

# 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

#### CONTACT

Pooja N. Bhayani pnbhayani@ucdavis.edu tel: .



#### **INVENTORS**

- Sun, Gang
- ▶ Wang, Luxin
- Zou, Jiahan

#### OTHER INFORMATION

**KEYWORDS** food sustainability, hydrogel, biomaterials,

environmentally friendly,

biodegradable, anti-

microbial

# CATEGORIZED AS Agriculture & Animal Science Other Other Processing and Packaging Materials & Chemicals

Other

**RELATED CASES** 2021-914-0

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

Patent Pending

# **ADDITIONAL TECHNOLOGIES BY THESE INVENTORS**

- ▶ Fumigant Detoxification via Reusable Cotton Material
- Pesticide Detection: Methyl Iodide and Methyl Bromide
- Photo-Rechargeable Antibacterial/Antiviral Materials
- Environmentally Friendly Manufacturing of Nano, Micro and Sub-micro Fibers with Hybrid CAB System

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