

MTM[®] 71

MTM71 prepreg is a toughened epoxy matrix resin prepreg system developed specifically for the manufacture of motorsport components, exhibiting excellent performance in the FIA side penetration test.

Features and Benefits

- 30 days out life at 21°C (70°F).
- 12 months storage at -18°C (0°F).
- Good tack and handling.
- Autoclave cure.
- 120°C (250°F) minimum cure.
- 155°C (310°F) Tg (DMA onset).
- High levels of toughness for crash resistant motorsport structures.

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	1 to 3°C (1.8 to 5.4°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.

ALTERNATIVE CURE CYCLES

Temperature	Duration
120°C (248°F)	1 hour
135°C (275°F)	1 hour



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POST-CURE

In applications demanding maximum temperature or environmental resistance, it is essential that the component is post-cured to fully develop the glass transition temperature.

Ramp rate	0.3°C (0.5°F)/minute
Post-cure cycle	2 hours at 150°C (302°F)*
Cool down	Maximum of 3°C (5.4°F)/minute to 60°C (140°F)

* Temperature must be measured by the lagging thermocouple attached to the part.

Notes: Parts may be loaded into a pre-heated oven or heated at 3°C (5.4°F)/minute to the initial cure temperature.

Large components should be adequately supported to avoid distortion. Post-cures from 135 to 150°C (275 to 302°F) may be used to suit specific applications. Please consult our technical support staff if you require assistance in determining the correct cure cycle for your application.

PHYSICAL PROPERTIES

Test	Sample conditions	Results
Cured resin density	1 hour at 120°C (248°) + 2 hours at 150°C (302°F)	1.19 g/cm ³
DMA E' onset Tg	1 hour at 120°C (248°F)	128°C (262°F)
	1 hour at 135°C (275°F)	137°C (278°F)
	1 hour at 120°C (248°) + 2 hours at 150°C (302°F)	155°C (310°F)

Note: Due to its highly toughened nature, MTM71 prepreg may exhibit some surface softening if cleaned with aggressive solvents. This softening is purely cosmetic and in no way detracts from the mechanical performance of the prepreg. To avoid this issue, Solvay recommends the use of Isopropyl Alcohol based (IPA) solvent.

MECHANICAL PROPERTIES

Cure cycle: 1 hour at 135°C (275°F), 6.2 bar (90 psi)

Test conditions: Room temperature, dry

Test	Test method	Units	Material	
			MTM71/ M46J-124-36%	MTM71/ T1000 GB-124-36%
0° Tensile strength	ASTM D3039	MPa (ksi)	1932 (280)	2966 (430)
0° Tensile modulus		GPa (msi)	248 (36.0)	156 (22.6)
90° Tensile strength	ASTM D3039	MPa (ksi)	31.6 (4.58)	43.4 (6.29)
90° Tensile modulus		GPa (msi)	6.20 (0.90)	7.10 (1.16)
0° Compression strength	SACMA SRM01R94	MPa (ksi)	742 (108)	1041 (151)
0° Compression modulus		GPa (msi)	209 (30.3)	143 (20.7)
90° Compression strength	SACMA SRM01R94	MPa (ksi)	175 (25.4)	208 (30.2)
90° Compression modulus		GPa (msi)	6.70 (9.72)	7.80 (1.13)
In-plane shear strength (IPSS)	ASTM D3518	MPa (ksi)	71.5 (10.4)	109 (15.8)
In-plane shear modulus (IPSM)		GPa (msi)	2.95 (0.43)	2.80 (0.41)
0° Interlaminar shear strength (ILSS)	ASTM D2344	MPa (ksi)	62.0 (9.15)	80.2 (11.6)

Data normalised to 55%Vf except for ILSS and IPSS & IPSM.



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Cure cycle: 1 hour at 135°C (275°F), 6.2 bar (90 psi)

Test conditions: Room temperature, dry

Test	Test method	Units	Material			
			MTM71/ CF4534*-42%	MTM71/ CF7234 ^X -42%	MTM71/ CF2115 [†] -42%	MTM71/ CF1218 ^{**} -42%
0° Tensile strength	ASTM D3039	MPa (ksi)	1197 (174)	1169 (170)	656 (95.1)	983 (142.5)
0° Tensile modulus		GPa (msi)	68.9 (9.99)	70.5 (10.2)	106 (15.4)	68.6 (9.95)
90° Tensile strength	ASTM D3039	MPa (ksi)	1194 (173)	1056 (153)	537 (77.9)	915 (133)
90° Tensile modulus		GPa (msi)	67.7 (9.82)	72.0 (10.4)	98.0 (14.2)	69.6.0 (10.1)
0° Compression strength	SACMA SRM01R9 4	MPa (ksi)	569 (82.5)	553 (80.2)	384 (55.7)	510 (74.0)
0° Compression modulus		GPa (msi)	62.1 (9.00)	62.8 (10.4)	90.9 (13.2)	61.3 (8.89)
90° Compression strength	SACMA SRM01R9 4	MPa (ksi)	562 (8.15)	593 (86.0)	399 (57.9)	517 (75.0)
90° Compression modulus		GPa (msi)	60.2 (8.73)	63.3 (9.18)	89.6 (13.0)	60.8 (8.82)
In-plane shear strength (IPSS)	ASTM D3518	MPa (ksi)	100 (14.5)	114 (16.5)	72.5 (10.5)	99.7 (14.5)
In-plane shear modulus (IPSM)		GPa (msi)	2.81 (0.41)	3.13 (4.45)	2.95 (0.43)	2.77 (0.40)
0° Interlaminar shear strength (ILSS)	ASTM D2344	MPa (ksi)	55.8 (8.10)	1169 (170)	50.9 (7.40)	59.0 (8.56)

Data normalised to 48%Vf except for ILSS and IPSS & IPSM.

*CF4534 is a 283g/m2 5HS fabric with 12k T1000 type fibres

^XCF7234 is a 200g/m2 2x2 twill with 6k T1000 type fibres

[†]CF2115 is a 200g/m2 2x2 twill fabric with 6k M46J fibres

**CF1218 is a 200g/m2 2x2 twill fabric with 6k T800HB fibres

AVAILABILITY

MTM71 prepregs are available on all key motorsport reinforcements (fabrics and unidirectional tapes).

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.



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EXOTHERM

MTM71 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 (0.40in) 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.

Please contact our technical department for further information on exotherm behaviour of this prepreg.

HEALTH & SAFETY

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

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