

SR 1124

Fire resistant epoxy systems

Epoxy system **SR 1124**:

- offers a very low viscosity with exceptional wetting-out properties for hand laminating.
- is a low density fire retardant system, intumescent and halogen free.
- has a low smokes opacity and toxicity.
- meets the stringent fire protection standards specified in construction and transportation.
- offers an exceptional fire resistance with SC FW16 coating (ASTM E84 class A) or with SGI 128 fire retardant epoxy gel-coat.

Guidelines

No filtering

Use a stirrer with high shear to homogenize resin part prior to use

Fire resistant Epoxy resin SR 1124

Appearance	White viscous liquid	
Storage stability	2 years @ 20 °C Stir thoroughly before use	
Viscosity (mPa.s)	@ 15 °C	6900
+/- 20 %	@ 20 °C	4000
	@ 25 °C	2400
	@ 30 °C	1500
	@ 40 °C	700
Density	@ 20 °C	1.23
+/-0.01		
Refractive Index		1,5560
+/- 0.0005		

Hardeners SD 893x

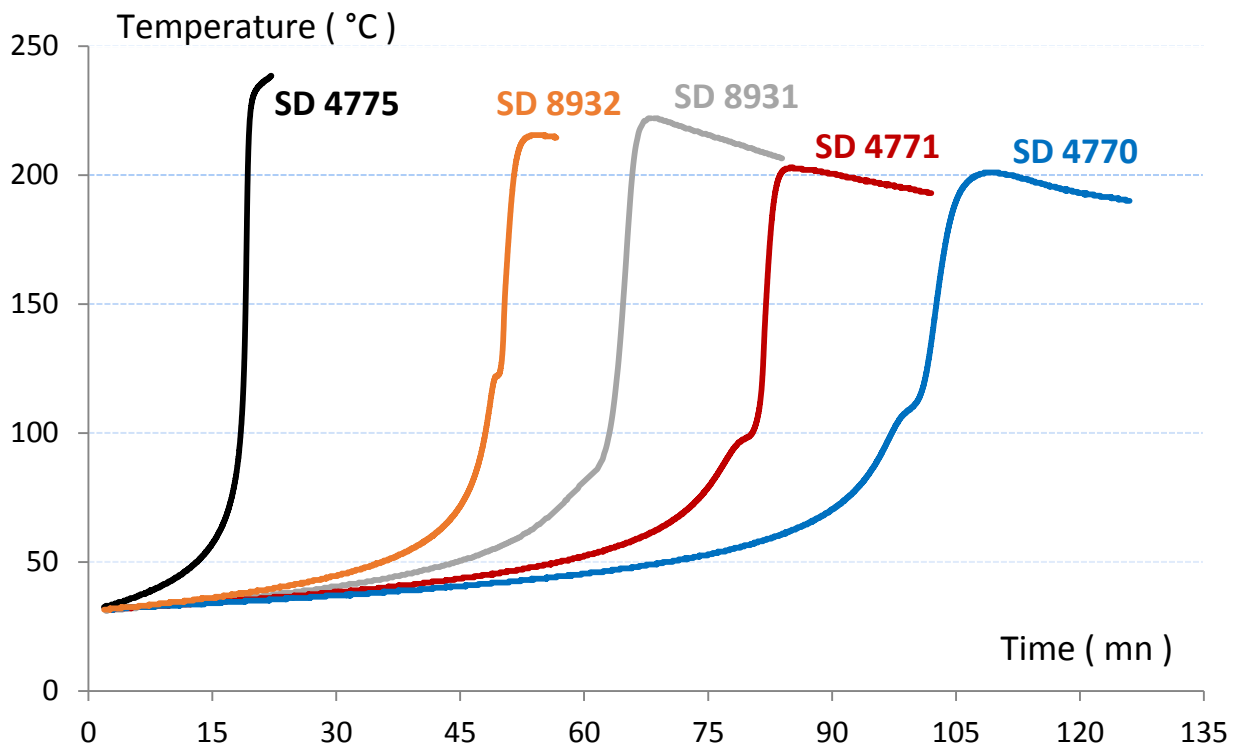
		SD 4775	SD 8932	SD 8931	SD 4771	SD 4770
Appearance				Liquid		
Color				Light yellow		
Color Gardner maximum		5	3	3	3	3
Reactivity		Fast	→			Mega slow
Viscosity (mPa.s)	@ 15 °C	285	33	42	13	13
+/- 20 %	@ 20 °C	190	25	32	11	11
	@ 25 °C	130	19	24	9	9
	@ 30 °C	95	15	19	7	7
	@ 40 °C	55	10	12	5	5
Density	@ 20 °C	1.01	0,94	0.95	0.94	0.94
+/- 0.01						
Refractive Index	@ 25 °C	1.4980	1,4819	1 ,4756	1.4590	1.4603
+/- 0.0005						

