

MTA® 240

MTA® 240 is a structural adhesive film suitable for bonding both aluminium and composite substrates either to themselves or to honeycomb core materials. It is formulated for cure compatibility with many of Syensqo's flexible cure MTM® structural prepreg matrices, including MTM49-3 and MTM249.

Features and Benefits

- 30 days out life at 21°C (70°F)
- 12 months storage at -18°C (0°F)
- Flexible cure between 80 and 177°C (176 and 351°F)
- Minimum cure temperature 80°C (175°F)
- Good performance achieved following 80 and 120°C (176 and 248°F) cures
- Optimum performance achieved following 135 and 177°C (275 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

The roll of adhesive film should be removed from the freezer, thawed and allowed to reach room temperature before removal from the protective polythene bag.

The surfaces to be bonded should be dry, free of grease and pre-treated to give a matt or slightly roughed surface. The pre-treatment method depends on the substrate material, chromic acid etching is recommended for aluminium, peel ply, light abrasion and degrease for composite substrates. Please consult our technical support staff for advice on pre-treatment of specific substrates.

The film should be cut to shape, the backing paper removed and the film applied to the substrate to be bonded, keeping the polythene interleave uppermost. When in position, the polythene interleave should be removed and joint assembly completed.

PRODUCT VARIANTS

- MTA240B – black pigmented version of MTA240

CURE CYCLE

Vacuum bag pressure	Minimum of 980mbar (29"Hg)*
Autoclave pressure	2.1 bar (30 psi)†
Ramp rate	1 to 3°C (1.8 to 5.4°F)/minute
Recommended 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.

†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 1bar (14psi) is necessary, 2.1bar (30psi) is recommended. For honeycomb sandwich bonding, the applied pressure is dependent on the compression strength of the honeycomb core.

**Sufficient time must be allowed for the bond line to achieve this temperature. This can normally be monitored by use of a thermocouple located on the substrates at the bond line. The service temperature of a part cured at 120°C (248°F) is 130°C (266°F).



ALTERNATIVE CURE CYCLES

Temperature

80°C (176°F)
100°C (212°F)
135°C (275°F)
177°C (351°F)

Duration

5 hours
2 hours
1 hour
1 hour

Service temperature

100°C (212°F)
120°C (248°F)
130°C (266°F)
130°C (266°F)

POST-CURE

For initial cures below 135°C (266°F), an optional post-cure may be carried out to achieve maximum performance. It is recommended that this is carried out under vacuum pressure.

Vacuum bag pressure	Minimum of 980mbar (29"Hg)*
Ramp rate	0.3°C (0.5°F)/minute 1 hour at 135°C 0/+5°C (275°F -0/+9°F)**
Post-cure cycle	or 1 hour at 177°C 0/+5°C (351°F -0/+9°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.

** 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.

PHYSICAL PROPERTIES

Colour	Blue
Cured resin density	1.23g/cm ³



MECHANICAL PROPERTIES

Material: MTA240/PK13-313g/m²

Cure cycle: Autoclave cure, 2.1 bar, (30psi)

All tests carried out in the as-cured state with no conditioning prior to testing.

Test	Test method	Test conditions	Units	Material			
				5 hours at 80°C (176°F)	1 hour at 120°C (248°F)	1 hour at 135°C (275°F)	1 hour at 177°C (351°F)
Lap shear strength	ASTM D3165-00	21°C (70°F)	MPa (ksi)	27.0 (3.92)	36.0 (5.22)	40.0 (5.80)	40.0 (5.80)
		100°C (212°F)		18.0 (2.61)	30.0 (5.22)	28.0 (4.06)	28.0 (4.06)
		130°C (266°F)		-	15.0 (2.18)	10.0 (1.45)	10.0 (1.45)
Honeycomb flatwise tensile strength	DTD 5577	21°C (70°F)	MPa (ksi)			10.0 (1.45)	10.0 (1.45)
Honeycomb climbing drum peel	ASTM D1781-76	Top skin	Nm/m (lbf/3 inch)	50.0 (33.6)	79.0 (53.1)	105 (70.6)	105 (70.6)
		Bottom skin		50.0 (33.6)	79.0 (53.1)	105 (70.6)	105 (70.6)

Lap shear specimens – adherents Alclad 2024T3 at 1.6mm thick prepared by degreasing and using chromic acid etch

Peel specimens – adherents Alclad 2024T3 at 0.48 mm thick prepared by degreasing and using chromic acid etch

Honeycomb specimens – 7.9 lb/ft³ density, ¼ inch cell vapour degreased 5052 aluminium core (12.7 mm thick)

Material: MTA240/150g/m² unsupported

Cure cycle: Autoclave cure, 2.1 bar, (30psi)

All tests carried out in the as-cured state with no conditioning prior to testing.

