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# *SR InfuGreen* 810

## Green Epoxy systems for Injection and Infusion

The ***InfuGreen* 810** is a two-component epoxy system. It has been specially formulated for resin transfer processes, such as injection or infusion.
This system has a very low viscosity at ambient temperature.
The different hardeners allow the production of small to very large parts.
The cured system gives a temperature resistance up to 100°C (Tg onset)
The hardeners SD 4770 and 4771 are designed for very thick laminates by infusions.

***SR InfuGreen* 810** Epoxy resin is produce with about 38 % of carbon from plant origin and has a lower environmental impact than standard Epoxy systems.
The bio-based Carbon content of our resin is certified by an independent laboratory using Carbon 14 measurements (ASTM D6866 or XP CEN/TS 16640).
This percentage is function of the carbon origin contained in the epoxy molecule.

***SR InfuGreen* 810** is DNV-GL *Maritime* approved DNV·GL.

GreenPoxy®

# Epoxy resin *SR InfuGreen* 810

| | | |
|---|---|---|
| Aspect<br>Color Gardner | | Clear liquid<br>1 maximum |
| Viscosity<br>( ± 20 % mPa.s) | @ 15 °C<br>@ 20 °C<br>@ 25 °C<br>@ 30 °C<br>@ 40 °C | 2 200<br>1200<br>750<br>470<br>210 |
| Carbon Green content ( ± 3 % ) | GreenPoxy® | 38 % |
| Density<br>Pycnometer (±0.01)<br>Helium (±0.005) | @ 20 °C | <br>1.16<br>1.152 |
| Refractive index<br>(± 0.0020) | @ 25 °C | 1.5491 |
| Storage stability | | 24 Months @ ambient temperature<br><br>Can crystallize at low temperature or after a long storage.<br>If SR InfuGreen 810 develops a haziness or crystallizes during storage, warming it @ 50 to 60 °C, with stirring, will restore it to its original state |

## Hardeners SD 882x SD 477x

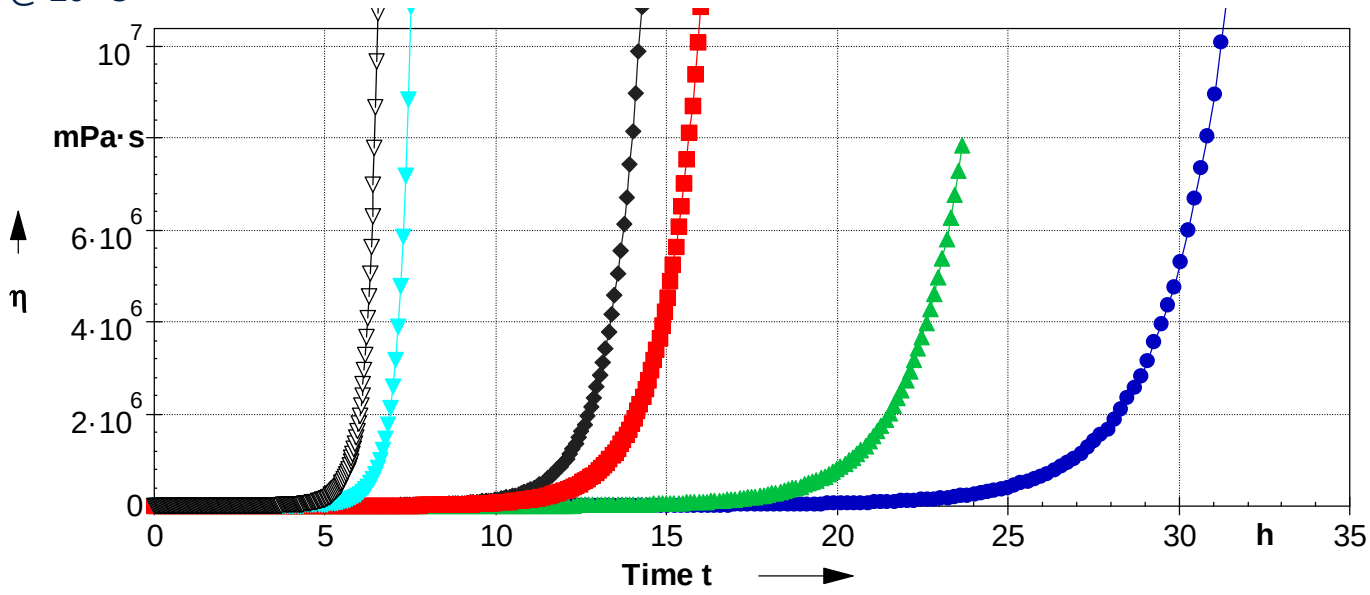
| Reference | | SD 8825.2 | SD 8824 | SD 8822 | SD 4772 | SD 4771 | SD 4770 |
|---|---|---|---|---|---|---|---|
| Reactivity type | | **Fast** | **Standard** | **Slow** | | **Ultra-slow** | **Mega slow** |
| Aspect / colour | | Light yellow liquid | | | | | |
| Color Gardner | | 3 maximum | 4 maximum | 5 maximum | 3 maximum | | |
| Viscosity (+ 20 % mPa.s) | @ 15 °C | 9 | 7 | 27 | 13 | | |
| | @ 20 °C | 7 | 6 | 20 | 11 | | |
| | @ 25 °C | 6 | 5 | 16 | 9 | | |
| | @ 30 °C | 5 | 4 | 13 | 7 | | |
| | @ 40 °C | 4 | 3 | 9 | 5 | | |
| Carbon Green content | % | none | | | | | |
| Storage stability | AT | 24 months<br>Hardeners react with carbon dioxide and moisture.<br>Keep tightly closed packaging, minimize maximum contact with the air. | | | | | |
| Density Pycnometer (±0.010) | @ 20 °C | 0.915 | 0.944 | 0.935 | 0.927 | 0.944 | 0.944 |
| Refractive index (± 0.002) | @ 25 °C | 1.4785 | 1.4982 | 1.4712 | 1.4822 | 1.4594 | 1.4604 |

