



METHOD FOR PRODUCTION OF MOLDS FROM COTTON MICRODUST WASTE AND ITS REINFORCEMENT WITH SAND

IITM Technology Available for Licensing

Problem Statement

- Inadequate dispersion and aggregation of cellulose in solvents hinder its effective utilization as reinforcement in mold production.
- Conventional methods rely on commercial cellulose materials and high-energy processes, lacking efficiency and sustainability.
- There is a need for an **improved method to utilize cellulosic waste**, such as cotton microdust, for mold development, addressing dispersion issues and reducing energy consumption.

Intellectual Property

- IITM IDF Ref. 2062
- **IN 463849 - Patent Granted**
- **NBA Appl. Ref. No. INBA3202204105**

Technology Category/ Market

Category - Green Manufacturing

Applications - Automotive Industry, Construction Sector, Consumer Goods Manufacturing

Industry - Packaging, Building Materials, Textile and Apparel Industry

Market- Regenerated Cellulose market is projected to reach USD 27.3 billion by 2027, growing at a **CAGR of 8.7%** from 2022-2027.

TRL (Technology Readiness Level)

TRL - 3 , Technology concept formulated.

Research Lab

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Technology

1

- The invention presents a novel two-step thermochemical treatment method for cotton microdust (CMD), transforming its morphology into powdery particles for improved dispersion.

2

- CMD is then solubilized in zinc chloride solution and combined with monosodium glutamate as a cross-linker to form molds, which are reinforced with sand fractions.

3

- The process ensures homogeneous mixing, controlled gelation, and efficient blending of sand without aggregation, resulting in sturdy mold structures suitable for various applications.

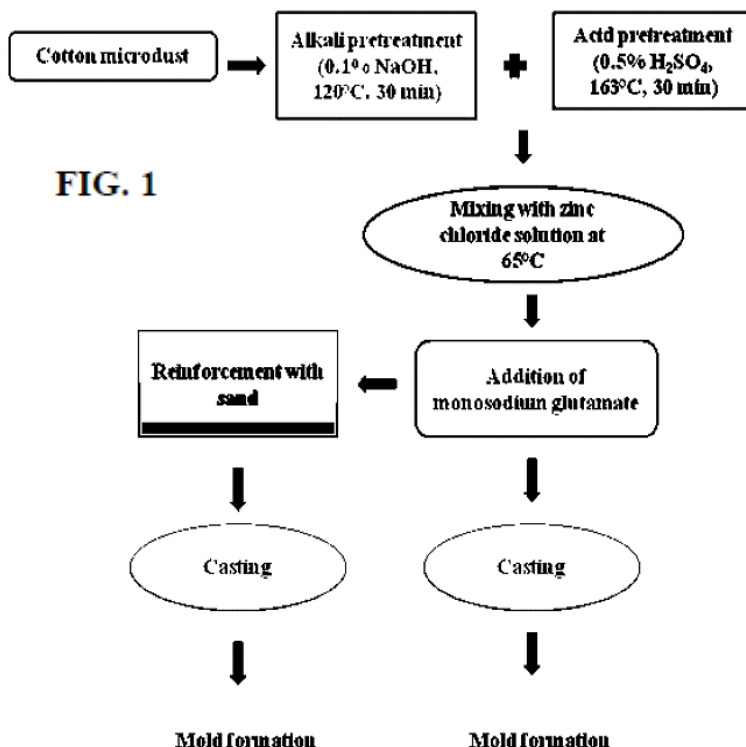


FIG. 1. A flowchart showing the process steps for fabrication of mold from cotton microdust (CMD).

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Key Features / Value Proposition

- 1. Sustainable Solution:** Offers a sustainable alternative to conventional mold production by utilizing cotton microdust waste.
- 2. Enhanced Dispersion:** Unique thermochemical treatment ensures efficient dispersion of cotton microdust, improving material performance.
- 3. Cost-Efficient Process:** Reduces production costs through the use of readily available waste material and optimized manufacturing techniques.
- 4. Versatile Applications:** Provides mold structures suitable for a wide range of industries, enhancing flexibility and market potential.
- 5. Consistent Quality:** Ensures consistent mold quality through controlled processes, reducing variability and enhancing reliability for end users.
- 6. Environmental Impact:** Contributes to environmental conservation by reducing waste and promoting eco-friendly manufacturing practices in the industry.



FIG. 2

FIG. 2 illustrates a sample mold prepared from the cotton microdust (CMD) waste.



FIG. 3



FIG. 4

FIG. 3 and FIG. 4 illustrates sample moldsand prepared from the cotton microdust (CMD) waste and is reinforced with sand.

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