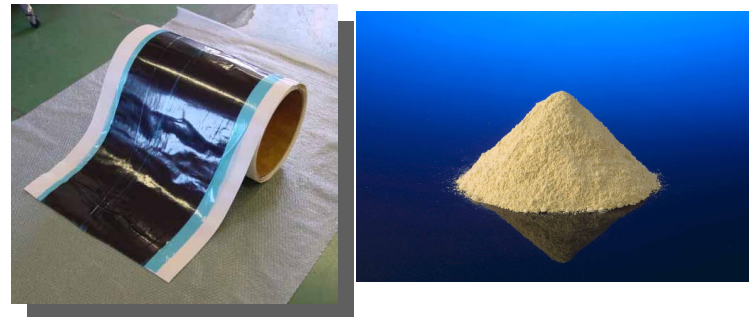


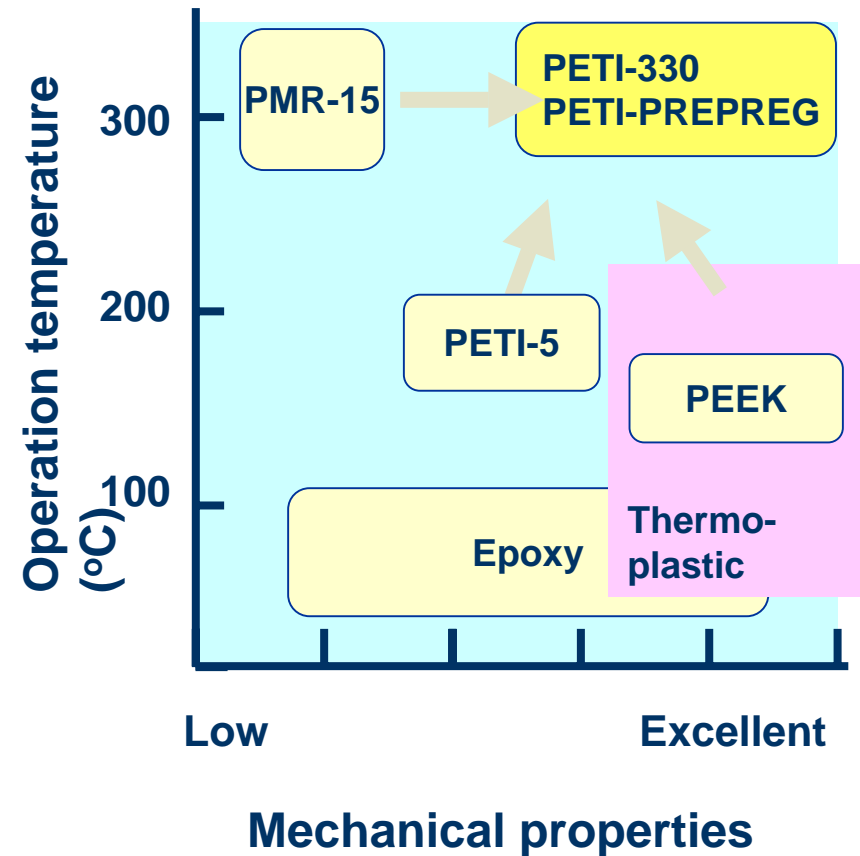
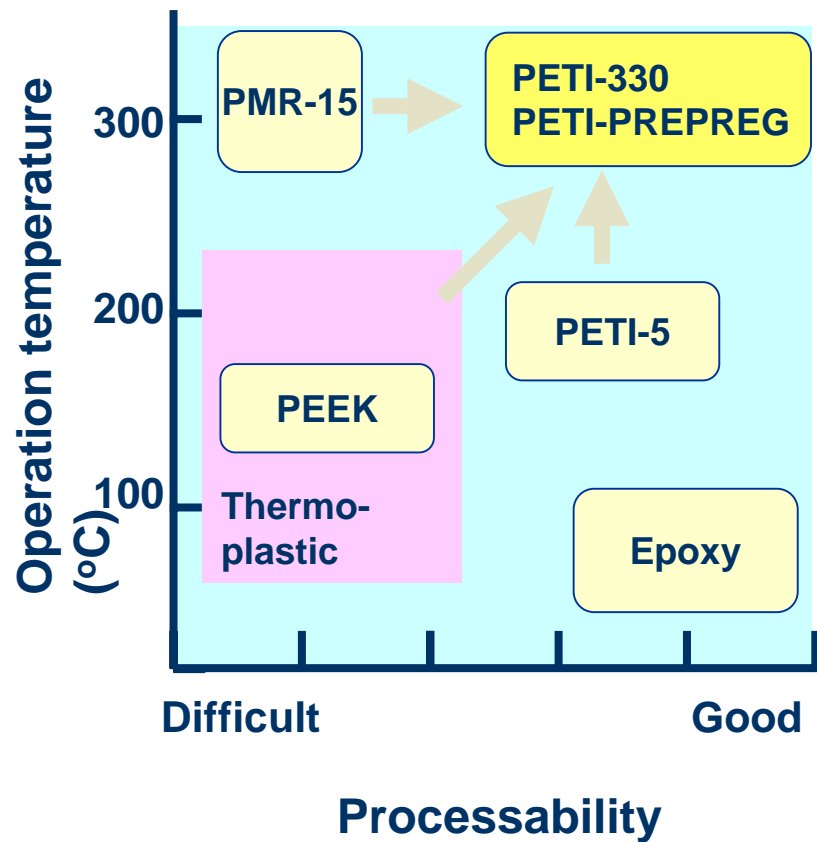
HIGH TEMPERATURE COMPOSITE MATERIALS

