa	95	88	83	80
Tensile E-Modulus	ISO 527	MPa	3,000	2,900	3,000	3,000
Tensile elongation (at break)	ISO 527	%	6.0	6.0	6.3	6.5
Flexural strength	ISO 178	MPa	130	125	126	124
Flexural E-Modulus	ISO 178	MPa	3,300	3,100	2,900	2,900
Compressive strength	ISO 604	MPa	115	104	110	106
Density	ISO 1183	g/cm ³	1.18	1.16	1.17	1.17
Shore hardness	ISO 868	-	D 86	D 86	D 86	D 86
Impact resistance	ISO 179	kJ/m ²	50	67	68	76

Typical Thermal Properties of Fully Cured Neat Resin

Biresin® CR80 resin (A)	with hardener (B) Biresin®		CH80-1	CH80-2	CH80-6	CH80-10
Heat distortion temperature	ISO 75A	°C	95	89	72	72
Glass transition temperature	ISO 11357	°C	100	93	85	85

Glass Transition Temperature vs. Cure Cycle



The test specimens were produced from 3 mm thick pure resin. Before the above postcuring, the samples were cured for 7 days at 23°C. When curing a composite part, the whole of the part (including the very middle of the laminate) needs to see the cure temperature.

Packaging (net weight, kg)

Biresin® CR80 resin (A)	1000	200	30	10
Biresin® CH80-1 hardener (B)		180	25	3
Biresin® CH80-2 hardener (B)		180	25	3
Biresin® CH80-2 hardener, blue (B)			20	
Biresin® CH80-6 hardener (B)		180	20	3
Biresin® CH80-6 hardener, blue (B)			20	
Biresin® CH80-10 hardener (B)		180	25	3

Storage

- Minimum shelf life of Biresin® CR80 resin (A) is 24 month and of hardeners (B) Biresin® CH80-1, CH80-2, CH80-6 and CH80-10 is 12 months under room conditions (18 - 25°C), when stored in original unopened containers.
- After prolonged storage at low temperature, crystallisation of resin (A) may occur. This is easily removed by warming up for a sufficient time at a minimum 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 safety related 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.

Source of Data

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 re-commendations in accordance to our most recent product data sheet. 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 General Terms and Conditions of Sales, Delivery and Payment. The most recent product data sheet applies. General Terms and product data sheets can be requested from us or are available to download at www.sika.de. Please check availability of local product data sheet at your local website. In cases of doubt the German text is valid.

Further information available at:

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Statement of Approval

DNV·GL

Approval No. **WP 1620019 HH**

The material described below complies with the applicable requirements as given in the Rules and Regulations of GL. 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 **Biresin CR80 - Series**

Description **Two Component Epoxy Resin System**

Producer **SIKA Deutschland GmbH
Stuttgarter Str. 139
72574 Bad Urach
Germany**

Normative Reference **GL Rules for Classification and Construction,
II - Material and Welding Technology
Part 2 Non-Metallic Materials**

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 2020-06-08.

Hamburg, 2016-06-09

DNV GL


i.d.
Guido Michalek


Joachim Rehbein

Statement of Approval

ANNEX

Date: 2016-06-09

Approval No. WP 1620019 HH

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Reference Documents Technical specifications deposited at DNV GL SE, Hamburg.

Assessed Documents - Technical Data Sheet
- Test Report No. B175/7 issued by IMA Dresden
- Quality Control Documents

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

Approved Variants Epoxy Resin Biresin CR80 with following hardeners:
- CH80-1
- CH80-2
- CH80-6
- CH80-10

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

Remarks This certificate supersedes the approval WP 1220037 HH.

End of Annex