

# WE90

## Prepreg

- **High flow matrix**
- **Excellent tack life**
- **Long shelf life at room temperature**
- **Suitable for a range of pressures**
- **Cure temperature between 85°C and 150°C**
- **Controllable temperature in thick sections**
- **Excellent laminate quality, low bleed**
- **Available in heavyweight reinforcements**
- **Good drapeability**

## Introduction

WE90 is a high flow, epoxy prepreg ideally suited to the manufacture of thick sections. It can be cured at temperatures as low as 85°C, but can also be used for the rapid manufacture of components through its 45-minute cure at 120°C. All of this can be achieved together with an out-life of 60 days at 21°C.

WE90 is designed for vacuum bag processing and offers excellent mechanical performance on glass fibre reinforcements. WE90 is pre-impregnated into three types of E-glass fibre, unidirectional, biaxial and triaxial, all of which are produced in large volumes in order to make it a cost-effective composite building block for a range of applications.

The unidirectional prepreg uses collimated E-glass roving in 1200, 1500 and 1600g fibre weights. This provides a very economical way of laying down a large thickness of a very high performance material. It is particularly suitable as the primary composite material in structures which are subjected to longitudinal compression and bending, such as masts, poles and other beam-like structures. It can be supplied in widths of up to 1470mm.

The biaxial prepreg is a  $\pm 45^\circ$  stitched E-glass fabric using a fibre weight of either 600 or 1000g. This material can either be used alone as a thick drapeable fabric or as a secondary product in conjunction with the unidirectional product, where it imparts tensile and torsional strength and shear stiffness. It can be supplied in widths of up to 1250mm wide.

The triaxial prepreg is a  $\pm 45^\circ$  biaxial E-glass stitched to unidirectional fabric giving a total fibre weight of either 900 or 1200g. This material can be used alone as a thick drapable fabric. The triaxial prepreg is available with a glass tissue on the biax side, which helps to prevent print-through. It is supplied in 1260mm widths.

# Instructions for Use

In order to maximise the potential of these products please contact the Gurit Technical Services Department. Contact details are on the back of this Product Data Sheet.

General prepreg working practices apply to these products, details of which can be obtained from the Guide to Composites or by contacting the above department.

## Properties

Uncured Resin Properties	
	Resin
Out-life @ 23°C (days)	60
Storage life @ -18°C (months)	18
Hazard Definition	Xn (N)

Cure Cycles	
Minimum Cure Time @ 85°C (hrs:mins)	12:00
Minimum Cure Time @ 100°C (hrs:mins)	3:00
Minimum Cure Time @ 120°C (mins)	45

Cured Matrix Properties		
	Dwell @ 80°C & 1hr @ 120°C	Test Method
Tensile Strength (MPa)	77.5	BS EN ISO 527
Tensile Modulus (GPa)	3.1	BS EN ISO 527
Strain (%)	3.75	BS EN ISO 527
Compressive Modulus (GPa)	3.3	ASTM D695
Compression Strength (MPa)	100	ASTM D695
Ultimate T <sub>g2</sub> (°C)	110-120	DSC
T <sub>g1</sub> (°C)	110-120	DMTA
Peak tan delta (°C)	125-135	DMTA
Cured Resin Density (g/cm <sup>3</sup> )	~1.18	

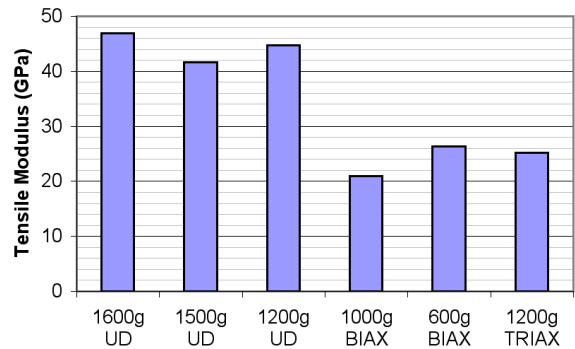
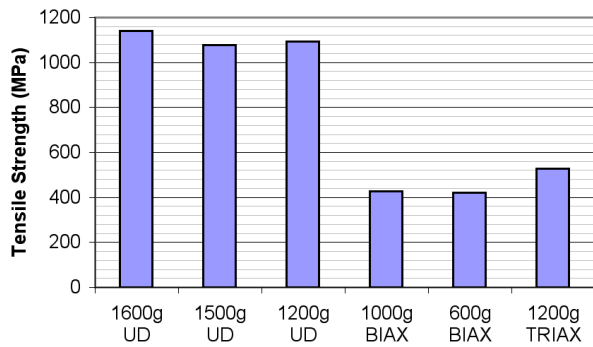
Prepreg Matrix Working Properties			
		Test Method	Notes
Minimum Cure Temperature (°C)	85.00	DSC	
Minimum Cure Time (hrs:mins) @ minimum T	12:00	DSC	
Minimum Viscosity (2°C/min ramp) (P)	<25	Rheometer	40-120°C @ 2°C/min
Temp @ Minimum Viscosity (°C)	105 ± 5	Rheometer	40-120°C @ 2°C/min