RTM Resin : PETI-330

PREPREG : PETI-365E PREPREG



Materials for High Temp. Composite UBE BPDA Technology



Resin for RTM

PETI-330

UBE
UBE INDUSTRIES, LTD.

Breakthrough Resin Technology for High Temperature Composite Fabrication by RTM

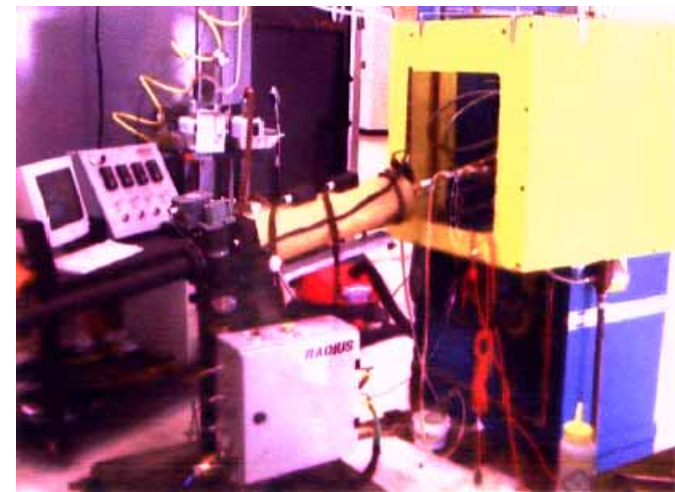
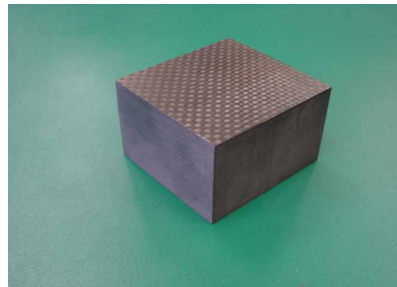
Licensed From the NASA Under US Patent 6,359,107

- PETI-330 is a new high temperature resin for **R**esin **T**ransfer **M**olding

Properties

Viscosity : 1.8 ~ 3.0 Pa•s (280°C)

Tg (cured) : 333 °C





Resin for RTM

PETI-330

UBE
UBE INDUSTRIES, LTD.



