

## Biresin® CR122 Composite resin system

### Product Description

Biresin® CR122 is a medium viscosity epoxy resin system suitable for the production of high performance fibre reinforced composites with a thermal performance up to 120°C.

### Application Areas

Biresin® CR122 systems are well suited to the hand lay-up process due to the optimized viscosity range for those processes. They can be used in the production of general industrial composites as well as in the production of composite tooling by hand lay-up and where temperature performance of up to 120°C is needed.

### Features / Advantages

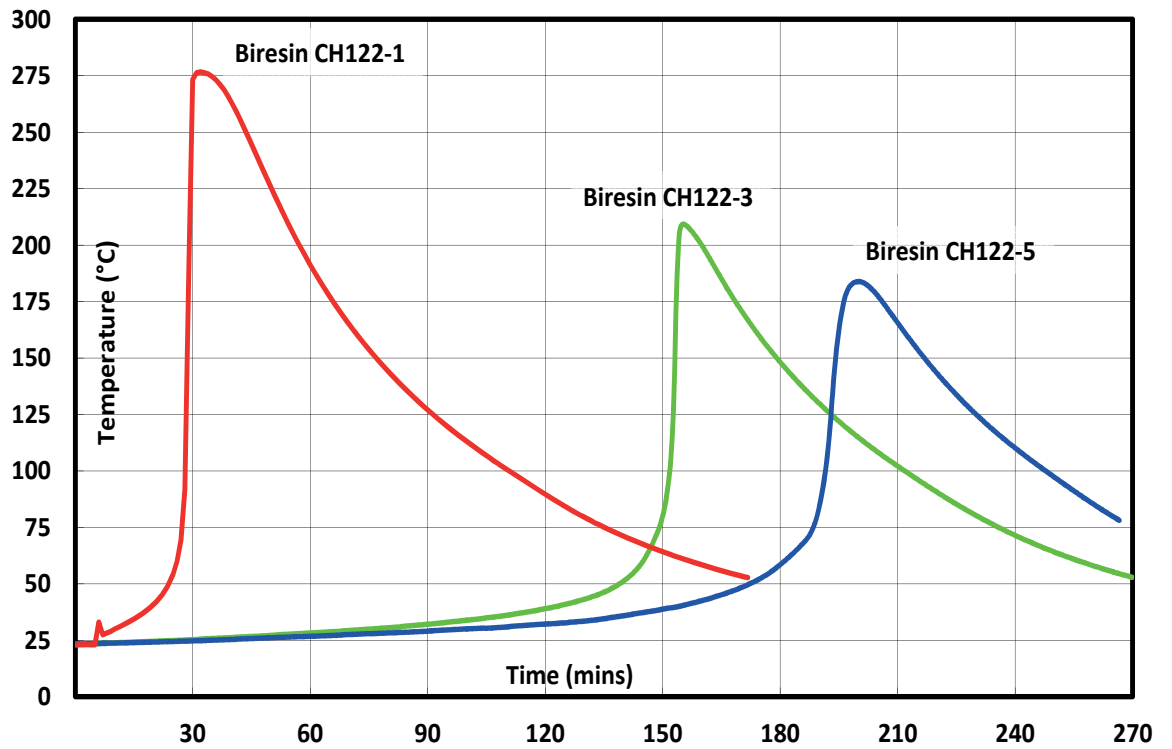
- Excellent impregnation and good non draining properties due to optimized mixed viscosity
- Biresin® CR122 (A) with hardeners (B) Biresin® CH122-3 and CH122-5 are Germanischer Lloyd approved, certificate no. WP 1620018 HH (see attached)
- Glass transition temperatures of up to 120°C are achievable depending on curing conditions
- Biresin® CR122 (A) with hardeners (B) Biresin® CH122-3, CH122-5 and CH122-9 are approved by Luftfahrt-Bundesamt (German Aeronautics Federal Office) as resin system for GRP, CRP and ARP parts for gliders and power gliders (see attached)
- 3 hardeners with a uniform mixing ratio of 100:30 gives a range of processing times and processing flexibility. The reactivity can be adapted by mixing the hardeners
- Demoulding is possible after RT curing when using the three fastest curing agents Biresin® CH122-1, CH122-3 (B) and CH122-5 (B)
- Hardener (B) Biresin® CH122-9 allows for a very long potlife but is only available in blue

