

SR GreenPoxy 33 / SD 499X Epoxy system for composites parts

High bio-based carbon content



SR GreenPoxy 33 resin is outcoming from the latest innovations in bio-based chemistry.
SR GreenPoxy 33 resin is produced with a high content of carbon from plant origin.
The bio-based Carbon content of our system is certified by an independent laboratory using Carbon 14 measurements (ASTM D6866 or XP CEN/TS 16640)

This is a significant technological advance on the following points:
Clarity, color, performances and guarantees of industrial tonnages availability.

SR GreenPoxy 33 is an epoxy resin which has 35% of its molecular structure coming from plant origin.

This percentage is function of the carbon origin contained in the epoxy molecule.
The final rate of the mix bio-based carbon content will depend on the hardener choice.

Epoxy system **SR GreenPoxy 33 / SD 499X**

Clear laminate and final aspect.

High mechanical properties.

Good wetting out properties resulting in a low resin consumption.

Good mechanical @ ambient temperature, post cure @ 40 to 60 °C

Mix bio-based carbon content of about 26 %.

Resin SR GreenPoxy 33:

Modified Epoxy matrix
 Low viscosity


Profile:

Clear color
 Very good adhesion on various material
 Design for outdoor's composites equipment
 2 hardener of extrem reactivity:
 SD 4999: Fast
 SD 4990: Ultra slow

Applications:

Wet lay-up
 Hand laminating, adhesive, tooling (casting & laminates @ 60 °C)


Resin SR GreenPoxy 33:

Appearance		Viscous liquid
Color		Clear
Gardner color		3 maximum
Chemical nature		Epoxy resin. Reactions product between Alcohols and epichlorhydrine.
Storage		Can crystallize at low temperature or after a long storage. Shelf life : 2 years @ 18 - 25°C
Density ± 0.01	@ 20 °C	1.159
% bio-based Carbon content		34 - 36 %
Viscosities (m.Pas ± 20 %)	@ 15 °C	6 380
	@ 20 °C	3 240
	@ 25 °C	1 780
	@ 30 °C	1 040
	@ 40 °C	410
Refractive index (± 0.0010)	@ 25 °C	1.5562

Hardener SD 499X:

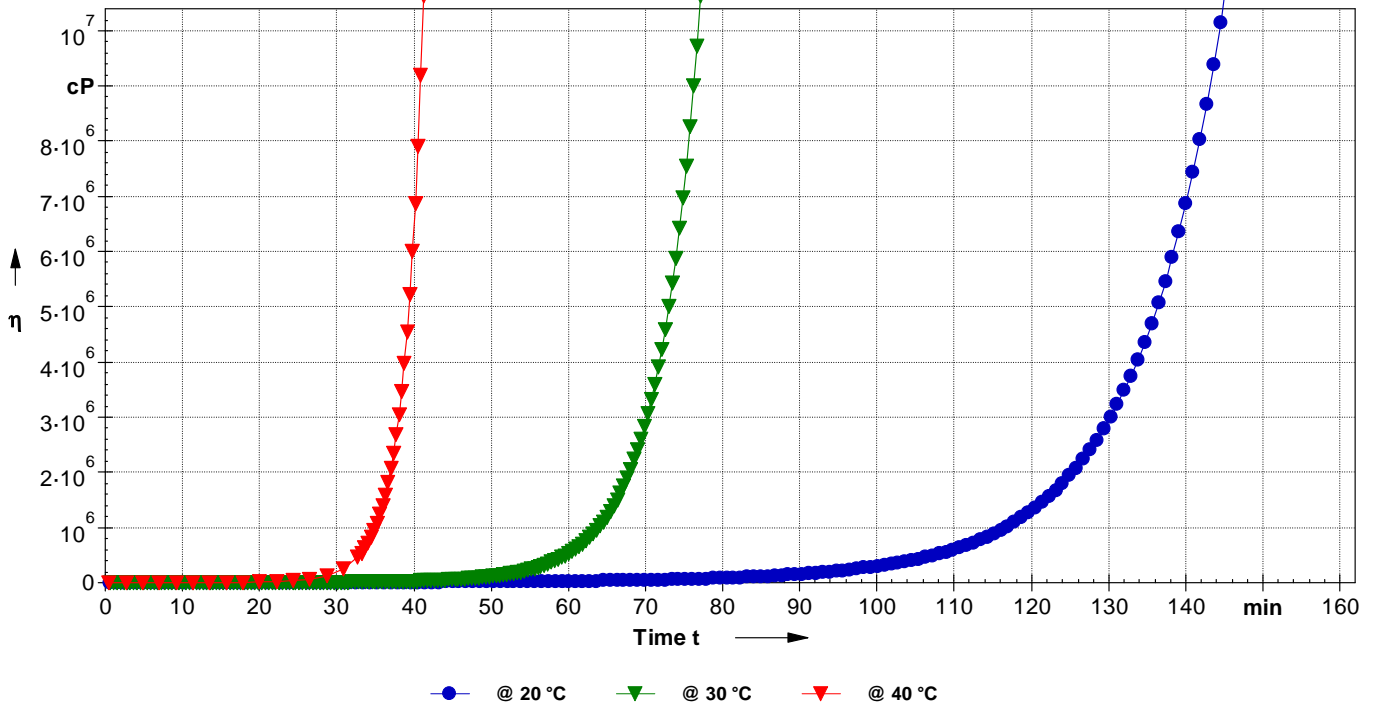
		SD 4999	SD 4993	SD 4991	SD 4990
Aspect		Liquid	Liquid	Liquid	Liquid
Color		Amber	Light yellow	Clear	Clear
Gardner color maximum		5	4	2	2
Reactivity levels		Fast	Medium	Slow	Ultraslow
Density ± 0.01	@ 20 °C	1.07	0.95	0.95	0.95
Bio-based Carbon	%			0	
Viscosities (m.Pas ± 20 %)	@ 15 °C	450	110	80	25
	@ 20 °C	300	80	60	18
	@ 25 °C	200	60	40	15
	@ 30 °C	140	40	30	11
	@ 40 °C	11	25	20	8
Refractive index (± 0.0010)	@ 25 °C	1.5740	1.5125	1.4708	1.4535

