SR GreenPoxy 550 / SD 55

Multipurpose epoxy system with high carbon content of plant origin.
***SR GreenPoxy* 550** resin comes from the latest innovations in green chemistry.
***SR GreenPoxy* 550** resin is produced with a high carbon content of vegetal origin.
***SR GreenPoxy* 550** resin represents a significant technological advance on the following points:
Purity, color, performance and guarantees on the industrial tonnages available
The green carbon content is certified by an independent laboratory (% ^{14}C - ASTM D6866).

		SD 55 Slow	SD 55 Medium	SD 55 Fast
Reactivity level		Slow	Standard	Fast
Initial viscosity (mPa.s)	20 °C	800	1 100	1 350
	30 °C	230	450	650
Pot Life (150 g)	20 °C	57 min	21 min	14 min
	30 °C	25 min	9 min	5 min
Mixing ratio				
	By weight	100 / 40	100 / 40	100 / 41
	By volume	100 / 50	100 / 50	100 / 50
Maximum strength	N/mm^2	72	72	73
% Elongation at max strength	%	4,2	4	4,2
Tg2	°C	91	88	87
Gel Time (1 mm)	20 °C	11 h 45	05 h 10	03 h 40
	30 °C	06 h 35	02 h 55	02 h 10
Time to reach 400 mPa.s	20 °C	04 h 00	57 min	01 h 30
	30 °C	02 h 30	40 min	50 min
Demold time	20 °C	28 h 00	16 h 15	11 h 30
	30 °C	15 h 45	09 h 00	06 h 45

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Fields of applications:

- bonding and protection of wood
- hand lay-up lamination (mold or industrial part)
- hot or cold press
- small castings

Hardeners SD 55 x:

- 3 hardeners allowing a simple dosage of 2/1 by volume
- 3 reactivities: Fast / Medium / Slow
- Without CMR
- Medium and Fast hardeners are biobased

Epoxy resin SR GreenPoxy 550

Appearance		liquid
Color		colourless
Viscosity (mPa.s)	15 °C	6350 ± 1270
	20 °C	3100 ± 620
	25 °C	1600 ± 320
	30 °C	890 ± 180
Density	20 °C	1,16
Bio-based Carbon content (%)		51
Storage (months)	23 °C	36

Hardener(s)

		SD 55 Slow	SD 55 Medium	SD 55 Fast
Appearance		liquid	liquid	liquid
Color		colourless	colourless	colourless
Gardner color		≤ 1	≤ 1	≤ 1
Reactivity level		Slow	Standard	Fast
Viscosity (mPa.s)	15 °C	70 ± 14	180 ± 36	330 ± 66
	20 °C	50 ± 10	120 ± 24	210 ± 42
	25 °C	40 ± 8	80 ± 16	140 ± 28
	30 °C	30 ± 6	60 ± 12	100 ± 20
Density	20 °C	0,96	0,98	0,99
Bio-based Carbon content (%)			12 ± 3	22 ± 3
Storage (months)	23 °C	24	24	24

Mixe(s) SR GreenPoxy 550 / SD 55

		SD 55 Slow	SD 55 Medium	SD 55 Fast
Appearance		liquid	liquid	liquid
Color		light yellow	light yellow	light yellow
Mixing ratio				
By weight		100 / 40	100 / 40	100 / 41
By volume		100 / 50	100 / 50	100 / 50
Initial viscosity (mPa.s)	20 °C	800	1 100	1 350
	30 °C	230	450	650
Density	20 °C	1,17	1,18	1,18

