**Variable View Factor Two-Phase Radiator**

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During spaceflight missions, a variable view factor radiator can be used to maintain the temperature of electronics within a target band over widely varying power and heat sink conditions. Under a NASA Phase I SBIR program, Advanced Cooling Technologies, Inc. successfully demonstrated a lab-scale prototype of a novel vapor-pressure-driven variable-view-factor radiator two-phase radiator (VVFTPR). The radiator consists of hollow curved and straight panels, filled with a two-phase fluid. An increase in internal vapor-pressure, due to an increase in fluid temperature, results in elastic bending of the curved panel and an increase in view-factor. A lab-scale prototype demonstrated a turndown ratio of thermal resistance to the sink greater than 37:1. While the Phase I prototype was constructed from stainless steel, aluminum alloys offer the potential for improved flexibility and mass savings. This paper extends previous 2D structural simulations to three dimensions. A set of important geometric variables are identified and their influence on the view factor is parametrically investigated. In addition, a thermal model of the variable-view-factor two-phase radiator is introduced and used to demonstrate the passive thermal control capabilities of the concept.

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