Characteristics

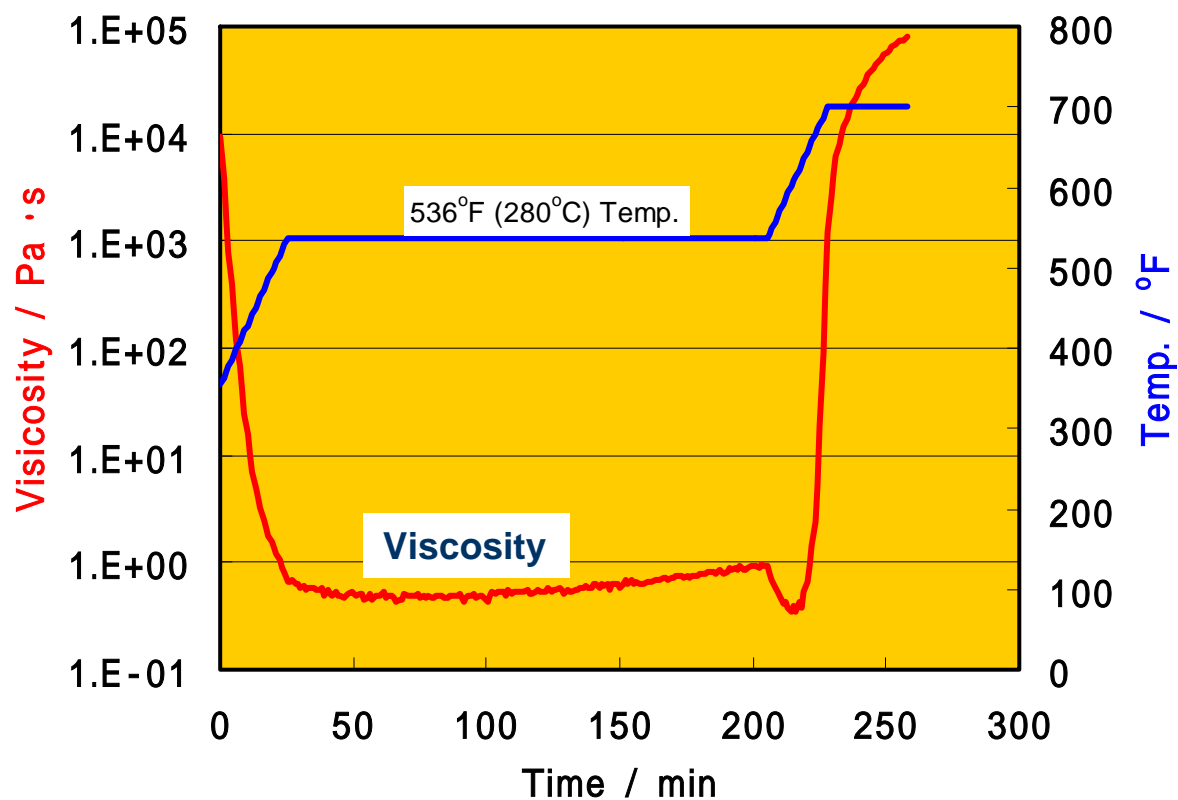
- ❖ **Easy Processing**
- ❖ **Tg 626°F/330°C**
- ❖ **Solvent Free**
- ❖ **Non Toxic**
- ❖ **Tough, Micro-crack resistant resin**
- ❖ **Thermo Oxidative Stability**
- ❖ **Dry Powder @ Room Temperature Easy handling**
- ❖ **12 month Shelf-life**

