

SR 8160 / SD 815 Bx

Flexible epoxy systems

The **SR 8160 / SD815 Bx** is a system designed for laminating parts that exhibit shock and impact resistance, like the underbody of off road car racing. It may be used alone or as an additive to modify other epoxy systems. Also, it may be used to impregnate the outer layer(s) of laminates (so to take first contact of impacts,) and to achieve anisotropic behavior (in terms of thickness) of a part. In this case special care should be taken so to prevent delamination by making a gradual transition from elastic to rigid matrix. This gradual transition can be achieved by using 2 or 3 progressively lower content ratios (on subsequent fabric layers) of **SR 8160** system, so to go from pure elastic to more rigid epoxy gradually. A very high ambient temperature is needed for pure **SR 8160** flexible system to start the hardening reaction.

Hardeners SD 815 Bx

SD 815 B2 & B3: Standard hardeners

SD 815 B4: Slow hardener

SD 815 B7: Super slow, low Tg

Description

80 to 110 % of elongation at break in tension

Shock resistance over 150 KJ / m²

Unfilled and translucent

Advantages compared to polyurethane

- Does not foam when in contact with humidity
- Memory of shape

Applications:

- Hand laminating, infusion, adhesive, tooling, casting, laminates
- Parts under vibrations, shocks, low temperature
- Flexible laminates: Body parts for cars, motorbike, 4X4 etc
- Casting and inclusion (degassing under vacuum)
- Part design / prototyping

Epoxy resin SR 8160

Appearance		Viscous liquid
Chemical nature		Epoxy resin. Reaction product between bisphenol and epichlorhydrine.
Storage		2 years Cristalisation free
Color gardner		3 maximum
Density	@ 20 °C	1.144
Viscosities (m.Pas ± 20 %)	@ 15 °C	14 400
	@ 20 °C	7 800
	@ 25 °C	3 900
	@ 30 °C	2 200
	@ 40 °C	850
Refractive index	@ 25 °C	1.5347

Base Hardeners SD 815 Bx :

		SD 815 B2	SD 815 B3	SD 815 B4	SD 815 B7
Aspect / Color		Liquid / Clear to yellow			
Reactivity levels		Standard	Standard	Slow	Ultra slow
Viscosities (m.Pas ± 20 %)	@ 15 °C	18	28	30	35
	@ 20 °C	15	22	24	28
	@ 25 °C	12	17	19	22
	@ 30 °C	10	13	15	12
Density ± 0.01	@ 20 °C	0.97	0.98	0.98	0.97
Refractive Index	@ 25 °C	1.4702	1.4727	1.4670	1.4465
Storage & stability		2 years Hardeners reacts with carbon dioxide and moisture. Keep tightly closed packaging, minimize maximum contact with the air.			

SR 8160 / SD 815.Bx Mixes :

	SR 8160/ SD 815 B2	SR 8160 / SD 815.B3	SR 8160 / SD 815 B4	SR 8160 SD 815 B7
Mixing ratio:				
Quantity by weigh	100 / 18	100 / 20	100 / 20	100 / 37
Quantity by volume	100 / 21	100 / 24	100 / 24	100 / 44
Viscosities mixes (m.Pas ± 20 %)				
@ 20 °C	2 100	2 300	2 750	1300
@ 30 °C	660	880	1 100	490
@ 40 °C	3600	310	500	260
@ 50 °C	/	/	/	120
@ 60 °C	/	/	/	80
@ 100 °C	/	/	/	17
@ 120 °C	/	/	/	10

Reactivities on 500 g mix SR 8160 / SD 815 Bx :

	SR 8160 / SD 815 B2	SR 8160 SD 815 B3	SR 8160 SD 815 B4	SR 8160 SD 815 B7
Exothermic temperature (°C) :				
@ 20 °C	45	50	/	/
@ 30 °C	130	120	45	/
@ 40 °C	160	155	80	/
Time taken to achieve exotherm :				
@ 20 °C	2 hrs 20 min	2 hrs	/	/
@ 30 °C	1 hrs 40 min	1 hrs 35 min	4 hrs	/
@ 40 °C	1 hr	55 min	2 hrs 45 min	/
Time taken to reach 50 °C :				
@ 20 °C	/	/	/	/
@ 30 °C	35 min	30 min	/	/
@ 40 °C	20 min	15 min	1 hr 10 min	/

