

SR 8200 / SD 720x Laminating epoxy system

The **SR 8200 / SD 720x** system exhibits very good mechanical properties, high elongation, fatigue resistance, low odor during application and relatively low cost. The maximum temperature resistance is at least 90 °C; however, some post curing is required in order to have service temperature of 60 - 70 °C. Typical applications include bows, masts and long service bending products.

Fast hardener SD 7206

Offers fast hardening at low temperature, low surface pollution, demolding of small parts after one night at 20 - 25 °C and excellent mechanical properties after post curing at 40 to 60 °C.

Hardeners SD 7204 & SD 7203

Specially formulated for hand laminating at ambient temperature, under press or small parts under vacuum. Offers fast hardening of laminates at ambient temperature for hand laminating, press or vacuum. Good mechanical properties at ambient temperature, excellent after post cure.

Slow hardener SD 7201

Reactivity formulated for hand laminating, under press or medium to large parts under vacuum. Requires a post-cure at 55°C to 60°C. Designed for manufacturing of high performance composites and tooling with service temperature of 60°C to 70°C.

Epoxy resin SR 8200

Aspect / colour		Clear liquid
Viscosity (mPa.s)	15 °C	5600 ± 1 000
Rheometer	20 °C	2900 ± 600
CP 50 mm	25 °C	1600 ± 300
Shear rate 10 s ⁻¹	30 °C	900 ± 200
	40 °C	400 ± 100
Density	20 °C	1.175 ± 0.01
Pycnometer NF EN ISO 2811-1		
Storage		24 months, do not crystallize

Hardeners SD 720x

		SD 72067206	SD 7204	SD 7203	SD 7201
Reactivity		"ultra fast"	"fast"	"standard"	"slow"
Aspect / couleur		Yellow liquid	Yellow liquid	Yellow liquid	Clear to yellow liquid
Viscosity (mPa.s)	15 °C	1 100 ± 200	180 ± 40	190 ± 40	80 ± 20
Rheometer	20 °C	650 ± 120	120 ± 25	120 ± 25	60 ± 15
CP 50 mm	25 °C	400 ± 80	90 ± 20	90 ± 20	45 ± 10
Shear rate 10 s ⁻¹	30 °C	250 ± 50	70 ± 15	60 ± 15	35 ± 5
Density	20 °C	1.04 ± 0.01	1.00 ± 0.01	1.01 ± 0.01	0.95 ± 0.01
Pycnometer					
NF EN ISO 2811-1					

