HexPly® M9/M10

120 °C (250 °F) curing epoxy matrix

Product Data

Description

HexPly® M9/M10 is a formulated epoxy resin which is suitable for low pressure moulding processes. It is very versatile and allows a range of processing temperatures from 85 °C (185 °F) up to 150 °C (302 °F). HexPly® M10 can be used for very large industrial components subjected to severe environmental conditions. HexPly® M10 has high fatigue resistance and gives a good surface finish. HexPly® M10 exhibits a very long shelf life at room temperature.

Several variations are available including:
- HexPly® M10 for medium tack
- HexPly® M9 for higher tack

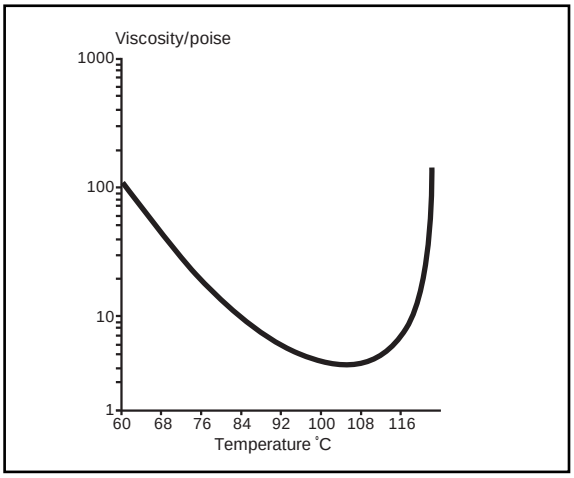
HexPly® M9/M10 is used extensively for structural marine applications, wind turbine blades and a wide variety of industrial applications.

Benefits and Features

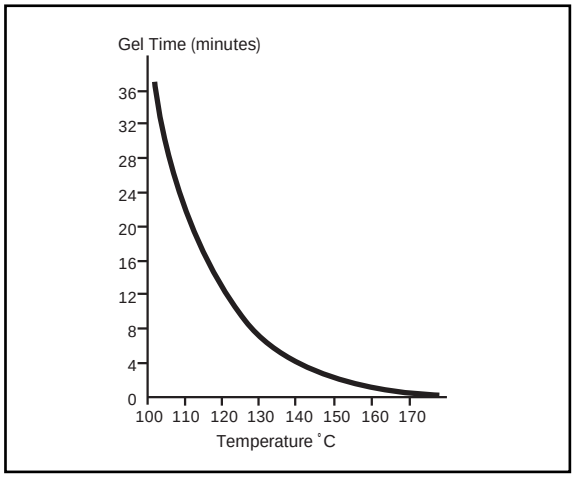
- Versatile cure cycle 85-150 °C (185-302 °F)
- Well adapted to low pressure processing
- Good flexibility and handleability of prepreg
- Excellent tack life
- High flow matrix
- Suitable for a range of pressures 0.3-5 bar (4-73 Psi)
- Suitable for thick laminates
- Good surface finish
- Low resin density
- Excellent fatigue resistance
- Translucent resin after curing

Resin Matrix Properties

Rheology



Gel Time



Cured Matrix Properties cured at 180 °C (350 °F)

		Method
Tensile strength	85 MPa (12.3 Ksi)	ISO R527
Tensile modulus	3.2 GPa (460 Ksi)	ISO R527
Strain	3.75 % ISO	R527
Flexural strength	136 MPa (19.7 Ksi)	ISO 178
Flexural modulus	3.16 GPa (458 Ksi)	ISO 178
Glass transition temperature	110-135 °C (230-275 °F)	DMA
Cured resin density	1.2 g/cm^3	

Prepreg Curing Conditions

The ideal cure cycle is 60 min at 120 °C (248 °F), at a pressure between 0.3 and 5 bar (4-73 Psi).
Alternative cure cycles can be used:

Temperature	Time
85 °C (185 °F)	12 to 16 hours
95 °C (203 °F)	6 hours
110 °C (230 °F)	4 hours
120 °C (250 °F)	1 hour
130 °C (266 °F)	45 min
140 °C (294 °F)	30 min
150 °C (302 °F)	10 min

Heat up rate 0.5-10°C (33-50 °F)/min

Typical Mechanical Properties on HexPly® M9/M10 prepregs

Main references (Others available)

TEST	E-glass Balanced fabric 600 g/m²	E-glass UD tape 1200 g/m²
0° Tensile strength MPa (Ksi)	600 (87)	1300 (188)
0° Tensile modulus GPa (Msi)	21 (3.04)	42 (6.1)
0° Flexure strength MPa (Ksi)	700 (101)	1200 (174)
0° Flexure modulus GPa (Msi)	20 (2.9)	41 (5.9)
0° Compression strength MPa (Ksi)	540 (78)	900 (130)
0° Short beam strength MPa (Ksi)	60 (8.7)	75 (10.9)
Fibre volume content %	50	55

TEST	HS 3k carbon Balanced fabric 193 g/m²	HS 12k carbon Balanced fabric 285 g/m²	HS 12k carbon ± 45° fabric 600 g/m²	HS 12k carbon UD tape 300 g/m²
0° Tensile strength MPa (Ksi)	850 (123)	950 (138)	905 (131)	2000 (290)
0° Tensile modulus GPa (Msi)	70 (10.1)	70 (10)	65 (9.4)	130 (18.8)
0° Flexure strength MPa (Ksi)	1000 (145)	850 (123)	800 (116)	1850 (268)
0° Flexure modulus GPa (Msi)	65 (9.4)	60 (8.7)	53 (7.7)	120 (17.4)
0° Compression strength MPa (Ksi)	680 (98)	720 (104)	600 (87)	1300 (188)
0° Short beam strength MPa (Ksi)	68 (9.8)	70 (10.1)	55 (8)	85 (12.3)
Fibre volume content %	60	60	55	60

HS = high strength

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 a **dwell** and a **controlled heat up rate.**

Dwell - 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 Storage Life

■ Tack Life	@ 23 °C (73 °F)	60 days
■ Guaranteed Shelf Life	@ -18 °C (0 °F)	12 months

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.

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For More Information
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- ■ Carbon, glass, aramid and hybrid prepregs
- ■ Reinforcement Fabrics
- ■ Structural Film Adhesives
- ■ Honeycomb Sandwich Panels
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