SR GreenPoxy 33 / SZ 8525

Clear epoxy system for compression moulding

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.

***SR GreenPoxy* 33 / SZ 8525** epoxy system:
Clear laminate and final aspect.
High mechanical properties.
Good wetting out properties resulting in a low resin consumption.
Recommended cycle of 10 min at 100 °C
Mix bio-based carbon content of about 28 %.

Resin *SR GreenPoxy* 33:

Modified Epoxy matrix
Low viscosity

Profile:

High reactivity – short cycle times
Clear color
Very good adhesion on various material
Design for outdoor's composites equipment

Applications:

Wet lay-up
Pressure moulding
Hot process (90 – 120 °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 (g/cm^3) ± 0.01	@ 20 °C	1.159
% bio-based Carbon content		34 - 36 %
Viscosities (m.Pas ± 20 %)	@ 15 °C @ 20 °C @ 25 °C @ 30 °C @ 40 °C	6 380 3 240 1 780 1 040 410
Refractive index (± 0.0005)	@ 25 °C	1.5562

Hardener SZ 8525:

Aspect / Color Gardner color		Liquid / Light yellow 3 maximum
Reactivity levels		Standard
Density ± 0.01	@ 20 °C	0.94
Bio-based Carbon	%	0
Viscosities (m.Pas ± 20 %)	@ 20 °C @ 30 °C @ 40 °C @ 50 °C @ 60 °C @ 70 °C @ 80 °C @ 90 °C	33 25 17 11 8 6 4 3
Refractive index (± 0.0005)	@ 25 °C	1.4908

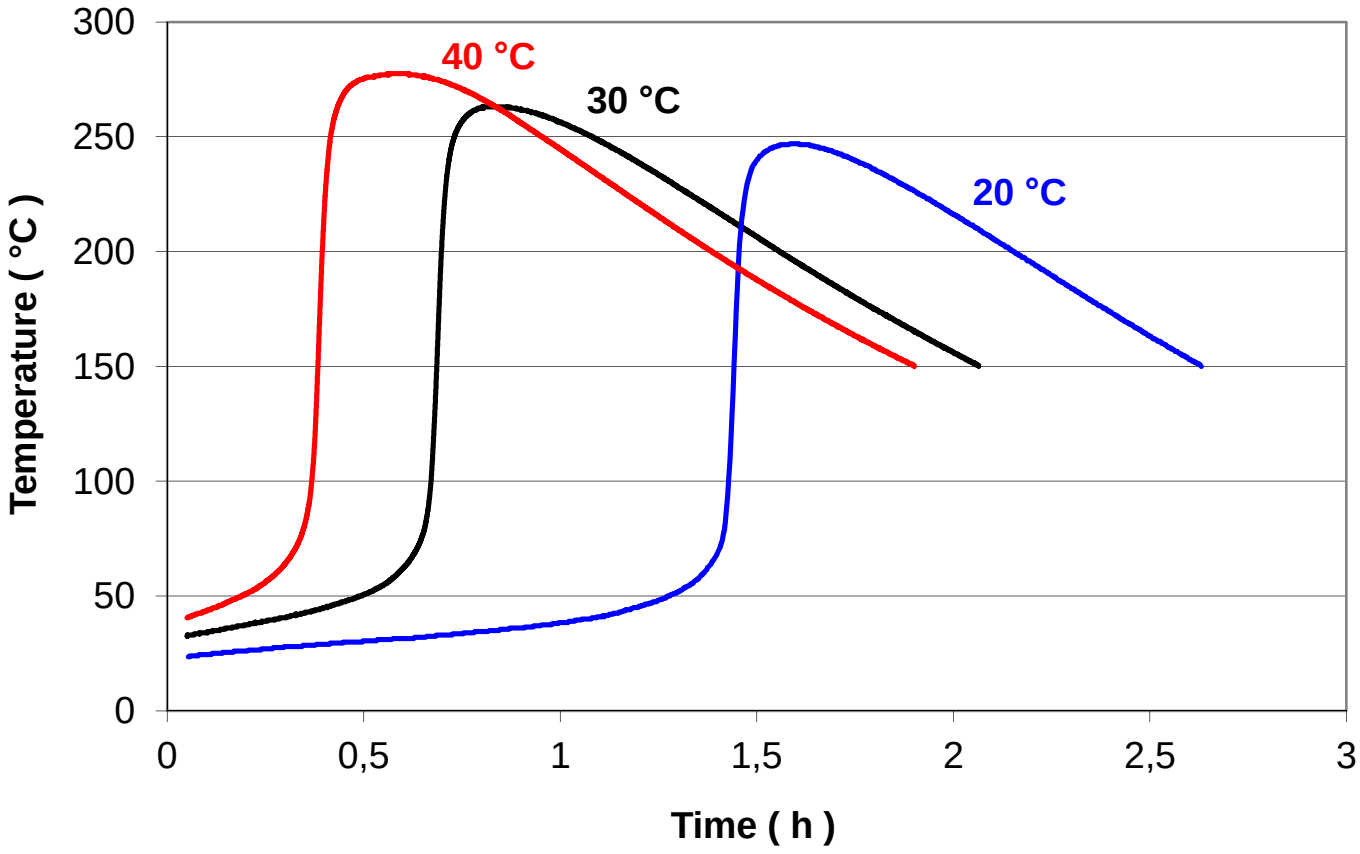
SR GreenPoxy 33 / SZ 8525 Mixes:

Mixing ratio:		
Quantity by weight		**100 / 24**
Quantity by volume		**100 / 30**
Mix % bio-based Carbon content		27– 29 %
Viscosities (m.Pas ± 20 %)	@ 20 °C @ 30 °C @ 40 °C @ 50 °C @ 60 °C @ 70 °C @ 80 °C @ 90 °C @ 100 °C	1 300 620 280 110 70 50 40 30 20

Reactivities on 500 g Mix *SR GreenPoxy* 33 / SZ 8525

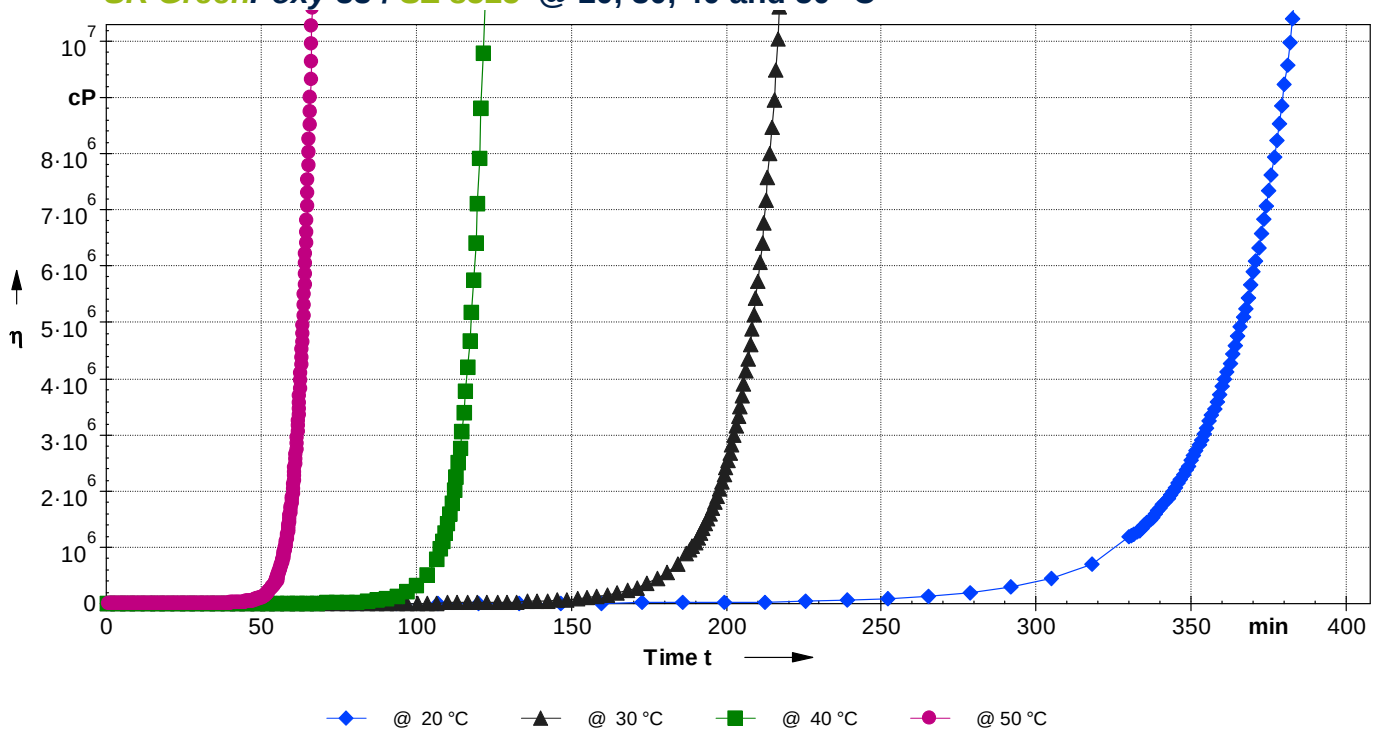
Exothermic temperature (°C) :	
@ 20 °C	250
@ 30 °C	260
@ 40 °C	280
Time taken to achieve exotherm :	
@ 20 °C	1 hrs 35’
@ 30 °C	48’
@ 40 °C	33’
Time taken to reach 50 °C :	
@ 20 °C	1 hrs 15’
@ 30 °C	30’
@ 40 °C	11’

