

REM EPOXY MATRIX

GENERAL FEATURES

REM a general use epoxy matrix, suitable to impregnate carbon, glass fabric and unidirectional. It can be processed both by hot press and autoclave cure.

MAIN CHARACTERISTICS

- Maximum Tg of 125°C (257°F).
- Suitable to impregnate a very wide range of support (UD, fabrics and multi-axial - carbon, glass, aramid and hybrids).
- Versatile in different manufacturing process and wide range of temperatures.

QUICK REFERENCE TIPS

It is suggested to vent the vacuum in autoclave process according to the curing cycle shown in the following pages in order to get the highest mechanical behaviour and to avoid both irregularities and pin holes on the surface.

The REM series is available in the following variants:

- **REMT:** higher viscosity for fabric prepregs
- **EU334:** modified tack, for high modulus fiber unidirectional prepreg
- **EU340:** higher viscosity
- **EU432:** modified tack for high modulus fiber unidirectional prepreg and low resin content
- **EI331:** higher viscosity white version for surface film prepreg

OPERATIONAL INSTRUCTIONS

CURE PROCESS RECOMMENDATIONS

This epoxy matrix system can be processed under a very wide range of temperature*. Just as indication, see below curing cycle:

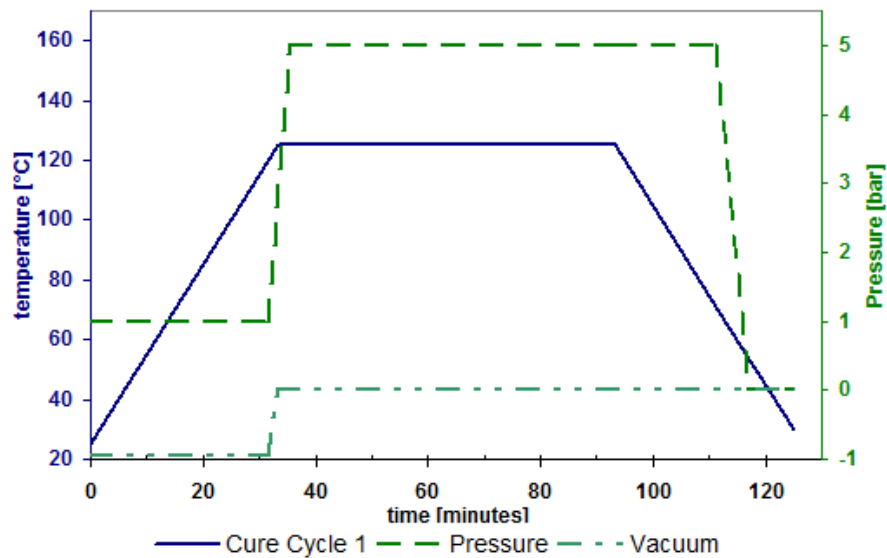
Temperature °C (°F)	Time	Tg °C (°F) DSC	Tg °C (°F) E' DMA
125 (257)	60'	125 (257)	132.5 (271)

*Personalized cure cycle can be developed with CIT Technical Department, in order to fulfil customer manufacturing process optimization.

AUTOCLAVE

Once determined the processing temperature and corresponding cure time, use these processing parameters in the following cure cycle:

Step	Temperature °C (°F)	Time (min)	Heating rate to isothermal °C/min (°F/min)	Pressure bar (psi)
1	25 (77)	–	–	Vacuum -0.8 (-11.6)
2	125 (257)	–	1÷3 (1.8÷5.4)	3÷7 (43÷102)
3	125 (257)	60	–	3÷7 (43÷102)
4	70 (158)	–	3÷5 (5.4÷9.0)	3÷7 (43÷102)
5	25 (77)	–	–	–



