

EY440

OOA EPOXY MATRIX

GENERAL FEATURES

EY440 is an epoxy matrix system suitable for out of autoclave application.

It can be processed with a minimum cure temperature of 70°C; after a suitable post-cure, it reaches a maximum service temperature of 147°C (297°F).

MAIN CHARACTERISTICS

- Excellent surface finishing, suitable for most of cosmetic applications;
- Can be processed with initial cure at 70°C;
- Low void content in thick laminates;
- Available on a very wide range of support (UD, fabrics and multi-axial - carbon, glass);
- Quality and durability of vacuum bag + oven cured parts are comparable to autoclave process;
- Outstanding handling: excellent tack level;
- Out-life over 40 days at room temperature.

OPERATIONAL INSTRUCTIONS

CURE PROCESS RECOMMENDATIONS

This epoxy matrix system can be cured under the following condition:

Temperature (°C)	Time (hours)
70	15
80	10
90	5
100	1.5
120	0.5

Custom cure cycles can be developed in conjunction with the CIT Technical Department

CURING THICK STRUCTURES

When curing large structures, the following cure conditions are preferable:

Processing Method		Vacuum Bag
Cure Cycle	Min Vacuum time before curing	60 minutes
	Typical Ramp rate	1-2 °C per minute
	Dwell Temperature	50°C
	Dwell Time	3 hours
	Cure Temperature	80°C
	Cure time	8 hours
Property	Dry Tg by DMA	108°C
	Inter-Laminar shear strength*	78.9 MPa