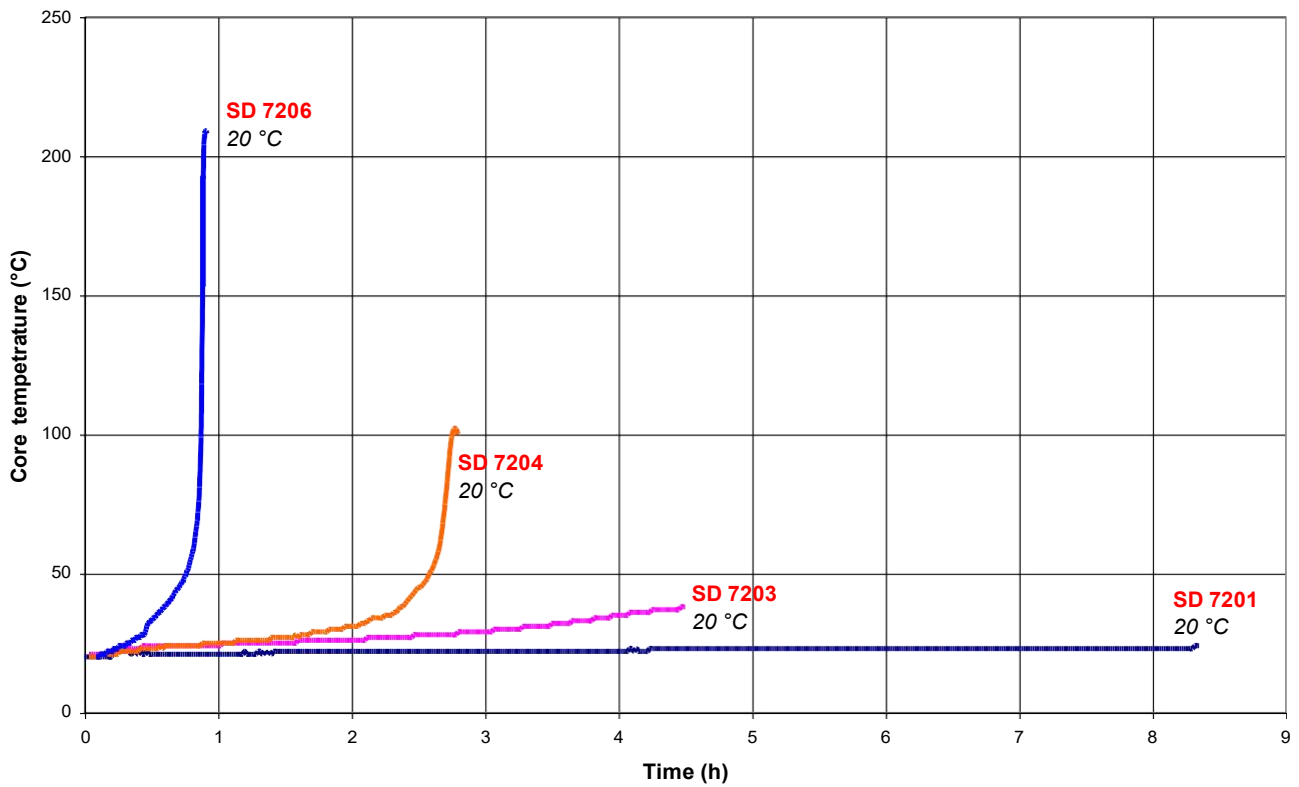
SR 8200 / SD 720x mix properties

		SR 8200 / SD 7206	SR 8200 / SD 7204	SR 8200 / SD 7203	SR 8200 / SD 7201
Weight ratio		100 / 37 g	100 / 37 g	100 / 37 g	100 / 37 g
Volume ratio		100 / 42 ml	100 / 44 ml	100 / 43 ml	100 / 46 ml
Mix viscosity	20 °C	1200 ± 250	1100 ± 150	1050 ± 200	790 ± 150
Rheometer	25 °C	850 ± 200	700 ± 150	620 ± 100	520 ± 100
PP 50 mm	30 °C	700 ± 100	470 ± 100	430 ± 100	380 ± 100
Shear rate 10 s ⁻¹					

