

## Technical Data Sheet

# Evopreg<sup>®</sup> EPC200

Variable temperature cure epoxy prepregs for component applications

### Introduction

Evopreg<sup>®</sup> EPC200 component prepregs are primarily designed for low-temperature, out-of-autoclave processing. Their flexible cure profile also makes them ideally suited to rapid processing at higher temperatures.

Based on a toughened epoxy resin system, Evopreg<sup>®</sup> EPC200 is formulated specifically for high performance, ease of lay-up and excellent surface finish.

The prepregs can be supplied with a range of reinforcement fibres and fabric constructions. They can be consolidated by vacuum bag/oven or autoclave and are designed for a range of applications including automotive, motorsport, sporting goods and general industrial.

### Key Features & Benefits

- Flexible cure temperature 65-120°C
- Service temperature up to 120°C
- Suitable for vacuum bag/oven and autoclave moulding
- 21 days out-life at room temperature
- 12 months storage life at -18°C
- Good tack and drape
- Toughened
- Excellent surface finish
- Available on a range of reinforcement fabrics

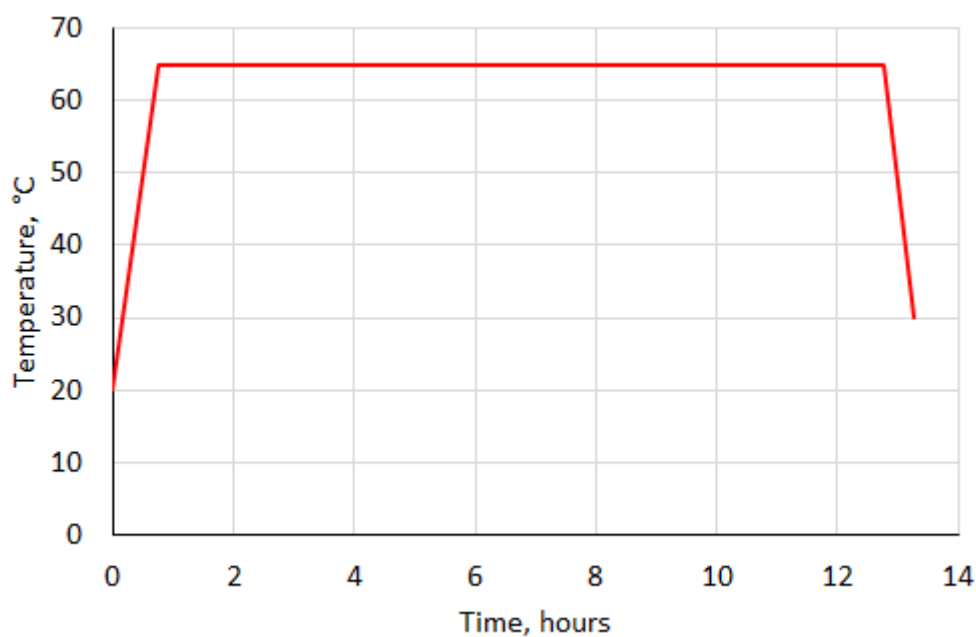
## Processing & Curing

The preregs can be processed using standard techniques including vacuum bag/oven and autoclave. Suggested cure cycles are shown below.