SR GreenPoxy 33 / SD 499X Mixes:

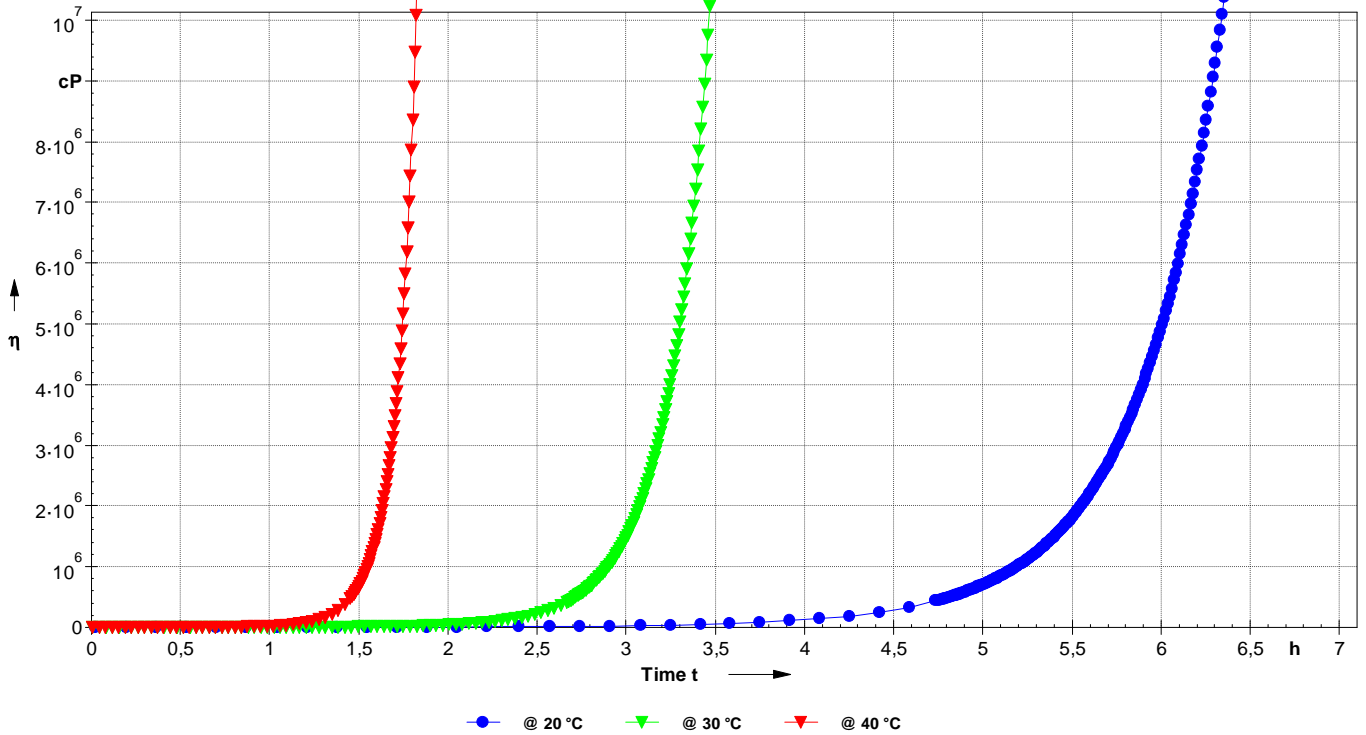
		GP 33 / SD 4999	GP 33 / SD 4993	GP 33 / SD 4991	GP 33 / SD 4990
Mixing ratio: Quantity by weight		← 100 / 35 →			
Quantity by volume		100 / 38	100 / 42	100 / 43	100 / 43
Mix % bio-based Carbon content		 25 - 27 %			
Mixes initial viscosities (m.Pas ± 20 %)	@ 20 °C	1 400	940	760	630
	@ 30 °C	700	360	300	220
	@ 40 °C	350	210	120	120