## *SR InfuGreen* 810 / SD 8822 SD 477x Mixes

| References | | SD 8825.2 | SD 8824 | SD 8822 | SD 4772 | SD 4771 | SD 4770 |
|---|---|---|---|---|---|---|---|
| Mixing ratio by weight | | 100 / 22 | **100 / 22** | **100 / 31** | **100 / 29** | | |
| Mixing ratio by volume | | 100 / 28 | **100 / 27** | **100 / 39** | **100 / 36** | | |
| Initial mix viscosities | @ 20 °C | 230 | 200 | 320 | 330 | 235 | 142 |
| | @ 30 °C | 130 | 100 | 120 | 90 | 115 | 100 |
| Time to reach 300 cps “ Optimal infusion time’’ | @ 20 °C | 28’ | 44’ | / | / | 60’ | 3 h 20’ |
| | @ 30 °C | 40’ | 50’ | 67’ | 90’ | 130’ | 160’ |
| Carbon Green content maximum Calculated (+/- 3 %) | GreenPoxy® | 31 | 31 | 29 | 29 | 29 | 29 |

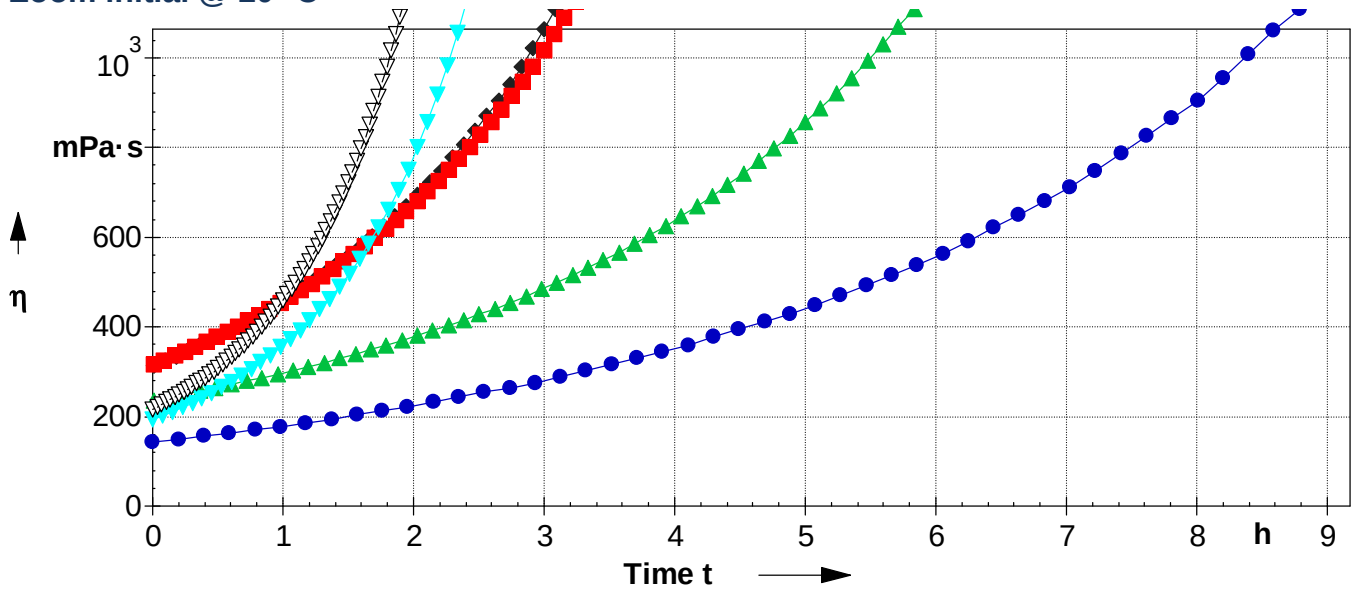
## Viscosities increase on 1 mm film thickness

