145 g

HiWood

Wood Redefined for High Performance

HiWood Epoxy Prepreg Fiber Paper (UD)

Technical Data Sheet

DESCRIPTION:

This grade is a continuous wood fiber reinforcement pre-impregnated with epoxy. It is primarily used to create continuous wood fiber-reinforced composite structures through hot molding, autoclave, etc., eliminating the need for additional impregnation. The polar groups in epoxy enable strong interfacial bonding with wood fibers, ensuring effective adhesion within the composite.

This grade is ideal for the forming of flat or other simple structures. For forming complex structures, 83 g/m^2 is recommended due to greater flexibility.

Most plant fibers possess inherent moisture absorption characteristics, so it's recommended to mold parts in an environment with a relative humidity no higher than 55%.

The epoxy used is designed for film release < 20°C, facilitating easy pool-off from release film.

KEY ADVANTAGES

- Excellent specific strength & modulus
- Superior vibration damping
- Wood aesthetic appearance
- Easy to process
- Environmentally friendly

SPECIFICATIONS

Length	1200–1500 mm
Width	120–220 mm
Consolidated thickness**	0.088±0.007 mm
Areal density	120-170 g/m^2
Fiber direction	UD along length
Color	Natural wood
Surface texture	Natural wood

** It is measured at a molding pressure of 0.8 MPa. Please adjust the number of layers based on the actual batch thickness and molding pressure.

COMPOSITION

Wood	80-90 wt.%
Epoxy	10-20 wt.%
% Bio-content	80-90 wt.%
% Biodegradability	80-90 wt.%

GENERAL PROPERTIES

Curing temperature	150 °C, 30 min or 120 °C, 60 min
Maximum service T of composite	110 °C
Freeze life at -18 ℃	12 months
Shelf life at 25 °C	14 days

TYPICAL PHYSICAL & MECHANICAL PROPERTIES

Density	1.25~1.35 g/cm^3	
Tensile strength (//)	300-450 MPa	ISO 527-5
Tensile modulus (//)	40-50 GPa	
Elongation at break （//）	0.7-1.2%	
Tensile strength (⊥)	35-45 MPa	
Tensile modulus (⊥)	7-8 GPa	
Poisson's ratio	0.4-0.5	
Flexural strength (//)	400-500 MPa	ISO 14125
Flexural modulus (//)	35-45 GPa	
Hardness	90 shore D	ISO 868
Loss factor @ 25 ℃ (DMA single cantilever)	4.2%-4.5%	0.01 % strain, 1 Hz

Note: average values obtained from 3rd party following ISO standards should serve only as guidelines. Composite performance is affected by the forming technique, equipment, environmental conditions, etc.

Freshape SA | www.freshape.com
Avenue d'Epenex 4A, 2nd floor, 1020 Renens, Switzerland

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STORAGE

This product has a shelf life of 12 months from the date of production. Product should be packaged and stored in a sealed manner with at -18 °C to -25 °C.

SAFETY INFORMATION

This material contains uncured epoxy resin which may cause allergic reactions with skin contact. Repeated or prolonged skin contact should be avoided. Please refer to the product safety data sheet before working with this material.

RECOMMENDED MANUFACTURING METHODS

1. Low-pressure molding (autoclave, vacuum bagging, etc.)
2. Compression molding
3. Roll wrapping

CURING

150°C for 30 minutes or 120°C for 60 minutes. Thicker components require longer curing times than thinner ones due to heat conduction.

MANUFACTURING GUIDANCE

1. Material preparation

Prior to manufacturing, please check if the products have been properly stored following guidance. The product should remain sealed before it is defrosted to ambient temperature. This will ensure no water will be formed on the product surface.

2. Layup method

The stretchability of HiWood fiber paper is lower than fabrics. Therefore, it is essential to pre-flatten complex curvatures before layup. "Surface flattening" (a feature available in many commercial 3D modeling software) is recommended to accurately map the material to the desired shape. The HiWood paper should then be cut accordingly to ensure a precise fit and optimal layup for complex geometries.

Layup should be performed at temperatures between 10–25°C. Lower temperatures increase viscosity which may negatively affect the bonding between the prepreg and the mold, as well as between prepreg layers, whereas higher temperatures can make handling more difficult.

Note: HiWood Epoxy prepreg is coated with epoxy on only one side, which is protected by release paper. Incorrect layering may result in delamination.

Due to its low thickness, HiWood epoxy prepreg fiber paper (UD), 83 g/m² is easier to bend. This grade is therefore recommended for forming complex geometries.

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3. Number of layers

To ensure sufficient material (i.e., adequate ply count) and to prevent delamination caused by failure to reach the required molding pressure (0.8 MPa), it is recommended that the initial ply count for trial production be calculated as:

Ply count ≈ Part thickness × 1.1 ÷ Compacted ply thickness (0.088).

Based on the results of the first trial, adjust the material quantity by increasing or reducing the number of plies as needed. If the molding pressure differs from 0.8 MPa, the ply count should be adjusted accordingly.

4. Pressure and Pressing Time

A pressure of 0.1–1 MPa is sufficient to ensure good interlayer bonding. However, it is not recommended to apply pressure immediately after placing the prepreg into the mold.

To prevent issues like localized bubbling or resin-starved areas in the molded part, it is advisable to first hold the material at a temperature of 115 ± 3 °C for several minutes (around 5 minutes, for example) without applying pressure. This allows any moisture present to fully evaporate before pressing. The higher the holding temperature, the shorter the holding time may be—but it should not be too short.

If using a hot-in/hot-out mold, it is also important to hold the material without pressure for a few minutes (about 3 minutes, depending on part size) to allow any moisture in the wood fiber to be released.

Additionally, this pre-press holding step allows the resin to better wet and adhere to the wood fiber paper. When the resin adheres well, the friction between fiber layers remains low, allowing slight slippage between layers under pressure. This helps the material conform to the mold surface and reduces the risk of wrinkling.

5. Waterproof coating

For waterproof applications, a 0.2 mm-thick epoxy coating uniformly covering the HiWood surface is recommended. Alternative coatings may be used, with thickness varying based on waterproof efficiency. A 1,000-hour humidity test (90% RH, 30°C) showed <5% water uptake and <5% loss in mechanical performance when HiWood-reinforced samples were coated with 0.2 mm of epoxy.

EXAMPLE*

Pressure	0.8 MPa (autoclave)
%Reinforcement	80~90 vol.%
Composite density	1.25~1.35 g/cm^3
Performance	Flexural strength: 400~500 MPa Flexural modulus: 35~45 GPa

TROUBLESHOOTING

a. Delamination

- Layering up the wrong side
- Resin not cured properly
- Moisture in HiWood paper

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b. Void

- Resin not cured properly
- Insufficient molding pressure
- Impurity on HiWood surface
- Locally uneven lamination

c. Wrinkle & Dislocation of HiWood

- Inappropriate layup method
- Resin movement during curing
- Premature application of pressure

d. Others

For other common composite manufacturing issues, refer to standard guidelines or seek expert guidance as needed.