

## SR 1126.2

### Fire resistant epoxy laminating system

**Auto extinguishing** laminating epoxy system.

Low smoke of low toxicity.

Bromine and antimony free

Filled and modified epoxy resin

The system expands when exposed to very high temperature or fire, producing a solid char barrier that protects inner materials from heat and flames.

Good temperature resistance

This system complies with:

- UL94 V0 and FAR 25 laminate parts
- AIRBUS and BOEING standards in terms of fumes and fume toxicity.

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

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

Demoulding possible after 24 h at 25 °C

Suitable for parts with service temperature up to 70 °C.

Ultra fast SD 8207 is suitable for low temperature application.

#### **Slow hardeners SD 8203 / 8202**

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

Post cure at minimum 40 °C before demoulding. 60 °C post cure is highly recommended

Suitable for parts with service temperature up to 70 °C.

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

Suitable for large parts, long pot life, hot process

Tg 1 – onset / DSC = 135 °C

Post cure at 120 °C minimum

#### **Guidelines**


Do not filter resin

Stir and homogenise resin with high shear prior to adding hardener.

## Epoxy resin SR 1126.2

		Modified epoxy resin with fillers Viscous liquid White
Appearance		
Color		
Viscosity ( ± 20 % mPa.s )	@ 15 °C	11 700
	@ 20 °C	7 200
	@ 25 °C	4 700
	@ 30 °C	3 200
	@ 40 °C	1 650
Density		
Pycnomètre ± 0.06	@ 20 °C	1.33
Fillers maximum size	μ	60
Refractive index ± 0.002	@ 25 °C	1.5527

