

WE91-1

HIGH TACK GLASS PREPREG

- ▮ WE91-1 high tack resin matrix
- ▮ 60 day out-life at 21°C
- ▮ High flow matrix
- ▮ Cure from 85°C to 120°C
- ▮ Germanischer Lloyd Certified

INTRODUCTION

WE 91 is part of Gurit's comprehensive offering of structural composite product solutions comprising of 3 main product groups; Prepreg, SPRINT® and SparPreg®. This unique product range provides technically and commercially competitive engineering materials, ideal for use either solely, or in conjunction with other Gurit products from within the range.

Gurit's WE91 prepreg product range comprises of two tack variants; WE91-1 high tack and WE91-2 medium tack prepregs. WE91 is a high flow epoxy prepreg ideally suited to structural composite component manufacture. It can be cured at temperatures as low as 85°C / 185°F, but can also be used for the rapid manufacture of components through its 45-minute cure at 120°C / 250°F. All of this can be achieved together with an out-life of 60 days at 21°C / 70°F. WE91-1 is designed for vacuum bag processing and offers excellent mechanical performance on glass and carbon fibre reinforcements.



PRODUCT INFORMATION

WE91-1 prepreg can be used with both SPRINT® and SparPreg™ products. It is supplied with a poly backer and can be applied to the substrate with either side against the tool. The product formats listed to the right also benefit from 3rd Party Certification.

PRODUCT DESCRIPTION	CERTIFICATION
600gsm ±45° E-Glass Biaxial Prepreg	Germanischer Lloyd

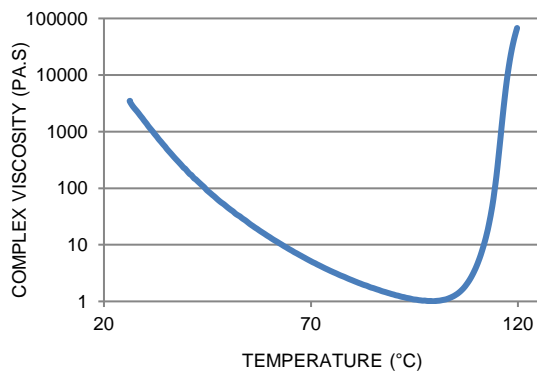
In order to maximise the potential of the prepreg product range please contact the Gurit Technical Support Department. Contact details are on the back of this Product Data Sheet. General prepreg / SPRINT® working practices apply to these products, details of which can be obtained from the Gurit Guide to Composites or by contacting the above department.

PREPREG PROPERTIES

RHEOLOGY DATA

WE91-1 resin viscosity profile conducted at 1°C (1.8°F) per minute.

PROPERTY	VALUE	
Minimum Viscosity	1.0 Pa.s	10.4 P
Temperature at Minimum Viscosity	98.5 °C	212 °F



TRANSPORT & STORAGE

When stored sealed & out of direct sunlight.

STORAGE TEMP		UNIT	VALUE
-18°C	0°F	months	18
+30°C	+86°F	weeks	3

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.

MINIMUM CURE TIME & TEMPERATURE

WE91-1 offers flexible curing options. The recommended minimum cure is 600 minutes at 85°C (185°F) with a 1°C (1.8°F) per minute ramp-rate.

PROPERTY	OVEN / VAC BAG		TEST STANDARD
Typical Laminate	4 plies of WE91-1 XE600 (biax) prepreg with 35% resin content		-
Typical Ramp Rate	1 – 2°C (2 – 4°F) per minute		-
Cure Temperature	85°C (185°F)	120°C (248°F)	-
Cure Dwell Time	600 (min)	45 (min)	-
Cure Pressure	-1bar (14.5Psi)		-
De-mould Temperature	< 60°C (140°F)		-
Dry T _{g1} (DMA)	110-125°C / 230 – 257°F		ASTM D2078

LAMINATE PROPERTIES

All data presented in this datasheet is based on the mechanical testing of a single batch of material.

CURED RESIN PROPERTIES

4mm resin cast oven cured using standard processing techniques and cured at 120°C (248°F) for 90 minutes.

