

SR *GreenPoxy* 51 UVR / SD EVO



SR *GreenPoxy* 51 UVR epoxy system is specially formulated for the manufacturing of surf boards, stand-up paddle, wave-ski, skim-board. **SR *GreenPoxy* 51 UVR** is suitable for hand lay up of glass, carbon, aramid, natural and synthetic fibers. **SR *GreenPoxy* 51 UVR** has improved UV resistance compared to standard epoxy resin and contains almost 51% bio-based carbon. It is compatible with all commercial foams: polystyrene, polyurethane, cross-linked & linear PVC foams and others.

SR *GreenPoxy* 51 UVR is compatible with all typical fillers used in the surf industry.

| | | SD EVO Slow | SD EVO Medium | SD EVO Fast |
|------------------------------|-------------------|-------------|---------------|-------------|
| Reactivity level | | Slow | Standard | Fast |
| Initial viscosity (mPa.s) | 20 °C | 945 | 1 900 | 1 610 |
| | 30 °C | 380 | 720 | 845 |
| Pot Life (150 g) | 20 °C | 31 min | 7 min | 6 min |
| | 30 °C | 17 min | 4 min | 3 min |
| Mixing ratio | By weight | 100 / 37 | 100 / 41 | 100 / 44 |
| | By volume | 100 / 50 | 100 / 50 | 100 / 50 |
| Maximum strength | N/mm ² | 69 | 68 | 62 |
| % Elongation at max strength | % | 3,8 | 3,8 | 3,5 |
| Tg max onset | °C | 85 | 80 | 73 |
| Gel Time (1 mm) | 20 °C | 08 h 00 | 03 h 10 | 02 h 40 |
| | 30 °C | 04 h 30 | 01 h 50 | 01 h 30 |
| Time to reach 400 mPa.s | 20 °C | 03 h 30 | 01 h 10 | 01 h 00 |
| | 30 °C | 02 h 10 | 45 min | 37 min |
| Demold time | 20 °C | 24 h 00 | 09 h 30 | 08 h 00 |
| | 30 °C | 13 h 30 | 05 h 30 | 04 h 30 |

Characteristics:

Ratio per volume 2:1.

High mechanical performance epoxy system recommended for surfboard production.

Yields surfboards with a flexible touch, high temperature and UV stability compared to standard epoxy resin.

High surface and plug finishing, for high gloss requirement.

Other applications: surf repairs, fin boxes & plugs, pattern and model coating, etc...

Low odor and reduced skin aggression for a better work environment.

Enhanced UV resistance

Advices for application:

Work in a clean environment with heating facility.

Ideal working temperature from 18 °C to 30 °C.

Maintain a constant temperature during lamination.

Avoid high ambient humidity.

Avoid exposure to U.V. during the cure. Laminates and coatings benefitting from a sun free post cure or polymerized for at least 7 days at 18°C will obtain greater U.V. resistance and mechanical properties

Do not dilute with solvents. Please consult our technical assistance.

The use of compatible pigments is possible.

Keep packaging well-sealed as hardeners are sensitive to carbonic gas and humidity.

A polyurethane or other top coat paint can (for best UV protection) be applied, without primer, after sanding the final layer of **SR GreenPoxy 51 UVR** .

Green Technology:

SICOMIN is heavily involved in green chemistry. When technology and availability of raw materials allows, we choose raw materials from biomass sourcing.

SR GreenPoxy 51 UVR epoxy resin is manufactured with a bio-based carbon content of about 51 % (resin alone)

OH additive, the shiniest Surf resin in the world

Sicom offers the possibility to use an extra additive to mix with the resin Surf Clear EVO to improve the light radiance of the laminates applied on top of white PS or PU foams. Used for colored board, OH additive can modify the color perception (blue effect with carbon or pink effect with wood or linen fabrics), please test before to avoid any surprises.

Mixing: 1 g of OH for 1 kg of resin **SR GreenPoxy 51 UVR** - First mix resin and OH additive, then mix with hardener



Epoxy resin SR GreenPoxy 51 UVR

| | | |
|------------------------------|-------|------------|
| Appearance | | liquid |
| Color | | colourless |
| Gardner color | | ≤ 1 |
| Viscosity (mPa.s) | 15 °C | 3200 ± 650 |
| | 20 °C | 1800 ± 400 |
| | 25 °C | 1100 ± 250 |
| | 30 °C | 588 ± 112 |
| Density | 20 °C | 1,20 |
| Bio-based Carbon content (%) | | 51 |
| Storage (months) | 23 °C | 24 |

Hardener(s)

