

SR 5550* Wood Epoxy system



The **SR 5550** is specially formulated for ambient temperature curing of marine and wood composites (laminating, bonding and protection of wood.) It has an excellent adhesion to all types of wood. It is handy, with adjustable working time, as it comes with 2 hardeners (fast and slow,) has low viscosity, and is crystallization free.

Suitable for room temperature applications, it gives a high gloss finish, with low surface pollution, and UV stability. This marine epoxy system has a low toxicity and should be preferred for laminating composite applications where post curing is not possible.

Epoxy resin SR 5550

Aspect / colour		Liquid, light yellow
Gardner color		3 maximum
Viscosity (mPa.s ±20 %):	@ 15 °C	2200
	@ 20 °C	1300
	@ 25 °C	700
	@ 30 °C	430
	@ 40 °C	190
Density	@ 20 °C	1.145
Refractive index	@ 25 °C	
Storage stability:		2 years Crystallisation free

Hardeners SD 550x

Products		SD 5506	SD 5505	SD 5504	SD 5503	SD 5502
Reactivity:		Very Fast				Very slow
Application:		Laminating & bonding		Clear coating	Laminating & bonding	Laminating, Bonding & filling
Aspect / colour		liquid, yellow				liquid, clear yellow
Gardner color maximum		5	5	5	3	3
Viscosity (mPa.s ±20%)	@ 15 °C	1780	1100	450	275	155
	@ 20 °C	1100	700	290	180	90
	@ 25 °C	650	430	190	130	65
	@ 30 °C	430	280	130	90	50
	@ 40 °C	190	130	70	50	30
Density	@ 20 °C	1.07	1.04	1.03	1.00	0.97
Refractive index	@ 25 °C	1.5630	1.5380	1.5260	1.5050	1.4900
Storage stability		Hardeners react with carbon dioxide and moisture. Need to be kept in its original closed container. Avoid to a maximum any contact with air. If the aspect becomes cloudy, do not use				