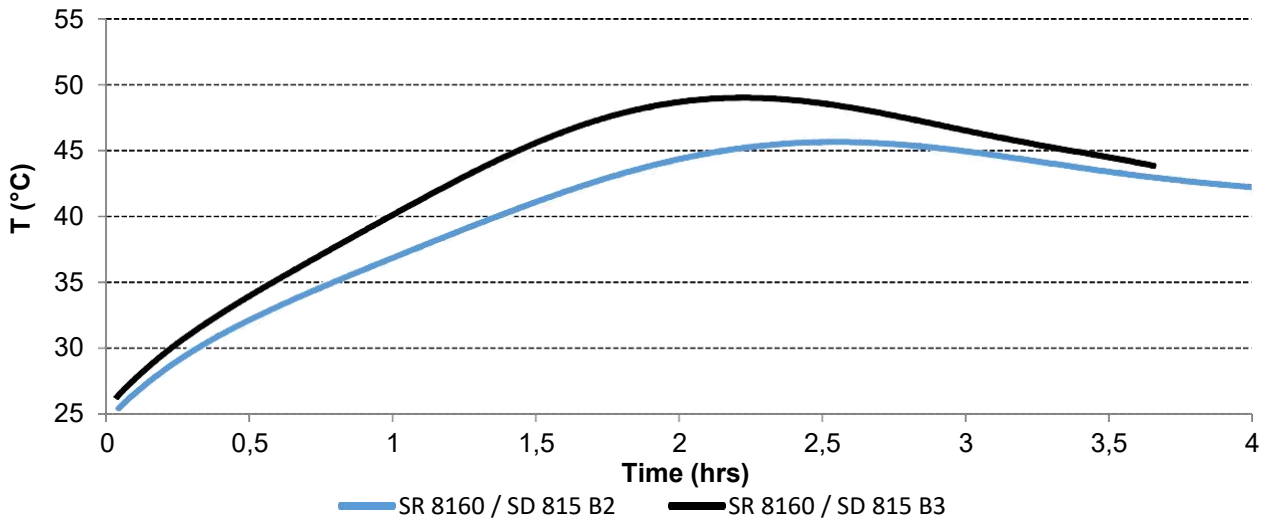
Curing cycle

12 to 24 hrs @ 60 °C is need to achieved full cured

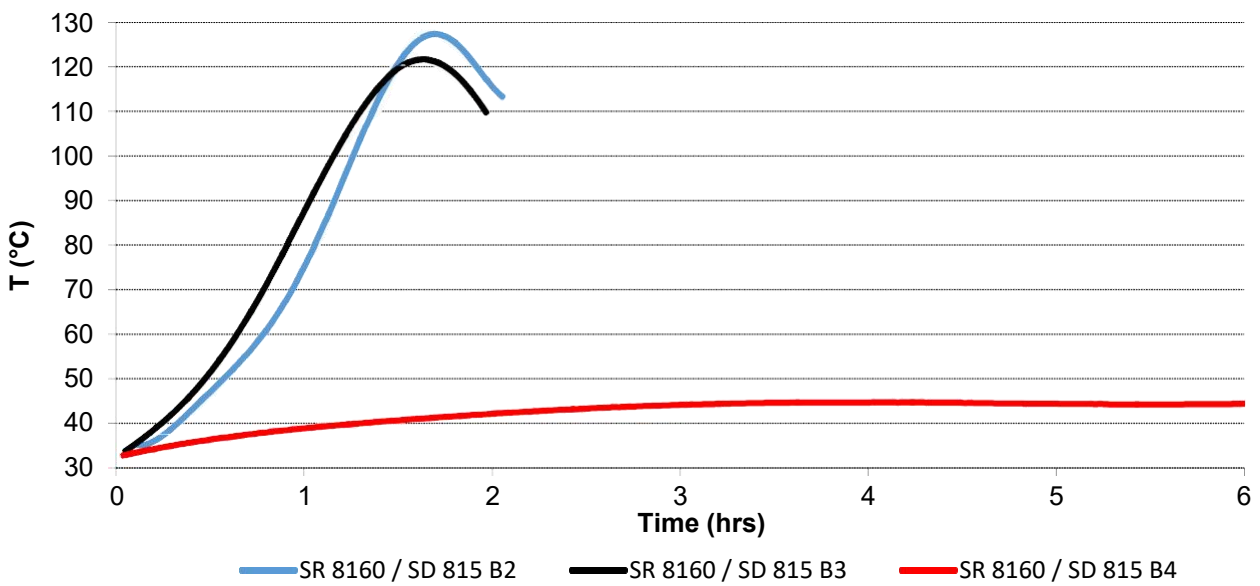
Fast curing cycle:

 45 ' @ 120 °C
 2 hrs @ 100 °C

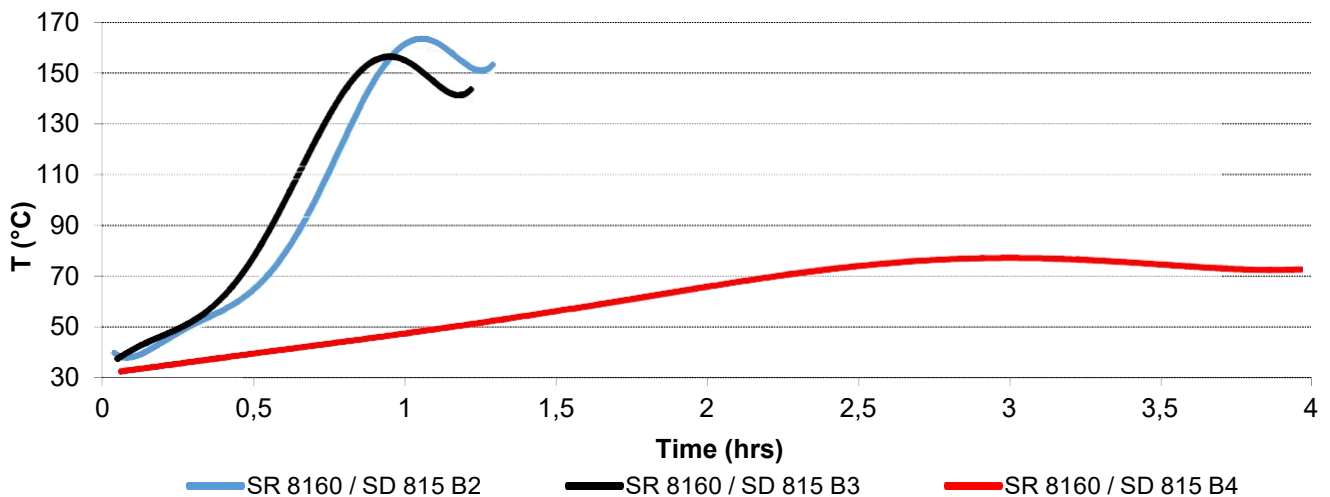
Pot Life 500 g @ 20 °C



Pot Life 500 g @ 30°C

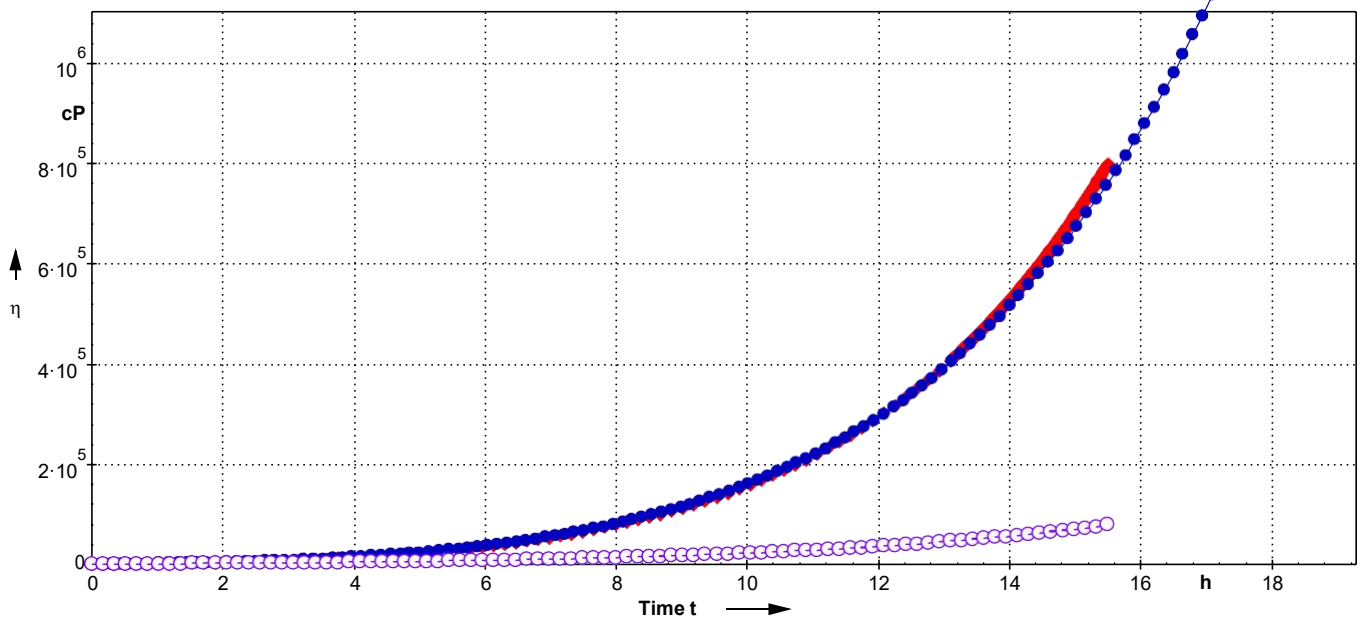


