



# HexPly<sup>®</sup> M10R

120°C curing epoxy matrix



## Product Data Sheet

### Description

HexPly<sup>®</sup> M10R is a formulated epoxy resin which is suitable for low pressure moulding processes.

HexPly<sup>®</sup> M10R is very versatile and allows a range of processing temperature from 85°C up to 150°C. HexPly<sup>®</sup> M10R can be used for very large industrial components subjected to several environmental conditions and exhibits a very long shelf life at room temperature.

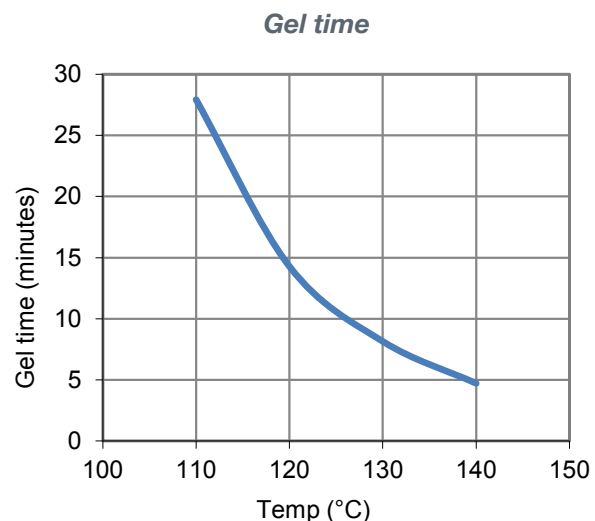
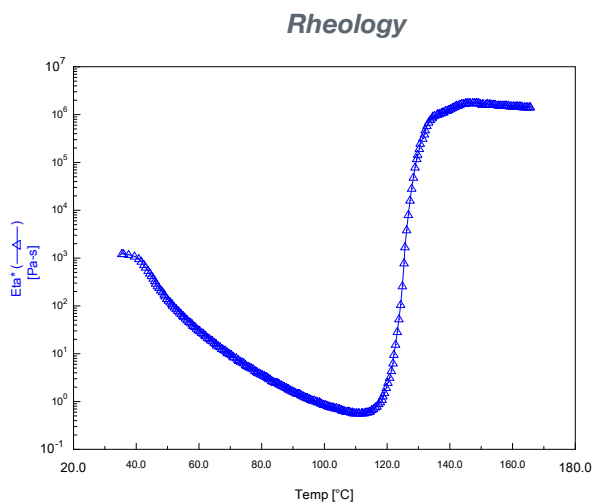
HexPly<sup>®</sup> M10R is used extensively for structural marine applications, recreational markets and a wide variety of industrial applications.

HexPly<sup>®</sup> M10R fulfils REACH compliance.

### Benefits and Features

- Versatile cure cycles 85 - 150°C
- Good tack life (up to 60 days)
- High flow matrix
- Good surface finish (using pressure)
- Low density
- Translucent resin after curing
- Suitable for thick laminates
- Available on large reinforcements range
- Adapted to low pressure processing: suitable for a range of pressure 0.9 – 5 bar

### Resin Matrix Properties



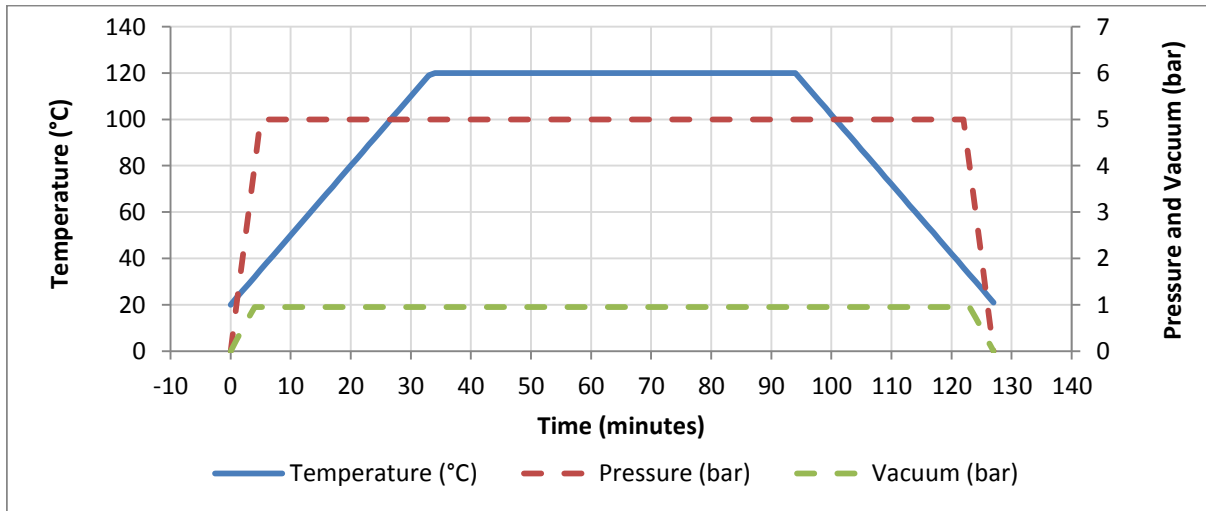
- Glass transition temperature\* (TG onset) : 120°C
- Resin density : 1.20 g/m<sup>3</sup>