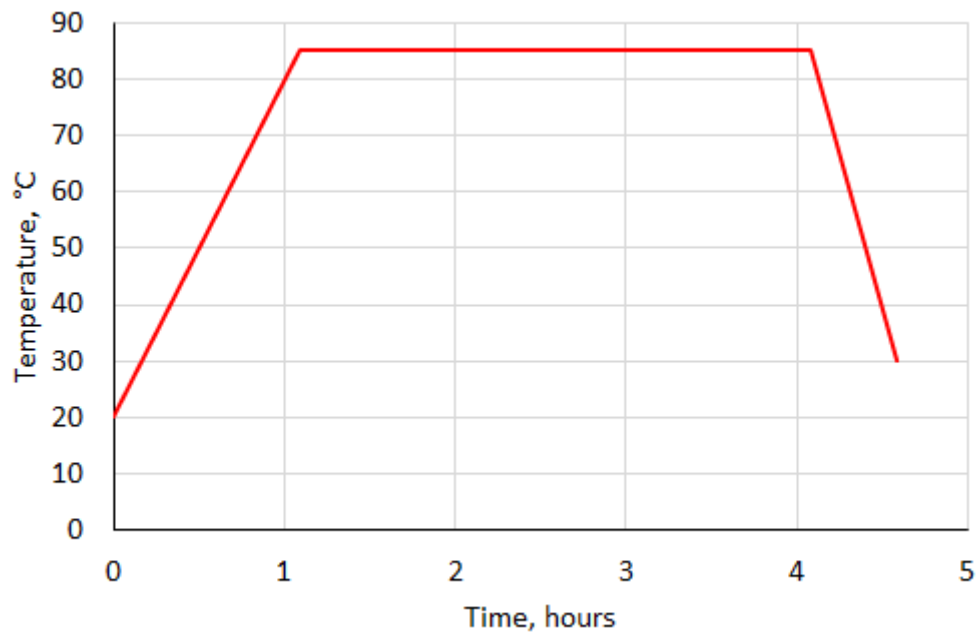
Cure temperature	Minimum cure time	Glass transition temperature, Tg	
		Tg, onset E'	Tg, peak tan $\delta$
65°C	12 hours	69°C	85°C
85°C	3 hours	95°C	119°C
120°C	30 minutes	124°C	145°C

- Recommended maximum ramp rate 1°C/min.
- Ramp rates may need to be reduced and/or cure times extended to account for thermal lag in large tools.
- For autoclave cures, we recommend using a relatively low pressure e.g. 30-50 psi (2-3.5 bar) to avoid excess resin bleed.
- If curing at 120°C out-of-autoclave, an initial hold at 80°C for at least 30 minutes before ramping to higher temperatures may assist resin flow to improve surface finish.
- Optional post-cure 120°C for 1 hour - Tg onset E' 128°C, Tg peak tan  $\delta$  145°C (max ramp rate 0.3°C/min).
- Alternative post-cure 95°C for 1 hour - Tg onset E' 114°C, Tg peak tan  $\delta$  131°C (max ramp rate 0.3°C/min).

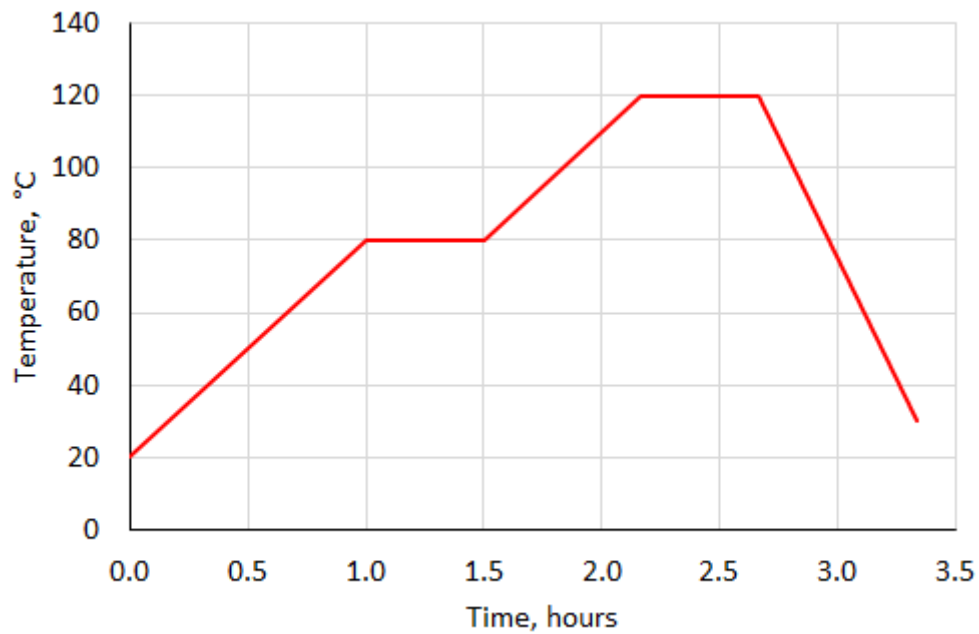
Suggested cure cycle for vacuum bag/oven cures at 65 °C:



Suggested cure cycle for vacuum bag/oven cures at 85 °C:



Suggested cure cycle for vacuum bag/oven cures at 120 °C:



# Composite Properties

## Mechanical Properties of Monolithic Laminates

### Carbon

#### EPC200-C205T

Typical data for laminates made from Evopreg® EPC200 205 g/m<sup>2</sup> 2x2 twill high strength carbon fibre prepreg (Evopreg® EPC200-C205T-HS-3K-45-1250) cured in a vacuum bag/oven for 12 hours at 65°C followed by a free standing post-cure for 1 hour at 120°C.

