

Biresin® CR141 Composite resin system for heat curing

Product Description

Biresin® CR141 is a three component, anhydride cured, low viscosity epoxy resin system suitable for the production of high performance fibre reinforced composites.

Application Areas

Biresin® CR141 system is particularly suited to the filament winding and pultrusion processes due to its low viscosity, good fibre wetting capabilities and very long potlife.

Features / Advantages

- The reactivity of the system can be adjusted by modifying the level of the accelerator (C) CA141
- Fast infiltration of dry fibres due to good wetting characteristics, low mixed viscosity and an elevated processing temperature
- Good wet-out of fibres, fabrics and non-wovens due to low viscosity and good wetting characteristics
- Approved by Germanischer Lloyd - Certificate No. WP 1420022 HH (attached)

Physical Data		Resin (A)	Hardener (B)	Accelerator (C)
Individual Components		Biresin® CR141	Biresin® CH141	Biresin® CA141
Mixing Ratio, parts by	Weight	100	90	2
Mixing Ratio, parts by	Volume	100	87	2.4
Colour		translucent	transparent	amber
Viscosity, 25°C	mPa.s	~8,250	~40	~200
Density, 25°C	g/ml	1.16	1.20	0.98
			Mixture	
Potlife, 100 g / RT, approx. values		h	> 24	
Mixed viscosity, 25°C, approx. values		mPa.s	600	

Processing

- The material and processing temperatures should be in the range 18 - 35°C.
- The mixing ratio must be followed accurately to obtain best results. Deviating from the correct mix ratio will lead to lower performance.
- Before demoulding precuring of at least 2 h at 90°C is recommended.
- The final mechanical and thermal values are dependent on the applied postcuring cycles.
- It is recommended to clean brushes or tools immediately after use with Sika Reinigungsmittel 5.
- Additional information is available in "Processing Instructions for Composite Resins".

Mechanical Data, neat resin specimen approx. values after 3 h / 80°C + 3 h / 120°C + 3 h / 140°C			
Biresin® CR141 resin (A)		with Biresin® CH141 hardener (B) and Biresin® CA141 accelerator (C)	
Tensile strength	ISO 527	MPa	78
Tensile E-Modulus	ISO 527	MPa	3,200
Elongation at break	ISO 527	%	3.3
Flexural strength	ISO 178	MPa	145
Flexural E-Modulus	ISO 178	MPa	3,100
Compressive strength	ISO 604	MPa	122
Density	ISO 1183	g/cm ³	1.20
Shore hardness	ISO 868	-	D 87
Impact resistance	ISO 179	kJ/m ²	18

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.

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 Thermal Properties of Cured Neat Resin, after 3 h / 80°C + 3 h / 120°C + 3 h / 140°C

Biresin® CR141 resin (A)		with Biresin® CH141 hardener (B) and Biresin® CA141 accelerator (C)	
Heat distortion temperature	ISO 75B	°C	137
Glass transition temperature	ISO 11357	°C	139

Packaging (net weight, kg)

Biresin® CR141 resin (A)	1,000	220	10
Biresin® CH141 hardener (B)	1,100	220	9
Biresin® CA141 accelerator (C)			10 0.2

Storage

- Minimum shelf life of Biresin® CR141 resin (A) is 24 month and of Biresin® CH141 hardener (B) and Biresin® CA141 accelerator (C) 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 at a minimum of 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.

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 1420022 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	Biresin CR141
Description	Two Component Epoxy Resin System
Producer	SIKA Deutschland GmbH Stuttgarter Str. 139 72574 Bad Urach Germany
Normative Reference	Rules for Classification and Construction, II - Material and Welding Technology Part 2 Non-Metallic Materials

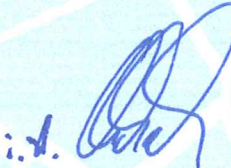
This document consists of this page and a one-page annex which is integral part of the approval.

This Statement of Approval is valid until 2018-05-21.

Hamburg, 2014-05-22

Germanischer Lloyd


Stefan Röhr


Guido Michalek

Statement of Approval



ANNEX

Approval No. WP 1420022 HH

Date: 2014-05-22

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- Reference Documents Technical specifications deposited at Germanischer Lloyd Head Office.
- Assessed Documents - Technical Data Sheet
- Test Report issued by IFB Stuttgart, dated on March 2014.
- 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 Epoxy Resin Biresin CR141 with following hardener:
- Biresin CH141 and Accelerator Biresin CA141
- Limitations Any significant changes in design and/or quality of the material will render the approval invalid.

End of Annex

Germanischer Lloyd

Handwritten signature

