



MTC581

Epoxy Component Prepreg

Introduction

MTC581 is a highly toughened, flow controlled, damage tolerant prepreg intended for applications in Sporting Goods, Automotive / Motorsport and Aerospace designed to be cured at 250°F (121°C). This 'hot melt' system is solvent-free with excellent tack and drape characteristics and can be supplied on a broad range of woven reinforcements and unidirectional tapes to meet your cost and manufacturing requirements. Snap-curing versions are available, contact SHD for details.

Typical applications: *Composite components made by Autoclave, Compression Mold & Vacuum Bag / Oven techniques.*

Product variants: MTC580 *Higher service temperature, lower flow control*

Key Features & Benefits

- Standard cure temperature of **250°F (121°C)**
- Suggested maximum service temperature of **190°F (88°C)**
- Low CTE and shrinkage
- Work life at 70°F (21°C): **30 days**
- Storage life at 0°F (-18°C): **12 months**
- Very low VOC content – no added solvents during manufacture
- Controlled flow

Storage & Out Life

This material should be kept frozen at 0°F (-18°C). Good industry standard handling practices for epoxy prepreps dictate that it should be kept sealed in a polythene bag, which is typically opened once 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.



Cure Cycles & performances

RECOMMENDED CURE CYCLE:

- **250°F (121°C) for 75mins**, at a ramp rate of **4-5°F (2-3°C) per min** under full vacuum and 90psi.

CURE CYCLE OPTIONS:

Temperature	Duration	Tg
185°F (85°C) (minimum)	16 hours	TBD – est. ~195°F (91°C)
195°F (91°C)	8 hours	TBD – est. ~205°F (96°C)
210°F (99°C)	4 hours	TBD – est. ~220°F (104°C)
250°F (121°C) (*maximum)	1 hour	250°F (121°C)

**Other cure cycles can be used, (e.g. shorter durations at higher temperatures such as press moulding applications) please consult SHD for more information.*

- SHD advises not to vent autoclave vacuum with MTC581 prepregs.
- Suitable controlled flow consumables and bagging methods should be used, please consult SHD for advice on best use of process materials.
- Curing Schedule is meant to be a guide only and is subject to customer process & local conditions.
- To avoid exotherm particular care must be taken with thick laminates.
Ramp rates must not exceed 5.4°F (3.0°C) per minute during initial cure in autoclave and oven processes.

TYPICAL TG:

DMA – Dry Tg	250°F for 75mins	Tg E' Onset	250 °F	(121 °C)	<i>Modified ASTM D7028 (Single Cantilever)</i>
		Tg Peak Tan δ	295 °F	(146 °C)	

Tests performed on **MTC581-C200T-HS-3K-42%RW** laminates.



Cured Material Properties

Tests performed on **MTC581-C200T-HS-3K-42%RW** laminates

(200gsm 2x2 twill, T300 3k carbon fabric)

Test	Results	StDev.	Standard
Vf	Fibre volume fraction	47.82 %	- BS EN ISO 14127 Method B
CPT	Cured ply thickness	0.235 mm	- BS EN ISO 14127 Method B
Tensile 0°	Tensile strength	687 MPa	24.4
	Tensile modulus	54.9 GPa	54.9
	Poisson's ratio	0.09	- 0.02
Tensile 90°	Tensile strength	670 MPa	29.0
	Tensile modulus	55.8 GPa	0.14
	Poisson's ratio	0.06	- 0.01
Compressive 0°	Compressive strength	750 MPa	25.8
	Compressive modulus	51.7 GPa	0.43
Compressive 90°	Compressive strength	745 MPa	8.9
	Compressive modulus	50.9 GPa	0.38
In-Plane Shear ±45°	In-Plane shear strength (5% strain)	69.7 MPa	0.4
	In-Plane shear strength (ultimate)	109.9 MPa	1.0
	In-Plane shear modulus	3.53 GPa	0.03
Interlaminar Shear 0°	Interlaminar shear strength	83.2 MPa	1.7
Interlaminar Shear 90°	Interlaminar shear strength	82.4 MPa	1.3
Flexural 0°	Flexural strength	887 MPa	25.7
	Flexural modulus	52.6 GPa	0.52
DMA – Dry Tg	Tg E' onset	121 °C	-
	Tg peak tan δ	146 °C	-
			Modified ASTM D7028 (Single Cantilever)

Mechanical testing carried out at 21±2°C. Cure: 120°C, autoclave 6bar. All figures in this report are actual test results and have not been normalised. Testing was either completed by SHD Composites laboratories, or independently by UKAS approved organisations. Complete test reports can be supplied independently upon request.



