

SparPreg™

UD Prepreg for SPRINT®-quality Blade Spars and Roots

- **UD prepreg ideal for use in thick sections**
- **Potential elimination of debulking/dry fabric production step**
- **Increased productivity, reduced weight & cost for manufacturers**
- **Excellent processing properties during lamination**
- **Fully compatible with current SPRINT®/prepreg products**
- **Excellent mechanical properties**
- **Recommended cure between 85°C and 120°C**
- **Out-of-autoclave curing**
- **Diuron-free chemistry**

Introduction

SparPreg™ is an innovative UD prepreg, developed to compliment the current WE and WT range of prepreg, and SPRINT®, products. This unique prepreg provides technically and commercially competitive engineering materials, ideal for use in conjunction with other Gurit products.

SparPreg™ was particularly developed to benefit the lay-up of thick UD sections, such as wind turbine blade spars and roots. The material can produce thick laminates of exceptional quality with low void content, without the need for an intermediary debulking process or additional dry fabric reinforcement to aid air removal. The net result enables blade manufacturer to eliminate production steps, redundant materials and increase capacity.

SparPreg™ has been specially formulated to achieve the outstanding in-cure and mechanical performance of the WE91 prepreg and WT93 SPRINT® systems. It is designed for vacuum bag processing and can be used with glass and carbon fibre unidirectional reinforcements.

SparPreg™ is a high flow, Diuron-free epoxy prepreg. 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.

Instructions for Use

A range of fibre types can be utilised with SparPreg™ to suit the application. SparPreg™ can be used with both SPRINT® and prepreg products. It is supplied with a poly backer and can be applied to the substrate with either side against the tool. SparPreg™ can also be used as a normal prepreg.

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

Thick UD Laminate Quality

SparPreg™ allows the customer to lay-up thick UD sections and achieve excellent laminate quality with low void content, without the need for debulking or dry fabric reinforcement to remove air from between the plies. A range of fibre types can be utilised with this material to suit the application. Please contact Gurit for more information

SparPreg™ also utilises a lower enthalpy than other Gurit WE systems. This allows for a faster cure, as the peak exotherm during cure is reduced, enabling faster ramp rates in production.

In order to maximise the potential of SparPreg™ for use within components, please contact the Gurit Composite Processing Department. Contact details are on the back of this Product Data Sheet.

Matrix Properties - Uncured

Thermal Properties (cure 20°C-250°C @ 10°C/minute)

Enthalpy (J/g)	250±50
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Time to 95°C

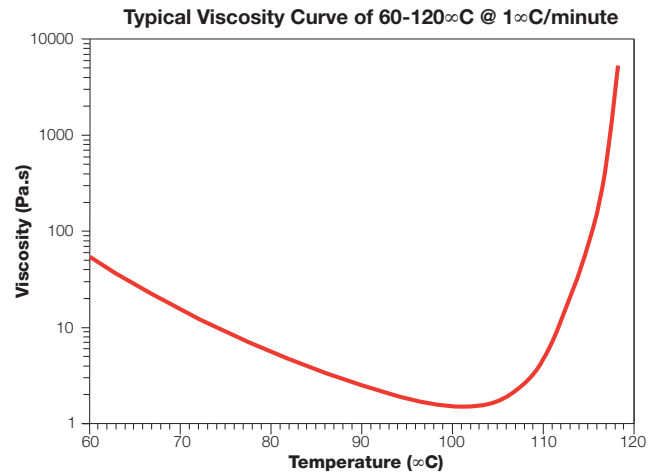
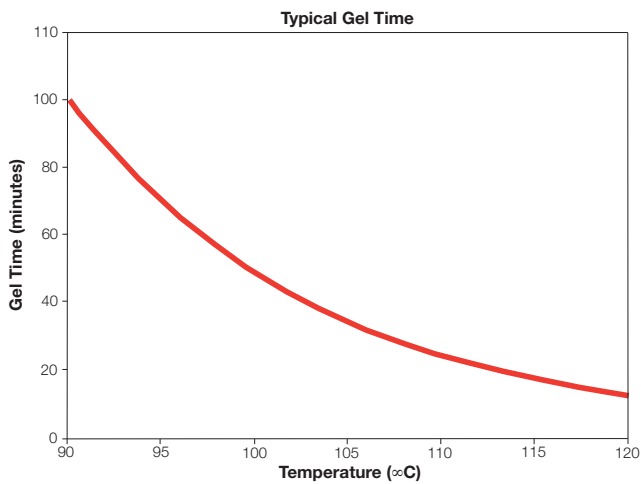
Minimum Cure Temperature (°C)	85
Time @ minimum cure temp (hours)	10
90°C (minutes)	400
100°C (minutes)	180
110°C (minutes)	90
120°C (minutes)	45

Colour

Matrix	Translucent
Resin	Clear
Catalyst	White

Rheology

	30-120°C @ 1°C/minute	30-120°C @ 2°C/minute
Temperature @ minimum Viscosity (°C)	102	112



Mechanical Properties

Tensile Strength (MPa)	57
Tensile Modulus (GPa)	3
Tensile Strain (%)	3
Compression Strength (MPa)	125
Compression Modulus (GPa)	4
Matrix density (g/cm ³)	1.2

Thermal Properties (cured between 90-120°C)

DSC T _{g2} (°C)	110-120
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Prepreg Properties

Uncured

Material Properties		
Tack	1-2	Low Tack

Outlife	
At -18°C (months)	18
At 5°C (months)	6
At 21°C (days)	60

Material Safety Information	
Hazard Code	Xi, N
Risk Phrases	36/38, 43, 51/53
Safety Phrases	24, 26, 28, 37/39, 57, 60
Solvent Content	0
Volatiles Content	0

Prepreg Reinforcement			
	1600g UD Glass	1200g UD Glass	600g UD Carbon
Resin Content (%)	32	32	35
Fibre Weight (g/m ²)	1600	1200	600
Aerial Weight (g/m ²)	2353	1765	923
Backer Type	MDPE		
Available Roll Width (mm)	900	900	1250
Packaging Type	Packaging Type is dependant on the length of roll requested		

Cured

Prepreg Reinforcement				
	1600g UD Glass	1200g UD Glass	600g UD Carbon	Test Method
Fibre Volume Fraction (%)	53	53	56	-
T _{g1} (°C)	108 - 112			DMTA
0° Tensile Strength (MPa)	930 - 965	1010 - 1120	1700 - 2200*	BS EN ISO 527
0° Tensile Modulus (GPa)	41 - 43	43 - 48	130 - 140*	BS EN ISO 527
0° Compressive Strength (MPa)	820 - 860	855 - 945	900 - 1200*	ISO 14126
0° Compressive Modulus (GPa)	40 - 43	41 - 46	115 - 130*	ISO 14126
0° ILSS (MPa)	73 - 80	65 - 71	65 - 80*	BS EN ISO 14130

*variation depends on grade of carbon used

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

Applicable Risk & Safety Phrases

R 36/38, 43, 51/53

S 24, 26, 28, 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. In most cases after some years, the material will become unworkable.

Notice

All advice, instruction or recommendation is given in good faith but Gurit AG (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/termsandconditions_en.html.

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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