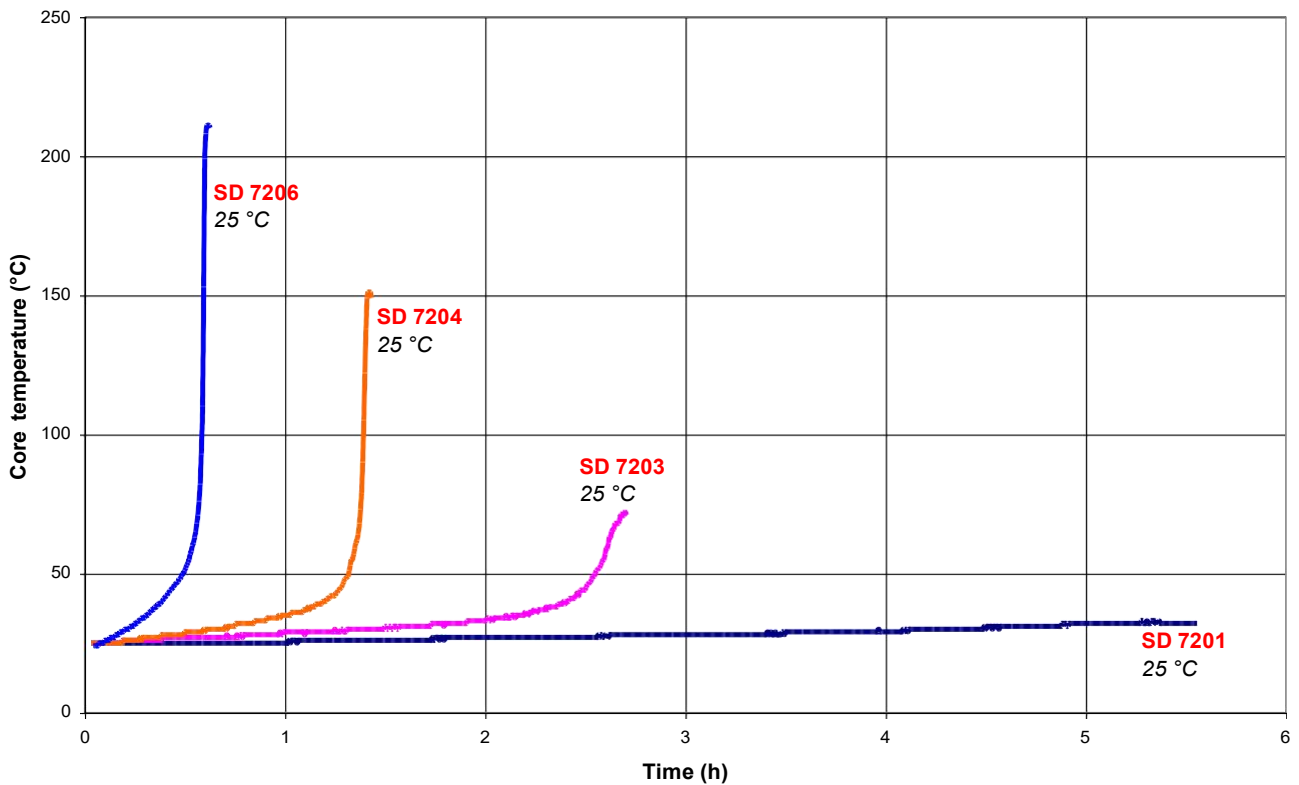
SR 8200 / SD 720x mix reactivity

		SR 8200 / SD 7206	SR 8200 / SD 7204	SR 8200 / SD 7203	SR 8200 / SD 7201
Exothermic temperature on 100 g mix:					
	30 °C	> 200 °C	200 °C	150 °C	90 °C
	25 °C	> 200 °C	150 °C	70 °C	30 °C
	20 °C	> 200 °C	100 °C	40 °C	25 °C
Time to reach exothermic peak on 100 g mix :					
