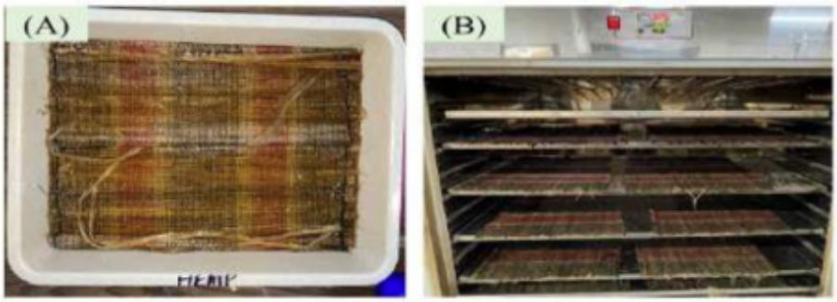
BITS Pilani
Pilani | Dubai | Goa | Hyderabad | Mumbai
An Institution of Eminence

विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY
सत्यमेव जयते

BITS Pilani
TECHNOLOGY
ENABLING
CENTRE
DST Supported

PENDING

(IN202411085488) A functionally graded hybrid composite, a method of producing the same, and uses thereof



NEED

Current composite materials face a 40% rejection rate due to brittleness or poor eco-sustainability, leading to $500M in losses globally. Industries urgently seek stronger, greener alternatives that perform reliably across extreme conditions without sacrificing lightweight properties.

TECHNOLOGY OVERVIEW

This new hybrid composite laminate combines natural fibers like hemp with synthetic fibers such as carbon or glass, arranged in a functionally-graded structure. The material achieves tensile strength up to 205 MPa and compression strength up to 76 MPa, providing both durability and sustainability in a lightweight format.

TECHNOLOGY KEY FEATURES

Functionally-graded hybrid layering, 69–76 MPa compression strength, 200–205 MPa tensile strength, precise fiber distribution (33.3–66.7%), eco-friendly fabrication with 100% natural top layer—outperforming standard composites without compromising green goals.

Read more here

MARKET ANALYSIS

The global fiber-reinforced composites market is projected to grow at a CAGR of 6.5% reaching $198 billion by 2033 (source: Precedence Research, 2024). Indian composites market is growing at 7.2% CAGR, driven by aerospace, automotive, and green construction trends (source: IMARC Group, 2024).

Target Industries

Aerospace lightweight structures, Automotive green composites, Sustainable Construction materials. , Composite material manufacturers, automotive OEM integrators, green building product developers. Go-to-market via partnerships with R&D divisions, Tier-1 suppliers, and infrastructure solution providers focused on eco-friendly materials.

AT A GLANCE

- SDG 9 (Industry, Innovation and Infrastructure), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action)

Technology is available for licensing/ co-development.

Reach out to Prof. Deepak Chitkara, Coordinator, BITS Technology Enabling Centre,
BITS Pilani Contact Details: tec.bits@pilani.bits-pilani.ac.in, 91 1596-255913

innovate achieve lead