

## SR Surf Clear EVO / SD EVO

### Epoxy system for surfboards



**Sicomin Surf Clear EVO** epoxy system is specially formulated for the manufacturing of surf boards.

**Surf Clear EVO** is suitable for hand lay up of glass, carbon, aramid, natural and synthetic fibers.

**Surf Clear EVO** is compatible with all commercial foams: polystyrene, polyurethane, cross-linked & linear PVC foams and others.

**Surf Clear EVO** is compatible with all typical fillers used in the surf industry.

		SD EVO Slow	SD EVO Medium	SD EVO Fast
Reactivity level		Slow	Standard	Fast
Initial viscosity (mPa.s)	@ 20 °C	1020	1570	2000
	@ 30 °C	440	610	660
Pot Life (150 g)	@ 20 °C	01 h 10	10 min	8 min
	@ 30 °C	33 min	6 min	4 min
Mixing ratio	By weight	100 / 38	100 / 39	100 / 41
	By volume	100 / 50	100 / 50	100 / 50
	N/mm <sup>2</sup>	72	70	68
% Elongation at max strength	%	3,9	4,1	4
TG1 max onset	°C	89	84	80
Gel Time	@ 20 °C	09 h 20	03 h 18	02 h 51
	@ 30 °C	05 h 00	01 h 57	01 h 42
Time to reach 400 mPa.s	@ 20 °C	04 h 20	-	01 h 08
	@ 30 °C	02 h 40	49 min	44 min
Demold time	@ 20 °C	28 h 00	09 h 54	08 h 33
	@ 30 °C	15 h 00	05 h 51	05 h 06

### Characteristics:

Ratio per volume 2:1.

High mechanical performance epoxy system recommended for surfboard production.

Yields surfboards with a flexible touch, high temperature and UV stability.

High surface and plug finishing, for high gloss requirement.

Other applications: surf repairs, fin boxes & plugs, pattern and model coating, etc...

Low odor and reduced skin aggression for a better work environment.

### Advices for application:

Work in a clean environment with heating facility.

Ideal working temperature from 18 °C to 30 °C.

Maintain a constant temperature during lamination.

Avoid high ambient humidity.

Avoid exposure to U.V. during the cure. Laminates and coatings benefitting from a sun free post cure or polymerized for at least 7 days at 18°C will obtain greater U.V. resistance and mechanical properties

Do not dilute with solvents. Please consult our technical assistance.

The use of compatible pigments is possible.

Keep packaging well-sealed as hardeners are sensitive to carbonic gas and humidity.

A polyurethane or other top coat paint can (for best UV protection) be applied, without primer, after sanding the final layer of **Surf Clear EVO**.

### Green Technology:

SICOMIN is heavily involved in green chemistry. When technology and availability of raw materials allows, we choose raw materials from biomass sourcing.

**Surf Clear EVO** epoxy resin is manufactured with a bio-based carbon content of about 40 % (resin alone)

### OH additive, the shiniest Surf resin in the world

Sicommin offers the possibility to use an extra additive to mix with the resin Surf Clear EVO to improve the light radiance of the laminates applied on top of white PS or PU foams. Used for colored board, OH additive can modify the color perception (blue effect with carbon or pink effect with wood or linen fabrics), please test before to avoid any surprises.

Mixing: 1 g of OH for 1 kg of resin SR Surf Clear EVO - First mix resin and OH additive, then mix with hardener



## Epoxy resin SR Surf Clear EVO

Appearance		liquid
Color		purple
Viscosity (mPa.s)	@ 15 °C	5500 ± 1100
	@ 20 °C	2925 ± 575
	@ 25 °C	1680 ± 320
	@ 30 °C	1070 ± 220
Density	@ 20 °C	1,1817
Refractive index	@ 25 °C	1,545 ± ,002
Storage (months)	@ Ta	24