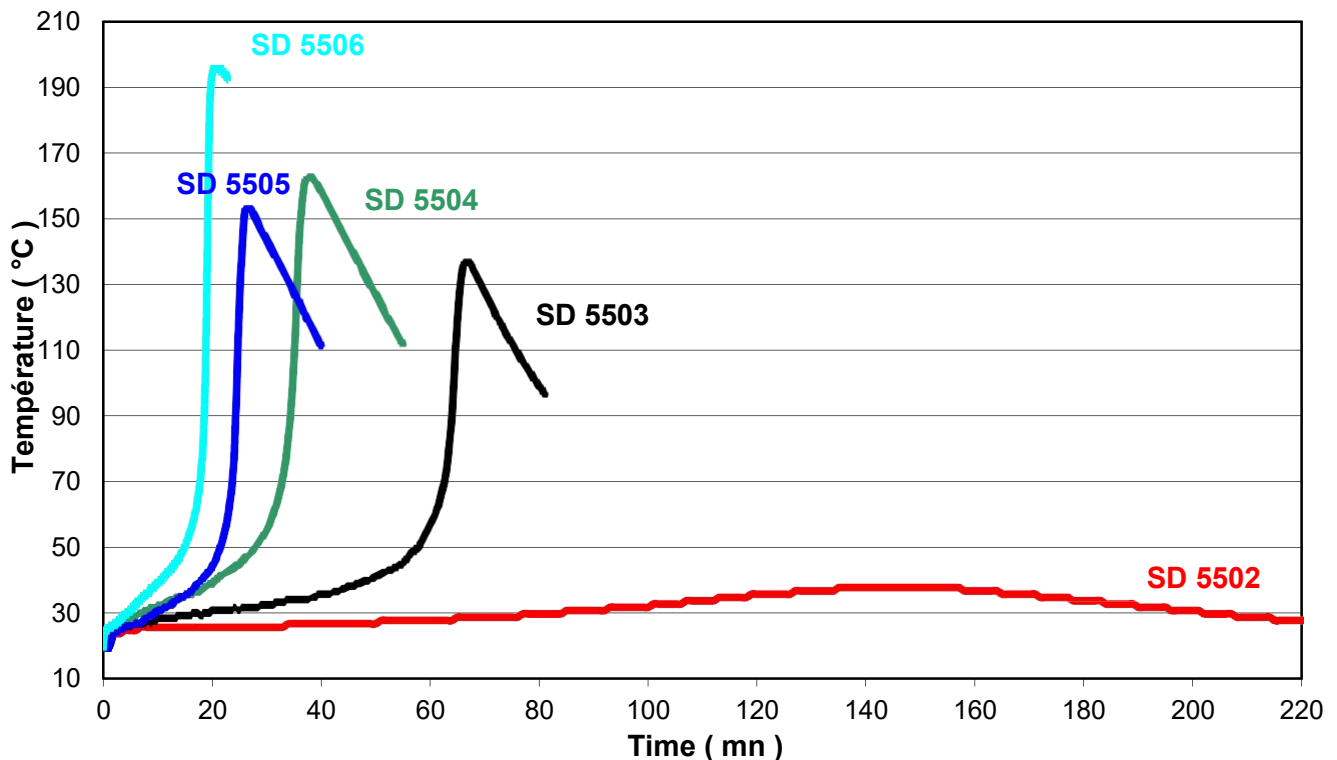
Resin / Hardeners blend

Systems		SR 5550 / SD 5506	SR 5550 / SD 5505	SR 5550 / SD 5504	SR 5550 / SD 5503	SR 5550 / SD 5502
Viscosity of the mixes (mPa.s ±20 %)	@ 20 °C	1800	1750	1600	1300	1150
	@ 30 °C	760	830	590	440	410
	@ 40 °C	180	350	240	210	160
Parts by weight		100 g / 29 g				100 g / 28 g
Parts by volume		100 ml / 33 ml or 3 / 1				

