Tooling & Composites

Product Data Sheet
Version 05 / 2017

Biresin® CR170 with Biresin® CH135-4 hardener
Composite resin system

Product Description

Biresin® CR170 resin (A) cured with Biresin® CH135-4 hardener (B) is an epoxy resin system suitable for the production of high performance fibre reinforced components by the RTM process.

Application Areas

Biresin® CR170/CH135-4 is especially suited to injection processes due to its viscosity range and reactivity. It can be used in areas where both higher temperature resistance and short cycle times are required.

Features / Advantages

- Fast injection and good wet-out of fabrics and non-wovens due to low viscosity and good wetting characteristics when injected at elevated temperature into a hot mould
- This system is particularly useful for applications where fast cycle times are required
- High temperature resistance - Tg >150°C possible

Physical Data		Resin (A)	Hardener (B)
Individual Components		**Biresin® CR170**	**Biresin® CH135-4**
Mixing Ratio, parts by	**Weight**	100	24
Mixing Ratio, parts by	**Volume**	100	30
Colour		translucent	colourless to yellowish
Viscosity, 25°C	mPa.s	~13,000	<10
Density, 25°C	g/ml	1.14	0.92
		Mixture	
Potlife, 100 g / RT, approx. values	min	140	
Mixed viscosity, 25°C, approx.	mPa.s	2,000	
Mixed viscosity, 55°C, approx.	mPa.s	200	
Mixed viscosity, 80°C, approx.	mPa.s	80	

Processing and processing properties

- 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 60°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”.

Thermal Properties Cured Neat Resin (approx. values after 4 h / 140°C)			
Biresin® CR170 resin (A)	with hardener (B) **Biresin®**		**CH135-4**
Heat distortion temperature	ISO 75B	°C	153
Glass transition temperature	ISO 11357	°C	153

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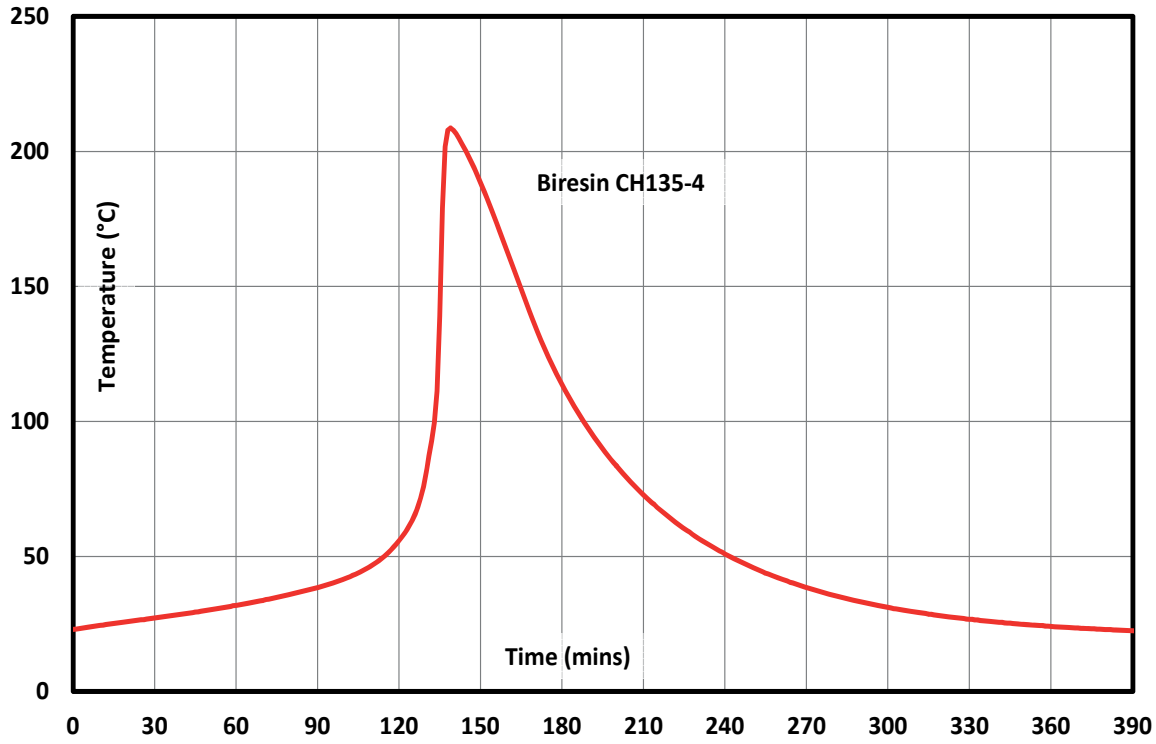
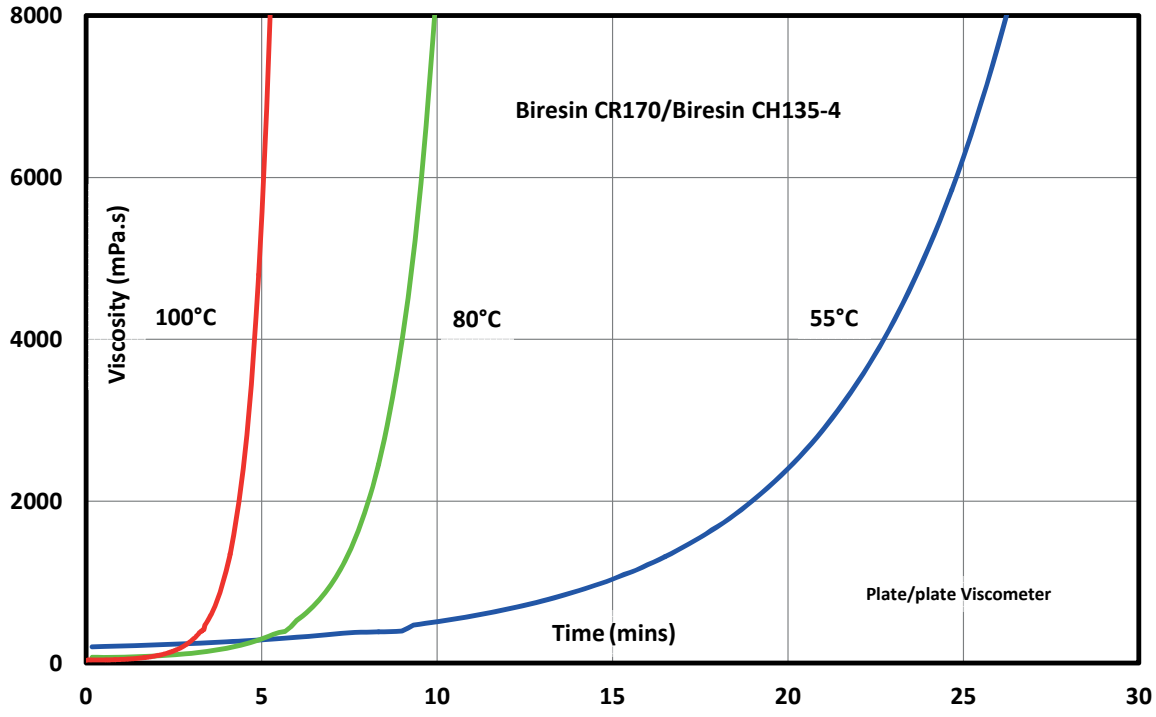
Development of Exotherm of Biresin® CR170 Resin (A) - CH135-4 Hardener (B) (100g / RT, insulated)



