SF 130FR

FIRE RETARDANT LOW SMOKE SURFACE FILM

- Provides an effective fire retardant surface layer
- Compatible with Epoxy and certain Phenolic prepregs
- Curable at temperatures as low as 85°C (185°F)
- Improves de-moulded surface finish
- Can achieve 130°C (266°F) Tg using vacuum bag processing
- Excellent drape allowing easy in-mould processing

INTRODUCTION

SF130FR is a black tinted, low temperature curing fire retardant and smoke suppressant epoxy resin surfacing film.

SF130FR 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. SF130FR provides an effective fire retardant layer to be used in conjunction with SE130FR Prepreg / ST130FR SPRINT™ to improve the surface finish direct from out of autoclave, vacuum only processing.

The resin matrix has been tested in accordance with the stringent European fire test standard, EN45545, achieving HL2 ratings in requirement groupings R1 and R7 categories (users must fire test their unique component laminates to ensure expected fire test results are achieved).

TYPICAL APPLICATIONS

SF130FR is ideally suited to rail / industrial / commercial marine craft and civil applications where additional resin is required for producing an exceptional surface finish in conjunction with other products in the range.

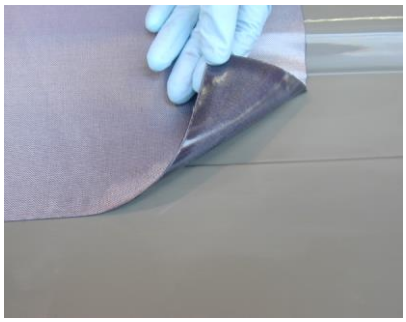
NSTRUCTIONS FOR USE

F130FR recommended vacuum bag processing guidelines are as follows:

. Ensure SF130FR surfacing material has attained ambient temperature (circa 18-23°C) before it is removed from its packaging to avoid condensation of water on the surface film whilst defrosting.

. Apply a single layer of SF130FR surfacing material to a suitably release treated mould surface. When applying directly to a mould, release agents suitable for epoxy resins should be used and tests should be performed by the user to ensure that satisfactory release is obtained.

. The product is designed to be applied with the resin-rich side against the tool face, this orientation is critical to the final properties of the cured part.



The material can be placed into the mould in any size/shape however it is important to keep overlaps to an absolute minimum, butt joins are ideal.

. Once the mould surface has been covered and before the backing laminate has been added, air paths need to be introduced around the circumference of the part. This is usually achieved by placing glass tows at a 0.5m interval around the perimeter of the part in contact with finer weave surface scrim through to the vacuum stack. Alternatively ensure that the surfacing film extends beyond the margin of the structural laminate such that the vacuum consumable stack can draw air directly from the perimeter of the surfacing film.

. Apply SPRINT™ or prepreg layers behind the surface film (NOTE: significant improvements in surface stability due to voiding and component quality are obtained if SPRINT™ layers are used behind the surfacing film rather than prepreg).

. Apply release film and breather suitable for the reinforcing laminate over the laminate stack. Cut and fit as necessary. Overlaps are acceptable. Consult SPRINT™ or prepreg datasheet for optimum bagging procedure.

. Apply vacuum bag with minimum 95% vacuum.

. Ramp to the final cure temperature required by the resin system and hold for the correct period. Temperature ramp rates should be between 0.3°C and 2°C per minute. Contact Gurit Technical Support for further information.

. Allow to cool to ambient temperature before removing consumables and de-moulding.

0. SF130FR can also be press moulded.

PRODUCT INFORMATION

F130FR is available with twin glass scrims to provide stability and breathability. It is supplied on a single silicon paper. Please contact echnical Support to discuss specific requirements and Customer Support for availability.

PROPERTY	UNIT	SF130FR
Tack	-	Medium
Colour	-	Grey-black
Surface Film Weight	g/m^2	200
Glass Carrier Weight	g/m^2	140
Total Film Weight	g/m^2	340

PREPREG PROPERTIES

RHEOLOGY DATA

SF130FR resin viscosity profile conducted at 1°C (1.8°F)/ minute.

PROPERTY	VALUE	
Minimum Viscosity	TBA	TBA
Temperature at Minimum Viscosity	TBA	TBA

TRANSPORT & STORAGE

When stored sealed & out of direct sunlight.

STORAGE TEMP		UNIT	VALUE
-18°C	0°F	months	12
+18-22°C	64-72°F	days	5

All SPRINT™ 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.

To avoid condensation on the rolls allow it to reach room temperature before unwrapping.

HEALTH AND SAFETY

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

MINIMIUM CURE TIME & TEMPERATURE

SF130FR offers flexible curing options. The recommended minimum cure is 6 hours at 85°C (185°F) with a minimum 0.3°C (0.5°F) 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 / 0.5°F per minute		-
Cure Temperature	85°C / 185°F	120°C / 248°F	-
Cure Dwell Time	6 hours	1 hour	-
De-mould Temperature	< 80^0C (176°F)		-
Glass Transition Temperature	> 100°C / 212°F	> 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 cull filling of any cuts or slits in the foam if required in the engineering. The cure cycles given in this datasheet are for typical monolithic flat panels and may not be appropriate for sandwich panels.

CURED RESIN PROPERTIES

Using vacuum pressure / oven only cure with standard processing techniques and using the 85°C cure schedule as defined above.

PROPERTY	SYMBOL	SF130FR		TEST STANDARD
Resin Density	ρ_{ply}	1.25 g/cm^3	0.045 lb/in^3	Archimedes
Tensile Strength	σ_T	44 MPa	6.4 ksi	ISO 527-2
Tensile Modulus	E_T	4.0 GPa	0.58 Msi	ISO 527-2
Flexural Strength	σ_F	80 MPa	11.6 Ksi	ISO 178
Flexural Modulus	E_F	3.9 GPa	0.57 Msi	ISO 178
Compressive Strength	σ_C	170 MPa	25 Ksi	ISO 178

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	4 x ST130FR/WRE581T/1250/42%/S/S + SF130FR/S2/200G/1255	TEST STANDARD
Critical Heat Flux (CFE)	kW/m^2	33.1	ISO5658-2
Maximum Average Rate of Heat Release (MARHE)	kW/m^2	47.8	ISO5660-1
Maximum Smoke Value D_S (Max)	Dimensionless	356	ISO5659-2
Smoke Value at 4 minutes $D_s(4.0)$	Dimensionless	291	ISO5659-2
Total Smoke Release after 4 minutes (VOF_4)	Dimensionless	550	ISO5659-2
Smoke Toxicity Index after 4 minutes CITG(4.0)	Dimensionless	0.19	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:

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24-HOUR CHEMICAL EMERGENCY NUMBER

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