MTM® 57

MTM® 57 series is toughened, 80 to 120°C (176 to 248°F) curing, epoxy matrices offering flexible processing and a range of handling characteristics.

MTM® 57 series exhibits excellent toughness and, after a suitable cure, can be used at temperatures up to 90°C (194°F).

Qualified to the Federal Motor Vehicle Safety standard no. 302 (flammability of motor vehicle interior materials), and to ISO 3795:1989 (determination of burning behaviours of interior materials for motor vehicles) – when reinforced with 3k carbon fabrics.

Features and Benefits

- Versatile processing: autoclave, oven vacuum bag and press moulding
- 30 days out life at 21°C (70°F)
- 24 months storage at -18°C (0°F) for MTM57; 12 months storage at -18°C (0°F) for variants
- Service temperature up to 90°C (194°F)
- Flexible curing capability: 80 to 120°C (176 to 248°F)
- Cures clear – recommended for cosmetic applications

PHYSICAL PROPERTIES

Property	Method	Units	Result
Cured Resin Density - Standard	ASTM D792	g/cm^3	1.19
Max DMA E' onset Tg	ASTM D7028	°C (°F)	125 (257)

PRODUCT REINFORCEMENTS AND VARIATIONS

MTM® 57 prepregs are available in a wide range of reinforcing fabrics and unidirectional tapes, including glass, carbon, aramid and hybrids. Contact Syensqo for available options.

MTM® 57 is available in the following variants:

- MTM57 Intermediate viscosity and tack
- MTM57-2 Modified tack and improved handling

Note: It is possible, when using combinations of the MTM57 series and certain carbon fibre reinforcements, for discolouration of the resin matrix to occur. Therefore, where the intended end application is for a cosmetic product, customers are advised to consult a Syensqo sales representative for specific advice on fibre selection when placing an order for material.

STORAGE

Out life* at 21°C (70°F)	Up to 30 days
Storage at -18°C (0°F)	24 months from date of manufacture for MTM 57 12 months from date of manufacture for all other variants

*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.

RECOMMENDED CURE CYCLE

Oven Vacuum Bag Cure

Parameter	Recommendation
Vacuum bag pressure	Minimum of 980mbar (29"Hg)*
Heating Rate	1 to 3°C (1.8 to 5.4°F)/minute
Recommend cure cycle	1 hour at 120°C (248°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

Autoclave Cure

Parameter	Recommendation
Vacuum bag pressure	Minimum of 980mbar (29"Hg)*
Autoclave Pressure	Apply min 6.2 bar † (90 psi) (0.62 MPa) and maintain vacuum
Heating Rate	1 to 3°C (1.8 to 5.4°F)/minute
Recommend cure cycle	1 hour at 120°C (248°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 producing sandwich panels, apply the maximum pressure allowable for the honeycomb type.

PRESS CURE

Mould tools should restrain the flow sufficiently under moulding conditions to avoid fabric or fibre distortion.

Parameter	Recommendation
Pressure Applied to Part	Minimum of 2.8 bar (40 psi)
Ramp rate	A suitable rate (dependant on mould tooling)
Recommended cure cycle	1 hour at 120°C (248°F)
Cool down	A suitable rate (dependant on mould tooling) to 60°C (140°F)

Note: Demoulding at the cure temperature may be possible if the tooling is suitably designed. A specific trial is recommended.

ALTERNATE CURE CYCLES

Dwell Temperature	Dwell time
80°C (176°F)	12 hours
100°C (212°F)	3 hours

If none of the cure cycles above are suitable, contact Syensqo technical support staff for further options.

POST CURE CYCLE

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

Parameter	Recommendation
Heating Rate	0.3°C (0.5°F)/minute
Post cure cycle	2 hours at 120°C (248°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.

PROPERTIES

Cure Cycle Comparison

Cure Cycle	DMA E′ onset Tg*
12 hours at 80°C (176°F), dry	100°C (212°F)
3 hours at 100°C (212°F), dry	120°C (248°F)
1 hour at 120°C (248°F), dry	125°C (257°F)

RELATED DOCUMENTS

- Debulking Guidelines (TDS1036)
- Autoclave Processing Guidelines (TDS1037)
- Oven Vacuum Bag Processing Guidelines (TDS1041)

EXOTHERM

MTM® 57 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.