HexPly® M92

125ºC versatile curing epoxy matrix for aerospace structures

HEXCEL®

Product Data Sheet

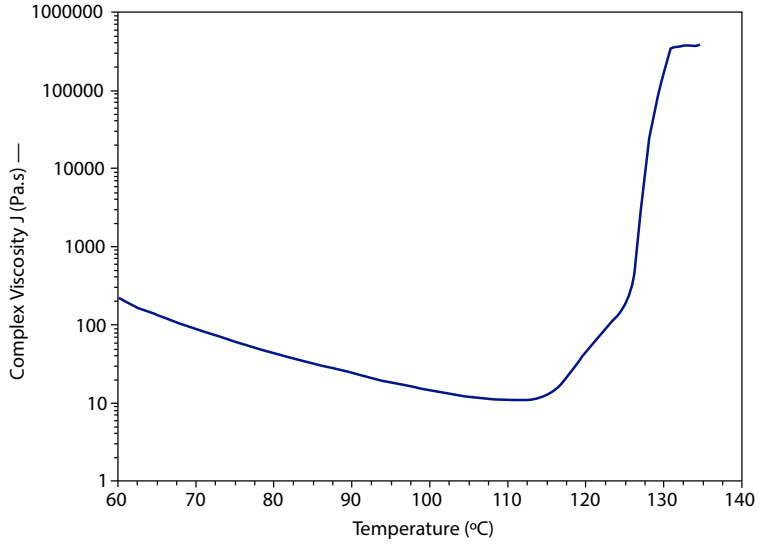
Description

HexPly® M92 combines all the key benefits achieved individually with other 125ºC curing epoxy resins, in one new system with no compromise: very good hot-wet performance, high toughness, self-adhesion, fire resistance and long out/tack life. This multi-tasking system has elevated hot wet Tg performance, allowing HexPly® M92 to operate at higher service temperatures, while still benefiting from the lower cost 125ºC cure. HexPly® M92 is available in a wide range of prepreg forms (woven and UD tape).

Benefits and Features

- HexPly® M92 exceeds the service temperature and hot wet retention of standard 125°C curing systems (T_g dry 160°C and Tg wet 115°C measured by DMA)
- Optimized for sandwich and monolithic structures with self-adhesive properties
- High toughness suitable for demanding aerospace structures
- Low exotherm for thick components
- Fire resistant performance (FAR 25.853 12s and 60s vertical burn test)
- High robustness with 60 days tack life and out life
- Low pressure moulding capability 0.8-3 bar
- Good surface aspect - limited preparation before painting

Resin Matrix Properties



Viscosity profile heating at 2°C/min

Cured Matrix Properties (cured at 125°C)

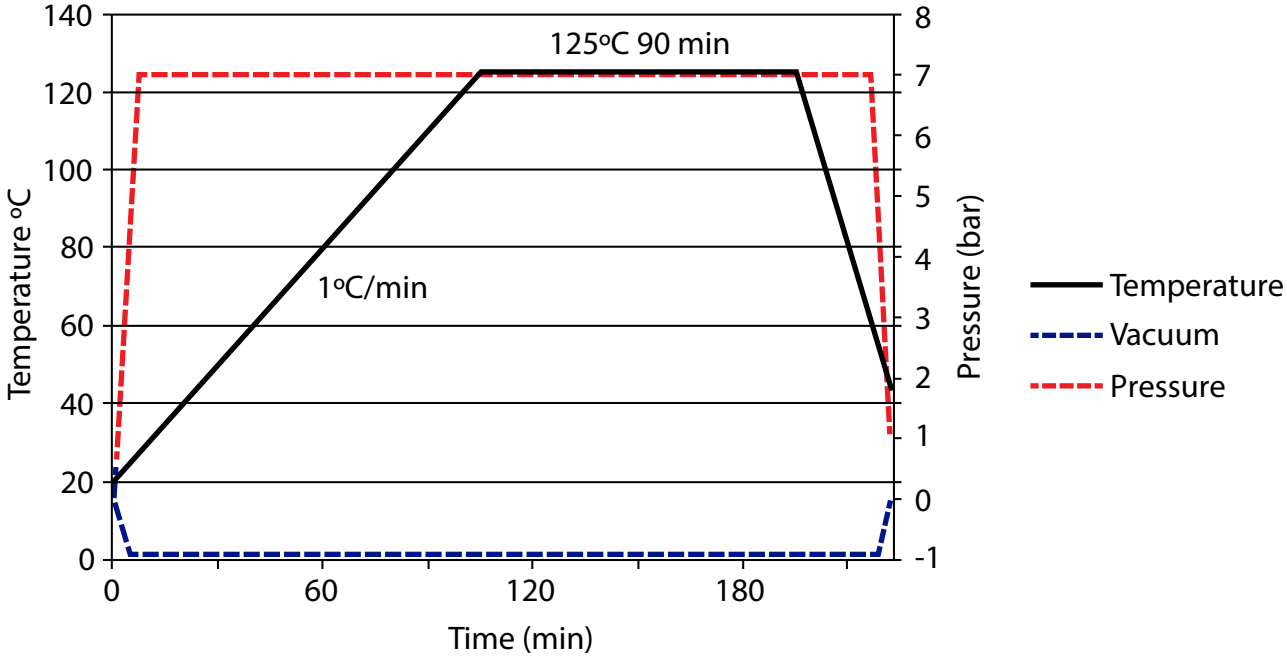
		Method
Tensile strength	60MPa	ISO R527 type 1
Tensile modulus	2.7GPa	ISO R527 type 1
Tensile strain at break	2.45%	ISO R527 type 1
Cured density	1.19g/cm^3	

Prepreg Curing Conditions

Defined heat up rates will vary depending on the autoclave dimensions, the mass of tooling used and the size of the component to be manufactured.