Blends Epoxy SR 1124 / SD xxxx

		SR 1124 / SD 4775	SR 1124 / SD 8932	SR 1124 / SD 8931	SR 1124 / SD 4771	SR 1124 / SD 4770
Appearance		White liquid				
Mixing ratio by weight				100 / 23		
Mixing ratio by volume		100 / 28	100 / 30	100 / 30	100 / 30	100 / 30
Viscosity (m.Pas)	@ 20 °C	1620	1400	1100	610	530
+/- 20 %	@ 30 °C	950	600	600	455	410
	@ 40 °C	560	300	350	225	158
Density mix	@ 25 °C			1.17		
+ / - 0.02						

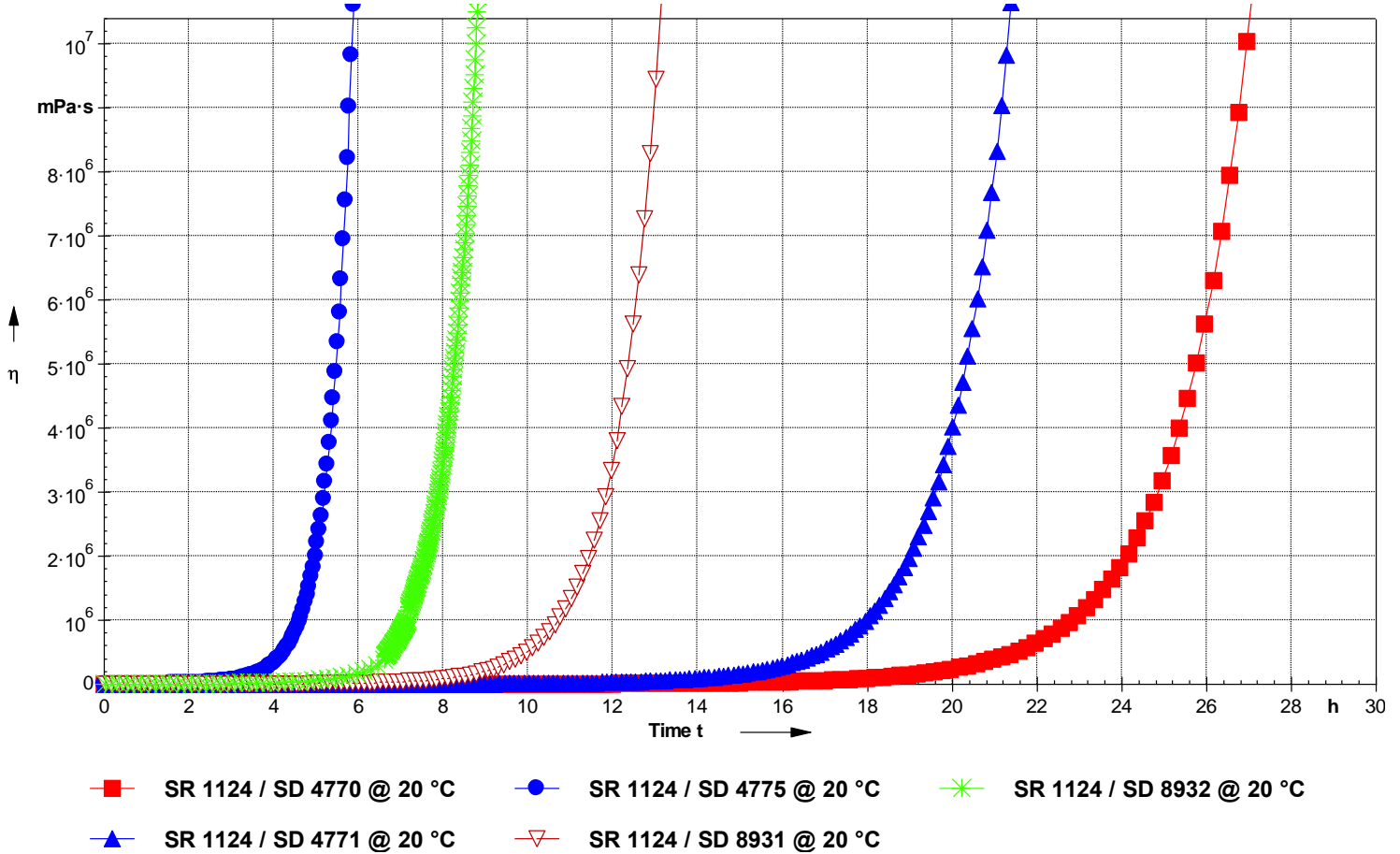
Mass reactivity 500 g @ 30 °C

	SR 1124 / SD 4775	SR 1124 / SD 8932	SR 1124 / SD 8931	SR 1124 / SD 4771	SR 1124 / SD 4770
Exothermic peak on 500 g mix (°C) : @ 30 °C	240	215	220	200	200
Time to reach exothermic peak : @ 30 °C	22'	53'	1 h 15'	1 h 40'	1 h 50'
Time to reach 50 °C on 500 g mix @ 30 °C	13'	35'	45'	55'	1 h 10'

