

ISOBOND SR 7100 / SD 710X

Epoxy structural adhesive for thin bonding and overlap stratification on prepreg

ISOBOND SR 7100 - SD 710X system has been specially formulated for thin bonding from 0.1 mm to a few mm. It exhibit high fatigue strength (excellent resistance against microcracks propagation).

		SD 7106	SD 7105	SD 7103
Reactivity level		Fast	Standard	Slow
Initial viscosity (mPa.s)	@ 20 °C	22300	32300	27800
	@ 30 °C	11400	28000	16500
Pot Life (500 g)	@ 20 °C	17 min	45 min	02 h 00
	@ 30 °C	8 min	15 min	50 min
Mixing ratio	By weight	100 / 45	100 / 45	100 / 45
	By volume	100 / 50	100 / 50	100 / 50
Shear strength	N/mm ²	33	35	29
% Elongation at max strength	%	2,9	3,8	3,8
Gel Time	@ 20 °C	03 h 55	05 h 10	11 h 00
	@ 30 °C	02 h 15	02 h 45	05 h 50
Time to reach 400 mPa.s	@ 20 °C	10 min	3 min	3 min
	@ 30 °C	30 min	3 min	3 min
Demold time	@ 20 °C	17 h 45	15 h 30	55 h 00
	@ 30 °C	10 h 45	12 h 15	27 h 30

ISOBOND SR 7100 - SD 710X system has been specially formulated for thin bonding from 0.1 mm to a few mm. It exhibit high fatigue strength (excellent resistance against microcracks propagation).

- High performance adhesive
- Adheres to most materials
- Specifically designed for composite structural bonding
- Excellent resistance against microcracks propagation (high GIc)
- Gel texture easy to apply and mix
- Outstanding wettability of surfaces
- 3 variable speed hardeners

Application on nonporous surface material is possible. The hand mixing for quantities greater than 200 or 300 grams can be complicated and induce significant risks of inhomogeneous mixture in production. A machine of dosing and mixing may then be considered and become essential in order to avoid any difference in quality.



Epoxy resin ISOBOND SR 7100

Appearance		gel
Color		blue
Viscosity (mPa.s)	@ 15 °C	33000 ± 6600
	@ 20 °C	21575 ± 4325
	@ 25 °C	14000 ± 4000
Density	@ 20 °C	1,1760
Refractive index	@ 25 °C	1,54 ± ,002
Storage (months)	@ Ta	24

Hardener(s)

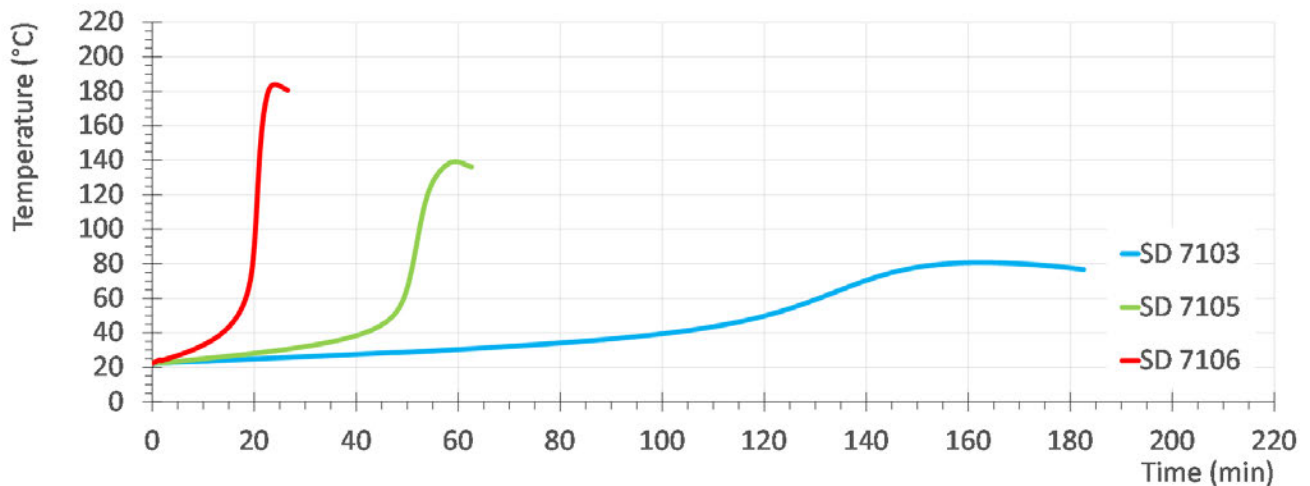
		SD 7106	SD 7105	SD 7103
Appearance		gel	gel	gel
Color		dark green / black	yellow-orange	red
Reactivity level		Fast	Standard	Slow
Viscosity (mPa.s)	@ 15 °C	53000 ± 10600	47010 ± 16710	35000 ± 7000
	@ 20 °C	35000 ± 7000	36310 ± 13610	26000 ± 5200
	@ 25 °C	23000 ± 4600	29470 ± 11570	21000 ± 4200
Density	@ 20 °C	1,0687	1,0240	1,0205
Refractive index	@ 25 °C	1,5368 ± ,002	1,5353 ± ,002	1,5077 ± ,002
Storage (months)	@ Ta	18	18	18

