SR 8500 / SZ 8525

Fast and clear epoxy system for hot processes

Low viscosity epoxy system formulated for large scale production
Short cycle times hot process: 10 minutes at 100 °C or 20' at 90 °C.
Clear system after cure

Epoxy Resin SR 8500

		SR 8500
Aspect		Liquid
Colour		Clear to light yellow Gardner <2
Viscosity (mPa.s) Rheometer CP 50 mm Shear rate 10 s^{-1}	20 °C 25 °C 30 °C 40 °C 50 °C 60 °C 70 °C 80 °C 90 °C 100 °C 110 °C	9 800 ± 1 000 4 500 ± 500 2 300 ± 300 750 ± 200 300 ± 150 150 ± 50 80 ± 30 50 ± 20 30 ± 10 25 ± 5 15 ± 3
Density : Picnometre ISO 2811-1	20 °C	1.17 ± 0.01

Hardener SZ 8525

		SZ 8525
Aspect		Liquid
Colour		Light yellow Gardner <3
Viscosity (mPa.s) Rheometer CP 50 mm Shear rate 10 s^{-1}	20 °C 25 °C 30 °C 40 °C 50 °C 60 °C 70 °C 80 °C	33 ± 5 25 ± 5 17 ± 5 11 ± 4 8 ± 3 6 ± 3 4 ± 2 3 ± 2
Density : Picnometre ISO 2811-1	20 °C	0.94 ± 0.01

SR 8500 / SZ 8525 mix properties

		SR 8500 / SZ 8525
Weight ratio		**100 / 25 g**
Volume ratio		**100 / 30 ml**
Viscosity (mPa.s)	20 °C	1 800 ± 400
Rheometer	25 °C	1 000 ± 200
PP 50 mm	30 °C	750 ± 150
Shear rate 10 s^{-1}	40 °C	320 ± 60
	50 °C	130 ± 30
	60 °C	70 ± 20
	70 °C	50 ± 15
	80 °C	35 ± 10
	90 °C	30 ± 7
	100 °C	20 ± 3
	110 °C	< 20

Reactivity (Hot Plate) / Tg

Tooling temperature	Gel time (film)	Dust free (film)	Curing process (mn)	Glass transition (DSC)* Onset / Tg1 (°C)
@ 80 °C	8’	12’	30’ 45’ 60’ 75’ 90’ 120’	85-90 99 102 103 104 106
@ 90 °C	6’	7’	15’ 20’ 25’ 30’ 40’	94 102 104 106 106
@ 100 °C	4’	4’ 50’’	10’ 20’	104 113
@ 110 °C	2’ 20’’	3’	6’ 10’	96 114

DSC According to standard Iso 11357-2 :1999

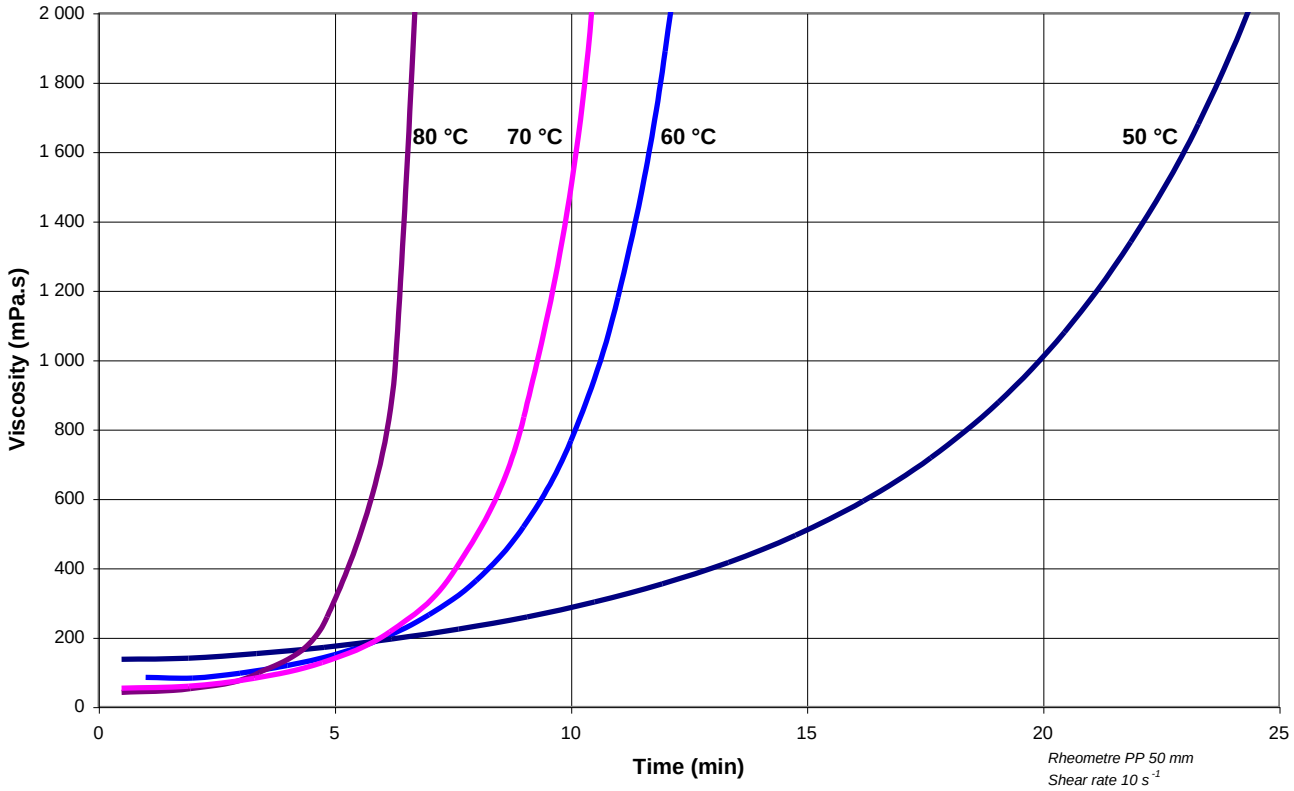
Typical curing cycle under hot press:

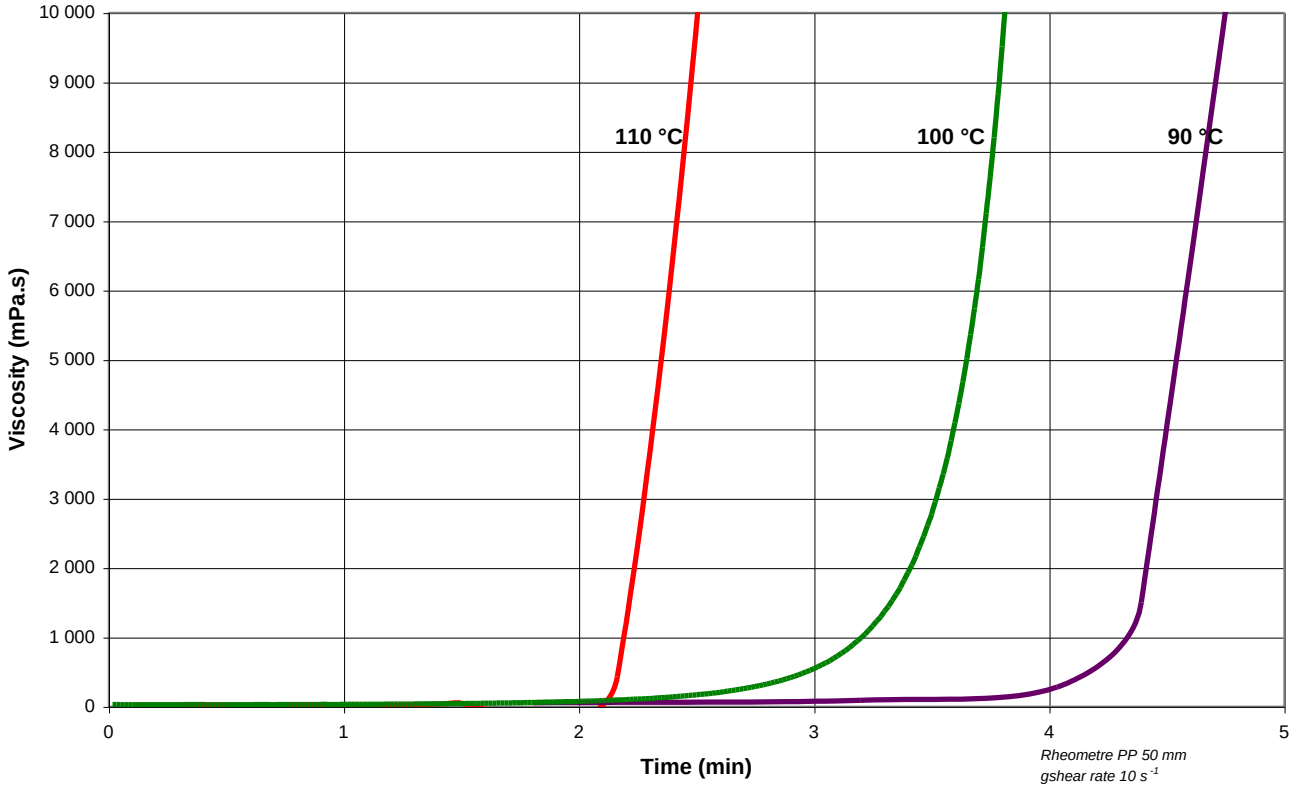
@ 80 °C : 1 hour
@ 90 °C : 20’
@ 100 °C : 10’
@ 110 °C : 8’

Pot-life:

100 g-mixture @ 23 °C: ~ 85 minutes

Reactivity – 1 mm film viscosity evolution at different temperatures





Mechanical properties on SR 8500 / SZ 8525 based laminates

Note about laminate manufacturieng process:
Fabrics have been placed under vacuum at 60 °C to allow the infusion to occur.
The mix has then been prepared at ambient temperature and infused in the hot fabric.
Once the infusion is over the laminate is heated up to 100 °C for 15 minutes at different heating speed.
Finally, the part is quickly cooled down to 25 °C for unmoulding.

		SR 8500 / SZ 8525		
Curing cycles :		10' at 60 °C then heat up 1°C / min then 15' at 100 °C	10' at 60 °C then heat up 5°C / min then 15' at 100 °C	10' at 60 °C then heat up 10°C / min then 15' at 100 °C
Total cycle time		65 minutes	33 minutes	29 minutes
Sampling				
Reinforcement		3300	3300	3300
Number of layers		15	15	15
process		infusion -0.8 bar	infusion -0.8 bar	infusion -0.8 bar
Reinforcement weight ratio (%) (Mf)		73	72	74
Flexion				
Modulus of elasticity	N/mm^2	25 000	23 000	22 100
Maximum resistance	N/mm^2	700	660	640
Elongation at maximum load	%	3.1	3.2	3.2
Shear strength				
Shear stress	N/mm^2	60	48	48
Charpy impact strength				
Resilience	kJ/m^2	240	210	225
Water absorption	%poids	0.25	0.35	0.29
Glass transition				
Tg 1	°C	114	110	100
Tg1 max.	°C	114	113	110

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/m2