

## SR 1126

### Fire resistant epoxy laminating system

**Auto extinguishing** laminating epoxy system.

Low smokes and low toxicity smokes.

Bromine Free

With high temperature or fire, the system expands, produce solid char barrier that protects inner materials from heat and flames.

This system allows to get :

- **UL94 V0** and **FAR 25** laminates parts
- **AIRBUS** and **BOEING** standards concerning fumes and fume toxicity.

*All details concerning FAR 25 and UL94 V0 approvals on last page of this data sheet*

Good temperature resistance

#### **Fast hardener SD 8205 / SD 8207**

Suitable for manufacturing small to medium parts by hand lay-up, press moulding and vacuum bagging.

Unmoulding possible after 24 h at 25 °C

Suitable for parts with service temperature up to 60-70 °C, performance composites.

Ultra fast's SD 8207 is suitable for low temperature.

#### **Slow hardeners SD 8203 and SD 8202**

Suitable for manufacturing medium to large part by hand lay, press moulding and vacuum bagging.

Post cure at 40 °C minimum before un moulding.

Suitable for parts with service temperature up to 60-70 °C, performance composites.

#### **Ultra slow hardener SD 1305**

Suitable for large parts, long pot life, hot process

Tg – onset / DSC = 130 °C

Post cure at 120 °C minimum

#### **Guidelines**

No filtering

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

## Epoxy resin SR 1126

Appearance		White viscous liquid
Storage		2 years @ 20 °C Stir thoroughly before use
Viscosity (m.Pas)	15 °C	15 000 ± 3 000
Rheometer	20 °C	9 000 ± 2 000
CP 50 mm	25 °C	6 000 ± 1 000
Shear rate 10 s <sup>-1</sup>	30 °C	3 700 ± 700
	40 °C	1 800 ± 300
Density		
Picnometer	20 °C	1.28 ± 0.01
ISO 2811-1		

## Hardeners SD xxxx

		SD 8207	SD 8205	SD 8203	SD 8202	SD 1305
Appearance / colour		Yellow liquid	Yellow liquid	Yellow liquid	Light yellow liquid	Yellow to red liquid
Reactivity		Ultra fast	Fast	Standard	Slow	Ultra slow
Viscosity	15 °C	590 ± 120	210 ± 40	80 ± 15	50 ± 15	426 ± 80
(mPa.s)	20 °C	380 ± 80	140 ± 30	60 ± 10	38 ± 10	278 ± 50
Rheometer	25 °C	250 ± 50	100 ± 20	45 ± 10	28 ± 10	173 ± 30
CP 50 mm	30 °C	180 ± 36	70 ± 30	30 ± 5	22 ± 5	110 ± 20
Shear rate 10 s <sup>-1</sup>	40 °C	90 ± 18	40 ± 10	20 ± 5	14 ± 5	55 ± 10
Density	20 °C	0,990 ± 0.005	1.040 ± 0.005	0.980 ± 0.005	0.960 ± 0.005	0.990 ± 0.005
Picnometer						
ISO 2811-1						