## Hardener(s)

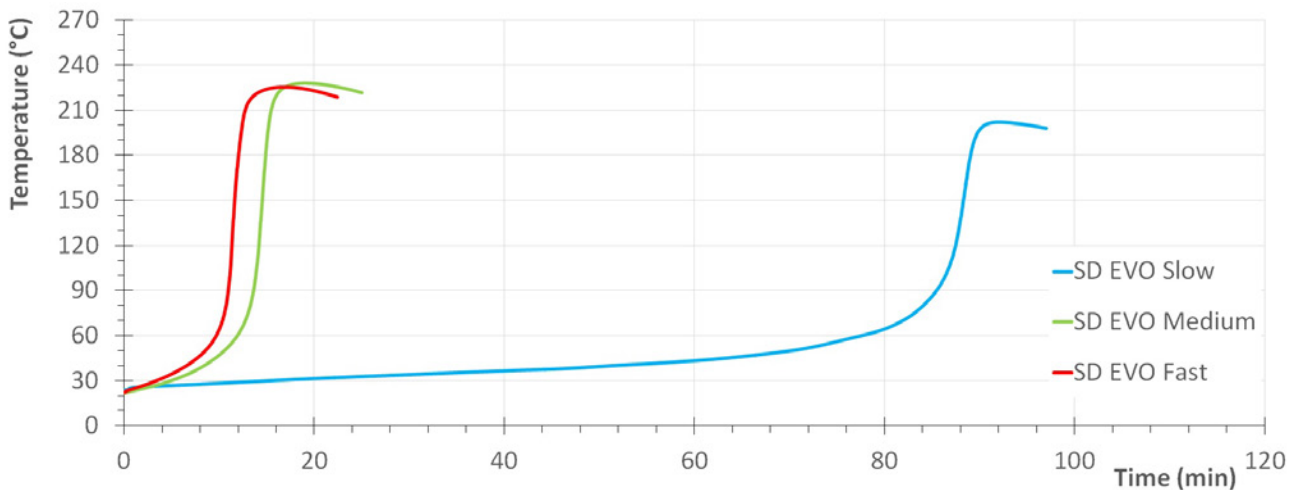
		SD EVO Slow	SD EVO Medium	SD EVO Fast
Appearance		liquid	liquid	liquid
Color		colourless	light yellow	colourless
Gardner color		≤ 2	≤ 1	≤ 1
Reactivity level		Slow	Standard	Fast
Viscosity (mPa.s)	@ 15 °C	80 ± 15	180 ± 40	290 ± 60
	@ 20 °C	60 ± 15	120 ± 25	190 ± 40
	@ 25 °C	45 ± 10	80 ± 20	125 ± 25
	@ 30 °C	32 ± 6	60 ± 12	90 ± 20
Density	@ 20 °C	0,9710	0,9920	1,0000
Refractive index	@ 25 °C	1,471 ± ,002	1,5113 ± ,002	1,5169 ± ,002
Storage (months)	@ Ta	24	24	24

## Mixe(s) SR Surf Clear EVO / SD EVO

	SD EVO Slow	SD EVO Medium	SD EVO Fast
Appearance	liquid	liquid	liquid
Color	purple	purple	purple
Mixing ratio			
By weight	100 / 38	100 / 39	100 / 41
By volume	100 / 50	100 / 50	100 / 50
Initial viscosity (mPa.s) @ 20 °C	1020	1570	2000
PP 50 mm / 10 s <sup>-1</sup> @ 30 °C	440	610	660
Density @ 20 °C	1,1	1,1	1,1

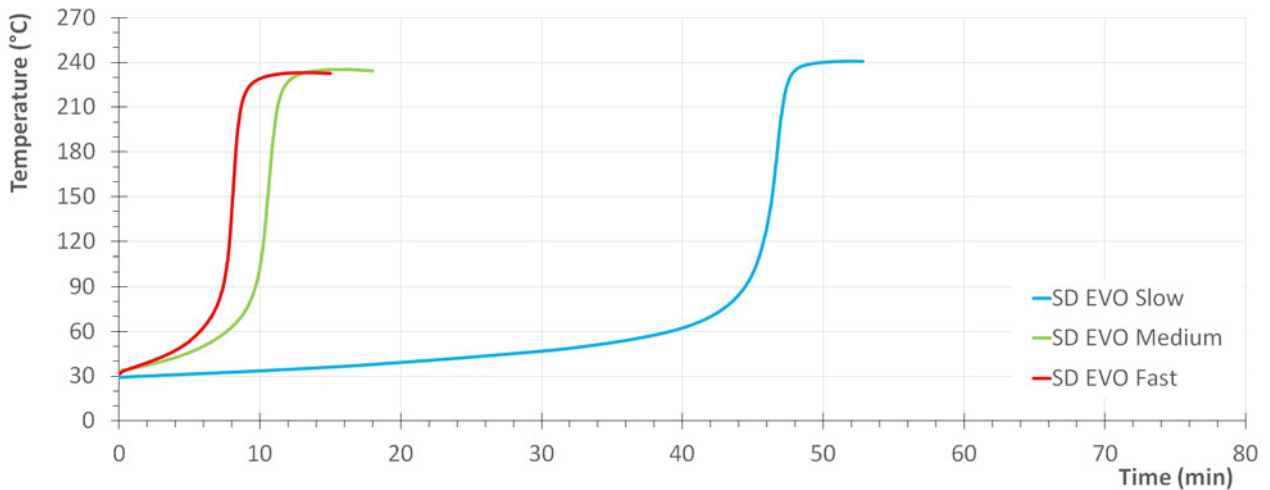
## Reactivity @ 20 °C for 150 g SR Surf Clear EVO / SD EVO

