



HexPly® M49

120°C curing epoxy matrix



Product Data Sheet

Description

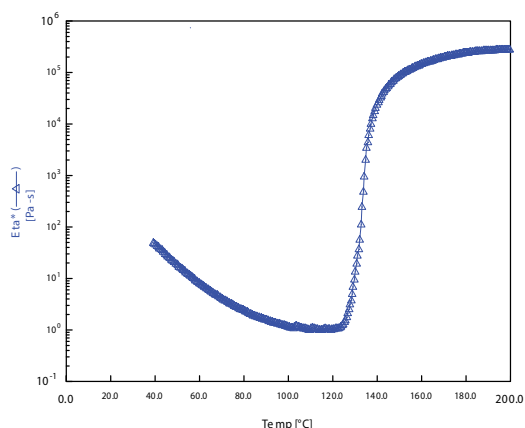
HexPly® M49 is a 120°C curing toughened epoxy matrix with good impact resistance suitable for use in performance cars. The matrix is highly tolerant to a wide variety of production techniques and equipment making it easy to process. HexPly® M49 is especially suitable for carbon look applications (eg car interiors).

Benefits and Features

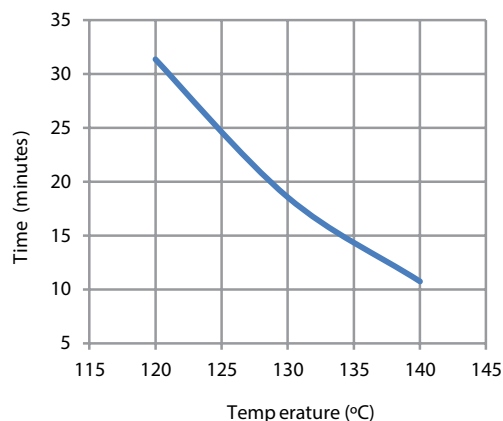
- High Toughened epoxy
- Good impact resistance
- Autoclave process for cosmetic application
- Self-adhesive on honeycomb
- Vacuum bag process with low porosity level achieved
- Good stability under UV
- Long shelf life and out life at room temperature
- Excellent tack and drape

Resin Matrix Properties

Rheology (EN6043-A, 2°C/min)



Gel time (hot plate)



- | | |
|--|--|
| • Colour | Transparent |
| • Density | 1,18 g/cm ³ |
| • Maximum Glass Transition Temperature, (TG onset dry) | 105°C (depending of the reinforcement) |
| • TG onset wet | 80 °C |



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Alternative Cure Cycles

HexPly® M49 is a versatile curing system which can be cured from 85°C to 140°C.

The nominal cure cycle is 1 hour at 120°C but alternative cure cycles can be used:

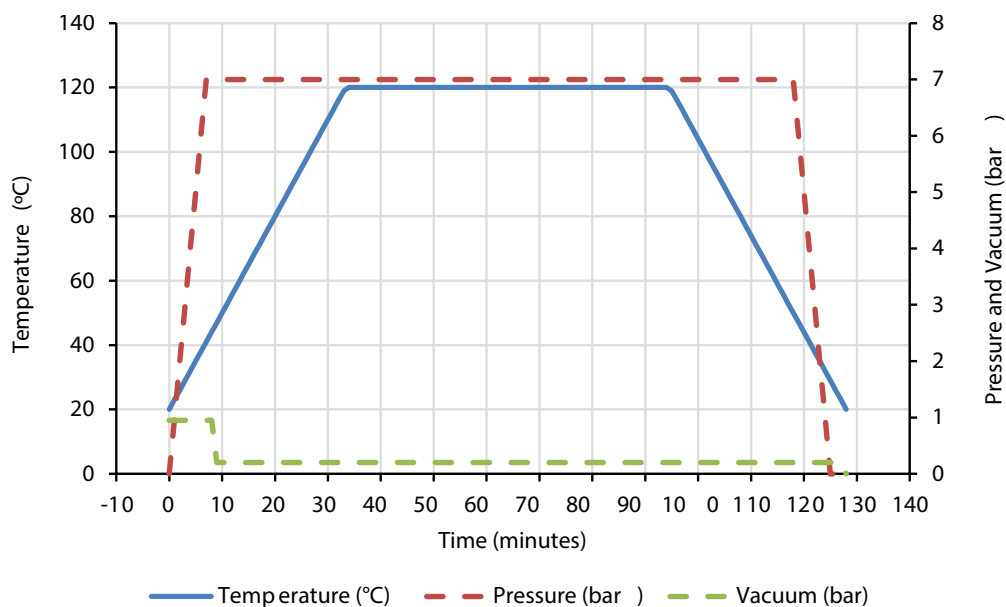
Cure Temperature	85°C	90°C	100°C	120°C	140°C
Time	720 min	360 min	120 min	60 min	30 min
Tg	Up to 105°C*				

*Depending of the reinforcement

Recommended Cure Cycle for thin parts

NB : For carbon look parts, autoclave process is recommended (contact Hexcel for optimal cure cycle).