Physical Data		Resin (A)		Hardener (B)		
Individual Components		Biresin® CR122	Biresin® CH122-1	Biresin® CH122-3	Biresin® CH122-5	Biresin® CH122-9
Mixing Ratio, parts by	<b>Weight</b>	100	30	30	30	40
Mixing Ratio, parts by	<b>Volume</b>	100	37	37	38	50
Colour		translucent	colourless to brownish			blue
Viscosity, 25°C	mPa.s	~850	<10	~15	1~5	~120
Density, 25°C	g/ml	1.17	0.95	0.94	0.93	0.94
			Mixture			
Potlife, 100 g / RT, approx. values	min		30	90	150	330
Mixed viscosity, 25°C, approx. values	mPa.s		310	370	380	680

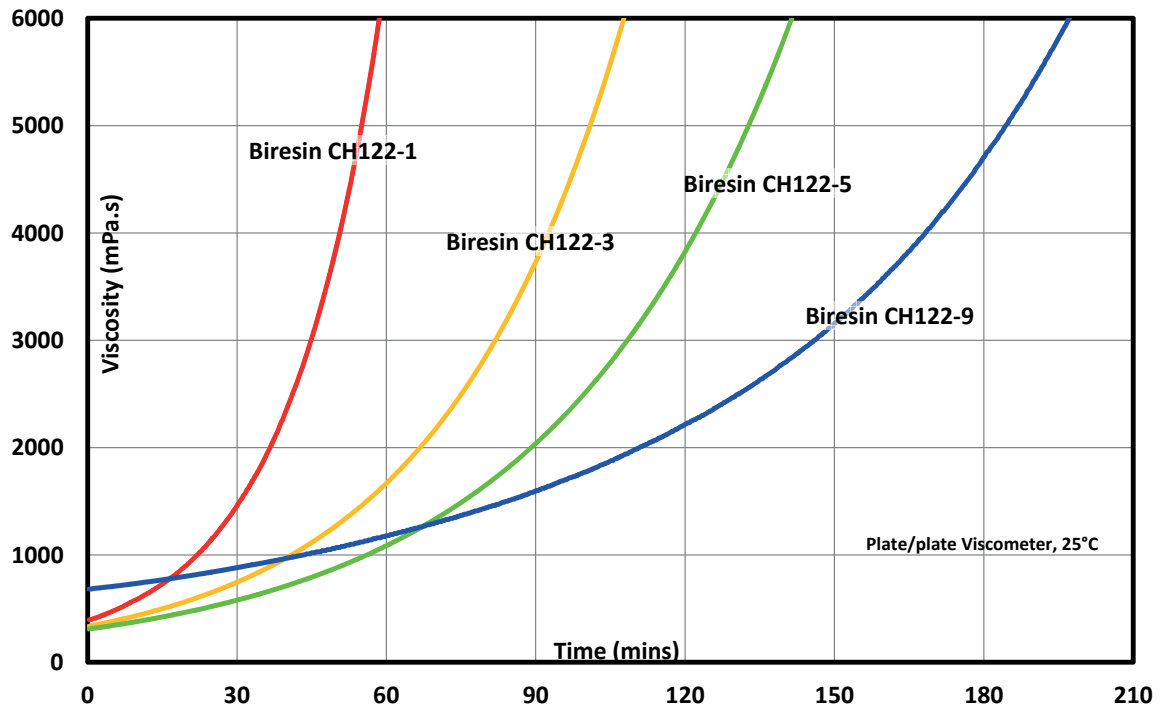
### Processing

- 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.
- Parts produced with Biresin® CH122-1, CH122-3 and CH122-5 hardeners (B) can be demoulded after cure at room temperature
- Postcuring is recommended.
- 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® CR122 Resin(A) - Hardener (B) Mixtures, 100g / 23°C, insulated