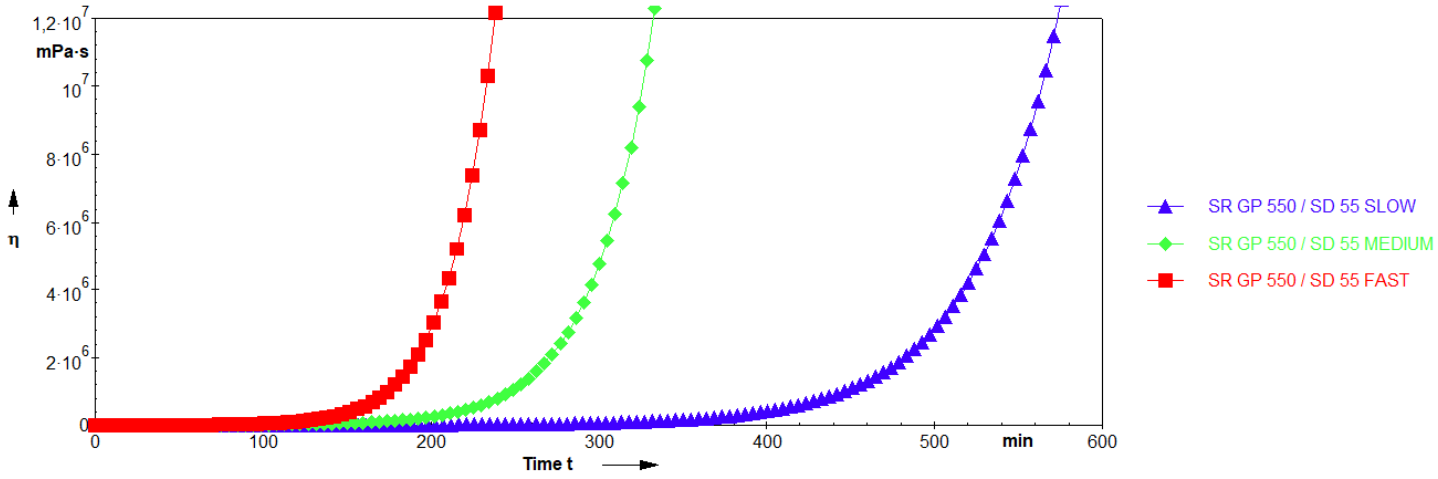
Reactivity SR GreenPoxy 550 / SD 55

20 °C for 150 g	SD 55 Slow	SD 55 Medium	SD 55 Fast
Exothermic temperature (°C)	165	182	180
Exothermic peak time	01 h 05	26 min	19 min
Time to reach 50 °C	57 min	21 min	14 min

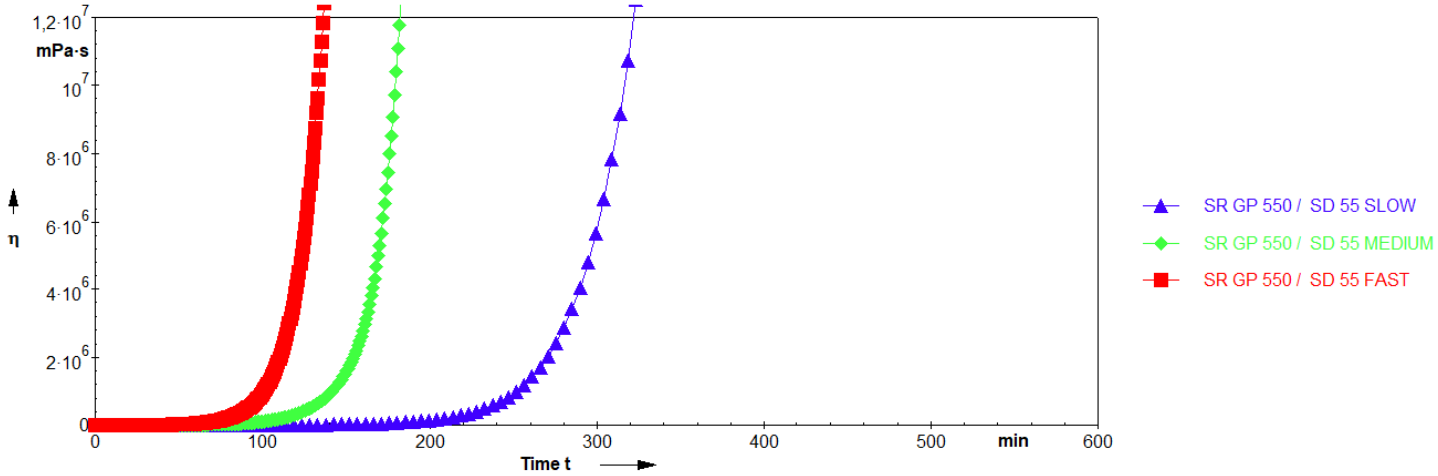
30 °C for 150 g	SD 55 Slow	SD 55 Medium	SD 55 Fast
Exothermic temperature (°C)	190	190	190
Exothermic peak time	33 min	14 min	9 min
Time to reach 50 °C	25 min	9 min	5 min