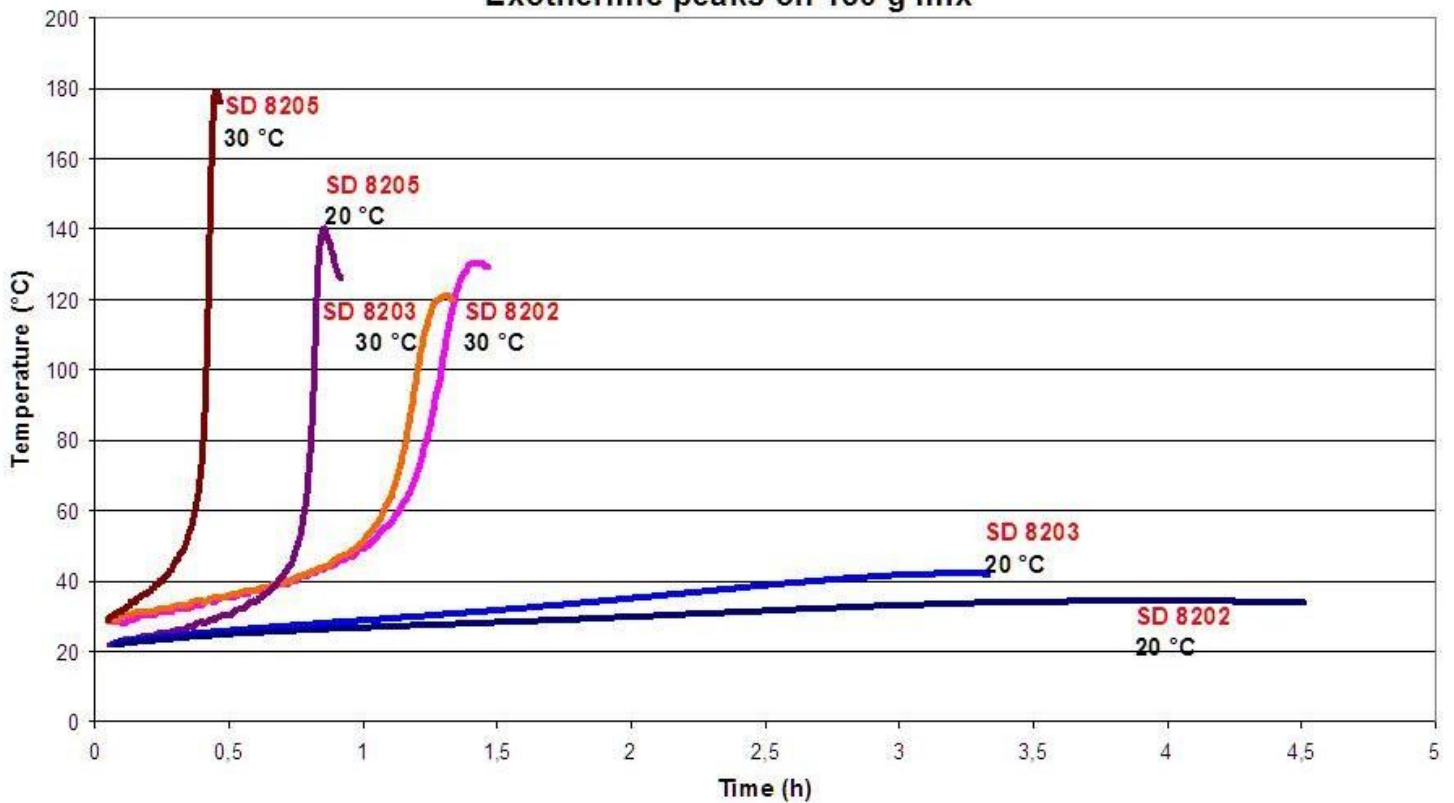
## SR 1126 / SD xxxx mix properties

		SR 1126 / SD 8207	SR 1126 / SD 8205	SR 1126 / SD 8203	SR 1126 / SD 8202	SR 1126 / SD 1305
Weight ratio		100 g / 20 g	100 g / 20 g	100 g / 20 g	100 g / 20 g	100 g / 18 g
Volume ratio		100 / 26 ml	100 / 25 ml	100 / 26 ml	100 / 27 ml	100 / 23 ml
Mix viscosity	- 5 °C	53 000				
Rheometer	5 °C	19 000				
PP 50 mm	20 °C		2 700 ± 500	2 100 ± 400	1 250 ± 250	4 200 ± 800
Shear rate 10 s <sup>-1</sup>	30 °C		1 500 ± 300	1 000 ± 200	770 ± 150	2 000 ± 400
	40 °C		850 ± 150	600 ± 100	500 ± 100	850 ± 150
	50 °C					620 ± 120
	60 °C					350 ± 70
	70 °C					300 ± 50
	80 °C					220 ± 40