RESIN MATRIX

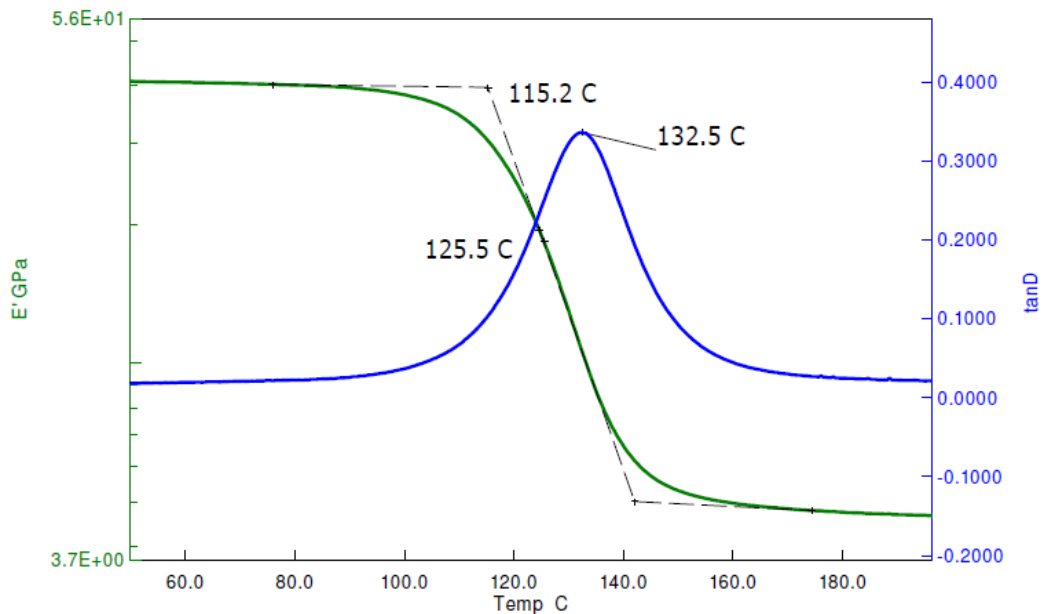
GENERAL PROPERTIES

Property	Unit	Value	Standard
Storage life @ -18°C (0°F)	months	12	
Out life @ 23°C (73°F)	days	30	
Prepreg volatiles	%wt	<1	ASTM D3530-97R03
Cured resin density	g/cm ³	1.20	ASTM D792-00
Tg (DSC)	°C (°F)	125 (257)	ASTM D3418-03
Tg E' (DMA)*	°C (°F)	115 (257)	ASTM E1640-09
Tg Peak Tan δ (DMA)*	°C (°F)	132,5 (270,5)	ASTM E1640-09
Tack		medium	
Elastic Modulus	GPa	3.36	ASTM D790-03

*Laminate Fully Cured 60'@125°C

THERMO-MECHANICAL DMA ANALYSIS

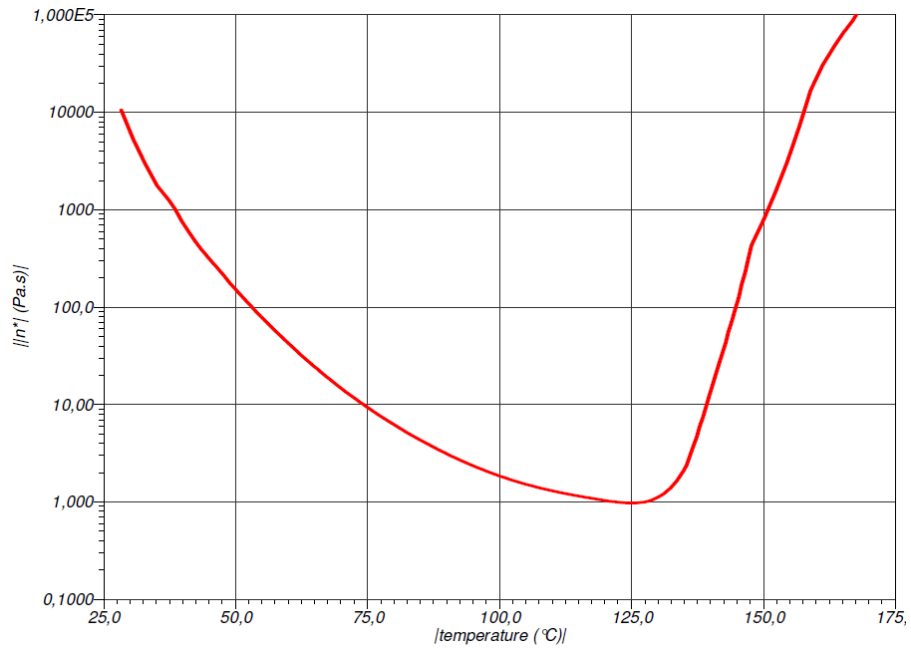
DMA trace of REM laminate cured for 60' @ 125°C.



DMA Analysis: modulus E' vs Temperature

Modulus E' evaluated under 2°C/min heating rate, 1Hz oscillating frequency.