Resin for RTM

PETI-330

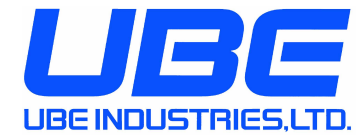


Melt Viscosity vs. Temperature Curve

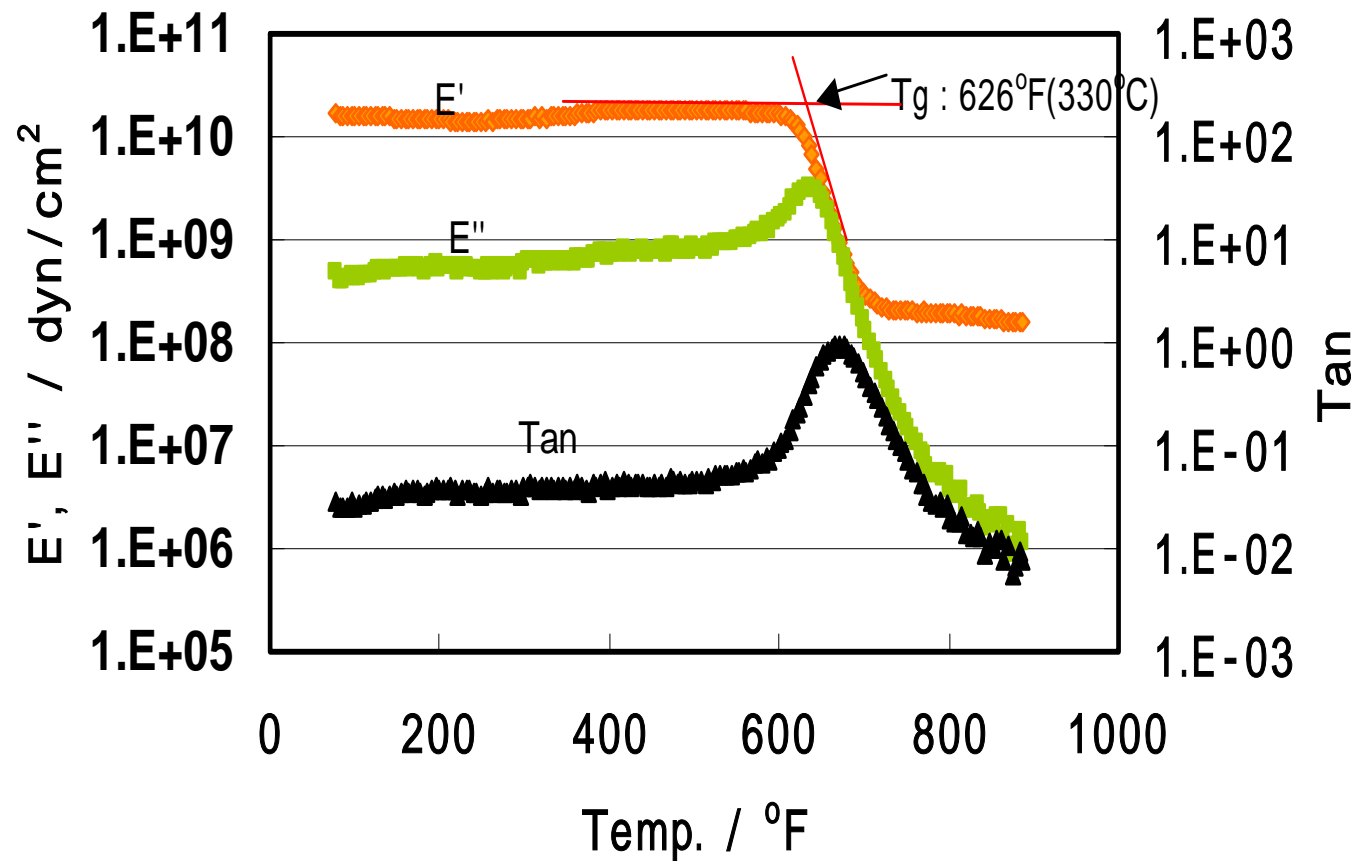


Resin for RTM