Pot Life 500 g @ 40°C



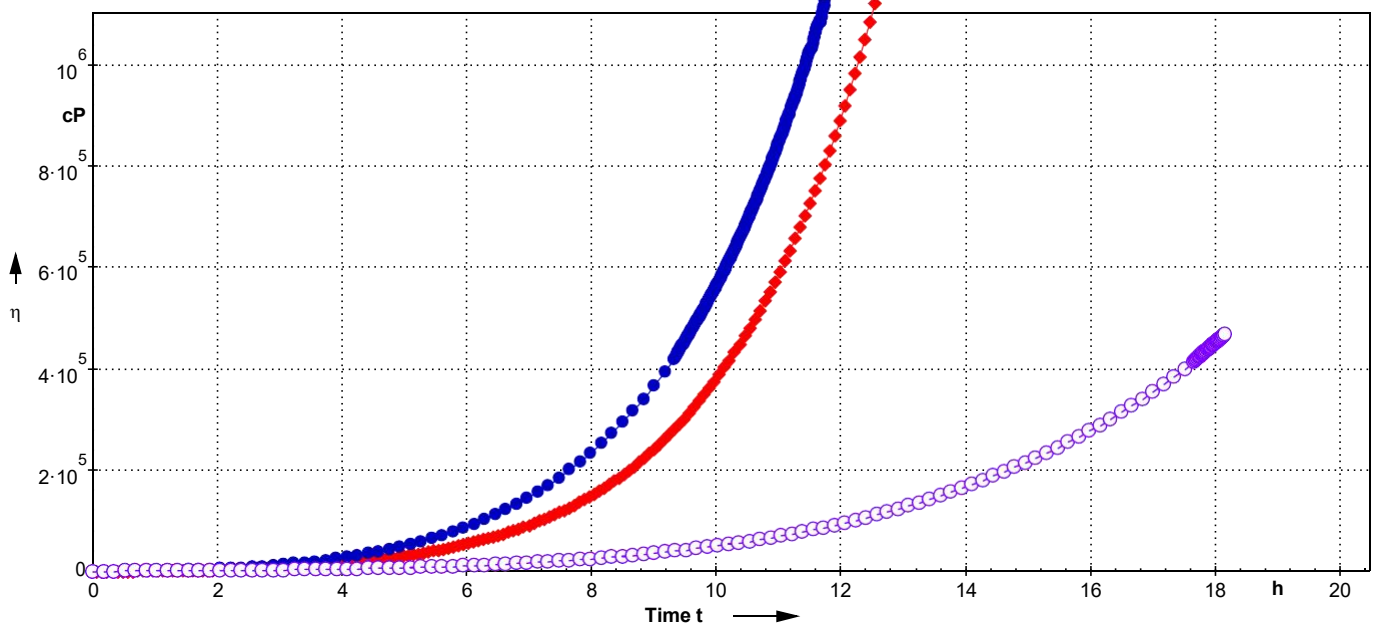
evolution with the temperature
@ 20 °C

8160 / SD 815 Bx Reactivity – 1 mm film viscosity