Test	Test method	Test conditions	Units	Material	
				2 hours at 135°C (275°F)	1 hour at 177°C (351°F)
Lap shear strength	ASTM D3165-00	21°C (70°F)	MPa (ksi)	40.0 (5.80)	36.0 (5.22)
Honeycomb flatwise tensile strength	DTD 5577	21°C (70°F)	MPa (ksi)	7.00 (1.02)	8.00 (1.16)
Honeycomb climbing drum peel	ASTM D1781-76	Top skin	Nm/m (lbf/3 inch)	50.0 (33.6)	60.0 (40.4)
		Bottom skin		47.0 (31.6)	50.0 (33.6)

Lap shear specimens – adherents Alclad 2024T3 at 1.6mm thick prepared by degreasing and using chromic acid etch

Peel specimens – adherents Alclad 2024T3 at 0.48 mm thick prepared by degreasing and using chromic acid etch

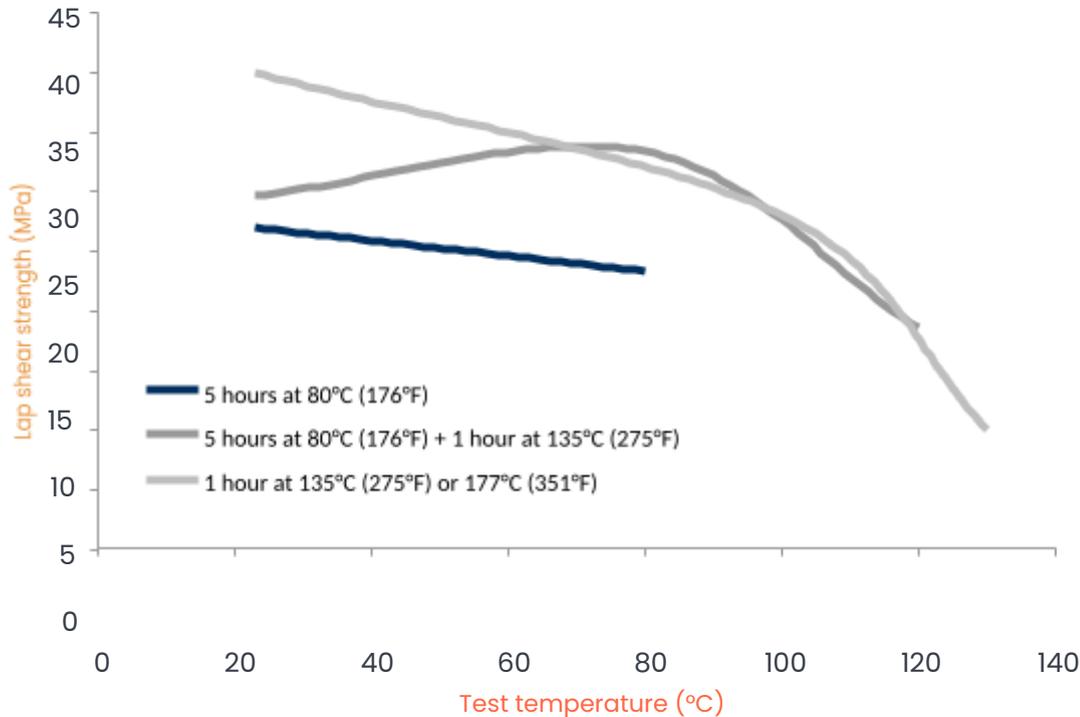
Honeycomb specimens – 7.9 lb/ft³ density, ¼ inch cell vapour degreased 5052 aluminium core (12.7 mm thick)



Material: MTA240/PK13-313g/m²

Cure cycle: Autoclave cure, 2.1 bar, (30psi)

Lap shear strength vs test temperature – effect of cure cycle



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 post-cure at 135°C (275°F) results in only a small improvement. If tested at 80°C (176°F) however, lap shear is enhanced by post-cure such that performance almost matches that achieved by standard cure.

Honeycomb peel is not enhanced by post-cure.

AVAILABILITY

MTA240 is available in the following standard formats:

MTA240/PK13-313g/m² 1100mm (43inch) wide

MTA240/PK13-188g/m² 1100mm (43inch) wide

These products contain 13g/m² knit polyester carrier for improved handleability and bond line thickness control.

Unsupported film can be supplied down to 100g/m² at a maximum width of 500mm (20inch). Special care is required in handling.

Alternative carriers can also be incorporated, please refer to our technical support staff for specific advice on special formats.



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.

HEALTH & SAFETY

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

