

CYCOM[®] 754 Marine Product Range

CYCOM[®] 754 has been developed to provide long out-life at ambient temperatures, combined with excellent mechanical properties generated at low cure temperatures.

CYCOM[®] 754 is a modified epoxy resin which has been specifically developed for versatile cures under vacuum only conditions; it can also be cured under pressure if required.

The cure cycle can be adapted to suit the application, provided a full cure is eventually obtained – if a structure such as a hull needs to be cured in various stages, a partial cure can be done for the initial steps, provided the final laminate schedule undergoes a full cure cycle. This will not reduce the mechanical properties of the structure in any way.

FM[®] 754 is an adhesive film that has been developed to co-cure with the CYCOM[®] 754 prepregs. It can also be used for secondary bonding applications where necessary.

Features and Benefits

- Minimum 30 days out-life at ambient temperature 21°C (70°F).
- Versatile cure from 70°C (160°F) upwards, depending on application
- Developed for vacuum only curing, but can also be cured under pressure
- Excellent handling characteristics
- Optimized flow and drape characteristics
- Low density epoxy formulation
- Available as unidirectional tape and fabric prepregs with a co-curable adhesive film

CURE CYCLE

The optimum cure cycle for the CYCOM[®] 754 product range is as follows:

- Apply full vacuum from start
- Heat up rate 0.5 - 1°C/minute (1 - 3°F/min) for large structures (eg hull, deck, bulkheads), 1 - 2°C/minute (3 - 5°F/min) for smaller parts and flat laminates (depending on thickness)
- Heat to 50°C (125°F), hold for 1 to 3 hours, depending on application
- Heat up at same ramp rate to 75°C (170°F)
- Hold at 75°C (170°F) for 6 hours
- Cool under vacuum

A full evaluation on various cure cycles has been completed, with Tg values given below:

CYCOM[®] 754 PREPREG



Cure Cycle

8 hours at 70°C (160°F) - no dwell
 6 hours at 75°C (170°F) - no dwell
 6 hours at 75°C (170°F) - 1 hour dwell at 50°C (125°F)
 6 hours at 75°C (170°F) - 3 hour dwell at 50°C (125°F)
 5 hours at 80°C (180°F) - no dwell
 4 hours at 90°C (195°F) - 2 hour dwell at 50°C (125°F)

Dry Tg, °C (°F)

92.0 (198.0)
 96.9 (207.0)
 99.0 (210.0)
 100.0 (212.0)
 101.0 (214.0)
 117.6 (243.7)

For all cure cycles, laminates are between 90 and 100% cured.

PROPERTIES

All mechanical data generated to date has been completed on one grade of unidirectional tape only - further testing is in progress.

CYCOM[®] 754 - 36% - HS - 200 – 300
 Cure Cycle : 6 Hours at 75°C (170°F), no dwell

Table 1 | Mechanical Properties

Test Conditions

Mean Value

Tensile strength @ RT dry	2178 MPa/ 316ksi
Tensile modulus @ RT dry	121 GPa/ 17.5 msi
Compressive strength @ RT dry	1200 MPa/ 174ksi
Compressive strength @ 70°C dry	950 MPa/ 138 ksi
Compressive strength @ RT wet ⁽¹⁾	To be determined
Compressive modulus @ RT dry	120 GPa/ 17.4 msi
Compressive modulus @ 70°C dry	115 GPa/ 16.7 msi
Compressive modulus @ RT wet ⁽¹⁾	To be determined
Flexural strength @ RT dry	1585 MPa/ 230 ksi
Flexural strength @ 70°C dry	1001 MPa/ 145 ksi
Flexural strength @ RT wet ⁽¹⁾	To be determined
Flexural strength @ RT wet ⁽²⁾	To be determined
Flexural modulus @ RT dry	115 GPa/ 16.7 msi
Flexural modulus @ 70° dry	113 GPa/ 16.4 msi
Flexural modulus @ RT wet ⁽¹⁾	To be determined
Flexural modulus @ RT wet ⁽²⁾	To be determined
ILSS @ RT dry	70 MPa/ 10.2 ksi
ILSS @ 70°C dry	36 MPa/ 5.2 ksi
ILSS @ RT wet ⁽¹⁾	To be determined
ILSS @ 70°C wet ⁽¹⁾	To be determined
ILSS @ RT wet ⁽²⁾	To be determined
ILSS @ 70°C wet ⁽²⁾	To be determined
In plane shear strength @ RT dry	75 MPa/ 10.9 ksi
In plane shear modulus @ RT dry	3.8 GPa/ 0.55 msi

(1) - 1 month at 50°C/95% RH
 (2) - 1 month in water at RT

CYCOM[®] 754 PREPREG



A limited amount of testing has also been completed with the material cured at 70°C and 80°C:

Cure Cycle	Test Condition	Mean Value
8 Hours at 70°C (160°F) - no dwell	Comp strength @ RT dry	1150 MPa/ 167 ksi
	Flex strength @ RT dry	1675 MPa/ 243 ksi
	Flex modulus @ RT dry	103 GPa/ 15.9 msi
	ILSS @ RT dry	69.5 MPa/ 10.1 ksi
	ILSS @ RT wet ⁽¹⁾	TBD
5 Hours at 80°C (180°F) - no dwell	Comp strength @ RT dry	1100 MPa/ 160 ksi
	Flex strength @ RT dry	1616 MPa/ 234 ksi
	Flex modulus @ RT dry	100 GPa/ 14.5 msi
	ILSS @ RT dry	69.7 MPa/ 10.1 ksi
	ILSS @ RT wet ⁽¹⁾	TBD

(1) 1 month in water at RT

TBD - Values to be determined

DISPOSAL OF SCRAP MATERIAL

Disposal of scrap material must be in accordance with local, state, and federal regulations.

HEALTH & SAFETY

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