Development of Viscosity of Biresin® CR122 Resin (A) - Hardener (B) Mixtures, 25°C



### Typical Mechanical Properties of Fully Cured Neat Resin

Biresin® CR122 resin (A)	with hardener (B) Biresin®		CH122-1	CH122-3	CH122-5	CH122-9
Tensile strength	ISO 527	MPa	86	84	84	87
Tensile E-Modulus	ISO 527	MPa	2,900	2,800	2,800	2,600
Tensile Elongation (at break)	ISO 527	%	6.3	5.4	5.6	6.9
Flexural strength	ISO 178	MPa	125	129	131	119
Flexural E-Modulus	ISO 178	MPa	2,900	2,900	2,800	2,600
Compressive strength	ISO 604	MPa	110	120	118	114
Density	ISO 1183	g/cm <sup>3</sup>	1.17	1.17	1.16	1.14
Shore hardness	ISO 868	-	D 86	D 86	D 86	D 86
Impact resistance	ISO 179	kJ/m <sup>2</sup>	58	47	34	44

### Typical Thermal Properties of Fully Cured Neat Resin,

Biresin® CR122 resin (A)	with hardener (B) Biresin®		CH122-1	CH122-3	CH122-5	CH122-9
Heat distortion temperature	ISO 75B	°C	101	117	116	119
Glass transition temperature	ISO 11357	°C	103	114	119	120

### 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.

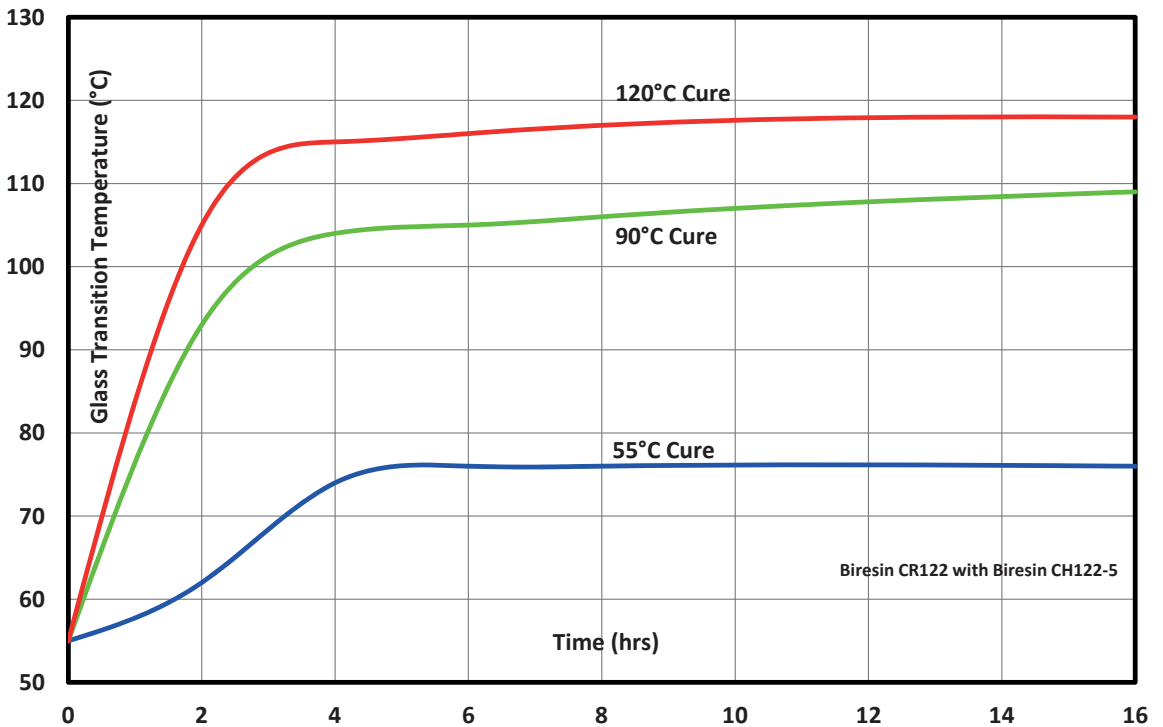
An appropriate cure cycle could look as follows:

- Heat-up rate of ca. 0.2°C/Minute until approx. 10°C below the required glass transition temperature (T<sub>g</sub>)
- 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.

To measure the mechanical performance of the resin system a SikaAxson standard cycle is used to ensure that the full T<sub>g</sub> potential of the system in question is reached.

### Glass Transition Temperature vs. Cure Cycle, Biresin® CR122 with Biresin® CH122-5



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® CR122 resin (A)	1000	200	30	10
Biresin® CH122-1 hardener (B)				3
Biresin® CH122-3 hardener (B)		180	25	3
Biresin® CH122-5 hardener (B)		180	25	3
Biresin® CH122-9 hardener (B), blue	900	180	20	4

### Storage

- Minimum shelf life of Biresin® CR122 resin (A) is 24 month and of Biresin® CH122-1, CH122-3, CH122-5 and CH122-9 hardeners (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 (A) may occur. This is easily removed by warming up for a sufficient time to a minimum of 60°C.
- Hardener (B) Biresin® CH122-9 may also crystallise. This crystallisation is easily removed by warming up for a sufficient time to 40°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.

### 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 re-recommendations 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](http://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:

Sika Deutschland GmbH

Subsidiary Bad Urach

Stuttgarter Str. 139

D - 72574 Bad Urach

Germany

Tel: +49 (0) 7125 940 492

Fax: +49 (0) 7125 940 401

Email: [tooling@de.sika.com](mailto:tooling@de.sika.com)

Internet: [www.sika.com](http://www.sika.com)





## Luftfahrt-Bundesamt

Bundesoberbehörde im Geschäftsbereich des Bundesministeriums für Verkehr,  
Bau und Stadtentwicklung (BMVBS)

Luftfahrt-Bundesamt - 38144 Braunschweig

Sika Deutschland GmbH  
z.Hd. Herrn Holger Giese  
Market-Development Manager  
Composite  
Stuttgarter Str. 139  
72574 Bad Urach

Ihr Zeichen:  
Ihre Nachricht vom: 15. Mai 2009  
Unser Zeichen: T 4-20500-FVK Sika/09  
Unsere Nachricht vom:

Auskunft erteilt: Herr Fendt  
Telefon: 0531 2355 295  
Fax: 0531 2355 724  
E-Mail: Helmut.Fendt@lba.de

Datum: 20. Mai 2009

### Harzsystem Sika Biresin® CR122 / CH122-3

#### Courtesy Translation

Dear Mr. Giese,

having reviewed the test results we received May 15th 2009, we do not object to the use of the resin-hardener-system

Sika Biresin® CR122 / CH122-3

for production of sailplanes and powered sailplanes, made from glasfiber, carbonfiber and aramidfiber reinforced plastics, provided that the user assesses suitability for his applications and production facilities. The register of LBA-accepted resin-hardener-systems has been amended accordingly.

Regarding the possible appearance of problems, related to the use of the resin-hardener-system, we expect prompt information from your side.

