

PRODUCT DATASHEET



TENCATE ADVANCED COMPOSITES

TenCate E760 Highly toughened epoxy component prepreg

PRODUCT TYPE

180°C (350°F) cure system

Highly toughened epoxy component prepreg

TYPICAL APPLICATIONS

- Structural applications within Formula 1
- High temperature automotive

SHELF LIFE

Out life

21 days at @ 18°C (64°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 E760 is a highly toughened epoxy resin system with exceptional high temperature performance. It has been designed for use in mechanically demanding structural applications exposed to elevated temperature environments, such as Formula 1 and high performance automotive.

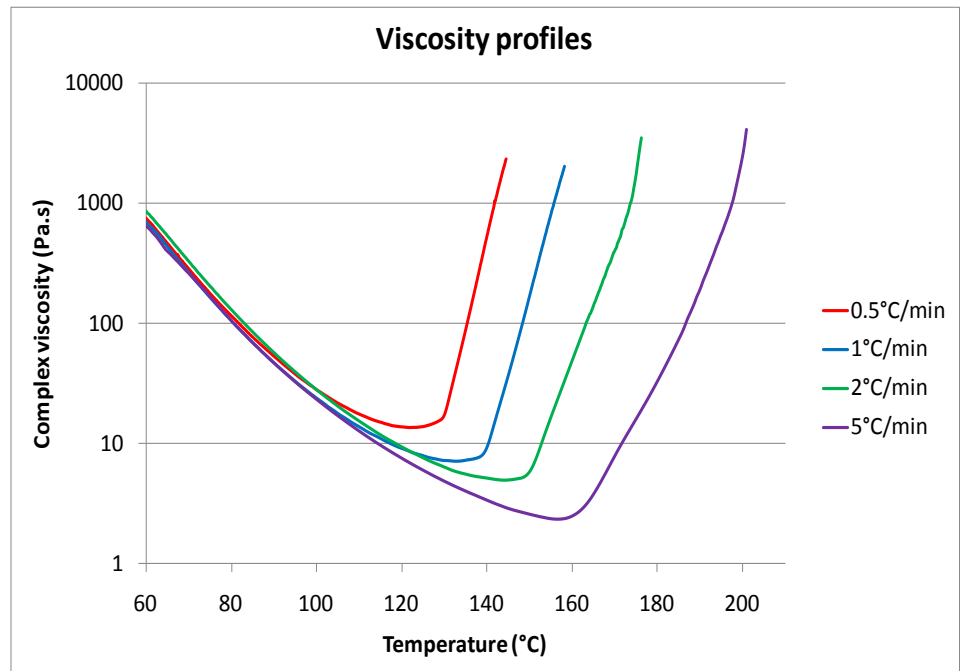
TENCATE E760 PREPREG BENEFITS/FEATURES

- Highly toughened resin system
- Excellent retention of properties at elevated temperature
- T_g above >200°C (392°F) after 180°C (356°F) cure
- Excellent mechanical properties
- Controlled flow

TYPICAL NEAT RESIN PROPERTIES

Density 1.21 g/cm³ (75.5 lbs/ft³)

T_g (DMA) after 2 hrs at 180°C (356°F)..... Onset: 204°C (399°F);
Peak tan δ: 216°C (421°F)

