SR *GreenPoxy* 550 / SD 55x

Biobased epoxy resin for wood

The **SR *GreenPoxy* 550 / SD 55x** system is designed for shipbuilding, specifically for bonding, lamination, fillet joints, and wood coating. The wide reactivity range provided by its four hardeners allows for adjusting the working time according to application conditions.

SR 5550 reinvented: **SR *GreenPoxy* 550 / SD 55x**, designed to promote better health and sustainability. In line with our HSE commitments, we have updated our historical system using an innovative and sustainable approach. This new biobased system reduces health and environmental risks through a formulation with lower toxicity. The hardeners are not classified as hazardous to the environment, and the system contains no CMR or SVHC substances.

For many years, Sicomin has been dedicated to reducing the carbon footprint of its products. Thanks to our expertise and innovation in chemistry, the **SR *GreenPoxy* 550** resin and the four **SD 55x** hardeners are made from renewable resources. The system can achieve a total of 32 % biobased carbons.

		SR *GreenPoxy* 550			
		SD 551	**SD 553**	**SD 555**	**SD 556**
Reactivity		Slow	Medium	Fast	Very fast
Initial viscosity (mPa.s)	20 °C	690	1 250	1 350	1 600
	30 °C	430	620	690	750
Mixing ratio	By weight	100 / 42	100 / 42	100 / 42	100 / 42
	By volume	2 / 1	2 / 1	2 / 1	2 / 1
Biobased carbon content (%)		29	30	31	32
Density (kg/L)	20 °C	1.15	1.16	1.16	1.16
T_g onset max. (°C)		65	65	65	65
Gel time	20 °C	12 h 40	6 h 20	4 h 40	3 h 40
	30 °C	6 h 30	3 h 20	2 h 30	2 h 00

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The **SR *GreenPoxy* 550 / SD 55x** system is user-friendly due to its volumetric mixing ratio of 2:1.

It is specifically designed to provide enhanced resistance to challenging application conditions compared to a standard epoxy system, such as low temperature or high humidity. However, when used at temperatures that are too low (< 15 °C) and in high humidity (> 70%), the curing process may be significantly delayed, incomplete, and surface contamination may occur. For optimal results, the use of peelable coating Peeltex is recommended.

Instructions for use

Recommended filler dosage for structural bonding:

	SR *GreenPoxy* 550 SD 55x	Treecell	Silicell	Wood Fill 250
Mixing ratio by volume	100	50	20 - 50	-
	100	-	-	100

Recommended filler dosage for fillet joints:

	SR *GreenPoxy* 550 SD 55x	Treecell	Silicell	Wood Fill 130	Wood Fill 250
Mixing ratio by volume	100	50	20 - 50	-	-
	100	-	-	200 - 250	-
	100	-	-	-	300

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Resin

		SR *GreenPoxy* 550
Aspect and color		Cloudy liquid
Gardner color		< 1
Viscosity (mPa.s)	15 °C	6 400
	20 °C	3 100
	25 °C	1 600
	30 °C	890
Density (kg/L)	20 °C	1.16
Biobased carbon content (%)		27
Shelf life	23 °C	36 months

Hardeners

		SD 551	SD 553	SD 555	SD 556
Reactivity		Slow	Medium	Fast	Very fast
Aspect et color		Orange liquid			
Gardner color		< 10	< 10	< 10	< 10
Viscosity (mPa.s)	15 °C	190	350	500	670
	20 °C	130	240	330	440
	25 °C	100	170	230	300
	30 °C	70	120	160	210
Density (kg/L)	20 °C	0.98	1.00	1.01	1.03
Biobased carbon content (%)		38	41	44	46
Shelf life	23 °C	24 months			

Mixtures SR *GreenPoxy* 550 / SD 55x

		SR *GreenPoxy* 550			
		SD 551	**SD 553**	**SD 555**	**SD 556**
Mixing ratio	By weight	100 / 42	100 / 42	100 / 42	100 / 42
	By volume	2 / 1	2 / 1	2 / 1	2 / 1
Initial viscosity (mPa.s)	10 °C	N/A	N/A	3 400	4 150
	20 °C	690	1 250	1 350	1 600
	30 °C	430	620	690	750
Density (kg/L)	20 °C	1.15	1.16	1.16	1.16
Biobased carbon content (%)		29	30	31	32

Reactivity of 100 g mixtures

Temperature : 20 °C	SR *GreenPoxy* 550			
	SD 551	**SD 553**	**SD 555**	**SD 556**
Pot life	1 h 30 – 1 h 45	30 – 35 min	20 – 25 min	15 – 20 min
Maximum temperature (°C)	110	160	160	160
Time to reach exothermic peak	2 h 00	40 min	30 min	25 min

Temperature : 30 °C	SR *GreenPoxy* 550			
	SD 551	**SD 553**	**SD 555**	**SD 556**
Pot life	30 – 35 min	9 – 13 min	7 – 11 min	5 – 9 min
Maximum temperature (°C)	160	175	175	175
Time to reach exothermic peak	45 min	18 min	16 min	13 min