Unidirectional Prepreg Properties				
	Unidirectional			Test Method
Fibre weight (g)	1600	1500	1200	
Resin content (%)	32	32	32	
Fibre Orientation (°)	0	0	0	
Cure (time/temp)	Dwell @ 80°C, 1hr @ 120°C	Dwell @ 80°C, 1hr @ 120°C	Dwell @ 80°C, 1hr @ 120°C	
Process	Vacuum Bag	Vacuum Bag	Vacuum Bag	
Tensile Strength (MPa)	1142	1079	1093	BS EN ISO 527-4
Tensile Modulus (GPa)	47	42	45	BS EN ISO 527-4
Cured Ply Thickness (mm)	2.40	2.37	1.74	
Number of Layers	2	2	2	
Tensile Laminate Fibre Volume (%)	51	48	53	
Normalised Tensile Strength @ 53% FVF	1184	1179	1097	
Normalised Tensile Modulus @ 53% FVF	49	46	45	
Flexural Strength (MPa)	1143	1335		BS EN ISO 14125
Flexural Modulus (GPa)	37	44		BS EN ISO 14125
Compressive Strength (MPa)		741		ISO 14126
Compression Modulus (GPa)	45	40		ISO 14126
ILSS	63	62	72	BS EN ISO 14130

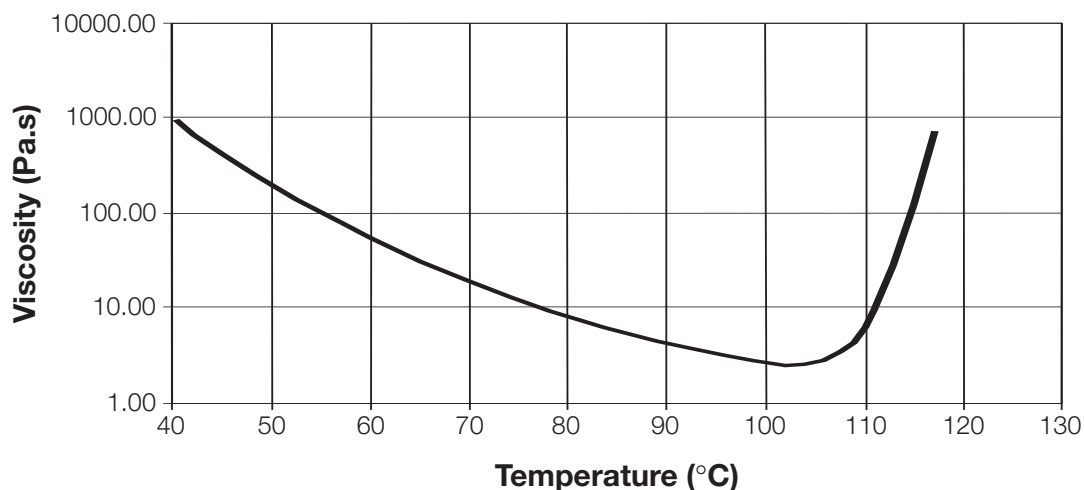
## Properties cont'd

Biaxial and Triaxial Prepreg				
	Biaxial		Triaxial	Test Method
Fibre weight (g)	1000	600	1200	
Resin content	48%	35%	38/43%	
Fibre Orientation	45°	45°	0°	
Cure (time/temp)	Dwell @ 80°C, 1hr @ 120°C	Dwell @ 80°C, 1hr @ 120°C	Dwell @ 80°C, 1hr @ 120°C	
Process	Vacuum Bag	Vacuum Bag	Vacuum Bag	
Tensile Strength (MPa)	427	422	529	BS EN ISO 527-4
Tensile Modulus (GPa)	21	26	25	BS EN ISO 527-4
Cured Ply Thickness (mm)	1.91	1.48	2.02	
Number of Layers	2	2	2	
Tensile Laminate Fibre Volume %	40	31	45	
Normalised Tensile Strength @ 53% FVF	565	719	616	
Normalised Tensile Modulus @ 53% FVF	28	45	29	
Flexural Strength (MPa)		837		BS EN ISO 14125
Flexural Modulus (GPa)		20		BS EN ISO 14125
Compressive Strength (MPa)		472	482	ISO 14126
Compression Modulus (GPa)		24	26	ISO 14126
ILSS	32	37	46	BS EN ISO 14130

## Mechanical Properties



## Rheology Profile



## Health and Safety

The following points must be considered:

1. Skin contact must be avoided by wearing protective gloves. Gurit recommends the use of disposable nitrile gloves for most applications. The use of barrier creams is not recommended, but to preserve skin condition a moisturising cream should be used after washing.
2. Overalls or other protective clothing should be worn when laminating or sanding. Contaminated work clothes should be thoroughly cleaned before re-use.
3. Eye protection should be worn. If contamination of the eye occurs then flush the eye with water for 15 minutes, holding the eyelid open, and seek medical attention.
4. If the skin becomes contaminated then the area must be immediately cleansed. The use of resin-removing cleansers is recommended. To finish, wash with soap and warm water. The use of solvents on the skin to remove resins etc must be avoided.

Washing should be part of routine practice:

- before eating or drinking
- before smoking
- before using the lavatory
- after finishing work

5. The inhalation of sanding dust should be avoided. If it settles on the skin then it should be washed off. After more extensive sanding operations, a shower/bath and hair wash is advised.

Gurit produces a separate full Material Safety Data Sheet (MSDS) for all hazardous products. Please ensure that you have the correct MSDS to hand for the materials you are using before commencing work. A more detailed guide for the safe use of Gurit resin systems is also available and can be found on our website at [www.gurit.com](http://www.gurit.com)

## Applicable Risk & Safety Phrases

R 36/38, 40, 43, 51/53

S 26, 28a, 36/37/39, 57, 60



## Transport & Storage

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 (the temperature of most freezers), some reaction will still occur, and after some years (in most cases), the material will be unworkable. The storage life for each product has been set such that if the material is kept for its full stated storage life at -18°C, and is then brought to 20°C, it should be useable right up to the last day of its out-life.

## Notice

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