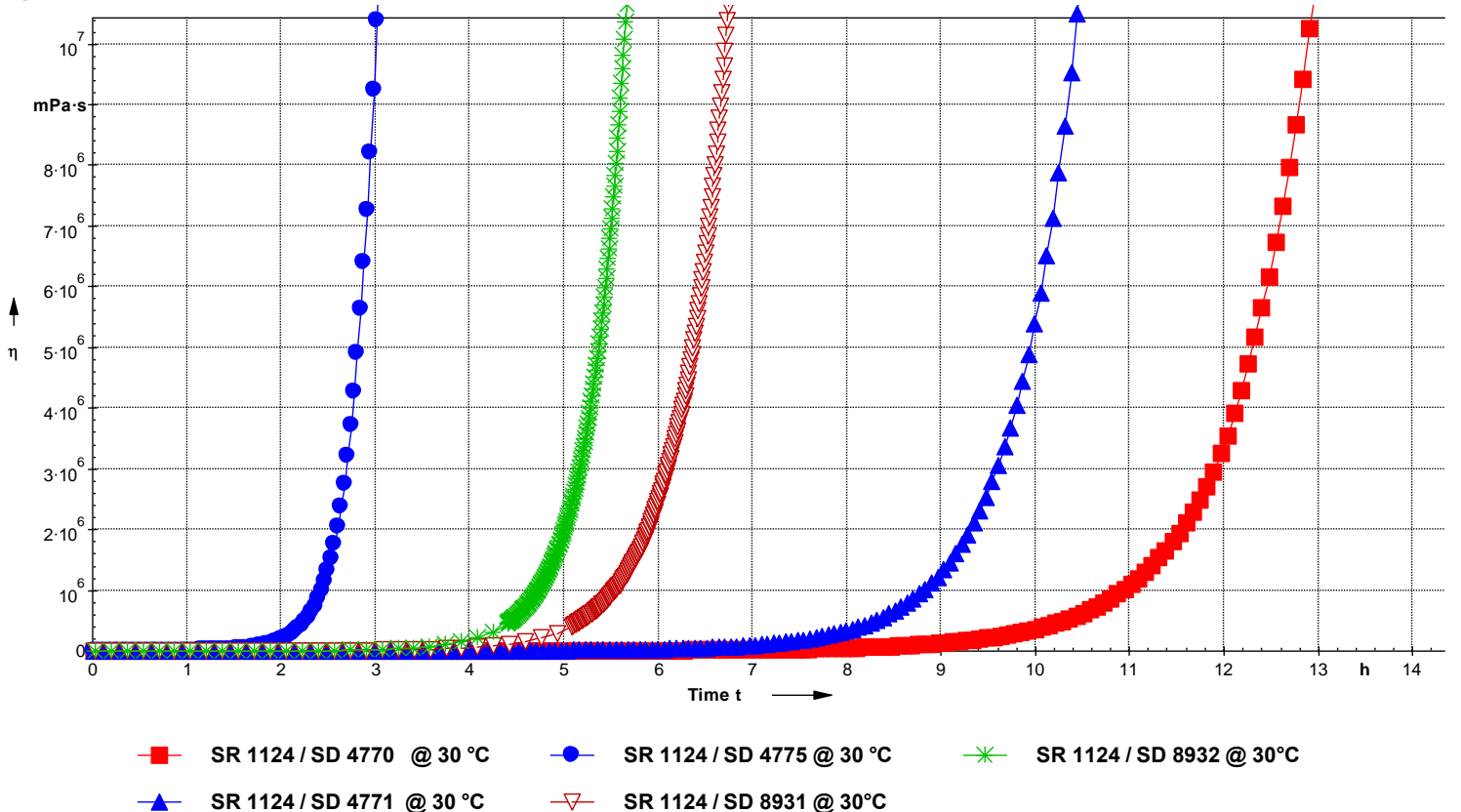


Increase of viscosity on 1 mm film @ 20, 30 and 40 °C

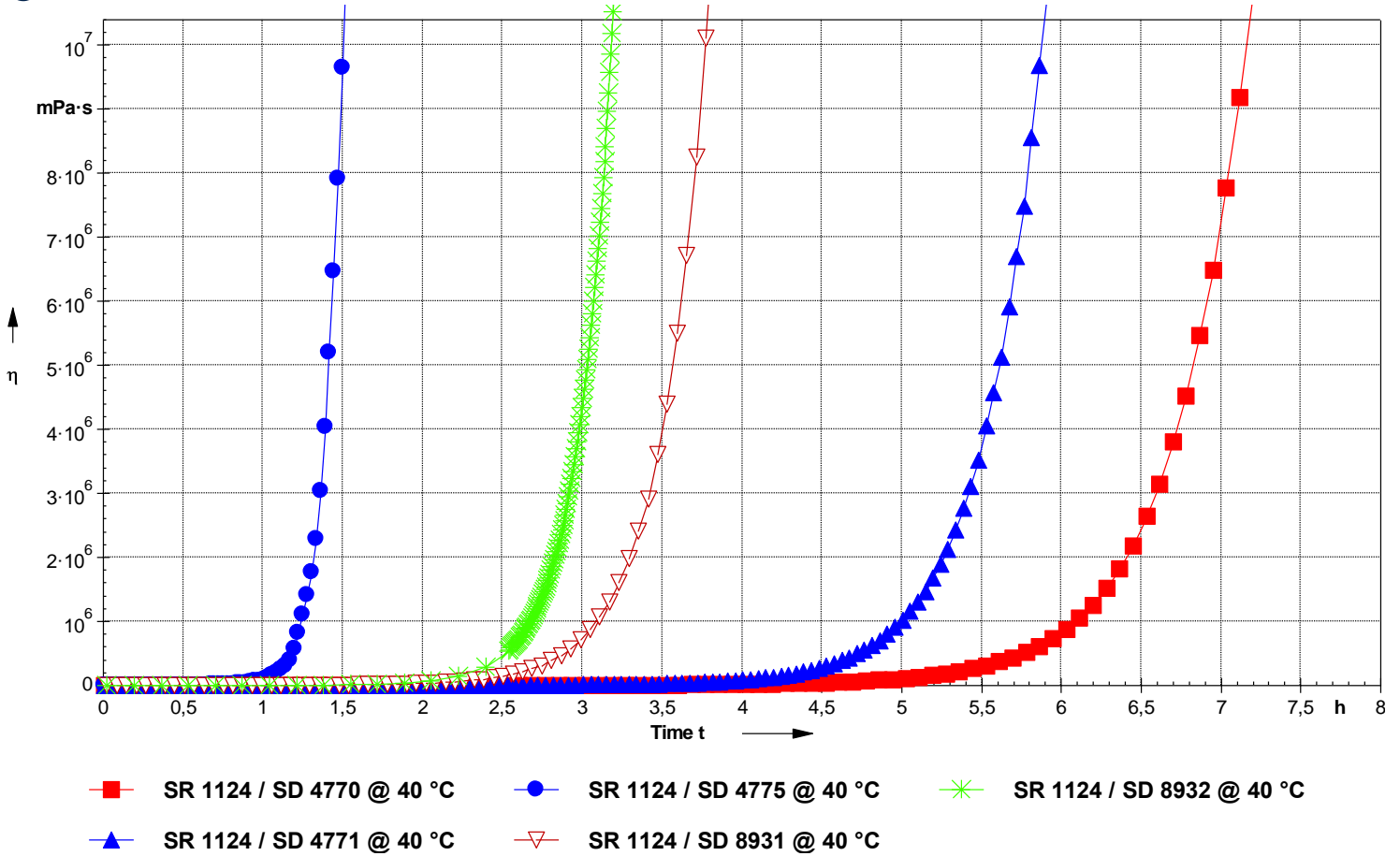
@ 20 °C



@ 30 °C



@ 40 °C



Mecanical properties on cast resin

		SR 1124 / SD 4775		
Curing schedule		2 days at 30 °C 24 hrs 40 °C	2 days at 30 °C 16 hrs 60 °C	2 days at 30 °C 4 hrs 60 °C 4 h 80 °C
Tensile				
Modulus of elasticity	N/mm ²	3 700	3 700	3 600
Maximum resistance	N/mm ²	53	53	56
Resistance at break	N/mm ²	53	53	56
Elongation at max.load	%	1.6	1.8	2.1
Elongation at break	%	1.6	1.8	2.1
Flexion				
Modulus of elasticity	N/mm ²	3 800	3 500	3 500
Maximum resistance	N/mm ²	79	90	87
Elongation at max. load	%	2.1	2.7	2.7
Elongation at break	%	2.1	2.7	2.7
Compression				
Compressive yield strength	N/mm ²	102	98	97
Offset compressive yield	%	13	16	17
Shear strength				
Maximum resistance	N/mm ²	45	42	43
Charpy impact strength				
Resilience	kJ/m ²	7	8	7
Glass transition				
Tg1 / Tg1 maximum DSC	°C	73	83	80 / 81
DTMA - pic Tan δ	°C	69	85	89