Reactivity – 1 mm film viscosity evolution @ 20, 30 and 40 °C

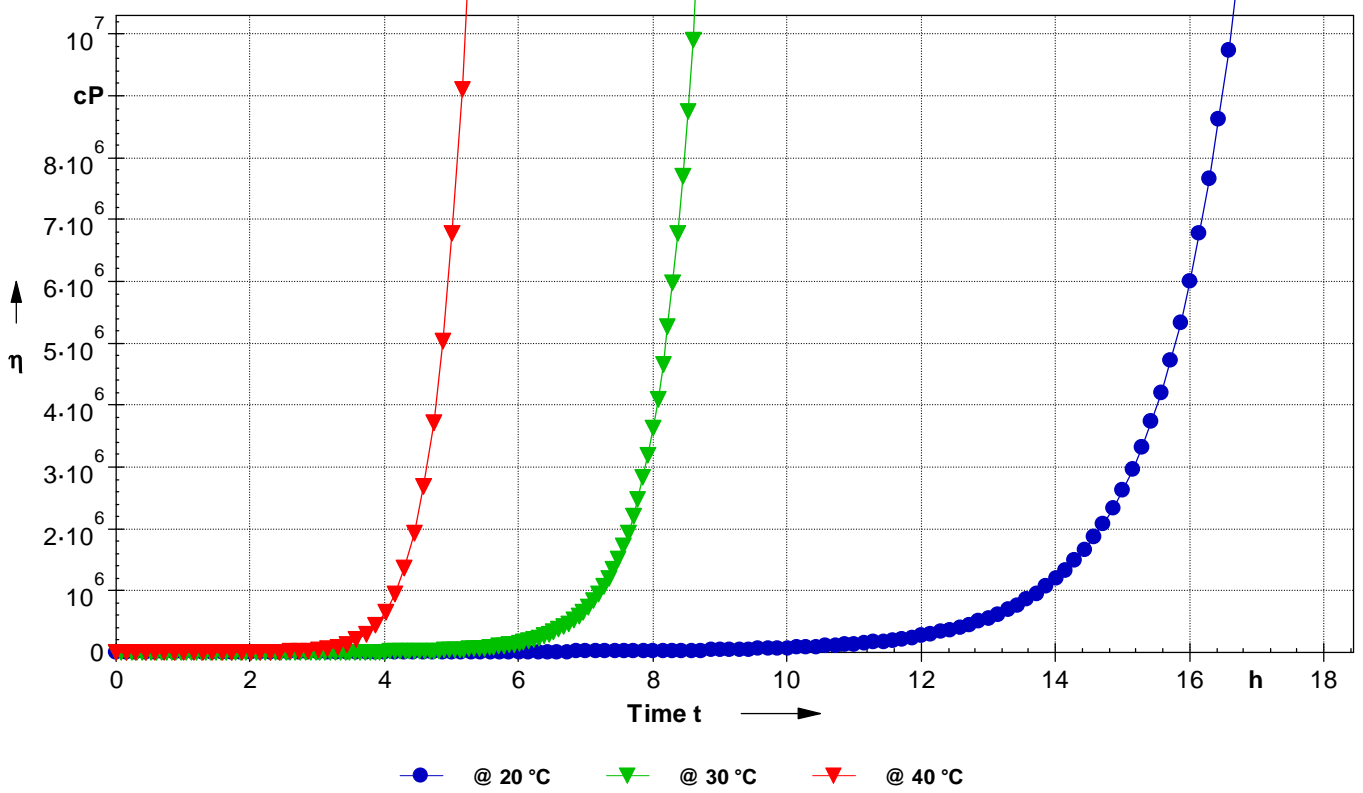
SR GreenPoxy 33 / SD 4999



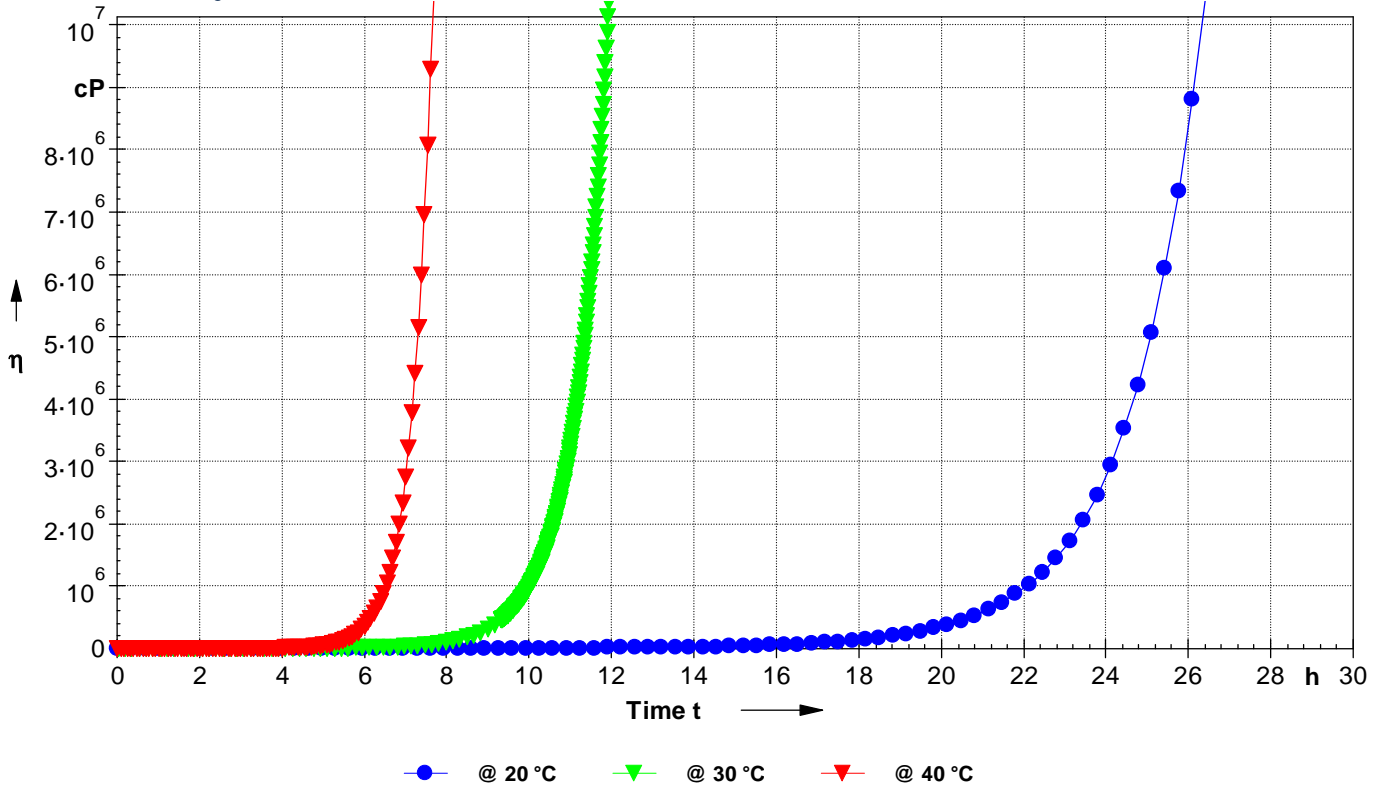
SR GreenPoxy 33 / SD 4993



SR GreenPoxy 33 / SD 4991



SR GreenPoxy 33 / SD 4990



Mechanical Properties of Pure casted mix Resin / Hardeners

Cure	SR GreenPoxy 33 / SD 4999		SR GreenPoxy 33 / SD 4993		
	AT + 24 hrs @ 40 °C	AT + 8 hrs @ 60 °C	AT + 24 hrs @ 40 °C	AT + 8 hrs @ 60 °C	
Tension					
Modulus of elasticity	N/mm ²	3250	3200	3150	3050
Maximum resistance	N/mm ²	76	79	77	77
Resistance at break		75	73	76	74
Elongation at max. resistance	%	3.6	4.2	3.4	4.0
Elongation at break	%	3.8	5.7	3.5	4.8
Flexion					
Modulus of elasticity	N/mm ²	3450	3250	3200	3100
Maximum resistance	N/mm ²	125	124	120	119
Elongation at max. resistance	%	4.9	5.6	4.5	5.5
Elongation at beak	%	9.3	8.2	10.0	9.0
Compressive					
Compressive yield strength	N/mm ²	112	112	103	103
Offset compressive yield	%	14	15	14	15
Shear strength					
Maximum resistance	N/mm ²	49	52	44	47
Charpy impact strength					
Resilience	KJ/m ²	20	29	24	35
Glass Transition					
Tg 1 Onset	°C	65	77	65	79
Tg 1 Onset maximum	°C		80		84

Cure		SR GreenPoxy 33 / SD 4991			SR GreenPoxy 33 / SD 4990		
