

## SR *GreenPoxy* 56 / SD 477X



**SR *GreenPoxy* 56** resin is out coming from the latest innovations in bio-based chemistry.

**SR *GreenPoxy* 56** 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).

**SR *GreenPoxy* 56** is an epoxy resin which has 51% of its molecular structure coming from plant origin.

		SD 4773	SD 4772	SD 4771	SD 4770
Reactivity level		Medium	Slow	Slow	Ultra slow
Initial viscosity (mPa.s)	@ 20 °C	915	415	500	355
	@ 30 °C	365	220	240	190
Pot Life (150 g)	@ 20 °C	21 min	31 min	01 h 05	01 h 30
	@ 30 °C	13 min	21 min	41 min	55 min
Mixing ratio	By weight	100 / 30	100 / 30	100 / 30	100 / 30
	By volume	-	-	-	-
Maximum strength	N/mm <sup>2</sup>	68	72	68	68
% Elongation at max strength	%	4,5	3,9	4,3	4,2
TG1 max onset	°C	83	79	85	82
Gel Time	@ 20 °C	06 h 00	07 h 10	11 h 40	14 h 10
	@ 30 °C	03 h 10	03 h 50	05 h 50	07 h 30
Time to reach 400 mPa.s	@ 20 °C	02 h 45	03 h 45	06 h 00	07 h 35
	@ 30 °C	01 h 40	02 h 10	03 h 20	04 h 20
Demold time	@ 20 °C	18 h 00	21 h 30	35 h 00	42 h 30
	@ 30 °C	09 h 30	11 h 30	17 h 30	22 h 30

**SR GreenPoxy 56** resin is out coming from the latest innovations in bio-based chemistry. **SR GreenPoxy 56** 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 56** is an epoxy resin which has 51% 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 56** / SD 477x :

- Good price / performance ratio
- Clear laminate
- High mechanical properties.
- Good wetting properties with low resin consumption.
- Good mechanical properties at room temperature and with a post-cure from 40 to 60 °C
- 2 hardeners of low viscosity, special warm season: **SD 4770 / 4771** suitable with ambient temperature from 25 to 40 °C
- 1 hardener special cold season: **SD 4773** suitable with ambient temperature from 15 to 30 °C



## Epoxy resin SR GreenPoxy 56

Appearance		liquid
Color		colourless
Gardner color		≤ 2
Viscosity (mPa.s)	@ 15 °C	NC ± NC
	@ 20 °C	NC ± NC
	@ 25 °C	NC ± NC
	@ 30 °C	NC ± NC
	@ 40 °C	NC ± NC
Density	@ 20 °C	1,1980
Bio-based Carbon content (%)		51 ± 1
Storage (months)	@ Ta	24

## Hardener(s)

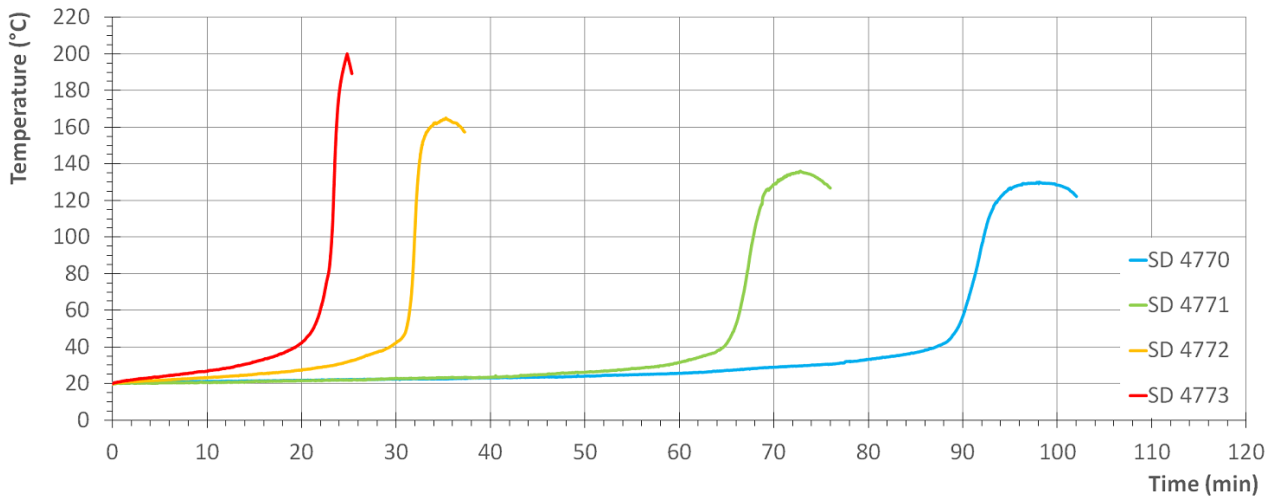
		<b>SD 4773</b>	<b>SD 4772</b>	<b>SD 4771</b>	<b>SD 4770</b>
Appearance		liquid	liquid	liquid	liquid
Color		yellow	colourless	colourless	colourless
Gardner color		≤ 4	≤ 3	≤ 1	≤ 3
Reactivity level		Medium	Slow	Slow	Ultra slow
Viscosity (mPa.s)	@ 15 °C	NC ± NC	NC ± NC	NC ± NC	NC ± NC
	@ 20 °C	NC ± NC	NC ± NC	NC ± NC	NC ± NC
	@ 25 °C	NC ± NC	NC ± NC	NC ± NC	NC ± NC
	@ 30 °C	NC ± NC	NC ± NC	NC ± NC	NC ± NC
	@ 40 °C	NC ± NC	NC ± NC	NC ± NC	NC ± NC
Density	@ 20 °C	0,9780	0,9270	0,9440	0,9440
Storage (months)	@ Ta	24	24	24	24

