

SE 130FR

130°C TG FIRE RETARDANT LOW SMOKE PREPREG

- Tested to EN45545 → HL2 Rating in R1, R7 and R17 Categories
- Curable at temperatures as low as 85°C (185°F)
- Can achieve 130°C Tg using vacuum bag processing
- Suitable for honeycomb sandwich panel manufacture

INTRODUCTION

SE 130FR is a black, low temperature curing, fire retardant & smoke suppressant epoxy prepreg product.

SE 130FR can be cured at temperatures as low as 85°C / 185°F, but can also be used for faster manufacture of components through its 45 minute cure at 120°C / 248°F . SE 130FR provides high quality laminates from out of autoclave, vacuum only processing.

SE 130FR 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

SE 130FR is ideally suited to rail / industrial / commercial marine craft and civil applications where fire retardant laminates are required.



PRODUCT INFORMATION

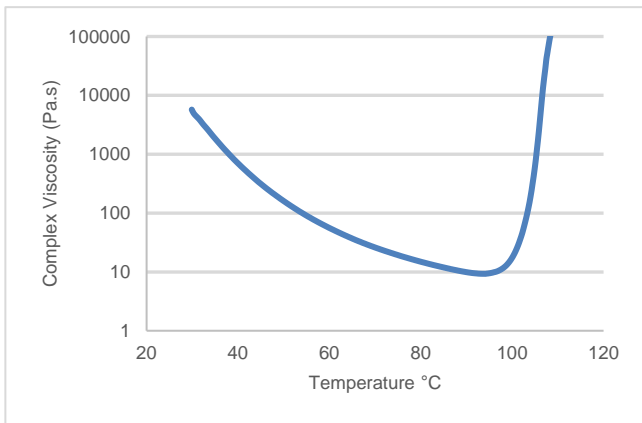
SE 130FR epoxy prepreg is available in a range of product formats. Please consult your local sales contact for further information. Full contact details can be found at www.gurit.com.

PREPREG PROPERTIES

RHEOLOGY DATA

SE 130FR resin viscosity profile conducted at 1°C (1.8°F) / minute.

PROPERTY	VALUE	
Minimum Viscosity	9.8 Pa.s	98 Poise
Temperature at Minimum Viscosity	93°C	199 °F



MINIMUM CURE TIME & TEMPERATURE

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 STANDARD
Typical Laminate	4 plies of SE 130FR 300g unidirectional carbon prepreg with 45% resin content			-
Typical Ramp Rate	0.3°C - 2°C per minute			-
Cure Temperature	85°C / 185°F	95°C / 203°F	120°C / 248°F	-
Cure Dwell Time	6 hours	180 min	45 min	-
Cure Pressure	Up to +6bar (85Psi)			-
Cure Vacuum	-1bar (14.5Psi)			-
De-mould Temperature	< 80°C (176°F)			-
Dry T _g (DMA)	c. 100°C / 221°F	c. 110°C / 230°F	c. 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.

TRANSPORT & STORAGE

When stored sealed & out of direct sunlight.

STORAGE TEMP		UNIT	VALUE
-18°C	0°F	months	18
+21°C	+70°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.

HEALTH AND SAFETY

Please refer to product SDS for up to date information specific to this product.

CURED RESIN PROPERTIES

Oven cured for 6 hours at 85°C (185°F) with a 1°C per minute ramp-rate.

