

## UPCOMING PRESENTATIONS

### WEBINARS

Achieving Higher Energy-Efficiency with Smaller-Diameter Copper Tubes

14:00 Brussels Time (GMT+2)

Tues 14 June 2011

Boost ACR Energy Efficiency with Copper MicroGroove Tubes

1 pm New York Time (GMT-4)

Wed 22 June 2011

### TECHNICAL PAPERS

"Simulation-Based Design Method for Room Air Conditioner with Smaller Diameter Copper Tubes"

By G.L. Ding, T. Ren, X.Y. Zheng and Y.F. Gao

Paper to be presented at 23rd IIR International Congress of Refrigeration, Prague, Aug 23-26

"Improving Performance of Refrigeration Systems"

By John Hipchen

Paper to be presented at ASHRAE

2011 Annual Conference

Monday, June 27, 2011

from 11:00 AM to 12:00 PM

### EXHIBITS

23rd IIR International Congress of Refrigeration  
Prague, Aug 23-26

## OEMs USE SMALLER-DIAMETER COPPER TUBES IN NEW ACR PRODUCTS



This evaporator coil for a window-type air conditioner from Haier uses 5 mm diameter inner-grooved copper tubes.

Product designers increasingly are using smaller diameter copper tubes in air-conditioning and refrigeration (ACR) products. This trend is fast becoming the norm as OEMs pay attention to the competitive advantages of MicroGroove technology.

Speaking from ICA's MicroGroove exhibit at the "China Refrigeration Expo" (CR-2011) in Shanghai, China, ICA's Deputy Director of Technology Wenson Zheng said, "The International Copper Association has been cooperating with OEMs on design strategies for increasing the performance of evaporator and condenser coils. The most spectacular gains in heat transfer efficiency have been realized by decreasing the diameter of the copper tubes in these coils."

Coils from five different OEMs, including Gree, Haier, Midea, Chigo and HiSense Kelon 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 as for split units.

"Most of these coils are taken from actual production models of residential air conditioners," said Mr. Zheng. "We are proud of the accomplishments of the small-tube-copper consortium in China, and research continues on the design and manufacture of coils with small diameter copper tubes."

## OEMS SEEK ANSWERS

Several years ago, ICA began working with universities, OEMs and tube suppliers in China, searching for the answer to one overarching question:

*How can we increase the energy efficiency of ACR products without increasing the material content?*

For those already making ACR products with high energy efficiency, the question is

*How can we use less material?*

Experiments were conducted on heat transfer coefficients; cut-and-try coils were made, directly substituting smaller diameter tubes in place of conventional tubes in coil designs; and computer simulations were made to optimize coil circuitry and fin design.

Inevitably, the answer obtained was "make the tube diameter smaller." This conclusion is expected to have huge economic consequences for the ACR industry.

## NEW TECHNOLOGY ON DISPLAY

Tubes were researched and coils were developed for and by select OEMs. Eight technical papers are now available online. The R&D clearly shows that lighter, more compact heat exchanger coils could be made to provide the heat transfer capacity required for high energy efficiency products.

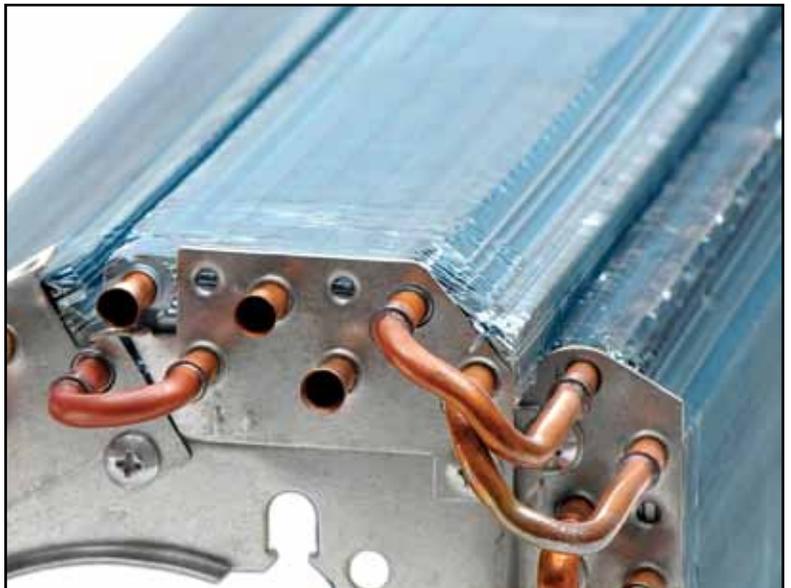
The technology is already in production. MicroGroove products were on display at several 2011 industry trade shows. Even if you missed ICA's MicroGroove exhibit in Shanghai and Las Vegas this year, you can still see video and photographs of the coil samples that were on display at AHR Expo and China Refrigeration.

That's a brief recap of the latest news about MicroGroove technology for this premiere issue of the MicroGroove Update. If you are still not sure about what the MicroGroove advantage means to you and your company then it's time you contacted one of the MicroGroove contacts listed in the new online Supplier Directory.

Thanks for your interest in this technology! ICA and its members wish you much success and prosperity in your development of energy efficiency ACR products.



These smaller-diameter copper tubes with inner grooves provide high-efficiency and reduced size and weight. This is one section of a condenser coil from Midea.



This evaporator coil for a Chigo split-type air conditioner uses smaller-diameter copper tubes.

**MICROGROOVE IS ONLINE**

**[WWW.MICROGROOVE.NET](http://WWW.MICROGROOVE.NET)**

Visit MicroGroove online for the latest information about webcasts, technical papers and exhibits.