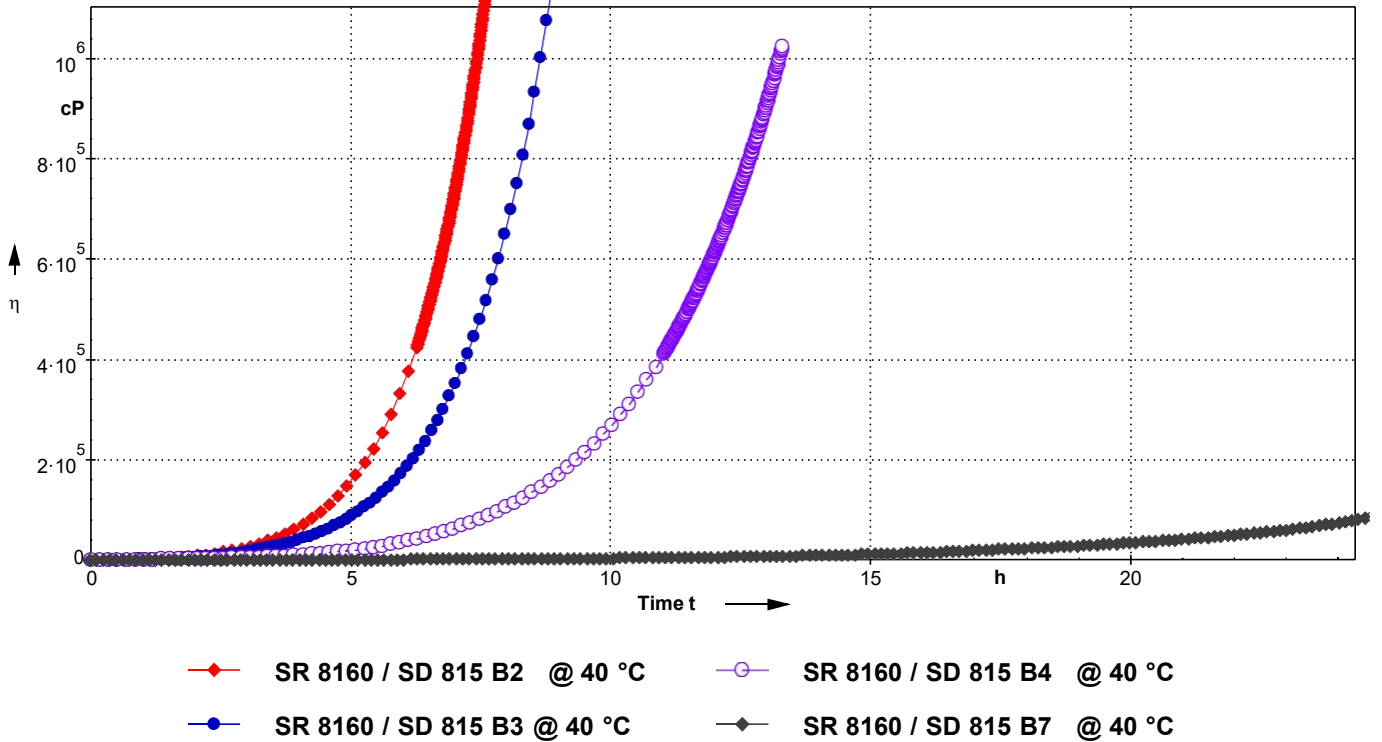
- ◆ SR 8160 / SD 815 B2 @ 20 °C
- SR 8160 / SD 815 B4 @ 20 °C
- SR 8160 / SD 815 B3 @ 20 °C E2

