

## **Research report for Jeong**

### **Publications**

Mark Anthony REDO, Jongsoo JEONG, Niccolo GIANNETTI, Koji ENOKI, Seiichi YAMAGUCHI, Kiyoshi SAITO, Hyunyoung KIM, Characterization of two-phase flow distribution in microchannel heat exchanger header for air-conditioning system. Experimental Thermal and Fluid Science, Article accepted for publication and currently under production.

### **Conference papers & Seminars**

Mark Anthony REDO, Jongsoo JEONG, Ikuhide OTA, Seiichi YAMAGUCHI, Kiyoshi SAITO, Hyunyoung KIM, Structural effect on the flow distribution in a vertical header of microchannel heat exchanger. Proceedings of the 28<sup>th</sup> JSME Environmental Engineering Symposium 2018 (2018 Symposium on Environmental Engineering), Manuscript ID 411. Jul. 11-12, 2018, Tokyo, Japan.(Best paper award)

Mark Anthony REDO, Jongsoo JEONG, Niccolo GIANNETTI, Seiichi YAMAGUCHI, Kiyoshi SAITO, Hyunyoung KIM, Inlet flow orientation and protrusion depth effect on flow distribution in microchannel heat exchanger header. Proceedings of the 29<sup>th</sup> International Symposium on Transport Phenomena (ISTP2019). Oct. 30 - Nov. 2, 2018, Hawaii, USA.

Mark Anthony Redo, Jongsoo Jeong, Seiichi Yamaguchi, Kiyoshi Saito, Hyunyoung Kim, Two-phase flow distribution at wide flow range in the vertical header of microchannel Evaporator, The 6th International Conference of Saving Energy in Refrigeration and Air-Conditioning, ICSERA2019-019, Mar. 12-15, 2019, Seoul, KOREA.

Jongsoo JEONG, Kiyoshi SAITO, Moisture transport in inverter power system of Automobile, Aug. 8, 2018, Namyang R&D center in Hwaseong, KOREA(Invited talk)

Jongsoo JEONG, Kiyoshi SAITO, Moisture transport in inverter power system of Automobile, Jan. 10-11, 2019, Namyang R&D center in Hwaseong, KOREA(Invited talk)

### **Research Summary**

I have mainly focused on the enhancement of the working fluid distribution performance and also clarified the characteristics of flow phenomena in microchannel heat exchanger header. One of the indispensable elements produced from the development of microfluidic technologies is the microchannel heat exchanger (MCHX), which its compactness gives the advantage of saving materials and production cost, saving space, as well as of reduction in refrigerant charge. The on-going challenge with this state-of-the-art technology is the flow maldistribution occurring inside the header, which consequently degrades the heat exchange performance.

Flow distribution was investigated for an actual size evaporator of an air-conditioning system. Enhancement was achieved via the dual-compartment header by increasing the inertial force that boosted the traversing liquid to the top section of the header, particularly at the lower mass flow rate region. As a future plan, a more uniform flow distribution is being aimed at, where the RSD should approach zero at a wide range of operating conditions.