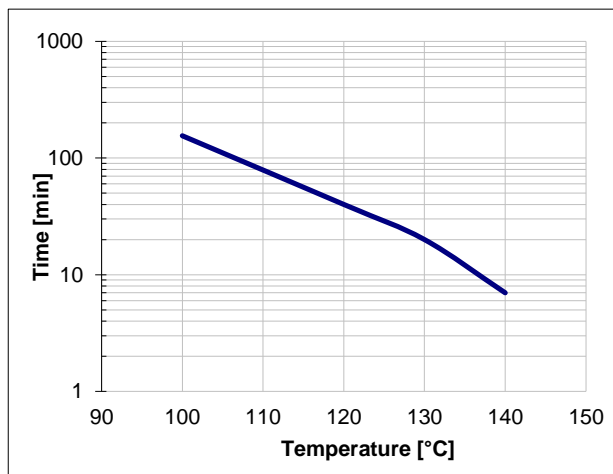
VISCOSITY PROFILE



Viscosity profile: temperature vs complex viscosity

Resin complex viscosity is measured under 3°C/min heating rate, 1Hz oscillating frequency.

GEL TIME



Temperature °C (°F)	Gel Time (min)
100 (212)	155
120 (248)	40
130 (266)	20
140 (284)	7

CURED PREPREG

Test carried out on a UD REM TAPE – 24k T700 Carbon Fiber at 35%wt resin content. Values are then normalized to 60% F.V. except for 90° properties, In-Plane Shear properties and Inter-laminar Shear.

Cured Material Property	Unit	Value Normalized 60%F.V.	Standard
Tensile Modulus 0°	GPa (Msi)	133 (19.2)	
Tensile Strength 0°	MPa (ksi)	2673 (388)	ASTM D3039-00
Poisson's ratio 0°	–	0.239	
Tensile Modulus 90°	GPa (Msi)	8.19 (1.19)	
Tensile Strength 90°	MPa (ksi)	55.6 (8.06)	ASTM D3039-00
Poisson's ratio 90°	–	0.03	
Elongation at failure 90°	%	0.68	
Compressive Strength 0°	MPa (ksi)	1147 (166)	SACMA SRM 1R-94
Compressive Strength 90°	MPa (ksi)	192 (27.8)	
In Plane Shear Modulus	GPa (Msi)	3.78 (0.548)	
In Plane Shear Strength @ failure	MPa (ksi)	123 (17.8)	ASTM D3518
In Plane Shear Strength @ 5% strain	MPa (ksi)	66.2 (9.60)	
Flexural Modulus	GPa (Msi)	121 (17.5)	ASTM D790-03
Flexural Strength	MPa (ksi)	1603 (299)	
Interlaminar Shear Strength	MPa (ksi)	85.4 (12.2)	ASTM D2344-00

SAFETY CONSIDERATIONS

- This product contains epoxy resin.
- May cause allergic reaction.
- Avoid prolonged contact with skin.
- The use of latex gloves for handling is suggested.
- It is also suggested to work in an aerated environment.
- Scraps are to be cured and discarded following national law.

Note: For further information check the Material Safety Data Sheet.

DELIVERY FORM AND PACKAGING

Custom widths, roll size, and packaging are available on request.

Prepreg fabrics: Supplied on 75 mm (3") diameter cardboard cores with release paper on one side and polyethylene film separator on the other side.

Rolls are sealed plastic bags and packed in cardboard boxes.

Standard width: 100 cm (39.4") or 127 cm (50").

Standard length: 50 m (54.7 In yds).

Unidirectional Prepreg: Supplied on 300 mm (12") diameter cardboard cores with release paper on one side and smooth polyethylene film separator on the other side. Rolls are sealed in plastic bags and packed in cardboard boxes.

Standard width: 60cm (23.6"), range from 30cm (11.8") up to 105cm (41.3")

Standard length: 100 m (109 In yds).

HANDLING AND CONDITIONING

- Stock rolls at -18 °C, sealed in original packages.
- Shop life at 23°C refers to rolls sealed in original packages.
- Before the use of the prepreg, get out the roll from the freezer and let it warm up to room temperature for 6 hours sealed in its original package.

IMPORTANT NOTICE:

Details provided in this document have been obtained from carefully controlled samples; data are an overview of this product and should not be intended as technical specification.

Because the properties of this product can be significantly affected by the fabrication and testing techniques employed and since CIT does not control the conditions under which its products are tested and used, CIT cannot guarantee that the properties provided will be obtained with other processes and equipment.

CIT has the right to change any data or information when deemed appropriate.

Copyright Composite Materials (Italy) s.r.l., March 2020, All rights reserved. RDS 15.016, Rev.03

Toray Group

Composite Materials (Italy) s.r.l. - Socio Unico

Via Quasimodo, 33 - 20025 Legnano (MI) ITALY

Capitale Sociale € 100.000 I.V. - R.E.A. MI n° 2052698

Iscrizione Registro Imprese C. F. n° 08844870967

P.IVA IT08844870967

Phone: +39 0331.467.555 • Fax: +39 0331.467.777

E-mail: info@composite-materials.it

www.composite-materials.it