Property	Result	Result, normalized 50% Vf	Test method
Fibre content by volume, Vf	46%	50%	-
Cured ply thickness	0.26 mm/ply	0.23 mm/ply	-
Density	1.46 g/cm <sup>3</sup>	1.49 g/cm <sup>3</sup>	-
Flexural strength, 0°	705 MPa	772 MPa	ISO 14125
Flexural modulus, 0°	49.0 GPa	53.7 GPa	ISO 14125
Tensile strength, 0°	582 MPa	678 GPa	ISO 527-4
Tensile modulus, 0°	51.7 GPa	60.3 MPa	ISO 527-4
Compression strength, 0°	548 MPa	607 MPa	ASTM D6641
Apparent interlaminar shear strength (ILSS), 0°	61.5 MPa	-	ISO 14130
In-plane shear strength, ±45°	88.9 MPa	-	ISO 14129 <sup>1</sup>

1. No clear failure, value taken at 5% strain

# Composite Properties

## Mechanical Properties of Monolithic Laminates

### Carbon

#### **EPC200-C650T**

Typical data for laminates made from Evopreg® EPC200 650 g/m<sup>2</sup> 2x2 twill high strength carbon fibre prepreg (Evopreg® EPC200-C650T-HS-12K-38-1250) cured in a vacuum bag/oven for 12 hours at 65°C followed by a free standing post-cure for 1 hour at 120°C.

Property	Result	Result, normalized 50% Vf	Test method
Fibre content by volume, Vf	51%	50%	-
Cured ply thickness	0.69 mm/ply	0.68 mm/ply	-
Density	1.48 g/cm <sup>3</sup>	1.48 g/cm <sup>3</sup>	-
Flexural strength, 0°	762 MPa	752 MPa	ISO 14125
Flexural modulus, 0°	46.0 GPa	45.4 GPa	ISO 14125
Tensile strength, 0°	529 MPa	522 MPa	ISO 527-4
Tensile modulus, 0°	54.4 GPa	53.7 GPa	ISO 527-4
Compression strength, 0°	399 MPa	390 MPa	ASTM D6641
Apparent interlaminar shear strength (ILSS), 0°	54.0 MPa	-	ISO 14130
In-plane shear strength, ±45°	70.1 MPa	-	ISO 14129

## Available Products

Evopreg® prepregs are available with a wide range of reinforcements, including woven, non-woven, non-crimp stitched and unidirectional fabrics in the following fibres:

- Carbon
- Glass
- ampliTex™ Flax
- Aramid
- Hybrids

## Packaging

The material is typically delivered in rolls and with a silicone coated release paper on the bottom and a polythene release film on the top. Typical packaging - 76 mm (3") diameter cardboard core, polythene bag, reusable cable ties, cardboard box and end supports. Where relevant, multiple boxes are typically stacked on a standard wooden pallet, strapped and covered with stretch wrap. Other packaging may be available on request. We recommend retaining the boxed packaging to protect the material during storage.

## Storage

The material should ideally be stored in a freezer at -18°C and sealed in a polythene bag. To protect the material, we recommend storing it in its original box with the end supports. To avoid moisture condensation, allow the material to defrost fully and reach room temperature before opening the polythene bag. Typical thaw time for a full roll is 4-6 hours. Keep the material sealed in the polythene bag when not in use to prevent moisture absorption. The cable tie that seals the polythene bag is reusable. Out-life at room temperature is 21 days. Storage life at -18°C is 12 months.

## Health & Safety

Please refer to the Safety Data Sheet (SDS) before use. This material contains epoxy resin and fibres which can cause irritation to skin and eyes and allergic reactions. Wear appropriate PPE including overalls and impervious gloves, and ensure adequate ventilation. Exothermic reactions can occur when curing epoxy resins, and particular care must be taken when curing thick laminates.

## Disclaimer

The information provided here is believed to be accurate but should be considered indicative only. It is the responsibility of the customer to check the suitability of the product for their specific application prior to use.

*Evopreg® EPC200 TDS v1.5 03/12/2021*