PETI-330



D.M.T.A. Data

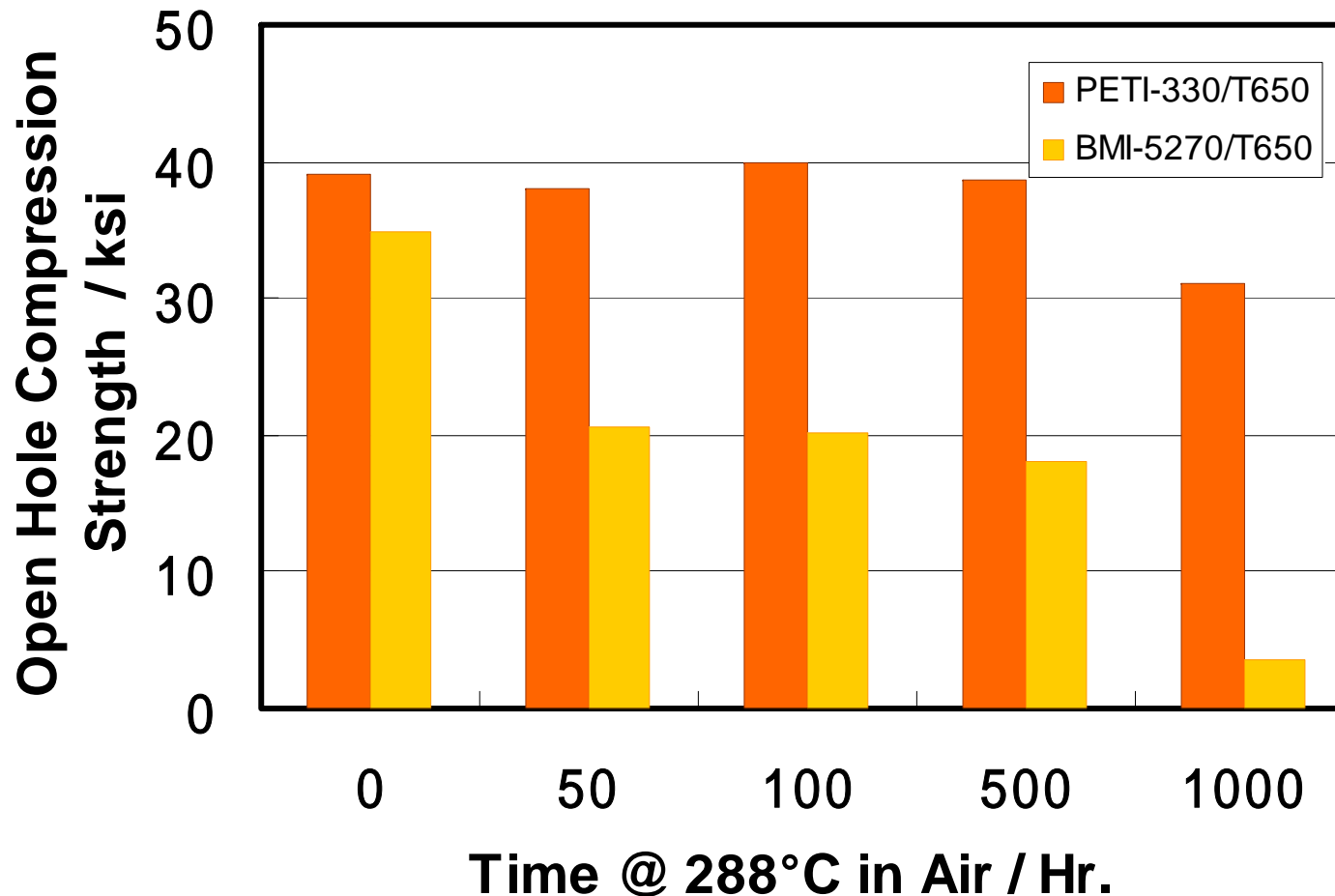


Resin for RTM

PETI-330



High Temperature Durability (Isothermal Aging) of T650-35/8HS Laminates

