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Non-melting, Sustainable, Reusable, Plastic-Free and Biodegradable Food Coolant Cubes

Tech ID: 32532 / UC Case 2021-914-0

ABSTRACT

Researchers at the University of California, Davis, have developed a nature-based, plastic-free, non-melting, reusable, sustainable, self-cleanable (anti-fungal), and biodegradable robust cooling system for the applications in cold chains. The system has comparable cooling efficiency to traditional ice and drastically reduces water consumption, prevents potential microbial cross-contamination caused by melt-water, and eliminates the use of plastic and other synthetic materials.

FULL DESCRIPTION

Food and pharmaceutical supply and delivery chains require temperature control during sourcing, processing, handling, distribution, transportation, and sale. Although traditional ice and reusable plastic bagged coolants are affordable and efficient, concerns arise from the microbial cross-contamination caused by melted water, intensive use of water and the use of synthetic materials in reusable coolants. In addition, the loss of coolant life due to the growth of molds inside the reusable coolant packs and cubes after several uses makes reusable coolants less attractive to customers. Most importantly, the thick plastic shells in the bagged coolants could decrease cooling efficiency and generate negative impacts on the environment.

Researchers at the University of California, Davis, have developed a nature-based, plastic-free, non-melting, reusable, sustainable, self-cleanable (anti-fungal), and biodegradable robust cooling system for the applications in cold chains. Materials developed are safe to be directly applied on and in contact with food. The system has comparable cooling efficiency to traditional ice, can be processed into varied sizes and shapes, can drastically reduce melt-water-caused microbial cross-contamination potential, prevent the product-life loss due to fungal-growth, and avoid potential pollutions caused by the use of plastic bags and synthetic contents. The application of this system has the potential to bring immediate benefits to the food and pharmaceutical industry, shipping companies, as well as coolant production companies by reducing microbial contamination of cooled foods and items, minimizing water consumption, and eliminating potential pollutions by synthetic coolants.

APPLICATIONS

- ▶ Perishable food transport and delivery
- ▶ Pharmaceutical and temperature sensitive material delivery
- ▶ Seafood and meat storage, sales, and display
- ▶ Farm-market-home temperature controlling
- ▶ Restaurant take-out and catering services

FEATURES/BENEFITS

- ▶ High cooling efficiency
- ▶ Cleaner to use than ice
- ▶ Reduced cross-contamination potential
- ▶ Anti-mold
- ▶ Designable and customizable shape and size
- ▶ Non-toxic
- ▶ Zero plastic material usage
- ▶ Biodegradable Sustainable and environmentally friendly
- ▶ Reusable Affordable Great for catering services, temperature sensitive shipping, and perishable food delivery

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Reference for National Filings	WO 2023/287469	01/19/2023	2021-914

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OTHER INFORMATION

KEYWORDS

food sustainability,
hydrogel, biomaterials,
environmentally friendly,
biodegradable, anti-
microbial

CATEGORIZED AS

- ▶ **Agriculture & Animal Science**
 - ▶ Other
 - ▶ Processing and Packaging
- ▶ **Materials & Chemicals**
 - ▶ Other

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