		AT + 24 hrs @ 40 °C	AT + 16 hrs @ 60 °C	AT + 8 hrs @ 80 °C	AT + 24 hrs @ 40 °C	AT + 16 hrs @ 60 °C	AT + 8 hrs @ 80 °C
Tension							
Modulus of elasticity	N/mm ²	3300	2900	2700	2750	2400	2300
Maximum resistance	N/mm ²	71	72	68	66	64	54
Resistance at break		68	69	67	63	59	46
Elongation at max. resistance	%	3.1	4.3	5.1	3.1	3.9	4.9
Elongation at break	%	3.1	4.8	6.0	3.4	4.8	9.6
Flexion							
Modulus of elasticity	N/mm ²	3250	3000	2700	3100	2800	2500
Maximum resistance	N/mm ²	113	113	110	103	99	87
Elongation at max. resistance	%	4.4	5.3	6.3	4.1	5.0	5.5
Elongation at beak	%	6.3	6.8	7.3	11.5	9.3	13.0
Compressive							
Compressive yield strength	N/mm ²	99	95	91	90	85	80
Offset compressive yield	%	14	16	18	13	14	15
Shear strength							
Maximum resistance	N/mm ²	45	47	46	42	42	40
Charpy impact strength							
Resilience	KJ/m ²	24	36	25	28	40	37
Glass Transition							
Tg 1 Onset	°C	68	86	97	65	79	85
Tg 1 Onset maximum	°C			97			87

Tests carried out on samples of pure cast resin, without prior degassing, between steel plates.**Measures undertaken according to the following norms:**

Tension :	Iso 527 - 2
Flexion :	Iso 178
Charpy impact strength:	NF T 51-035
Shear Strength	ASTM D 732 - 93
Compressive	ISO 604
Water absorption:	Internal. Polymerisation according to cycle, machining, weighing, time spent in distilled water at 70 °C / 48 hours, weighing 1 hour after emerging,
Glass transition DSC :	ISO 11357-2 : 1999 -5°C to 180°C under nitrogen gaz Tg1 or Onset : 1st point at 20 °C/mn Tg1 maximum or Onset : second passage
Glass transition DTMA:	ISO 11357-1 - TG onset G' Temperature ramp 0°C to 180 °C @ 2°C/min ASTM D4065 - TG peak G''

Physical tests according standard ::

Gardner color:	NF EN ISO 4630 Visual metod
Refractive index :	NF ISO 280
Viscosity:	NF EN ISO 3219 Rheometer 50 mm, shear 10s ⁻¹
Density:	NF EN ISO 2811-1 Pyknometer
Gel time :	Cross G' G'' / rheometer CP50 - Shear rate 10 s ⁻¹
GreenCarbon content:	ASTM D6866 or XP CEN/TS 16640 Avril 2014

LEGAL NOTES :

The information given in writing or verbally, in the context of our technical assistance and our trials, do not engage our responsibility. They are 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. So, we advise the users of SICOMIN products, to check by some practical trials they are suitable for the envisaged processes and applications. The customer's storage, the use, the implementation and the transformation of the supplied products, are not under our control and your responsibility only will respond for it.

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 implement 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.