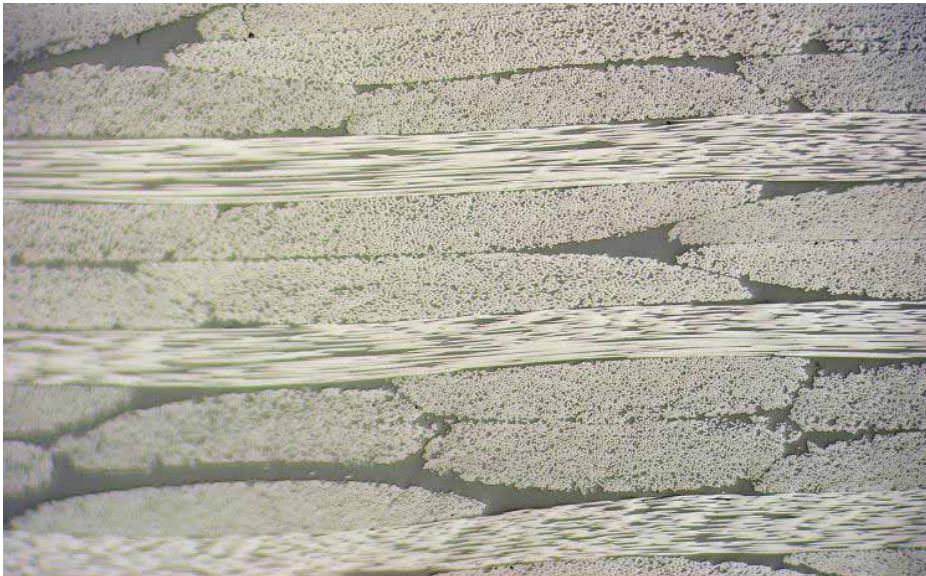


Resin for RTM

PETI-330

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**PETI-330 Composite
Micro-crack resistant**



