

SR 1670 / SD 7160

Transparent and colorless casting resin

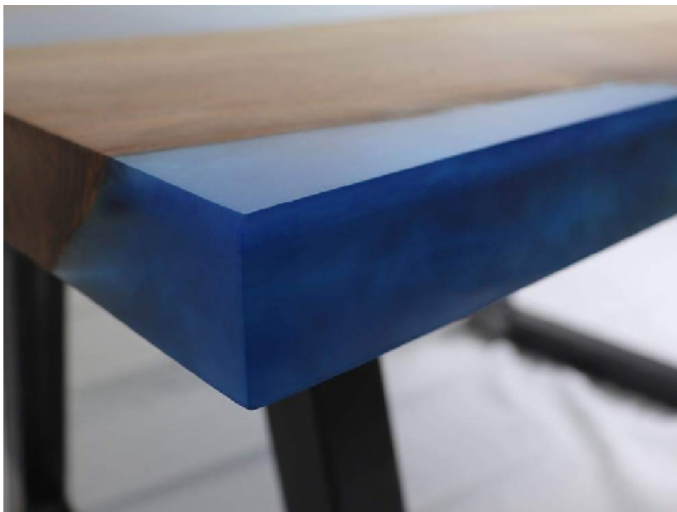
Epoxy system with UV resistance enhanced, designed for the production by casting decorative objects, bottles prototypes, jewellery, river table...

- Low reactivity allowing castings up to 10 mm thick at 30 °C
- Obtaining a polymer with high clarity, good brightness and colourless.
- Cures at room temperature, if necessary post cure from 40 to 80 °C.
- Almost odourless.
- Excellent impact resistance and thermal shock.
- Good UV resistance compared to standard epoxy resin

		SD 7160
Reactivity level		Slow
Initial viscosity (mPa.s)	20 °C	600
	30 °C	300
Pot Life (1 kg)	20 °C	08 h 40
	30 °C	02 h 50
Mixing ratio	By weight	100 / 47
	By volume	100 / 50
Density		1,18
Tg max onset	°C	67
Gel Time (1 mm)	20 °C	32 h 00
	30 °C	16 h 20
Demold time	20 °C	96 h 00
	30 °C	49 h 00

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Epoxy resin SR 1670

Appearance		liquid
Color		purple
Viscosity (mPa.s)	15 °C	2950 ± 550
	20 °C	1600 ± 300
	25 °C	925 ± 175
	30 °C	580 ± 120
Density	20 °C	1,16
Storage (months)	23 °C	24

Hardener(s)

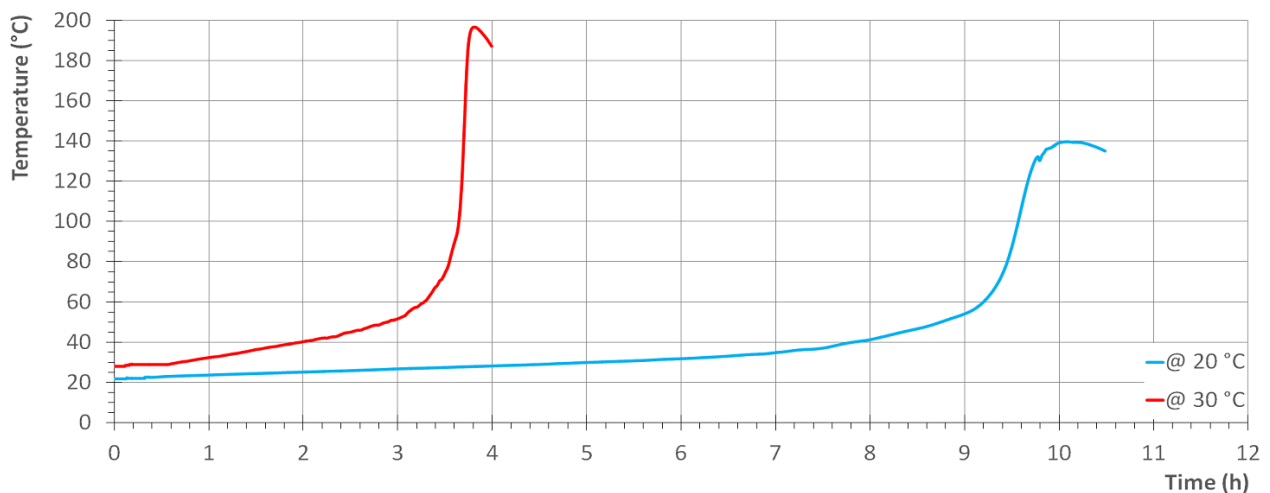
		SD 7160
Appearance		liquid
Color		colourless
Gardner color		≤ 1
Pt/Co Color Index		≤ 50
Reactivity level		Slow
Viscosity (mPa.s)	15 °C	180 ± 30
	20 °C	125 ± 20
	25 °C	90 ± 15
	30 °C	70 ± 10
Density	20 °C	0,97
Storage (months)	23 °C	24