@ 30 °C

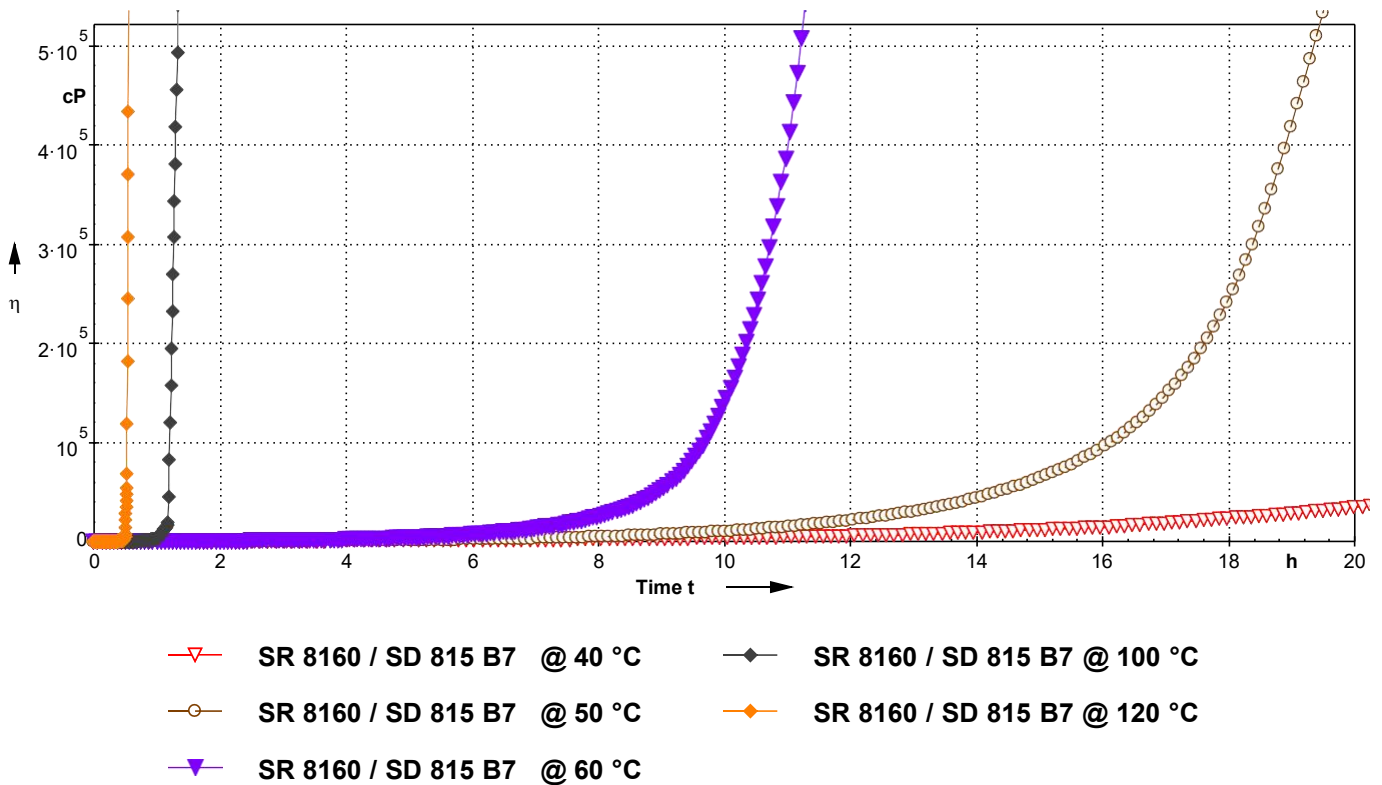


- ◆ SR 8160 / SD 815 B2 @ 30 °C
- SR 8160 / SD 815 B4 @ 30 °C
- SR 8160 / SD 815 B3 @ 30 °C

@ 40 °C



SR 8160 / SD 815 B7 @ 40 to 120 °C



Mechanical properties of pure resin

Cure Schedule	SR 8160 / SD 815 B2	SR 8160 / SD 815 B3	SR 8160 / SD 815 B4	SR 8160 / SD 815 B7
	24 hrs 25 °C + 12 hrs 60 °C	24 hrs 25 °C + 12 hrs 60 °C	24 hrs 25 °C + 12 hrs 60 °C	2 hrs 40 °C + 24 h 60 °C
Tensile				
Modulus of elasticity	N/mm ² 150	180	380	/
Maximum resistance	N/mm ² 10	14	14	/
Resistance at break	N/mm ² -	-	14	/
Elongation at max. resistance	% > 130	> 130	> 90	>90
Dureté Shore A	98	95	95	58
Glass transition / DSC				
Tg onset	°C 33	33	37	7

Tests carried out on samples of pure cast resin, without prior degassing, between steel plates.

Measures undertaken according to the following norms:

Tension	:	Iso 527 - 2
Flexion	:	Iso 178
Charpy impact strength:		NF T 51-035
Shear Strength		ASTM D 732 - 93
Compressive		ISO 604
Water absorption:		Internal. Polymerisation according to cycle, machining, weighing, time spent in distilled water at 70 °C / 48 hours, weighing 1 hour after emerging,
Glass transition DSC :		ISO 11357-2 : 1999 -25 °C to 100 °C under nitrogen gaz Tg1 or Onset : 1st point at 20 °C/mn Tg1 maximum or Onset : second passage
Glass transition DTMA:		ISO 11357-1 - TG onset G' Temperature ramp 0 °C to 180 °C @ 2°C/min ASTM D4065 - TG peak G''
Physical tests according standard ::		
Gardner color:		NF EN ISO 4630 Visual method
Refractive index :		NF ISO 280
Viscosity:		NF EN ISO 3219 Rheometer 50 mm, shear 10s ⁻¹
Density:		NF EN ISO 2811-1 Pycnometer
Gel time :		Cross G' G'' / rheometer CP50 - Shear rate 10 s ⁻¹
GreenCarbon content:		ASTM D6866 or XP CEN/TS 16640 Avril 2014

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