

Attain High Energy Efficiency with Less Materials Using Smaller-diameter, Inner-Grooved Copper Tubes

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UPCOMING PRESENTATIONS

WEBINARS

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TECHNICAL PAPERS

23rd IIR International
Congress of Refrigeration
Paper by Professor
G.L. Ding of SJTU *et alia.*
Wednesday, August 24.
See "Events" page at
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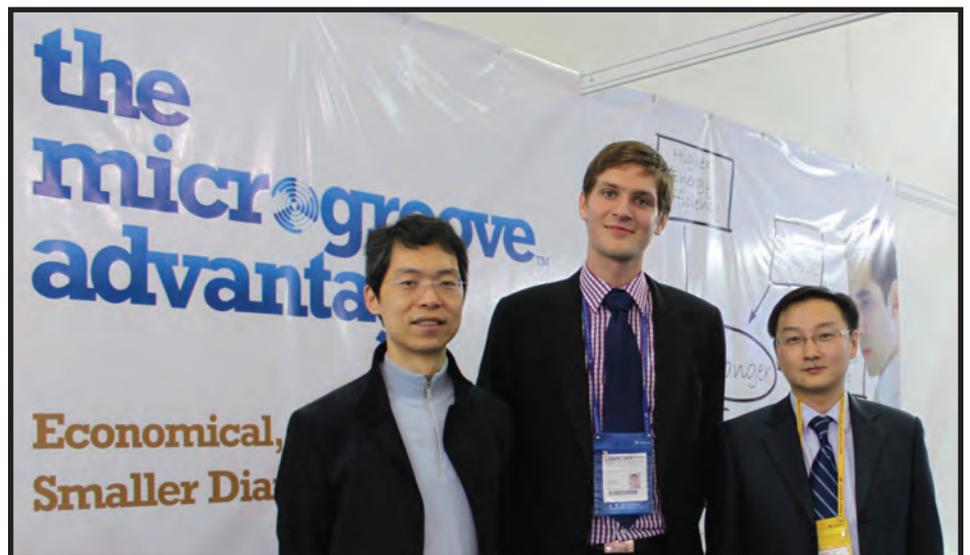
EXHIBITS

23rd IIR International
Congress of Refrigeration
Prague, Aug 23-26
See "Events" page at
www.microgroove.net

ABOUT THE CONGRESS

The International Congress of Refrigeration is the most important and prominent forthcoming event of the International Institute of Refrigeration (IIR, www.iifir.org). More than 600 papers will be presented at the Congress, which is held every four years. The theme for this year is "Refrigeration for Sustainable Development." The International Institute of Refrigeration (IIR) is a scientific and technical intergovernmental organization enabling pooling of scientific and industrial know-how in all refrigeration fields on a worldwide scale.

MICROGROOVE TECHNOLOGY ON DISPLAY AT REFRIGERATION CONGRESS IN PRAGUE



Wenson Zheng (left) and Kerry Song (right) from ICA's Shanghai office will be available to answer questions about MicroGroove Technology at the International Congress on Refrigeration in Prague. Here they are at the China Refrigeration Expo last April.

Once every four years, the world's leading experts in various sciences and technologies relating to refrigeration converge on the International Congress of Refrigeration (ICR).

This year, the 23rd IIR ICR event will be held in Prague, Czech Republic at the Prague Congress Centre where MicroGroove technology will be on display at Booth 11, which is situated on the first floor in the halls near the conference rooms. The MicroGroove exhibit will run for the entire five days of the Congress from August 21-26. If you are attending this Congress, visit Booth 11 and ask about MicroGroove technology.

Attending the booth will be representatives from the European office. In addition, several representatives from the Shanghai Office of the International Copper Association will attend the Congress, including Wenson Zheng, Frank Gao and Kerry Song. They have in-depth technical knowledge and will be happy to meet with you, to discuss current applications of MicroGroove technology as well as ICA-sponsored research.

MicroGroove technology refers to the use of smaller-diameter copper tubes with inner grooves in the design of ACR products. The higher local heat transfer coefficients of such tubes compared to larger diameter copper tubes means that evaporators and condensers made with MicroGroove tubes can deliver a specified cooling capacity using less material, including less tube, less fin and less refrigerant. Consequently, air conditioners and refrigeration products can be made more energy efficient without increasing manufacturing costs.

(continued on next page)

JOINT PAPER WITH SJTU DESCRIBES OPTIMIZATION OF RESIDENTIAL AIR CONDITIONERS WITH SMALLER DIAMETER COPPER TUBES

ICA and Shanghai Jiao Tong University (SJTU) conducted joint research on the optimization of coil designs made with smaller diameter copper tubes. Simulation-based design methods were applied to minimizing total system costs of a unit with a nominal cooling capacity of 3450 watts. Costs were reduced by 17 percent compared to systems made with larger diameter tubes.

A paper titled "Simulation-Based Design Methods for Room Air Conditioners with Smaller Diameter Copper Tubes" is slated for presentation at 9:00 am on Wednesday, August 24 at the International Congress of Refrigeration in Prague. Coauthors include Professor G.L. Ding and T. Ren of the Institute of Refrigeration and Cryogenics at Shanghai Jiao Tong University (SJTU) in Shanghai, China; and Wenson Zheng and Frank Gao of the International Copper Association.

The design goal was to minimize the total cost (including costs of materials, processes and labor) for manufacturing an air conditioner of a given capacity. The parameters to be optimized included heat exchanger length, fin pitch, number of paths and other physical and geometrical design factors. System cooling capacity did not vary by more than one percent.

"The simulation-based design method allows for many heat exchanger designs to be explored more efficiently than traditional cut-and-try methods," explained Wenson Zheng, Deputy Director of Technology for ICA.

The design methodology encompasses a heat-exchanger simulator as well as a knowledge-based evolution method (KBEM). The simulator performs heat exchange calculations to determine system performances based on physical properties and geometrical design parameters, while the KBEM eliminates unfeasible or impractical designs, before the simulations are performed, allowing for a more efficient sampling of the design space.

In a case study using the design method, optimized coils were designed using smaller diameter inner grooved tubes. System costs were lowered by 17 percent compared to designs that used larger diameter tubes. The design method and case study will be discussed at the presentation in Prague. For more information about MicroGroove technology and technical papers, visit www.microgroove.net. 

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Nigel Cotton, Global OEM Team Leader for the ICA, will also be at the Congress. He says, "MicroGroove technology is already increasing the energy efficiency of AC products on global markets. Yet the potential for saving energy using this technology is just beginning to be realized. The IIR Congress provides an ideal venue to introduce its advantages to ACR researchers and product design engineers throughout the world."

Several papers will be presented at the Congress on the design of heat exchanger coils using smaller-diameter copper tubes. For more information about MicroGroove Technology, including technical papers, visit MicroGroove (Booth 11) at the Congress during the exhibit hours, or visit www.microgroove.net. 



Coils from OEMs were on display at the MicroGroove booth in Shanghai. The samples are representative of both condensers and evaporators, for window-type air conditioners as well for split units. Coils will also be on display in Prague.

MICROGROOVE RESEARCH

Several years ago, ICA began working with universities, OEMs and tube suppliers to increase the energy efficiency of ACR product without increasing the material content. Today, that technology is already in production. If you are still not sure about what the MicroGroove advantage means to you and your company then it's time to visit www.microgroove.net and introduce yourself to one of the MicroGroove contacts listed in the new online Supplier Directory.

ICA and its members wish you much success and prosperity in your development of energy efficient ACR products.

Thanks for your interest in this technology!

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