Autoclave typical cure cycle (monolithic)

- Apply full vacuum (-0.95bar)
- Apply 7 bar gauge pressure (for sandwich structures 2 or 3 bar is recommended)
- Heat up at between 1 – 3 °C/min to 125°C
- Hold at 125°C (0 +10 °C) for 90 min
- Cool down at 2-5°C/min
- Vent autoclave pressure when temperature reaches 60°C or below



Cured Woven Prepreg Properties

Physical properties	Units	M92/48%/ 285H5/AS4C-3K	M92/50%/ 193PW/AS4C-3K	M92/45%/ 160WUD/AS4C-3K
Fibre		AS4C-3K	AS4C-3K	AS4C-3K
Weave		5HS	PW	UDPW
Fibre mass	g/m^2	285	193	160
	(oz/yd^2)	8.4	5.7	4.7
Nominal prepreg mass	g/m^2	548	386	291
	(oz/yd^2)	16.1	11.4	8.6
Nominal cured ply thickness	mm	0.38	0.27	0.20
	(inch)	0.015	0.011	0.008
Nominal fibre volume	%	42	42	45
Resin density	g/cm^3	1.19		
	(lbs/ft^3)	74.1		
Fibre density	g/cm^3	1.78		
	(lbs/ft^3)	111		
Nominal laminate density	g/cm^3	1.44	1.44	1.46
	(lbs/ft^3)	90.0	90.0	91.1

Mechanical properties	Units	M92/48%/ 285H5/AS4C-3K	M92/50%/ 193PW/AS4C-3K	M92/45%/ 160WUD/AS4C-3K
Glass Transition Temp. DRY	°C (°F)	166 (331)		
Glass Transition Temp. WET		115 (239)		
Method		EN6032 - DMA extrapolated onset E'		
Warp tension strength	MPa (Ksi)	782 (113)	687 (100)	1593 (230)
Warp tension modulus	GPa (msi)	50.3 (7.3)	50.2 (7.3)	101.1 (14.7)
Method		EN2561B		
Warp compression strength	MPa (Ksi)	573 (83)	564 (82)	943 (137)
Warp compression modulus	GPa (msi)	40.4 (5.9)	44.1 (6.4)	86.0 (12.5)
Method		EN2850B		
ILSS	MPa (Ksi)	57.4 (8.3)	59 (8.6)	70 (10.2)
Method		EN 2563		
In-plane Shear Strength	MPa (Ksi)	96 (13.9)	94 (13.6)	93 (13.5)
In-plane Shear Modulus	GPa (msi)	2.7 (0.39)	2.5 (0.36)	2.4 (0.35)
Method		EN 6031		
Vf used for normalisation	%	42	42	45

Note:
These are average values showing typical data and not guaranteed minimum values

Comments:
Data generated after autoclave cure at 125°C for 90 minutes
Tension and compression tested in warp direction and normalised to respective fiber volume content (Vf)
Nominal cured ply thickness is based on zero bleed
Wet condition: 1 week at 70°C 95% relative humidity (RH) plus 3 weeks 70°C 85% (RH)

Storage and Handling

- Shelf Life[1]: 12 months
- Out Life[2]: 60 days
- Tack life[3]: 60 days

[1] Shelf Life: the maximum storage life for HexPly® prepreg, after date of manufacture, when stored continuously, in a sealed moisture-proof bag, at -18°C/0°F. To accurately establish the exact expiry date, onsult the box label.

[2] Out Life: the maximum accumulated time allowed at room temperature between removal from the freezer and cure.

[3] Tack Life : The time, at room temperature, during which prepreg retains enough tack for easy component lay-up.

Prepreg should be stored as received in a cool dry place or in a refrigerator. After removal from refrigerator storage, prepreg should be allowed to reach room temperature before opening the polyethylene bag, thus preventing condensation. (A full reel in its packing can take up to 48 hours).

Precautions For Use

The usual precautions when handling uncured synthetic resins and fine fibrous materials should be observed, and a Safety Data Sheet is available for this product. The use of clean disposable inert gloves provides protection for the operator and avoids contamination of material and components.

For more information

Hexcel is a leading worldwide supplier of composite materials to aerospace and industrial markets.
Our comprehensive range includes:

- HexTow® carbon fibers
- HexForce® reinforcements
- HiMax® multiaxial reinforcements
- HexPly® prepregs
- HexMC®-i molding compounds
- HexFlow® RTM resins
- HexBond™ adhesives
- HexTool® tooling materials
- HexWeb® honeycombs
- Acousti-Cap® sound attenuating honeycomb
- Engineered core
- Engineered products
- Polyspeed® laminates & pultruded profiles
- HexAM® additive manufacturing

For U.S. quotes, orders and product information call toll-free 1-800-688-7734. For other worldwide sales office telephone numbers and a full address list, please go to:

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