### @ 20 °C



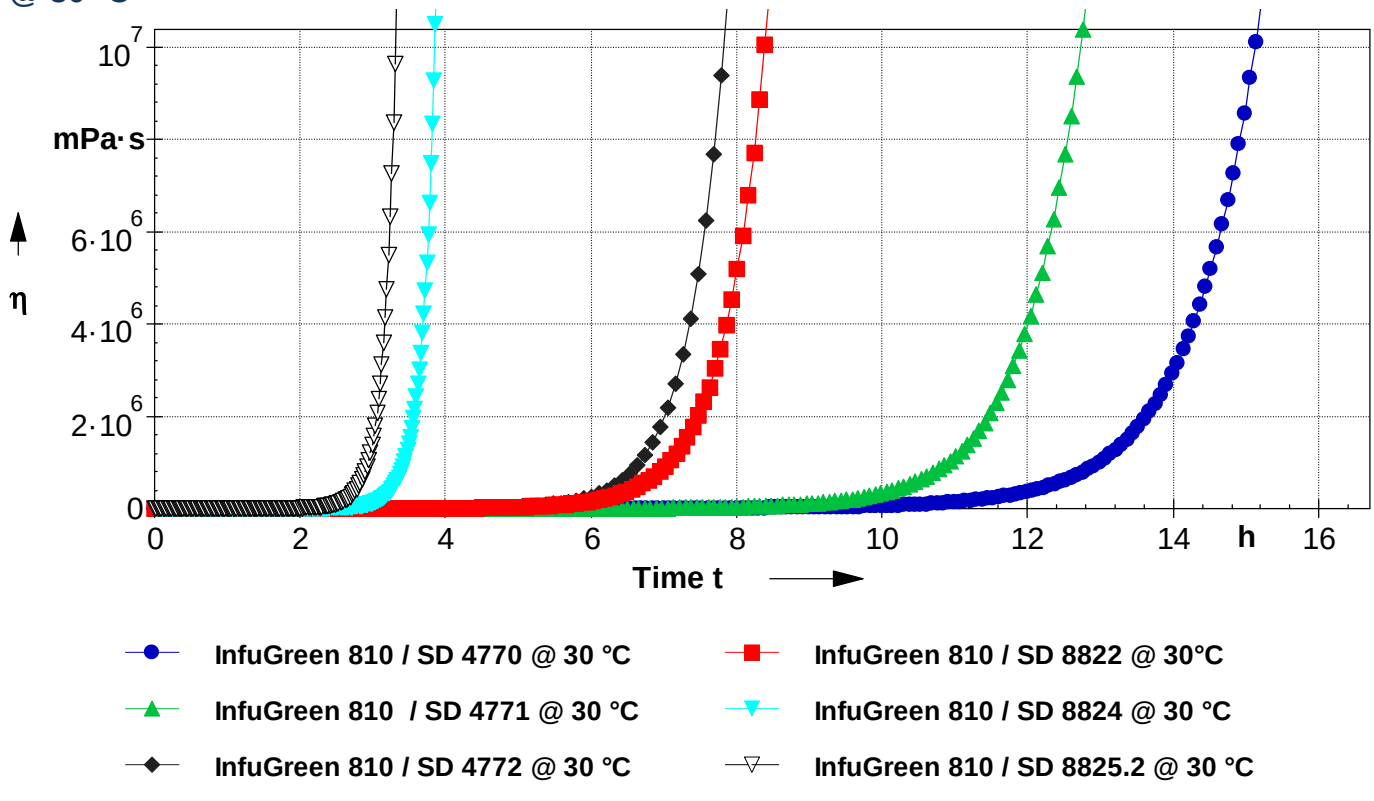

- InfuGreen 810 / SD 4770 @ 20°C
- InfuGreen 810 / SD 8822 @ 20°C
- InfuGreen 810 / SD 4771 @ 20°C
- InfuGreen 810 / SD 8824 @ 20 °C
- InfuGreen 810 / SD 4772 @ 20 °C
- InfuGreen 810 / SD 8825.2 @ 20°C

