

GREENPOXY 56 High Biomass Carbon Content

The system **GREENPOXY 56** is out coming from the latest innovations in green chemistry.

The system **GREENPOXY 56** is a produce with a high content of carbon from vegetable origin.

The Green Carbon content of our system is certified by an independent laboratory using Carbon 14 measurements.

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

SICOMIN obtains a rate of 56% of the molecular structure from plant origin, with the pair SR **GREENPOXY 56** / SD GP 505 v2.

Other systems **GREENPOXY 56**, SD XXXX are possible (please see TDS).

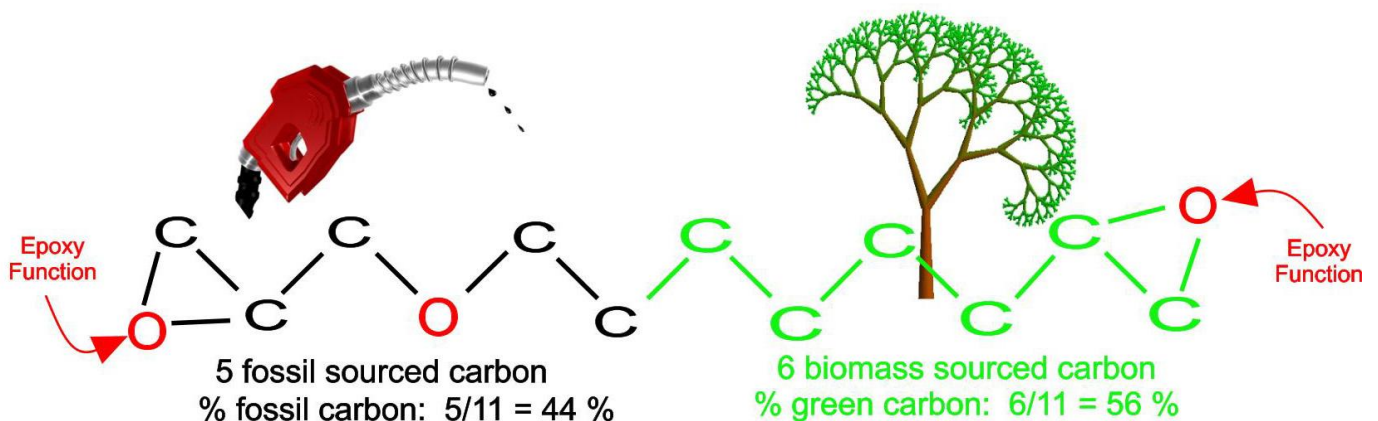
The rate of final Green carbon content will depend on the hardener choice.

SR **GREENPOXY 56** is an epoxy resin which has 56% of its molecular structure coming from plant origin.

This percentage is function of the origin of the carbon contained in the molecule.

Below, as shown in this hypothetical molecule of 11 carbons, 6 being coming from green chemistry, so it contains 56% green carbon.

Hardener SD GP 505 v2 follows the same logic and contains the maximum rate possible of biomass carbon.



GREENPOXY 56 has an average viscosity enabling the manufacturing of various parts

Applications

- Hand lamination for tooling or industrial parts
- RTM processes (infusion, injection...)
- Filament winding
- Hot or cold press
- Casting
- Bonding

SR GREENPOXY 56 Resin

Aspect / colour		Yellow liquid
Chemical nature		Epoxy
Storage		2 years, cristalisation free
Viscosity (mPa.s)	15 °C	2500 ± 500
Rheometer CP 50 mm	20 °C	1400 ± 280
Shear rate 10 s ⁻¹	25 °C	800 ± 160
	30 °C	500 ± 100
	40 °C	250 ± 50
% Green Carbon		56 ± 2
Color (Gardner) ISO 4630		2 max
Density NF EN ISO 2811-1	20 °C	1.198 ± 0.005
Refractive index DIN 514423-2	25 °C	1.535 + 0.002

SD GP 505 V2 Hardener

Aspect / colour		Reddish yellow liquid
Typical reactivity		Fast
Viscosity (mPa.s)	15 °C	1800 ± 360
Rheometer CP 50 mm	20 °C	1200 ± 240
Shear rate 10 s ⁻¹	25 °C	820 ± 165
	30 °C	580 ± 115
	40 °C	320 ± 60
% Green carbon		58 ± 3
Color (Gardner) ISO 4630		17 max
Density NF EN ISO 2811-1	20 °C	0.986 ± 0.005