Mixe(s) ISOBOND SR 7100 / SD 710X

	SD 7106	SD 7105	SD 7103
Appearance	gel	gel	gel
Color	dark green / black	green	purple
Mixing ratio			
By weight	100 / 45	100 / 45	100 / 45
By volume	100 / 50	100 / 50	100 / 50
Initial viscosity (mPa.s) @ 20 °C	22300	32300	27800
Density @ 20 °C	1,072	1,063	1,1001
PP 50 mm / 10 s ⁻¹ @ 30 °C	11400	28000	16500

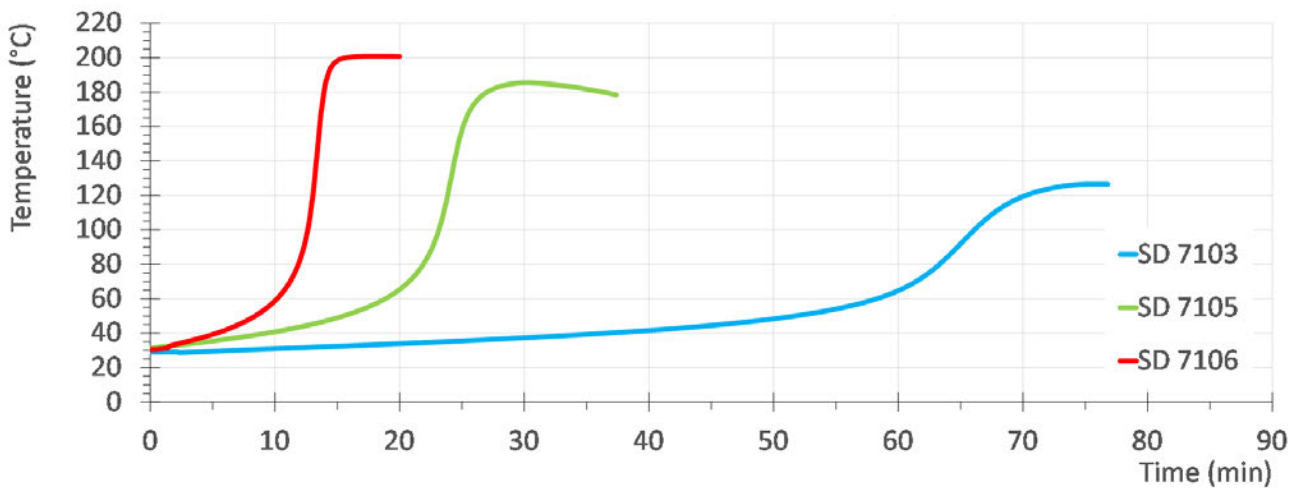
Reactivity @ 20 °C for 500 g ISOBOND SR 7100 / SD 710X