**Performed following EN 2563 standard on a carbon UD plate T700S fiber 300gsm at 36% resin content*

RESIN MATRIX

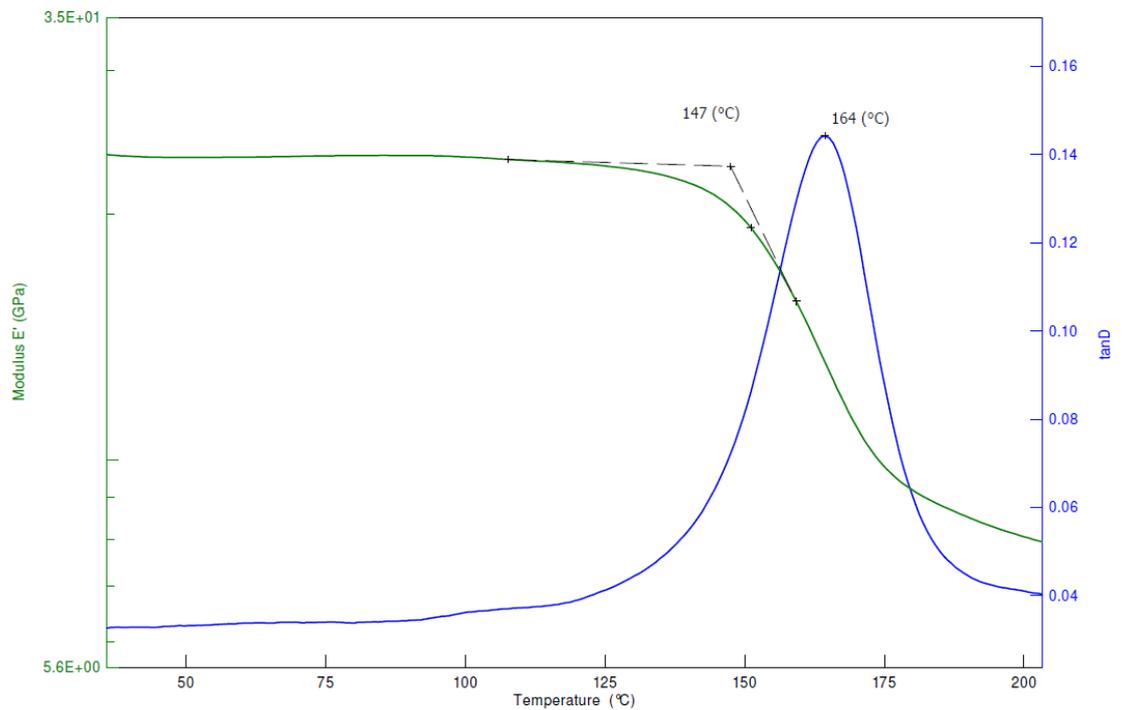
GENERAL PROPERTIES

Property	Unit	Value	Standard
Storage life @ -18°C (0°F)	months	12	
Out life @ 23°C (73°F)	days	40	
Prepreg volatiles	%wt	<1	ASTM D3530
Cured resin density	g/cm3	1.22	ASTM D792-00
Tg E' (DMA)*	°C (°F)	147 (297)	ASTM E1640-09
Tack		Medium	

* Laminate cured 15 min @ 130°C.

THERMO-MECHANICAL DMA ANALYSIS

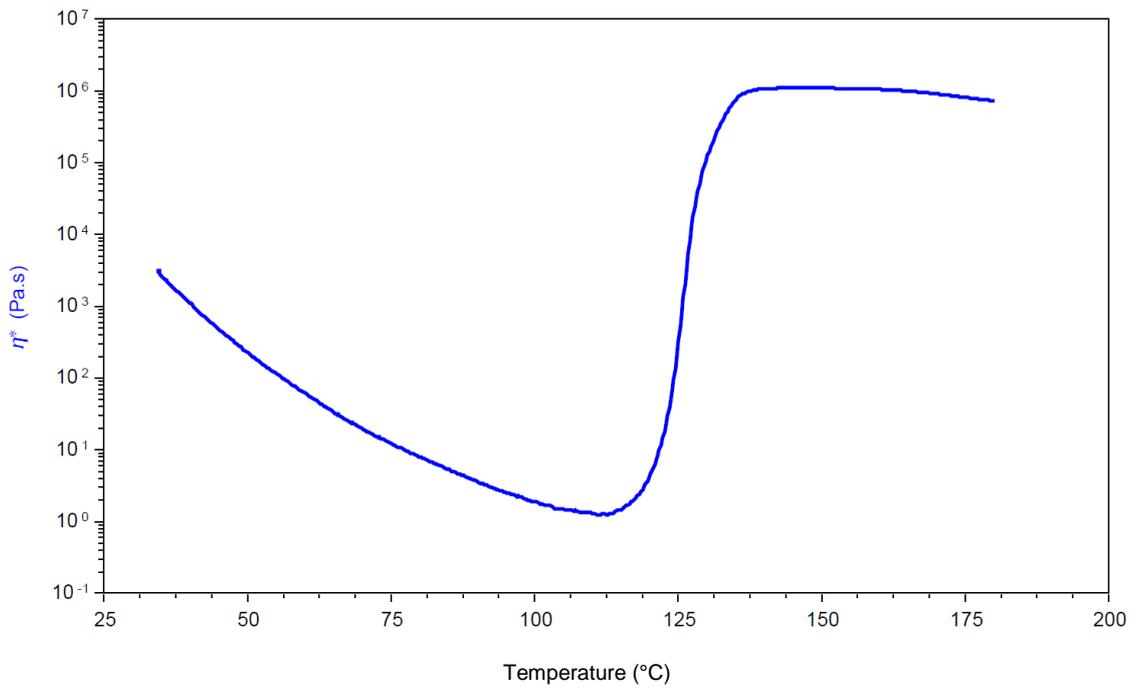
DMA trace of EY440 laminate cured for 15 min @ 130°C.



DMA Analysis: modulus E' vs Temperature

Modulus E' evaluated under 5°C/min heating rate, 1Hz oscillating frequency.

