

SR **GreenCast** 160 / SD 7160 Clear Casting Resin System



SR GreenCast 160 is an epoxy system with enhanced UV resistance, designed for production by casting of decorative objects, bottle prototypes, jewellery, river tables...

- Very low reactivity allowing high thicknesses up to 10 cm at 20 °C.
- Obtaining a high clarity polymer, colourless and with good brightness.
- Cures at room temperature

| | | SD 7160 |
|---------------------------|-----------|----------------|
| Reactivity level | | Slow |
| Initial viscosity (mPa.s) | @ 20 °C | 360 |
| | @ 30 °C | 250 |
| Pot Life (500 g) | @ 20 °C | 12 h 00 |
| | @ 30 °C | 06 h 00 |
| Mixing ratio | By weight | 100 / 42 |
| | By volume | 100 / 50 |
| Density | | 1,1307 |
| TG1 max onset | °C | 61 |
| Gel Time (on 6mm) | @ 20 °C | 26 h 00 |
| | @ 30 °C | 23 h 00 |
| Demold time (on 6mm) | @ 20 °C | 60 h 00 |
| | @ 30 °C | 48 h 00 |

SR GreenCast 160 resin is out coming from the latest innovations in bio-based chemistry. **SR GreenCast 160** resin is produced with a high content of carbon from plant origin. The bio-based Carbon content of our system is certified by an independent laboratory using Carbon 14 measurements (ASTM D6866 or XP CEN/TS 16640)

This is a significant technological advance on the following points:
Clarity, color, performance and guaranty of available industrial tonnages.

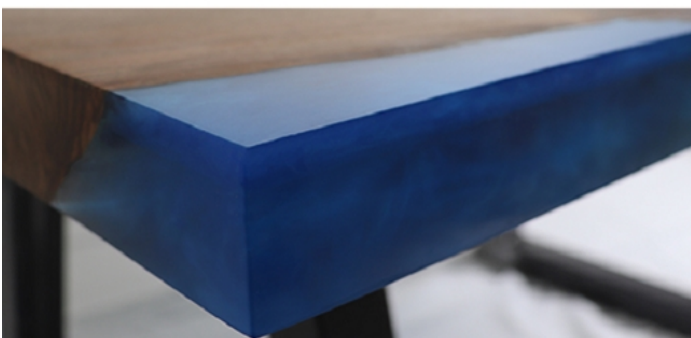
SR GreenCast 160 is an epoxy resin which has 37% of its molecular structure coming from plant origin.

This percentage is function of the carbon origin contained in the epoxy molecule.
The final rate of the mix bio-based carbon content will depend on the hardener choice.

SR GreenCast 160 is an epoxy system with enhanced UV resistance, designed for production by casting of decorative objects, bottle prototypes, jewellery, river tables...

- Very low reactivity allowing high thicknesses up to 10 cm⁽¹⁾ at 20 °C.
- Obtaining a high clarity polymer, colourless and with good brightness.
- Cures at room temperature
- Almost odourless.
- 2:1 ratio and very easy mixing.
- Excellent degassing.
- Excellent impact and thermal shock resistance.
- Good UV resistance

(1) castings made from thermally insulating materials should not exceed 5 cm in thickness at 20 ° C.



Epoxy resin SR Green Cast 160

| | | |
|-------------------|---------|------------|
| Appearance | | liquid |
| Color | | colourless |
| Gardner color | | ≤ 0 |
| Viscosity (mPa.s) | @ 15 °C | 1480 ± 300 |
| | @ 20 °C | 850 ± 170 |
| | @ 25 °C | 520 ± 105 |
| | @ 30 °C | 330 ± 70 |
| | @ 40 °C | 210 ± 42 |
| Density | @ 20 °C | 1,1700 |
| Storage (months) | @ Ta | 24 |

Hardener(s)

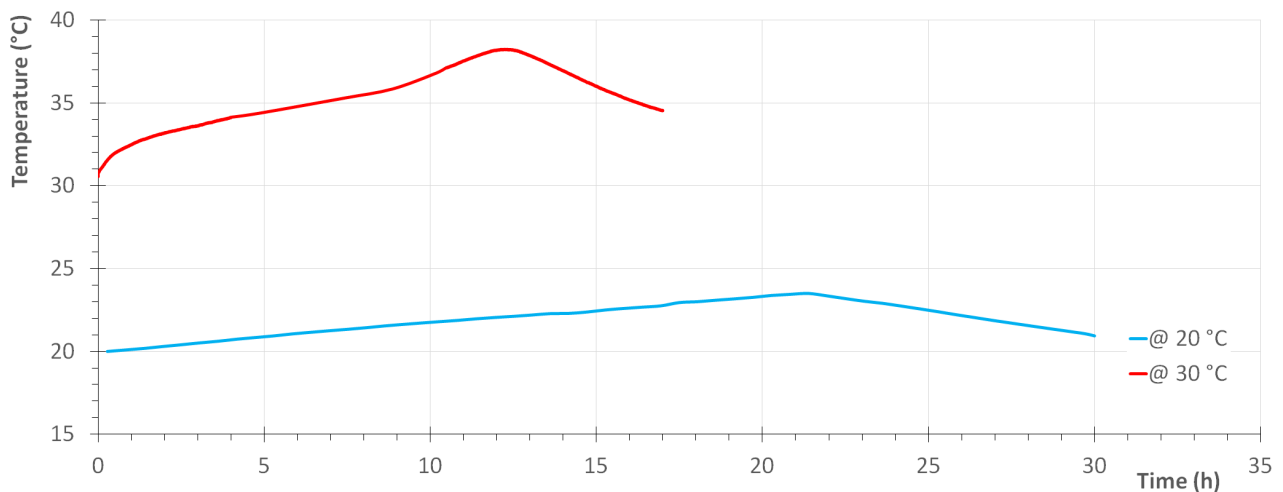
| | | SD 7160 |
|-------------------|---------|------------|
| Appearance | | liquid |
| Color | | colourless |
| Gardner color | | ≤ 1 |
| Pt/Co Color Index | | ≤ 50 |
| Reactivity level | | Slow |
| Viscosity (mPa.s) | @ 15 °C | 180 ± 30 |
| | @ 20 °C | 125 ± 20 |
| | @ 25 °C | 90 ± 15 |
| | @ 30 °C | 70 ± 10 |
| Density | @ 20 °C | 0,9700 |
| Storage (months) | @ Ta | 24 |