PROPERTY	SYMBOL	UNIT	SE 130FR	TEST STANDARD
Resin Density	ρ_{ply}	g/cm ³	1.35	Archimedes
Tensile Strength	σ_T	MPa	44	ISO 527-2
Tensile Modulus	E_T	GPa	5.2	ISO 527-2
Flexural Strength	σ_F	MPa	85	ISO 178
Flexural Modulus	E_F	GPa	5.1	ISO 178
Compressive Strength	σ_C	MPa	159	ISO 178

UNIDIRECTIONAL LAMINATE PROPERTIES

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

PROPERTY	SYMBOL	UNIT	SE 130FR/HEC/300/400/45%	TEST STANDARD
Resin Content	-	%	45	-
Fibre Volume Fraction	v_t	%	46-50	
Cure Method	-	-	Vacuum bag cured at -1 bar	-
Cure Schedule	-	-	6 hours at 85°C (185°F)	-
Cured Ply Density	ρ_{ply}	-	-	Archimedes
Glass Transition Temperature	T_{g1}	°C	106	ISO 6721 (DMA)
Cured Ply Thickness	t_{ply}	mm	0.33-0.36	ASTM D 3171 Method II
0° Tensile Strength*	X_T	MPa	1988	ISO 527-4
0° Tensile Modulus*	E_{T11}	GPa	108	ISO 527-4
0° Compressive Strength*	X_C	MPa	942	SACMA SRM1-94
0° Compressive Modulus*	E_{C11}	GPa	101	SACMA SRM1-94
0° Flexural Strength	X_F	MPa	1390	ISO 14125
0° Flexural Modulus	E_{F11}	GPa	93	ISO 14125
90° Tensile Strength	X_T	MPa	37	ISO 527-4
90° Tensile Modulus	E_{T11}	GPa	8.5	ISO 527-4
0° ILSS	X_{ILSS}	MPa	65	ISO 14130

*Normalised to 50% FVF

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	UNIT	SE 130FR/XC411	TEST STANDARD
Fabric Description	-	-	+45/-45 Stitched Biaxial HEC	-
Nominal Fabric Weight	-	g/m ²	410	-
Resin Content	-	%	48	ASTM D 3171-II
Fibre Volume Fraction	vt	%	45-48	ASTM D 3171-II
Cured Ply Thickness	tply	mm	0.49-0.51	ASTM D 3171-II
0° Tensile Strength*	XT	MPa	1334	ISO 527-4
0° Tensile Modulus*	ET	GPa	61.6	ISO 527-4
0° Compressive Strength*	XC	MPa	812	SACMA SRM1-94
0° Compressive Modulus*	EC	GPa	57.7	SACMA SRM1-94
+45 In-Plane Shear Strength	τ12 (0.05)	MPa	67	ISO 14129
+45 In-Plane Shear Modulus	G12	GPa	4.8	ISO 14129
0° ILSS	XILSS	MPa	46	ISO 14130

* Carbon Normalised to 50% fibre volume fraction

EN45545 FIRE TESTING BURN BEHAVIOUR

PROPERTY	Units	10 x SE 130FR/HEC/300/500/45%	TEST STANDARD
Critical Heat Flux (CFE)	kW/m ²	43	ISO5658-2
Maximum Average Rate of Heat Release (MARHE)	kW/m ²	42	ISO5660-1
Maximum Smoke Value D _s (Max)	Dimensionless	403	ISO5659-2
Smoke Value at 4 minutes D _s (4.0)	Dimensionless	186	ISO5659-2
Total Smoke Release after 4 minutes (VOF ₄)	Dimensionless	275	ISO5659-2
Smoke Toxicity Index after 4 minutes CITG(4.0)	Dimensionless	0.26	ISO5659-2

Results equate to a HL2 Rating in R1,R7 and R17

NOTICE

All advice, instruction or recommendation is given in good faith but the selling Gurit entity (the Company) only warrants that advice in writing is given with reasonable skill and care. No further duty or responsibility is accepted by the Company. All advice is given subject to the terms and conditions of sale (the Conditions) which are available on request from the Company or may be viewed at Gurit's Website: www.gurit.com/terms-and-conditions.aspx

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.

TECHNICAL CONTACT INFORMATION

For all other enquiries such as technical queries:

Telephone + 44 1983 828000 (08:30 – 17:00 GMT)
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24-HOUR CHEMICAL EMERGENCY NUMBER

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