HexPly® M78.1

110 – 160°C Curing Epoxy Matrix

HEXCEL®

Product Data Sheet

Description

HexPly® M78.1 is a formulated, hot melt epoxy resin matrix, especially designed for prepreg applications where short cure cycles using temperatures ≥110°C are required. Due to its high reactivity, HexPly® M78.1 can be used for economic, environmentally friendly and fast manufacture of industrial composites.

HexPly® M78.1 is based on a modified, toughened epoxy resin and a highly reactive curative package applicable for pre-impregnation into carbon, glass or aramide fibers, combining the outstanding feature of being curable within e.g, 7 minutes at 120°C and with a shelf-life of at least 2 weeks at ambient conditions.

The versatility of HexPly® M78.1 allows a range of processing temperatures, recommended from 110°C up to 160°C. Following a cure cycle in the recommended range, HexPly® M78.1 demonstrates superior mechanical properties and high glass transition temperatures. The controlled-flow characteristics of HexPly® M78.1 offers excellent adhesion to auxiliary and core materials like aluminum, wood, thermoplastics and elastomers.

The solvent-free, non-corrosive character of HexPly® M78.1 offsets the commonly known drawbacks of in-house prepreg systems that typically include hazardous components causing limitations regarding environmental, health and safety conditions.

Benefits and Features

- Versatile, short cure cycles:110 – 160°C, 18-1.5 minutes respectively
- Optimum cure cycle 25 -120°C at 20 °C/minute, 7 minutes at120 °C
- Outstanding shelf life performance, ≥2 weeks at+23°C
- Excellent adhesion to core materials (wood, aluminum, thermoplastics, elastomers) by controlled flow technology
- Suitable for thin and thick laminates
- Well adapted to pressure moulding processes, suitable for a range of pressures (1 to 10 bar)
- Good flexibility, convenient handling and good adhesion to moulds by low tack
- Good surface finish
- Full REACH compliance
- Solvent-free, non-aggressive, no observable exposure limits

Resin Matrix Properties

Dynamic Thermal Properties

by DSC (ISO 11357-5)

Cure	-40 to 270°C @10°C/min
T_{Onset}	110 – 125°C
T_{Peak}	130 – 140°C
Enthalpy	250-400 J/g

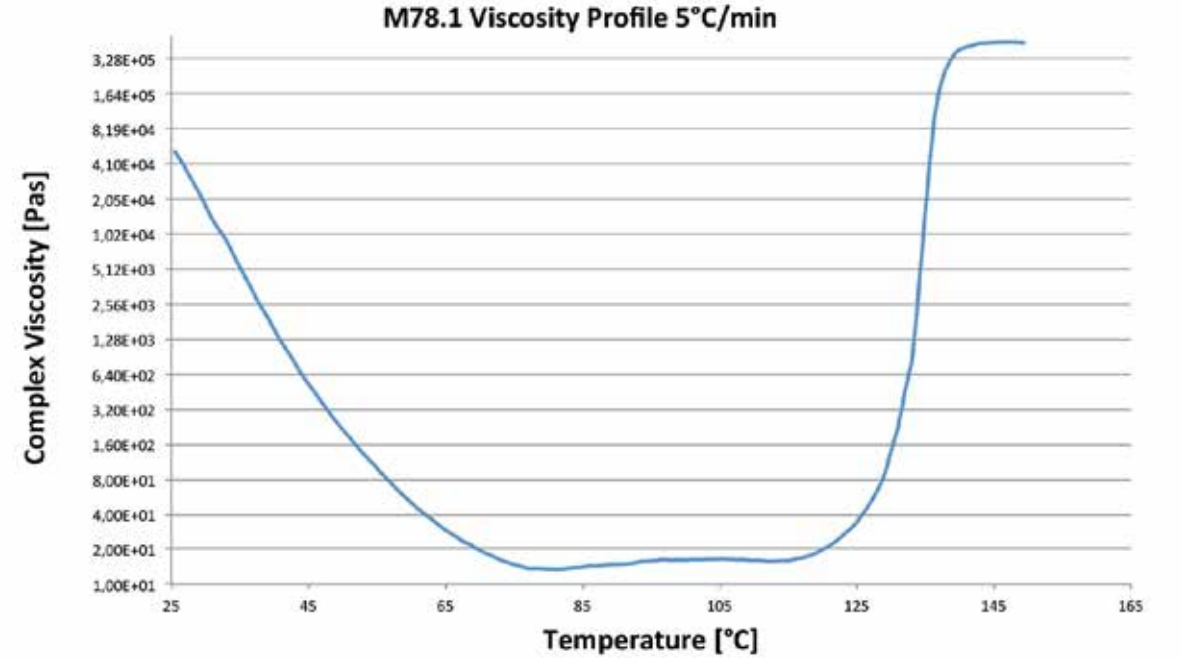
Isothermal Cure Properties by DSC

Temperature	*Cure Time (95%)**
110°C	18 minutes
120°C	7 minutes
130°C	5 minutes
140°C	3 minutes
150°C	2 minutes
160°C	1.5 minutes

**time to 95% conversion (ISO 11357-5)*

- Tg after 5 minutes at 130°C: 125°C (DSC, ISO 11357-2, 20°C/min)
- Density: 1.1-1.25 g/cm³
- Color: Milky

Dynamic Viscosity



Minimum Viscosity: 13.5 Pas @80°C (controlled flow technology)

Prepreg-Types and Mechanical Properties after Curing

Product	Reinforcement				Physical Properties				Mechanical Properties	
	Fiber	Fabric	Fiber Weight (g/m²)	Orientation 0°/90°/+45°/+45° [g/m²]	Cured Ply Thickness [mm]	Weight [g/m²]	Resin Content [%]	Resin Flow [%]	Tensile Strength [MPa]	Tensile Modulus [GPa]
M78.1/42%/LBB450/C	Carbon	non-woven	450	157/0/147/147	0,53	776	42	20	0°:1020 45°:800	0°: 49 45°: 43
M78.1/34%/LT570/G+F	Glass	non-woven + fleece	560	432/75/0/0 + fleece 35	0,45	848	34	15	800	32
M78.1/35%/LBB790/G+F	Glass	non-woven + fleece	787	425/0/150/150 + fleece 50	0,67	1215	35	15	0°: 660 45°:240	0°: 27.7 45°:16.2
M78.1/34%/L845/G+F	Glass	non-woven + fleece	845	720/0/0/0 + fleece 100	0,70	1280	34	15	900	36
M78.1/39%/UD120/CHS	Carbon	UD	120	120/0/0/0	0,13	197	39	20	2400	128

Mechanical data are based on a cure cycle of 130°C, 15 min, 5 bar.

Curing Conditions

- Recommended heat-up rate: 5 - 25°C/min
- Recommended cure cycle: 25-120°C at 20°C/min, 7 minutes at 120°C
- Pressure range: 1-10 bars

The optimum cure cycle, heat-up rate and dwell period is dependent on component size, layup construction, oven capacity and thermal mass of tool.

Storage Stability

- Out-life

  @ + 23°C ≥ 2 weeks
  @ + 5°C TBD
  @ - 18°C 18 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.

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
- HexPly® prepregs
- HexMC® molding compounds
- HexFlow® RTM resins
- Redux® adhesives
- HexTOOL® tooling materials
- HexWeb® honeycombs
- Acousti-CAP® sound attenuating honeycomb
- Engineered core
- Engineered products

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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