PRODUCT DATASHEET

TENCATE ADVANCED COMPOSITES

TenCate E650

Low temperature curing toughened epoxy component prepreg

PRODUCT TYPE

50 to 80°C (122°F to 176°F) cure

Low temperature curing toughened epoxy component prepreg

TYPICAL APPLICATIONS

- Production of composite structures in the leisure and sporting industries
- Range of engineering applications

SHELF LIFE

Out life
5 days at @ 20°C (68°F)

Storage life
12 months @ -18°C (0°F)

Out life is the maximum time allowed at room temperature before cure.

To avoid moisture condensation:
Following removal from cold storage, allow the prepreg to reach room temperature before opening the polythene bag. Typically the thaw time for a full roll of material will be 4 to 6 hours.

PRODUCT DESCRIPTION

TenCate E650 is a low temperature curing toughened resin system pre-impregnated into high performance fibres such as carbon, glass & aramid. It is designed for the production of composite structures in the leisure and sporting industries also for a range of engineering applications. TenCate E650 is compatible for co-cure with TenCate's low temperature cure resin film, TenCate EF44, and TenCate's low temperature cure syntactic core, TenCate Amlite LT64.

TENCATE E650 PREPREG BENEFITS/FEATURES

- Low initial cure temperature 50 to 80°C (122°F to 176°F)
- Medium tack level, easily laminated to mould surface
- Excellent drape – 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 moulding and vacuum bag cure cure
- Low volatile content - no solvents used during processing

TYPICAL NEAT RESIN PROPERTIES

Density ....1.2 g/cm^3 (74.9 lbs/ft^3) at 23°C (73.4°F)

Tg (DMTA) after 4 hour post-cure at 140°C (284°F).....Onset: 121°C (250°F)

Peak tan δ: 133°C (271°F)

TYPICAL LAMINATE PROPERTIES

HS0804 – CARBON 205 GSM 2x2 TWILL FT300B 40B 3K - 0/90° CONFIGURATION WOVEN LAMINATES, CURED 3½ HOURS AT 70°C (158°F).

Property	Condition	Method	Results	
Tensile Strength (Warp)*	RTD	ISO 527-4	689 MPa	100 ksi
Tensile Modulus (Warp)*	RTD	ISO 527-4	61.2 GPa	8.9 Msi
Tensile Strength (Weft)*	RTD	ISO 527-4	708 MPa	103 ksi
Tensile Modulus (Weft)*	RTD	ISO 527-4	59.6 GPa	8.6 Msi
Poisson's Ratio	RTD	0.05		
Compression Strength (Warp)*	RTD	EN2580	713 MPa	103 ksi
Compression Modulus (Warp)*	RTD	EN2580	58.1 GPa	8.4 Msi
Compression Strength (Weft)*	RTD	EN2580	652 MPa	95 ksi
Compression Modulus (Weft)*	RTD	EN2580	60.3 GPa	8.7 Msi
In-Plane Shear Strength	RTD	ISO 14129	89 MPa	13 ksi
In-Plane Shear Modulus	RTD	ISO 14129	3.34 GPa	0.5 Msi
ILSS (Warp)	RTD	ISO 14130	57 MPa	8 ksi
ILSS (Weft)	RTD	ISO 14130	57 MPa	8 ksi

*Results normalised to 55% Vf. Other results are at actual 48.3%.

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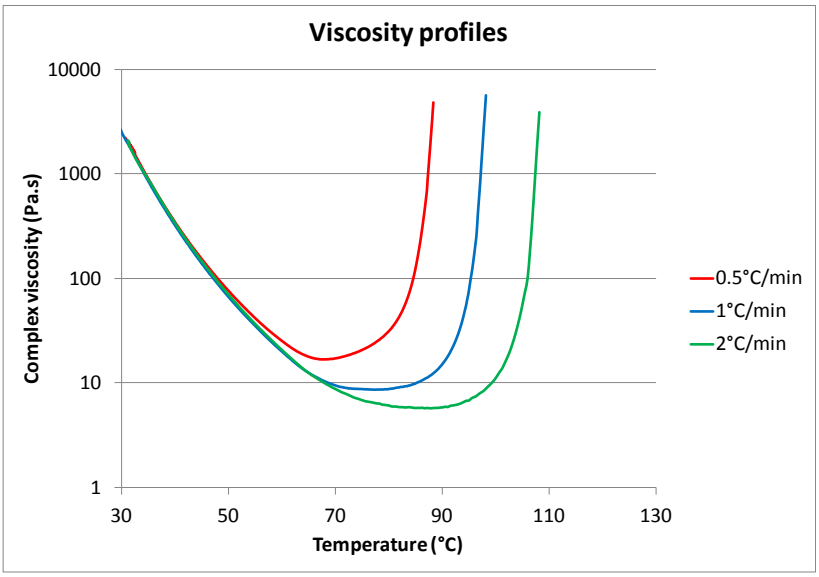
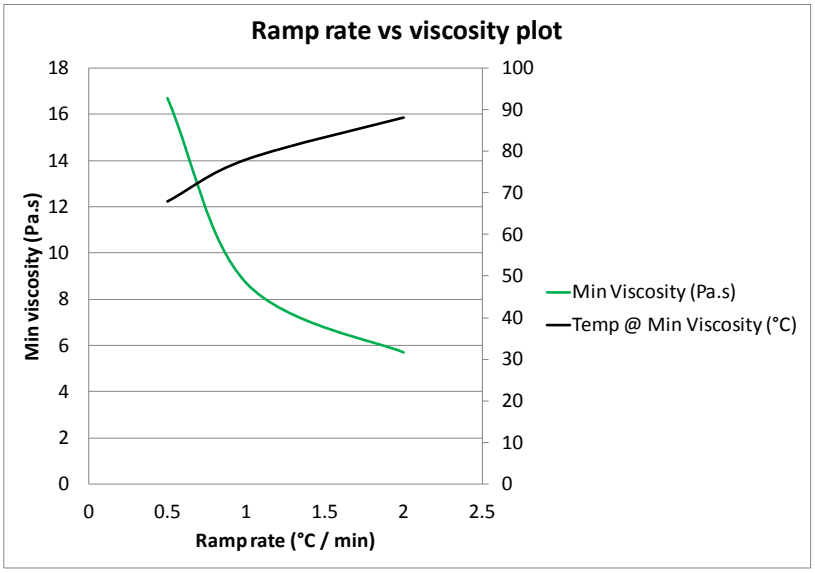


