VICTREX LMPAEK™ UDT AS4-143-34

Product Description

Unidirectional (UD) composite prepreg tape with high performance semi-crystalline thermoplastic polymer.

- Base polymer: VICTREX low melt PolyArylEtherKetone, LMPAEK™ Polymer.
- Continuous carbon fibre reinforcement: Hexcel HexTow® AS4 12K.

Typical Application Areas

- Aerospace – Primary & Secondary structures
- Aircraft interiors including high load applications
- Aerospace – Brackets, Ribs, Stiffeners
- Aerospace – Engine Applications
- e-Mobility / Advanced Air Mobility
- Battery Systems

Key Characteristics

- Excellent toughness and fatigue performance
- Exceptional resistance to aggressive chemicals & solvents
- Lower viscosity than PEEK at processing temperatures
- Can operate at or above glass transition temperature
- LMPAEK™ materials are suitable for overmoulding with PEEK resin
- Low coefficient of thermal expansion
- Low moisture absorption
- FST performance meets recognized industry standards
- Room temperature storage, no freezer required
- Suitable for welding and thermoplastic joining applications
- Available in widths for ATL and AFP lay-up, long lengths without splices (>1000 m)

BASE POLYMER PROPERTIES		
	TEST METHOD	TYPICAL VALUE
Property		
Melting Point	ISO11357	305°C (581°F)
Glass Transition (T_g) Onset	ISO11357	149°C (300°F)
Melt Viscosity@ 400 °C	ISO11443	150 Pa.s
Crystallinity	ISO11357-2	25 ± 5%
Density	ISO1183	1.30g/cm³ (81.2 lb/ft³)

UDT PHYSICAL PROPERTIES	
	NOMINAL VALUE
Property	
Fibre Areal Weight (FAW)	143gsm (4.22 oz/yd^2)
Resin Content by Weight (RC)	34%
Prepreg Areal Weight (PPAW)	217gsm (6.39 oz/yd^2)
Consolidated Ply Thickness (CPT)	0.137mm (0.0054 in)
Fibre Volume Fraction	58.10%
Density	1.576g/cm^3 (98.4 lb/ft^3)

MECHANICAL PROPERTIES				
	CONDITIONS	TEST METHOD	TYPICAL VALUES	
Property				
Tensile Strength 0°	RTA	ASTM D3039	2320 MPa	336.4 ksi
Tensile Modulus 0°	RTA	ASTM D3039	130 GPa	18.9 Msi
Compression Strength 0°	RTA	ASTM D6641	1420 MPa	206.4 ksi
Compression Modulus 0°	RTA	ASTM D6641	120 GPa	17.5 Msi
Compression Strength 90°	RTA	ASTM D6641	192 MPa	27.9 ksi
Compression Modulus 90°	RTA	ASTM D6641	9.6 GPa	1.4 Msi
In-Plane Shear Strength	RTA	EN 6031	145 MPa	21 ksi
In-Plane Shear Modulus	RTA	EN 6031	4.5 GPa	0.65 Msi
Open-Hole Compression Strength	RTA	ASTM D6484	314 MPa	45.5 ksi
Open-Hole Compression Strength	ETW	ASTM D6484	243 MPa	35.3 ksi
Open-Hole Tensile Strength	RTA	ASTM D5766	391 MPa	56.7 ksi
Flexural Strength 0º	RTA	ASTM D790	1360 MPa	197.1 ksi
Compression After Impact Strength 6.67 J/mm (1500 in-lb/in) Impact Energy	RTA	ASTM D7137	289 MPa	42 ksi

Room Temperature Ambient (RTA)
Elevated Temperature Wet (ETW) is 121°C (250°F) after equilibrium at 71°C/85%RH (160°F/85%RH)

This product grade is approved by the United States National Centre for Advanced Materials Performance (NCAMP) for use in aerospace programs. Detailed data available on our website www.victrex.com or upon request

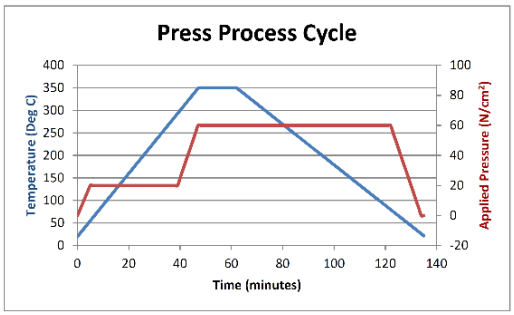
TYPICAL PROCESSING

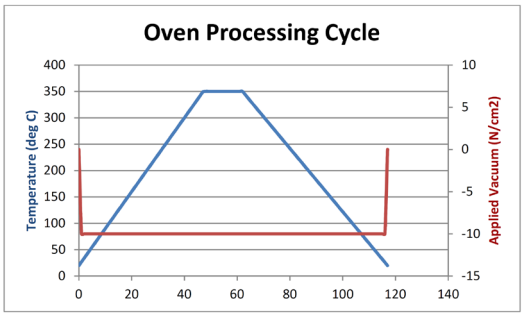
Drying (if required)	
Drying Temperature / Time	150°C / 3h or 120°C / 5h (residual moisture <0.02%)

Consolidation

VICTREX LMPAEK™ UDT can be consolidated in a press, autoclave, or in an oven under a polyimide vacuum bag (OOA - Out of Autoclave consolidation) requiring as little as 1 bar pressure to consolidate the stacked prepreg tapes. Tapes can be hand-laid or by automated processes such as automated fibre placement (AFP) or automated tape laying (ATL).

Processing conditions for VICTREX LMPAEK™ UDT need to be set to ensure that the LMPAEK™ polymer matrix is melted and fully fused. Typical consolidation temperatures are in the range 349-390°C (660-750°F) with a minimum applied pressure of 1-10 bar (15-150 psi). For a static press, a typical minimum dwell within the melt range given above is 20 minutes, but thicker laminates may need additional time. Press cooling rate of 5-25 °C/min may be used to attain proper crystallinity levels (typically 25%±5%). Parts may be removed from tooling below 200 °C (392 °F).





Important notes:

1. Processing conditions quoted in our datasheets are typical of those used in our processing laboratories.
2. Data is generated in accordance with prevailing national, international, and internal standards, and should be used for material comparison. Actual property values are highly dependent on part geometry, mould configuration and processing conditions.

Detailed data available on our website www.victrex.com or upon request.

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