Reactivity on 1 mm thick layer

20 °C



30 °C



Post-curing

The thermomechanical values of an epoxy system can be optimized by implementing a post-curing cycle. The Sicomin laboratory provides several predefined post cure cycles on its data sheets allowing users to compare systems. These experimental cycles are adaptable to your specific applications, taking the following parameters into account:

- Selected epoxy system (Tg max)
- Available heat source
- Room Dimension and Sampling
- Nature of the tooling (thermal conductivity of material)

Many systems can provide good mechanical properties after curing at room temperature and from 18°C for 24 to 48 hours before demolding.
The mechanical properties progress very quickly with a slightly higher temperature of around 40°C for several hours.
Epoxy systems with high Tg and slow and extra-slow hardeners imperatively require post-curing at a higher temperature. It is possible to start the cycle as soon as the exothermic peak passes, but also to start post-curing later after assembly of the various components and before the finishing operations. If the nature of the models and tools is not suitable for high temperatures, we recommend carrying out the first stages up to the maximum admissible temperature then, after cooling and demoulding, continuing the cycle on a suitable former.
For a conventional epoxy system, we recommend carrying out a cycle in steps of 20°C for 4 hours.

Example for an epoxy system Tg max 100°C:
4 hrs at 40°C + 4 hrs at 60°C + 4 hrs at 80°C + cooling to room temperature before unmoulding.

There are many short cycle, high temperature epoxy systems that do not fit into this post-cure scheme (pultrusion, hot press, pre-preg). For these systems, initial curing provides maximum thermomechanical performance without post-curing.

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

Mechanical properties on cast resin :

		SR GreenPoxy 550 / SD 55 Slow			SR GreenPoxy 550 / SD 55 Medium		
		24 h TA + 24 h 40 °C	24 h TA + 16 h 60 °C		24 h TA + 24 h 40 °C	24 h TA + 16 h 60 °C	
Tensile							
Modulus	N/mm^2	3 400	3 400		3 500	3 400	
Maximum strength	N/mm^2	65	72		68	72	
Breaking Strength	N/mm^2	51	64		65	66	
Elongation at max strength	%	3,3	4,2		2,8	4	
Elongation at break	%	5,5	6,2		3,2	6,1	
Flexion							
Modulus	N/mm^2	3 250	3 100		3 200	3 200	
Maximum strength	N/mm^2	111	112		116	121	
Breaking Strength	N/mm^2						
Elongation at max strength	%	4,6	5,6		4,9	5,9	
Elongation at break	%	11,9	9,6		9,3	9,7	
Shear							
Breaking Strength	N/mm^2	45	47		51	53	
Compression							
Modulus	N/mm^2						
Yield strength	N/mm^2	89	90		105	109	
Offset compression yield	%	12,5	14,4		13,1	15,3	
Charpy impact strength							
Resilience	kJ/m^2	53	47		40	44	
DSC glass transition							
Tg1	°C	69	90		69	87	
Tg2	°C		91			88	
DTMA glass transition							
Tg tan delta	°C						
TeiG onset G’	°C						
TmG midpoint G’	°C						
TefG endpoint	°C						
TG peak G ‘’	°C						

These curing cycles are applied after a 24-hour hardening period at room temperature, allowing the reaction to freeze and exotherm bevond.

