



# CEM160

## Cyanate Ester Component Prepreg

### Introduction

CEM160 is a cyanate ester prepreg designed to cure at medium temperatures, whilst producing durable components with excellent high temperature performance. It can be supplied on a variety of fabrics and in UD format to meet your cost and manufacturing requirements.

**Typical applications:** *High service temperature – Aerospace / Motorsport*

### Key Features & Benefits

- Cure temperature from **120°C to 135°C**
- Service temperature up to **270°C** and localised exposure up to **400°C** after post cure
- Low CTE and shrinkage
- Work life at 20°C: **21 days**
- Storage life at -18°C: **12 months**
- Very low VOC content – no added solvents during manufacture
- **High service temperature**
- **UD reinforcements available** – consult SHD for details

### Storage & Out Life

This material should be kept frozen at -18°C. It must be kept sealed in a polythene bag which must not be opened until fully thawed to room temperature. If the material is not fully used, then the material must be resealed in the polythene bag to prevent moisture absorption.

#### **Important Note:**

If bags are opened before fully cured, condensation may form on the material. Cyanate ester prepreps may react with moisture, which can affect the curing reaction and cause voidage. Great care must be taken to avoid contact with water. Thoroughly dry all tooling and fixtures before commencing lay-up.



## Cure Cycles & performances

- Recommended Initial cure:
  - **135°C for 2h**, at a ramp rate of **1.0°C/min**
- Recommended Post cure:
  - **250°C for 2h**, at a ramp rate of **0.3°C/min**

*Note: may produce charring and reduce service life*

### CURE CYCLE OPTIONS:

| Temperature |           | Duration | Tg     |
|-------------|-----------|----------|--------|
| 120°C       | (minimum) | 3 hours  | 125°C  |
| 135°C       | (maximum) | 2 hours  | 140°C  |
| 180°C       | Post Cure | 2 hours  | 275°C* |
| 250°C       | Post Cure | 2 hours  | 275°C  |

*\*A 180°C post cure will give the same service temperature than a 250°C post cure, however a 250°C is recommended in order to reach a higher degree of cure.*

### Important Note:

It is recommended that post curing is carried out immediately after initial cure. This will remove the risk of performance degradation due to moisture absorbance.

- Curing Schedule is meant to be a guide only and is subject to local conditions.
- To avoid exotherm particular care must be taken with thick laminates.  
Ramp rates must not exceed **3.0°C** per minute during **initial cure**.  
Ramp rates must not exceed **0.3°C** per minute during **post cure** (free standing).
- Typical Tg:

| Test | Results                    |               | Standard                                   |
|------|----------------------------|---------------|--|
| DMA  | Tg – Storage Modulus Onset | <b>275 °C</b> | Modified ASTM D7028<br>(Single Cantilever) |
|      | Tg – Tan δ Peak            | <b>296 °C</b> |  |

*Tests performed on **CEM160** specimens, cured as per the recommended cure and post-cure cycles above.*



## Cured Material Properties

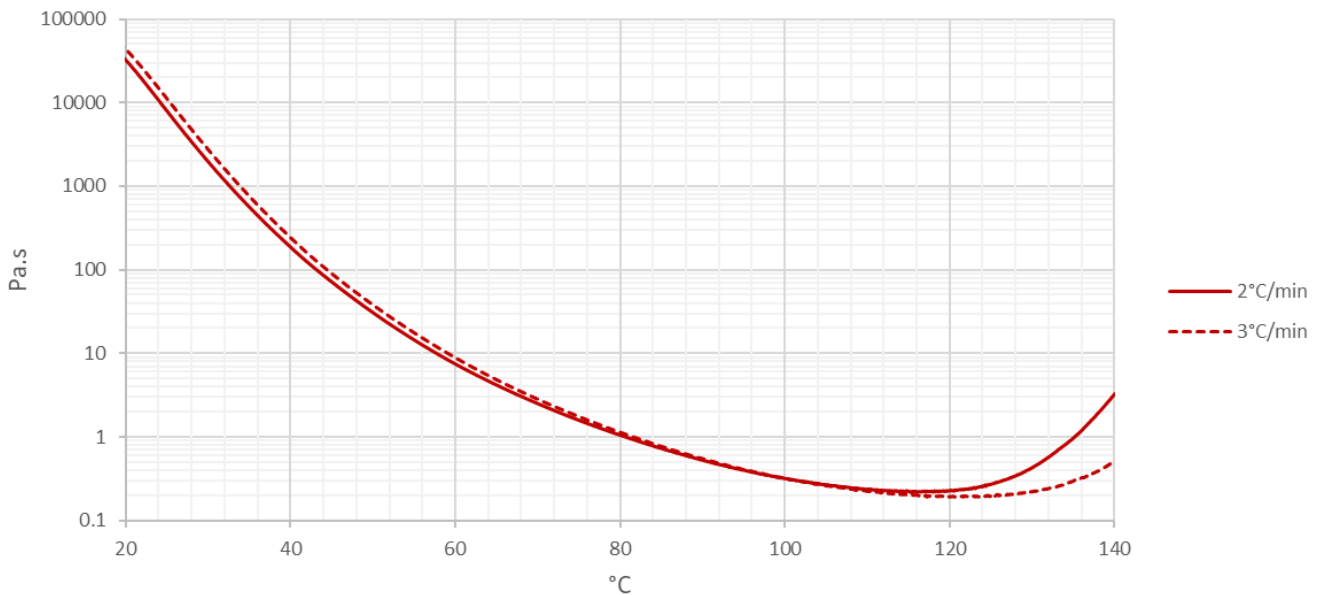
Tests performed on **CEM160** neat resin, cure as per the recommended cure and post-cure cycles on page 2.

| Test              | Results  | Standard       |
|-------------------|--|----------------|
| <b>Outgassing</b> | TML (Total Mass Loss)                          | <b>0.687</b> % |
|                   | CVCM (Collected Volatile Condensable Material) | <b>0.008</b> % |
|                   | RML (Recovered Mass Loss)                      | <b>0.177</b> % |
|                   | WVR (Water Vapour Regained)                    | <b>0.510</b> % |

Tests completed independently by external accredited test laboratories. Complete tests reports can be supplied independently upon request.

## Viscosity Profile

Testing carried out using a rotational rheometer.



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## Health and Safety

Please refer to the product Safety Data Sheet before using this material. The following precautions must be taken when using epoxy resin prepregs:

- Overalls must be worn.
- Impervious gloves must be worn.
- Curing schedule is meant to be as a guide only and is subject to local conditions.
- To avoid exotherm, particular care must be taken with thick laminates.
- Ramp rates must not exceed 1.0°C/min during initial cure and 0.3°C/min during post cure.

**Disclaimer:** Technical advice, instruction, data or recommendation, whether verbal or in writing, is given in good faith. The SHD company providing any such advice gives no warranty or guarantee, whether express or implied, in relation to such advice.

Customers must carry out their own tests and assessments as necessary in order to determine the quality and suitability of the product for their particular application and circumstances. Such testing should be performed under conditions identical to those to which the final component/product may be subjected. Values listed in any SHD document are for typical properties of the product or substance in question and are not intended to be used in establishing either statistical specifications nor engineering basis values. They do not constitute either minimum or maximum values for the product or substance in question.