



SR 1700

High performance epoxy laminating system

Systems based on SR 1700 resin

High modulus, high resistance systems
 Low water absorption of cured systems
 Excellent adhesion on all types of reinforcements (glass, aramid, carbon, polyester...)
 Reactivity adjustable by choice of hardener
 Temperature to be used after post-curing, above 100°C, (82°C for the **SD 2713**)
 The **SD 2706, 2705** and **2713** hardeners offer good mechanical properties at ambient temperature;
SD 2703, SD 7820, SD 6131 are requiring a minimum post-cure temperature of 55°C
 Developed for: naval and aerospace structures and automotive prototypes...

Fast hardeners SD 2706, SD 2705

Reactivity adapted for thin laminates under vacuum.
 Quick repairs.
 Fast hardening of laminates at an ambient temperature of 20 to 30°C.
 Good mechanical properties at ambient temperature, excellent after post-curing.

Slow hardener SD 2703

Medium reactivity hardener, long working time.
 Reactivity adapted for the laminating of medium thickness composites.
 Good mechanical properties, items can be released after 24 hours at 18°C
 Mechanical properties optimised by post-curing at 50-55°C
 Designed for the manufacture of parts with a service temperature up to 60-70°C, high performance composites.

Slow hardener SD 7820

Very slow hardener, very low viscosity allowing fast wet out of the reinforcements.
 Laminates requiring 6 to 8 hours of working time.
 Adapted to the production of parts with a service temperature up to 120°C.
 Items can be handled and extracted from moulds after 12 hours at 40°C or 8 h at 60°C






Very slow hardener SD 6131

Very slow hardener, low viscosity allowing fast wet out of the reinforcements
 Low exotherm, laminates up to 15mm thick at an ambient temperature of 20°C.
 Low-pressure injection, parts produced in composite moulds with low thermal conductivity, laminates requiring 8 to 10 hours of working time...
 Post-cure required before de-moulding, post-cure above 55°C

Polymerisation

	SD 2706 SD 2705	SD 2703 SD 2713	SD 6131	SD 7820
Time to wait at 20°C before curing	2 to 4 hours	24 hours	24 hours	24 hours
Minimum curing cycle	7 days 25°C	24 hours 40 °C	16 hours 50 °C	16 h 60°C
Recommended curing cycle	24 h 40°C or 6 hours 60°C	20 hours 50°C or 16 hours 60°C	16 hours 60°C or 8 hours 80°C	8 h 80°C + 4h 100°C + 4 h 120°C

Toxicity / Labelling

References	Symbols	Dangers	Risk Phrases
SR 1700		Xn : Harmful	36/38 22 40 51/53 43
		N : Dangerous for the environment	
SD 2706 SD 2705 SD 2713		C : Corrosive	21/22 34 43
SD 7820		C : Corrosive	21/22 34 37 43
SD 2703 SD 6131		T : Toxic	45 48/20/21/22 37 43

EEC Classification in accordance with Annex I of the Directive 67 / 548 / EEC

Packaging (in Kg)

Kits (kg)	Resin SR 1700 (kg)	Hardener SD 2706 / SD 2705 (kg)
268.5	1 x 220	5 x 9.7
42.7	1 x 33	1 x 9.7
13.42	1 x 11	1 x 2.42
6.71	1 x 5.5	1 x 1.21
1.22	1 x 1	1 x 0.22
	Resin SR 1700	Hardener SD 2703
291.61	1 x 220	7 x 10.23
43.23	1 x 33	1 x 10.23
14.4	1 x 11	2 x 1.7
7.2	1 x 5.5	1 x 1.7
1.31	1 x 1	1 x 0.31
	Resin SR 1700	Hardener SD 7820
299.2	1 x 220	8 x 9.9
42.9	1 x 33	1 x 9.9
15.0	1 x 11	2 x 2
7.5	1 x 5.5	1 x 2
1.36	1 x 1	1 x 0.36
	Resin SR 1700	Hardener SD 6131
301.44	1 x 220	8 x 10.18
43.18	1 x 33	1 x 10.18
15.08	1 x 11	2 x 2.04
7.54	1 x 5.5	1 x 2.04
1.37	1 x 1	1 x 0.37

Epoxy resin SR 1700

Appearance / colour	yellow liquid	
Viscosity (m.Pas)	at 20 °C	1700
	at 25 °C	1050
Density (g/cm ³)	at 20 °C	1.157