	30 °C	16'	1 h	1 h 28'	3 h 34'
	25 °C	37'	1 h 25'	2 h 41'	6 h 40'
	20 °C	54'	2 h 45'	4 h 26'	8 h
Time to reach 50 °C on 100 g mix:					
	30 °C	12'	51'	1 h 09'	2 h 56'
	25 °C	29'	1 h 19'	2 h 33'	na
	20 °C	46'	2 h 35'	na	na

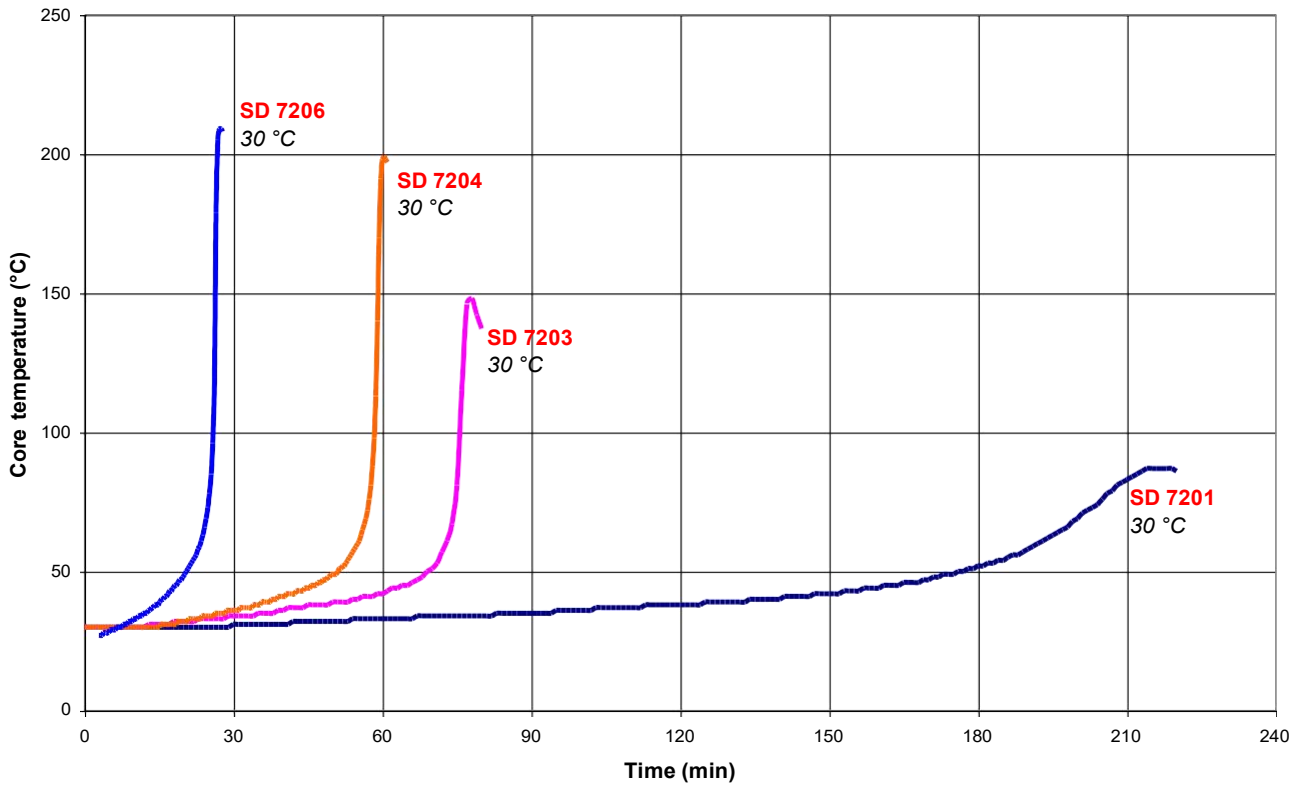
**Mass reactivity – core temperature evolution for 100 g mix
- 20°C**



