

ST 130FR

130°C TG FIRE RETARDANT LOW SMOKE SPRINT™

- 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
- Excellent tack and drape allowing easy in-mould repositioning
- SPRINT™ enables high quality thick cored laminate production in one operation

INTRODUCTION

ST 130FR is a black, low temperature curing, fire retardant & smoke suppressant epoxy SPRINT™ product.

The SPRINT™ format makes this product ideal for the manufacture components requiring a high level of fire protection. It 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 . ST 130FR provides high quality laminates from out of autoclave, vacuum only processing.

ST 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

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



PRODUCT INFORMATION

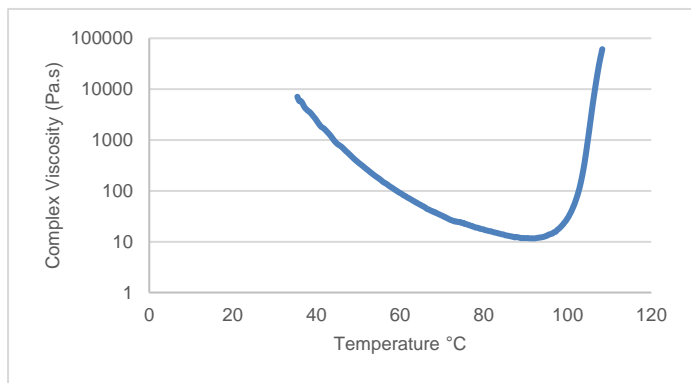
ST 130FR epoxy SPRINT™ is available in a range of product formats. Data from the following formats is presented in this datasheet. Please consult your local sales contact for further information. Full contact details can be found at www.gurit.com.

PREPREG PROPERTIES

RHEOLOGY DATA

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

PROPERTY	VALUE	
Minimum Viscosity	11.6 Pa.s	116 Poise
Temperature at Minimum Viscosity	92°C	198°F



MINIMUM CURE TIME & TEMPERATURE

ST 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
Autoclave Pressure	Up to +6bar (85Psi)		-
Vacuum Pressure	-1bar (14.5Psi)		-
Typical Ramp Rate	0.3°C - 2°C per minute		-
Cure Temperature	85°C / 185°F	120°C / 248°F	-
Cure Dwell Time	6 hours	1 hour	-
De-mould Temperature	< 80°C (176°F)		-
Glass Transition Temperature	c. 100°C / 212°F	c. 130°C / 266°F	ISO 6721

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	24
+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	ST 130FR	TEST STANDARD
Resin Density	ρ_{ply}	g/cm ³	1.37	ISO1183-1A
Tensile Strength	σ_T	MPa	45	ISO 527-2
Tensile Modulus	E_T	GPa	5.2	ISO 527-2
Flexural Strength	σ_F	MPa	77	ISO 178
Flexural Modulus	E_F	GPa	5.3	ISO 178
Compressive Strength	σ_C	MPa	185	ISO 178
Glass Transition Temperature	T_{g1}	°C	c. 100°C / 212°F	ISO 6721

WOVEN FABRIC 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	ST 130FR/WRE 581T	ST 130FR/RC416T	TEST STANDARD
Fabric Description	-	-	0/90 Twill Woven E Glass	0/90 Twill Woven HEC	-
Nominal Fabric Weight	-	g/m ²	581	416	-
Resin Content	-	%	42	48	ASTM D 3171-II
Fibre Volume Fraction	v_t	%	42-46	46-48	ASTM D 3171-II
Cured Ply Thickness	t_{ply}	mm	0.49-0.55	0.49-0.50	ASTM D 3171-II
0° Tensile Strength*	X_T	MPa	447	749	ISO 527-4
0° Tensile Modulus*	E_{T11}	GPa	27.5	53.9	ISO 527-4
0° Compressive Strength*	X_C	MPa	553	589	SACMA SRM1-94
0° Compressive Modulus*	E_{C11}	GPa	28.3	56.3	SACMA SRM1-94
±45° In-Plane Shear Strength	$\tau_{12 (0.05)}$	MPa	TBA	69	ISO 14129
±45° In-Plane Shear Modulus	G_{12}	GPa	TBA	4.6	ISO 14129
0° ILSS	X_{ILSS}	MPa	45	48	ISO 14130

* Glass Normalised to 45% fibre volume fraction, Carbon 50% fibre volume fraction

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	ST 130FR/XE603	ST 130FR/XC411	TEST STANDARD
Fabric Description	-	-	+45/-45 Stitched Biaxial E-Glass	+45/-45 Stitched Biaxial HEC	-
Nominal Fabric Weight	-	g/m ²	600	410	-
Resin Content	-	%	42	48	ASTM D 3171-II
Fibre Volume Fraction	v_t	%	42-45	47-49	ASTM D 3171-II
Cured Ply Thickness	t_{ply}	mm	0.52-0.55	0.47-0.48	ASTM D 3171-II
0° Tensile Strength*	X_T	MPa	452	924	ISO 527-4
0° Tensile Modulus*	E_T	GPa	26.1	64.7	ISO 527-4
0° Compressive Strength*	X_C	MPa	552	605	SACMA SRM1-94
0° Compressive Modulus*	E_C	GPa	27.9	54.2	SACMA SRM1-94
In-Plane Shear Strength	$\tau_{12 (0.05)}$	MPa	62	63	ISO 14129
In-Plane Shear Modulus	G_{12}	GPa	4.3	4.4	ISO 14129
0° ILSS	X_{ILSS}	MPa	40	42	ISO 14130

* Glass Normalised to 45%, Carbon to 50% fibre volume fraction

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	4x ST130FR/WRE581T/1250/42%/S/S	4x ST130FR/RC416T/1270/48%/S/S	TEST STANDARD
Critical Heat Flux (CFE)	kW/m ²	43	32	ISO5658-2
Maximum Average Rate of Heat Release (MARHE)	kW/m ²	36	60	ISO5660-1
Maximum Smoke Value D _s (Max)	Dimensionless	304	275	ISO5659-2
Smoke Value at 4 minutes D _s (4.0)	Dimensionless	163	179	ISO5659-2
Total Smoke Release after 4 minutes (VOF ₄)	Dimensionless	302	302	ISO5659-2
Smoke Toxicity Index after 4 minutes CITG(4.0)	Dimensionless	0.22	0.17	ISO5659-2

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

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)
Email technical.support@gurit.com

24-HOUR CHEMICAL EMERGENCY NUMBER

For advice on chemical emergencies, spillages, fires or exposures:

Europe +44 1273 289451
Americas +1 646 844 7309
APAC +65 3158 1412

E customer.support@gurit.com

W www.gurit.com