SD hardeners

Hardeners Reactivity type	SD 2706 "fast"	SD 2705 "standard"	SD2713 "slow"	SD 2703 "slow"	SD 7820 "slow"	SD 6131 "very slow"	
Appearance / colour	yellow liquid	yellow liquid	yellow liquid	red liquid	colourless liquid	red liquid	
Viscosity (m.Pas)	at 20°C	310	245	180	150	60	80
	at 25°C	250	200	125	100	50	50
Viscosity of the mix (m.Pas)	at 20°C	800	700	700	760	490	530
	at 25°C	600	540	500	600	390	340
Density (g/cm ³)	at 20°C	1.04	1.04	1.00	0.99	0.96	0.98
Density of the mix (g/cm ³)	at 20°C	1.13	1.13	1.10	1.10	1.10	1.10
Mixing ratio by weight	100 g of SR 1700 for:						
	22 g	22 g	39 g	31 g	36 g	37 g	
Mixing ratio by volume	100 ml of SR 1700 for						
	24 ml	24 ml	36 ml	45 ml	43 ml	43 ml	

Reactivity of the mixes SR 1700 / SD

Systems SR 1700	SD 2706	SD 2705	SD 2713	SD 2703	SD 7820	SD 6131	
Exotherm temperature (°C) on 500 g of mix:	at 20°C	330	300		245	140	46
	at 25°C	330	340		260	210	108
Time to reach exotherm measured on 500 g of mix :	at 20°C	34 mn	45 mn	1 h 15'	2 h	9 h 30'	10 h
	at 25°C	24 mn	30 mn	45'	1 h 20'	4 h 15'	6 h
Time to reach 50°C measured on 500 g of mix:	at 20°C	26 mn	36 mn		1 h 45'	8 h 45'	/
	at 25°C	17 mn	20 mn		1 h	3 h 45'	4 h 20'
Maximum working time for 3 layers of E glass of 300 g / m ² :	at 20°C	2 h	3 h 30'	6 h 30'	5 h 30'	9 h	10 h
	at 25°C	1 h 30'	2 h 30'	5 h	5 h	6 h	7 h



Mechanical properties on cast resin :

		SR 1700 / SD 2706					SR 1700 / SD 2705		
Post-cure cycles		14 days @ amb T°C	24 h TA + 24 h 40°C	24 h TA + 16 h 60°C	24 h TA + 4 h 80°C	16 h 60°C + 7days in water @ 23°C	24 h TA + 24 h 40°C	24 h TA + 16 h 60°C	24 h TA + 4 h 80°C
Tensile									
Modulus of elasticity	N/mm ²	3840	4060	3600	4210	3900	3710	3420	3310
Maximum resistance	N/mm ²	82	95	100	94	100	81	100	98
Resistance at break	N/mm ²	82	95	99	94	96	81	97	97
Elongation at maximum resistance	%	2.6	3.3	4.5	3.9	4.4	2.9	4.9	5.4
Elongation at break	%	2.6	3.4	5.0	4.0	5.1	2.9	5.7	6.4
Flexion									
Modulus of elasticity	N/mm ²	4180	4260	3920	3920	4110	3956	3840	3470
Maximum resistance	N/mm ²	149	155	154	154	149	146	151	148
Elongation at maximum resistance	%	4.5	5.1	5.7	5.9	5.5	5.0	5.7	6.4
Elongation at break	%	5.5	6.0	6.1	6.2	6.1	6.3	6.0	7.6
Compression									
Compressive yield strength	N/mm ²						132		
Offset compressive yield	%						5.2		
Charpy Impact strength									
Resilience	KJ/m ²	15	17	16	15	14	15	14	12
Glass transition									
Tg1	°C	56	73	80	101	78	69	86	101
Tg1 max.	°C				103				109

Tests carried out on cast resin, without prior degassing, between steel plates.
Procedures carried out in accordance with AFNOR norms:

Tensile : NF T51-034
Flexion : NF T51-001
Compression: NF T51-101
Charpy Impact Strength: NF T51-501
Glass transition : DSC Tg 1 = 1° point at 10°C / minute

Mechanical properties on cast resin :

