

SE 90FRBL

EPOXY PREPREG SYSTEM

- **Fire retardant**
- **Black tinted resin**
- **Outstanding compressive properties**
- **Controlled flow**
- **Light tack**
- **Suitable for thick and thin sections**

INTRODUCTION

SE 90FRBL is a fire-retardant, hot-melt, epoxy prepreg system that offers an extremely good balance of mechanical properties.

The system is ideal for structural components where self-extinguishing fire performance and high load bearing capability are desired.

SE 90FRBL can be cured at 90°C, yet retains an outlife of up to 56 days at 23°C. With its 90 minute cure at 120°C, it is also suitable for the quick manufacture of parts, and is also used in the development of trial components.

INSTRUCTIONS FOR USE

When preparing the lay-up, the prepreg should be removed from the freezer approximately six hours before use (or until it has attained ambient temperature (circa 18-23°C)) before it is removed from its packaging to avoid condensation of water on the surface whilst defrosting.

The mould surface should be release coated and must have been tested for vacuum integrity prior to lay-up.

Place the lay-up on a tool or caul sheet which has been treated with a release agent or film and insert a thermocouple into the lay-up near the centre ply of the thickest edge section.

A layer of peel ply can be applied to the surface of the lay-up to aid good secondary bonding. A nylon peel ply, such as Tygavac Stitch Ply A, is strongly recommended. This is particularly important where the cure temperatures exceed 90°C. The peel ply should then be covered with perforated release film. No edge resin bleeder is usually required. P9 grade release film is recommended. With perforated release film, the amount of resin bled away is controlled by the number of dry plies of resin bleeder cloth placed over the perforated release film. For thin skins, care must be taken not to overbleed the laminate (prepreg peel ply – SC15-1744) will ensure this does not occur).

Install a vacuum bag using standard techniques. At least two vacuum stems should be inserted through the bag, connecting one to the vacuum source, to a calibrated vacuum gauge. Position the component in the oven or autoclave and draw vacuum to check for bag or system leaks. A minimum of 85% is recommended for the entire cure cycle, although higher vacuums will improve laminate quality and surface finish.

Commence the heat-up cycle, typically between 0.3°C/minute and 2°C/minute to the final cure temperature. At 90°C, temperature should be held for 12 hours or for 90 minutes at 120°C. All temperatures should be measured by the previously installed thermocouples.

Once curing is complete, the heat should be turned off and the part allowed to cool until its temperature has fallen below 60°C. When fully cooled, the part may be debagged, trimmed and machined as necessary.

Gloves should be worn both to avoid skin contact with the prepreg, and to avoid transfer of sweat onto the prepreg, which may cause voiding on cure.

If the lay-up is to take several days, a vacuum debulk is recommended at the halfway stage.

PROPERTIES

Uncured Properties	
Out-Life @ 18-22°C	8 wks
Storage Life @ -18°C	2 years
Hazard Designation	Xi, N
Risk Phrases	36/38, 43
Safety Phrases	24, 26, 28, 37/39, 57

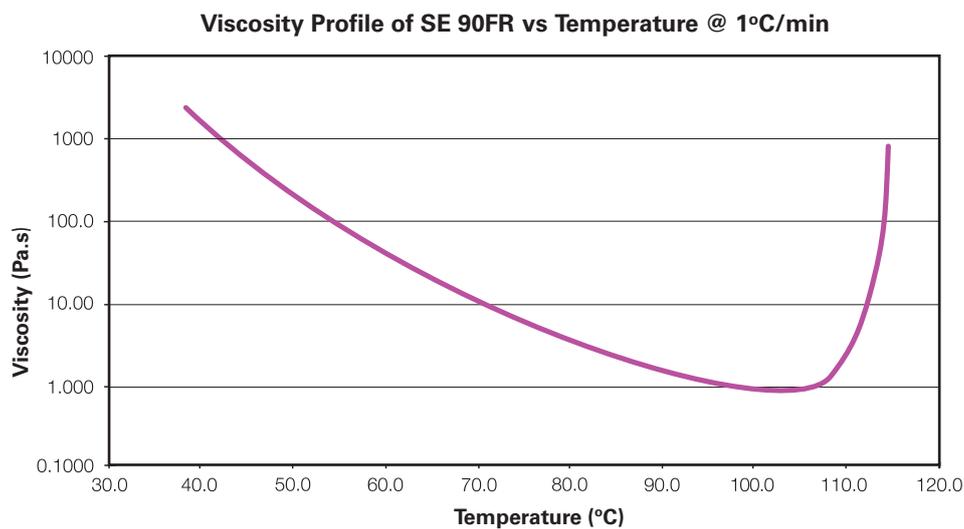
Cured System Physical Properties		
	Cure	Tg (°C)
Tg DMTA (Peak Tan δ) (°C)	90 minutes @ 120°C	177
Tg1 DMTA (°C)	90 minutes @ 120°C	129.5
Tg2 by DSC (°C)	8 hrs @ 90°C	108.5
Tg2 by DSC (°C)	12 hrs @ 90°C	109.7
Uncured Resin Density (g/cm³)	-	1.31