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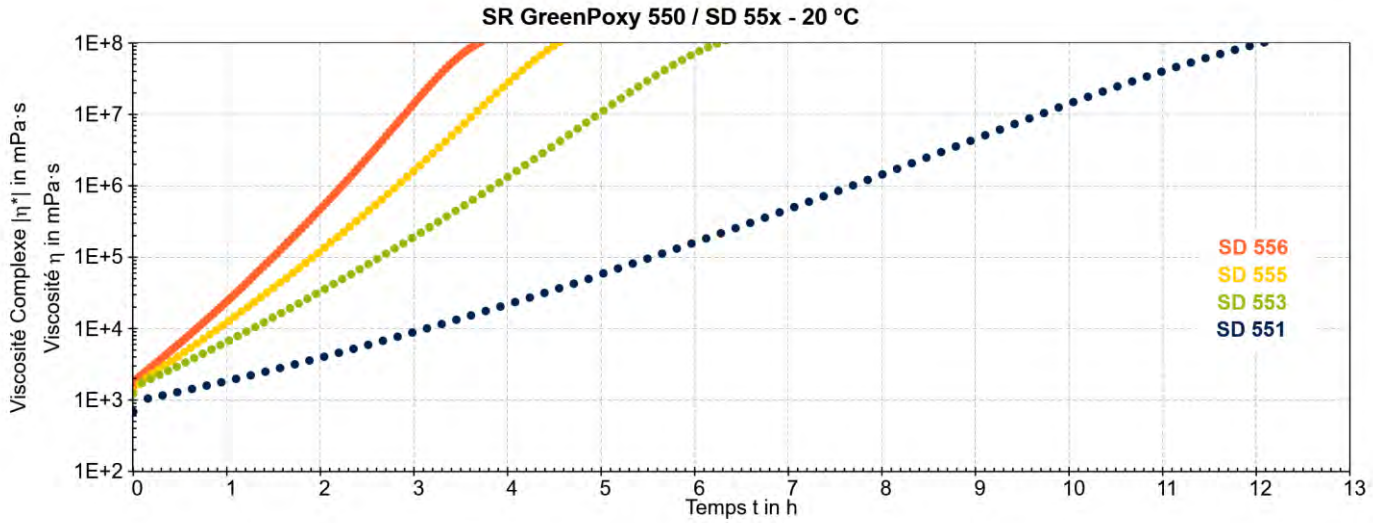
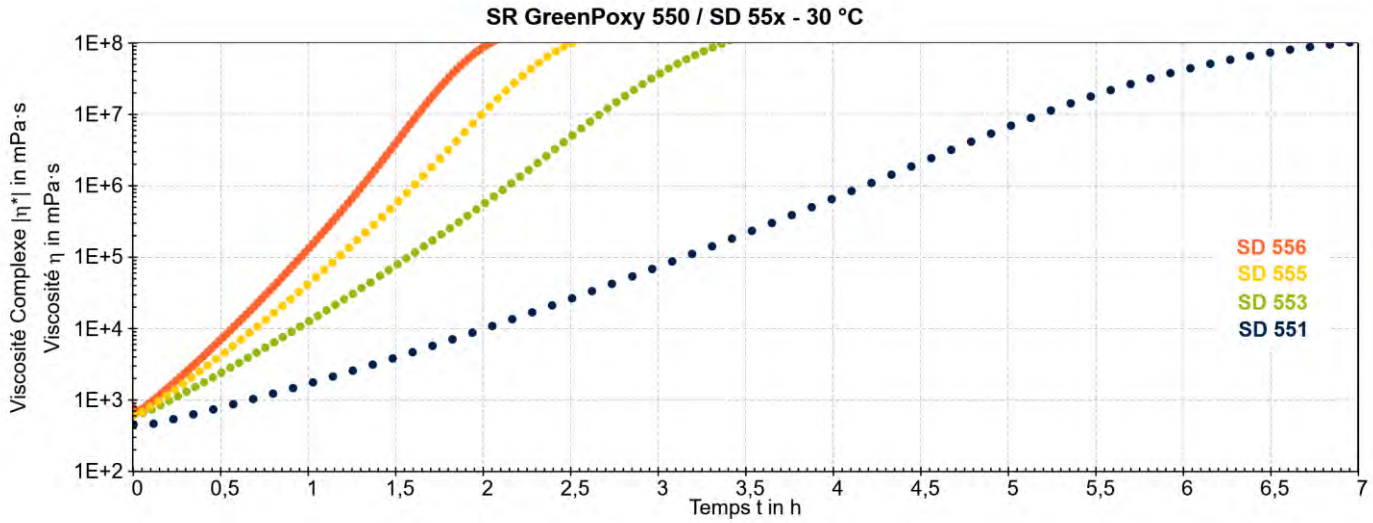
Reactivity of 1 mm thickness film

		SR *GreenPoxy* 550			
		SD 551	**SD 553**	**SD 555**	**SD 556**
Gel time	10 °C	N/A	N/A	8 h 40	7 h 00
	20 °C	12 h 40	6 h 20	4 h 40	3 h 40
	30 °C	6 h 30	3 h 20	2 h 30	2 h 00