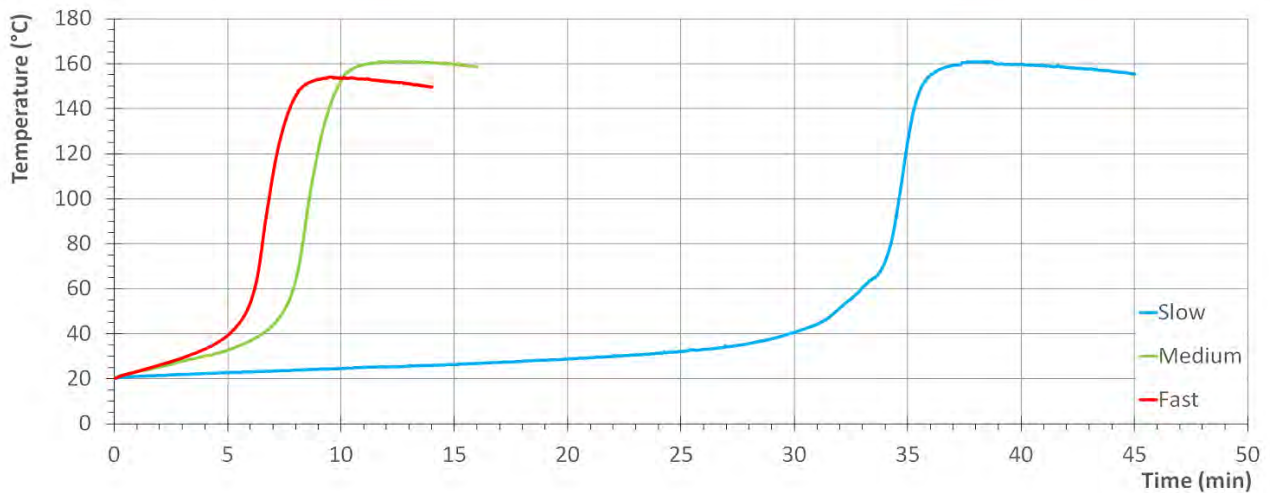
| | | SD EVO Slow | SD EVO Medium | SD EVO Fast |
|-------------------|-------|-------------|---------------|-------------|
| Appearance | | liquid | liquid | liquid |
| Color | | colourless | light yellow | colourless |
| Gardner color | | ≤ 2 | ≤ 1 | ≤ 1 |
| Reactivity level | | Slow | Standard | Fast |
| Viscosity (mPa.s) | 15 °C | 80 ± 15 | 180 ± 40 | 290 ± 60 |
| | 20 °C | 60 ± 15 | 120 ± 25 | 190 ± 40 |
| | 25 °C | 45 ± 10 | 80 ± 20 | 125 ± 25 |
| | 30 °C | 32 ± 6 | 60 ± 12 | 90 ± 20 |
| Density | 20 °C | 0,97 | 0,99 | 0,98 |
| Storage (months) | 23 °C | 24 | 24 | 24 |

Mixe(s) SR GreenPoxy 51 UVR / SD EVO

| | | SD EVO Slow | SD EVO Medium | SD EVO Fast |
|---------------------------|-----------|-------------|---------------|-------------|
| Appearance | | liquid | liquid | liquid |
| Color | | colourless | colourless | colourless |
| Mixing ratio | | | | |
| | By weight | 100 / 37 | 100 / 41 | 100 / 44 |
| | By volume | 100 / 50 | 100 / 50 | 100 / 50 |
| Initial viscosity (mPa.s) | 20 °C | 945 | 1 900 | 1 610 |
| | 30 °C | 380 | 720 | 845 |
| Density | 20 °C | | | |