SR GREENPOXY 56 / SD GP 505 V2 Mix Properties

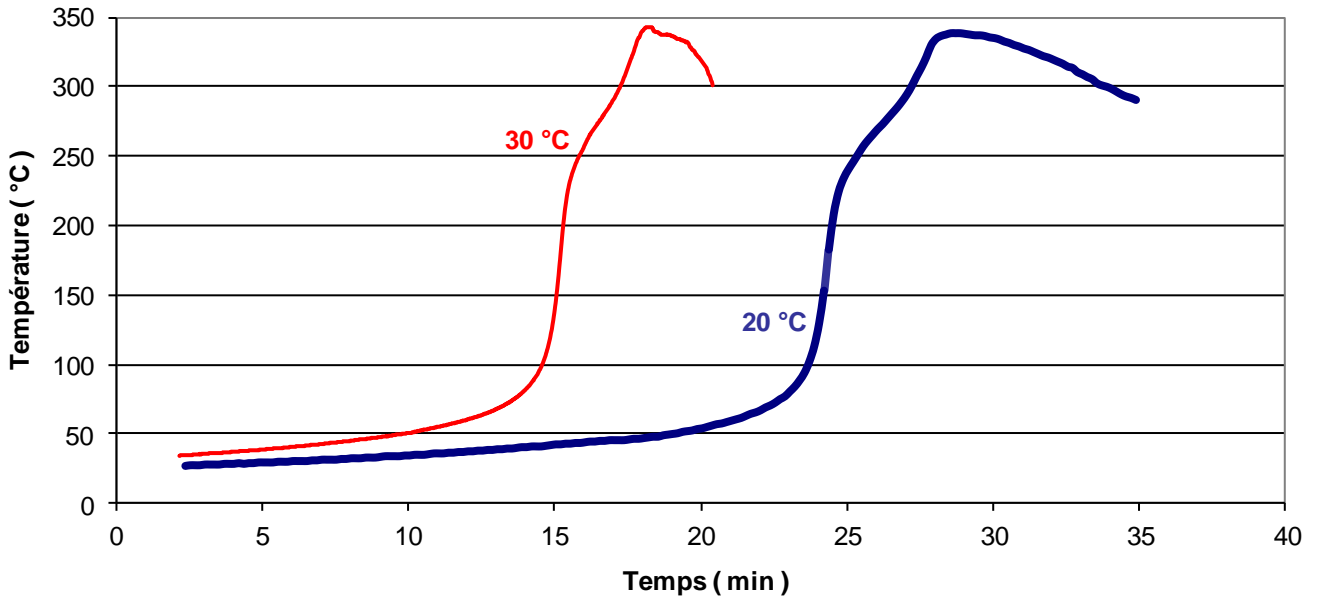
Weight ratio		100 / 42 g
Volume ratio		100 / 50 ml 2 / 1
% Green carbon		> 56 %
Mix viscosity (mPa.s)		
Rheometer CP 50 mm	20 °C	1400 ± 280
Shear rate 10 s ⁻¹	30 °C	780 ± 160

Reactivity – Mass Exotherm On 500 G Mix

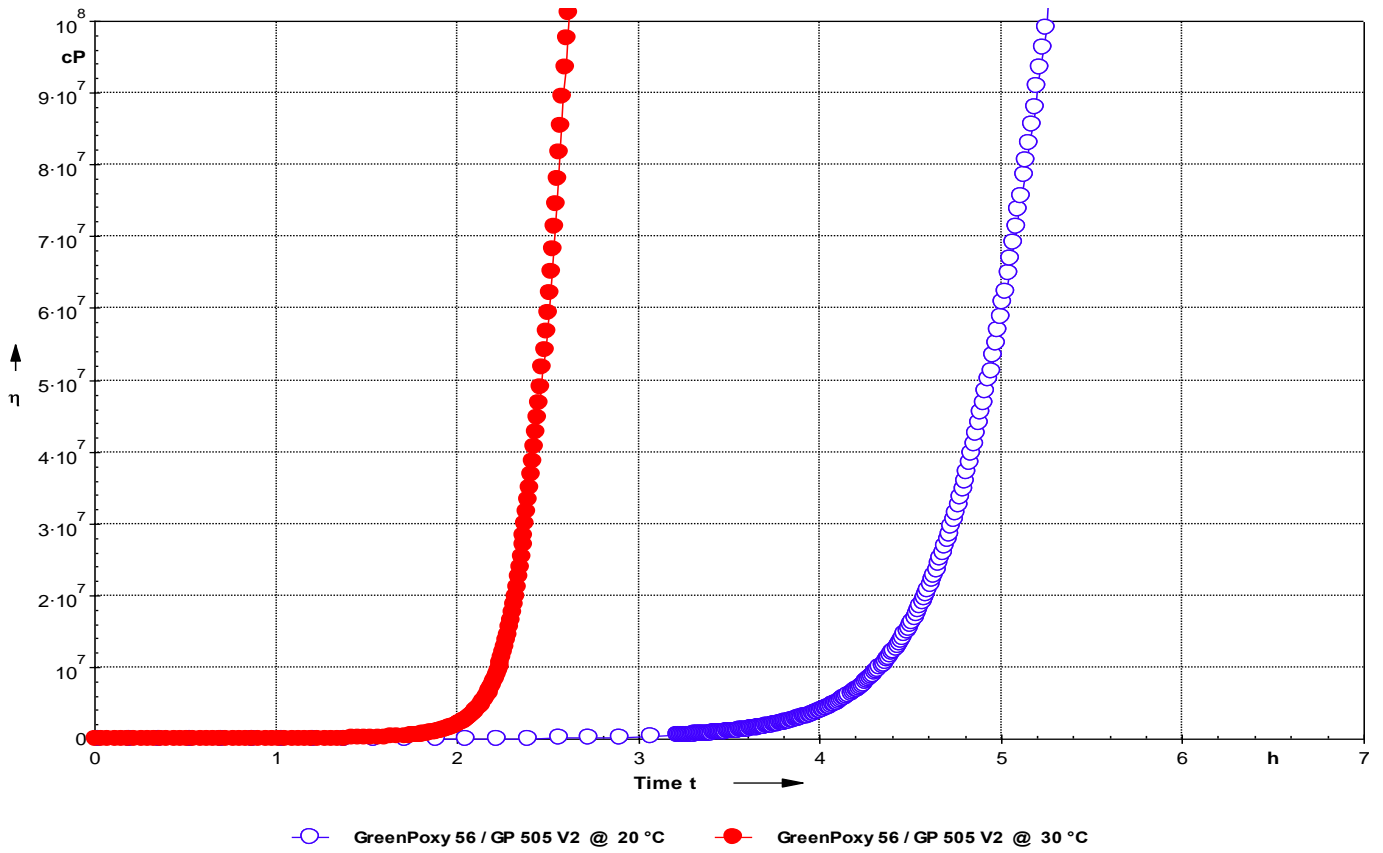
SR GREENPOXY 56 / SD GP 505 V2		
Exothermic peak:		
	20 °C	340 °C
	30 °C	340 °C
Time to reach exothermic peak :		
	20 °C	28'
	30 °C	18'
Time to reach 50 °C ::		
	20 °C	19'
	30 °C	10