## Hardeners

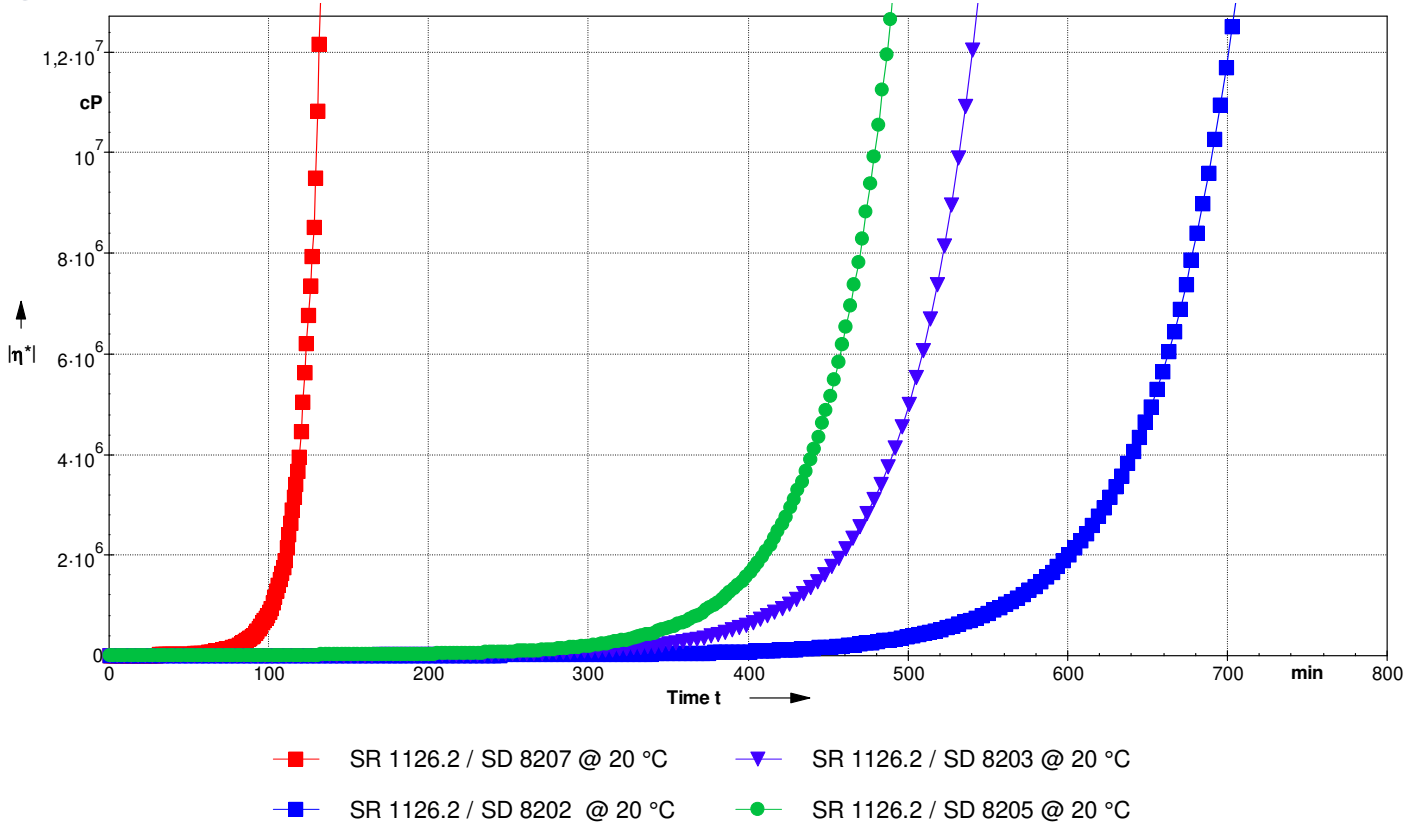
		<b>SD 8207</b> <i>E1715.3</i>	<b>SD 8205</b> <i>E1692.1</i>	<b>SD 8203</b> <i>E1692.3</i>	<b>SD 8202</b> <i>E1692.2</i>	<b>SD 1305</b> <i>E1305.1</i>
Reactivity		super fast  Ultra slow				
Appearance		Fluid liquids, unfilled				
Color		orange	yellow	yellow	clear to yellow	yellow to red
Gardner maximum		8	5	3	2	10
Pt-Co maximum		na/	800	500	300	na
Viscosity ( ± 20 % m.Pas)	@ 15 °C	69	180	70	45	350
	@ 20 °C	51	120	50	30	210
	@ 25 °C	38	90	35	25	135
	@ 30 °C	29	60	27	18	92
	@ 40 °C	19	35	17	12	50
Density	@ 20 °C	0.98	0.99	0.96	0.95	0.99
Refractive index	@ 25 °C	1,5123	1.5077	1.4941	1.4823	1.5506
Storage Stability	Hardeners react irreversibly with air (carbon dioxide and moisture), resulting with salt formation. Hardeners needs to be kept in their original closed containers. Avoid any long exposure to air.					