**SR 1126 / SD 820x mass reactivity**

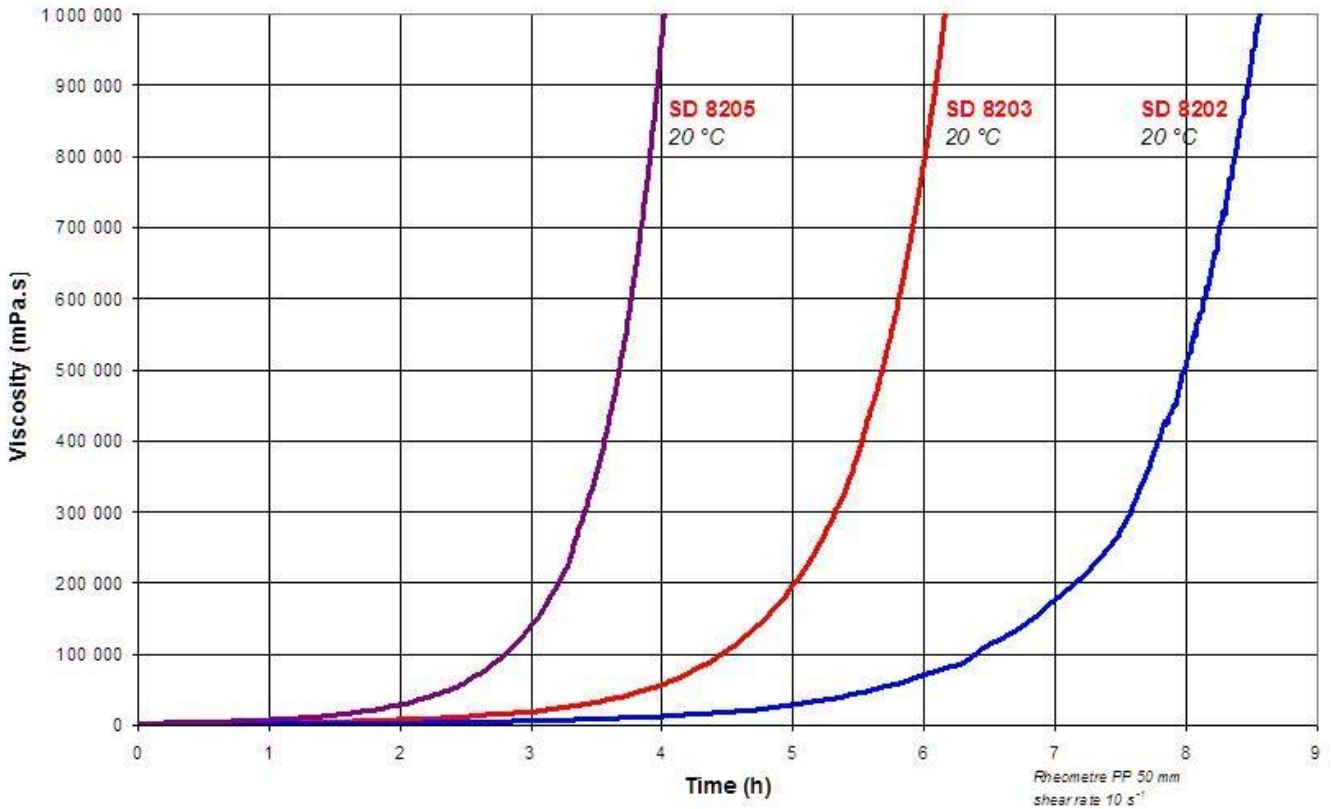
	<b>SR 1126 / SD 8205</b>	<b>SR 1126 / SD 8203</b>	<b>SR 1126 / SD 8202</b>
Exothermic peak (°C) with 150 g mix			
30 °C	179 °C	121 °C	130 °C
20 °C	140 °C	42 °C	34 °C
Time to reach exothermic peak with 150 g mix			
30 °C	27'	1 h 18'	1 h 24'
20 °C	51'	3 h	3 h 20'
Time to reach 50 °C with 150 g mix			
30 °C	20'	59'	1 h
20 °C	46'	-	-

