



TECHNOLOGY

Flexible-Actively Controlled Heat Exchanger Based on Thin-Film Technology

OVERVIEW

The microscale heat exchanger manufactured using the wafer technology can't be scaled for large applications. Also macroscale heat exchangers are usually rigid and require fins to have a secondary heat transfer area for better heat transfer on the air side. Besides, installing bypass valves and temperature sensor in conventional heat exchanger can't be integrated due to material limitations.

Researchers at the University of Maryland have developed a new Heat Exchanger technique that utilizes micro-machined channels of scales varying from Nano to mm ranges for internal fluid flow [water, fluorinated hydrocarbons, hydrocarbons, natural refrigerants] to form a grid of interconnected channels [mesh-like channels] which enables the utilization of improved heat exchange performance used in micro-chip cooling application to the macro-scale W to kW applications.

The advantages of the invention are:

- 1) Ability to produce a macro-scale heat exchanger using micro-machining technology
- 2) Benefit from the improved heat transfer performance of the micro-scale flow passage
- 3) Actively control the internal fluid flow inside the heat exchanger to optimize for pressure drop and thermal distribution
- 4) Phase separation for lower pressure drop through the heat exchanger

For additional information, please contact the Office of Technology Commercialization, University of Maryland College Park, via e-mail at otc@umd.edu or phone at 301-405-3947.

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Additional Information

INSTITUTION

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PATENT STATUS

Patent(s) pending

LICENSE STATUS

Contact OTC for licensing information

CATEGORIES

- Engineering
- Chemical

EXTERNAL RESOURCES

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