		SR 1700 / SD 2713			SR 1700 / SD 2703		
Post-cure cycles		24 h Ta + 24 h 40°C	24 h Ta + 16 h 60°C	24 h Ta +16 h 60°C + 7 d water 23°C	24 h Ta + 24 h 40°C	24 h Ta + 16 h 60°C	24 h TA + 8 h 80°C
Tensile							
Modulus of elasticity	N/mm ²	3440	3420	3600	3750	3670	3530
Maximum resistance	N/mm ²	82	85	87	80	90	96
Resistance at break	N/mm ²	76	81	85	80	90	96
Elongation at maximum resistance	%	3.8	4.2	3.9	2.6	3.4	4.4
Elongation at break	%	4.6	5.4	4.6	2.6	3.4	4.5
Flexion							
Modulus of elasticity	N/mm ²	3520	3540	3740	3850	3880	3690
Maximum resistance	N/mm ²	131	134	142	129	149	148
Elongation at maximum resistance	%	5.0	5.5	5.0	3.8	5.6	5.6
Elongation at break	%	7.7	6.5	5.9	3.7	6.6	5.7
Compression							
Compressive yield strength	N/mm ²	124				133	
Offset compressive yield	%	4.0				6.7	
Water absorption							
	%			0.27			
	Weight						
Charpy Impact strength							
Resilience	KJ/m ²	17	18	12	18	14	8
Glass transition							
Tg1	°C	64	73	72	69	85	98
Tg1 max.	°C		82 max.				106 max.

Tests carried out on cast resin, without prior degassing, between steel plates.
Procedures carried out in accordance with AFNOR norms:

Tensile : NF T51-034
Flexion : NF T51-001
Compression: NF T51-101
Charpy Impact strength:: NF T51-501
Glass transition: DSCTg 1 = 1° point at 10°C / minute

Mechanical properties on cast resin :

		SR 1700 / SD 7820					SR 1700 / SD 6131		
Post cure cycles		14 days 23°C	24 h TA + 24 h 40°C	24 h TA + 16 h 60°C	24 h TA + 8h 80°C	Ta +6h60°C + 45h120C	48 h TA + 24 h 50°C	48 h TA + 16 h 60°C	48 h TA + 8 h 80°C
Tensile									
Modulus of elasticity	N/mm ²	3550	3200	3200	3100	2620	3270	3260	3280
Maximum resistance	N/mm ²	30	62	86	93	92	80	90	93
Resistance at break	N/mm ²	30	62	84	93	92	80	89	93
Elongation at maximum resistance	%	0.9	2.1	3.8	5.4	6.4	3.2	4.6	4.9
Elongation at break	%	0.9	2.1	4.1	6.4	6.7	3.2	5.1	5.1
Flexion									
Modulus of elasticity	N/mm ²	3590	3630	3530	3380	3000	3480	3450	3390
Maximum resistance	N/mm ²	68	113	136	137	130	141	141	145
Elongation at maximum resistance	%	1.8	3.4	5.4	6.5	7.0	5.4	5.8	6.1
Elongation at break	%	1.8	3.4	6.9	8.0	7.5	7.1	7.7	6.5
Compression									
Compressive yield strength	N/mm ²						125	124	123
Offset compressive yield	%						6.8	7.5	7.7
Charpy Impact strength									
Resilience	KJ/m ²	2	21	25	23	15	21	23	20
Glass transition									
Tg1	°C	62	69	88	108	140	75	86	100
Tg1 max.	°C					140			106

Tests carried out on cast resin, without prior degassing, between steel plates.
Procedures carried out in accordance with AFNOR norms:

Tensile : NF T51-034
Flexion : NF T51-001
Compression: NF T51-101
Charpy Impact Test:: NF T51-501
Glass transition: DSC Tg 1 = 1° point at 10°C / minute

Mechanical properties of laminates based on SR 1700 resin:

Sample		SD 2705	SD 2703	SD 2703	SD 6131	SD 7820
SR 1700 / SD xxxx matrix						
Reinforcement		3300	3300	EL PB 567	3300	3300
Number of layers		15	15	9	15	15
Implementation		Press	Press	Press	Press	Press
Fiber content by weight	%	73	75	77	70	77
Post-curing		20' 100 °C	16 h 60°C	1 h 120 °C	16 h 60°C	16 h 60 °C
Flexion						
Modulus of elasticity	N/mm ²	27600	27200	44250	25000	29000
Maximum resistance	N/mm ²	700	710	1165	630	760
Elongation at maximum resistance	%	3.2	3.2	2.8	3.0	3.2
Shear						
Shear stress	N/mm ²	62	64	57	62	60
Charpy Impact Strength						
	KJ/m ²	250	235	390	220	220
Water absorption after 48 hours in distilled water at 70°C						
	%	0.12	+ 0.16		+ 0.08	0.08
Glass transition						
Tg 1	°C	95	88	102	91	92
Tg1 max.	°C	107	105	105	105	112

Tests carried out in accordance with norms:

Tensile : NF T 57-102

Flexion : NF T 57-105

Shear: NF T 57-104

Charpy Impact Strength: NF T 57-108

Glass transition : DSC 1° point at 10°C / minute

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/m²

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