HexPly® M78.1

110 – 160°C curing epoxy resin matrix for prepregs

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. 8 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.

Resin Matrix Properties

Dynamic Thermal Properties by DSC (ISO 11357-5)

(cure -40 to 270°C @10°C/min) (1)

Uncured T_g: 5 – 15°C

T_{Onset}: 115 – 127°C

T_{Peak}: 130 – 140°C

Enthalpy: 340J/g +/-20%

(1) Data obtained from neat resin upon delivery

Isothermal Cure Properties by DSC

Temperature	Cure Time (95%) (2)
110°C	≤18min
120°C	≤8min
130°C	≤6min
140°C	≤3min
150°C	≤2min
160°C	≤1.5min

(2) time to 95% conversion (ISO 11357-5), total scan time 30min @110°C, 15min @120-130°C, 5min @140°C-150°C, 2min @160°C

- Typical cured T_g: 125°C +/-5°C (following a 6min cure @130°C) (3)
- Optimum cured T_g: 135°C +/-5°C (following a 15min cure @130°C) (3)

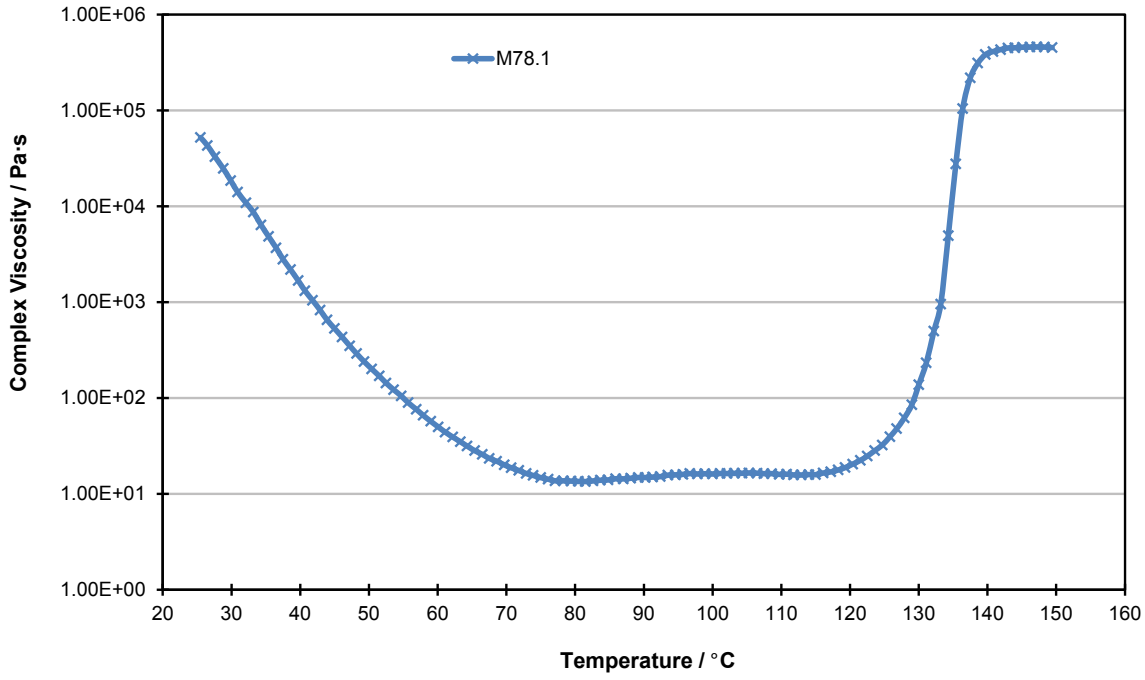
(3) according to ISO 11357-2 using a 10°C/min ramp rate, -40 to 270°C; based on 95% conversion

- Density (ISO1183-1): 1.1 – 1.25g/cm³
- Color: Opaque
- Tack: Moderate-Low

Typical Viscosity Profile

(Data obtained from plate-plate rheometry, temperature run in reference to ISO 6721-10; Representative for a selected, single batch)

Dynamic Complex Viscosity of HexPly® M78.1 @ 5°C/min



Shelf Life [4]

(Stored sealed, in dry conditions and in absence of direct sunlight)

@ +23°C	2 weeks
@ +5°C	6 months
@ -18°C	18 months

(4) Shelf Life refers to the maximum time at given temperature after which the resin is being impaired in its thermal or rheological properties from date of manufacture. An increase in uncured T_g above NTP temperature limitation (NIST) defines the end of shelf-life of the resin matrix.

Typical Curing Conditions

- Recommended heat-up rate: 0.5 – 5°C/min
- Recommended cure cycle: 15min @130°C
- Pressure gauge: 1 – 10bar

Dependent on the application, alternative cure temperatures than the ones from 110 – 160°C might be applied but degree of conversion and cured T_g can deviate from stated ranges. The optimum cure cycle, heat-up rate and dwell period is dependent on component size, layup construction, oven capacity and thermal mass of tool.

Precautions for Use

HexPly® M78.1 is exclusively available in prepreg or semipreg format and a Safety Data Sheet can be provided for this product. The usual precautions when handling uncured synthetic resins and fine fibrous materials should be observed. 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
- HiMax® multiaxial reinforcements
- HexPly® prepregs
- HexMC®-i molding compounds
- HexFlow® RTM resins
- HexBond™ adhesives
- HexTool® tooling materials
- HexWeb® honeycombs
- Acousti-Cap® sound attenuating honeycomb
- Engineered core
- Engineered products
- Polyspeed® laminates & pultruded profiles
- HexAM® additive manufacturing

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:

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