

# SE130FR

## FIRE RETARDANT LOW SMOKE PREPREG

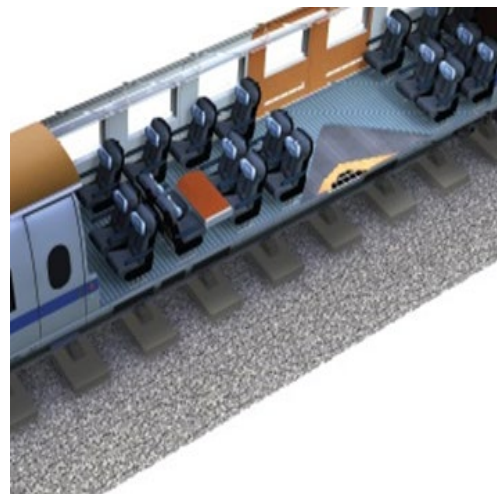
**SE130FR is a black, low temperature curing, fire retardant & smoke suppressant epoxy prepreg product.**

SE130FR can be cured at temperatures as low as 85°C / 185°F, but can also be used for faster manufacture of components through its 60 minute cure at 120°C (248°F). SE130FR provides high quality laminates from out of autoclave, vacuum only processing.

SE130FR has been tested in accordance with the stringent European fire test standard EN45545, achieving a HL2 rating in R1, R7 and R17 categories (users must fire test their unique component laminates to ensure expected fire test results are achieved)

### TYPICAL APPLICATIONS

SE130FR is ideally suited to rail / industrial / commercial marine craft and civil applications where fire retardant laminates are required.



- Tested to EN45545→HL2  
Rating in R1, R7 and R17 categories
- Curable at temperatures as low as 85°C
- Can achieve Tg of 130°C / 266°F from appropriate cure
- Suitable for honeycomb sandwich panel manufacture

## PRODUCT INFORMATION

### AVAILABILITY

SE130FR prepreg is available with various glass or carbon reinforcements including unidirectional and multiaxial in weights ranging from 100g/m<sup>2</sup> to 660g/m<sup>2</sup>.

### COMPATIBLE ADHESIVE FILMS

SA130FR adhesive film, developed for this system, is supplied with or without a supporting medium in 250g or 400g film weights.

### COMPATIBLE SURFACING FILMS

SPRINT™ SF130FR has been developed specifically for this system.

### TRANSPORT AND STORAGE

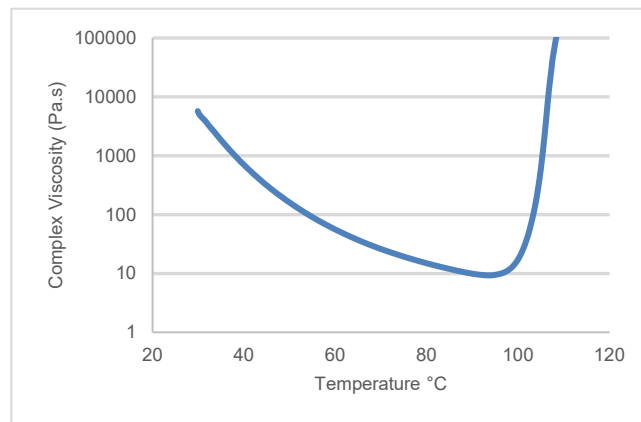
STORAGE TEMPERATURE	UNITS	VALUE
-18°C (0°F)	Months	24
+18-20°C (64-68°F)	Weeks	4

All prepreg materials should be stored in a freezer when not in use to maximise their useable life, since the low temperature reduces the reaction of resin and catalyst to virtually zero. However, even at -18°C (0°F), the temperature of most freezers, some reaction will still occur. In most cases after some years, the material will become unworkable.

## PREPREG PROPERTIES

### RHEOLOGY DATA

SE130FR resin viscosity profile conducted at 1°C (1.8°F) /minute.



PROPERTY	UNITS	VALUE
Minimum viscosity	Pa.s (P)	9.8 (98)
Temperature at minimum viscosity	°C (°F)	93 (199)

## TYPICAL CURE TIME AND TEMPERATURES

SE 130FR offers flexible curing options including vacuum bag and autoclave methods. The recommended minimum cure is 6 hours at 85°C (185°F) with a 0.3°C per minute ramp-rate.