**SR 1126 / SD 820x**  
**Exothermic peaks on 150 g mix**

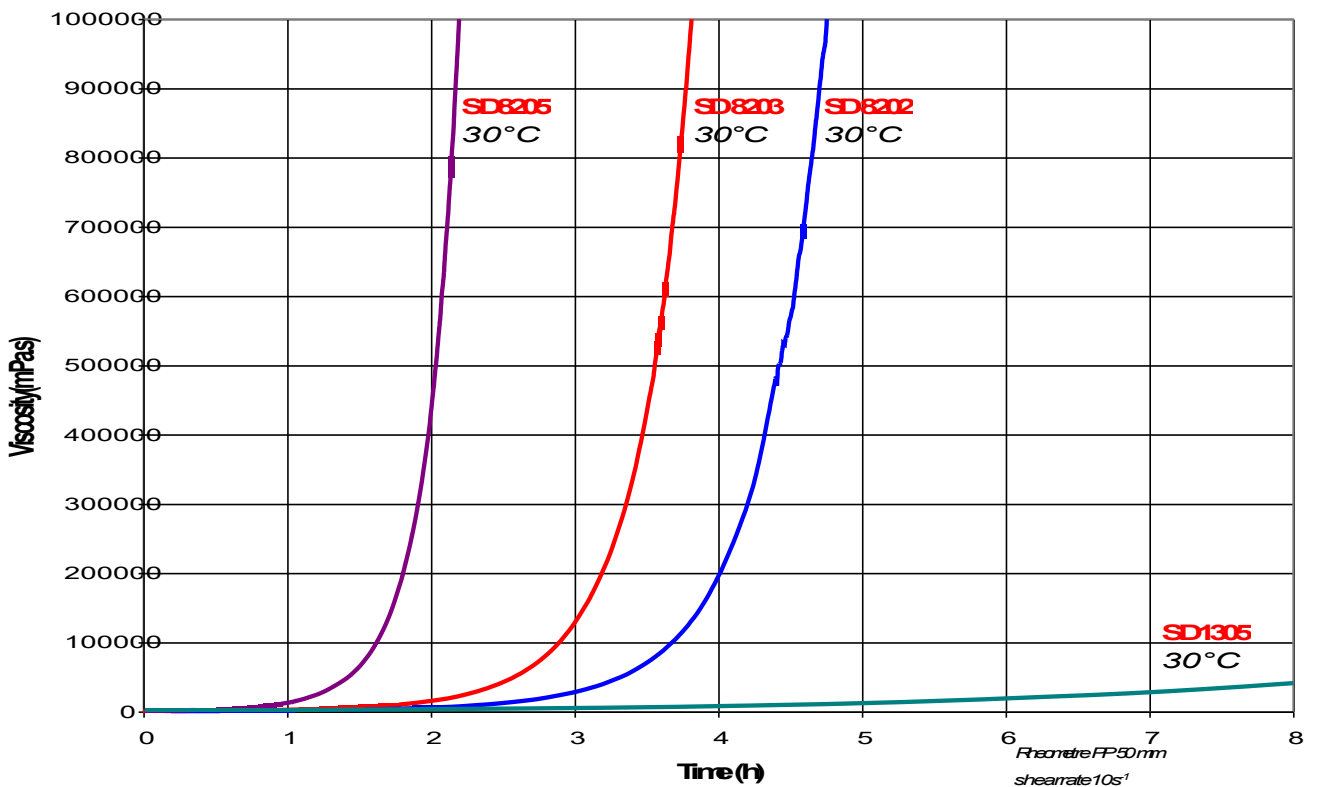


**Reactivity – Viscosity evolution on a 1 mm film**

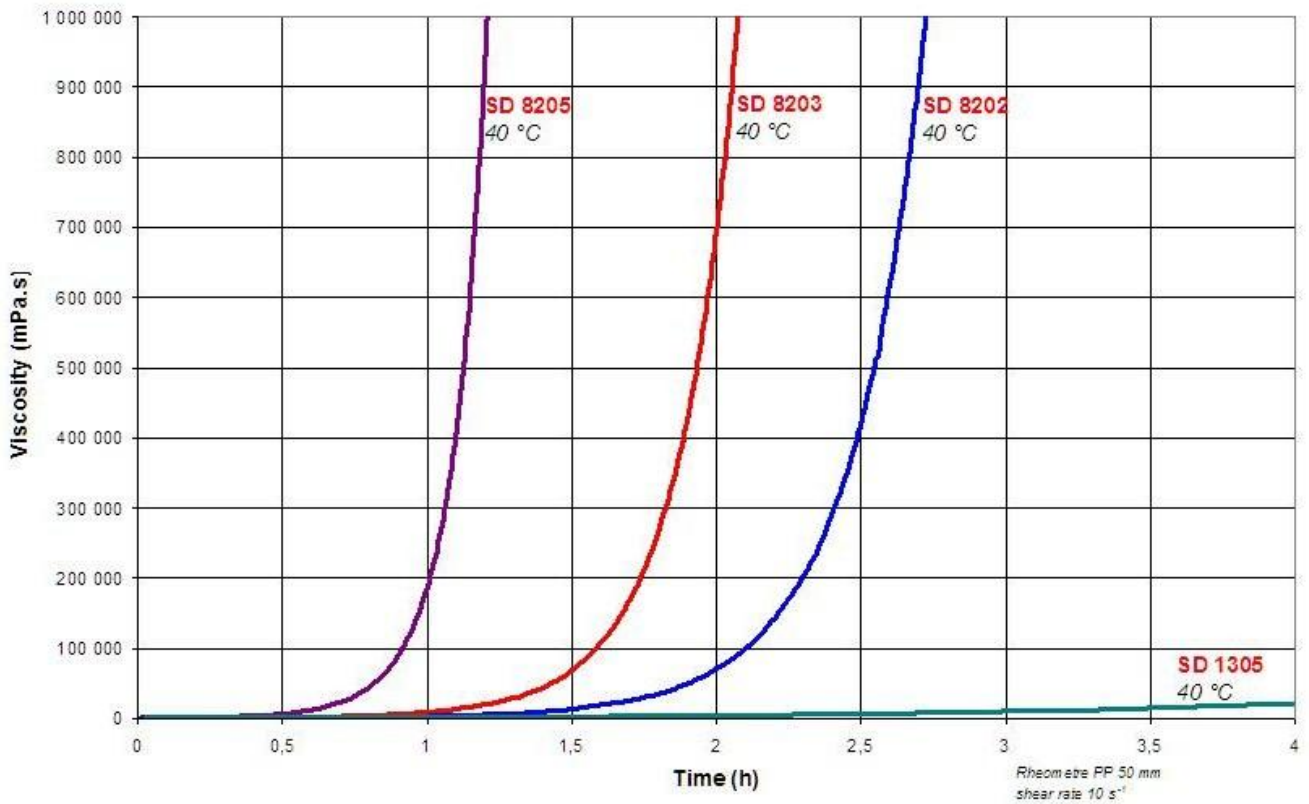
- at 20 °C



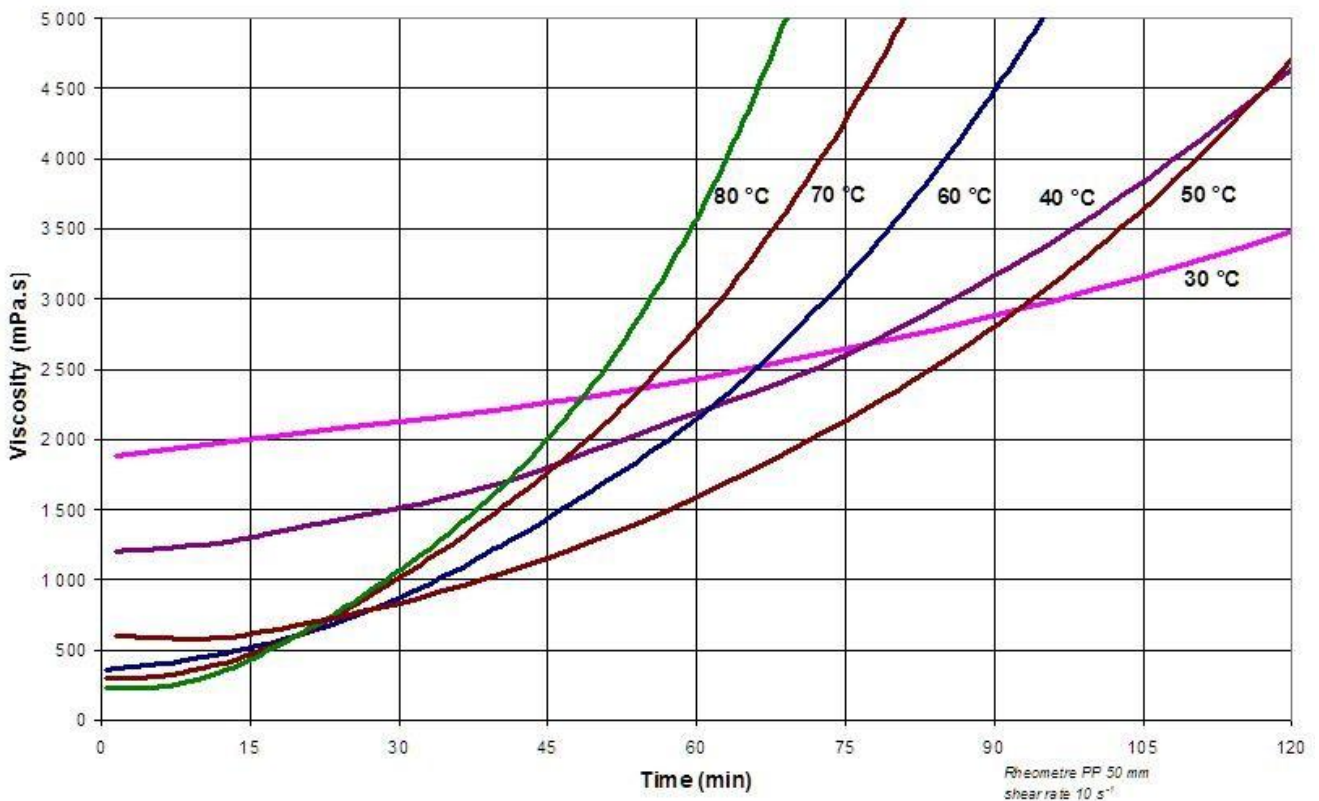
- at 30 °C



- at 40 °C



**SR 1126 / SD 1305 – film reactivity in warm conditions**



## Post curing recommendations

	<b>SR 1126 / SD 8205</b>	<b>SR 1126 / SD 8203</b>	<b>SR 1126 / SD 8202</b>	<b>SR 1126 / SD 1305</b>
Minimum post cure	12 h 40 °C	24 h 40 °C	24 h 40 °C	1 h 100 °C + 2 h 120 °C
Recommended post cure	8 h ambient + 6 h 60 °C	12 h ambient + 6 h 40 °C + 4 h 60 °C + 4 h 80 °C	12 h ambient + 6 h 40 °C + 4 h 60 °C + 4 h 80 °C	1 h 100 °C 4 h 140 °C

