

ST 110

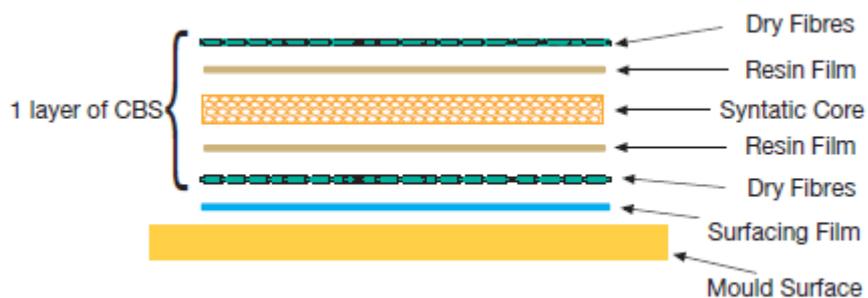
CAR BODY PANEL SYSTEM SPRINT™ RESIN

- Drape and thickness optimised for excellent handling
- Ideal for complex or vertical mouldings
- Excellent balance of mechanical performance and toughness
- Suitable for autoclave and vacuum bag processing

INTRODUCTION

Structural ST 110 is used to form a multi layered material referred to as CBS Car Body SPRINT for body and closure panels for automotive applications.

ST 110 is used alongside a suitable surfacing film (SF80, SF80FROBL or SF96) and SY110 Syntactic Core to build up a CBS panel. The woven carbon and glass reinforcements can be used to lay up various panel combinations to suit the required stiffness and weight targets needed.



INSTRUCTIONS FOR USE

It is important to take care unrolling the material to avoid wrinkling or creasing the product. Do not leave the rolls lying flat on a bench/floor or box, as this will flatten one side of the product roll.

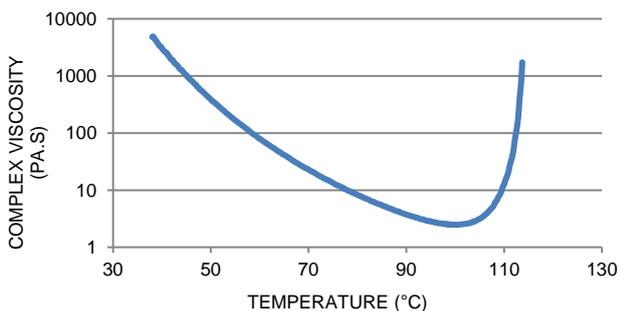
1. Place the ST 110 into the laminate lay-up as desired; it is usual for both faces of the ST 110 to be covered with a prepreg or SPRINT™ material to form an in-situ sandwich construction.
2. If required apply a peel ply, pre-impregnated or dry, over the top of the laminate stack. Note that for good secondary bonding of a peel-plyed laminate, a nylon peel ply such as Gurit Stitch Ply A, is strongly recommended. If using SPRINT™, insert high tex glass strands at an interval of 0.5m on the perimeter of the tool on the front and back of the laminate lead them out so that they will protrude from underneath the next layer in the vacuum stack, the release film and contact the breather material. Cover the peel ply entirely with a release film, followed by breather material such as Gurit / Tygavac Econoweave 44W or equivalent, so that it extends over the release film in all direction and contacts the dry glass strands.
3. Install a vacuum bag by standard techniques. Insert at least two vacuum stems through the bag connecting one to the vacuum source and the other, at a point on the part furthest from the source, to a calibrated vacuum gauge. Position part in the oven and draw vacuum to check for bag or system leaks.
4. Cure the laminate in accordance with the specification given later in this datasheet.

PRODUCT INFORMATION

RHEOLOGY DATA

ST 110 resin viscosity profile conducted at 1°C (1.8°F)/minute.