	SD 7106	SD 7105	SD 7103
Exothermic temperature (°C)	185	140	80
Exothermic peak time	23 min	01 h 00	02 h 40
Time to reach 50 °C	17 min	45 min	02 h 00



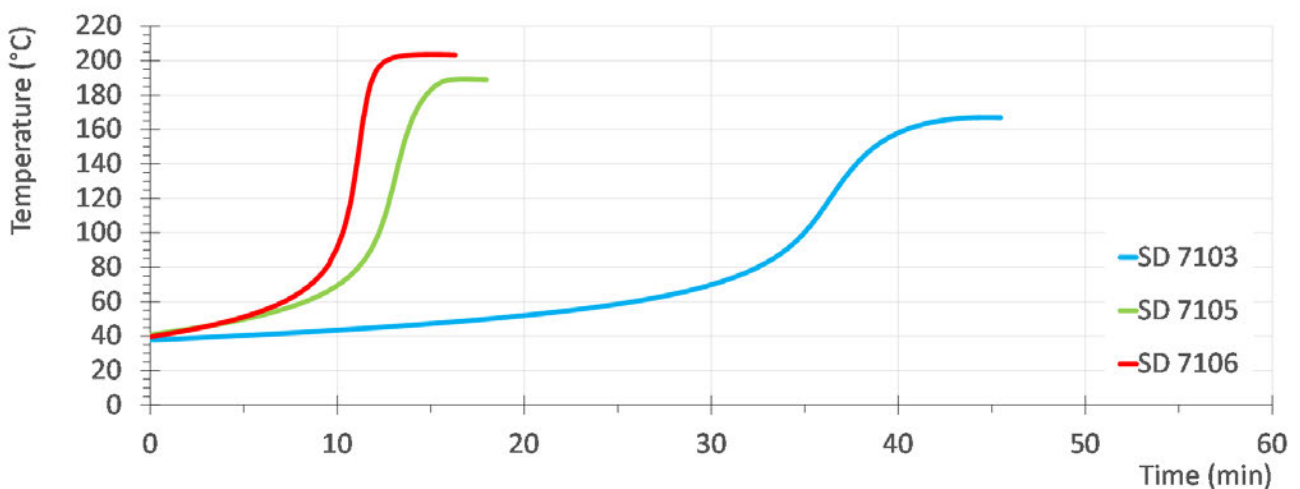
Reactivity @ 30 °C for 500 g ISOBOND SR 7100 / SD 710X

	SD 7106	SD 7105	SD 7103
Exothermic temperature (°C)	200	185	130
Exothermic peak time	16 min	30 min	01 h 15
Time to reach 50 °C	8 min	15 min	51 min



