ENGINEERED TEXTILE SOLUTIONS & ASSOCIATES, LLC

E15001
TECHNICAL DATA SHEET

DESCRIPTION AND OVERVIEW

- E15001 series prepregs are based on a variable temperature cure, flow controlled, toughened epoxy resin system.
- E15001 series prepregs can be cured at a range of temperatures, from 90°C to 140°C, with a service temperature up to 120°C.
- E15001 series prepregs give an excellent, pinhole free surface on cured composite parts.
- E15001 series prepregs are based on an epoxy resin system that gives excellent optical clarity when cured.
- E15001 series prepregs are available with a wide variety of woven and unidirectional, carbon fibre and E-glass reinforcements.
- E15001 series prepregs have good handleability and flexibility before curing, and an excellent combination of static and dynamic mechanical properties after curing.
- E15001 series prepregs can be used in many different composite manufacturing processes, such as autoclave cure, press / compression moulding, and table rolling / shrink tape.
- E15001 series prepregs have a guaranteed shelf life of 5 weeks at 20°C, and 12 months at -18°C.

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FEATURES AND BENEFITS

- Excellent surface finish.
- Wide curing range; 90°C to 140°C.
- Good optical clarity on cured resin.
- Flexible, easy to handle prepreg.
- Good shelf life; >1 month at 20°C.

AVAILABILITY

E15001 series prepregs are available with a wide variety of woven and unidirectional, carbon fibre and E-glass reinforcements.
The most common products are:

- **E15001 C200T**
  200gsm 2/2 twill weave 3K carbon prepreg, 1,000mm width.
  3K standard modulus carbon fibre, 42% resin content.
- **E15001 C245T**
  245gsm 2/2 twill weave 3K carbon prepreg, 1,000mm width.
  3K standard modulus carbon fibre, 42% resin content.
- **E15001 C450T**
  450gsm 2/2 twill weave 12K carbon prepreg, 1,000mm width.
  12K standard modulus carbon fibre, 45% resin content.
- **E15001 C650T**
  650gsm 2/2 twill weave 12K carbon prepreg, 1,000mm width.
  12K standard modulus carbon fibre, 38% resin content.
- **E15001 C150UD**
  150gsm uni-directional carbon prepreg, 1,000mm width.
  12K standard modulus carbon fibre, 35% resin content.

CURING PROPERTIES

TEMPERATURE (°C)	MINIMUM CURE TIME		TG (°C)
	MINUTES	HOURS	
90	720	12.00	100
100	360	6.00	110
110	180	3.00	120
120	90	1.50	130
130	60	1.00	130
140	45	0.75	130

TG measured using DMA, E' onset.

RECOMMENDED PROCESSING CONDITIONS AND HANDLING PROCEDURES

E15001 series prepregs are versatile, with a number of possible cure cycles. It is not possible to list them all, so a some recommendations are listed below:

- When curing in an autoclave, use a temperature ramp rate of between 1°C and 3°C per minute, if possible.
- Note the minimum cure times at given temperatures, shown within this Technical Data Sheet. Bear in mind the thermal lag between the air temperature in an oven / autoclave, and the part itself. Always ensure that the part is exposed to any given temperature for at least the minimum recommended time.
- Always demould below 60°C.
- This material should be kept frozen at -18°C. It must be kept sealed in a polythene bag which must not be opened until fully thawed to room temperature. If the material is not fully used, then the material must be resealed in the polythene bag to prevent moisture absorption.

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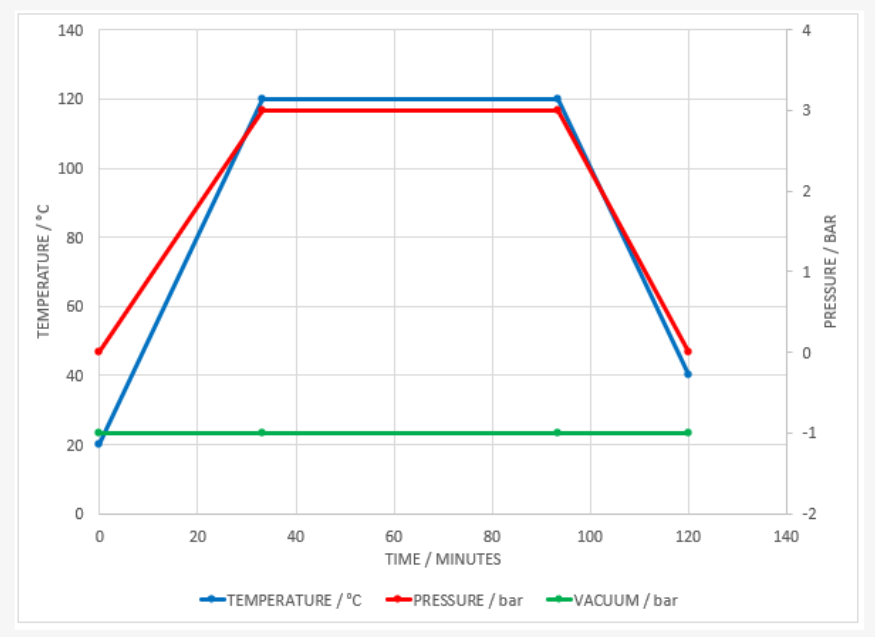
CURED MATERIAL PROPERTIES

Tests performed on 200gsm 2/2 twill weave 3K carbon prepreg, 42% RC.

