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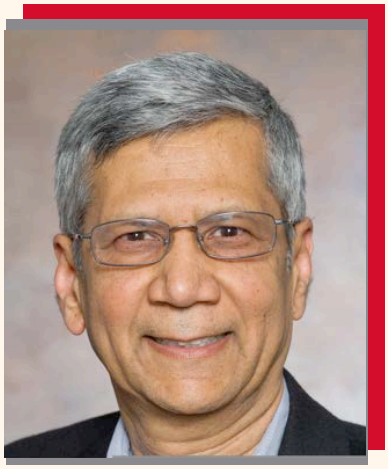
Flow Boiling in Microchannels – New Pathways to High Heat Flux Dissipation



SATISH G. KANDLIKAR

Professor
Department of Mechanical Engineering
Rochester Institute of Technology
Rochester, NY

ABSTRACT:

Reaching a high heat flux dissipation goal of 1 kW/cm2 from a large area with low temperature differences has been the implicit goal of research utilizing flow boiling in microchannels. After a decade of intense research, flow boiling in lain and fin-enhanced microchannels could not reach this goal due to instabilities and inherent low performance. A new class of microchannels has emerged and the possibility of reaching these high flux goals has become a reality. Recent research at RIT on Open Microchannels with tapered Manifold (OMM) has been able to meet these demands. The talk will illustrate the worldwide journey embarked by researchers in this quest and current status in this field.

BIOGRAPHY:

Satish G. Kandlikar is a Gleason Professor of mechanical Engineering at Rochester Institute of Technology in Rochester, NY, USA. He has been active in research in the areas of pool and flow boiling, microchannel flows, electronics cooling, hydrogen energy, fuel cells, microchannels and microfluidics. He has published over 350 journal and conference papers. He is the author/editor of several books/handbooks including Handbook of Phase Change: Boiling and Condensation published by Taylor and Francis, and Heat Transfer and Fluid Flow in Minichannels and Microchannels published by Elsevier Publishing Co. He is the founding chair of the ASME Nanochanncels, Microchannels and Minichannels conference. He has received a number of awards including Rochester Engineer of the Year Award, ASME Dedicated Service Award, Eisenhart Award for Outstanding Teaching and the prestigious ASME Heat Transfer memorial Award.