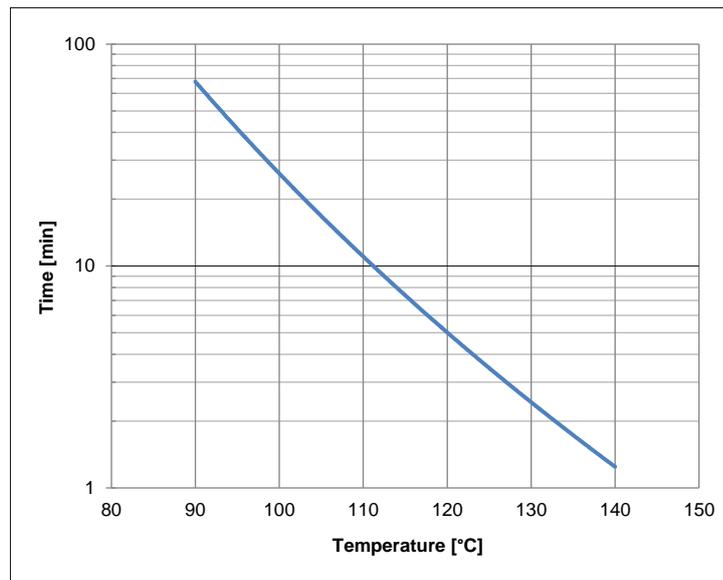
VISCOSITY PROFILE



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)
90 (194)	62
100 (212)	27
120 (248)	6
140 (284)	1.1

LAMINATE

MECHANICAL PROPERTIES OF FABRIC PREPREG LAMINATES

Test carried out at room temperature

Cure condition: 2 hours @135°C

Values normalized to 55% Vf except for Poisson's Ratio, IPSM, IPSS, ILSS and CPT

Cured Material Property	Test method	Units	CC384 T700 EY440 40%
0° Tensile Modulus		GPa	62.2
0° Tensile Strength	ASTM D3039	MPa	1072
Poisson's ratio		-	0.07
90° Tensile Modulus		GPa	63.4
90° Tensile Strength	ASTM D3039	MPa	1040
0° Compressive Modulus	ASTM D6641	GPa	56.0
0° Compressive Strength	SACMA SRM 1R94	MPa	727
90° Compressive Modulus	ASTM D6641	GPa	54.5
90° Compressive Strength	SACMA SRM 1R94	MPa	712
In-Plane Shear Modulus		GPa	3.65
In-Plane Shear strength at 5% strain	ASTM D3518	MPa	69.8
In-Plane Shear strength at failure		MPa	93.3
0° Inter-laminar Shear Strength	ASTM D2344	MPa	58.3
Cured ply thickness	-	mm	0.425

CC 384: 380gsm 2x2 Twill T700S fiber

MECHANICAL PROPERTIES OF UNIDIRECTIONAL PREPREG LAMINATES

Test carried out at room temperature

Cure condition: 2 hours @135°C

Values normalized to 60%Vf (except for 90° TS, ILSS, IPSS)

Cured Material Property	Test method	Units	HS T700S
0° Tensile Modulus	ASTM D3039	GPa	139
0° Tensile Strength		MPa	2790
90° Tensile Strength	ASTM D3039	MPa	46
0° Compressive Strength	SACMA SRM 1R94	MPa	1520
0° Flexural Modulus	ASTM D790	GPa	123
0° Flexural Strength		MPa	1690
Interlaminar Shear Strength	ASTM D2344	MPa	79
In-Plane Shear Strength at failure	ASTM D3518	MPa	111

SAFETY CONSIDERATIONS

- Please consult the Material Safety Data Sheet.
- This product contains epoxy resin, and may cause allergic reaction.
- The use of latex gloves for handling is recommended.
- Waste material should be discarded following national law.

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

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

IMPORTANT NOTICE:

The data and statements supplied in this datasheet are met to provide an overview of this product and its properties. Users should perform their own verification and testing to determine suitability of this material for their specific end use applications. NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSED OR IMPLIED. Nothing herein is to be taken as permission to practice any patented invention without a licence.

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