

# 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 3<sup>rd</sup> Party Certification.

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

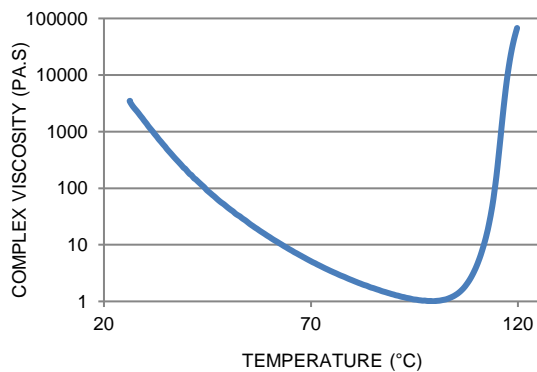
In order to maximise the potential of the prepreg product range please contact the Gurit Technical Support Department. Contact details are on the back of this Product Data Sheet. General prepreg / SPRINT® working practices apply to these products, details of which can be obtained from the Gurit Guide 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	24
+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 <sub>g1</sub> (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	$\sigma_T$	76 MPa	11 Ksi	ISO 527-2
Tensile Modulus	$E_T$	3.0 GPa	0.44 Msi	ISO 527-2
Flexural Strength	$\sigma_F$	119 MPa	17 Ksi	ISO 178
Flexural Modulus	$E_F$	2.8 GPa	0.41 Msi	ISO 178
Compressive Strength	$\sigma_C$	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 <sup>2</sup> Stitched Biaxial using E-glass		1600g/m <sup>2</sup> 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	$\tau_{12}$	-	-	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	$\nu_{12}$	-		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](http://www.gurit.com/terms-and-conditions.aspx).

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