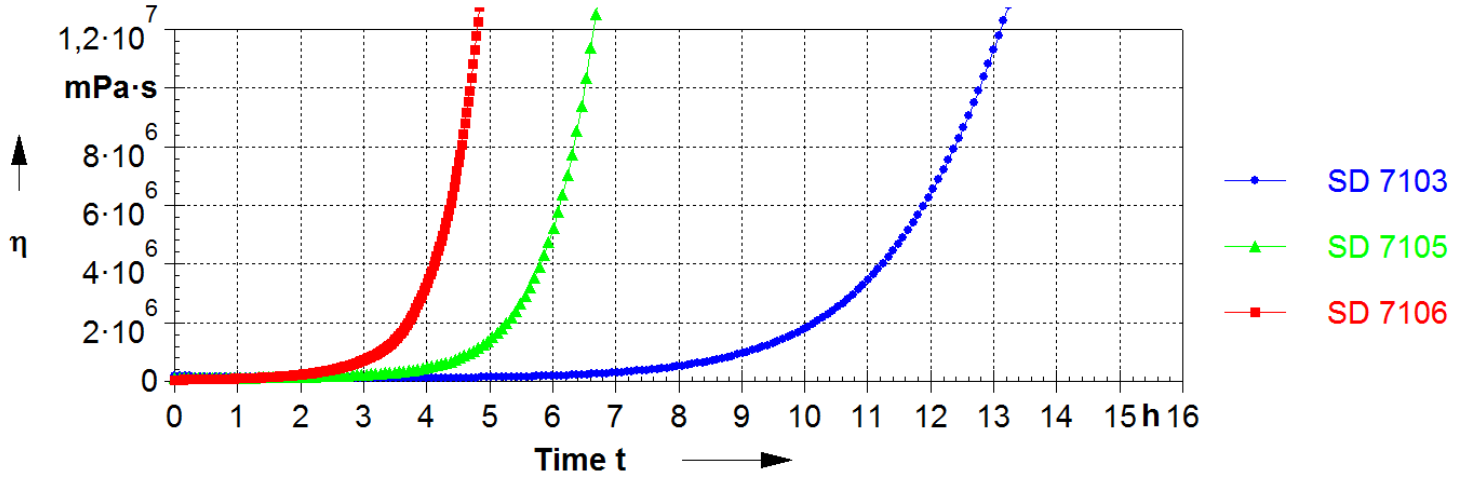
Reactivity @ 40 °C for 500 g ISOBOND SR 7100 / SD 710X

	SD 7106	SD 7105	SD 7103
Exothermic temperature (°C)	205	190	165
Exothermic peak time	14 min	16 min	43 min
Time to reach 50 °C	4 min	5 min	18 min