Post-curing

The mechanical properties on an epoxy system can be optimized through the implementation of a post-curing cycle. The Sicomin laboratory uses predefined cycles to create technical data sheets and facilitate the comparison of different systems. These experimental cycles can be adapted to the specific target application, taking into account the following parameters:

- Selected epoxy system (max. T_g)
- Available heating methods
- Dimensions and sampling of the piece
- Nature of the tooling (thermal conductivity of the material)

Many system can provide good mechanical properties after curing at room temperature (>18 °C) for 24 to 48 hours before demolding. However, mechanical properties improve rapidly with a slightly higher temperature, around 40 °C, for several hours.

Epoxy systems with high T_g and slow hardeners imperatively require post-curing at higher temperature. The post-curing can start immediately after the exothermic peak, but it can also begin later, after the assembly of different components and before finishing operations. If the nature of the models and tooling is not suitable for high temperatures, we recommend carrying out the initial steps up to a maximum admissible temperature, then, after cooling and demolding, continuing the cycle with suitable former.

For a conventional epoxy system, we recommend a step-by-step cycle of 20 °C each for a duration of 4 hours.

Example for an epoxy system with a max. T_g of 100 °C:

4 h at 40 °C + 4 h at 60 °C + 4 h at 80 °C + cooling at room temperature before demolding.

There are many epoxy systems with short, high temperature curing cycles that do not fit into this post-curing scheme (pultrusion, hot press, pre-preg). For these systems, the initial curing achieves maximum mechanical performance without post-curing.

We invite you to contact our technical department for any questions on this subject.

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Mechanical properties on cast resin

		SR *GreenPoxy* 550			
		SD 551	**SD 553**	**SD 555**	**SD 556**
Post-curing cycle*		24 h 40 °C			
Tensile					
Modulus	N/mm²	2 800	2 900	2 900	2 900
Maximum strength	N/mm²	55	60	62	62
Breaking strength	N/mm²	37	46	48	47
Elongation at max. strength	%	3.5	3.7	3.8	3.9
Elongation at break	%	10.5	8.0	7.1	8.3
Flexion					
Modulus	N/mm²	2 900	2 900	2 800	2 800
Maximum strength	N/mm²	95	99	103	101
Breaking strength	N/mm²	49	52	65	66
Elongation at max. strength	%	4.6	4.9	5.0	5.1
Elongation at break	%	14.0	15.6	12.2	10.4
Shear					
Breaking strength	N/mm²	41	42	44	45
Compression					
Yield strength	N/mm²	88	91	93	94
Offset compression yield	%	12.4	12.3	12.4	12.9
Charpy impact strength					
Resilience	kJ/m²	48	36	33	35
Glass transition					
T_g onset	°C	65	65	65	65
T_g onset max.	°C	65	65	65	65

*These post-curing cycles are applied after a 24 h ambient temperature hardening period, allowing to surpass gel point and the exothemic peak.

Mechanical tests are carried out on samples of pure cast resin, without prior degassing, between steel plates.

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Measurements are carried out following norms:

Physical properties

Gardner color	*NF EN ISO 4630*
Viscosity	*NF EN ISO 3219 - Rheometer, geometry cône/plate 50 mm - 2 ° at 10 s^{-1}*
Liquid density	*ISO 2811-1 - Pycnometer*
Powder density	*NF EN ISO 1183-3 – Helium pycnometer*
Foam density	*NF EN ISO 845*
Biobased carbon content	*ASTM D68166-16 – Some values are theorically calculated*

Reactivity

Gel time	*Time sweep G' = G''- Rheometer, geometry plate/plate 50 mm*
Pot life	*Mean time to reach 50 °C or limit time for use*

Thermal properties

Glass transition	*NF EN ISO 11357-2 - Ramp from -5 to 180 °C at 20 °C/min* *T_g onset : 1^{er} pass* *T_g onset max. : 2^{nd} pass*

Mechanical properties

Tensile	*ISO 527-2*
Flexion	*ISO178*
Compression	*ISO 604 ou NF EN ISO 844 (foams)*
Charpy impact strength	*NF EN ISO 179-1*
Shear	*ASTM D732-17 (Punch Tool)*
Toughness	*ISO 13586:2000*

Legal notes :

Information given in writing or verbally, in the context of our technical assistance and our trials, does not engage our responsibility. Information is given in good faith based on SICOMIN's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with SICOMIN's recommendations. We advise users of SICOMIN products to check by some practical trials that they are suitable for the intended processes and applications. The customer's storage, the use, the implementation and the transformation of the supplied products are not under SICOMIN's control and entirely under the sole responsibility of the user. SICOMIN reserves the right to change the properties of its products. All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data and tolerance may vary due to circumstances beyond our control. If our responsibility should nevertheless be involved, it would be, for all the damages, limited to the value of the goods supplied by us and processed by the customer. We guaranty the non-reproachable quality of our products, in the general context of sales 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.