



HexPly® M48

180°C curing epoxy matrix

Product Data

Description

HexPly® M48 is a highly toughened epoxy matrix with excellent mechanical and temperature behaviour, designed specifically for high-performance structural applications such as in High Performances Cars.

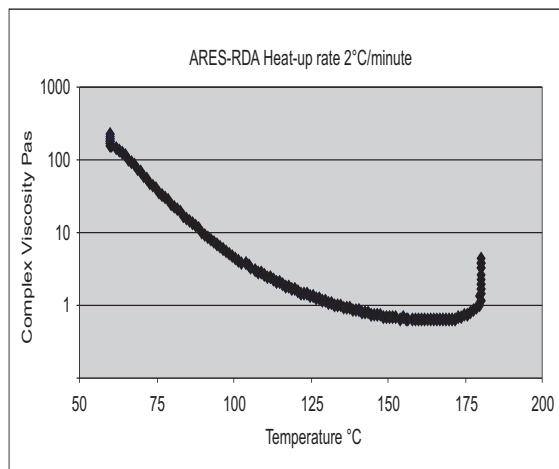
HexPly® M48 has evolved from aerospace technology and is a high temperature, cost effective system that exhibits excellent damage tolerance.

Benefits and Features

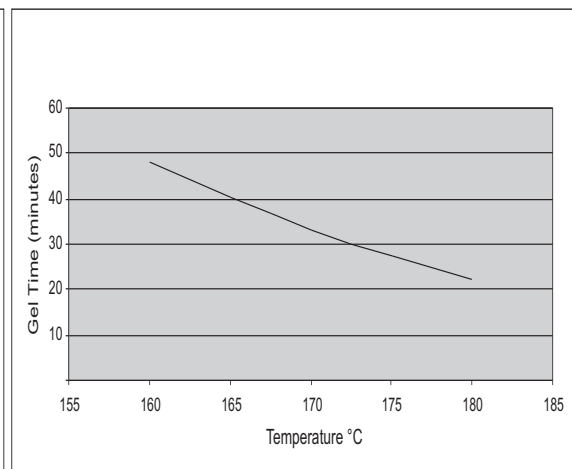
- Highly toughened epoxy matrix, especially at high energy impacts.
- Elevated temperature performance : Tg and service temperature (average Tg onset DMA 185°C)
- Optimum mechanical performance from an autoclave or press cure
- Low volatiles
- Good drape and tack suitable for structural parts or chassis
- Good surface finish
- Long shelf life and out-life

Resin Matrix Properties

Rheology



Gel Time

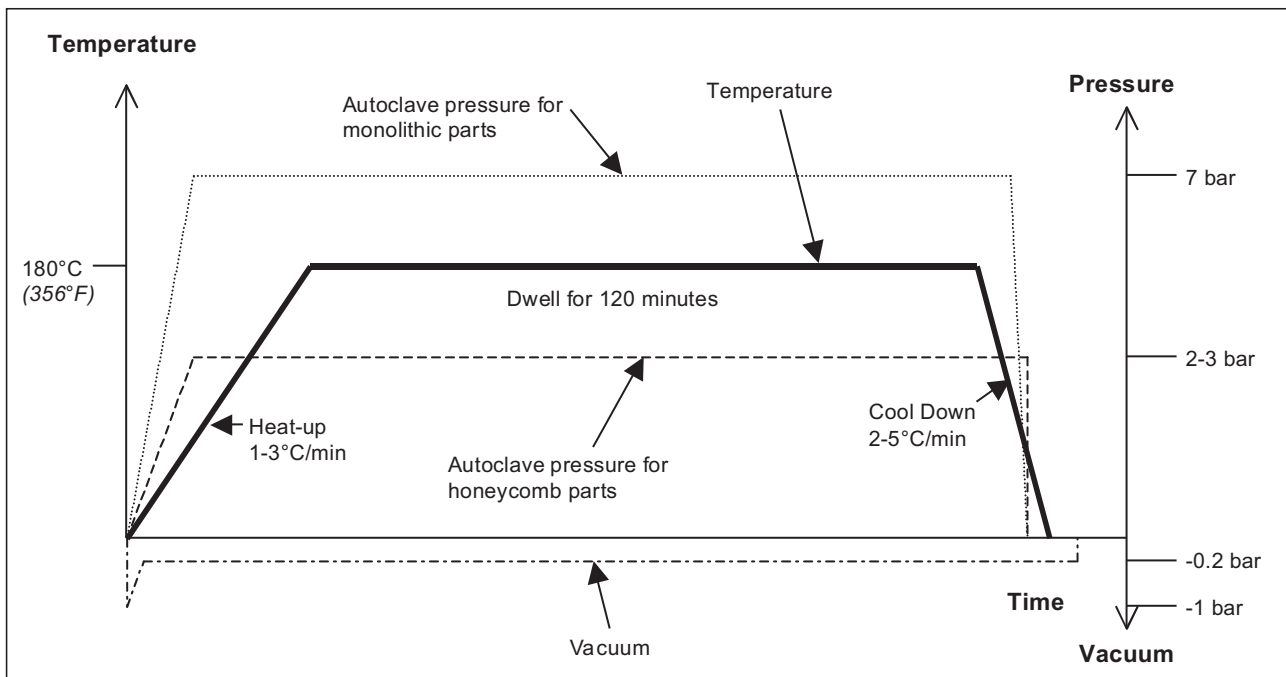




Prepreg Curing Conditions

A typical autoclave cure cycle for a monolithic laminate is 120 minutes at 180°C.