	SD EVO Slow	SD EVO Medium	SD EVO Fast
Exothermic temperature (°C)	202	228	225
Exothermic peak time	01 h 30	18 min	15 min
Time to reach 50 °C	01 h 10	10 min	8 min



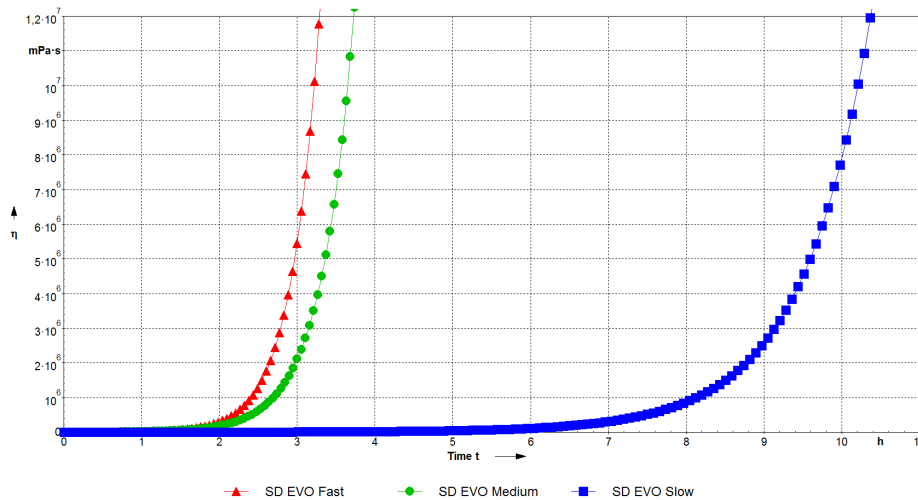
### Reactivity @ 30 °C for 150 g SR Surf Clear EVO / SD EVO

	SD EVO Slow	SD EVO Medium	SD EVO Fast
Exothermic temperature (°C)	241	235	233
Exothermic peak time	53 min	14 min	12 min
Time to reach 50 °C	33 min	6 min	4 min