DTMA - T _{efG} onset – G' (TG1 onset)	°C	61	75	76
DTMA - T _{mG} – G'	°C	65	79	85
DTMA - T _{efG} – G'	°C	71	90	94
DTMA - T _G pic G''	°C	63	78	78

		SR 1124 / SD 8932		
Curing schedule		AT 8 hrs 23 °C 24 hrs 40 °C	AT 8 hrs 23 °C 16 hrs 60 °C	AT 8 hrs 23 °C 4 hrs 60 °C 4 hrs 80 °C
Tensile				
Modulus of elasticity	N/mm ²	3800	3600	3400
Maximum resistance	N/mm ²	46	46	44
Resistance at break	N/mm ²	46	46	44
Elongation at max.load	%	1.3	1.4	1.4
Elongation at break	%	1.3	1.4	1.4
Flexion				
Modulus of elasticity	N/mm ²	3800	3600	3400
Maximum resistance	N/mm ²	68	73	76
Elongation at max. load	%	1.7	2.0	2.3
Elongation at break	%	1.7	2.0	2.3
Compression				
Compressive yield strength	N/mm ²	95	97	96
Offset compressive yield	%	10	15	16
Shear strength				
Maximum resistance	N/mm ²	40	46	45
Charpy impact strength				
Resilience	kJ/m ²	5	6	7
Glass transition				
Tg1 / Tg1 maximum DSC	°C	75	93	102 / 102
DTMA - pic Tan δ	°C	73	92	105
DTMA - T _{eiG} onset – G' (TG1 onset)	°C	61	78	93
DTMA - T _{mG} – G'	°C	67	86	100