\* DMA Onset Tg after nominal cure cycle (60min at 120°C, at 5 bar pressure and -0.95 bar vacuum)



### Curing Conditions

The nominal cure cycle for HexPly® M10R is 60min at 120°C, heat up rate 3°C/min, 5 bar pressure and -0.95 bar vacuum.



HexPly® M10R is a flexible curing system and can be cured at temperatures from 85 to 150°C, at pressure between 0.9 to 5 bar. Heat up rate can be also adapted (from 0.5 up to 10°C/min) depending on the part design.

Cure Temperature	85°C	95°C	110°C	120°C	130°C	140°C	150°C
Time	16 hours	6 hours	4 hours	1 hour	45 min	30 min	10 min

### Curing Conditions

#### **What is the best cure cycle for vacuum process components?**

To ensure a minimum void content in the component, it is recommended to incorporate an intermediate **dwelling** and a **controlled heat up rate**.

#### **What are the best processing methods for thicker components?**

For components up to 10 mm thick, it is recommended to use internal bleed layers of dry fabric. These absorb excess resin and become an integral part of the cured composite. This procedure has the following advantages:

- Vacuum is easily distributed, eliminating any void content in the composite
- Excess matrix accumulating between the layers is absorbed
- Fibre volume is controlled
- For monolithic structures, dry fabric plies must be evenly distributed throughout the thickness of the component
- For sandwich structures, dry fabric plies must always be evenly distributed in the outer 2/3 of the skin
- The dry fabric layers must always overlap the prepreg stack to allow connection to the vacuum system

#### **What is the best cure cycle for thicker components?**

To avoid exotherms it is advisable to incorporate an intermediate dwelling and a controlled heat up rate.

**Dwelling** - used to equalise tool and component temperatures and to initiate a controlled prepreg cure.

**Controlled heat up rate** - avoids a large temperature differential between the air temperature and the component. Any accumulations of resin are prone to exotherm under these conditions.



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

Product Designation		M10R/38%/UD150/CHS	M10R/42%/200T2/CHS-3K	M10R/42%/285T2/CHS-12K	M10R/42%/600T2/CHS-12K
Fibre	-	HS Carbon 12K	HS Carbon 3K	HS Carbon 12K	HS Carbon 12K
Weave	-	UD	Twill 2x2	Twill 2x2	Twill 2x2
Mass	g/m <sup>2</sup>	150	200	285	600
Nominal Cured Ply Thickness	mm	0.16	0.23	0.33	0.70
Nominal Fibre Volume	%	52	48	48	48
Nominal Laminate Density	g/cm <sup>3</sup>	1.57	1.48	1.48	1.48

**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 5 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	Units	Methods	Test Temp °C	M10R/38%/UD150/CHS	M10R/42%/200P/CHS-3K	M10R/42%/285T2/CHS-12K	M10R/42%/600T2/CHS-12K
Tensile Strength	MPa	EN2561	23	2600	1000	1300	950
Tensile Modulus	GPa		23	140	67	67	60
Flexural Strength	MPa	EN 2562	23	1400	950	950	750
Flexural Modulus	GPa		23	110	57	55	45
ILSS	MPa	EN 2563	23	75	55	55	55
Comp. Strength	MPa	EN 2850B	23	1200	700	660	600

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



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### Prepreg Storage Life

Shelf Life<sup>1</sup>: 18 months at -18°C/0°F or at 5°C/41°F (from date of manufacture).

<sup>1</sup> Shelf Life: The maximum storage life for HexPly<sup>®</sup> 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 Life<sup>2</sup>: 60 days at room temperature (25°C max).

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

Tack Life<sup>3</sup>: between 45 and 60 days (depending of the reinforcements) at room temperature (25°C max).

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

### Storage Conditions

HexPly<sup>®</sup> M10R prepregs 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<sup>®</sup> carbon fibers
- HexFlow<sup>®</sup> RTM resins
- Acusti-Cap<sup>®</sup> sound attenuating honeycomb
- HexForce<sup>®</sup> reinforcements
- Redux<sup>®</sup> adhesives
- Engineered core
- HexPly<sup>®</sup> prepregs
- HexTool<sup>®</sup> tooling materials
- Engineered products
- HexMC<sup>®</sup> molding compounds
- HexWeb<sup>®</sup> honeycombs

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/salesoffice>

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