Technical Datasheet
VICTREX LMPAEK™ UDT IM7-149-34

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® IM7 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)

NEAT 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/cm^3 (81.2 lb/ft^3)

PREPREG PHYSICAL PROPERTIES	
	NOMINAL VALUE
Property	
Fibre Areal Weight (FAW)	149gsm (4.39 oz/yd^2)
Resin Content by Weight (RC)	34%
Prepreg Areal Weight (PPAW)	226gsm (6.66 oz/yd^2)
Consolidated Ply Thickness (CPT)	0.143mm (0.0056 in)
Fibre Volume Fraction	58.6%
Density	1.581g/cm^3 (98.7 lb/ft^3)

MECHANICAL PROPERTIES				
	CONDITIONS	TEST METHOD	TYPICAL VALUES	
Property				
Tensile Strength 0°	RTA	ASTM D3039	2655 MPa	385 ksi
Tensile Modulus 0°	RTA	ASTM D3039	150 GPa	21.7 Msi
Tensile Strength 90°	RTA	ASTM D3039	79 MPa	11.4 ksi
Tensile Modulus 90°	RTA	ASTM D3039	8.5 GPa	1.2 Msi
In-Plane Shear Strength $^{s0.2\%}$	RTA	ASTM D3518	41 MPa	5.9 ksi
In-Plane Shear Modulus	RTA	ASTM D3518	4.45 GPa	0.64 Msi
Open-Hole Compression Strength	RTA	ASTM D6484	292 MPa	42.3 ksi
Flexural Strength 90º	RTA	ASTM D790	114 MPa	16.5 ksi
Flexural Modulus 90º	RTA	ASTM D790	8.8 MPa	1.2 ksi

Panels were consolidated using a press
Room Temperature Ambient (RTA)
Fibre dominated properties normalised to the nominal Consolidated Ply Thickness (CPT)

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

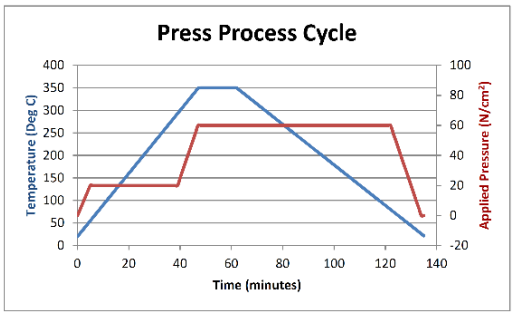
TYPICAL PROCESSING

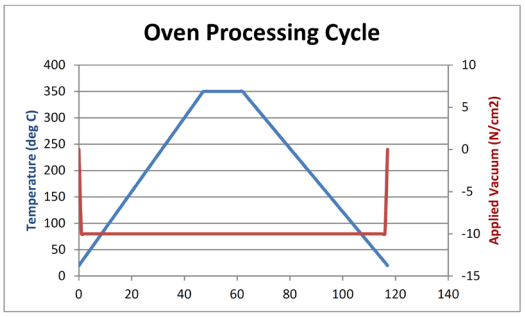
Drying (if required)	
Drying Temperature / Time	150°C / 3h or 120°C / 5h (residual moisture <0.02%)

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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