Tests performed on **MTC581-UD150-T700-24K-35%RW** laminates (150gsm UD, T700 24k carbon fibre)

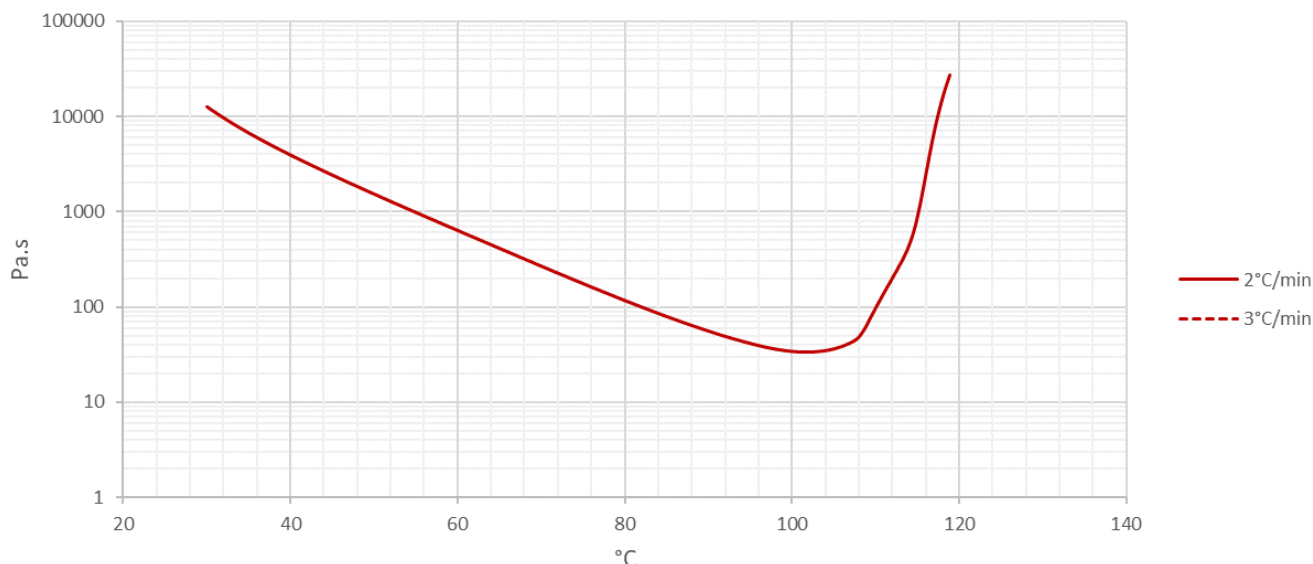
Test	Results	StDev.	Standard
Vf	Fibre volume fraction	52.05 %	- BS EN ISO 14127 Method B
CPT	Cured ply thickness	0.164 mm	- BS EN ISO 14127 Method B
Tensile 0°	Tensile strength	2504 MPa	96.5
	Tensile modulus	113.9 GPa	3.98
	Poisson's ratio	0.32 -	0.01
Tensile 90°	Tensile strength	55 MPa	4.6
	Tensile modulus	7.5 GPa	0.08
	Poisson's ratio	0.04 -	0.00
Compressive 0°	Compressive strength	1292 MPa	91.4
	Compressive modulus	103.3 GPa	3.76
Compressive 90°	Compressive strength	211 MPa	5.2
	Compressive modulus	8.6 GPa	0.03
In-Plane Shear ±45°	In-Plane shear strength (5% strain)	65.5 MPa	0.5
	In-Plane shear strength (ultimate)	117.0 MPa	1.4
	In-Plane shear modulus	3.73 GPa	0.08
Interlaminar Shear 0°	Interlaminar shear strength	88.8 MPa	1.2
DMA – Dry Tg IC	Tg E' onset	134 °C	-
	Tg peak tan δ	155 °C	-
(Single Cantilever)			

Mechanical testing carried out at 21±2°C. Cure: 120°C, autoclave 6bar. All figures in this report are actual test results and have not been normalised. Testing was either completed by SHD Composites laboratories, or independently by UKAS approved organisations. Complete test reports can be supplied independently upon request.



Viscosity Profile

Testing carried out 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 5.4°F (3.0°C) /min during initial cure in autoclave and oven processes, and 0.5°F (0.3°C) /min during free standing 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.