

Title **Two-phase Flow Distribution in Heat Exchangers**

Speaker Prof. Sang Yong Lee
Professor
Department of Mechanical Engineering
Korea Advanced Institute of Science and Technology (KAIST)
Korea



Date & Time Friday, June 29, 2012 4:00p.m.

Place INAMORI Hall, Ito campus, Kyushu University

Abstract

In this lecture, the phenomena of flow distribution of gas-liquid two-phase mixture at header-channel junctions of heat exchangers (such as the evaporators and condensers) are discussed. The presentation starts with the flow-split behaviour at single T-junctions that is considered as a unit element of the header-channels assembly of the heat exchangers. Experimental observations and appropriate models for prediction of the flow split to the branch are introduced. Then the effect of the flow interaction between two neighbouring channels (branches) on the flow-split pattern is considered. To simulate the practical shape of the header-channels assembly of compact heat exchangers, a partitioned header was connected to multiple parallel channels and the split of the gas-liquid flow were examined. At the same time, dependence of the flow distribution pattern on various operating conditions and header-channels configurations is summarized. Finally, practical techniques to achieve uniform distribution of gas-liquid two-phase flow from the header to the parallel channels are introduced and the future research issues are presented.

About the Speaker

Dr. Sang Yong Lee is a professor in Department of Mechanical Engineering, KAIST, which he joined as a faculty member in 1982. He performs and teaches various topics on the phase-change heat transfer and atomization/spray technology. Currently, he is working on the flow distribution of refrigerants in evaporators of the air-conditioning systems, two-phase flow instabilities for power plant design, micro drop/bubble generation, and on the drop-wall interaction. He authored more than 150 technical publications and published two books on the liquid atomization and the two-phase flow heat transfer, respectively. He was a visiting scientist at Argonne National Laboratory (1987 – 1988), a visiting professor at Purdue University (1996) and University of Michigan - Ann Arbor (2002 – 2003), and a technical consultant at LG Electronics (2011). He also served as the presidents of the Institute for Liquid Atomization and Spray Systems - Korea (ILASS-Korea, 2005 – 2007) and the Korean Society of Mechanical Engineers (KSME, 2009), and was elected to an ASME Fellow in 2001.

Host: Professor Yasuyuki TAKATA

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CONTACT: Research Support and International Affairs division
International Institute for Carbon-Neutral Energy Research
TEL:092-802-6934