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MTC510 Epoxy Component Prepreg

Introduction

MTC510 is an epoxy resin system designed to cure between 80°C and 120°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.

Key Features & Benefits

- Cure temperature from 80°C - 120°C
- Service temperatures up to 135°C after postcure.
- Low CTE and shrinkage.
- Work life at 20°C: 28 days.
- Storage life at -18°C: 12 months.
- Very low VOC content – no added solvents during manufacture.
- Excellent surface finish.

Storage & Out Life

The 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.

Mechanical Properties

MTC510-42%-2X2T-3K-T300-1250				
Compression Test - BS EN ISO 14126 : 1999				
	Sample	Dimensions (mm)	Max Load (kN)	Comp Strength (MPa)
001: 0 Direction	1	9.80 x 1.90	11.3	606
002: 0 Direction	2	9.78 x 1.90	11.3	608
003: 0 Direction	3	9.78 x 1.90	11.7	631
Mean			11.4	615
Standard Deviation			0.23	13.9
% Co-Efficient of Variance			2.02	2.26
Item 01: Through Thickness Shear				
Item 03: Through Thickness Shear				

MTC510-42%-2X2T-3K-T300-1250					
Tension - ISO 527-4: 9					
	Sample	Dimensions (mm)	Max Load (kN)	Tensile Strength (MPa)	Tensile Modulus (GPa)
004: Tension 0	1	1.93 x 24.87	32.00	666	55.00
005: Tension 0	2	1.95 x 24.89	30.70	633	55.60
006: Tension 0	3	1.95 x 24.84	30.80	637	54.90
Mean			31.20	645	55.20
Standard Deviation			0.72	18.00	0.38
% Co-Efficient of Variance			2.32	2.79	0.69

MTC510-42%-2X2T-3K-T300-1250							
DMA - AITM 1-0003 Issue 3							
	Sample	Width	Thickness	Span Length (mm)	Tg-Onset Tg (°C)	Tg-Loss Tg (°C)	Tg-Peak Tg (°C)
007: DMA	1	10.17	1.86	17.00	139.10	144.60	147.70
008: DMA	2	10.18	1.86	17.00	139.60	145.20	148.10
009: DMA	3	10.19	1.96	17.00	140.00	145.30	148.40
Mean						145.03	148.07
Standard Deviation						0.38	0.35
% Co-Efficient of Variance						0.26	0.24

MTC510-42%-2X2T-3K-T300-1250							
Flexure - ISO 14125 : 1998							
	Sample	Dimensions (mm)	Span	Maximum Load (kN)	Flexural Strength (MPa)	Flexural Modulus (GPa)	Strain to Failure (%)
010: Flexure 0°	1	15.29 x 1.90	75.50	0.42	870	59.00	1.5
011: Flexure 0°	2	15.32 x 1.89	75.50	0.41	852	60.20	1.4
012: Flexure 0°	3	15.33 x 1.87	75.50	0.44	924	61.10	1.6
Mean				0.42	882	60.10	1.5
Standard Deviation				0.02	37.50	1.05	
% Co-Efficient of Variance				3.61	4.25	1.75	
010: Tensile Fracture							
011: Tensile Fracture							
012: Tensile Fracture							

MTC510-42%-2X2T-3K-T300-1250 **Inter Laminar SB - BS EN 2563 : 1997**							
	Sample	Dimensions (mm)	Span	Initial Load (kN)	Failure Load (kN)	Inter Shear Strength (MPa)	Shear Strength (MPa)
013: Inter Laminar SB	1	10.22 x 1.90	9.43	1.82	1.83	70.4	70.8
014: Inter Laminar SB	2	10.24 x 1.89	9.43	1.81	1.81	70.2	70.2
015: Inter Laminar SB	3	10.22 x 1.87	9.43	1.75	1.75	68.8	68.8
Mean				1.79	1.80	69.8	69.9
Standard Deviation				0.04	0.04	0.87	1.03
% Co-Efficient of Variance				2.11	2.32	1.25	1.47
013: Multiple Shear							
014: Multiple Shear							
015: Multiple Shear							

Mechanical testing carried out at 23+/- 2°C, 50+/- 5% RH.

DMA Specimens were conditioned at 105°C for a week prior to testing.

The test speed for compression = 1mm/min.
The test speed for tension = 2mm/min.
The test speed for flexure = 2mm/min.
The test speed for ILSS =1mm/min.

All mechanical tests were completed independently by Exova UK Ltd who is a UKAS and Nadcap approved organisation. All tests results reported above can be supplied independently upon request.

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Cure Cycles & Performance

Cure	Initial Min Cure (hours)	Tg
80°C (Min)	16	90°C
90°C	8	100°C
100°C (Optimum)	4	110°C
120°C (Max)	1	120°C
Post Cured at 120°C	1	130°C

- Initial cure: from 80°C to 120°C.
- Post cure (where required for high Tg) 1 hour dwell at 120°C – maximum ramp rate of 3°C per minute.

Health and Safety

MTC510 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 at all times when using MTC510
- 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°C per minute

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