DTMA - T _{efG} – G'	°C	74	95	108
DTMA - T _G pic G''	°C	64	82	95

		SR 1124 / SD 8931		
Curing schedule		AT 8 hrs 23 °C 24 hrs 40 °C	AT 8 hrs 23 °C 16 hrs 60 °C	AT 8 hrs 23 °C 4 hrs 60 °C 4 hrs 80 °C
Tensile				
Modulus of elasticity	N/mm ²	3700	3600	3400
Maximum resistance	N/mm ²	44	48	43
Resistance at break	N/mm ²	44	48	43
Elongation at max.load	%	1.3	1.6	1.4
Elongation at break	%	1.3	1.6	1.4
Flexion				
Modulus of elasticity	N/mm ²	3600	3400	3400
Maximum resistance	N/mm ²	66	67	76
Elongation at max. load	%	1.8	1.9	2.3
Elongation at break	%	1.8	1.9	2.3
Compression				
Compressive yield strength	N/mm ²	90	91	89
Offset compressive yield	%	11	16	15
Shear strength				
Maximum resistance	N/mm ²	42	47	46
Charpy impact strength				
Resilience	kJ/m ²	5	5	6
Glass transition				
Tg1 / Tg1 maximum DSC	°C	72	87	95 / 98
DTMA - pic Tan δ	°C	70	87	99
DTMA - T _{efG} onset – G' (TG1 onset)	°C	59	75	87
DTMA - T _{mG} – G'	°C	65	82	95
DTMA - T _{efG} – G'	°C	74	91	104
DTMA - T _G pic G''	°C	61	78	89