CURE PROPERTIES: VISCOSITY PROFILE (30°C TO 110°C OR 86°F TO 230°F)

Ramp rate [°C (°F) /min]	Min viscosity (Pa.s)	Temp @ min. viscosity °C (°F)
0.5 (1.0)	16.71	68 (154)
1 (1.8)	8.71	78 (172)
2 (3.6)	5.7	88 (190)



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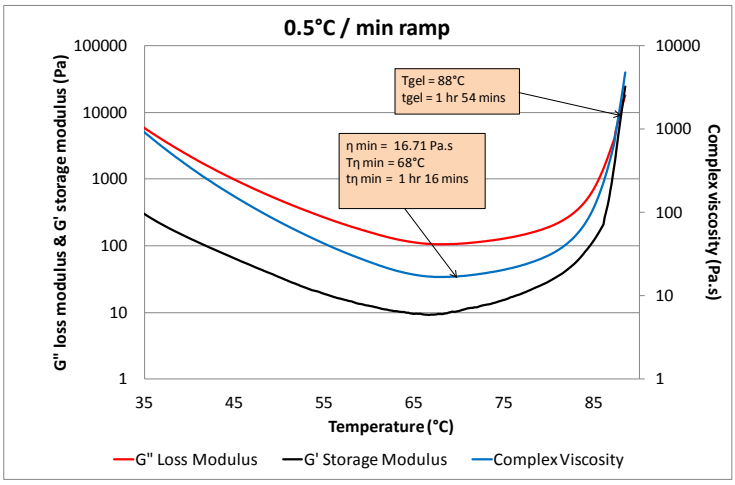

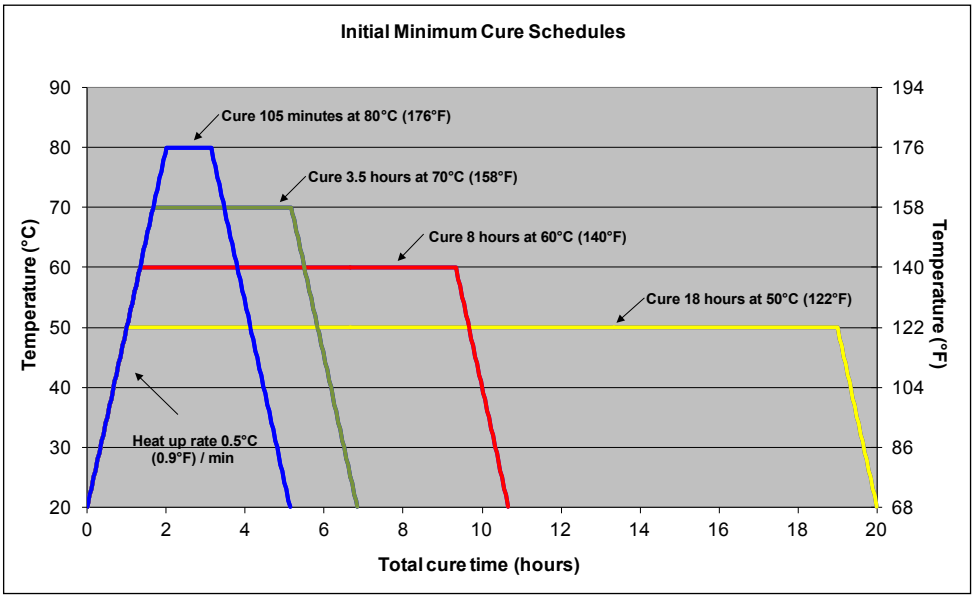

Cure temperature °C (°F)	Recommended cure time
50 (122)	18 hr
60 (140)	8 hr
70 (158)	3.5 hr
80 (176)	105 min

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 Tg (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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PROCESSING

Following removal from refrigerated storage, to avoid moisture condensation, allow the 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.

TenCate E650 can be successfully moulded by vacuum bag, autoclave or matched die moulding techniques.

EXOTHERM

In certain circumstances, such as the production of thick section laminates rapid heat up rates or highly insulating masters, TenCate 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.

HANDLING SAFETY

Observe established precautions for handling epoxy resins and fibrous materials - wear gloves.

For further information refer to Material Safety Data Sheet.

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TENCATE ADVANCED COMPOSITES

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