Working Properties	
Minimum Cure Temperature (°C)	90
Minimum Cure Time (@ minimum cure temperature) (hrs)	12
Minimum Viscosity (isothermal @ minimum cure temperature) (P)	50
Minimum Viscosity (1°C/minute ramp) (P)	23
Temperature @ minimum viscosity (1°C/minute ramp) (°C)	100°C
Minimum Cure Time @ 90°C (hrs:mins)	12:00
Minimum Cure Time @ 100°C (hrs:mins)	6:00
Minimum Cure Time @ 110°C (hrs:mins)	3:00
Minimum Cure Time @ 120°C (hrs:mins)	1:30

PROPERTIES (CONT'D)

Mechanical Properties		
	300g HEC U/D High Strength Carbon	300g HEC U/D High Strength Carbon
Cure (time/temp/pressure)	12 hrs / 90°C / 1 Bar	1.5 hrs / 120°C
Process	Vacuum Bag	Vacuum Bag
Fibre weight (g/sqm)	300	300
Prepreg areal weight (g/sqm)	462	462
Prepreg resin content (% bw)	35	35
Tensile laminate fibre volume (%)	57.4	57.8
Cured ply thickness (mm)	0.271	0.263
Normalised Tensile Strength @ 60% FVF (MPa)*	2234	2241
Normalised Tensile Modulus @ 60% FVF (GPa)*	138.2	139.1
Compressive Strength (MPa)	1157	1376
Compressive laminates fibre volume (%)	57.4	57.8
Normalised Compressive Strength @ 60% FVF (MPa)	1209	1428

* Calculated values from measured resin and fibre properties



Notes: *C.P.T. is of tensile laminate unless no tensile data is given.

All figures quoted are indicative of the properties of the product concerned. Some batch to batch variation may occur.

HEALTH AND SAFETY

Although SE 90FRBL has greatly improved health and safety characteristics when compared to wet lay-up epoxy systems, the following points must still be considered:-

1. Avoid skin contact - wear disposable rubber gloves and use skin barrier creams.
2. Avoid eye contact. If this occurs, flush with water for 15 minutes and seek medical advice.
3. Ensure good ventilation of vacuum pump exhaust during laminate cure.
4. Avoid inhalation and eye contact with sanding dust. After any sanding operation of reasonable size a shower or bath should be taken and should include hair washing.
5. Wear overalls or other protective clothing. Thoroughly clean or discard soiled garments.
6. Use only resin removing creams/soap and water on exposed skin. Do not use solvents.

Washing should be part of routine practice:

- **before eating or drinking**

- **before smoking**

- **before using the lavatory**

- **after finishing work**

Gurit produces a separate full Safety Data Sheet for this product covering usage, transport, storage and emergencies. Please ensure that you have the correct SDS's to hand for the materials you are using before commencing work.

APPLICABLE RISK & SAFETY PHRASES

Please refer to SDS.

Transport & Storage

When not in use SE 90FRBL products should be maintained at -18°C. Shelf life for SE 90FRBL is two years at -18°C and six weeks at 18-22°C. To avoid condensation on their surfaces, allow rolls to reach room temperature before unwrapping.

NOTICE

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

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

E customer.support@gurit.com

W www.gurit.com