Neat Resin Elongation

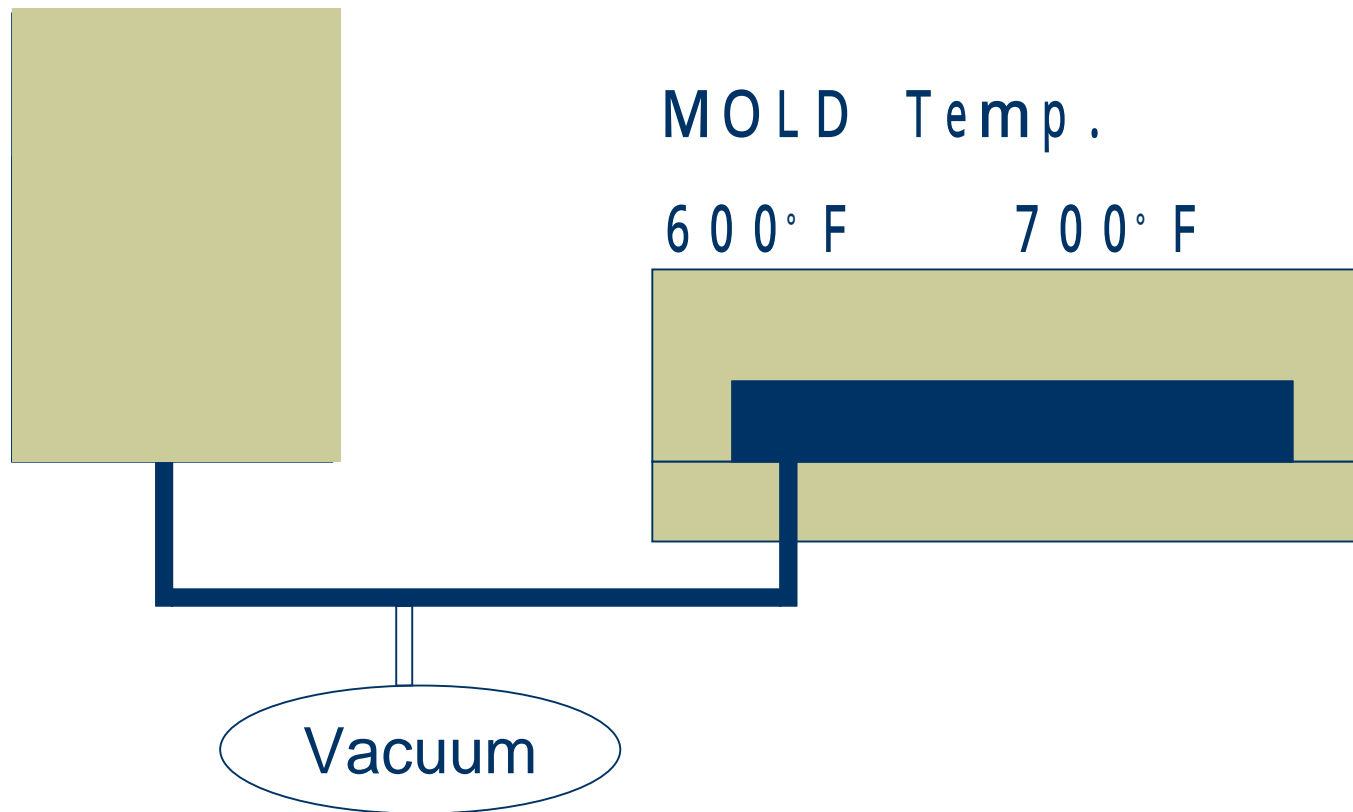
PETI-330	8%
PMR-15	1%
PETI-5	32%

Resin for RTM

PETI-330

UBE
UBE INDUSTRIES, LTD.

How to make composite by RTM (TBD)



Resin for RTM

PETI-330

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Package

- 1kg - 9kg
1kg polyethylene bottles in cardboard box
- 10kg and up
10kg moisture proof bag in paper drum



Prepreg for High Temp. Composite

PETI-365E Prepreg



Features and benefits

- ✚ Polyimide resin matrix
- ✚ Tg : 365°F
- ✚ Tough, Micro-crack resistant resin
- ✚ Alcohol based prepreg system similar with PMR family
- ✚ Thermo Oxidative Stability

Prepreg for High Temp. Composite

PETI-365E Prepreg



Typical Properties

Carbon fiber
(320g/m²)

Resin content

Volatile content

T800-12k plane woven

38~42wt%

11~14wt%

Water, Alcohol

$T_g = 365^{\circ}\text{C}$



Prepreg for High Temp. Composite

PETI-365E Prepreg

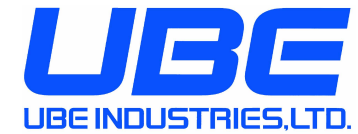


Neat Resin Properties

Density	1.33g/cc	ASTM D792
Tg	357°C	ASTM E1356
Tensile at 73°F(23°C)		ASTM D882
Strength	128MPa	
Modulus	2.8GPa	
Elongation at break	13%	
Water absorption at 73°F(23°C)	2.20%	ASTM D570 saturation
Coefficient thermal expansion	51ppm/ °C	ASTM E233
Weight loss 527°F(275°C),500hrs	0.15%	
Weight loss 572°F(300°C),500hrs	0.60%	

Prepreg for High Temp. Composite

PETI-365E Prepreg



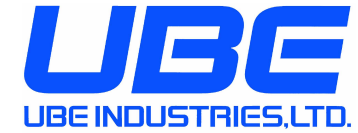
Typical Composite Properties

	73°F(23°C)	550°F(288°C)	Method
SBS Strength	69MPa	-	ASTM D2344
Flexural Strength	815MPa	479MPa	ASTM D790
Flexural Modulus	62GPa	62GPa	