## Mixes - Reactivity & Process

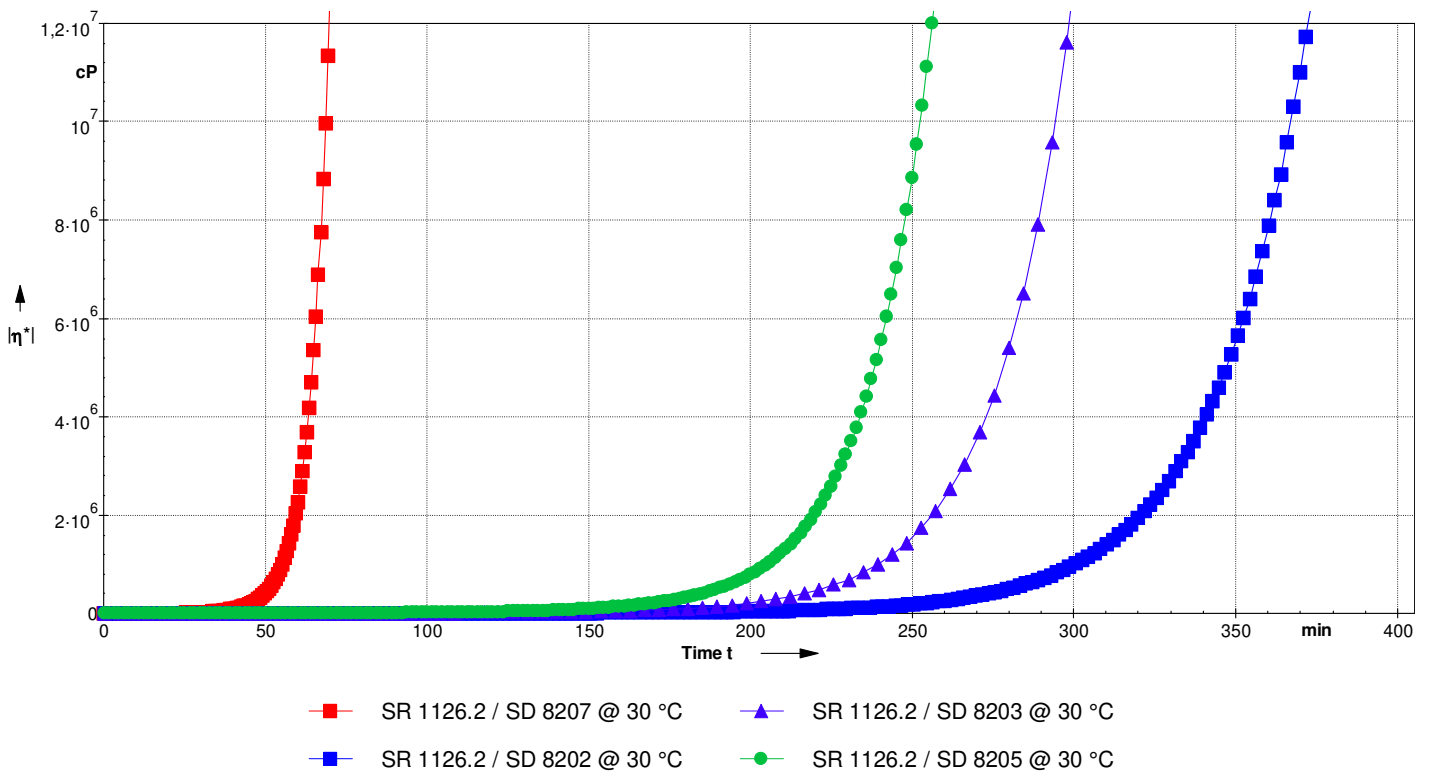
		SR 1126.2 SD 8207	SR 1126.2 SD 8205	SR 1126.2 SD 8203	SR 1126.2 SD 8202	SR 1126.2 SD 1305	
Weight ratio		<b>100 g / 20 g</b>					100 g / 18 g
Volume ratio		100 / 27	100 / 27	100 / 28	100 / 28	100 / 24	
Viscosity initial mPa.s ± 20 %	@ 20°C @ 30°C @ 40°C	2000 860 -	2 200 1 070 580	1 600 830 570	1100 610 370	- 1900 1100	
Time to reach 10 000 cps@	@ 20°C @ 30°C @ 40°C	33 min 24 min -	2 h 1 hr 30' 1 hr	2 hrs 30' 1 hr 45' 1 hr 9'	3 hrs 50' 2 hrs 30' 1 hr 32'	- 4 hr 55' 3 h 44'	
Gel time 1 mm film	@ 20°C @ 30°C @ 40°C	1 hr 50' 1 hr -	6 hrs 40' 3 hrs 25' 2 hrs	7 hrs 4 hrs 2 h 17'	10 hrs 5 hrs 30' 3 hrs	- 30 hrs 20 hrs	
Minimum time before handling parts	@ 20°C @ 30°C @ 40°C	5 hrs 30' 3 hrs -	20 hrs 10 hrs 15' 6 hrs	21 hrs 12 hrs 6 hrs 50'	30 hrs 16 hrs 30' 9 hrs	- 90 hrs 60 hrs	
Density Helium ± 0.02 After cure @ 60 °C	@ 20°C	1.33					