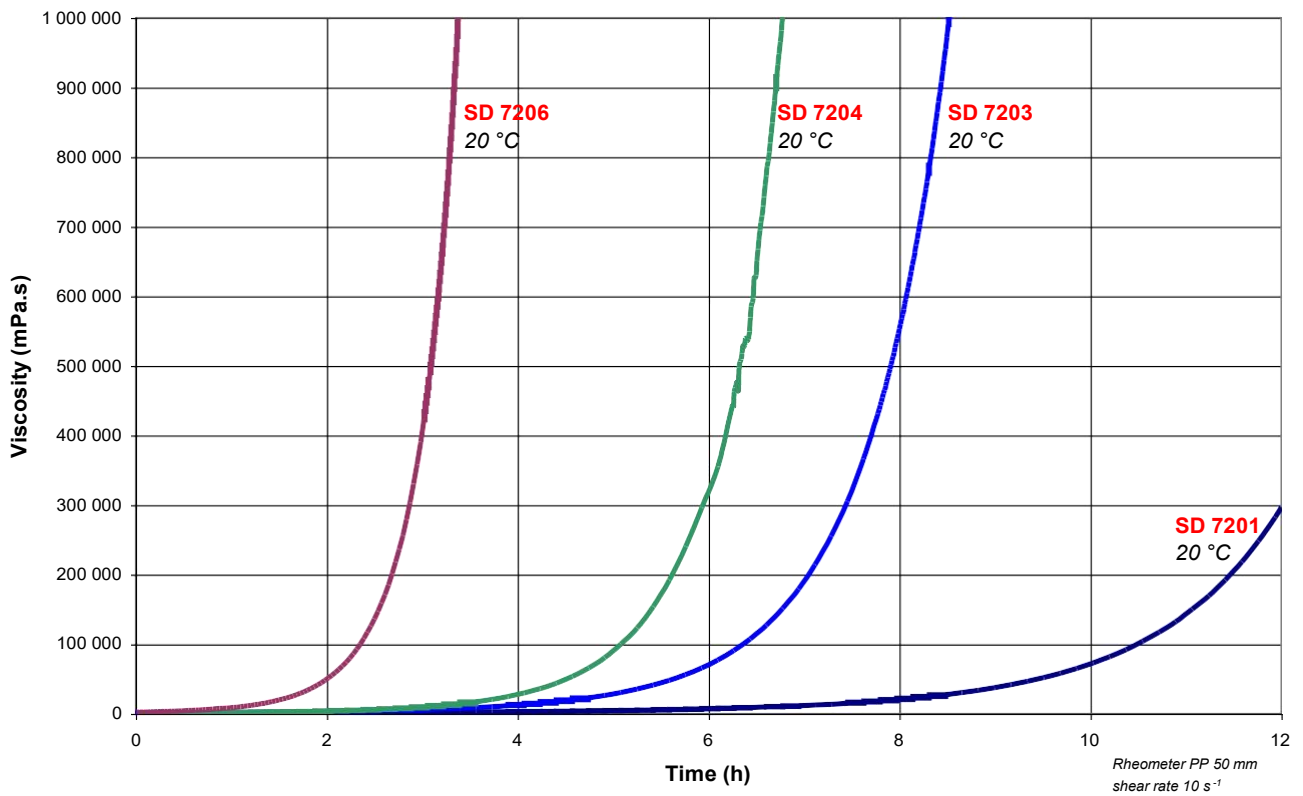
- 25°C



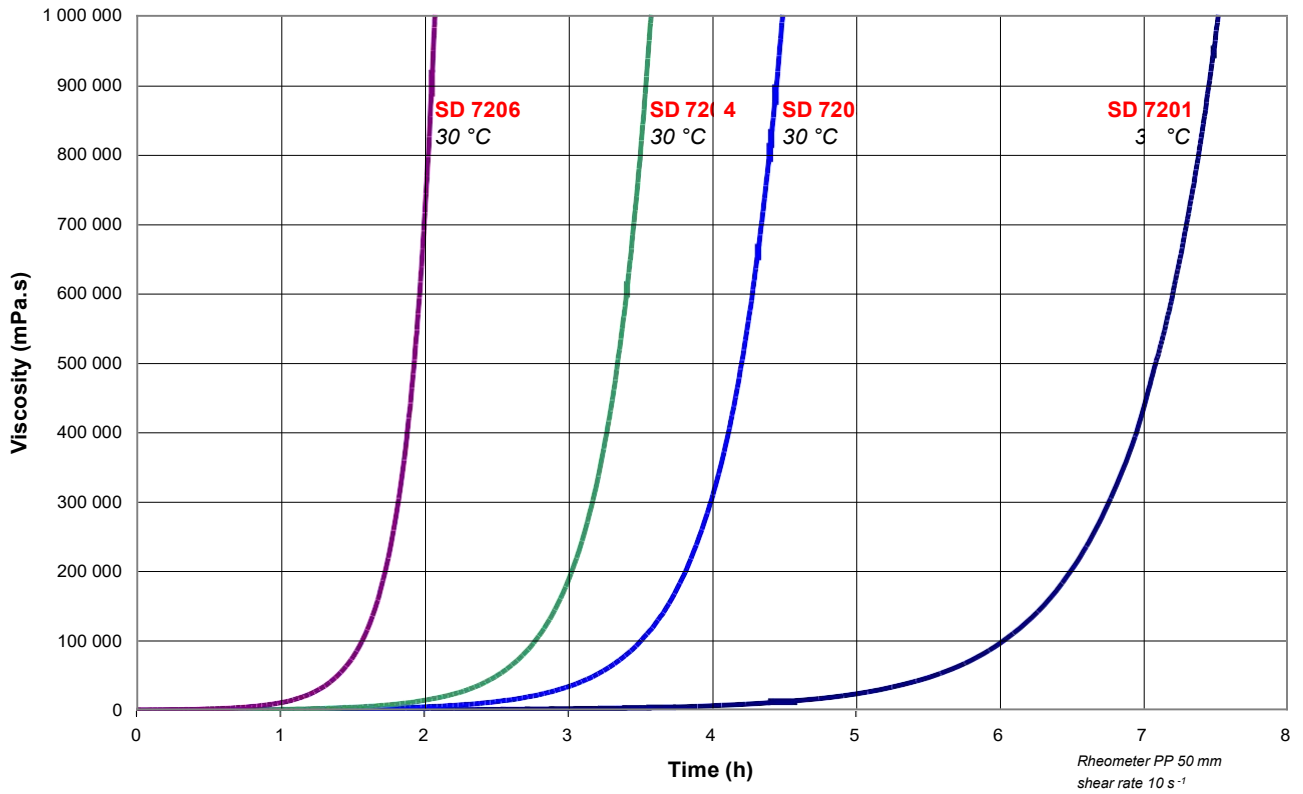
- 30°C



**Reactivity – 1 mm film viscosity evolution
- 20°C**



- 30°C



Mechanical properties of pure resin :

