SR *Green**Poxy* 33 / SZ 8525 EVO

Biobased epoxy system for hot press molding

This biobased system is specially formulated for the production of composite parts using hot press molding. Its unique formulation provides excellent adhesion to a wide variety of materials. Its short curing cycles and high hot reactivity enable fast production while ensuring optimal impregnation of all types of reinforcements. The system also offers very good impact and mechanical stress resistance, ensuring durable parts.

- Excellent multi-material adhesion
- Optimized processability for hot press molding
- Short production cycles
- Excellent impregnation of various reinforcements

		SR *Green**Poxy* 33 SZ 8525 EVO
Reactivity		Very fast
Initial viscosity (mPa.s)	25 °C	1 100
	80 °C	48
	100 °C	27
Mixing ratio	By weight	100 / 24
T_g2 (°C)		110
Gel time	25 °C	6 h 20
	80 °C	12 min
	100 °C	5 min

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Resin

		SR *Green*Poxy 33
Aspect and color		Clear liquid
Gardner color		< 3
Viscosity (mPa.s)	15 °C	6 850
	20 °C	3 410
	25 °C	1 770
	30 °C	1 100
Density (kg/L)	20 °C	1.16
Biobased carbon content (%)		31
Shelf life	23 °C	24 months

Hardener

		SZ 8525 EVO
Reactivity		Very fast
Aspect et color		Yellow liquid
Gardner color		< 3
Viscosity (mPa.s)	15 °C	66
	20 °C	46
	25 °C	35
	30 °C	27
Density (kg/L)	20 °C	0.94
Shelf life	23 °C	24 months

Mixture SR *Green*Poxy 33 / SD 8525 EVO

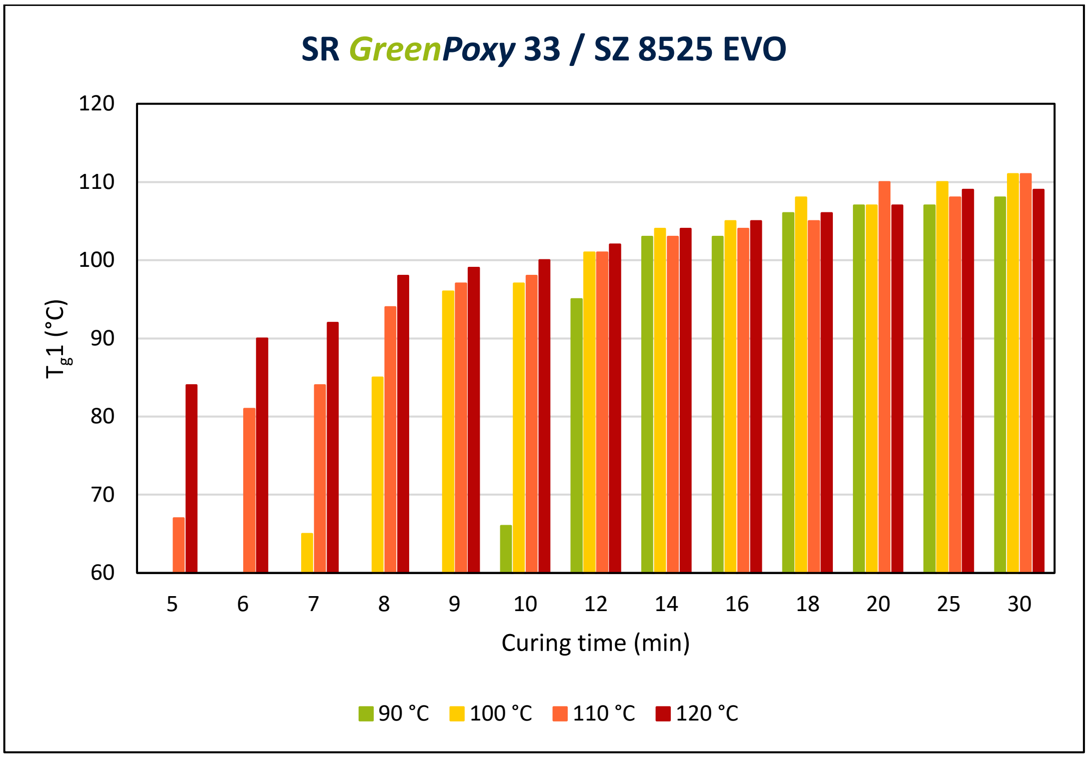
		SR *Green*Poxy 33 SZ 8525 EVO
Mixing ratio	By weight	100 / 24
Initial viscosity (mPa.s)	25 °C	1 100
	80 °C	48
	90 °C	35
	100 °C	27
Gel time (1 mm)	25 °C	6 h 20
	80 °C	12 min
	90 °C	7 min
	100 °C	5 min

Reactivity of 100 g mixture

Temperature: 20 °C	SR *Green*Poxy 33 SZ 8525 EVO
Pot life	2 h 55 – 3 h 05
Maximum temperature (°C)	125
Time to reach exothermic peak	3 h 20

Temperature: 30 °C	SR *Green*Poxy 33 SZ 8525 EVO
Pot life	48 – 52 min
Maximum temperature (°C)	175
Time to reach exothermic peak	1 h 10

Influence of curing cycle



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 (T_g2)
- 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 T_g2 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.

Mechanical properties on cast resin

		SR *Green**Poxy* 33 SZ 8525 EVO
Post-curing cycle*		15 min 100 °C
Tensile		
Modulus	N/mm²	3 400
Maximum strength	N/mm²	87
Breaking strength	N/mm²	87
Elongation at max. strength	%	5.2
Elongation at break	%	5.2
Flexion		
Modulus	N/mm²	3 200
Maximum strength	N/mm²	137
Breaking strength	N/mm²	137
Elongation at max. strength	%	5.9
Elongation at break	%	5.9
Shear		
Breaking strength	N/mm²	52
Compression		
Yield strength	N/mm²	117
Offset compression yield	%	18.5
Charpy impact strength		
Resilience	kJ/m²	15
Glass transition		
T_g1	°C	105
T_g2	°C	110

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

Measurements are carried out following norms:

Physical properties

Gardner color	*NF EN ISO 4630*
Viscosity	*NF EN ISO 3219 - Rheometer, geometry cone/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 theoretically 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* *The T_g values are recorded at the midpoint using the tangent method.* *T_g1 : 1^{er} pass* *T_g2 : 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*