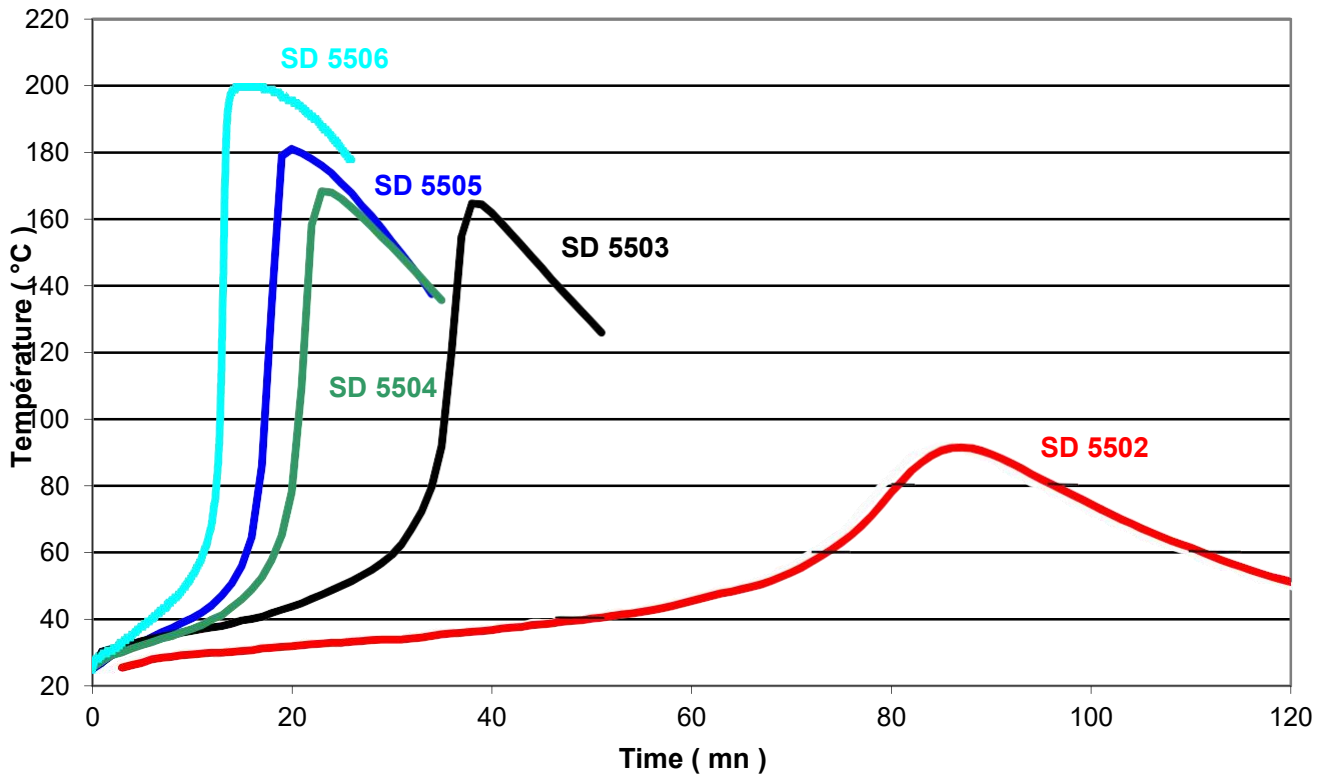
SR 5550 / SD 550x - Blend Reactivity

Systems SR 5500 / SD 550x	SR 5550 / SD 5506	SR 5550 / SD 5505	SR 5550 / SD 5504	SR 5550 / SD 5503	SR 5550 / SD 5502	
Exothermic temperature (°C) on 100 g mix	@ 25 °C	> 200	170	170	160	90
	@ 20 °C	200	160	160	140	40
Time to reach the exothermic temperature on 100 g mix	@ 25 °C	15'	26'	23'	38'	1 h 25'
	@ 20 °C	20'	35'	37'	1 h 05'	2 h 15'
Time to reach 50 °C on 100 g mix	@ 25 °C	9'	17'	26'	25'	1 h 05'
	@ 20 °C	15'	28'	28'	57'	/
Drying time, set to touch on 1 mm wet film	@ 25 °C	1 hr 10'	1 hr 35'	1 hr 50'	2 hrs 15'	3 hrs 30'
	@ 20 °C	1 hr 35'	2 hrs 15'	2 hrs 30'	3 h 30'	4 h 20'
Time before sanding	@ 25 °C	2 hrs 30'	5 hrs	6 hrs	8 hrs	12 hrs