PROPERTY	VALUE	
Minimum Viscosity	2.46 Pa.s	24.6 P
Temperature at Minimum Viscosity	100 °C	212°F



MINIMUM CURE TIME & TEMPERATURE

ST 110 cured using vacuum bag processing with recommended minimum cure of 10 hours at 85°C (185°F)

PROPERTY	LOW TEMPERATURE SLOW CURE	THIN SECTION RAPID CURE	HIGH TEMPERATURE STANDARD CURE	TEST STANDARD
Processing Method	Vacuum Bag			
Typical Ramp Rate	1°C (1.8°F) per minute	2°C (3.6°F) per minute	2°C (3.6°F) per minute	-
Cure Temperature	85°C (185°F)	120°C (248°F)	130°C (266°F)	-
Cure Dwell Time	600 (min)	110 (min)	30 (min)	-
Cure Pressure	-1 (bar)			-
Dry Tg ₁ (DMA)	> 115°C (239°F)			ISO 6721 (DMA)

CURING SCHEDULE

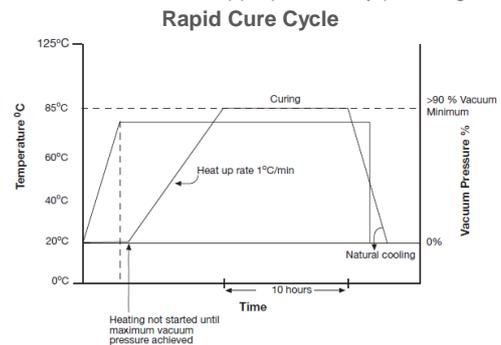
CURE ENVELOPE

ST 110 has a relatively flexible cure envelope. The minimum cure is 85°C (185°F) for 10 hours and a quick cure is 130°C (266°F) for 30 minutes.

ST 110 will co-cure with other Gurit prepreg and SPRINT™ products. However, the minimum cure table for ST 110 must be followed.

TYPICAL CURE PROFILES

The successful use of these cure schedules will depend on part size and laminate construction. Heat up rate and dwell periods need to be tailored to take consideration of oven capacity, thermal mass of tool, laminate construction etc. It is recommended that Gurit Technical Support is contacted for further advice before utilising any suggested cure cycles. Please contact Gurit Technical Support for advice on post-cure schedule to achieve appropriate body panel Tg.



TRANSPORT & STORAGE

When stored sealed & out of direct sunlight.

STORAGE TEMP	UNIT	VALUE
-18°C	0°F	months
+18-22°C	64-72°F	weeks

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 to reach room temperature before unwrapping.

HEALTH AND SAFETY

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

LAMINATE PROPERTIES

CURED LAMINATE PROPERTIES

Cured laminate data is currently being generated for ST 110.

PROPERTY	SYMBOL	RE400T		TEST STANDARD
Fabric / Fibre Description	-	390g/m2 2x2 Twill E-Glass Woven		-
Resin Content	-	42 %		-
Cure Method	-	Vacuum Bag		-
Cure Schedule	-	1hr dwell at 120°C (266°F)		-
Cure Ply Thickness	t_{ply}	0.35 mm	0.0138 in	ASTM D 3171 Method II
Glass Transition Temperature	T_{g1}	127°C	261°F	ISO 6721 (DMA)
0° Tensile Fibre Volume*	V_f	42.1 %		ASTM D 3171 Method I
0° Tensile Strength (Normalised to 45%)	X_T	403 MPa	59 ksi	ISO 527-4
0° Tensile Modulus (Normalised to 45%)	E_{T11}	24 GPa	3.5 Msi	ISO 527-4
0° Compressive Str. Fibre Volume*	V_f	41.9 %		ASTM D 3171 Method I
0° Compressive Strength (Normalised to 45%)	X_C	642 MPa	93 ksi	SACMA SRM1-94
0° Compressive Mod. Fibre Volume*	V_f	41.5 %		ASTM D 3171 Method I
0° Compressive Modulus (Normalised to 45%)	E_{C11}	25 GPa	3.6 Msi	SACMA SRM1-94
±45° IPS Fibre Volume*	V_f	41.1 %		ASTM D 3171 Method I
±45° In-Plane Shear Strength	τ_{12}	87 MPa	13 ksi	ISO 14129
±45° In-Plane Shear Modulus	G_{12}	3.1 GPa	0.4 Msi	ISO 14129
±45° In-Plane Shear Poisson's Ratio	ν_{12}	0.61		ISO 14129
0° ILSS Fibre Volume*	V_f	41.6 %		ASTM D 3171 Method I
0° ILSS	X_{ILSS}	61 MPa	8.8 ksi	ISO 14130

*original laminate fibre volume fraction

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.

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

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E customer.support@gurit.com

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