

Product Description

MTA240 is a structural film adhesive suitable for bonding both aluminium and composite substrates either to themselves or to honeycomb core materials. It is formulated for cure compatibility with ACG's flexible cure structural prepreg matrices MTM®49-3 and MTM®249.

Features

- Flexible cure between 80°C and 177°C (176°F and 351°F).
- Minimum cure temperature 80°C (175°F).
- Good performance is achieved following 80°C and 120°C (176°F and 248°F) cures.
- Optimum performance is achieved following 135°C and 177°C (275°F and 351°F) cures.
- Maximum dry service temperature of 130°C (265°F) following a suitable post cure.
- Excellent tack and handleability for easy positioning.
- Controlled flow giving excellent honeycomb peel properties.

Instructions for use

As with all bonding operations, the surfaces to be bonded should be dry, free of grease and pre-treated to give a matt or slightly roughened surface. The pre-treatment method depends on the substrate material, chromic acid etching is recommended for aluminium, peel ply and light abrasion for composite substrates. Please consult ACG for advice on pre-treatment of specific substrates.

Remove the roll of film from the freezer and allow it to warm to room temperature prior to use. The effects of moisture on adhesive films can critically affect their performance in service. ACG recommends that the roll of material be allowed to fully thaw before the seal on the storage bag is broken. It can take 6 hours for the centre of the roll to reach room temperature.

Cut the film to the shape and size required, remove backing paper and apply to the substrate to be bonded, keeping the polythene interleave uppermost. When in position, lift the corner of the polythene and remove by pulling sharply. Complete the joint assembly.

Initial cure:

Recommended cure options are:

Cure Temperature	Recommended Cure Time	Maximum Service Temperature
80°C (176°F)	5 hours	100°C (212°F)
100°C (212°F)	2 hours	120°C (248°C)
120°C (248°C)	1 hour	130°C (266°F)
135°C (275°F)	1 hour	130°C (266°F)
177°C (351°F)	1hour	130°C (266°F)

Sufficient time must be allowed for the glue line to achieve this temperature. This can normally be monitored by use of a thermocouple located on the substrates at the glue line.

Sufficient pressure must be applied to maintain good contact between the substrates during the curing process. For metal to metal or composite to composite bonding, whilst a minimum pressure of 0.1MPa (14psi) is necessary, 0.21MPa (30psi) is recommended. For honeycomb sandwich bonding, the applied pressure is dependent on the compression strength of the honeycomb core.

It is recommended that components be cooled to below 70°C (158°F) before releasing pressure.

Optional postcure:

The bonded assembly may be postcured at either 135°C (275°C) or 177°C (351°F) for 1hr to achieve the maximum service temperature. It is recommended that a minimum pressure of 0.1MPa (14psi) be maintained during postcure. Heat up rate from 135°C (275°F) should be 20°C (36°F) per hour.

Outlife:

MTA240 has a cumulative outlife of 30 days when stored at 21°C (70°F).

Mechanical Performance

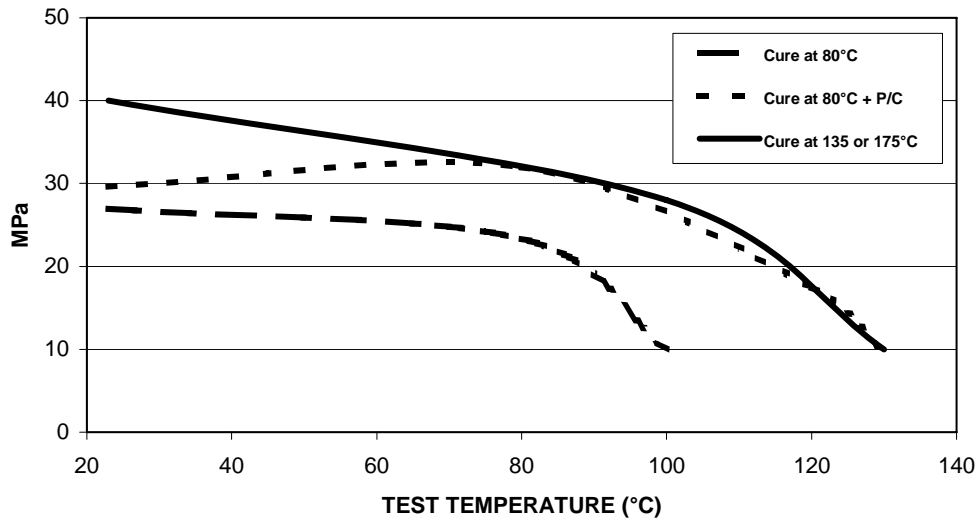
Adherends were aluminium 2024T3 at 1.6mm thick (lap shear) or 0.48mm (honeycomb peel), degreased and chromic acid etched. Honeycomb was 7.9lb/ft³ density, ¼in cell, vapour degreased 5052 aluminium core (12.7mm thick).