Exotherm on 100 g mix @ 20 °C

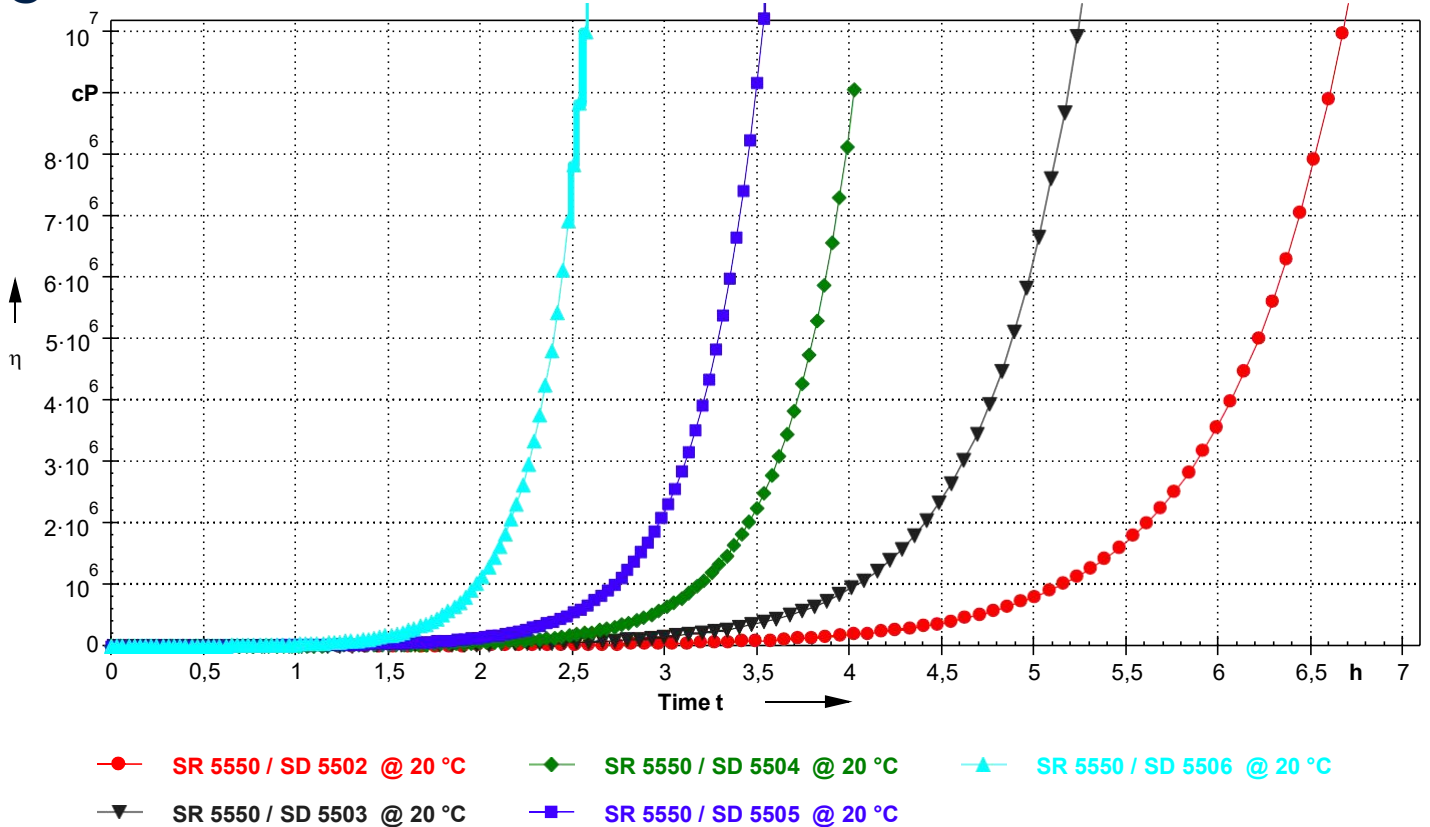


Exotherm on 100 g mix @ 25 °C

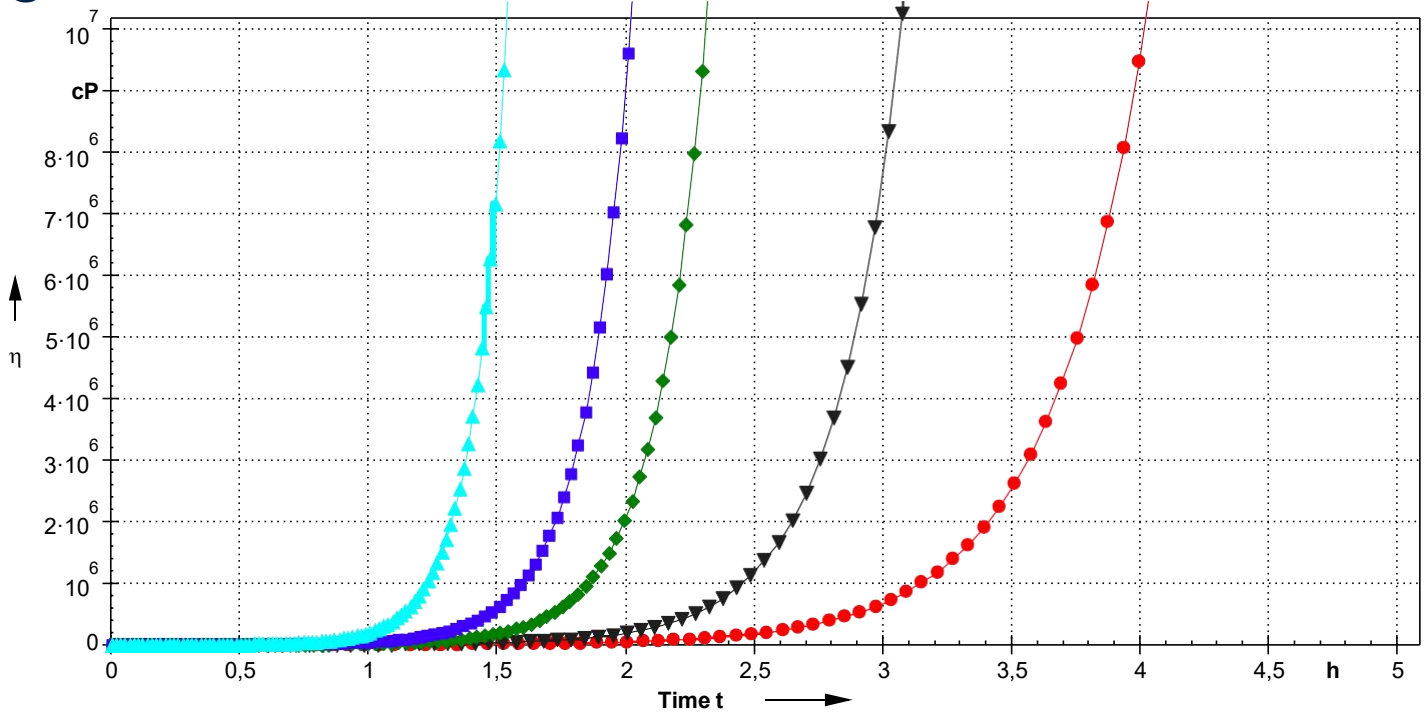


Viscosities increase on 1 mm film thickness:

@ 20 °C

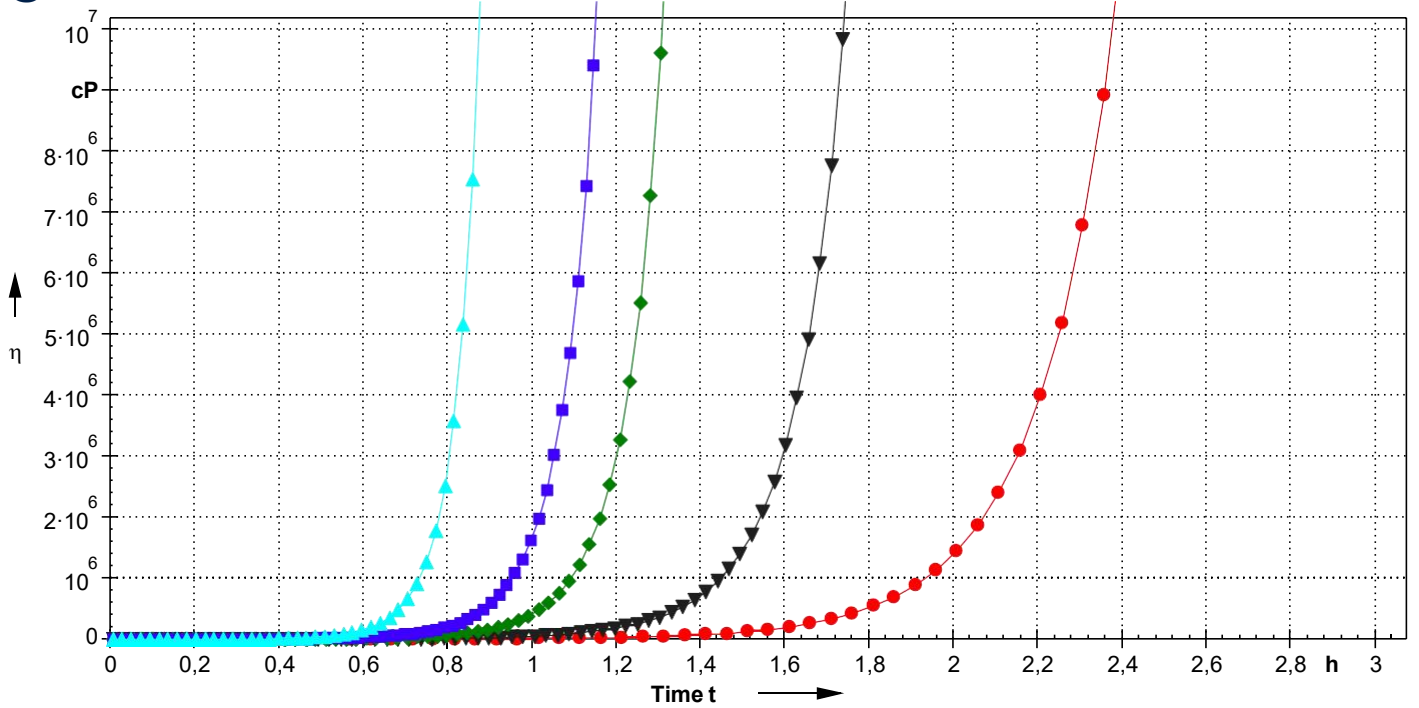


@ 30 °C



- SR 5550 / SD 5502 @ 30 °C ◆ SR 5550 / SD 5504 @ 30 °C ▲ SR 5550 / SD 5506 @ 30 °C
- ▼ SR 5550 / SD 5503 @ 30 °C ■ SR 5550 / SD 5505 @ 30 °C

@ 40 °C



- SR 5550 / SD 5502 @ 40 °C ◆ SR 5550 / SD 5504 @ 40 °C ▲ SR 5550 / SD 5506 @ 40 °C
- ▼ SR 5550 / SD 5503 @ 40 °C ■ SR 5550 / SD 5505 @ 40 °C

Mechanical properties on cast resin

		SR 5550 / SD 5505	SR 5550 / SD 5504	SR 5550 / SD 5503	SR 5550 / SD 5502
Cure		24 hrs @ room temperature + 24 hrs @ 40 °C			
Tensile		3000	2850	2810	2480
Modulus of elasticity	N/mm ²	68	64	63	60
Maximum resistance	N/mm ²	52	45	48	45
Resistance at break		3.7	3.6	3.7	4.1
Elongation at max. resistance	%	5.7	6.9	7.3	7.4
Elongation at break	%				
Flexion		3000	3070	3170	2750
Modulus of elasticity	N/mm ²	100	102	105	93
Maximum resistance	N/mm ²	4.9	4.7	4.8	5.0
Elongation at max. resistance	%	12.4	13.7	13.2	14.7
Compression					
Compressive yield strength	N/mm ²	113	112	108	102
Offset compressive yield	%	6	6	6	5.9
Tensile shear strength					
Plywood bonding	N/mm ²	4.5*		4.5*	4.5*
Charpy impact strength					
Resilience	KJ/m ²	26	40	39	30
Glass transition					
Tg onset	°C	57	57	59	60
Tg maximum	°C	63	62	64	64

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

Measures undertaken according to the following norms:

Tension: NF T 51-034

Flexion: NF T 51-001

Compression: NF T 51-101

Charpy impact strength: NF T 51-035

Glass transition DSC: ISO 11357-2: 1999 -5 °C to 180 °C under nitrogen gaz

Tg1 or Onset: 1st point at 20 °C/mn

Tg1 maximum or Onset: second passage

*Tensile shear strength

NF T 76-107 .

Bonding made with 6 mm thick plywood Lloyds agreement, 5 layers made of Sapelli.

Breaking type: in the plywood

System used: SR 5550 / SD 550x / Treecell / Silicell according to structural bonding formula

Curing cycle: 24 hours ambient temperature + 24 h @ 40 °C

Curing

SR 5550 / SD 550x epoxy system cures at ambient temperature.

