



## MULTIPREG E650

### Low Temperature Curing Toughened Epoxy Component Prepreg

E650 is a low temperature curing toughened resin system of medium viscosity, pre-impregnated into high performance fibers such as carbon, glass & aramid. Designed for the production of composite structures in the leisure and sporting industries, and for a range of engineering applications.

\*E650 is compatible for co-cure with Amber Composites low temperature cure resin film EF44 and Amber Composites low temperature cure syntactic core Amlite LT64B.

#### CHARACTERISTICS:

- > Low initial cure temperature 50 to 80°C (122°F to 176°F)
- > Medium tack level, easily laminated to mold surface
- > Excellent drapeability – complex shapes easily formed
- > 5 days shelf life at ambient temperature
- > Good quality surface finish under vacuum bag conditions
- > Suitable for processing by autoclave, press molding and vacuum bag cure
- > Low volatile content – no solvents used during processing

#### RESIN PROPERTIES

Density	1.2 g/cm <sup>3</sup> (74.9lbs/ft <sup>3</sup> ) at 23°C (73.4°F)
Tg (DMTA) after 4hr post-cure at 140°C (284°F)	Onset: 121°C (250°F) Peak Tan δ: 133°C (271°F)



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#### PROCESSING

Following removal from refrigerated storage, to avoid moisture condensation, allow prepreg to reach room temperature before opening the polythene bag.

Cut patterns to size and lay up the laminate in line with design instructions taking care not to distort the prepreg. If necessary, the tack of the prepreg may be increased by gentle warming with hot air. The lay up should be vacuum debulked at regular intervals using a P3 (pin pricked) release film on the prepreg surface, vacuum of 980 mbar (29 ins Hg) is applied for 20 minutes.

E650 can be successfully molded by vacuum bag, autoclave or matched die molding techniques.

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#### E650 RECOMMENDED MINIMUM CURE TIMES

Cure temperature °C (°F)	Recommended cure time
50 (122)	18 hrs
60 (140)	8 hrs
70 (158)	3.5 hrs
80 (176)	75 mins

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#### EXOTHERM

In certain circumstances, such as the production of thick section laminates rapid heat up rates or highly insulating masters, E650 prepreg can undergo exothermic heating leading to rapid temperature rise and component degradation in extreme cases. The risk of exotherm increases with lay-up thickness and increasing cure temperature. It is strongly recommended that trials, representative of all the relevant circumstances, are carried out by the user to allow a safe cure cycle to be specified.

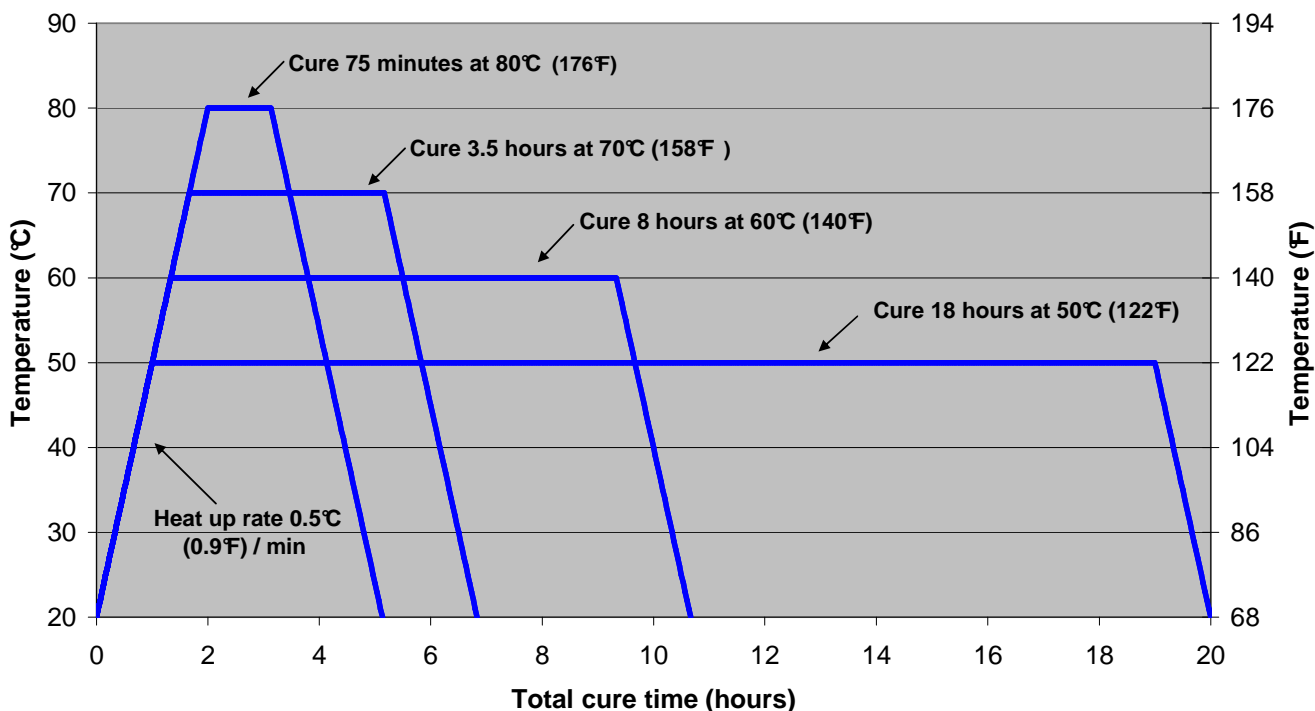


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### CURING CYCLES

Initial Minimum Cure Schedules - E650



### POST-CURE

In applications demanding maximum temperature or environmental resistance, it is essential to develop the glass transition temperature to the maximum level by a suitable post-cure. Ramp from initial cure temperature to 140°C (284°F) at 20°C (36°F) / hr and hold for 4 hours minimum, this post cure will result in a T<sub>g</sub> (Peak Tan δ) of approximately 133°C (271°F). Laminates may be post cured unsupported unless the size, shape and laminate thickness would allow excessive distortion under self-weight.



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### TYPICAL LAMINATE PROPERTIES (at Room Temperature)

**200gsm 2/2 twill T300 HS carbon 90° configuration w oven laminates, cured 5.5 hours at 80°C (176°F ), results normalised to 55% Vf.**

Tensile Strength	728 MPa	EN 2597
Tensile Modulus	66.8 GPa	EN 2597
Tensile Poisson's Ratio	0.06	EN 2597
Compression Strength	569.5 MPa	EN 2850
Compression Modulus	64 GPa	EN 2850
In-Plane Shear Strength	91.6 MPa	EN 6031
In-Plane Shear Modulus	2.44 GPa	EN 6031

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### STORAGE

Shelf life is at least 5 days at ambient temperature 20°C (68°F)

Refrigerated storage life is 12 months at -18°C (0°F)

To avoid moisture condensation: Following removal from cold storage, allow prepreg to reach room temperature before opening the polythene bag.

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### HANDLING SAFETY

Observe established precautions for handling epoxy resins and fibrous materials.

For further information refer to Material Safety Data Sheet.

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### FURTHER INFORMATION

Please contact Amber Composites for additional information.

This is not a specification. The information given in this data sheet in relation to the performance, storage and other characteristics of the product is based on results gained from experience and tests and is believed to be accurate. Given, however, that conditions of use and storage will vary, Amber Composites will not be liable for any loss or damage resulting from reliance upon such information. The purchaser is recommended to carry out his own tests to establish the suitability of the product for its particular purpose. The use of the product in certain processes may require third party consent.