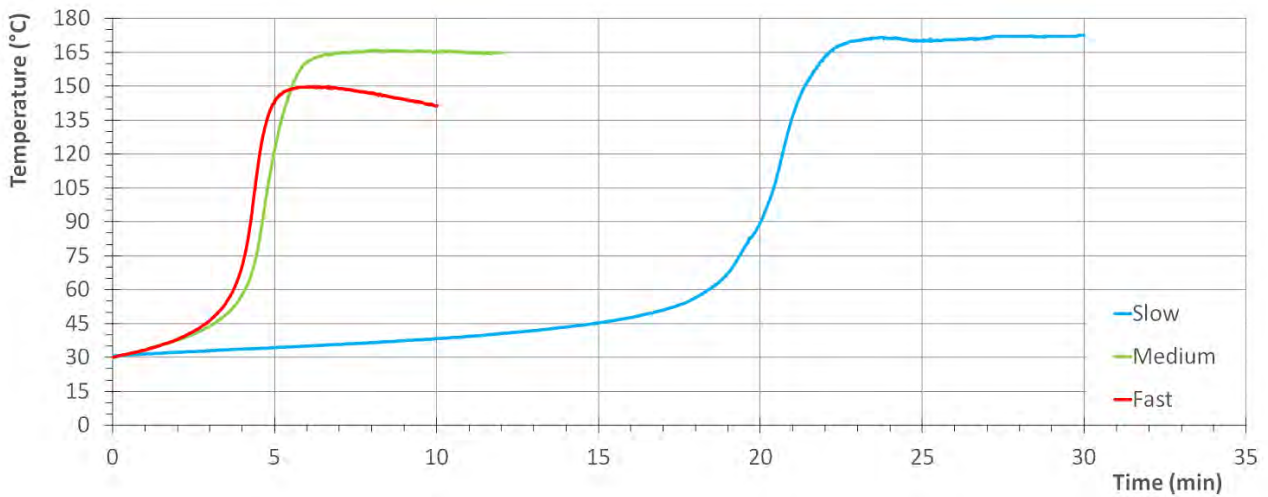
Reactivity 20 °C for 150 g SR GreenPoxy 51 UVR / SD EVO

| | SD EVO Slow | SD EVO Medium | SD EVO Fast |
|-----------------------------|-------------|---------------|-------------|
| Exothermic temperature (°C) | 161 | 161 | 154 |
| Exothermic peak time | 38 min | 12 min | 9 min |
| Time to reach 50 °C | 31 min | 7 min | 6 min |