PROPERTY	SYMBOL	90 MINUTES @ 120°C (175°F)		TEST STANDARD
Tensile Strength	σ_T	76 MPa	11 Ksi	ISO 527-2
Tensile Modulus	E_T	3.0 GPa	0.44 Msi	ISO 527-2
Flexural Strength	σ_F	119 MPa	17 Ksi	ISO 178
Flexural Modulus	E_F	2.8 GPa	0.41 Msi	ISO 178
Compressive Strength	σ_C	143 MPa	21 Ksi	ISO 604

CURED LAMINATE

Cured using standard processing techniques and a cure time of 90 minutes at 120°C (248°F).

PROPERTY	SYMBOL	XE600		UC1600		TEST STANDARD
Fabric / Fibre Description	-	600g/m ² Stitched Biaxial using E-glass		1600g/m ² Unidirectional E-glass		-
Resin Content	-	35 %		32 %		-
Cure Method	-	Vacuum bag cured at -1 bar				-
Cure Schedule	-	90 minutes at 120°C (248°F)				-
Glass Transition Temperature	T_{g1}	110-125°C	230 – 257°F	110-125°C	230 – 257°F	ISO 6721 (DMA)
Cured Ply Thickness	t_{ply}	0.45 mm	0.018 in	1.22 mm	0.048 in	ASTM D 3171 Method II
0° Tensile Cured Fibre Volume*	V_f	51.5 %		51.2 %		ASTM D 3171 Method II
0° Tensile Strength (Normalised to 60%)	X_T	544 MPa	79 Ksi	1028 MPa	40 Ksi	ISO 527-4
0° Tensile Modulus (Normalised to 60%)	E_{T11}	30 GPa	4.4 Msi	47 GPa	1.9 Msi	ISO 527-4
±45° Compressive Str. Fibre Volume*	V_f	50.0 %		-		ASTM D 3171 Method II
±45° Compressive Strength	X_{C12}	151 MPa	22 Ksi	-	-	SACMA SRM1-94
±45° Compressive Mod. Fibre Volume*	V_f	51.2 %		-		ASTM D 3171 Method II
±45° Compressive Modulus	E_{C12}	13 GPa	1.84 Msi	-	-	SACMA SRM1-94
±45° Tensile Cured Fibre Volume*	V_f	50.9 %		-		ASTM D 3171 Method II
±45° Tensile Strength	Y_{T12}	146 MPa	21 Ksi	-	-	ISO 527-4
±45° Tensile Modulus	E_{T12}	13 GPa	1.9 Msi	-	-	ISO 527-4
90° Tensile Fibre Volume*	V_f	-		48.9 %		ASTM D 3171 Method II
90° Tensile Strength	Y_{T22}	-	-	35 MPa	1.4 Ksi	ISO 527-4
90° Tensile Modulus	E_{T22}	-	-	9.3 GPa	0.37 Msi	ISO 527-4
±45° IPS Fibre Volume*	V_f	-		49.8 %		ISO 14129
±45° In-Plane Shear Strength	τ_{12}	-	-	48 MPa	1.9 Ksi	ISO 14129
±45° In-Plane Shear Modulus	G_{12}	-	-	4.4 GPa	0.17 Msi	ISO 14129
±45° In-Plane Shear Poisson's Ratio	ν_{12}	-		0.60		ISO 14129
0° ILSS Fibre Volume*	V_f	52.2 %		50.4 %		ASTM D 3171 Method II
0° ILSS	X_{ILSS}	45 MPa	6.6 Ksi	66 MPa	2.6 Ksi	ISO 14130
±45° ILSS Fibre Volume*	V_f	50.9 %		-		ASTM D 3171 Method II
±45° ILSS	X_{ILSS12}	37 MPa	5.3 Ksi	-	-	ISO 14130

* original laminate fibre volume fraction

NOTICE

All advice, instruction or recommendation is given in good faith but 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 the Company's Website: www.gurit.com/terms-and-conditions.aspx.

The Company strongly recommends that Customers make test panels and conduct appropriate testing of any goods or materials supplied by the Company 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. 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 are continuously reviewing and updating literature. Please ensure that you have the current version, by contacting Gurit Marketing Communications or your sales contact and quoting the revision number in the bottom right-hand corner of this page.

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