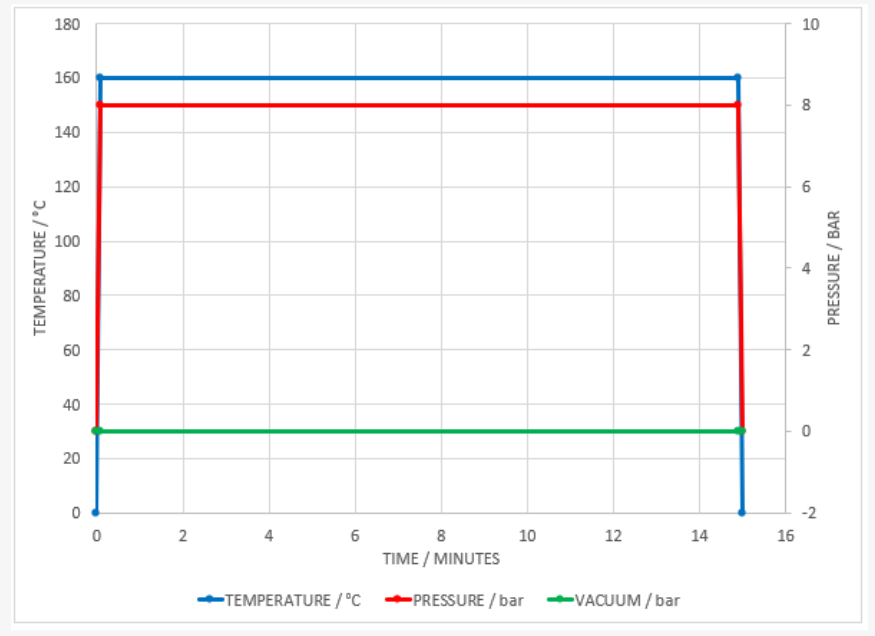
PROPERTY	TEST STANDARD	VALUE	UNITS
0° Tensile Strength	ASTM D3039	846	MPa
0° Tensile Modulus	ASTM D3039	57.5	GPa
90° Tensile Strength	ASTM D3039	802	MPa
90° Tensile Modulus	ASTM D3039	56.1	GPa
0° Compressive Strength	ASTM D6641	668	MPa
0° Compressive Modulus	ASTM D6641	51.7	GPa
90° Compressive Strength	ASTM D6641	649	MPa
90° Compressive Modulus	ASTM D6641	52.0	GPa
Flexural Strength	ASTM D790	848	MPa
Flexural Modulus	ASTM D790	55.4	GPa
Interlaminar Shear Strength	ASTM D2344	65.3	MPa

Mechanical testing carried out at 21±2°C.
Cure cycle: 90 minutes at 120°C, autoclave 5 bar pressure.
All figures in this report are actual test results and have not been normalised.

EXAMPLE CURE CYCLE: AUTOCLAVE CURE



EXAMPLE CURE CYCLE: PRESS CURE / COMPRESSION MOULDING



HEALTH AND SAFETY

E15001 prepregs contain epoxy resin which can cause allergic reactions with skin contact. We recommend avoiding repeated and prolonged skin contact. Please refer to the product Safety Data Sheet before using E15001 prepregs. The following precautions are recommended when using E15001 prepregs:

- Wear overalls.
- Wear impervious gloves.
- Take care with thick laminates, to avoid excessive exotherm.
- Avoid ramp rates exceeding 3.0°C/min if possible.

DISCLAIMER

Technical advice, instruction, data or recommendation, whether verbal or written, is given in good faith. In providing such advice, Engineered Textile Solutions & Associates LLC [ETS] gives no warranty or guarantee, either express or implied, in relation to it.
Customers must carry out their own tests and assessments as necessary in order to determine the quality and suitability of the product for their particular application.
Such testing should be performed under conditions identical to those to which the final component/product may be subjected.
Values listed in any ETS document are typical properties of the product in question and are not intended to be used in establishing either statistically valid engineering basis values. They do not constitute minimum or maximum values for the product in question.