



## TenCate E644

### Low temperature curing toughened epoxy component prepreg

#### PRODUCT TYPE

50°C (122°F) to 80°C (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

7 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 E644 is a toughened epoxy resin system for low temperature cures, 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 E644 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 E644 PREPREG BENEFITS/FEATURES

- Excellent surface finish
- Low initial cure temperature
- High end use temperature when post cured
- Autoclave, vacuum only processing and press moulding
- 7 days shelf life at ambient temperature
- Good dimensional stability and thermal durability up to 250°C (482°F) after post-cure
- Low prepreg volatile content
- Suitable for autoclave and vacuum bag cure

#### TYPICAL NEAT RESIN PROPERTIES

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

Tg (DMTA) after 4 hours post-cure at 140°C (284°F)..... Onset: 124°C (255°F)  
Peak tan δ: 138°C (280°F)

#### TYPICAL LAMINATE PROPERTIES

##### HIGH STRENGTH CARBON 280 GSM 4x4 TWILL, T300 3K - 0/90° CONFIGURATION WOVEN LAMINATES, CURED 3½ HOURS AT 70°C (158°F).

Property	Condition	Method	Results	
Tensile Strength	RTD	EN ISO 527-4	672 MPa	98 ksi
Tensile Modulus	RTD	EN ISO 527-4	56.4 GPa	8.2 Msi
Poisson's Ratio	RTD		0.05	
Compression Strength	RTD	EN 2850	524 MPa	76 ksi
Compression Modulus	RTD	EN 2850	71.9 GPa	10.4 Msi
Flexural Strength	RTD	CRAG 200	840 MPa	122 ksi
Flexural Modulus	RTD	CRAG 200	62 GPa	9 Msi
ILSS	RTD	CRAG 100	70 MPa	10 ksi

\* Results normalized to 55%

\* Tensile Strain to Failure (%) = 1.1

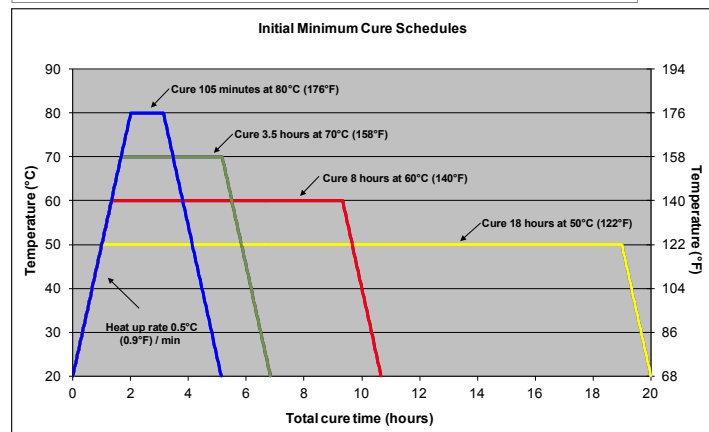
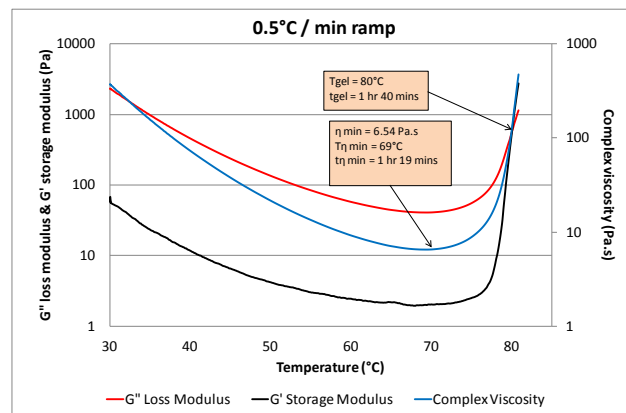
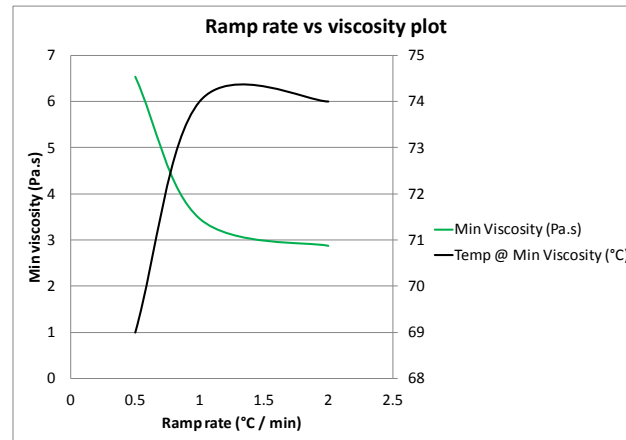
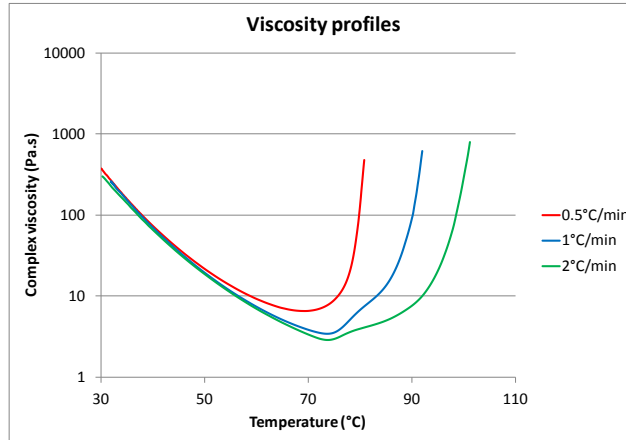
# TECHNICAL DATA



