

SEMINAR – BRUNEL UNIVERSITY

Heat transfer in mini-channels and compact heat exchangers, flow boiling and single phase flow.

**Professor Bjorn Palm, Royal Institute of Technology,
Stockholm**

Date: 28th March, 2008

Time: 12.00 – 1pm

Venue: Bit Lab (Tower B)

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During the last decade there has been an increased interest in mini- and microchannel heat transfer, for use in cooling of electronics and other small scale applications, but also for applications in highly efficient compact heat exchangers for large scale applications. For applications within the refrigeration industry, the interest in compact heat exchangers is motivated by the need to reduce the charge of refrigerant in systems with flammable or poisonous refrigerants, and by the need to reduce leakages of HFC refrigerants. Mini/microchannel heat exchangers may also enhance system performance by smaller temperature differences in the heat exchangers of such systems.

During this decade there has been a discussion whether classical heat transfer correlations for larger size channels are valid also at the small scale.

This talk will give a presentation of some research projects done at the Department of Energy Technology of the Royal Institute of Technology in Stockholm addressing this issue. The presentation will include discussion of single phase heat transfer in tubes in the range 0.6 to 3 mm. Flow regimes for flow boiling in single glass tubes in the same diameter range with different refrigerants will also be presented, together with semi-local heat transfer coefficients.

Performance of a newly designed prototype water to refrigerant heat exchanger with flat multichannel aluminium tubes, used as both an evaporator and condenser, will also be presented and the results compared to the single tube tests.

Plate heat exchangers are frequently used as evaporators and condensers in compact vapour compression refrigeration systems. The influence of the geometry on the performance as evaporators will also be covered in the presentation.

The Seminar will last about one hour, with opportunities for discussion.

HTS members are invited to contact David Reay on DAREay@aol.com if they would like to attend the lecture.