Full cure after: 7 days 25 °C or 48 hrs @ 30 °C or 12 hrs @ 40 °C or 6 hrs @ 60 °C

SR 5550

Wood epoxy system application

Workshop conditions

Ventilated workshop.

Minimum ambient temperature for bonding: 15 °C

Minimum ambient temperature for coating: 18 °C

Risks taken if used at too low temperature and high relative humidity: fiber, wood not thoroughly wet-out excessive consumption of resin, slow hardening and pollution of the system.

Storage

The products will be stored sheltered from moisture at 18-25 °C. Close immediately after use, especially the hardeners which react with carbon dioxide and moisture.

The products are stable at least one year in the original container.

Mixing instructions

Quantity determination can be by weight (scale +/- 1g) or by volume (graduated container, syringes). Close the container after use to preserve the whole physico-chemical properties of the components.

Mix the two components thoroughly.

Pour into a large and open container which is dry and clean. The results obtained are directly subject to the precision and the care given to the quantity determination and mixing operations.

Tool cleaning: MEK, EP 217 or Acetone.

Surface preparation

The wood must be dry (joinery quality), sanded and dust free.

The adhesion of the epoxy resin is better onto sanded rather than planed wood.

For surfaces already treated with epoxy, sand down and dust off.

Avoid the use of greasy solvent such as white spirit.

Keep the surfaces clean before bonding or coating.

Respect the operations order:

- 1-de-grease.
- 2-sand.
- 3-remove dust.

Wood wet out

Work at decreasing temperature. For example start the laminate at midday and finish later, because when the wood is warm and dry, the air contained in it expand and get out (degassing). So if you laminate onto a warm substrate that is cooling down then the resin is sucked in by the wood.

The first coat can be diluted with **EP N° 217** diluent.

SR 5550 / SD 5505	1 volume
Diluent EP 217	0.5 to 1 maximum volume

Advice: Mix the resin and hardener first, and then wait 5 minutes @ 25 °C or 10 minutes @ 15 °C before dilution. Mix the epoxy system and diluent thoroughly for 3 minutes.

Wet out the surface, the thickness should be as thin as possible to let the solvent evaporate quickly.

Recommended tools: spatula, short-haired roller.

Wait approximately half an hour before starting the laminating or bonding operations.

Laminating

The **SR 5550** system is perfectly adapted for laminating glass fiber onto wood.

The use of peel ply fabric **PEELTEX** for the last layer limits surface defects, suppresses the sanding operation before the priming, bonding or laminating.

Adhesion between coats / overlay

Work « wet on wet »

The adhesion between the layers is optimal when they are applied before the out of dust time (depends on the hardener, the temperature and moisture). If the overlay cannot be done in this period of time, let it polymerise till the next day and sand the surface before applying the next layer.

Structural bonding

Apply with a spatula or a brush.

The bonding epoxy system can be filled with **Treecell** or **Wood Fill 250**, in order to increase its viscosity and to fill up the wood defects.

For bonds under load, maintain under pressure during:

36 hours if the ambient temperature is 15 °C

24 hours if the ambient temperature is 18-20 °C

16 hours if the ambient temperature is 25 °C.

The fillers are always added **after** mixing the resin and the hardener.

Mix 5550 / 550x		Treecell		Silicell		Wood Fill 250
1 volume	+	0.5 volume	+	0.2 to 0.5 volume		
or 1 volume					+	1 volume

spreadsheet 1- Advised proportions of fillers for the structural bonding based on **SR 5550 / SD 550x**

