SR 8100 EVO / SD 882x

Infusion epoxy system

This two-component epoxy system with very low viscosity is specially designed for low-pressure injection and infusion processes. It provides excellent mechanical and thermomechanical properties.

Our **SR 8100** reinvented, this new system reduces health risks thanks to a low-toxicity formulation: the system contains no CMR products or SVHC substances.

		SR 8100 EVO	
		SD 8822	**SD 8824**
Reactivity		Slow	Intermediate
Initial viscosity (mPa.s)	20 °C	340	210
	30 °C	150	115
Mixing ratio	By weight	100 / 31	100 / 22
	By volume	100 / 39	100 / 27
Density (kg/L)	20 °C	1.15	1.17
T_g2 (°C)		97	88
Gel time	20 °C	20 h 20	9 h 10
	30 °C	11 h 30	4 h 30

Usage recommendations

Optimal temperature: from 18 °C

Optimal humidity: below 70 %

The hardener should be selected according to the application conditions: ambient temperature, processing method, and dimensions of the part to be produced.

For optimal performance, cure at room temperature and complete with a post-cure between 40 to 80 °C.

Resin

		SR 8100 EVO
Aspect and color		Colorless liquid
Gardner color		< 2
Viscosity (mPa.s)	15 °C	2 350
	20 °C	1 250
	25 °C	765
	30 °C	475
Density (kg/L)	20 °C	1,16
Shelf life	23 °C	24 months

Hardeners

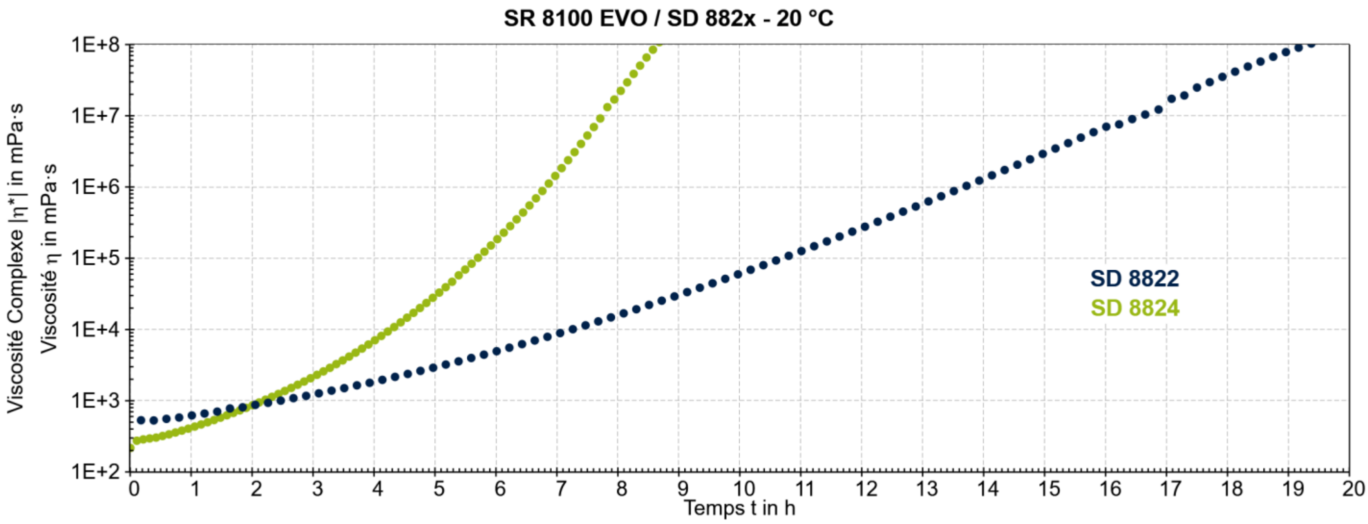
		SD 8822	SD 8824
Reactivity		Slow	Intermediate
Aspect et color		Colorless liquid	Yellow liquid
Gardner color		< 3	< 4
Viscosity (mPa.s)	15 °C	26	7
	20 °C	20	6
	25 °C	16	5
	30 °C	13	4
Density (kg/L)	20 °C	0.94	0.95
Shelf life	23 °C	24 months	