### Zoom initial @ 20 °C

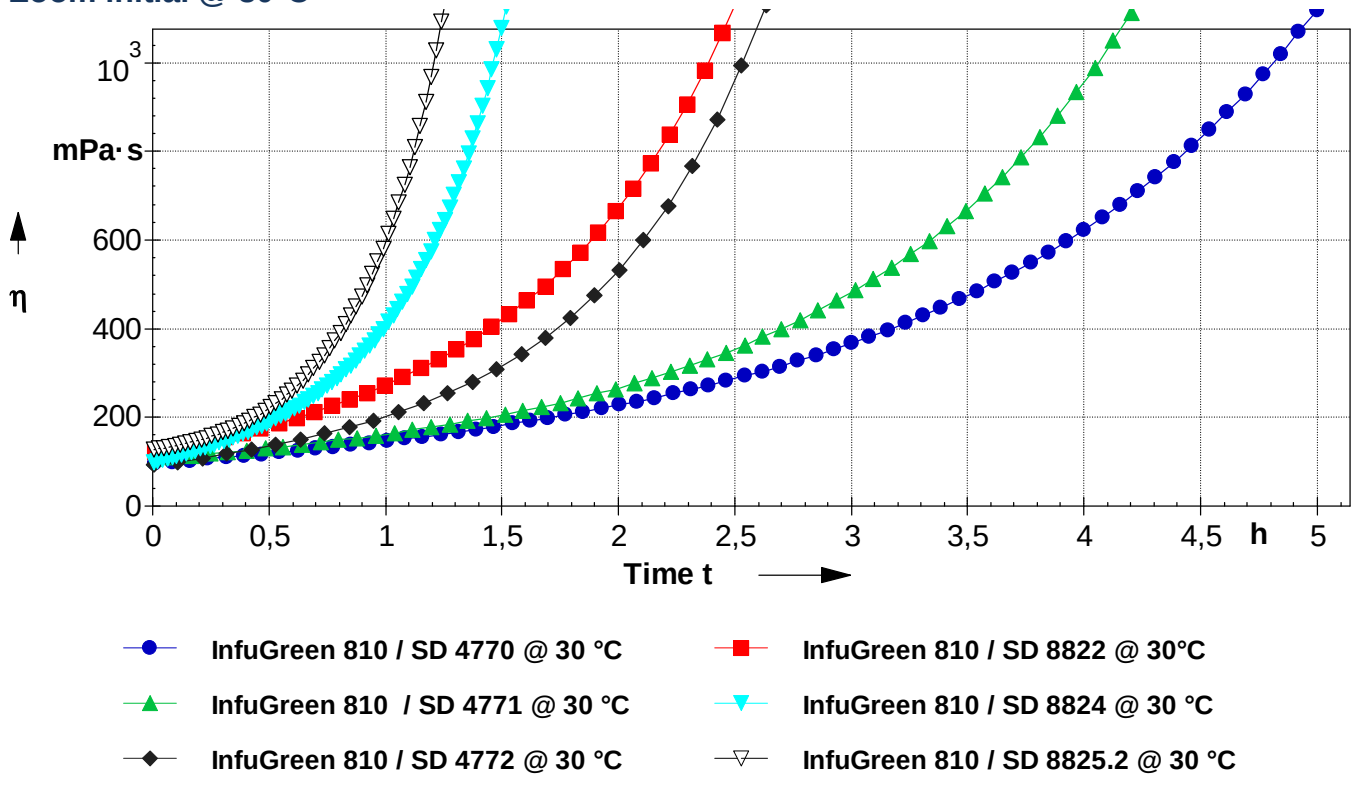



- InfuGreen 810 / SD 4770 @ 20°C
- InfuGreen 810 / SD 8822 @ 20°C
- InfuGreen 810 / SD 4771 @ 20°C
- InfuGreen 810 / SD 8824 @ 20 °C
- InfuGreen 810 / SD 4772 @ 20 °C
- InfuGreen 810 / SD 8825.2 @ 20°C

## @ 30 °C




## Zoom initial @ 30°C



## Mechanical properties on cast resin

| | | ***SR InfuGreen* 810 / SD 8825.2** | | | ***SR InfuGreen* 810 / SD 8824** | | |
|---|---|---|---|---|---|---|---|
| **Curing cycle** → | | AT + 24 hrs 40 °C | AT + 16 hrs 60 °C | AT + 8 hrs 80 °C | AT + 8 hrs 40 °C | AT + 16 hrs 60 °C | AT + 8 hrs 80 °C |
| **Tension** | | | | | | | |
| Modulus of elasticity | $N/mm^2$ | 3000 | 2700 | 2600 | 3000 | 2800 | 2600 |
| Maximum resistance | $N/mm^2$ | 69 | 68 | 67 | 68 | 65 | 60 |
| Resistance at break | $N/mm^2$ | 55 | 53 | 64 | 57 | 57 | 52 |
| Elongation at max.load | % | 3.8 | 4.8 | 5.7 | 3.6 | 4.4 | 5.0 |