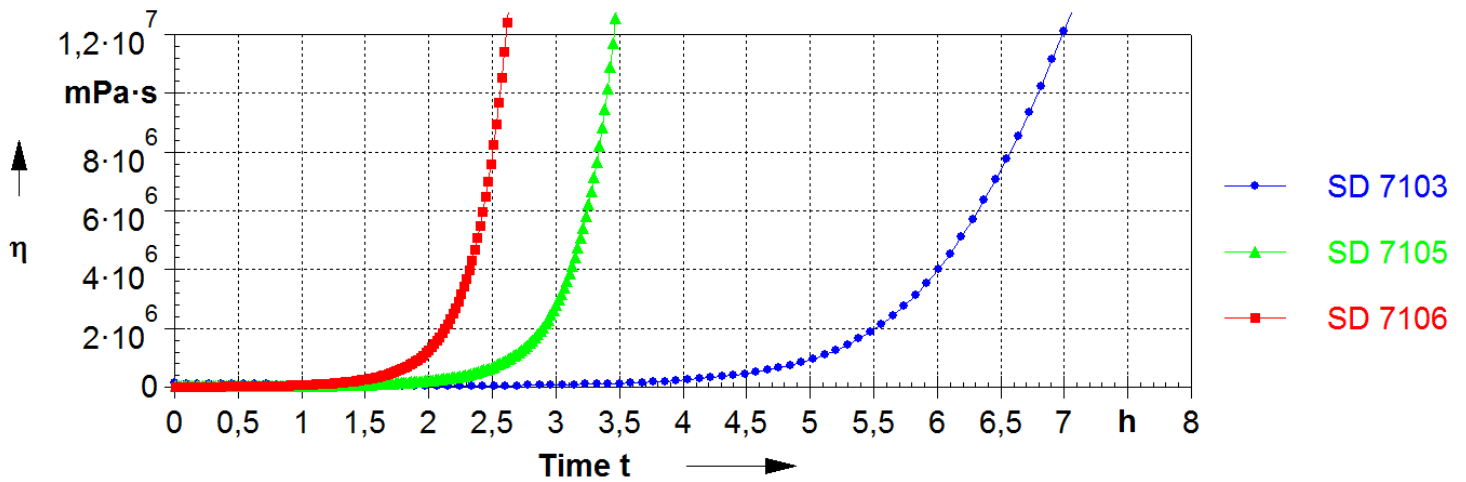


1 mm thick layer reactivity

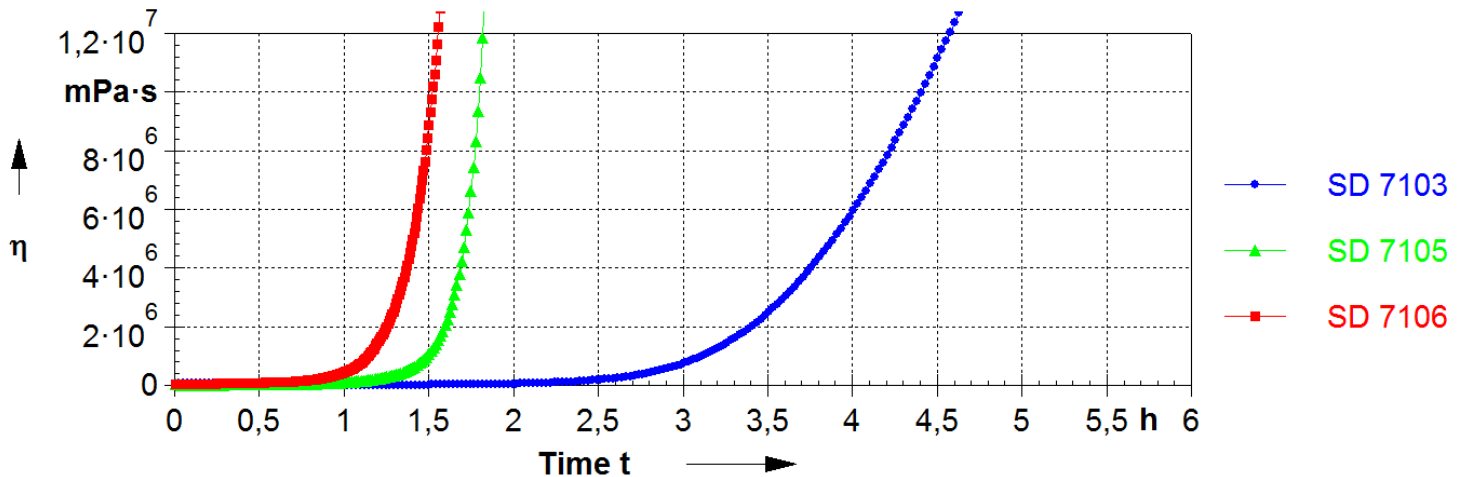
@ 20 °C



@ 30 °C



@ 40 °C



Mechanical properties on cast resin :

		ISOBOND SR 7100 / SD 7106			ISOBOND SR 7100 / SD 7105		
Curing cycles		7 j @ TA	24 h @ TA + 16 h @ 40°C	24 h @ TA + 8 h @ 60°C	7 j @ TA	24 h @ TA + 16 h @ 40°C	24 h @ TA + 8 h @ 60°C
Tensile							
Modulus	N/mm ²	2 800	2 570	3 050	2 200	2 200	2 250
Maximum strength	N/mm ²	42	42	45	45	47	48
Breaking Strength	N/mm ²	40	40	43	30	33	36
Elongation at max strength	%	2,5	2,8	2,9	3,7	3,8	3,8
Elongation at break	%	2,8	3,2	3,8	11	15,5	26
Flexion							
Modulus	N/mm ²	2 390	2 360	2 200	2 100	2 100	1 900
Maximum strength	N/mm ²	76	78	76	76	77	73
Breaking Strength	N/mm ²	39	53	41	NB	NB	NB
Elongation at max strength	%	4,4	4,7	5	4,6	4,9	5,1
Elongation at break	%	3,6	11,1	13,5	NB	NB	NB
Compression							
Yield strength	N/mm ²	70	75	74	68	70	64
Shear strength							
On pure resin	N/mm ²	33	34	33	32	31	35
Alu / Alu bonding	N/mm ²	18,8	24,4	21,9	23,5	24,8	24,1
Steel / Steel bonding	N/mm ²	21	25	23	27,9	27,1	30,3
Stainless / Stainless bonding	N/mm ²	22,2	26,2	24	28,5	29	28,4
Wood / Wood bonding	N/mm ²	FT	FT	FT	FT	FT	FT
GRP/GRP bonding	N/mm ²	27,7	30,7	28	28,5	31,5	32,4
Toughness							
G1c interlaminar (J/m ² -CBT)		NC	NC	NC	960	950	940
DSC glass transition							
TG1 onset	°C	59	57	59	50	50	50
TG1 max onset	°C			60			58

