



TRANSIT FOOD STORAGE DEVICE WITH MULTI-LAYER ENERGY STORAGE INSULATION

IITM Technology Available for Licensing

Problem Statement

- Significant agricultural produce is wasted in India due to inadequate storage facilities, leading to losses estimated at 40-50%.
- Conventional transportation methods for perishable goods, such as reefer vehicles, are **capital and energy intensive**, with energy costs alone accounting for approx. 30% of total transportation costs.
- **Current transit food storage technologies face challenges from global temperature rises**, necessitating improvements in thermal insulation and efficiency.

Intellectual Property

- IITM IDF Ref. 1716
- **IN 540450 - Patent Granted**

TRL (Technology Readiness Level)

TRL - 5: Technology validated in relevant environment.

Technology Category/ Market

Category - Transit Food Storage, Energy, Energy Storage & Renewable Energy

Applications- Cold Chain Logistics, Food Retail and Distribution

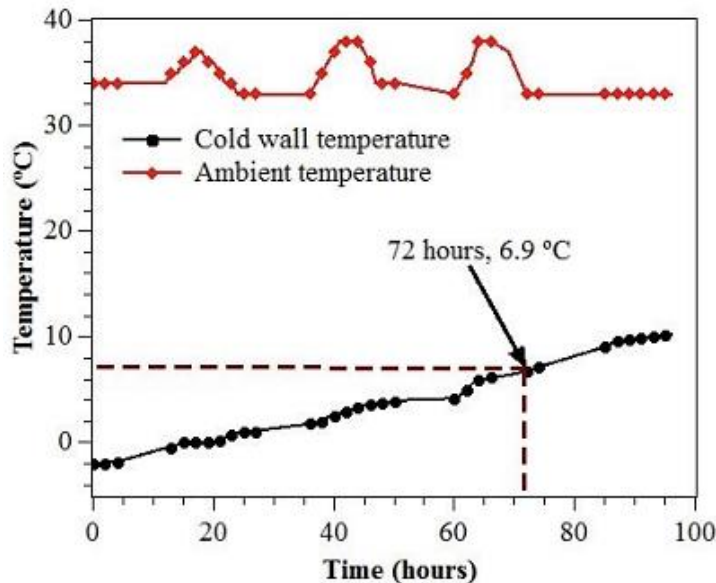
Industry- Transportation and Logistics, Food and Beverage

Market - Global thermal energy storage market was valued at USD 5 billion in 2023 and grew at a **CAGR of 15%** from 2024 to 2033. The market's growth will be influenced by the increasing demand for renewable energy.

Research Lab

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FIG. 1. illustrates graphical representation indicating the performance metrics of the transit food storage device.



Technology

1

Innovative Thermal Insulation:

- The transit food storage device employs high thermal density energy storage (HTDES) insulation, featuring multi-layer organic materials designed to efficiently maintain food temperatures during transit.

2

Operational Efficiency

- It incorporates a passive cooling system with organic HTDES slabs that absorb and release latent heat, reducing energy consumption and operational costs by approximately 40% compared to conventional methods.

3

Versatile Applications:

- Designed for various perishable goods including fruits, vegetables, dairy, and meats, the device adapts to different temperature requirements (-50°C to +10°C), ensuring optimal storage conditions without active refrigeration during transport.

CONTACT US

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Table 1: In line with proposed technology following materials will be used and can be claimed in the use of proposed technology.

Food product	Storage temperature
Fish, Meat, Dairy products and Processed foods	-50 to -15 °C
Vegetables, Fruits, Juices, carbonated drinks and processed foods	0 to 10 °C
Milk and milk products	2 to 6 °C
Frozen fruits and vegetables, pulses	-18 to -25 °C

Key Features / Value Proposition

1. Enhanced Food Safety

Maintains precise temperature control (-50°C to +10°C) to prevent spoilage and ensure food safety during transportation.

2. Sustainable Solution

Minimizes carbon emissions by eliminating fuel consumption for refrigeration, promoting environmental sustainability in logistics.

3. Reliable Performance

Employs high-density organic HTDES insulation to provide robust thermal protection and maintain stable storage conditions over extended periods.

4. Scalability and Adaptability

Designed for scalability from portable units to vehicle containers, accommodating varied logistics needs while ensuring efficient energy use.

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