Unit 4
The Reservation
Sleaford Enterprise Park
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MTC400-1

Epoxy Component Prepreg

Introduction

MTC400-1 is an epoxy resin system designed to cure between 80°C and 135°C allowing flexibility in component manufacture. It is a toughened epoxy resin system designed for component manufacturing that can be supplied on a variety of fabrics and in UD format to meet your cost and manufacturing requirements.

Typical applications: *Motorsport / Aerospace*

Key Features & Benefits

- Cure temperature from **80°C** to **135°C**
- Service temperature up to **200°C** after post cure
- Low CTE and shrinkage
- Work life at 20°C: **30 days**
- Storage life at -18°C: **12 months**
- Very low VOC content – no added solvents during manufacture
- **Improved toughness** over MTC400

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.

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Cure Cycles & performances

CURE CYCLE OPTIONS:

Temperature		Duration		Tg
80°C	(minimum)	16	hours	90°C
90°C		8	hours	100°C
100°C		4	hours	110°C
110°C		2	hours	120°C
135°C	(maximum)	1	hour	145°C
180°C	Post Cure	2	hours	205°C

- 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).

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Cured Material Properties

PLY: ***200gsm 2x2 twill 6k, 42% resin weight***
Material description: *MTC400-1-C200T-T800-42%RW-1250 (SHD0447-1250)*

Test	Results			*Standard*
Vf	Fibre volume fraction	**48.79**	**%**	*BS EN ISO 14127 Method B*
CPT	Cured ply thickness	**0.225**	**mm**	*BS EN ISO 14127 Method B*
Tensile 0°	Tensile strength	**981**	**MPa**	*BS EN ISO 527-4*
	Tensile modulus	**67.0**	**GPa**	
	Poisson's ratio	**0.07**		
Tensile 90°	Tensile strength	**893**	**MPa**	
	Tensile modulus	**66.5**	**GPa**	
	Poisson's ratio	**0.07**		
Compressive 0°	Compressive strength	**737**	**MPa**	*prEN 2850 Type B*
	Compressive modulus	**61.0**	**GPa**	
Compressive 90°	Compressive strength	**765**	**MPa**	
	Compressive modulus	**61.7**	**GPa**	
Flexural 0°	Flexural strength	**1032**	**MPa**	*BS EN ISO 14125*
	Flexural modulus	**64.5**	**GPa**	
Flexural 90°	Flexural strength	**1056**	**MPa**	
	Flexural modulus	**64.9**	**GPa**	
In-Plane Shear ±45°	In-Plane shear strength (5% strain)	**95.9**	**MPa**	*BS EN ISO 14129*
	In-Plane shear strength (ultimate)	**118.6**	**MPa**	
	In-Plane shear modulus	**4.00**	**GPa**	
Interlaminar Shear 0°	Interlaminar shear strength	**97.4**	**MPa**	*BS EN ISO 14130*
Interlaminar Shear 90°	Interlaminar shear strength	**91.8**	**MPa**	
Fracture Toughness (G1c)	G_{1c}	**390**	**J/m²**	*prEN 6033*
DMA – Dry Tg	Tg E' Onset	**154**	**°C**	*Modified ASTM D7028 (Single Cantilever)*
	Tg Peak Tan δ	**222**	**°C**	

Cure schedule: 15 mins @ 85°C then 90 mins @ 135°C, 2°C/min ramp rate (solid release, autoclave cured, 6 bar). All figures in this table are actual test results and have not been normalised. Complete test reports can be supplied independently upon request.

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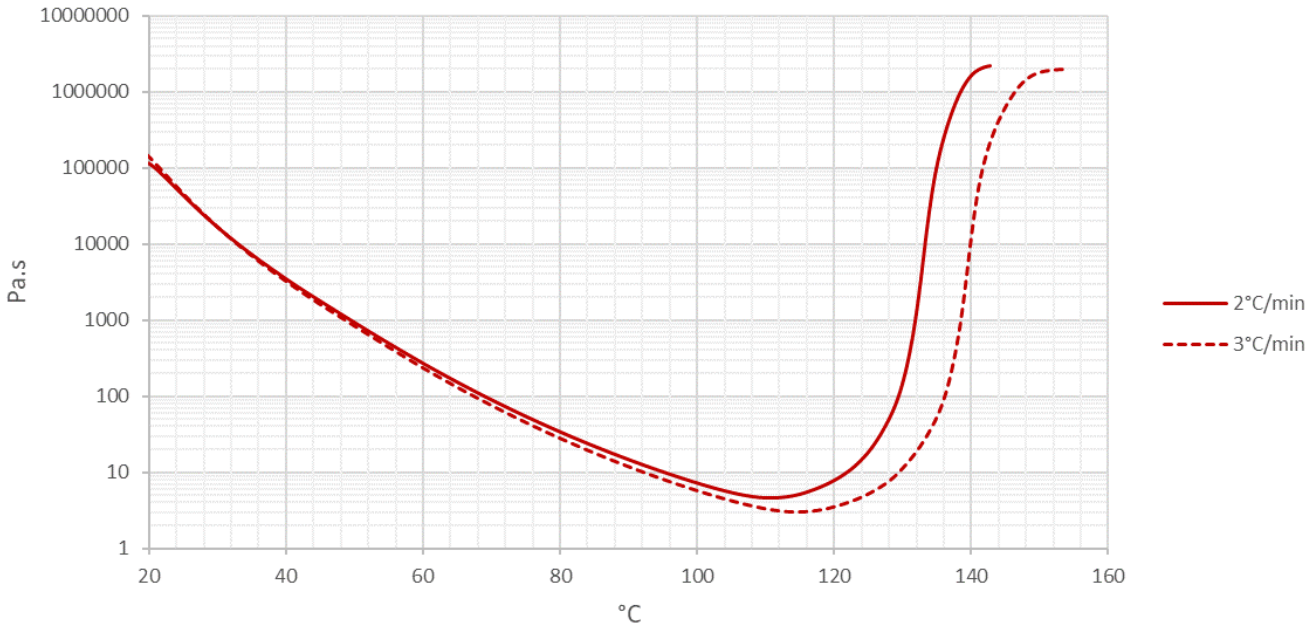
Viscosity Profile

Measured using a rotational rheometer



Health and Safety

This material contains epoxy resin which can cause allergic reactions with skin contact and must avoid repeated and prolonged skin contact.

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 3.0°C/min during initial cure and 0.3°C/min during post cure.