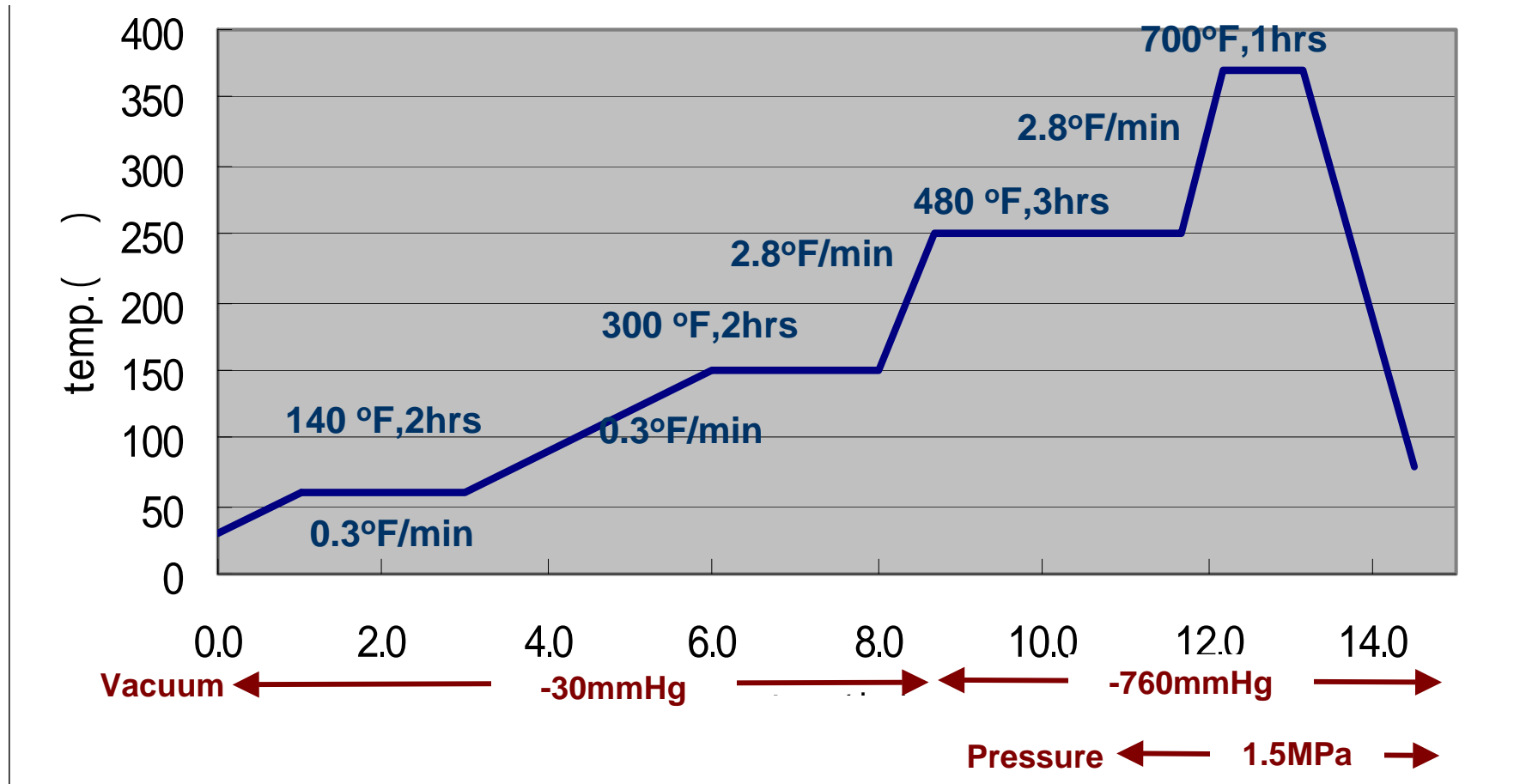
Composite: PETI-365E/T800 12K plane woven
300x300x4mm,[90/0]12lay-up,Fiber volume 59%

Prepreg for High Temp. Composite

PETI-365E Prepreg

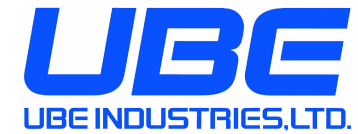


Autoclave Processing Parameters

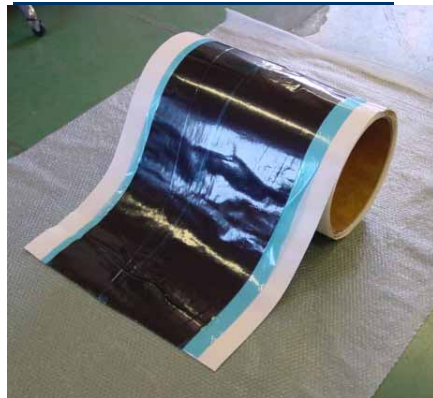


Prepreg for High Temp. Composite

PETI-365E Prepreg



UD PREPREG



500mm x 50m Roll

Cloth PREPREG



1000mm x 50m Roll

Delivery Time	:	3 months
Transport Temperature	:	< 6°C
Storage Temperature	:	< -18°C