PROPERTY	VACUUM BAG / AUTOCLAVE			TEST METHOD
Typical laminate	4 plies SE130FR/HEC300/45%			
Vacuum pressure	-1bar			
Cure pressure (Autoclave)	Up to 6 bar (85psi)			
Typical ramp rate	0.3 – 2°C/minute			
Cure temperature	85°C (185°F)	95°C (203°F)	120°C (248°F)	
Cure time	6 hrs	180 minutes	45 minutes	
Demould temperature	<60°C (140°F)			
Dry Tg (DMA)	100°C (212°F)	110°C (230°F)	120°C (248°F)	ASTM D7028

This product can be used in conjunction with typical core materials. Representative test panels should be made to ensure that the laminate construction, curing method and other variables allow filling of any cuts or slits in the foam, if required in the engineering. Additional resin film may also be required for sufficient skin-core bonding. The cure cycles given in this datasheet are for typical monolithic flat panels and may not be appropriate for sandwich panels.

## MECHANICAL PROPERTIES

Values are representative of the typical properties to be expected but do not constitute a guaranteed specification.

### CURED RESIN PROPERTIES

Resin cast oven cured, mean values.

PROPERTY	SYMBOL	UNITS	6 HOURS 85°C (185°F)		TEST METHOD
Cured resin density	$\rho_{\text{cured}}$	g/cm <sup>3</sup> (oz/in <sup>3</sup> )	1.35	(0.78)	Archimedeian principle
Tensile strength	$\sigma_T$	MPa (ksi)	44	(6.38)	ISO 527-2
Tensile modulus	$E_T$	GPa (Msi)	5.2	(0.75)	ISO 527-2
Flexural strength	$\sigma_F$	MPa (ksi)	85	(12.3)	ISO 178
Flexural modulus	$E_F$	GPa (Msi)	5.1	(0.74)	ISO 178
Compressive yield strength	$\sigma_C$	MPa (ksi)	159	(23.1)	ISO 604

### UNIDIRECTIONAL CARBON LAMINATE PROPERTIES

Cured using standard vacuum processing techniques and a minimum cure time of 6 hours at 85°C (185°F).

PROPERTY	SYMBOL	UNITS	SE130FR/HEC300/400/45%		TEST METHOD
Resin content		%	45		ASTM D3171- II
Fiber volume Fraction	$V_f$	%	46 - 50		ASTM D3171 - II
Cured ply thickness		mm (in)	0.33-0.66		ASTM D3171 - II
0° tensile strength*	$X_T$	MPa (ksi)	1988	(288)	ISO527-5
0° tensile modulus*	$E_T$	GPa (Msi)	108	(15.66)	ISO527-5
0° compressive strength*	$X_C$	MPa (ksi)	942	(137)	SACMA SRM1-94
0° compressive modulus*	$E_{C11}$	GPa (Msi)	101	(14.65)	SACMA SRM1-94
0° flexural strength	$X_F$	MPa (ksi)	1390	(202)	ISO 14125
0° flexural modulus	$E_{F11}$	GPa (Msi)	93	(13.48)	ISO 14125
90° Tensile strength*	$X_T$	MPa (ksi)	37	(5.37)	ISO527-4
90° Tensile modulus*	$E_T$	GPa (Msi)	8.5	(1.23)	ISO527-4
Glass transition temperature	$T_{g1}$	°C (°F)	106	(223)	ISO 6721 (DMA)
0° ILSS	$X_{ILSS}$	MPa ksi	65	(9.43)	ISO14130

\*Carbon Normalised to 50%  $V_f$

## STITCHED MULTIAXIAL LAMINATE PROPERTIES

Cured using standard vacuum processing techniques and a minimum cure time of 6 hours at 85°C (185°F). Values are representative of the typical properties to be expected but do not constitute a guaranteed specification.