Post cure cycles	SR 8200 / SD 7206				SR 8200 / SD 7204				
	10 days 23 °C	24 h 23°C. + 24h 40°C	24 h 23°C + 16 h 60°C	24 h 23°C + 8 h 80 °C	10 days 23 °C	24 h 23°C + 24h 40°C	24 h 23°C + 16 h 60°C	24 h 23°C + 8 h 80 °C	
Tensile									
Modulus of elasticity	N/mm ²	3500	3240	3040	2950	3016	3070	2840	2760
Maximum resistance	N/mm ²	47	79	87	84	44	67	78	75
Resistance at break	N/mm ²	47	79	81	77	44	67	75	72
Elongation at max. resistance	%	1.3	3	5	5	1.7	2.7	4.4	4.2
Elongation at break	%	1.3	3	6	8	1.7	2.7	5	4.6
Flexion									
Modulus of elasticity	N/mm ²	3800	3500	3500	3300	3484	3070	3130	2790
Maximum resistance	N/mm ²	99	118	135	123	69	104	118	114
Elongation at max. load	%	3	4	6	6	2.0	4.3	5.6	6.1
Elongation at break	%	3	6	12	12	2.1	5.5	9.3	10.4
Charpy impact strength									
Resilience	kJ/m ²	12	20	28	34	10	14	24	36
Glass transition									
Tg1	°C	50	69	89	91	55	72	86	93
Tg1 max.	°C				94				94

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
 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

Mechanical properties on pure resin :

Post cure cycles	SR 8200 / SD 7203				SR 8200 / SD 7201				
	10 days 23 °C	24 h 23 °C + 24h 40°C	24 h 23°C + 16 h 60° C	24 h 23°C + 8 h 80 °C	4 days 30 °C	24 h 23°C + 24h 40°C	24 h 23°C + 16 h 60°C	24 h 23°C + 6 h 50 °C + 8 h 80 °C	
Tensile									
Modulus of elasticity	N/mm ²	2900	3010	2900	2640	2720	2980	2810	2800
Maximum resistance	N/mm ²	39	70	69	70	36	71	73	74
Resistance at break	N/mm ²	39	70	67	70	36	71	71	73
Elongation at max. resistance	%	1.5	3.0	3.6	4.3	1.5	3.4	3.8	4.7
Elongation at break	%	1.5	3.1	4.1	4.5	1.5	3.5	4.0	5.3
Flexion									
Modulus of elasticity	N/mm ²	3438	3200	3070	2570	3229	3120	2720	2490
Maximum resistance	N/mm ²	69	104	117	108	60	109	107	104
Elongation at max. load	%	2.0	3.6	5.5	6.4	1.8	4.7	5.8	6.5
Elongation at break	%	2.1	3.8	9.2	8.4	1.9	8.7	8.4	8.8
Charpy impact strength									
Resilience	kJ/m ²	7	12	16	30	5	15	33	27
Glass transition									
Tg1	°C	59	71	87	89	59	68	87	93
Tg1 max.	°C				92				93

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
 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

SR 8200 based laminate mechanical properties

Samples Matrix		SR 8200 / SD 7206	SR 8200 / SD 7204	SR 8200 / SD 7203	SR 8200 / SD 7201
Reinforcement material		3300	3300	3300	3300
Number of layers		15	15	15	15
Method		Press	Press	Press	Press
Weight of reinforcement	%	68	68	66	72
Cure Schedule		8 h 60 °C	8 h 60 °C	8 h 60 °C	16 h 60 °C
Flexion					
Modulus	N/mm ²	25 700	24 930	25 740	26 350
Maximum resistance	N/mm ²	734	655	670	650
Maximum elongation	%	3.2	3	3	2.9
Shear strength					
Shear load at rupture	N/mm ²	60	56	55	51
Charpy impact strength					
Resilience	kJ/m ²	217	186	190	196
Water absorption					
	%	0.10	0.18	0.12	0.10
Glass transition					
Tg 1	°C	90	94	92	93
Tg1 max.	°C	94	94	92	93

Tests carried out in accordance with the following norms:

Flexion :	NF T 57-105
Shear:	NF T 57-104
Charpy Impact Strength:	NF T 57-108
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
Water absorption:	Internal. Polymerisation according to cycle, machining, weighting, time spent in distilled water at 70 °C / 48 hours, weighting 1 hour after emerging, drying 24 h at 40°C, weighting, mechanical tests on 10 samples
Reinforcement 3300:	Twill 2/2 E Glass, weight 300 g/m ²

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