Viscosity Development of Biresin® CR170-Resin (A) with CH135-4 Hardener (B) at Various Temperatures



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Typical Mechanical Properties of Fully Cured Neat Resin			
Biresin® CR170 resin (A)	with hardener (B) **Biresin®**		**CH135-4**
Tensile strength	ISO 527	MPa	91
Tensile E-Modulus	ISO 527	MPa	2,750
Tensile Elongation (at break)	ISO 527	%	6.0
Flexural strength	ISO 178	MPa	135
Flexural E-Modulus	ISO 178	MPa	2,850
Compressive strength	ISO 604	MPa	123
Density	ISO 1183	g/ml	1.14
Shore hardness	ISO 868	-	D86
Impact resistance	ISO 179	kJ/m²	24

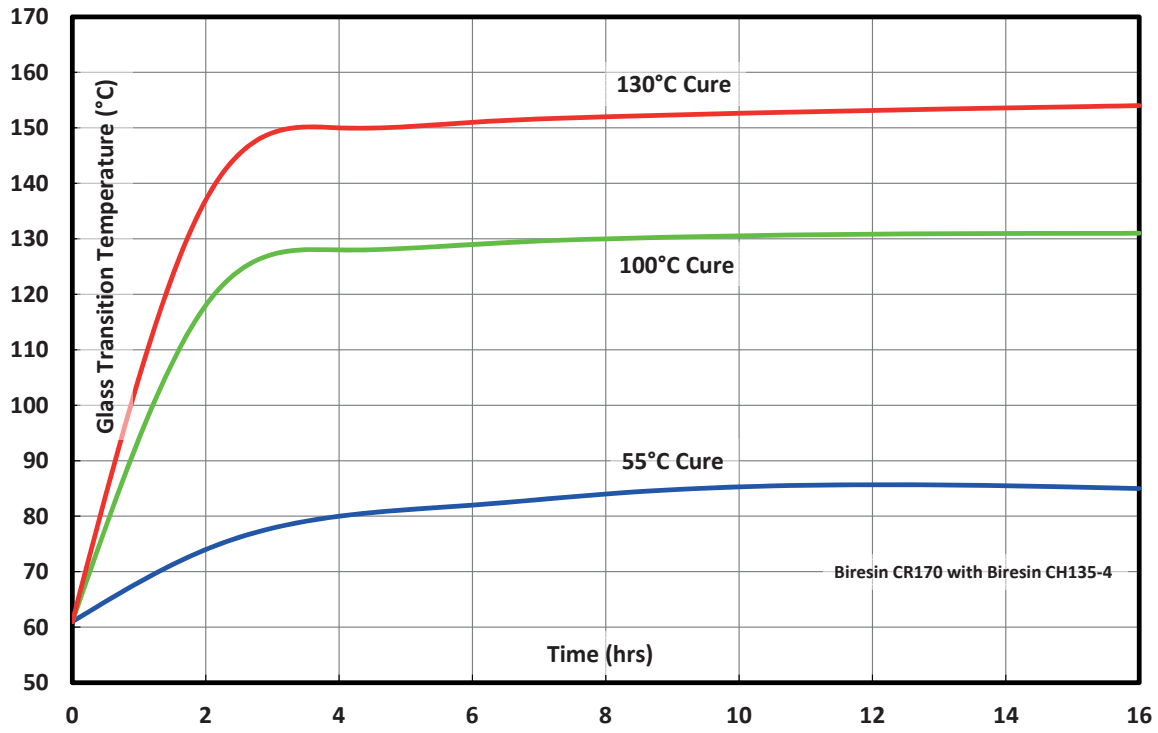
Postcuring

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 (Tg)
- 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 Tg potential of the system in question is reached.

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® CR170 resin (A)	1,000	200		10
Biresin® CH135-4 hardener (B)	850	180	26	3

Storage

- Minimum shelf life of Biresin® CR170 resin (A) is 24 month and of Biresin® CH135-4 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 (A) may occur. This is easily removed by warming up for a sufficient time 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.

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

Further information available at:

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