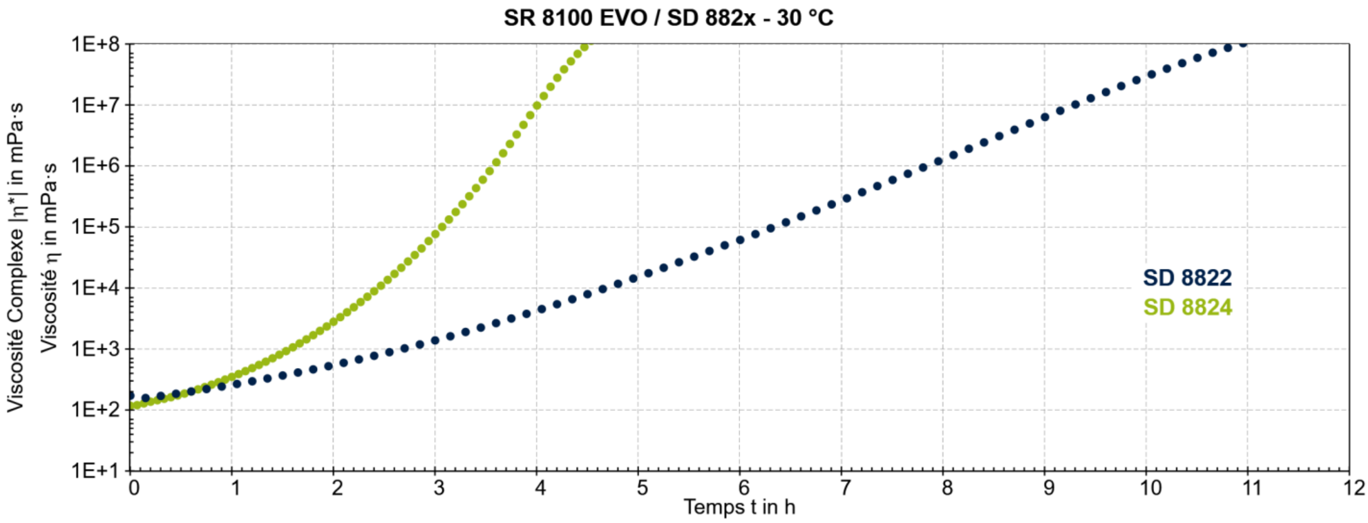
Mixtures SR 8100 EVO / SD 882x

		SR 8100 EVO	
		SD 8822	SD 8824
Mixing ratio	By weight	100 / 31	100 / 22
	By volume	100 / 39	100 / 27
Initial viscosity (mPa.s)	20 °C	340	210
	30 °C	150	115
Density (kg/L)	20 °C	1.15	1.17

Reactivity of 1 mm thickness film

		SR 8100 EVO	
		SD 8822	SD 8824
Gel time	20 °C	20 h 20	9 h 10
	30 °C	11 h 30	4 h 30





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 8100 EVO			
		SD 8822		SD 8824	
Post-curing cycle*		24 h 40 °C	8 h 80 °C	24 h 40 °C	8 h 80 °C
Tensile					
Modulus	N/mm²	3 600	3 200	3 300	3 000
Maximum strength	N/mm²	63	74	68	65
Breaking strength	N/mm²	63	68	48	52
Elongation at max. strength	%	2.1	4.0	3.4	4.4
Elongation at break	%	2.1	6.5	5.8	6.9
Flexion					
Modulus	N/mm²	3 100	2 900	3 100	2 800
Maximum strength	N/mm²	112	120	112	109
Breaking strength	N/mm²	105	110	59	76
Elongation at max. strength	%	4.3	6.0	4.6	5.8
Elongation at break	%	5.0	7.9	12.4	11.9
Shear					
Breaking strength	N/mm²	54	47	44	43
Compression					
Yield strength	N/mm²	107	100	100	90
Offset compression yield	%	11.3	13.5	12.4	13.9
Charpy impact strength					
Resilience	kJ/m²	22	49	105	59
Glass transition					
T_g1	°C	66	90	71	85
T_g2	°C		97		88

*These post-curing cycles are applied after a 24 hour 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.

SICOMIN
31 Avenue de la Lardière
13 220 Châteauneuf les Martigues
France

+33 (0)4 42 42 30 20
info@sicomin.com

www.sicomin.com

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*