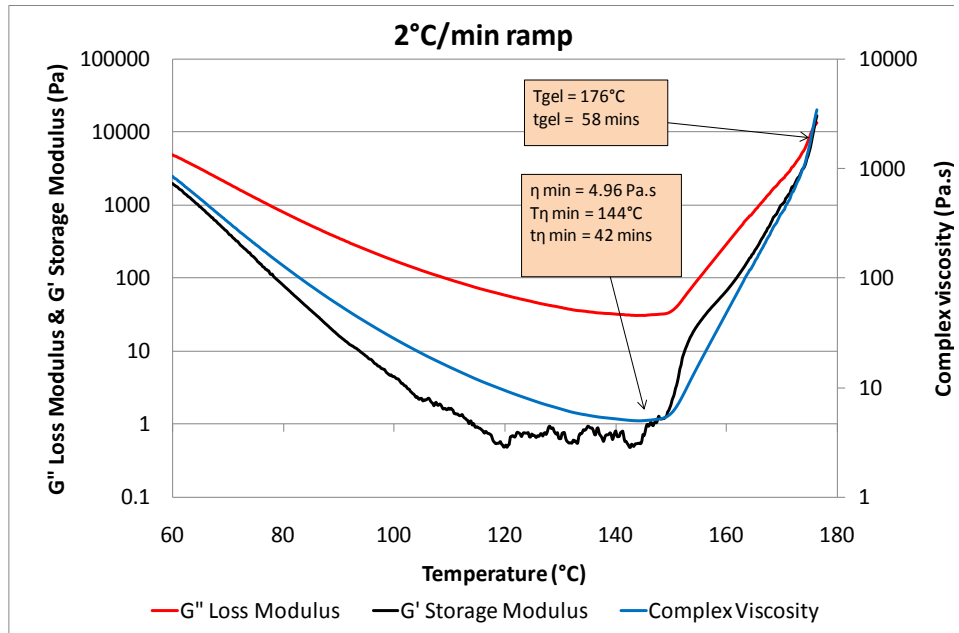
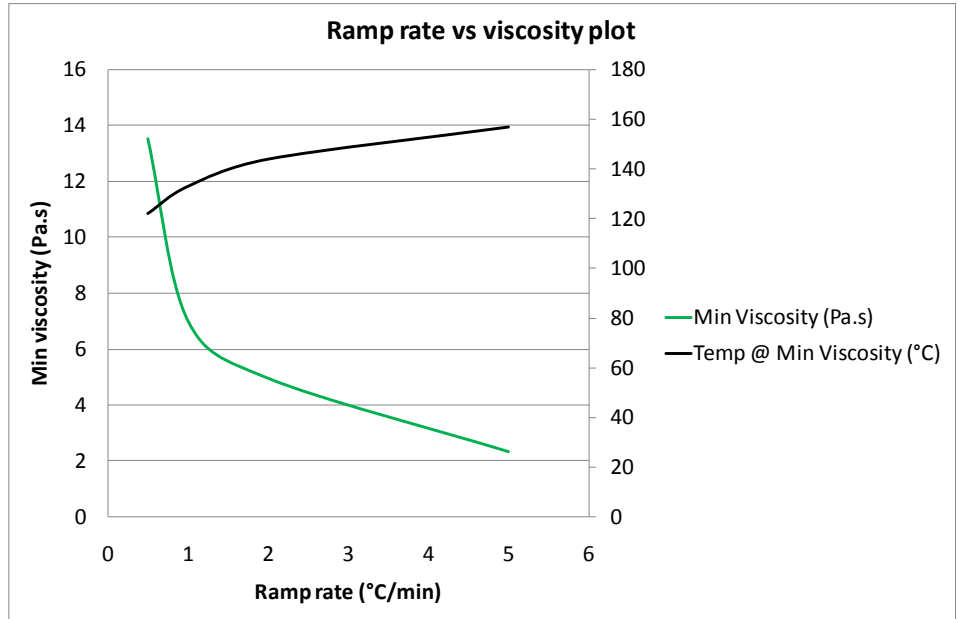


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CURE PROPERTIES: VISCOSITY PROFILE (60°C TO 200°C OR 140°F TO 392°F)

| Ramp rate [°C (°F)/min] | Min viscosity (Pa.s) | Temp @ min viscosity °C (°F) |
|-------------------------|----------------------|------------------------------|
| 0.5 (0.9) | 13.54 | 122 (251) |
| 1 (1.8) | 7.02 | 133 (271) |
| 2 (3.6) | 4.96 | 144 (291) |
| 5 (9) | 2.33 | 157 (314) |

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TYPICAL CURE PROFILES

| 180°C (356°F) cure temperatures | | |
|---------------------------------|--|---------------------|
| Ramp | 2.0°C (3.6°F) / minute to 180°C (356°F) | Dwell for 2 hours |
| Cool | 2.0°C (3.6°F) / minute to below 60°C (140°F) | Followed by demould |
| Total time: 4 hours | | |