## Mixe(s) SR GreenPoxy 56 / SD 477X

		SD 4773	SD 4772	SD 4771	SD 4770
Appearance		liquid	liquid	liquid	liquid
Color		yellow	colourless	colourless	colourless
Mixing ratio					
	By weight	100 / 30	100 / 30	100 / 30	100 / 30
	By volume	-	-	-	-
Density	@ 20 °C	1,203	1,1855	1,1959	1,1953
Initial viscosity (mPa.s)	@ 20 °C	915	415	500	355
PP 50 mm / 10 s <sup>-1</sup>	@ 30 °C	365	220	240	190

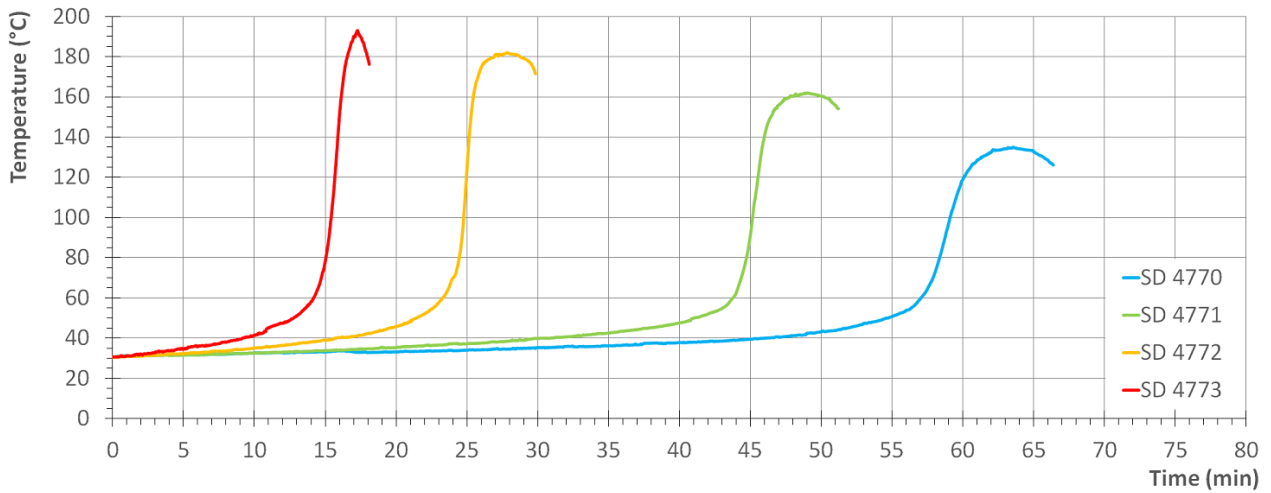
## Reactivity @ 20 °C for 150 g SR GreenPoxy 56 / SD 477X

	SD 4773	SD 4772	SD 4771	SD 4770
Exothermic temperature (°C)	200	165	136	130
Exothermic peak time	25 min	35 min	01 h 15	01 h 40
Time to reach 50 °C	21 min	31 min	01 h 05	01 h 30