| Elongation at break | % | 5.9 | 9.1 | 8.0 | 5.3 | 5.9 | 9.5 |
| **Flexion** | | | | | | | |
| Modulus of elasticity | $N/mm^2$ | 3000 | 2700 | 2600 | 3100 | 2800 | 2600 |
| Maximum resistance | $N/mm^2$ | 113 | 112 | 108 | 109 | 107 | 101 |
| Elongation at max.load | % | 4.9 | 6.1 | 6.6 | 4.6 | 5.7 | 6.0 |
| Elongation at break | % | 12.6 | 11.6 | 11.9 | 12.6 | 9.3 | 13.4 |
| **Shear strenght** | | | | | | | |
| Maximum resistance | $N/mm^2$ | 46 | 45 | 45 | 43 | 42 | 41 |
| **Compressive** | | | | | | | |
| Compressive yield strength | $N/mm^2$ | 98 | 95 | 93 | 91 | 87 | 82 |
| Offset compressive yield | % | 11.7 | 15.1 | 15.7 | 12.3 | 13.0 | 14.9 |
| **Impact Choc Charpy** | | | | | | | |
| Resilience | $KJ/m^2$ | 80 | 80 | 70 | 100 | 90 | 90 |
| **Glass Transition** | | | | | | | |
| Tg1 onset | **°C** | 72 | 91 | 96 | 69 | 83 | 82 |
| Tg1 onset maximum | **°C** | | | 94 | | | 82 |

