

**TECH OFFER**

## Advanced Bamboo-Fiber Composite



### KEY INFORMATION

TECHNOLOGY CATEGORY:

Materials - Composites

Materials - Bio Materials

Sustainability - Circular Economy

TECHNOLOGY READINESS LEVEL (TRL): **TRL5**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174357**

### OVERVIEW

Timber has been considered as a primary construction material for its versatile properties such as high superior strength and durability. However, it is not as strong as materials such as concrete or steel and takes a long time to grow. A sustainable alternative to timber is bamboo, a fast-growing plant that is readily available. As a natural composite material, bamboo has a high strength-to-weight ratio that makes it suitable for structural applications in the construction industry.

The technology on offer is a patented bamboo-based composite that blends laminated bamboo fibres with a specially formulated bio-compatible binder. The resultant material is strong, environmentally friendly, economically feasible, and durable. In comparison to hardwood and engineered wood products, this bamboo-based composite material is three times stronger and can be used in a variety of applications, especially in buildings to replace beams and columns and for the production of high-performance niche furniture products.

## TECHNOLOGY FEATURES & SPECIFICATIONS

The technology consists of bamboo fibers as the reinforcement phase, blended with a proprietary binder matrix through a patented processing method to create a high-performance bamboo composite material. With a strength of up to three times of hardwood and other engineered wood products, the fabricated bamboo composite material employs a bionic design process and has a low volume of material usage when compared to timber. Other characteristics of the material include:

- Lightweight
- Excellent dimensional stability
- Good weather resistance
- Superb moisture resistance
- Not susceptible to decay and rot

The material also provides CO<sub>2</sub> sequestration through bamboo growth while helping to meet the global demand for sustainable and environmentally friendly construction materials.

## POTENTIAL APPLICATIONS

This technology is applicable to industries requiring lightweight and high-performance materials. Some industries include (but are not limited to):

- Construction and building - as structural or non-structural components including beams, columns, doors, window frames as well as flooring
- Furniture - for medium to high-end furniture products where sustainability, high quality, and performance matter.

## MARKET TRENDS & OPPORTUNITIES

The green building materials market is projected to reach USD 548.41 Billion by 2027 due to concerns about global warming and environmental degradation. Introduction of legislation to encourage the use of building materials that are renewable and low in carbon footprint has fuelled market growth and led to the increased development of sustainable building and construction materials.

## BENEFITS

- Provides customers an industrially viable alternative to timber
- High strength – up to three times stronger in bending than traditional hardwood timber
- Durable – UV, Insects, humidity resistant
- CO<sub>2</sub> neutral
- Affordable - comparable to hardwood and cheaper than laminated veneer lumber