## Reactivity SR 1126.2 / SD 820x on 1 mm film Viscosity evolution with temperature

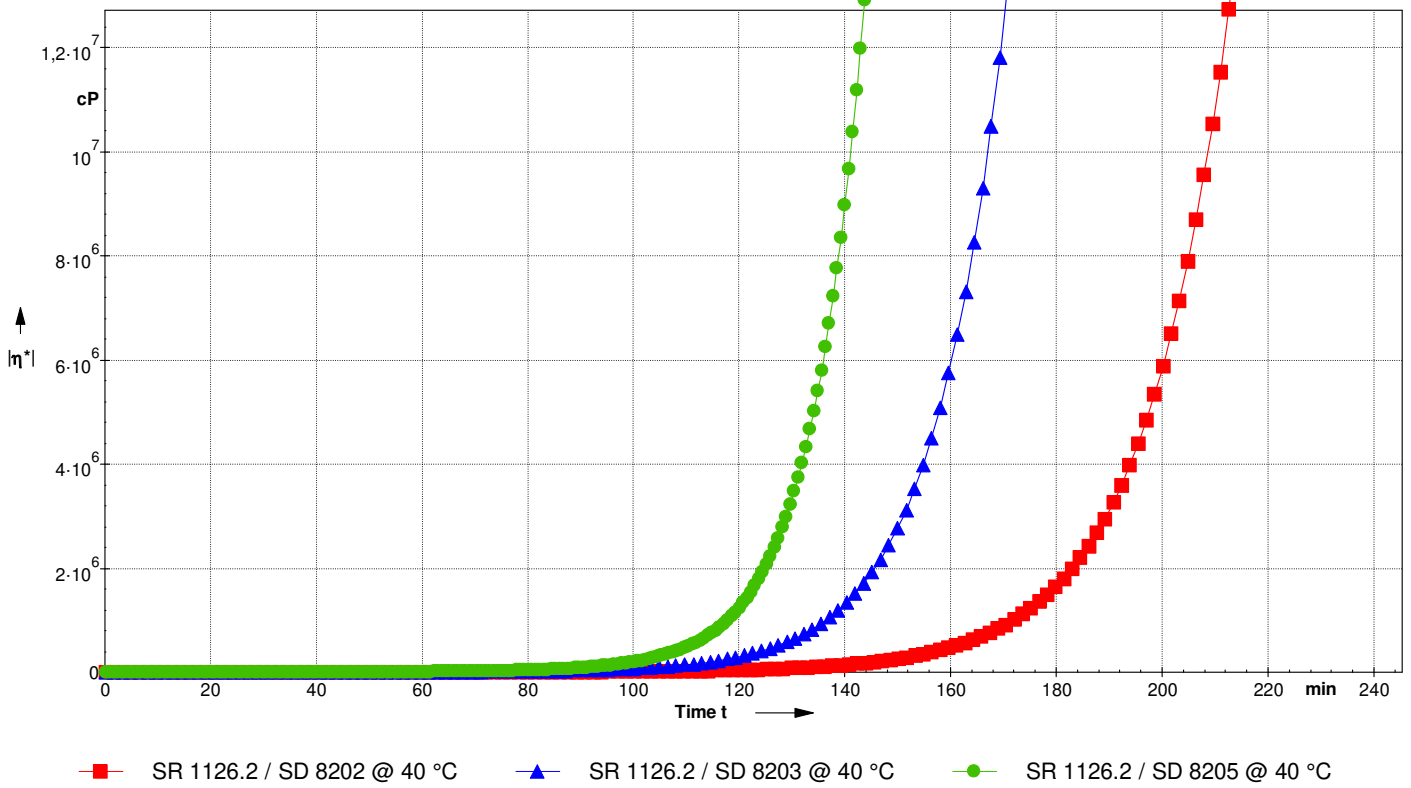
@ 20 °C



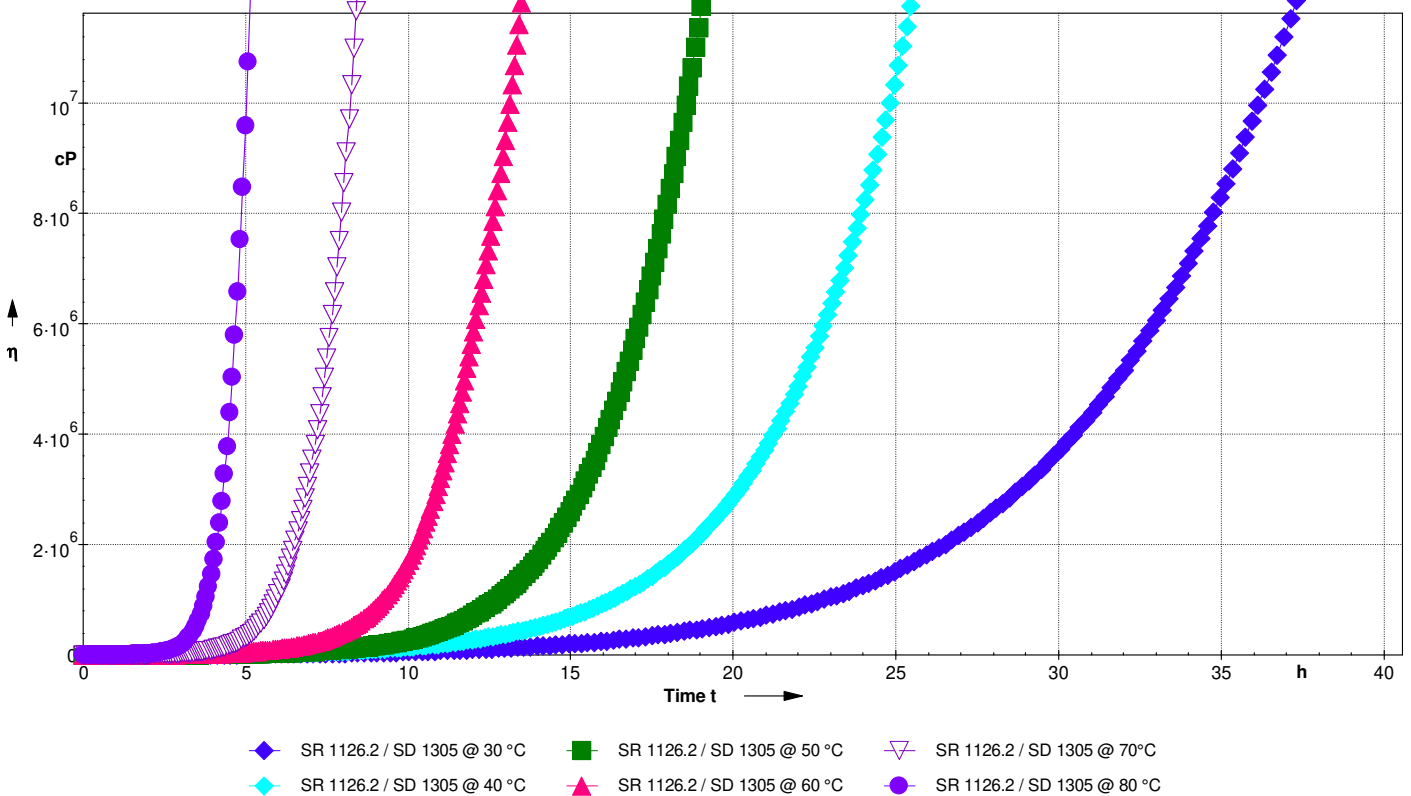
@ 30 °C



**@ 40 °C**




**SR 1126.2 / SD 1305 @ 30 to 80 °C**




## Mechanical properties on cast resin


### SR 1126.2 / SD 8207

Curing cycle 		7 days AT	AT + 24 hrs 40 °C	AT + 8 hrs 80 °C
<b>Tension</b>				
Modulus of elasticity	N/mm <sup>2</sup>	4700	4800	4600
Maximum resistance	N/mm <sup>2</sup>	42	44	44
Resistance at break	N/mm <sup>2</sup>	42	44	44
Elongation at max.load	%	1.1	1.2	1.2
Elongation at break	%	1.1	1.2	1.2
<b>Flexion</b>				
Modulus of elasticity	N/mm <sup>2</sup>	4600	4400	4400
Maximum resistance	N/mm <sup>2</sup>	73	79	78
Elongation at max.load	%	1.9	2.1	2.0
Elongation at break	%	1.9	2.1	2.0
<b>Shear strenght</b>				
Maximum resistance	N/mm <sup>2</sup>	40	41	38
<b>Compressive</b>				
Compressive yield strength	N/mm <sup>2</sup>	95	98	102