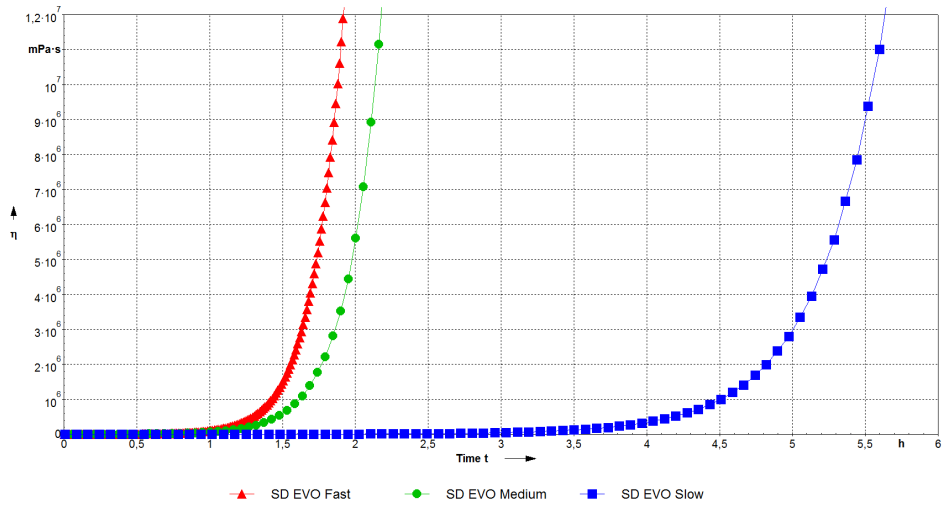


### Reactivity on 1 mm thick layer

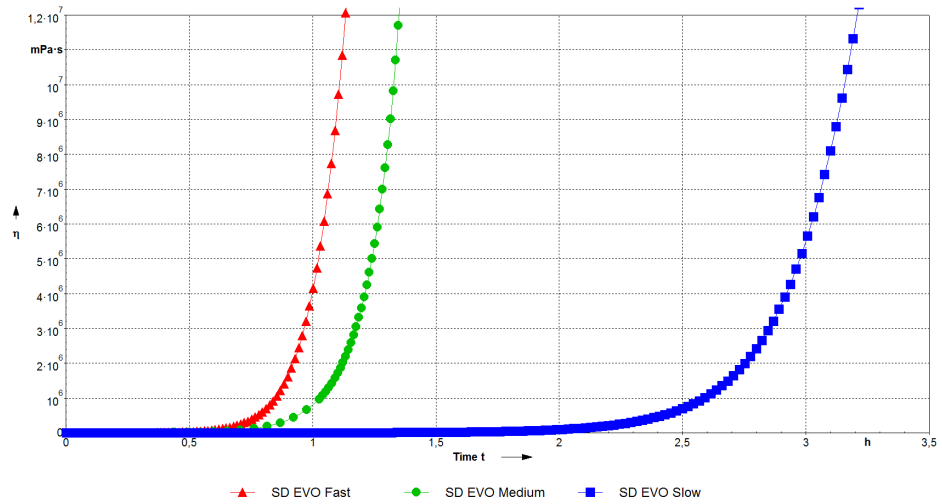
@ 20 °C



@ 30 °C



@ 40 °C



## Mechanical properties on cast resin :

		SR Surf Clear EVO / SD EVO Slow			SR Surf Clear EVO / SD EVO Medium		
Curing cycles	→	24 h @ Ta + 16 h @ 60 °C			24 h @ Ta + 16 h @ 60 °C		
<b>Tensile</b>							
Modulus	N/mm <sup>2</sup>	3 400			3 400		
Maximum strength	N/mm <sup>2</sup>	72			70		
Breaking Strength	N/mm <sup>2</sup>	67			66		
Elongation at max strength	%	3,9			4,1		
Elongation at break	%	5,1			6		
<b>Flexion</b>							
Modulus	N/mm <sup>2</sup>	3 100			3 200		
Maximum strength	N/mm <sup>2</sup>	120			122		
Breaking Strength	N/mm <sup>2</sup>	111			108		
Elongation at max strength	%	5,4			5,7		
Elongation at break	%	7,2			8,2		
<b>Shear</b>							
Breaking Strength	N/mm <sup>2</sup>	47			49		
<b>Compression</b>							
Modulus	N/mm <sup>2</sup>						
Yield strength	N/mm <sup>2</sup>	99			105		
Offset compression yield	%	13,4			15,8		
<b>Charpy impact strength</b>							
Resilience	kJ/m <sup>2</sup>	44			40		
<b>DSC glass transition</b>							
TG1 onset	°C	86			88		
TG1 max onset	°C	89			84		
<b>DTMA glass transition</b>							
TG tan delta	°C						
TeiG onset G'	°C						
TmG midpoint G'	°C						
TefG endpoint	°C						
TG peak G''	°C						

## Mechanical properties on cast resin :

		SR Surf Clear EVO / SD EVO Fast	
Curing cycles	→	24 h @ Ta + 16 h @ 60 °C	
<b>Tensile</b>			
Modulus	N/mm <sup>2</sup>	3 400	
Maximum strength	N/mm <sup>2</sup>	68	
Breaking Strength	N/mm <sup>2</sup>	65	
Elongation at max strength	%	4	
Elongation at break	%	6,5	
<b>Flexion</b>			
Modulus	N/mm <sup>2</sup>	3 200	
Maximum strength	N/mm <sup>2</sup>	117	
Breaking Strength	N/mm <sup>2</sup>	103	
Elongation at max strength	%	5,6	
Elongation at break	%	8,5	
<b>Shear</b>			
Breaking Strength	N/mm <sup>2</sup>	48	
<b>Compression</b>			
Modulus	N/mm <sup>2</sup>		
Yield strength	N/mm <sup>2</sup>	103	
Offset compression yield	%	14,3	
<b>Charpy impact strength</b>			
Resilience	kJ/m <sup>2</sup>	38	
<b>DSC glass transition</b>			
TG1 onset	°C	80	
TG1 max onset	°C	80	
<b>DTMA glass transition</b>			
TG tan delta	°C		
TeiG onset G'	°C		
TmG midpoint G'	°C		
TefG endpoint	°C		
TG peak G''	°C		



**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,

**Thermal tests:**

Glass transition DSC:	NF EN ISO 11357-2:2014	-5°C to 180 °C under nitrogen gas
	$T_{G1}$ or Onset:	1 <sup>st</sup> scan at 20 °C/min
	$T_{G1}$ maximum or Onset:	2nd scan at 20 °C/min

Glass transition DTMA:	Temperature ramp 0 °C to 180 °C @ 2°C/min under normal atmosphere	
	NF EN ISO 11357-1:2016	$T_G$ onset G'
	ASTM D4065-12	$T_G$ peak G''

**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 <sup>-1</sup>
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 <sup>-1</sup>
Green Carbone content:	ASTM D6866-16 or XP CEN/TS 16640 Avril 2014	

TA: Ambient temperature (20 to 25 °C)

**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.