Mechanical properties on cast resin :

		SR GreenPoxy 550 / SD 55 Fast		
		24 h TA + 24 h 40 °C	24 h TA + 16 h 60 °C	
Tensile				
Modulus	N/mm^2	3 600	3 500	
Maximum strength	N/mm^2	72	73	
Breaking Strength	N/mm^2	61	68	
Elongation at max strength	%	3,3	4,2	
Elongation at break	%	5,5	6,1	
Flexion				
Modulus	N/mm^2	3 450	3 300	
Maximum strength	N/mm^2	121	125	
Breaking Strength	N/mm^2			
Elongation at max strength	%	4,9	5,9	
Elongation at break	%	10,2	9,6	
Shear				
Breaking Strength	N/mm^2	51	52	
Compression				
Modulus	N/mm^2			
Yield strength	N/mm^2	106	107	
Offset compression yield	%	13,1	14,4	
Charpy impact strength				
Resilience	kJ/m^2	46	40	
DSC glass transition				
Tg1	°C	70	85	
Tg2	°C		87	
DTMA glass transition				
Tg tan delta	°C			
TeiG onset G’	°C			
TmG midpoint G’	°C			
TefG endpoint	°C			
TG peak G ‘’	°C			

These curing cycles are applied after a 24-hour hardening period at room temperature, allowing the reaction to freeze and exotherm bevond.

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

Measures undertaken according to the following norms:

Mechanical tests:

Tension:	*NF EN ISO 527-2:2012*
Flexion:	*NF EN ISO 178:2011*
Compression:	*NF EN ISO 604:2004 or NF EN ISO 844:2014 (foam product)*
Charpy impact strength:	*NF EN ISO 179-1:2010*
Shear Strength:	*ASTM D732–17 (Punch Tool)*
Interlaminar shrinkage strength:	*ASTM D5528-13*
Toughness (GIC et KIC) :	*ISO 13586:2000*
Water absorption:	*Internal. Polymerization according to cycle, machining, weighing, time spent in distilled water at 70 °C / 48 hours, weighing 1 hour after emerging,*
Bonding Strength Double lap shear:	*ASTM D3528-96* *ADH = adhesive failure* *COH = cohesive failure* *TLC = thin-layer cohesive failure* *FT = fiber-tear failure.* *LFT = light-fiber-tear failure*

Thermal tests:

Glass transition DSC:	*NF EN ISO 11357-2 - Ramp from -5 to 180 °C at 20 °C/min* *T_g values are recorded at midpoint using tangent method.* *T_g1 : 1er pass* *T_g2 : 2nd pass*
Glass transition DTMA:	*Temperature ramp 0 °C to 180 °C @ 2°C/min under normal atmosphere* *ASTM D4065-12*

Physical tests:

Gardner color:	*NF EN ISO 4630:2016*	*Visual method*
Refractive index:	*NF ISO 280:1999*	
Viscosity:	*NF EN ISO 3219:1994*	*Rheometer 50 mm, shear 10 s^{-1}*
Density on liquids:	*ISO 2811-1:2016*	*Pycnometer*
Density on solid:	*NF EN ISO 1183-3:1999*	*Helium Pycnometer*
Density on foam:	*NF EN ISO 845:2009*	
Gel time:	*Cross G' G"*	*Rheometer CP50 - Shear rate 10 s^{-1}*
Green Carbone content:	*ASTM D6866-16 or XP CEN/TS 16640 Avril 2014*	

TA:	*Ambient temperature (20 to 25 °C)*
NC:	*No information Communicated*
NB:	*No Breaking (maximum flexion deformation : 15 %)*

Table 1st page:

Pot Life:	*Time to reach 50 °C or time limit for use*
Gel time:	*Intersection of tangents on the viscosity curve of 1 mm thick layer*
Release time:	*Time required to obtain sufficient mechanical strength to release*
Minimum Vacuum Time:	*Time in which vacuum can be applied (25000 mPa.s)*
Maximum Vacuum time:	*Limit time below which a vacuum can be applied (G'G " crossing)*
Optimum Infusion time:	*Time to reach 400 mPa.s*
Max Infusion Time:	*Time to reach 25000 mPa.s*
Vacuum cut-off time:	*Time to reach G'G " crossover + 20%*

LEGAL NOTES:

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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