

Free-Particle Boiling Enhancement Technique

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- Mechanical Engineering

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- Heat Transfer
- Mechanical Engineering

Nucleate boiling is the process by which small steam bubbles form at the heat transfer surface and then break away and are carried through the rest of the fluid. Once through, the bubbles collapse into the fluid, thus dissipating the heat. This type of heat transfer is common in applications where liquid is used as a coolant such as in nuclear reactors, chemical reactors, refrigeration systems, electronics-cooling applications, and automotive applications.

Researchers at Purdue University have developed an improved nucleate boiling heat transfer technique. This technology employs particles, which are free to move, on the heat transfer surface in order to increase nucleation. These particles have been shown to increase nucleate boiling heat transfer performance by up to 216 percent. In addition, unlike other attempts to boost heat transfer capabilities through particle sintering or more exotic steps, this free-particle technique is relatively inexpensive.

Advantages:

- Relatively inexpensive
- Significantly increases heat transfer

Potential Applications:

- Nuclear reactors
- Chemical reactors
- Refrigeration systems
- Electronics cooling applications
- Automotive applications

People:

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Intellectual Property:

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