Radius or Fillet joint

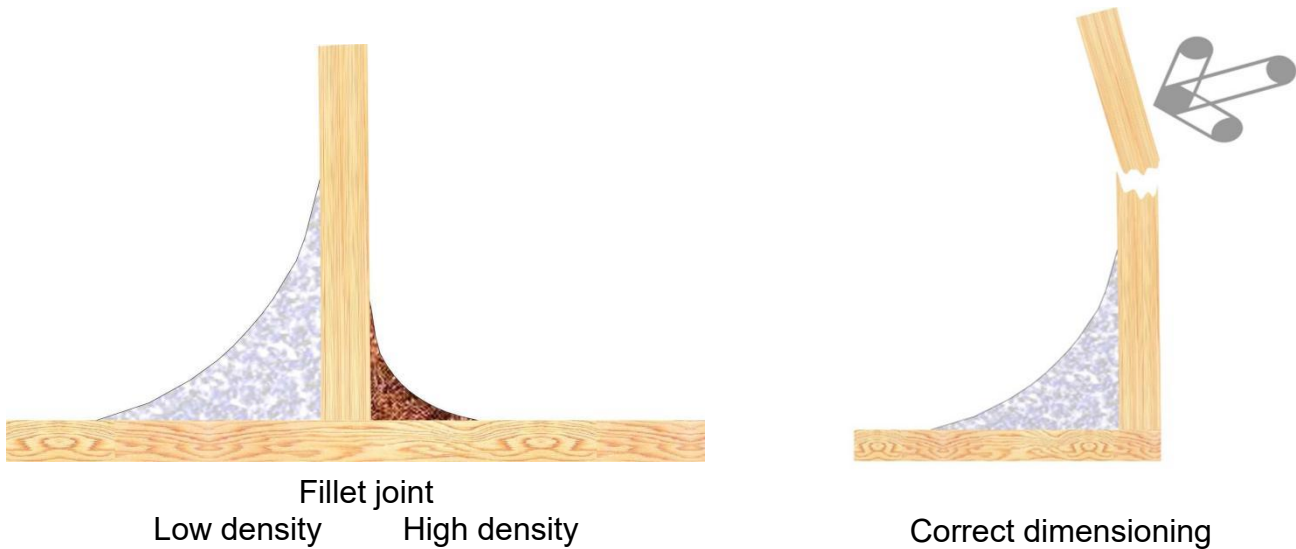
The radius or fillet joint permits the assembling of panels, it can be overlaid with a stripe of bi-axial fabric, if the loads require it.

-High density radius, fillet joint: add to the mix resin / hardener the **Wood Fill 250** or a **Treecell / Silicell** mix.

-Low density radius, fillet joint: add to the mix resin / hardener the **Wood Fill 130** or a **microbaloon / Silicell** mix.

SR 5550 /SD 550x		Treecell		Silicell		Wood Fill 250		Wood Fill 130
1 volume	+	0.5 volume	+	0.2 to 0.5 volume				
or 1 volume					+	1.5 volume		
or 1 volume							+	2 to 2.5 volumes

spreadsheet 2- Advised proportions of fillers for the structural bonding based on **SR 5550 / SD 550x**



Coating on vertical surfaces

Two thin coats of **SR 5550 / SD 550x** are better than one thick coat.

Health and safety

The epoxy resins can be used safely, by respecting certain rules and precautions.

The mix resin / hardener is corrosive and can irritate, by contact with the skin, or the eyes. Wear gloves, protective glasses and clothing.

Contact with skin: wash with soap and water, remove contaminated clothing and obtain medical attention.

Contact with eyes: immediately flush the eyes with plenty of water and continue for at least 5 minutes. obtain medical attention.

In a workshop properly ventilated and temperate, the handling of the resin does not require a breathing apparatus

However, in case of insufficient ventilation, of work in a confined environment, or for any persons having breathing problems: wear full face respirator with organic vapour cartridge A2B2 or extract the vapours.

Wear a dust-mask for sanding operations.

Do not smoke, drink or eat around the preparation and application areas using epoxy resins.

Do not wash the hands with solvent.

Read the instructions on the back of each packaging.

For more informations, consult the complete health and safety data sheet of each component.

Nature and functions of the fillers

It is essential to thoroughly mix the resin **SR 5550** with the hardeners **SD 550x** before adding the fillers.

Lightening microballoons

Whitecell: microballoons of white thermoplastic copolymer.

Very low apparent density. Very low density of the finished filler. Fine particle sizes, easy to apply (good, even consistency and flow characteristics , easy to smooth), easily sanded. Ideal for hyper light structures, radius or fillet joints under laminate, finishing filler or « stopper » before painting.

Glasscell 10: white glass microballoons.

Ultra light version of the **Glasscell 25** for filling and finishing before painting, increases the density of foam, bonding of soft wood, syntactic foam having excellent compression characteristics. Mechanical performances and chemical stability, excellent density / compression resistance ratio.

Phenolic microballoons: brown coloured phenolic microballoons.

This filler do not « fly » and is easier to mix than **Whitecell**.
Structural applications: syntactic foams, bonding, brown coloured radius or fillet joints blending with wood, finishing filler and « stopper » before painting. Easy to apply (good, even consistency and flow characteristics, easy to smooth), easily sanded.
Hygroscopic: keep the packing tightly sealed when not in use.

Glasscell 25: white glass microballoons.

Easy to mix and to apply, better abrasion resistance than phenolic microballoons. Finishing filler and « stopper » before painting, increases the density of foam, bonding of soft wood, syntactic foam having excellent compression characteristics. Mechanical performances and chemical stability, excellent density / compression resistance ratio.

Fillite: aluminium silicate microballoons

Easy to mix, good hardness and rigidity of the mouldings. Used for coarse fillers, resurfacing, sound-proofing and thermal insulation, volume filling. The best of the microballoons fillers for compression resistance, chemical stability. Economical.

