

MTM® 228

MTM228 prepreg is a highly toughened, 120°C (248°F) cure epoxy matrix resin developed for high- energy impact resistant structures in motorsport.

MTM228 offers a significant increase in dry Tg and a lower cured density compared to other matrices of this type.

Features and Benefits

- 30 days out life at 21°C (70°F)
- 12 months storage at -18°C (0°F)
- Good tack and drape
- 100°C (212°F) service temperature
- Excellent energy absorption
- Low density

RELATED DOCUMENTS

- De-bulking guidelines (TDS1036)
- Autoclave processing – lay-up and bagging guidelines (TDS1037)

RELATED PRODUCTS

- MTA240 adhesive film (PDS1166)
- VTF266 surface improvement film (PDS1255)

CURE CYCLE

Autoclave cure

Vacuum bag pressure	Minimum of 980mbar (29"Hg)* †
Autoclave pressure	6.2 bar (90 psi)**
Ramp rate	0.5 to 2°C (0.9 to 3.6°F)/minute
Recommended cure cycle	1 hour at 120°C, +5/-0°C (248°F, +9/-0°F)
Cool down	Maximum of 3°C (5.4°F)/minute to 60°C (140°F)

*This is the ideal vacuum level, however, it is recognised that it is not always possible to attain. If in doubt, please contact our technical support staff for advice.

†If manufacturing complex shapes, the vacuum can be vented when the pressure reaches 2 bar (30psi) if there is a perceived risk of a bag burst and hence the need to avoid pressurised air going down the vacuum line.

**If producing sandwich panels, apply the maximum pressure allowable for the honeycomb type.



PHYSICAL PROPERTIES

Test	Sample conditions	Results
Cured resin density	1 hour at 120°C (248°F)	1.19 g/cm ³
DMA E' onset Tg (MTM228/HS fibre prepregs)		110°C (230°F)
Gel time	At 120°C (248°F)	7 to 8 minutes

MECHANICAL PROPERTIES

Material: MTM228/CF03001 - 200g/m² (3K) 2x2 twill

Cure cycle: 1 hour at 120°C (248°F), autoclave, 2 bar (30 psi)

Test conditions: Room temperature, dry

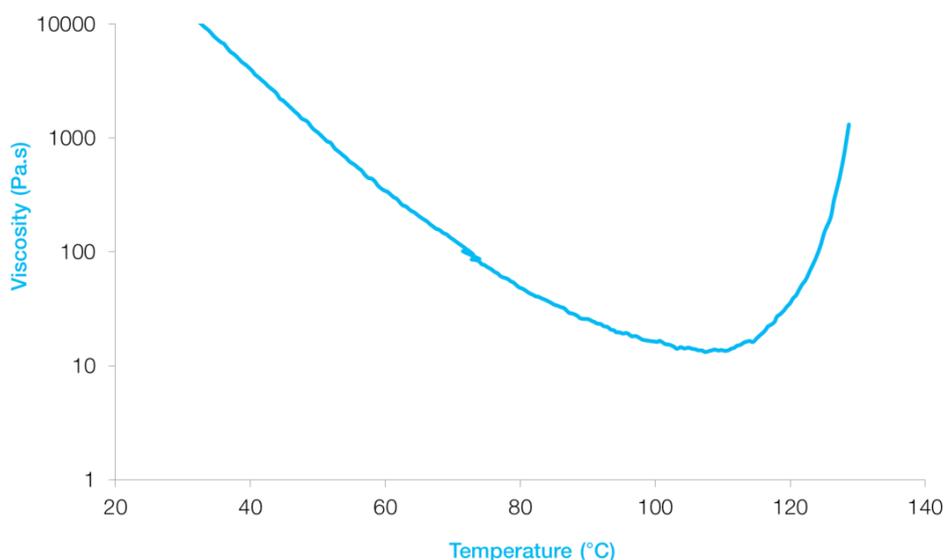
Test	Test method	Units	Results
0° Tensile strength	ASTM D3039	Mpa (ksi)	931 (135)
0° Tensile modulus		GPa (msi)	63.1 (81.6)
90° Tensile strength		Mpa (ksi)	953 (138)
90° Tensile modulus		GPa (msi)	62.9 (9.12)
0° Tensile strain to failure		%	1.46
90° Tensile strain to failure		%	1.49
0° Tensile poisson's ratio		-	0.06
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0° Compression strength	ASTM D3410	Mpa (ksi)	714 (104)
0° Compression modulus		GPa (msi)	55.7 (8.08)
90° Compression strength		Mpa (ksi)	687 (99.6)
90° Compression modulus		GPa (msi)	57.2 (8.30)
0° Compression strain to failure		%	1.30
90° Compression strain to failure		%	1.18
0° Compression poisson's ratio		-	0.07
90° Compression poisson's ratio		-	0.06
0° In-plane shear strength (IPSS)	ASTM D3058	Mpa (ksi)	115 (16.7)
0° In-plane shear modulus (IPSM)		GPa (msi)	2.82 (0.41)
0° Flexural strength	CRAG 200	Mpa (ksi)	1229 (178)
0° Flexural modulus		Gpa (msi)	57.3 (8.31)
0° Interlaminar shear strength (ILSS)	ASTM D2344	Mpa (ksi)	63.7 (9.24)

Data normalised to 55% Vf except for ILSS and In-plane shear



Impact properties

Test	Test Method	Impact energy (J/mm)	Unit	CSAI strength
Compression strength after impact (CSAI)	SACMA SRM-2R-94	0	MPa (ksi)	339.2 (49.18)
		2.2		330.3 (47.89)
		3.3		319.7 (46.36)
		4.4		312.4 (45.30)
		5.5		304.7 (44.18)
		6.7		277.4 (40.22)

Dynamic viscosity at 2°C/minute

AVAILABILITY

MTM228 prepregs are available in a wide range of reinforcing fabrics and unidirectional tapes including glass, carbon, aramid and hybrids.

We offer prepreg materials with specially controlled fibre and resin ratios for ultimate performance in impact structures. These products are identified by the suffix "I". Standard products are:

MTM228/CF0300"I" HS (3K) fibre-200g/m² -2x2 twill

MTM228/CF0600"I" HS (3K) fibre-283g/m² -5HS

MTM228/CF0100"I" HS (3K) fibre-283g/m² -4x4twill



STORAGE

Out life* at 21°C (70°F)	30 days
Storage at -18°C (0°F)	12 months from date of manufacture

*Out life refers to accumulated time out of the freezer before the part is cured.

Note:

The actual freezer storage life and out life are dependent on a number of factors, including; fibre type, format and application. For certain formats, it may be possible for the storage life and out life to be longer than stated. Please contact our technical support staff for advice.

EXOTHERM

MTM® 228 prepregs are reactive formulations which can undergo severe exothermic heat up during the initial curing process if incorrect curing procedures are followed.

Great care must be taken to ensure that safe heating rates, dwell temperatures and lay-up/bagging procedures are adhered to, especially when moulding solid laminates in excess of 10mm (0.4in) thickness. The risk of exotherm increases with lay-up thickness and increasing cure temperature. It is strongly recommended that trials, representative of all the relevant circumstances, are carried out by the user to allow a safe cure cycle to be specified. It is also important to recognise that the model or tool material and its thermal mass, combined with the insulating effect of breather/bagging materials can affect the risk of exotherm in particular cases.

HEALTH & SAFETY

Please refer to the product SDS for safe handling, personal protective equipment recommendations and disposal considerations.

