

## SR **GreenPoxy 80** / SZ 852x EVO

Hot press biobased epoxy system

SR **GreenPoxy 80** / SZ 852x EVO is a highly biobased epoxy system, SR **GreenPoxy 80** contains 80 % of biobased carbons. It has high reactivity for short curing cycles and is specially designed for hot press applications (90 – 120 °C). Designed for outdoors composite equipment, it has very good adhesion on various materials.

		SR <b>GreenPoxy 80</b>	
		SZ 8525 EVO	SZ 8526 EVO
<b>Reactivity</b>		Fast	Very fast
<b>Initial viscosity</b> (mPa.s)	20 °C	2 170	2 700
	80 °C	76	68
<b>Mixing ratio</b>	By weight	100 / 25	100 / 23
<b>T<sub>g</sub>2</b> (°C)		100	103
<b>Gel time</b>	20 °C	4 h 35	3 h 55
	80 °C	4 min	4 min

## Resin

		SR <i>GreenPox</i> y 80
<b>Aspect and color</b>		Cloudy liquid
<b>Gardner color</b>		< 3
<b>Viscosity</b> (mPa.s)	15 °C	3 500
	20 °C	2 100
	25 °C	1 300
	30 °C	830
<b>Density</b> (kg/L)	20 °C	1.21
<b>Biobased carbon content</b> (%)		80
<b>Shelf life</b>	23 °C	24 months

## Hardeners

		SZ 8525 EVO	SZ 8526 EVO
<b>Reactivity</b>		Fast	Very fast
<b>Aspect and color</b>		Yellow liquid	
<b>Gardner color</b>		< 3	< 4
<b>Viscosity</b> (mPa.s)	15 °C	66	85
	20 °C	47	60
	25 °C	35	45
	30 °C	27	33
<b>Density</b> (kg/L)	20 °C	0.94	0.94
<b>Shelf life</b>	23 °C	12 months	12 months

## Mixtures SR *GreenPoxy* 80 / SZ 852x EVO

		SR <i>GreenPoxy</i> 80	
		SZ 8525 EVO	SZ 8526 EVO
Mixing ratio	By weight	100 / 25	100 / 23
Initial viscosity (mPa.s)	20 °C	2 170	2 700
	80 °C	76	68
Biobased carbon content (%)		64*	64

\*Calculated value

## Reactivity of 100 g mixtures

Temperature: 20 °C	SR <i>GreenPoxy</i> 80	
	SZ 8525 EVO	SZ 8526 EVO
Pot life	20 – 24 min	18 – 22 min
Maximum temperature (°C)	216	221 °C
Time to reach exothermic peak	34 min	30 min

## Reactivity of 1 mm thickness film

		SR <i>GreenPoxy</i> 80	
		SZ 8525 EVO	SZ 8526 EVO
Gel time	20 °C	4 h 35	3 h 55
	80 °C	4 min	4 min

**Optimal curing temperature: 100 °C**

## 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 ( $T_g$ )
- 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 ( $>18\text{ °C}$ ) for 24 to 48 hours before demolding. However, mechanical properties improve rapidly with a slightly higher temperature, around  $40\text{ °C}$ , 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  $20\text{ °C}$  each for a duration of 4 hours.

Example for an epoxy system with a  $T_g$  of  $100\text{ °C}$ :

4 h at  $40\text{ °C}$  + 4 h at  $60\text{ °C}$  + 4 h at  $80\text{ °C}$  + 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

		<b>SR <i>GreenPoxy</i> 80</b>	
		<b>SZ 8525 EVO</b>	<b>SZ 8526 EVO</b>
<b>Post-curing cycle*</b>		8 h 80 °C	
<b>Tensile</b>			
Modulus	N/mm <sup>2</sup>	3 450	3 600
Maximum strength	N/mm <sup>2</sup>	69	72
Breaking strength	N/mm <sup>2</sup>	69	72
Elongation at max. strength	%	4.4	3.2
Elongation at break	%	4.4	3.2
<b>Flexion</b>			
Modulus	N/mm <sup>2</sup>	3 300	3 400
Maximum strength	N/mm <sup>2</sup>	118	129
Breaking strength	N/mm <sup>2</sup>	117	128
Elongation at max. strength	%	6.2	5.6
Elongation at break	%	6.8	5.9
<b>Shear</b>			
Breaking strength	N/mm <sup>2</sup>	54	56
<b>Compression</b>			
Yield strength	N/mm <sup>2</sup>	102	120
Offset compression yield	%	22.0	23.0
<b>Charpy impact strength</b>			
Resilience	kJ/m <sup>2</sup>	27	20
<b>Glass transition</b>			
T <sub>g1</sub>	°C	100	103
T <sub>g2</sub>	°C	100	103

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

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 <sup>-1</sup>
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 <sup>er</sup> pass $T_{g2}$ : 2 <sup>nd</sup> pass
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**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

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