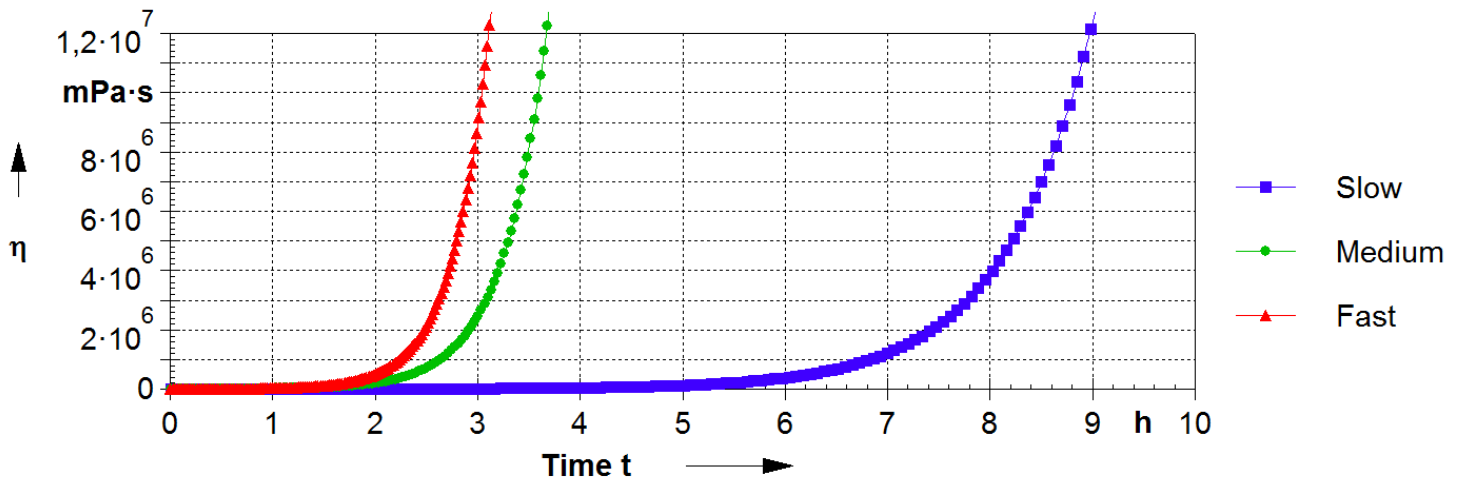


Reactivity 30 °C for 150 g SR GreenPoxy 51 UVR / SD EVO

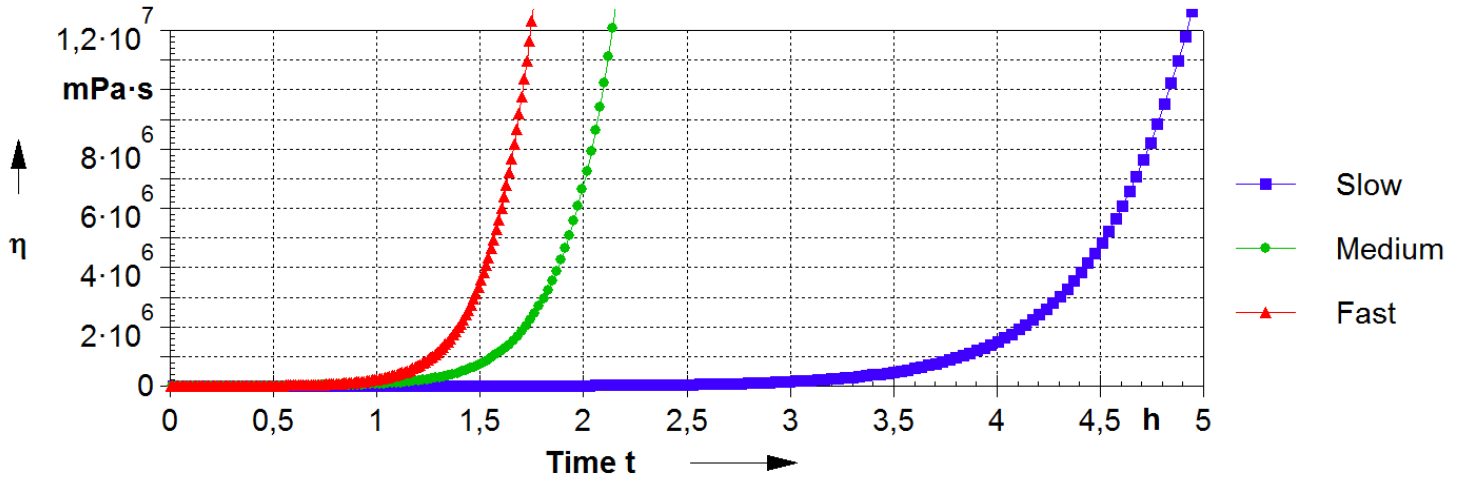
| | SD EVO Slow | SD EVO Medium | SD EVO Fast |
|-----------------------------|-------------|---------------|-------------|
| Exothermic temperature (°C) | 173 | 166 | 150 |
| Exothermic peak time | 30 min | 8 min | 6 min |
| Time to reach 50 °C | 17 min | 4 min | 3 min |



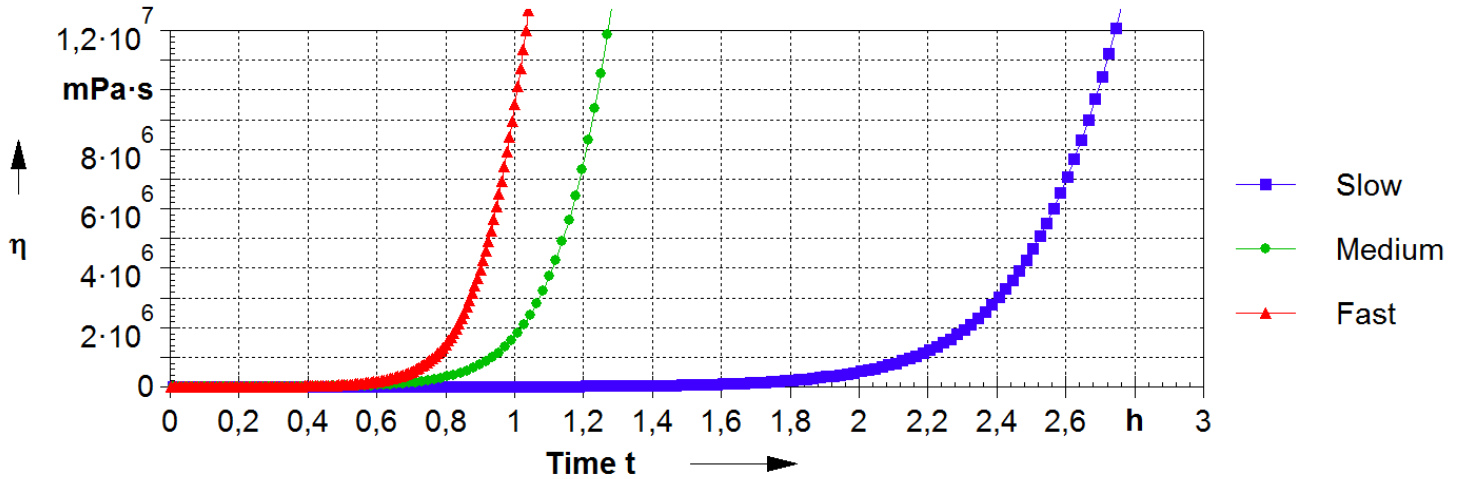
20 °C



30 °C



40 °C



Post-curing

The thermomechanical values of an epoxy system can be optimized by implementing a post-curing cycle. The Sicommin 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 un moulding.