Mixe(s) SR GreenCast 160 / SD 7160

| | | SD 7160 |
|-------------------------------|-----------|------------|
| Appearance | | liquid |
| Color | | colourless |
| Mixing ratio | | |
| | By weight | 100 / 42 |
| | By volume | 100 / 50 |
| Density | @ 20 °C | 1,1307 |
| Initial viscosity (mPa.s) | @ 20 °C | 360 |
| PP 50 mm / 10 s ⁻¹ | @ 30 °C | 250 |

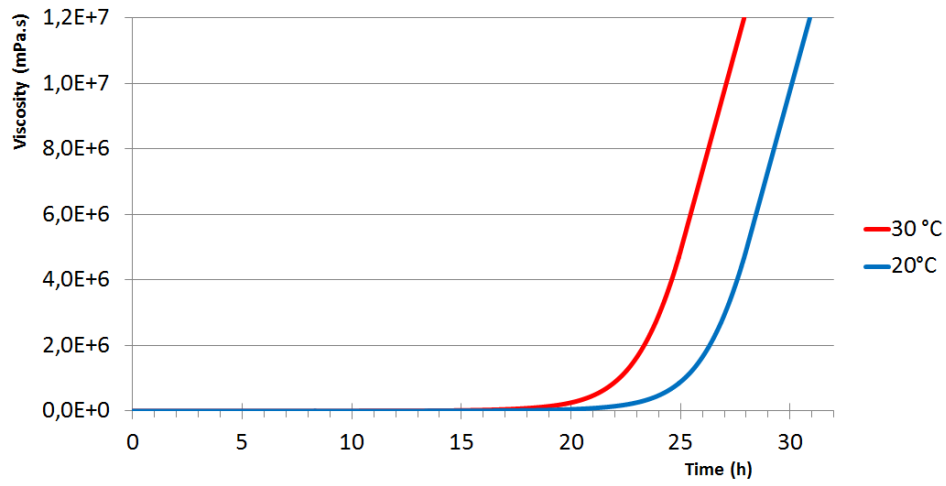
Reactivity for 500 g

| | 20 °C | 30 °C | °C |
|-----------------------------|---------|---------|----|
| Exothermic temperature (°C) | 23,5 | 38 | |
| Exothermic peak time | 21 h 30 | 12 h 00 | - |
| Time to reach 50 °C | - | - | - |



Reactivity on a 6 mm thick cast

@ 20 & 30 °C



Mechanical properties on cast resin :

| | | SR Green Cast 160 / SD 7160 | | |
|-------------------------------|-------------------|-----------------------------|-----------------------------|-----------------------------|
| Curing cycles | | 7 days @ TA | 48 h @ TA + 24 h @ 40 °C | 48 h @ TA + 16 h @ 60 °C |
| Tensile | | | | |
| Modulus | N/mm ² | 620 | 1 500 | 2 150 |
| Maximum strength | N/mm ² | 11,5 | 26 | 38 |
| Breaking Strength | N/mm ² | | | |
| Elongation at max strength | % | 5,9 | 3,3 | 3,1 |
| Elongation at break | % | 50 | 27,8 | 19 |
| Flexion | | | | |
| Modulus | N/mm ² | 780 | 1 200 | 1 940 |
| Maximum strength | N/mm ² | 20 | 32 | 59 |
| Breaking Strength | N/mm ² | | | |
| Elongation at max strength | % | 6,2 | 5,5 | 4,9 |
| Elongation at break | % | 15 | 15 | 15 |
| Shear | | | | |
| Breaking Strength | N/mm ² | 17,5 | 25 | 30 |
| Compression | | | | |
| Modulus | N/mm ² | | | |
| Yield strength | N/mm ² | 30 | 25 | 65 |
| Offset compression yield | % | 12,1 | 10,8 | 10,7 |
| Charpy impact strength | | | | |
| Resilience | kJ/m ² | 84 | 67 | 58 |
| DSC glass transition | | | | |
| TG1 onset | °C | 45 | 50 | 58 |
| TG1 max onset | °C | | | 61 |
| DTMA glass transition | | | | |
| TG tan delta | °C | | | |
| TeiG onset G' | °C | | | |
| TmG midpoint G' | °C | | | |
| TefG endpoint | °C | | | |
| TG peak G'' | °C | | | |

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: | 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% |

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