Mechanical properties on cast resin :

		ISOBOND SR 7100 / SD 7103		
Curing cycles		7 j @ TA	24 h @ TA + 16 h @ 40°C	24 h @ TA + 8 h @ 60°C
Tensile				
Modulus	N/mm ²	1 790	2 070	1 890
Maximum strength	N/mm ²	29	32	30
Breaking Strength	N/mm ²	25	25	26
Elongation at max strength	%	3,6	3,5	3,8
Elongation at break	%	9,7	12,7	12,5
Flexion				
Modulus	N/mm ²	1 660	1 730	1 710
Maximum strength	N/mm ²	52	55	55
Breaking Strength	N/mm ²	NB	NB	34
Elongation at max strength	%	5,1	5	5,2
Elongation at break	%	NB	NB	14
Compression				
Yield strength	N/mm ²	49	51	54
Shear strength				
On pure resin	N/mm ²	28	27	29
Alu / Alu bonding	N/mm ²	21,7	19,1	24,7
Steel / Steel bonding	N/mm ²	24,6	25,6	25,8
Stainless / Stainless bonding	N/mm ²	25,3	26,4	27,5
Wood / Wood bonding	N/mm ²	FT	FT	FT
GRP/GRP bonding	N/mm ²	23,2	24,4	30,7
Toughness				
G1c interlaminar (J/m ² -CBT)		NC	NC	NC
DSC glass transition				
TG1 onset	°C	54	53	51
TG1 max onset	°C			51

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,

Bonding Strength Double lap shear:	ASTM D3528-96
	ADH = adhesive failure
	COH = cohesive failure
	TLC = thin-layer cohesive failure
	FT = fiber-tear failure.
	LFT = light-fiber-tear failure

Thermal tests:

Glass transition DSC:	NF EN ISO 11357-2:2014 -5°C to 180 °C under nitrogen gas
	T_{G1} or Onset: 1 st scan at 20 °C/min
	T_{G1} maximum or Onset: 2 nd 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 ⁻¹
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 ⁻¹
Green Carbone content:	ASTM D6866-16 or XP CEN/TS 16640 Avril 2014	

TA:	Ambient temperature (20 to 25 °C)
NC:	No information Communicated
NB:	No Breaking (maximum flexion deformation : 15 %)

Table 1st page:

Pot Life:	Time to reach 50 °C or time limit for use
Gel time:	Intersection of tangents on the viscosity curve of 1 mm thick layer
Release time:	Time required to obtain sufficient mechanical strength to release
Minimum Vacuum Time:	Time in which vacuum can be applied (25000 mPa.s)
Maximum Vacuum time:	Limit time below which a vacuum can be applied (G'G'' crossing)
Optimum Infusion time:	Time to reach 400 mPa.s
Max Infusion Time:	Time to reach 25000 mPa.s
Vacuum cut-off time:	Time to reach G'G'' crossover + 20%

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