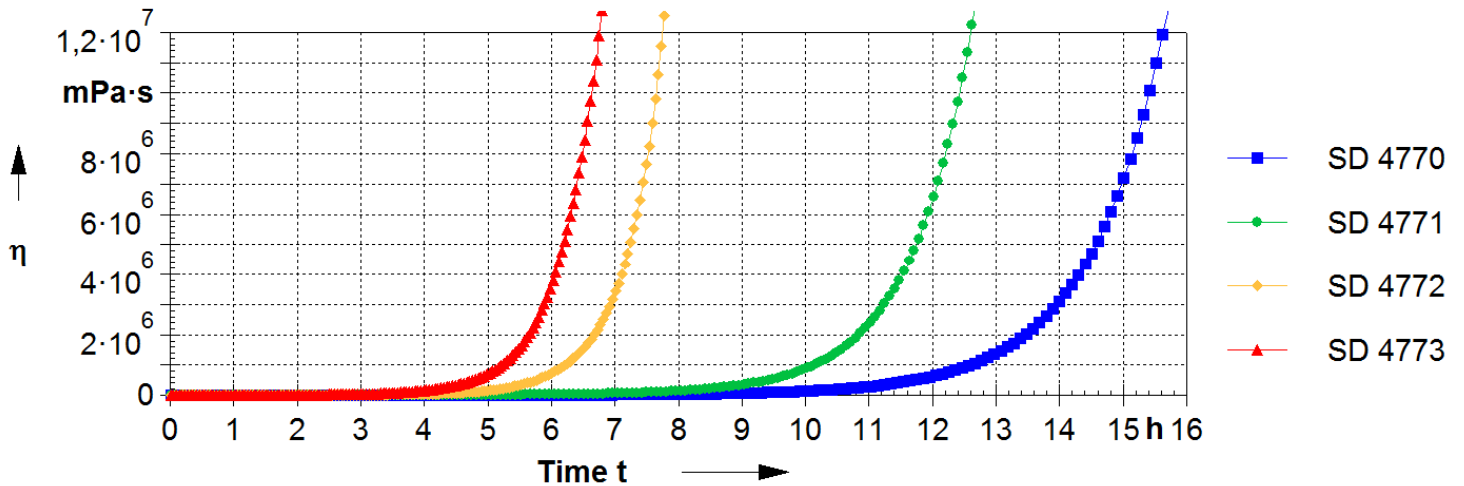


### Reactivity @ 30 °C for 150 g SR GreenPoxy 56 / SD 477X

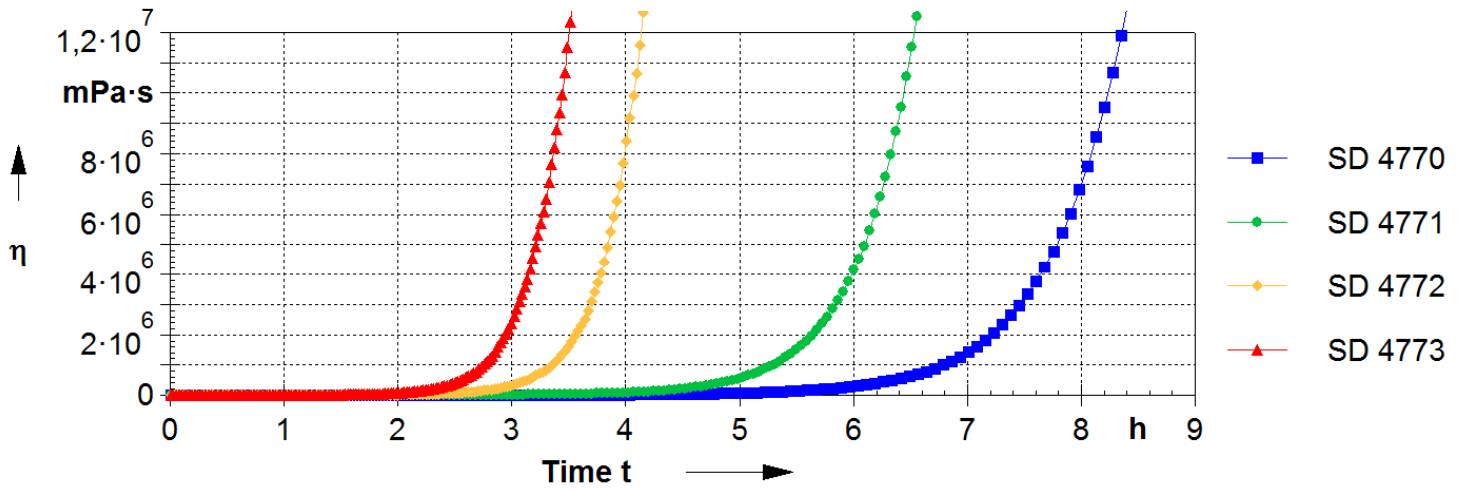
	SD 4773	SD 4772	SD 4771	SD 4770
Exothermic temperature (°C)	193	182	162	135
Exothermic peak time	17 min	28 min	49 min	01 h 00
Time to reach 50 °C	13 min	21 min	41 min	55 min