Thixotropic agent

Silicell: fumed colloidal silica

Thickening and thixotropic agent (increases the holding qualities on vertical surface). Added to the epoxy systems, it increases the viscosity, the initial adherence (tack), the bonding rate and maintains fillers in suspension during cure.
Hygroscopic: keep the packing tightly sealed when not in use.

Formulated fillers ready to use

Mixfill 30: fillers for sanding mastic.

Formulated filler mainly made with microballoons for the fabrication of medium particle size paste which is easy to sand. Usually used with the **SR 1610 / SD 2613** system.

Saves time: only one filler to add, **reproducible consistency**.

Very interesting economically compared to the ready to use epoxy fillers.

Fill up **3 cm** deep defects (with a spatula or a long ruler).

The finishing paste will be made with a softer filler as the **Mixfill 10**, the **Whitecell** or the **phenolic microballoons**.

Mixfill 10: fillers for sanding mastic

Softer than **Mixfill 30**, easy to sand, fine particle size. Used before polyurethane or epoxy primers.

The dust is not sticky, doesn't clog the sandpaper.

Wood Fill 250: polyvalent and resistant filler.

Cream coloured powder blending with wood after being mixed with the resin. Used for making high density radius or fillet joints, to bond wood and increase its density.

Wood Fill 130: polyvalent and low density filler.

White filler for low density radius or fillet joints, mastic, gap or hole filling.

Fill' Tool: hard filler for tooling gel-coat.

Formulated grey filler for making tooling gel-coat on site. Increases the hardness of the surface and abrasion resistance of the epoxy systems. Its dark colour help the control the void content of laminates. Thixotropy modified by the quantity of **Fill'Tool** added.

Fill' Tool Alu: filler for aluminium filled tooling.

Formulated filler made with aluminium powder for the fabrication of tooling gel-coat on site. Used with aluminium granules casting, when thermal conduction parameter must be optimal.

Other fillers:

Treecell: pure cellulose microfibers.

White cotton texture powder. Used generally with epoxy system for the wood (**SR 5550, SR8450**) as an structural additive. Excellent thickening properties and good filling of the bonding surfaces on the wood, high density radius or fillet joints. Combined with **Silicell**, it is easier to smooth and more thixotropic

Graphite powder

Black plate shape filler. Applications: chemical resistance, friction modifier, lubricating properties, wear reduction, thermal shocks resistance, vibrations absorbing properties, electric and thermal conductivity.

Coarse aluminium powder 200-1000 microns

Permits the fabrication of large volume tooling having an excellent thermal conductivity: thermoforming under vacuum or pressure. For an equal volume and the same epoxy system, the casting made with the coarse aluminium powder will be less exothermic and more resistant in compression, than the one made with microballoons. Can be added as much as 3: 1 by weight with the mixed epoxy system for vac form tools.

In practice, the fillers are often combined together. We give the mini-maxi to add, as well as the densities that you can obtain.

Proportions of the fillers in the resin

Fillers ↓	Appearant density	weight min. – max for 100 g of R + H*	Volume min. – max for 100 ml de R + H*	Maximum density of the filled mix (g/l)
Whitecell	36	2 - 7	120 - 190	370
Glasscell 10				
Phenolic	104	7 - 35	60 - 320	500
Glasscell 25	140	5 - 25	30 - 200	600
Fillite	350	30 - 110	85 - 320	730
Mix Fill 30	310	40 - 100	130 - 320	600
Mix Fill 10	100	24-30	240-300	660
Wood Fill 250	250	20 - 80	80 - 320	1080
Wood Fill 130	130	20 - 50	150 - 380	770
Treecell	80	5 - 17	40 - 210	1150
Silicell	50	3 - 9	60 - 180	1170
Fill' tool	930	80 - 200	90 - 210	1800
Fill' tool Alu		60 - 180		1630
Graphite powder	415	20 - 70	50 - 170	1360
coarse alu powder 200-1000	1160	100 - 250	90 - 220	1720

Spreadsheet 3 - Mini-maxi rates of fillers that you can add, in a resin system having a viscosity of 800 Cps at 20 °C.

*: R+H Mélange Resin et Hardener

SICOMIN's fillers are not constituting an initiating base to the professional diseases. However , the same precautions than the ones regarding the manipulation of powder and dust, must be taken to avoid their inhalation.

The information that we give by writing or verbally, in the context of our technical assistance and our trials, do not engage our responsibility. We advice the users of SICOMIN's epoxy system, to verify by some practical trials if our products are suitable for the envisaged processes and applications. The use, the implementation and the transformation of the supplied products, are not under our control and your responsibility only will respond for it.

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 implement by you. We guaranty the non-reproachable quality of our products, in the general context of sales and delivery.