POST-CURE

After the initial cure, a post-cure up to 200°C may be required to maximise the end-use temperature as follows:

- Ramp temperature at 2°C/min (3.6°F/min) to 200°C (392°F)
- Hold at 200°C (392°F) for 2 hours
- Cool oven to 60°C (140°F) at 3°C/min (5.4°F/min)

CURE CYCLE COMPARISON

| Cure cycle | Tg (Onset) °C (°F) |
|--|--------------------|
| 3 hours at 135°C (275°F) | 162 (324) |
| 3 hours at 135°C (275°F) plus 2 hours at 180°C (356°F) | 200 (392) |
| 2 hours at 180°C (356°F) | 204 (399) |
| 2 hours at 180°C (356°F) plus 2 hours at 200°C (392°F) | 216 (421) |

TYPICAL LAMINATE PROPERTIES

E760-00 HM0322 -CARBON M46JB 285 GSM 5HS 6K 42% R.W CURED 2HRS AT 180°C (356°F)

| Property | Method | Test Temperature | |
|-----------------------------------|-----------|------------------|---------------|
| | | RT | 120°C (248°F) |
| Tensile Strength (MPa) - Warp | ISO 527-4 | 627 | 744 |
| Tensile Modulus (GPa) - Warp | ISO 527-4 | 98 | 99.3 |
| Tensile Strength (MPa) - Weft | ISO 527-4 | 604 | 689 |
| Tensile Modulus (GPa) - Weft | ISO 527-4 | 95.3 | 97.3 |
| Poisson's Ratio | ISO 527-4 | 0.02 | |
| Compression Strength (MPa) - Warp | prEN2580 | 445 | 392 |
| Compression Modulus (GPa) - Warp | prEN2580 | 85.7 | 86.1 |
| Compression Strength (MPa) - Weft | prEN2580 | 431 | 397 |
| Compression Modulus (GPa) - Weft | prEN2580 | 85.3 | 84.3 |
| In-Plane Shear Strength (MPa) | prEN6031 | 73 | 55.6 |
| In-Plane Shear Modulus (GPa) | prEN6031 | 3.7 | 2.9 |
| Poisson's Ratio | prEN6031 | 0.9 | |

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| Property | Method | Test Temperature | | | | |
|-------------------------|-----------|------------------|---------------|--|--|--|
| | | RT | 120°C (248°F) | | | |
| ILSS Warp (MPa) | ISO 14130 | 49 | 39.4 | | | |
| ILSS Weft (MPa) | ISO 14130 | 51.0 | 38.8 | | | |
| Bearing strength (MPa) | prEN6037 | 698 | -- | | | |
| GIC (J/m ²) | prEN6033 | 607 | -- | | | |

| Property | Method | Test Temperature | | | | |
|-----------------------------------|-----------|------------------|--------------|---------------|---------------|---------------|
| | | RT | 80°C (176°F) | 120°C (248°F) | 150°C (302°F) | 180°C (356°F) |
| Compression Strength (MPa) - Warp | prEN2580 | 445 | 420 | 418 | 392 | 404 |
| Compression Strength (MPa) - Weft | prEN2580 | 431 | 430 | 404 | 397 | 378 |
| ILSS (MPa) - Warp | ISO 14130 | 49 | 47.8 | 44 | 39.4 | 31.5 |
| ILSS (MPa) - Weft | ISO 14130 | 51 | 47 | 44 | 38.8 | 30.5 |

PROCESSING

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

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.

For autoclave cures, use of a non-perforated release film on the prepreg surface trimmed to within 25-30mm of prepreg edge is recommended for the cure cycle, a vacuum bag should be installed using standard techniques.

EXOTHERM

In certain circumstances, such as the production of thick section laminates rapid heat up rates or highly insulating masters. TenCate E760 can undergo exothermic heating leading to rapid temperature rise and component degradation in extreme cases.

Where this is likely, a cure incorporating an intermediate dwell is recommended in order to minimize the risk.

Revised 02/2015

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

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