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 GreenPoxy 51 UVR / SD EVO Slow | | | SR GreenPoxy 51 UVR / SD EVO Medium | | |
|-------------------------------|-------------------|-----------------------------------|-------------------------|------------------------|-------------------------------------|-------------------------|------------------------|
| | | 48 h Ta | 24 h Ta + 16 h 60 °C | 24 h Ta + 8 h 80 °C | 48 h Ta | 24 h Ta + 16 h 60 °C | 24 h Ta + 8 h 80 °C |
| Tensile | | | | | | | |
| Modulus | N/mm ² | | 3 710 | | 3 710 | | |
| Maximum strength | N/mm ² | | 69 | | 68 | | |
| Breaking Strength | N/mm ² | | 65 | | 56 | | |
| Elongation at max strength | % | | 3,8 | | 3,8 | | |
| Elongation at break | % | | 5,3 | | 7,9 | | |
| Flexion | | | | | | | |
| Modulus | N/mm ² | | 3 080 | | 3 070 | | |
| Maximum strength | N/mm ² | | 113 | | 113 | | |
| Breaking Strength | N/mm ² | | 107 | | 94 | | |
| Elongation at max strength | % | | 5,4 | | 5,4 | | |
| Elongation at break | % | | 6,8 | | 9,5 | | |
| Shear | | | | | | | |
| Breaking Strength | N/mm ² | | 45 | | 42 | | |
| Compression | | | | | | | |
| Modulus | N/mm ² | | | | | | |
| Yield strength | N/mm ² | | 94 | | 102 | | |
| Offset compression yield | % | | 11,7 | | 12,7 | | |
| Charpy impact strength | | | | | | | |
| Resilience | kJ/m ² | | 31 | | 45 | | |
| DSC glass transition | | | | | | | |
| Tg onset | °C | | 85 | | 78 | | |
| Tg max onset | °C | | 85 | | 80 | | |
| 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.

Mechanical properties on cast resin :

| | | SR GreenPoxy 51 UVR / SD EVO Fast | | |
|-------------------------------|-------------------|-----------------------------------|-------------------------|------------------------|
| | | 48 h Ta | 24 h Ta + 16 h 60 °C | 24 h Ta + 8 h 80 °C |
| Tensile | | | | |
| Modulus | N/mm ² | | 3 510 | |
| Maximum strength | N/mm ² | | 62 | |
| Breaking Strength | N/mm ² | | 50 | |
| Elongation at max strength | % | | 3,5 | |
| Elongation at break | % | | 9 | |
| Flexion | | | | |
| Modulus | N/mm ² | | 2 950 | |
| Maximum strength | N/mm ² | | 102 | |
| Breaking Strength | N/mm ² | | 73 | |
| Elongation at max strength | % | | 5,1 | |
| Elongation at break | % | | 11,6 | |
| Shear | | | | |
| Breaking Strength | N/mm ² | | 45 | |
| Compression | | | | |
| Modulus | N/mm ² | | | |
| Yield strength | N/mm ² | | 94 | |
| Offset compression yield | % | | 11,6 | |
| Charpy impact strength | | | | |
| Resilience | kJ/m ² | | 59 | |
| DSC glass transition | | | | |
| Tg onset | °C | | 68 | |
| Tg max onset | °C | | 73 | |
| 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: 1st scan at 20 °C/min
 T_{G1} maximum or Onset: 2nd 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% |

LEGAL NOTES:

Information given in writing or verbally, in the context of our technical assistance and our trials, does not engage our responsibility. Information is given in good faith based on SICOMIN's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with SICOMIN's recommendations. We advise users of SICOMIN products to check by some practical trials that they are suitable for the intended processes and applications. The customer's storage, the use, the implementation and the transformation of the supplied products are not under SICOMIN's control and entirely under the sole responsibility of the user.

SICOMIN reserves the right to change the properties of its products. All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data and tolerance may vary due to circumstances beyond our control.

If our responsibility should nevertheless be involved, it would be, for all the damages, limited to the value of the goods supplied by us and processed by the customer. We guaranty the non-reproachable quality of our products, in the general context of sales and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

Mix

| SR GreenPoxy 51 UVR | Resin part + Hardener part (kg) | Resin part (kg) | Hardener part (kg) |
|--------------------------------|--|------------------------|---------------------------|
| SD EVO Slow | | | |
| SD EVO Medium | | | |
| SD EVO Fast | | | |