		SR 1124 / SD 4771			
Curing schedule		2 days at 30 °C 24 hrs 40 °C	2 days at 30 °C 16 hrs 55 °C	2 days at 30 °C 16 hrs 60 °C	2 days at 30 °C 4 hrs 60 °C 4 hrs 80 °C
Tensile					
Modulus of elasticity	N/mm ²	3 800	3 400	3600	3 300
Maximum resistance	N/mm ²	51	52	53	50
Resistance at break	N/mm ²	51	52	53	50
Elongation at max.load	%	1.7	1.7	1.9	1.9
Elongation at break	%	1.7	1.7	1.9	1.9
Flexion					
Modulus of elasticity	N/mm ²	3 600	3 700	3 700	3 400
Maximum resistance	N/mm ²	75	76	84	79
Elongation at max. load	%	2.1	2.1	2.3	2.5
Elongation at break	%	2.1	2.1	2.3	2.5
Compression					
Compressive yield strength	N/mm ²	95	93	95	85
Offset compressive yield	%	12	12	13	13
Shear strength					
Maximum resistance	N/mm ²	42	43	42	41
Charpy impact strength					
Resilience	kJ/m ²	6	15	13	15
Glass transition					
Tg1 / Tg1 maximum DSC	°C	67	74	82	85 / 83
DTMA - pic Tan δ	°C	66	78	82	88
DTMA - T _{eiG} onset – G' (TG1 onset)	°C	58	70	73	78
DTMA - T _{mG} – G'	°C	62	74	79	82
DTMA - T _{efG} – G'	°C	70	82	87	93
DTMA - T _G pic G''	°C	59	71	75	80

		SR 1124 / SD 4770		
Curing schedule		2 days at 30 °C 24 hrs 40 °C	2 days at 30 °C 16 hrs 60 °C	2 days at 30 °C 4 hrs 60 °C 4 hrs 80 °C
Tensile				
Modulus of elasticity	N/mm ²	3 600	3 300	3 200
Maximum resistance	N/mm ²	50	46	49
Resistance at break	N/mm ²	49	46	47
Elongation at max.load	%	1.7	1.6	1.9
Elongation at break	%	1.7	1.6	1.9
Flexion				
Modulus of elasticity	N/mm ²	3 600	3 500	3 400
Maximum resistance	N/mm ²	72	73	76
Elongation at max. load	%	2	2	2.3
Elongation at break	%	2	2.1	2.3
Compression				
Compressive yield strength	N/mm ²	95	97	89
Offset compressive yield	%	14	13	13
Shear strength				
Maximum resistance	N/mm ²	41	41	39
Charpy impact strength				
Resilience	kJ/m ²	5	5	7
Glass transition				
Tg1 / Tg1 maximum DSC	°C	66	79	82 / 82
DTMA - pic Tan δ	°C	64	81	85
DTMA - T _{eiG} onset – G' (TG1 onset)	°C	55	72	71
DTMA - T _{mG} – G'	°C	60	77	81
DTMA - T _{efG} – G'	°C	66	84	90
DTMA - T _G pic G''	°C	57	73	73

Laminate mechanical properties :

Epoxy system : **SR 1124 / SD 8932**
 Reinforcement : E Glass fabric, Twill 2/2, 300 g / m² Ref 3300
 Process: Hand laminate + press

Number of glass layers		15	15
Glass fiber content by % weight		60	65
Cure		24 hrs Ambient + 16 hrs 60 °C	24 hrs Ambient + 4 hrs 60 °C + 4 hrs 80 °C
Flexural			
Modulus of elasticity	N/mm ²	15 500	19 300
Maximum resistance	N/mm ²	450	550
Elongation at max. load	%	3	3
Bending delamination			
Shear load at rupture	N/mm ²	46	36
Impact (Choc Charpy)			
Resilience	KJ/m ²	178	176
Glass transition / DSC			
Tg 1 / Tg1 maximum	°C °C	86	99 / 103

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 method
 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 CENTS 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.