Mixe(s) SR 1670 / SD 7160

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Appearance		liquid
Color		colourless
Mixing ratio		
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	By volume	100 / 50
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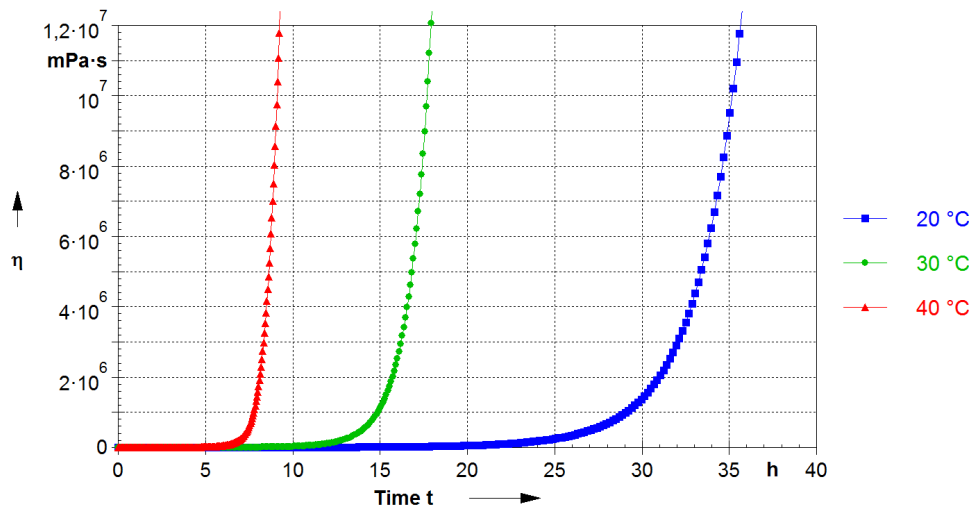
Reactivity for 1 000 g

	20 °C	30 °C
Exothermic temperature (°C)	140	197
Exothermic peak time	10 h 00	03 h 50
Time to reach 50 °C	08 h 40	02 h 50



1 mm thick layer reactivity

20, 30 & 40 °C



Post-curing

The thermomechanical values of an epoxy system can be optimized by implementing a post-curing cycle. The Sicomin laboratory provides several predefined post cure cycles on its data sheets allowing users to compare systems. These experimental cycles are adaptable to your specific applications, taking the following parameters into account:

- Selected epoxy system (Tg max)
- Available heat source
- Room Dimension and Sampling
- Nature of the tooling (thermal conductivity of material)

Many systems can provide good mechanical properties after curing at room temperature and from 18°C for 24 to 48 hours before demolding.

The mechanical properties progress very quickly with a slightly higher temperature of around 40°C for several hours.

Epoxy systems with high Tg and slow and extra-slow hardeners imperatively require post-curing at a higher temperature. It is possible to start the cycle as soon as the exothermic peak passes, but also to start post-curing later after assembly of the various components and before the finishing operations. If the nature of the models and tools is not suitable for high temperatures, we recommend carrying out the first stages up to the maximum admissible temperature then, after cooling and demoulding, continuing the cycle on a suitable former.

For a conventional epoxy system, we recommend carrying out a cycle in steps of 20°C for 4 hours.

Example for an epoxy system Tg max 100°C:

4 hrs at 40°C + 4 hrs at 60°C + 4 hrs at 80°C + cooling to room temperature before unmounting.

There are many short cycle, high temperature epoxy systems that do not fit into this post-cure scheme (pultrusion, hot press, pre-preg). For these systems, initial curing provides maximum thermomechanical performance without post-curing.

We invite you to contact our technical department for your questions on this subject.

Mechanical properties on cast resin :

		SR 1670 / SD 7160		
		7 days Ta	48 h Ta + 24 h 40 °C	48 h Ta + 24 h 60 °C
Tensile				
Modulus	N/mm ²	3 660	3 460	3 100
Maximum strength	N/mm ²	62	60	55
Breaking Strength	N/mm ²	57	56	47
Elongation at max strength	%	2,7	2,8	3,1
Elongation at break	%	3,3	3,5	4,8
Flexion				
Modulus	N/mm ²	3 080	3 070	2 800
Maximum strength	N/mm ²	101	97	93
Breaking Strength	N/mm ²		51	61
Elongation at max strength	%	3,9	3,9	4,7
Elongation at break	%		9,6	11,7
Shear				
Breaking Strength	N/mm ²	39	38	36
Compression				
Modulus	N/mm ²			
Yield strength	N/mm ²	89	85	76
Offset compression yield	%	9,7	9,6	10
Charpy impact strength				
Resilience	kJ/m ²	61	57	59
DSC glass transition				
Tg onset	°C	54	58	64
Tg max onset	°C			67
DTMA glass transition				
Tg tan delta	°C			
TeiG onset G'	°C			
TmG midpoint G'	°C			
TefG endpoint	°C			
TG peak G''	°C			

These curing cycles are applied after a 24-hour hardening period at room temperature, allowing the reaction to freeze and exotherm beyond.

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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Mix

SR 1670	Resin part + Hardener part (kg)	Resin part (kg)	Hardener part (kg)
SD 7160			