### @ 20 °C



@ 30 °C



## Mechanical properties on cast resin :

		SR GreenPoxy 56 / SD 4773			SR GreenPoxy 56 / SD 4772		
Curing cycles		24 h @ TA + 24 h @ 40 °C	24 h @ TA + 16 h @ 60 °C	24 h @ TA + 8 h @ 80 °C	24 h @ TA + 24 h @ 40 °C	24 h @ TA + 16 h @ 60 °C	24 h @ TA + 8 h @ 80 °C
<b>Tensile</b>							
Modulus	N/mm <sup>2</sup>	4 070	4 030	4 340	3 710	3 650	3 500
Maximum strength	N/mm <sup>2</sup>	71	72	68	65	70	72
Breaking Strength	N/mm <sup>2</sup>	61	66	62	60	59	69
Elongation at max strength	%	3,3	4,1	4,5	2,5	3,7	3,9
Elongation at break	%	4,7	6,9	9,4	3	7,6	5,3
<b>Flexion</b>							
Modulus	N/mm <sup>2</sup>	3 400	3 250	3 200	3 390	3 220	3 250
Maximum strength	N/mm <sup>2</sup>	121	124	117	116	118	122
Breaking Strength	N/mm <sup>2</sup>	96	109	103	94	110	118
Elongation at max strength	%	4,9	6	6,5	4,5	5,3	5,6
Elongation at break	%	7,8	8,8	9,6	6,9	8,7	6,9
<b>Shear</b>							
Breaking Strength	N/mm <sup>2</sup>	49	50	50	49	49	49
<b>Compression</b>							
Modulus	N/mm <sup>2</sup>						
Yield strength	N/mm <sup>2</sup>	101	101	98	104	102	102
Offset compression yield	%	11,6	14,2	15,6	11,9	13,2	13
<b>Charpy impact strength</b>							
Resilience	kJ/m <sup>2</sup>	43	41	37	44	41	33
<b>DSC glass transition</b>							
TG1 onset	°C	73	83	84	69	82	80
TG1 max onset	°C			83			79
<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 GreenPoxy 56 / SD 4771			SR GreenPoxy 56 / SD 4770		
Curing cycles		24 h @ TA + 24 h @ 40 °C	24 h @ TA + 16 h @ 60 °C	24 h @ TA + 8 h @ 80 °C	24 h @ TA + 24 h @ 40 °C	24 h @ TA + 16 h @ 60 °C	24 h @ TA + 8 h @ 80 °C
<b>Tensile</b>							
Modulus	N/mm <sup>2</sup>	3 940	3 560	3 660	3 490	3 390	3 330
Maximum strength	N/mm <sup>2</sup>	69	69	68	68	67	68
Breaking Strength	N/mm <sup>2</sup>	53	61	61	59	56	60
Elongation at max strength	%	3,1	4	4,3	3,3	3,8	4,2
Elongation at break	%	5,4	6,8	7,6	4,7	8,4	7,9
<b>Flexion</b>							
Modulus	N/mm <sup>2</sup>	3 280	3 150	3 050	3 160	3 010	3 040
Maximum strength	N/mm <sup>2</sup>	114	116	116	108	110	112
Breaking Strength	N/mm <sup>2</sup>	77	102	99	61	89	90
Elongation at max strength	%	4,6	5,7	6,1	4,6	5,4	5,9
Elongation at break	%	7,5	8,2	9,7	11,2	9,5	10,1
<b>Shear</b>							
Breaking Strength	N/mm <sup>2</sup>	47	47	47	48	48	48
<b>Compression</b>							
Modulus	N/mm <sup>2</sup>						
Yield strength	N/mm <sup>2</sup>	99	96	95	93	91	97
Offset compression yield	%	11,6	14,2	14,2	11,2	13,5	14,5
<b>Charpy impact strength</b>							
Resilience	kJ/m <sup>2</sup>	55	40	40	45	43	36
<b>DSC glass transition</b>							
TG1 onset	°C	70	86	89	69	71	83
TG1 max onset	°C			85			82
<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,

Bonding Strength Double lap shear:	ASTM D3528-96
	ADH = adhesive failure
	COH = cohesive failure
	TLC = thin-layer cohesive failure
	FT = fiber-tear failure.
	LFT = light-fiber-tear failure

**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	

<b>TA:</b>	Ambient temperature (20 to 25 °C)
<b>NC:</b>	No information Communicated
<b>NB:</b>	No Breaking (maximum flexion deformation : 15 %)

Table 1st page:

Pot Life:	Time to reach 50 °C or time limit for use
Gel time:	Intersection of tangents on the viscosity curve of 1 mm thick layer
Release time:	Time required to obtain sufficient mechanical strength to release
Minimum Vacuum Time:	Time in which vacuum can be applied (25000 mPa.s)
Maximum Vacuum time:	Limit time below which a vacuum can be applied (G'G'' crossing)
Optimum Infusion time:	Time to reach 400 mPa.s
Max Infusion Time:	Time to reach 25000 mPa.s
Vacuum cut-off time:	Time to reach G'G'' crossover + 20%

**LEGAL NOTES:**

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