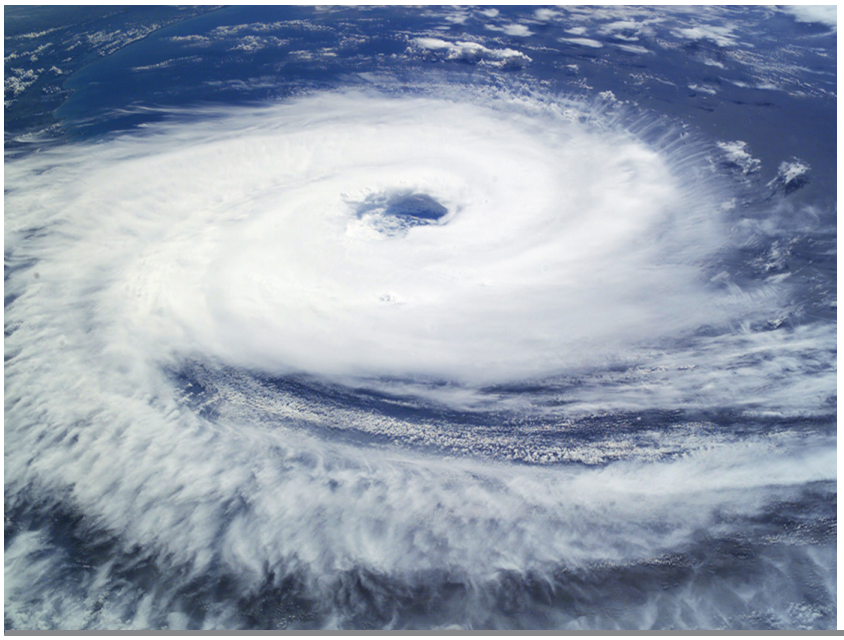

National Aeronautics and Space Administration

TECHNOLOGY SOLUTION

Mechanical and Fluid Systems

Micro scale electro hydrodynamic (EHD) modular cartridge pump

EHD modular cartridge pump that is designed and engineered to be the smallest and simplest iteration in NASAs arsenal.

This NASA innovation incorporates a simplistic design that reduces the number of components required to make an assembly by up to 90% over previous iterations, insuring a solid reliable electrical connection to the electrodes that form the pumping sections and is modular in overall design to allow for flexibility in incorporating the pump cartridge into various assemblies and applications.

BENEFITS

- Low malfunction rate due to no moving parts
- Simple and robust system
- Light weight and low energy consumption

THE TECHNOLOGY

NASA GSFCs EHD pump uses electric fields to move a dielectric fluid coolant in a thermal loop to dissipate heat generated by electrical components with a low power system. The pump has only a few key components and no moving parts, increasing the simplicity and robustness of the system. In addition, the lightweight pump consumes very little power during operation and is modular in nature. The pump design takes a modular approach to the pumping sections by means of an electrically insulating cartridge casing that houses the high voltage and ground electrodes along with spacers that act as both an insulator and flow channel for the dielectric fluid. The external electrical connections are accomplished by means of commercially available pin and jack assemblies that are configurable for a variety of application interfaces. It can be sized to work with small electric components or lab-on-a-chip devices and multiple pumps can be placed in line for pumping greater distances or used as a feeder system for smaller downstream pumps. All this is done as a one-piece construction consolidating an assembly of 21 components over previous iterations.

APPLICATIONS

The technology has several potential applications:

- Computer thermal control
- Aerospace
- Automotive

PUBLICATIONS

Patent No: 10461621

technology.nasa.gov

NASA's Technology Transfer Program pursues the widest possible applications of agency technology to benefit US citizens. Through partnerships and licensing agreements with industry, the program ensures that NASA's investments in pioneering research find secondary uses that benefit the economy, create jobs, and improve quality of life.

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More Information

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