

Product Description

ACG MTM57 is based on a 120°C (248°F) curing epoxy matrix resin designed for component manufacture.

The system exhibits excellent toughness and can be used at temperature up to 90°C(194°F) after a suitable cure.

Features

- Cure 30 minutes at 120°C(248°F).
- Versatile processing autoclave, vac bag or press cures.
- Good tack and drape.
- Good impact resistance.
- Service up to 90°C(194°F).

Instructions for Use

The prepreg should be removed from the freezer and allowed to reach room temperature before removal from the polythene protective bag.

Prepreg should normally be cut to shape using templates and laid up in accordance with design instructions. Care must be taken to ensure the prepreg conforms exactly to the tool shape, especially around internal corners. If necessary, the tack of the system may be increased by gentle warming with hot air. The lay up should be vacuum debulked at regular intervals using a P3 (pin pricked) Halar release film on the prepreg surface and 2 thin breather layers. The laminate is vacuum bagged and a vacuum of 980 mbar (29in Hg) applied for 30 minutes.

Once the required thickness has been built up, the laminate may be prepared for cure.

For autoclave cures, the use of solid Halar film directly against laminate followed by a complete layer of a heavyweight breather extending beyond the edges of the laminate is recommended. The breather should connect directly to the vacuum ports where two or three layers of breather may be applied locally.

Cure Cycle

Vacuum Bag Cure:

The laminate should be heated to 120°C, +5°C/-0°C(248°F, +9°F/-0°F) at 3°C(5.4°F)/min. under vacuum of 980 mbar (29in Hg).

The temperature of 120°C, +5°C/-0°C(248°F, +9°F/-0°F) should be held for 30 minutes.

The laminate should be cooled to 80°C(176°F) at 3.0°C(5°F)/min. maximum and the vacuum released.

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

Autoclave Cure:

With 980mbar (29in Hg) vacuum applied to the bag, the autoclave pressure should be increased to 0.14MPa (20psi) and the bag vented to atmosphere.

The pressure should be raised to 0.62MPa (90psi) or the maximum allowable for the honeycomb type if producing sandwich structures.

The temperature should be increased to 120°C, +5°C/-0°C(248°F, +9°F/-0°F) at 3°C(5.4°F)/min. and held at 120°C, +5°C/-0°C(248°F +9°F/-0°F) for 30 minutes.

The laminate should be allowed to cool under pressure to 80°C(176°F) at 3°C(5°F)/min. The pressure may then be released.

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

Matched Die Moulding:

MTM57 may also be processed by compression moulding. Mould tools should restrain flow sufficiently under moulding conditions to avoid fabric or fibre distortion.

The material should be placed in the mould and a minimum pressure of 40 psi applied.

The assembly should be heated to 120°C, +5°C/-0°C(248°F (+9°F/-0°F) at a suitable rate and held at 120°C, +5°C/-0°C(248°F, +9°F/-0°F) for 30 minutes.

The assembly should be allowed to cool to below 80°C(176°F) prior to removal of the laminate.

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

Alternative cure cycles may be employed, please consult The Advanced Composites Group for advice on specific cure requirements.

Exotherm

In certain circumstances, such as the production of thick section laminates (over 10mm) rapid heat up rates or highly insulating masters, MTM57 can undergo exothermic heating leading to rapid temperature rise and component degradation in extreme cases.

Where this is likely, a cure incorporating an intermediate dwell of 1 hour at 80°C (176°F) is recommended in order to minimise the risk.

Technical Data

Cured Resin Properties:

Prepreg volatiles (%)	• 1
Cured resin density (g/cm ³)	1.22
Tg after 30 minutes at 120°C(248°F)	95°C(203°F)

Typical Mechanical Properties:

Woven Carbon Laminate:

280gsm 4x4 Twill T300 (3K) 0/90 configuration.
40 minutes @ 120°C(248°F) autoclave cure.

(Flexural properties normalised to 55% Vf).		(MPa) Dry	(MPa) Wet
Interlaminar Shear Strength	at 22°C(70°F)	76	73
	at 80°C(176°F)	52	49
Flexural Strength	at 22°C 70°F)	942	996
	at 80°C(176°F)	825	751
Flexural Modulus	at 22°C(70°F)	48,000	51,000
	at 80°C(176°F)	52,000	55,000

Wet conditioning 2 hour waterboil in deionised water.

Compression after Impact:

280gsm 4x4 Twill T300 (3K) 0/90 configuration. Cured for 1 hour at 120°C(248°F).

Compression strength after 3 Joule impact is 224MPa.
Compression strength after 8.8 Joule impact is 120MPa.

Availability

MTM57 is available with a wide range of reinforcing fabrics and unidirectional tapes including Glass, Carbon, Aramid and Hybrids.

Storage

MTM57 has a tack life of 1 month when stored at 20°C(70°F) in sealed wrapping in a dry place.

The storage life in sealed wrapping at -18°C(0°F) is 1 year.

Health and Safety

MTM57 contains an epoxy resin which can cause allergic reaction on prolonged or repeated skin contact. Gloves and protective clothing must be worn.

Wash skin thoroughly with soap and water or resin removing cream after handling. Do not use solvents for cleaning the skin.

Use mechanical exhaust ventilation when heat curing the resin system.

For further information, consult ACG Material Safety Data Sheet No 142.