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# Network Of Architected Structures For Fluid And Heat Transport

Tech ID: 34435 / UC Case 2024-983-0

## BRIEF DESCRIPTION

An innovative, nature-inspired system that efficiently captures, transports, and stores fluids while providing passive cooling through controlled fluid dynamics.

## FULL DESCRIPTION

This bio-inspired system captures moisture from dry air, transports it through capillary pore networks, and stores it for controlled cooling and fluid use. Hydrophilic–hydrophobic surfaces and hydration-activated fiber valves precisely regulate intake and flow. Its modular, tunable architecture supports multiple fluids and scales across applications from arid-region water harvesting to thermal management in aerospace, automotive, defense, and construction.

## SUGGESTED USES

- » Self-cooling, water-harvesting building panels and infrastructure with water management and thermal regulation in arid regions
- » High-performance thermal control in aerospace and automotive systems, including hypersonic vehicle components and interior cooling/humidification
- » Advanced defense, sporting, and specialized wearable applications requiring impact resilience and fluid absorption

## ADVANTAGES

- » Efficiently captures and transports fluids from dry air while enabling passive, low-energy cooling.
- » Integrates multiple functions (e.g., self-cooling, fluid storage) within a single, mechanically robust, biomaterial-inspired structure.
- » Reduces dependence on fossil-fuel–based cooling systems, lowering carbon emissions, energy use, and noise pollution.
- » Features a flexible, modular design adaptable across aerospace, automotive, housing, defense, and wearable or textile applications.

## PATENT STATUS

Patent Pending

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## OTHER INFORMATION

### CATEGORIZED AS

- » **Materials & Chemicals**
  - » Chemicals
  - » Composites
  - » Textiles
  - » Thin Films
- » **Security and Defense**
  - » Other
- » **Engineering**
  - » Other

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2024-983-0

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