All tests were carried out on specimens as received (no special conditioning prior to test). The figures below represent the average of two batches:

TEST	Test Temp. °C (°F)	MTA240 PK13-313 gsm				
		5 hrs at 80°C (176°F)	1 hr at 120°C (248°F)	1 hr at 135°C (275°F)	1 hr at 177°C (351°F)	
Lap Shear Strength MPa (ASTM D3165-00)	RT 100 (212) 130 (266)	27 18 -	36 30 15	40 28 10	40 28 10	
Honeycomb Flatwise Tensile MPa (DTD5577)	RT	-	-	10	10	
Honeycomb Climbing Drum Peel Nm/m (ASTM D1781-76)	Top skin	RT	50	79	105	105
	Bottom skin	RT	56	79	105	105

TEST	Test Temp. °C (°F)	MTA240 150 gsm unsupported				
		5 hrs at 80°C (175°F)	1 hr at 120°C (248°F)	2 hrs at 135°C (275°F)	1 hr at 177°C (351°F)	
Lap Shear Strength MPa (ASTM D3165-00)	RT 100 (212) 130 (266)	- - -	- - -	40 - -	36 - -	
Honeycomb Flatwise Tensile MPa (DTD5577)	RT	-	-	7	8	
Honeycomb Climbing Drum Peel Nm/m (ASTM D1781-76)	Top skin	RT	-	-	50	60
	Bottom skin	RT	-	-	47	50

LAP SHEAR STRENGTH vs TEMPERATURE



Effect of cure temperature:

Optimum flow occurs at 135°C (275°F) giving optimum mechanical performance, particularly honeycomb peel. Reduction in cure temperature reduces flow and affects mechanical performance as shown in the tables above.

In the case of lap shear strength, room temperature performance is significantly reduced and postcure at 135°C (275°F) results in only a small improvement. If tested at 80°C (176°F) however, lap shear is enhanced by postcure such that performance almost matches that achieved by standard cure.

Honeycomb peel is not enhanced by postcure.

Availability

ACG MTA240 is available in 10sqm or 40sqm rolls with the following standard formats:

MTA240/PK13-313gsm	1100mm wide
MTA240/PK13-188gsm	1100mm wide

(PK13 is a 13gsm knit polyester carrier for improved handleability and glue line thickness control)

Unsupported film may be supplied at a weight of 100gsm but maximum 500mm wide. Special care is required in handling lightweight unsupported films.

Alternative carriers may also be incorporated - please refer to ACG for advice on non-standard formats.

Storage

MTA240 should be stored at -18°C (0°F) in a sealed polythene bag. Under these conditions the material has a storage life of at least 12 months from the date of manufacture.

Health and Safety

MTA240 contains epoxy resins that can cause allergic reactions on skin contact. Use gloves and protective clothing.

In case of contact, wash skin thoroughly with soap and water, or use resin-removing cream.

Use mechanical exhaust ventilation when curing the resin.

For further information, consult ACG Material Safety Data Sheet No. 371.