**Mechanical properties on cast resin:**

		SR 1126 / SD 8205			SR 1126 / SD 8203		
		4 days 30 °C	24 h 23 °C + 24 h 40 °C	24 h 23 °C + 16 h 60 °C	4 days 30 °C	24 h 23 °C + 24 h 40 °C	24 h 23 °C + 16 h 60 °C
<b>Curing schedule</b>							
<b>Tension</b>							
Modulus of elasticity	N/mm <sup>2</sup>	4580	4380	4250	3800	3200	3600
Maximum resistance	N/mm <sup>2</sup>	34	35	35	23	33	31
Resistance at break	N/mm <sup>2</sup>	34	35	35	23	33	31
Elongation at max. load	%	0.7	0.8	0.8	0.7	0.9	0.9
Elongation at break	%	0.7	0.8	0.8	0.7	0.9	0.9
<b>Flexion</b>							
Modulus of elasticity	N/mm <sup>2</sup>	4780	4700	4500	3900	4000	3600
Maximum resistance	N/mm <sup>2</sup>	67	66	70	54	75	75
Elongation at max. load	%	1.5	1.5	1.6	1.3	2.1	2.3
Elongation at break	%	1.5	1.5	1.7	1.4	2.1	2.4
<b>Compression</b>							
Compressive yield strength	MPa				91		
Offset compressive yield	%				5.8		
<b>Charpy impact strength</b>							
Resilience	kJ/m <sup>2</sup>	4	6	6	5	4	6
<b>Glass transition</b>							
Tg1	°C	62	70	80	63	70	85
Tg1 max.	°C			81			90

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

Compression: NF T 51-101

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 cast resin:**

		SR 1126 / SD 8202			SR 1126 / SD 1305		
		4 days 30 °C	24 h 23 °C + 24 h 40 °C	24 h 23 °C + 16 h 60 °C	1 h 100 °C + 4 h 140 °C		
<b>Curing schedule</b>							
<b>Tension</b>							
Modulus of elasticity	N/mm <sup>2</sup>	4420	4330	3890	3750		
Maximum resistance	N/mm <sup>2</sup>	34	35	36	52		
Resistance at break	N/mm <sup>2</sup>	34	35	36	52		
Elongation at max. load	%	0.8	0.8	0.9	1.8		
Elongation at break	%	0.8	0.8	0.9	1.8		
<b>Flexion</b>							
Modulus of elasticity	N/mm <sup>2</sup>	4700	4800	4200	3950		
Maximum resistance	N/mm <sup>2</sup>	64	66	78	71		
Elongation at max. load	%	1.4	1.4	2.1	1.9		
Elongation at break	%	1.4	1.4	2.1	1.9		
<b>Charpy impact strength</b>							
Resilience	kJ/m <sup>2</sup>	5	5	6	10		
<b>Glass transition</b>							
Tg1	°C	60	69	93	130		
Tg1 max.	°C			93	130		



## Laminate mechanical properties

		SR 1126 / SD 8203		
		3300 15 layers vacuum - 0.4 bar	3300 15 layers vacuum - 0.4 bar	3300 15 layers vacuum - 0.4 bar
Reinforcement				
Number of layers				
Processing				
Weight fibre content	%	60	60	60
Post-curing		4 jours 30 °C	24 h Ta + 24 h 40 °C	24 h Ta + 16 h 60 °C
<b>Flexion</b>				
Modulus of elasticity	N/mm <sup>2</sup>	15 900	16 000	15 900
Maximum resistance	N/mm <sup>2</sup>	370	380	400
Elongation at max. resistance	%	2.6	2.7	2.8
Elongation at break	%	2.7	2.6	2.9
<b>Shear strength</b>				
Shear stress	N/mm <sup>2</sup>	25	27	26
<b>Charpy impact strength</b>				
Resilience	kJ/m <sup>2</sup>	177	180	173
<b>Glass Transition / DSC</b>				
Tg 1	°C	58	68	88
Tg 1 max	°C		91	93