Offset compressive yield	%	8.8	10.1	10.2
<b>Impact Choc Charpy</b>				
Resilience	KJ/m <sup>2</sup>	8	9	10
<b>Glass Transition</b>				
Tg1 onset	°C	60	68	72
Tg1 onset maximum	°C			78

**SR 1126.2 / SD 8205**


Curing cycle 		AT +	AT +	AT +
		24 hrs 40 °C	8 hrs 60 °C	8 hrs 80 °C
<b>Tension</b>				
Modulus of elasticity	N/mm <sup>2</sup>	4700	4700	4700
Maximum resistance	N/mm <sup>2</sup>	33	33	36
Resistance at break	N/mm <sup>2</sup>	33	33	36
Elongation at max.load	%	0.6	0.6	0.8
Elongation at break	%	0.6	0.6	0.8
<b>Flexion</b>				
Modulus of elasticity	N/mm <sup>2</sup>	4370	4050	4000
Maximum resistance	N/mm <sup>2</sup>	60	64	68
Elongation at max.load	%	1.5	1.7	1.9
Elongation at break	%	1.5	1.7	1.9
<b>Shear strenght</b>				
Maximum resistance	N/mm <sup>2</sup>	42	42	42
<b>Compressive</b>				
Compressive yield strength	N/mm <sup>2</sup>	92	90	86
Offset compressive yield	%	10.3	11.3	12.4
<b>Impact Choc Charpy</b>				
Resilience	KJ/m <sup>2</sup>	7	8	9