Pot life 500 g mix @ 20, 30 and 40 °C

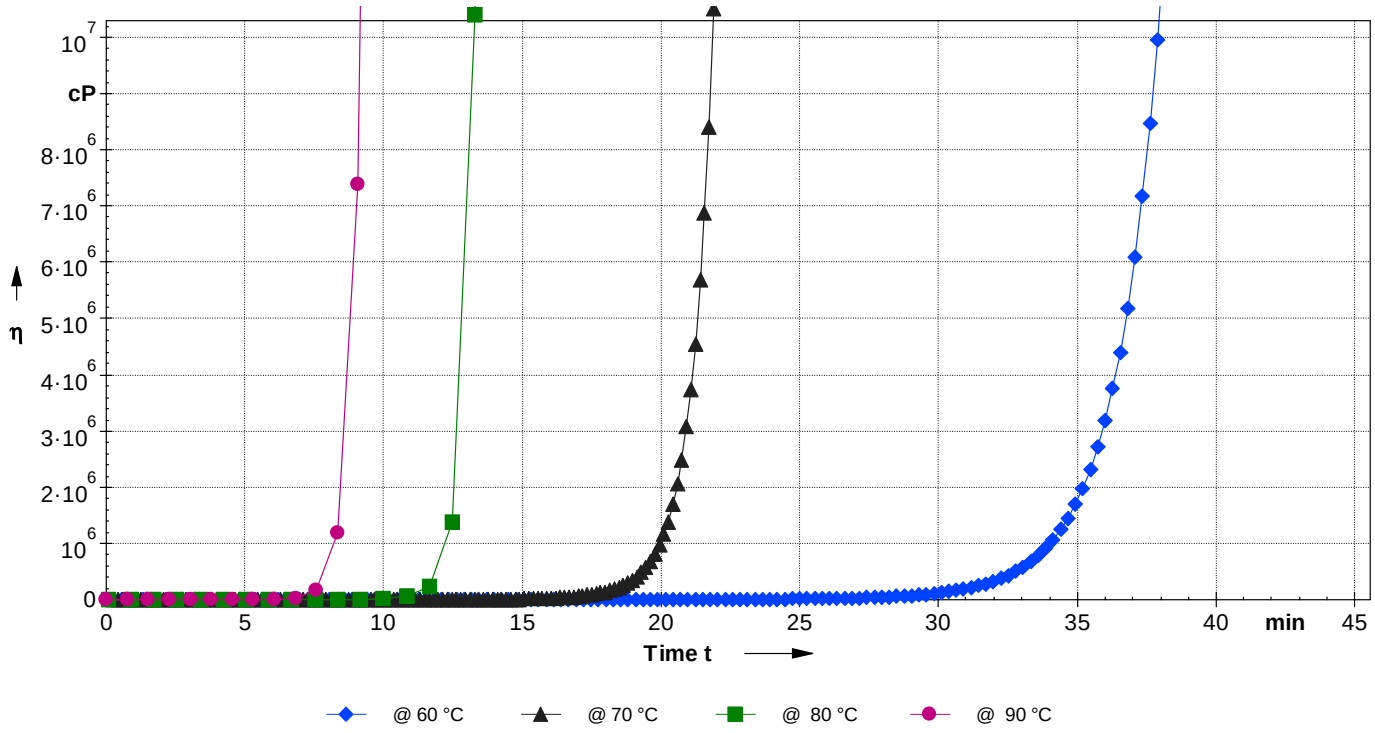


Reactivity – 1 mm film viscosity evolution with the temperature

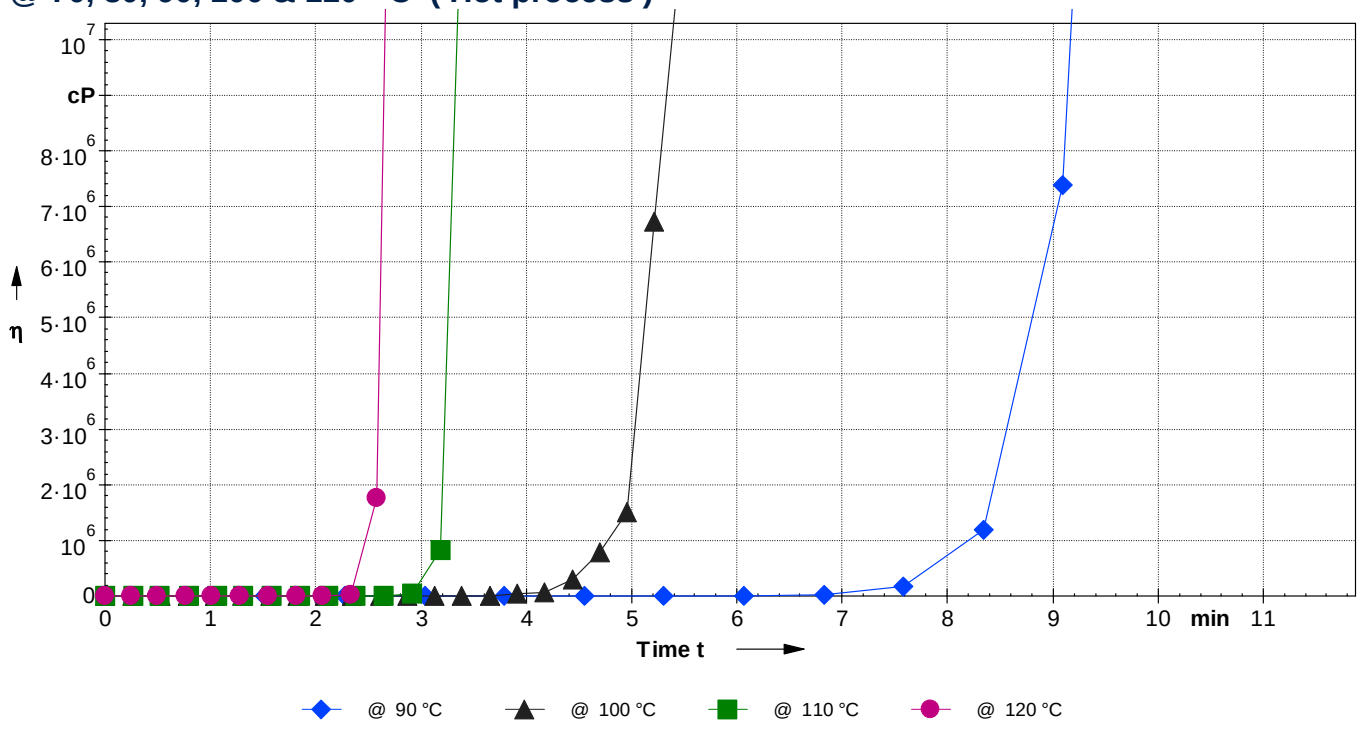
SR GreenPoxy 33 / SZ 8525 @ 20, 30, 40 and 50 °C



@ 50, 60, 70 °C (Hot process)



@ 70, 80, 90, 100 & 110 °C (Hot process)



Time of Cure / hot process

Curing time	Tg onset DSC @ 80 °C	Tg onset DSC @ 90 °C	Tg onset DSC @ 100 °C	Tg onset DSC @ 110 °C	Tg onset DSC @ 120 °C
7’	/	/	/	/	87
8’	/	/	/	87	93
9’	/	/	/	93	100
10’	/	/	/	98	104
11’	/	/	87	100	107
12’	/	/	93	105	110
13’	/	/	100	107	112
14’	/	/	103	109	114
15’	/	87	105	112	116
17’	/	93	107	114	118
20’	/	100	112	117	120
25’	87	107	114	120	
35’	93	111	117		
45’	100	114	120		
1 h 10’	107	116			
2 h 15’	114	118			
2 h 45’	117	120			
4 h 30’	120				

/: not recommended, insufficient crosslinking
Data: without heating time to reach the curing temperature and without the time necessary to cooling of the mold.

Mechanical Properties of Pure casted mix Resin/hardener

Cure		Ambiant + 3 hrs 80°C	Ambiant + 1 hrs 100 °C	Ambiant + 30' 120 °C
Tension				
Modulus of elasticity	N/mm²	3300	3000	3150
Maximum resistance	N/mm²	71	80	80
Resistance at break		71	80	77
Elongation at max. resistance	%	2.8	5.1	5.6
Elongation at break	%	2.8	5.2	6.1
Flexion				
Modulus of elasticity	N/mm²	3380	3150	3050
Maximum resistance	N/mm²	128	119	115
Elongation at max. resistance	%	6.2	6.6	6.6
Shear strengh	N/mm²	57	55	53
Compression				
Compressive yield strength	N/mm²	134	124	125
Offset compressive yield	%	10	11	10
Charpy impact strength				
Resilience	KJ/m²	18	20	27
Glass Transition				
Tg 1 Onset	°C	117	120	120
Tg 1 Onset maximum	°C			114

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 Strenght	*ASTM D 732 - 93*
Compresive	*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*	

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