PROPERTY	SYMBOL	UNITS		SE 130FR / XC411		TEST METHOD
Fabric description		+/-45° stitched carbon (HEC fiber)				
Nominal fabric weight		g/m²	oz/yd²	410	12.1	
Resin content		%		48		ASTM D3171 - II
Fiber volume fraction	V <sub>f</sub>	%		45 - 48		ASTM D3171 - II
Cured ply thickness	t <sub>ply</sub>	mm	in	0.49 – 0.51		ASTM D792
+45° tensile strength**	X <sub>T</sub>	MPa	ksi	1334	(193)	ISO527-4
+45° tensile modulus**	E <sub>T</sub>	GPa	Msi	61.6	(8.93)	ISO527-4
+45° compressive strength**	X <sub>C</sub>	MPa	ksi	812	(118)	SACMA SRM1-94
+45° compressive modulus**	E <sub>C11</sub>	GPa	Msi	57.7	(8.37)	SACMA SRM1-94
In plane shear strength	τ <sub>12</sub> (0.05)	MPa	ksi	67	(9.72)	ISO 14129
In plane shear modulus	G <sub>12</sub>	GPa	Msi	4.8	(0.69)	ISO 14129
0° ILSS	X <sub>ILSS</sub>	MPa	ksi	46	(6.67)	ISO14130

\*\* Carbon normalised to 50% V<sub>f</sub>

## EN45545 FIRE TESTING BURN BEHAVIOUR

Cured using standard vacuum processing and low bleed release film using a cure time of 6 hours at 85°C (185°F). Values represent the fire performance of the panel tested.

PROPERTY	UNITS	10 x SE130FR/HEC300/500/45%	TEST METHOD
Resin content	%	42	ISO 5658-2
Critical heat flux (CFE)	kW/m <sup>2</sup>	43	ISO5658-2
Maximum average rate of heat release (MARHE)	kW/m <sup>2</sup>	42	ISO5660-1
Maximum smoke value D <sub>s</sub> (Max)	-	403	ISO5659-2
Smoke value at 4 minutes D <sub>s</sub> (4.0)	-	186	ISO5659-2
Total smoke released after 4 minutes	-	275	ISO5659-2
Smoke toxicity index after 4 minutes CITG (4.0)	-	0.26	ISO5659-2

Results equate to a HL2 rating in categories R1,R7 and R17.

## HEALTH AND SAFETY

The following points must be considered:

1. Skin contact must be avoided by wearing protective gloves. Gurit recommends the use of disposable nitrile gloves for most applications. The use of barrier creams is not recommended, but to preserve skin condition a moisturizing cream should be used after washing.
2. Protective clothing should be worn when mixing, laminating or sanding. Contaminated work clothes should be thoroughly cleaned before re-use.
3. Eye protection should be worn if there is a risk of resin, hardener, solvent or dust entering the eyes. If this occurs flush the eye with water for 15 minutes, holding the eyelid open, and seek medical attention.
4. Ensure adequate ventilation in work areas. Respiratory protection should be worn if there is insufficient ventilation. Solvent vapors should not be inhaled as they can cause dizziness, headaches, loss of consciousness and can have long term health effects.
5. If the skin becomes contaminated, then the area must be immediately cleansed. The use of resin-removing cleansers is recommended. To finish, wash with soap and warm water. The use of solvents on the skin to remove resins etc must be avoided.

Washing should be part of routine practice:

- before eating or drinking
- before smoking & vaping
- before using the lavatory
- after finishing work

6. The inhalation of sanding dust should be avoided and if it settles on the skin then it should be washed off. After more extensive sanding operations a shower/bath and hair wash is advised.

Gurit produces a separate full Safety Data Sheet for all hazardous products. Please ensure that you have the correct SDS to hand for the materials you are using before commencing work.

## NOTICE

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The Company strongly recommends that Customers make test panels in the final process conditions and conduct appropriate testing of any goods or materials supplied by the Company prior to final use to ensure that they are suitable for the Customer's planned application. Such testing should include testing under conditions as close as possible to those to which the final component may be subjected. The Company specifically excludes any warranty of fitness for purpose of the goods other than as set out in writing by the Company. Due to the varied nature of end-use applications, the Company does, in particular, not warrant that the test panels in the final process conditions and/or the final component pass any fire standards.

The Company reserves the right to change specifications and prices without notice and Customers should satisfy themselves that information relied on by the Customer is that which is currently published by the Company on its website. Any queries may be addressed to the Technical Services Department.

Gurit is continuously reviewing and updating literature. Please ensure that you have the current version by contacting your sales contact and quoting the revision number in the bottom left-hand corner of this page.

## CONTACT INFORMATION

Please see local contact information at [www.gurit.com](http://www.gurit.com)

## 24-HOUR CHEMICAL EMERGENCY NUMBER

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