Exotherms on 500 g mix @ 20 et 30 °C:

NB: Large casting develop very exotherm temperature and high smokes densities



Reactivity – 1 mm film viscosity evolution



Gel time on 1 mm thickness:

@ 20 °C	3 h 20'
@ 30 °C	1 h 45'

Gel time: intersection $G' = G''$ / rheometer CP50 - Shear rate 10 s^{-1}

Other possibilities

	Mixing By weight	% C Green	Tg 1 maximum or Onset (°C)	Best use
SR GREENPOXY 56 / SD Surf Clear	100 / 37	41	SD SC : 75	Clear laminates
SR GREENPOXY 56 / SD Glass One	100 / 42	40	SD GO: 69	Clear laminates
SR GREENPOXY 56 / SD GP 505	100 / 47	56	DP 505: 71	
SR GREENPOXY 56 / SD 1213	100 / 50	37	1213 : 43	Large clear casting
SR GREENPOXY 56 / SD 280x	100 / 37	41	2806 : 66 2803 : 72 2801 : 80	Multipurpose
SR GREENPOXY 56 / SD 477x	100 / 29	43	4775: 80 4771: 74	Multipurpose
SR GREENPOXY 56 / SD 550x	100 / 37	41	5505 : 78 5503 : 85 5502 : 84	Multipurpose
SR GREENPOXY 56 / SD 597.20	100 / 21	46	597.20 : 100	Very large casting
SR GREENPOXY 56 / SD 720x	100 / 37	41	7206 : 84 7203 : 82 7201 : 80	Multipurpose
SR GREENPOXY 56 / SD 860x	100 / 37	41	8605 : 67 8601 : 56	Multipurpose
SR GREENPOXY 56 / SD 882x	8824 100 / 21 8822 100 / 31	46 43	8824 : 90 8822 : 71	Infusion

Mechanical properties on pure cast resin

		GREENPOXY 56 / GP 505 V2	GREENPOXY 56 / GP 505 V2	GREENPOXY 56 / GP 505 V2
Curing cycle		7 days 23 °C	24 h 23 °C + 24 h 40 °C	24 h à 23 °C + 8 h 60 °C
Tension				
Modulus of elasticity	N/mm ²	3 100	3 100	2800
Maximum resistance	N/mm ²	64	66	67
Resistance at break	N/mm ²	64	66	67
Elongation at max. load	%	3.2	3.8	4.0
Elongation at break	%	3.2	3.8	4.1
Flexion				
Modulus of elasticity	N/mm ²	2 900	2 800	2 700
Maximum resistance	N/mm ²	99	96	95
Elongation at max. load	%	4,5	4,2	4,5
Elongation at break	%	6,5	4,9	5,2
Charpy impact strength				
Resilience	kJ/m ²	14	21	13
Glass transition				
Tg1	°C	55	61	84 / 78
Tg1 maximum	°C	-	-	84

Tests carried out on samples of pure cast resin, without prior degassing, between steel plates.

Measures undertaken according to the following norms:

Tension: NF T 51-034

Flexion: NF T 51-001

Charpy impact strength: NF T 51-035

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