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(57) Abstract :
The present invention relates to a smart natural fiber composite material equipped with self-healing capabilities. This composite integrates natural fibers, such as jute, flax, hemp, and sisal, with a matrix material that includes embedded self-healing agents. The self-healing agents, contained in microcapsules or distributed through a microvascular network within the matrix, are designed to autonomously repair damage to the composite material. When the composite experiences mechanical damage, the microcapsules rupture or the microvascular network activates, releasing the healing agents to bond and repair the damaged areas, thereby restoring the material's structural integrity. The invention also includes a method for manufacturing such a composite, involving the preparation of natural fibers, matrix material, and self-healing agents, and the incorporation of these components into a cohesive, durable material. This smart natural fiber composite offers enhanced durability, sustainability, and reduced maintenance requirements, making it suitable for a wide range of applications, including automotive, aerospace, construction, and consumer goods. Accompanied Drawing [FIGS. 1-2]

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