- (1) Apply full vacuum (1 bar).
- (2) Apply 7 bar gauge autoclave pressure.
- (3) Reduce the vacuum to a safety value of 0.2 bar when the autoclave pressure reaches approximately 1 bar gauge.
- (4) Heat-up at 1 – 3 °C/minute to 180°C ±5°C.
- (5) Hold at 180°C ±5°C for 120 minutes ±5 minutes.
- (6) Cool at 2 – 5 °C/minute.
- (7) Vent autoclave pressure when the component reaches 60°C or below.



For a honeycomb sandwich panel, a cure pressure of 2 – 3 bars should be used, depending on honeycomb density.

Heat-up rates are dependent on component thickness, eg, slow heat-up rates should be used for components thicker than 10mm and larger tools than 1sqm. Accurate temperature measurements of the component should be made during the cure cycles by using thermocouples and performance testing should be done in order to ensure suitability of the cure cycle for the particular application.

Specific cure cycles [temperature, pressure (amount and time of application)] depend on autoclave type and dimensions, the extent and type of tooling used and the size and complexity of the lay-up. Please contact your local Hexcel Technical Support for consultation prior to cycle definition.

Cured Prepreg Physical Properties

Physical Properties.

		M48/35%/150/IM7	M48/42%/370T2/CHS-12K	M48/38%/UD300/CHS	M48/35%/UD300/T700
Fibre Weave / UD Mass	g/m ²	IM7 UD 150	HS 12K 2x2 Twill 370	HS 24K UD 300	HS 12K UD 300
Nominal Prepreg Mass	g/m ²	231	638	484	462
Nominal Cured Ply Thickness	mm	0.147	0.417	0.309	0.293
Nominal Fibre Volume	%	57.0	49.8	53.4	56.8
Resin Density	g/cm ³	1.28	1.28	1.28	1.28
Fibre Density	g/cm ³	1.79	1.78	1.82	1.8
Nominal Laminate Density	g/cm ³	1.57	1.53	1.57	1.57

Cured Prepreg Mechanical Properties

Mechanical properties are based on 180°C cure for 120 minutes at 7 bar pressure and 0.9 bar vacuum.

Data is the result from several tests on autoclave cured laminates. Some of the values achieved would have been higher, and some lower than the figure quoted. These are nominal values.

Test	Units	Method	Temp °C	M48/35%/150/IM7	M48/42%/370T2/CHS-12K	M48/38%/UD300/CHS	M48/35%/UD300/T700
ILSS	MPa	EN2563	23	105	48.4	100	100
Flexural Strength	MPa	EN2562	23	-	911	1550	1600
Flexural Modulus	GPa	EN2562	23	-	50	106	110
Tensile Strength	MPa	EN2561 Type A	23	2895	1022	2100	2300
Tensile Modulus	Gpa	EN2561 Type A	23	167	58	132	140
Compression Strength	Mpa	EN2850 Type B	23	1693	765	1100	1400
Compression Modulus	GPa	EN2850 Type B	23	153	56	110	115
CAI @ 6.7J/mm	MPa	AITM 1.0010	23	282	200	-	-
Glass transition temperature	°C	DMA	-	Tg onset 185			

NB : Data normalised to Vf = 55% for carbon fabrics and 57% for carbon UD, except for ILSS and Flexural.



Prepreg Storage Life

- Tack Life @ 23°C 15 days
- Out Life @ 23°C 30 days
- Guaranteed Shelf Life @ -18°C 12 months

Definitions:

- Tack Life: The time, at room temperature, during which prepreg retains enough tack for easy component lay-up.
- Out Life: The maximum accumulated time allowed at room temperature between removal from the freezer and cure.
- Shelf Life: The maximum storage life for HexPly® Prepreg, when stored continuously, in a closed moisture proof bag, at -18°C (0°F). To accurately establish the exact expiry date, consult the box label.

Storage Conditions

HexPly® M48 prepreps 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 polythene bag, thus preventing condensation. (A full reel in its packaging can take up to 48 hours).

Precautions for Use

The usual precautions when handling uncured synthetic resins and 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.

Important

All information is believed to be accurate but is given without acceptance of liability. Users should make their own assessment of the suitability of any product for the purposes required. All sales are made subject to our standard terms of sale which include limitations on liability and other important terms.

©Copyright Hexcel Corporation
Publication FTA172c (Jan 2009)

For More Information

Hexcel is a leading worldwide supplier of composite materials to aerospace and other demanding industries. Our comprehensive product range includes:

- | | |
|---|-----------------------------|
| ■ Carbon Fibre | ■ Structural Film Adhesives |
| ■ RTM Materials | ■ Honeycomb Sandwich Panels |
| ■ Honeycomb Cores | ■ Engineered Core |
| ■ Carbon, glass, aramid and hybrid prepreps | ■ Reinforcement Fabrics |
| ■ HexTOOL® composite tooling material | |

For US 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:

<http://www.hexcel.com/contact/salesoffices>