1. Apply the full vacuum (0.9 bar)
2. Apply 7 bar gauge autoclave pressure
3. Reduce vacuum to a safety value of 0.2 bar when the autoclave pressure reaches around 1 bar gauge
4. Heat at 1 to 3 ° C/min to 120° C
5. Hold at 120° C for 60 minutes
6. Cool at 2 to 5° C/minute
7. Vent autoclave pressure when the part reaches 60° C or below



Heat-up rates are dependent on component thickness, eg, slow heat-up rates should be used for thicker components and large tools. Accurate temperature measurements of the component should be made during the cure cycles by using thermocouples. For a honeycomb sandwich panel, a cure cycle of 1 to 3 bar should be used, dependent on honeycomb density.

Performance testing should accompany alternative cure cycles to ensure suitability for the particular application.



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Prepreg Physical Properties (Examples only. For the wider prepreg range contact Hexcel)

Product Designation		M49/42%/200T2X2/CHS-3K	M49/42%/245T2/AS4-3K	M49/42%/370T2/CHS-12K	M49/39%/600T2X2/CHS-12K	M49/32%/600S8/GE-300
Fibre	-	HS Carbon	HS Carbon	HS Carbon	HS Carbon	E Glass
Tow	-	3K	3K	12K	12K	-
Weave	-	Twill 2x2	Twill 2x2	Twill 2x2	Twill 2x2	Satin 8
Mass	g/m ²	200	245	370	600	600
Nominal Cured Ply Thickness	mm	0.235	0.286	0.433	0.659	0.473
Nominal Fibre Volume	%	47.8	47.6	47.5	50.6	49.5
Nominal Laminate Density	g/cm ³	1.47	1.47	1.47	1.47	1.20

Cured Prepreg Mechanical Properties (Examples only. For the wider prepreg range contact Hexcel)

Mechanical Properties are based on 120°C cure for 60 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 will have been higher, and some lower than the figure quoted. These are nominal values.

Test	Methods	Units	M49/42%/200T2X2/CHS-3K	M49/42%/245T2/AS4-3K	M49/42%/370T2/CHS-12K	M49/39%/600T2/CHS-12K	M49/32%/600S8/GE-300
Tensile Strength	Carbon EN2561	MPa	1050	980	1000	840	550
Tensile Modulus	Glass EN 2747	GPa	68	66	66	63	20
Flexural Strength	Carbon EN 2562	MPa	1000	960	800	780	660
Flexural Modulus	Glass EN 2746	GPa	60	60	55	55	21
ILSS	Carbon EN 2563	MPa	60	57	60	62	56
	Glass EN 2377						
Comp. Strength	EN 2850 B	MPa	730	760	650	500	460

NB : Data normalised to Fibre Volume Content (55% for fabrics; 60% for UD) except for ILSS and Flexural.



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Prepreg Storage Life

Shelf Life¹: 12 months at -18°C/0°F (from date of manufacture).

¹ Shelf Life: The maximum storage life for HexPly[®] prepreg, when stored continuously, in a sealed moisture-proof bag, at -18°C/0°F or 5°C/41°F. To accurately establish the exact expiry date, consult the box label.

Out Life²: 30 days at room temperature (25°C max).

² The maximum accumulated time allowed at room temperature between removal from the freezer and cure.

Tack Life³: Up to 30 days (depending of the reinforcements and the resin content) at room temperature (25°C max).

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

Storage Conditions

HexPly[®] M49 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 it's packaging can take up to 48 hours).

Precautions for Use

The usual precautions when handling uncured synthetic resins and fibrous materials should be observed. 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 | ● HexFlow [®] RTM resins | ● Engineered core |
| ● HexForce [®] reinforcements | ● HexBond [™] adhesives | ● Engineered products |
| ● HiMax [®] multiaxial reinforcements | ● HexTool [®] tooling materials | ● Polyspeed [®] laminates & pultruded profiles |
| ● HexPly [®] prepreps | ● HexWeb [®] honeycombs | ● HexAM [®] additive manufacturing |
| ● HexMC [®] -i molding compounds | ● Acousti-Cap [®] sound attenuating honeycomb | |

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:

<https://www.hexcel.com/contact>

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