| | | ***SR InfuGreen* 810 / SD 8822** | | | ***SR InfuGreen* 810 / SD 4770** | | |
|---|---|---|---|---|---|---|---|
| **Curing cycle** → | | AT + 24 hrs 40 °C | AT + 24 hrs 40 °C | AT + 16 hrs 60 °C | AT + 8 hrs 80 °C | AT + 16 hrs 60 °C | AT + 8 hrs 80 °C |
| **Tension** | | | | | | | |
| Modulus of elasticity | $N/mm^2$ | 3000 | 2900 | 2700 | 3160 | 3100 | 2700 |
| Maximum resistance | $N/mm^2$ | 66 | 67 | 61 | 71 | 74 | 70 |
| Resistance at break | $N/mm^2$ | 55 | 60 | 53 | 70 | 68 | 69 |
| Elongation at max.load | % | 3.5 | 4.4 | 4.9 | 3.1 | 4.2 | 5.0 |
| Elongation at break | % | 4.3 | 6.1 | 8.0 | 3.2 | 5.1 | 5.6 |
| **Flexion** | | | | | | | |
| Modulus of elasticity | $N/mm^2$ | 2900 | 2800 | 2700 | 3250 | 3000 | 2770 |
| Maximum resistance | $N/mm^2$ | 99 | 106 | 101 | 116 | 116 | 115 |
| Elongation at max.load | % | 4.4 | 5.6 | 6.0 | 4.6 | 5.4 | 6.4 |
| Elongation at break | % | 15.5 | 13.6 | 13.6 | 9.8 | 7.4 | 7.8 |
| **Shear strenght** | | | | | | | |
| Maximum resistance | $N/mm^2$ | 43 | 43 | 41 | 47 | 47 | 45 |
| **Compressive** | | | | | | | |
| Compressive yield strength | $N/mm^2$ | 91 | 91 | 84 | 104 | 100 | 95 |
| Offset compressive yield | % | 11 | 12 | 13 | 11.3 | 12.8 | 14.6 |
| **Impact Choc Charpy** | | | | | | | |
| Resilience | $KJ/m^2$ | 85 | 88 | 75 | 85 | 83 | 80 |
| **Glass Transition** | | | | | | | |
| Tg1 onset | **°C** | 63 | 74 | 85 | 69 | 84 | 97 |
| Tg1 onset maximum | **°C** | | | 84 | | | 98 |

## *Measures undertaken according to the following norms:*

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

| | |
|---|---|
| *Tension:* | *ISO 527 - 2* |
| *Flexion:* | *ISO 178* |
| *Charpy impact strength:* | *NF T 51-035* |
| *Shear Strength:* | *ASTM D 732 - 93* |
| *Compression:* | *ISO 604* |
| *Water absorption:* | *Internal. Polymerization 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 -5°C to 180 °C under nitrogen gas*
*$T_{G1}$ or Onset: 1st point at 20 °C/min* *$T_{G1}$ maximum or Onset: second passage*

*Glass transition DTMA:* *ISO 11357-1 - $T_G$ onset G'* *Temperature ramp 0 °C to 180 °C @ 2°C/min*
*ASTM D4065 - $T_G$ 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 10 $s^{-1}$* |
| *Density:* | *NF EN ISO 2811-1* | *Pycnometer* |
| *Density solid* | *NF EN ISO 845* | |
| *Gel time:* | *Cross G' G''* | *Rheometer CP50 - Shear rate 10 $s^{-1}$* |
| *Green Carbone content:* | *ASTM D6866 or XP CEN/TS 16640 Avril 2014* | |

*AT:* *Ambiant temperature*

## *LEGAL NOTES:*

*The information given in writing or verbally, in the context of our technical assistance and our trials, do not engage our responsibility. They are 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. So, we advise the users of SICOMIN products, to check by some practical trials they are suitable for the envisaged processes and applications. The customer's storage, the use, the implementation and the transformation of the supplied products, are not under our control and your responsibility only will respond for it.*

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