<b>Glass Transition</b>				
Tg1 onset	°C	68	79	83
Tg1 onset maximum	°C	-	-	84

**SR 1126.2 / SD 8203**


Curing cycle 		AT	AT	AT
		+ 24 hrs 40 °C	+ 16 hrs 60 °C	+ 8 hrs 80 °C
<b>Tension</b>				
Modulus of elasticity	N/mm <sup>2</sup>	4600	4400	4200
Maximum resistance	N/mm <sup>2</sup>	32	33	36
Resistance at break	N/mm <sup>2</sup>	32	33	36
Elongation at max.load	%	0.7	0.8	0.8
Elongation at break	%	0.7	0.8	0.8
<b>Flexion</b>				
Modulus of elasticity	N/mm <sup>2</sup>	4400	4200	4000
Maximum resistance	N/mm <sup>2</sup>	49	58	66
Elongation at max.load	%	1.2	1.5	1.8
Elongation at break	%	1.2	1.5	1.8
<b>Shear strenght</b>				
Maximum resistance	N/mm <sup>2</sup>	39	40	41
<b>Compressive</b>				
Compressive yield strength	N/mm <sup>2</sup>	91	94	95
Offset compressive yield	%	9.5	10.7	12.0
<b>Impact Choc Charpy</b>				
Resilience	KJ/m <sup>2</sup>	5	6	8
<b>Glass Transition</b>				
Tg1 onset	°C	67	91	96
Tg1 onset maximum	°C	-	-	96