		SR 1126 / SD 8202	SR 1126 / SD 1305	SR 1126 / SD 1305
Reinforcement		3300	3300	3300
Number of layers		15 layers	15 layers	15 layers
Processing		vacuum - 0.4 bar	press	press
Weight fibre content	%	57	63	66
Thickness	mm	4.6	4.0	3.6
Density		1.71	1.79	1.91
Post-curing		24 h Ta + 16 h 60 °C	1 h 100 °C 4 h 140 °C	1 h 100 °C 4 h 140 °C
<b>Flexion</b>				
Modulus of elasticity	N/mm <sup>2</sup>	18 800	18 000	21 300
Maximum resistance	N/mm <sup>2</sup>	470	305	280
Elongation at max. resistance	%	2.9	1.8	1.4
Elongation at break	%	3.2	2.2	2.1
<b>Shear strength</b>				
Shear stress	N/mm <sup>2</sup>	39	35	32
<b>Charpy impact strength</b>				
Resilience	kJ/m <sup>2</sup>	175	85	65
<b>Glass Transition / DSC</b>				
Tg 1	°C	88	128	128
Tg 1 max	°C	93	130	130

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  
 Reinforcement 3300: Twill 2/2 E Glass, weight 300 g/m2

### Fire resistance certifications

Standards	<b>UL 94</b> , 5 <sup>th</sup> edition / Oct, 1996 July, 10 1998	<b>FAR 25</b> FAR 25-853 (a) Vertical (12s) et horizontal
Laboratory	LNE- France	CEAT - DGA
Test / report:	D100086/Cemat/67/AC	M-08/8150/127/A
Samples	E glass laminate <b>SR 1126 / SD 8203</b> 1.4 mm thick, 57 % glass weight	E glass laminate <b>SR 1126 / SD 8203</b> 1.7 mm thick, 55 % glass weight
Classification	UL 94 V0 / vertical	FAR 25

### Smoke certification:

Standards	<b>AIRBUS</b> NBS smoke chamber ABD 031 document, issue F Method : AITM 2.0007	<b>BOEING</b> NBS smoke chamber Boeing D6-51377 document Method: BSS 7238
Laboratory	CEAT – DGA 07/2008	CEAT – DGA 07/2008
Test / report:	MT-08 / 8150155 / P1 / A	MT-08 / 8150155 / P1 / A
Samples	E glass laminate <b>SR 1126 / SD 8202</b> 2.3 mm thick, 58 % glass weight	E glass laminate <b>SR 1126 / SD 8202</b> 2.3 mm thick, 58 % glass weight
Classification	Flaming test : DS max = 56 < 200 No flaming test : DS max. = 12.3 < 200	Flaming test : DS max. 56 < 200

### Smoke toxicity certification:

Standards	<b>AIRBUS</b> Document ABD 031, issue F Method : AITM 3.0005	<b>BOEING</b> Document Boeing D6-51377 Method: BSS 7239
Laboratory	CEAT - DGA	CEAT - DGA
Test / report:	MT-08 / 8150155 / P1 / A	MT-08 / 8150155 / P1 / A
Samples	E glass laminate <b>SR 1126 / SD 8202</b> 2.3 mm thick, 58 % glass weight	E glass laminate <b>SR 1126 / SD 8202</b> 2.3 mm thick, 58 % glass weight
Gas after 4 minutes	HF : 0 ppm HCL : 0 ppm SO2: 0 ppm HCN: traces CO: 113 ppm / 1000 NOx: 9 ppm / 100	HF : 0 ppm HCL : 0 ppm SO2: 0 ppm HCN: traces NOx: 9 ppm / 100



E glass / Epoxy laminates after fire tests:  
Brominated Epoxy / **SR 1126** Epoxy