

**Paper Number:** ICR0314

**Title of Paper:** Pressure Drop and Visualization of Adiabatic R134a Two-Phase Flow inside Chevron Type Plate Heat Exchanger

**Presenter:** J. Claessan and B. Simanic

**Session:** B1-19

**Person Contributing Discussion or Question:** K.D. Timmerhaus, University of Colorado 424, Boulder, CO 80309

**Comment or Question:** Were different angles for the Chevrons used in the study? Different angled Chevrons provide different heat transfer coefficients and also different pressure drops.

**Presenter's Reply:** No, only one angle was tested.

**Paper Number:** ICR0378

**Title of Paper:** A General Prediction Model of Two-Phase Glow Distribution in a Multipass Evaporator

**Presenter:** M. Watanaba

**Session:** B1-19

**Person Contributing Discussion or Question:** K.D. Timmerhaus, University of Colorado 424, Boulder, CO 80309

**Comment or Question:** What type (wavy? plug, stratified, etc.) flow did you obtain from the evaporator? There are a number of types of two phase flow that could be present and their affects that heat transfer rate.

**Presenter's Reply:** In the experiment, I mentioned in presentation, we made visualized the flow at the inlet of each pass. From the visualization, we confirmed various flow patterns from wavy flow to annular flow. We compared with flow pattern map proposed by Baker, and Maudhane. Both showed an acceptable agreement with our experiment data.

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**Paper Number:** ICR0378

**Title of Paper:** A General Prediction Model of Two-Phase Glow Distribution in a Multipass Evaporator

**Presenter:** M. Watanaba

**Session:** B1-19

**Person Contributing Discussion or Question:** Jose AR Parise, Pentifical Catholic University of Rio, Dept. Mechanical Engineering, 22453-900, Rio De Janeiro Brazil

**Comment or Question:** What are the limits of application of your model? Fluids? Minimum and maximum flow rates, vapor qualities, etc.? Geometry: diameters, diameter ratios?

**Presenter's Reply:** The most important thing of my present model is that we can predict the complex two-phase flow distribution in multipass evaporator by considering multipass tube as a combination of simple elements (straight tube and T-junction). This concept has no limitations. The limit is due to equations we adapt to make a calculation.

**Paper Number:** ICR0346

**Title of Paper:** Experimental and Analytical Evaluation of Flat Plate Type Geothermal Ground Heat Exchanger.

**Presenter:** S. Sun and W.E. Murphy

**Session:** B1-19

**Person Contributing Discussion or Question:** Nowacui Jan-Erik, UTH, 10044 SM.

**Comment or Question:** 1. How are you sure of the geometry of the bag (earth cave in?). 2. Aren't you afraid of leakage (thin maker all (1.5mm). 3. Is the plastic reinforced?

**Presenter's Reply:** My suggestions to answers. 1. The trench maintains its geometry and does not cave in. 2. No. 3. No.

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**Paper Number:** ICR0346

**Title of Paper:** Experimental and Analytical Evaluation of Flat Plate Type Geothermal Ground Heat Exchanger

**Presenter:** S. Sun and W.E. Murphy

**Session:** B1-19

**Person Contributing Discussion or Question:** Bjoru Palm, Royal lust. Tech 10044 Stockholm, Sweden.

**Comment or Question:** 1. What was the total volume of water in the system? 2. Was the large volume the reason not to use antifreeze? 3. Would it be customary not to use antifreeze in ground source heat pump systems in USA?

**Presenter's Reply:** 1. The bad has the dimensions of 3 ft. X 100 ft. 2. That is our assumption, but the experiment results shows different conclusion. 3. Depends on the location of the application; this type ground HEX only suitable for certain areas.

**Paper Number:** ICR0062

**Title of Paper:** Development of Innovative Plate Heat Exchangers for Refrigeration Application

**Presenter:** G.A. Longo

**Session:** B1-19

**Person Contributing Discussion or Question:** Bouma, J., P.O. Box 17, 6130 AA, Sittard, NC

**Comment or Question:** How is the surface roughness actually made and how reproducible are the results.

**Presenter's Reply:** The manufacturing process of the roughed surface is a proprietary technology covered by a patent.

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**Paper Number:** ICR0062

**Title of Paper:** Development of Innovative Plate Heat Exchangers for Refrigeration Application

**Presenter:** G.A. Longo

**Session:** B1-19

**Person Contributing Discussion or Question:** Bjoru Palm, Royal Inst. Tech 10044 Stockholm, Sweden.

**Comment or Question:** Was the surface of the water side altered also, or was only the refrigerant-side surface structured?

**Presenter's Reply:** This enhanced surface is applied only on refrigerant side, whereas OU water-side we have a normal smooth surface.

**Paper Number:** ICR0062

**Title of Paper:** Development of Innovative Plate Heat Exchangers for Refrigeration Application

**Presenter:** G.A. Longo

**Session:** B1-19

**Person Contributing Discussion or Question:** K. D. Timmerhaus, University of Colorado 424, Boulder, CO 80309

**Comment or Question:** Was only one refrigerant used in the experimental study? Was two phase flow achieved within the plate heat exchanger?

**Presenter's Reply:** We tested our prototypes in condensation and vaporization of R22. In the future we will use new refrigerant such as R407C.

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