**SR 1126.2 / SD 8202**

Curing cycle 		AT	AT	AT
		+ 3 days 30 °C	+ 24 hrs 40 °C	+ 8 hrs 80 °C
<b>Tension</b>				
Modulus of elasticity	N/mm <sup>2</sup>	4700	4600	4500
Maximum resistance	N/mm <sup>2</sup>	40	39	42
Resistance at break	N/mm <sup>2</sup>	40	39	42
Elongation at max.load	%	1.0	1.0	1.2
Elongation at break	%	1.0	1.0	1.2
<b>Flexion</b>				
Modulus of elasticity	N/mm <sup>2</sup>	4500	4400	4200
Maximum resistance	N/mm <sup>2</sup>	64	74	79
Elongation at max.load	%	1.6	1.9	2.2
Elongation at break	%	1.6	1.9	2.2
<b>Shear strenght</b>				
Maximum resistance	N/mm <sup>2</sup>	39	40	39
<b>Compressive</b>				
Compressive yield strength	N/mm <sup>2</sup>	92	96	98
Offset compressive yield	%	8.6	9.5	10.7
<b>Impact Choc Charpy</b>				
Resilience	KJ/m <sup>2</sup>	5	6	9
<b>Glass Transition</b>				
Tg1 onset	°C	59	70	87
Tg1 onset maximum	°C			85

**SR 1126.2 / SD 8201** (E1692.41)

Curing cycle				
		AT + 3 days 30 °C	AT + 24 hrs 40 °C	AT + 16 hrs 60 °C
<b>Tension</b>				
Modulus of elasticity	N/mm <sup>2</sup>	4400	4400	4100
Maximum resistance	N/mm <sup>2</sup>	37	40	41
Resistance at break	N/mm <sup>2</sup>	37	40	41
Elongation at max.load	%	0.9	1.0	1.2
Elongation at break	%	0.9	1.0	1.2
<b>Flexion</b>				
Modulus of elasticity	N/mm <sup>2</sup>	4400	4200	3900
Maximum resistance	N/mm <sup>2</sup>	61	66	69
Elongation at max.load	%	1.5	1.7	2.0
Elongation at break	%	1.5	1.7	2.0
<b>Shear strenght</b>				
Maximum resistance	N/mm <sup>2</sup>	39	39	39
<b>Compressive</b>				
Compressive yield strength	N/mm <sup>2</sup>	90	93	93
Offset compressive yield	%	9.1	9.7	10.9
<b>Impact Choc Charpy</b>				
Resilience	KJ/m <sup>2</sup>	5	6	8
<b>Glass Transition</b>				
Tg1 onset	°C	59	70	88
Tg1 onset maximum	°C			89

**SR 1126.2 / SD 1305**

<b>Curing cycle</b>		8 hrs 80 °C 1 hr 100 °C 6 hrs 140 °C
<b>Tension</b>		
Modulus of elasticity	N/mm <sup>2</sup>	3700
Resistance at break	N/mm <sup>2</sup>	33
Elongation at max.load	%	1.2
Elongation at break	%	1.2
<b>Flexion</b>		
Modulus of elasticity	N/mm <sup>2</sup>	3600
Maximum resistance	N/mm <sup>2</sup>	75
Elongation at max.load	%	2.9
Elongation at break	%	2.9
<b>Shear strenght</b>		
Maximum resistance	N/mm <sup>2</sup>	37
<b>Compressive</b>		
Compressive yield strength	N/mm <sup>2</sup>	98
Offset compressive yield	%	16.7
<b>Impact Choc Charpy</b>		
Resilience	KJ/m <sup>2</sup>	9
<b>Glass Transition</b>		
Tg1 onset	°C	135
Tg1 onset maximum	°C	135

**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,

**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: 2<sup>nd</sup> 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  
AT: Ambient temperature (20 to 25 °C)

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