Yours sincerely

By order

Fendt

- enclosure

2 lists LBA-accepted resin-hardener-systems



## Luftfahrt-Bundesamt

Bundesoberbehörde im Geschäftsbereich des Bundesministeriums für Verkehr,  
Bau und Stadtentwicklung (BMVBS)

Luftfahrt-Bundesamt - 38144 Braunschweig

Sika Deutschland GmbH  
z.Hd. Herrn Holger Giese  
Market-Development Manager  
Composite  
Stuttgarter Str. 139  
72574 Bad Urach

Ihr Zeichen:  
Ihre Nachricht vom: 23. Juni 2009  
Unser Zeichen: T 4-20500-FVK Sika 2/09  
Unsere Nachricht vom:

Auskunft erteilt: Herr Fendt  
Telefon: 0531 2355 295  
Fax: 0531 2355 724  
E-Mail: Helmut.Fendt@lba.de

Datum: 15. Juli 2009

### Harzsystem Sika Biresin® CR122 / CH122-5

#### Courtesy Translation

Dear Mr. Giese,

having reviewed the test results we received July 6<sup>th</sup> 2009, we do not object to the use of the resin-hardener-system

Sika Biresin® CR122 / CH122-5

for production of sailplanes and powered sailplanes, made from glasfiber, carbonfiber and aramidfiber reinforced plastics, provided that the user assesses suitability for his applications and production facilities.

Please explicitly advise the users of the temper cycle, which is recommended in the test report.

The register of LBA-accepted resin-hardener-systems has been amended accordingly. Regarding the possible appearance of problems, related to the use of the resin-hardener-system, we expect prompt information from your side.

Yours sincerely

By order

Fendt

- enclosure

2 lists LBA-accepted resin-hardener-systems



## Luftfahrt-Bundesamt

Bundesoberbehörde im Geschäftsbereich des Bundesministeriums für Verkehr,  
Bau und Stadtentwicklung (BMVBS)

Luftfahrt-Bundesamt - 38144 Braunschweig

Sika Deutschland GmbH  
z.Hd. Herrn Holger Giese  
Market-Development Manager  
Composite  
Stuttgarter Str. 139  
72574 Bad Urach

Ihr Zeichen:

Ihre Nachricht vom: 22.12.2011

Unser Zeichen: T 3-20500-FVK Sika 1/12

Unsere Nachricht vom:

Auskunft erteilt: Herr Fendt

Telefon: 0531 2355 295

Fax: 0531 2355 724

E-Mail: Helmut.Fendt@lba.de

Datum: 17. Februar 2012

### Harzsystem Sika Biresin® CR122 / CH122-9

Sehr geehrter Herr Giese,

nach Durchsicht der uns mit Datum vom 23. Dezember 2011 zugegangenen  
Versuchsergebnisse erheben wir gegen die Verwendung des Harz-Härter-Systems

Sika Biresin® CR122 / CH122-9

bei der Herstellung von Segelflugzeugen und Motorseglern in GfK-, CfK-Bauweise keine  
Einwände, wenn der Verwender anhand der technischen Unterlagen feststellt, dass dieses  
Laminierharzsystem für seinen Anwendungsfall und seine Fertigungseinrichtungen geeignet  
ist.

Die Listen der LBA-anerkannten Harz-Härter-Systeme haben wir entsprechend ergänzt.  
Über eventuell auftretende Probleme bei der Verwendung der Harz-Härter-Systeme sind wir  
umgehend zu informieren.

Mit freundlichen Grüßen

Im Auftrag

Fendt

- Anlage

2 Listen LBA-anerkannter Harz-Härter-Systeme

# Statement of Approval

DNV·GL

Approval No. **WP 1620018 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 CR122 - 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 2020-05-22.

Hamburg, 2016-05-23

DNV GL



Guido Michalek



Joachim Rehbein



# Statement of Approval

DNV·GL

## ANNEX

Approval No. WP 1620018 HH

Date: 2016-05-23

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

Assessed Documents

- Technical Data Sheet
- Test Report No. 175/7 issued by IMA Dresden
- Test Report issued by IFB Stuttgart
- 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 CR122 and CR122 thix (as variant with higher viscosity) with following hardeners:

- CH93-2
- CH122-3
- CH122-5

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

Remarks This certificate supersedes the approval WP 1520010 HH.

End of Annex