TENCATE ADVANCED COMPOSITES

## TenCate E644

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### CURE PROPERTIES: VISCOSITY PROFILE (30°C TO 105°C OR 86°F TO 221°F)

Ramp rate [°C (°F) /min]	Min viscosity (Pa.s)	Temp @ min. viscosity °C (°F)
0.5 (1.0)	6.54	69 (156)
1 (1.8)	3.46	74 (165)
2 (3.6)	2.87	74 (165)

### RECOMMENDED CURE TIMES

Cure temperature °C (°F)	Recommended cure time
50 (122)	18 hrs
60 (140)	8 hrs
70 (158)	3.5 hrs
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) / hour and hold for 4 hours minimum, this post cure will result in a T<sub>g</sub> (Peak tan δ) of approximately 138°C (280°F).
- Laminates may be post cured unsupported unless the size, shape and laminate thickness would allow excessive distortion under self-weight.

### 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 in Hg) is applied for 20 minutes.

TenCate E644 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 E644 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 and protective clothing.

For further information refer to Material Safety Data Sheet.

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*All data given is based on representative samples of the materials in question. Since the method and circumstances under which these materials are processed and tested are key to their performance, and TenCate Advanced Composites has no assurance of how its customers will use the material, the corporation cannot guarantee these properties.*

## TENCATE ADVANCED COMPOSITES

18410 Butterfield Blvd.  
Morgan Hill, CA 95037 USA  
Tel: +1 408 776 0700  
Fax: +1 408 776 0107

2450 Cordelia Road  
Fairfield, CA 94534 USA  
Tel: +1 707 359 3400  
Fax: +1 707 359 3495

Amber Drive, Langley Mill  
Nottingham, NG16 4BE UK  
Tel: +44 (0)1773 530899  
Fax: +44 (0)1773 768687

G. van der Muelenweg 2  
7443 PV Nijverdal NL  
Tel: +31 548 633 933  
Fax: +31 548 633 299

[www.tencate.com](http://www.tencate.com)  
[www.tencateadvancedcomposites.com](http://www.tencateadvancedcomposites.com)  
[www.tencateindustrialcomposites.com](http://www.tencateindustrialcomposites.com)  
info@tcac-usa.com (USA)  
advancedcomposites.europe@tencate.com (Europe)