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## PRESENTATIONS

### SEMINAR

#### MicroGroove Technology for Commercial Systems

WHEN: Tuesday, January 29, 2013, 2 to 4 p.m.

WHERE: New Product & Technology Theater B  
Dallas Convention Center, AHR Expo 2013  
(See Full Agenda on Next Page)

### TECHNICAL PAPERS

#### The Tenth IIR Gustav Lorentzen Conference on Natural Refrigerants

1. "Developing Low Charge R290 Room Air Conditioner by Using Smaller Diameter Copper Tubes" by Guoliang Ding, Wei Wu, Tao Ren, Yongxin Zheng, Yifeng Gao, Ji Song, Zhongmin Liu and Shaokai Chen

#### The Fourteenth International Refrigeration and Air Conditioning Conference

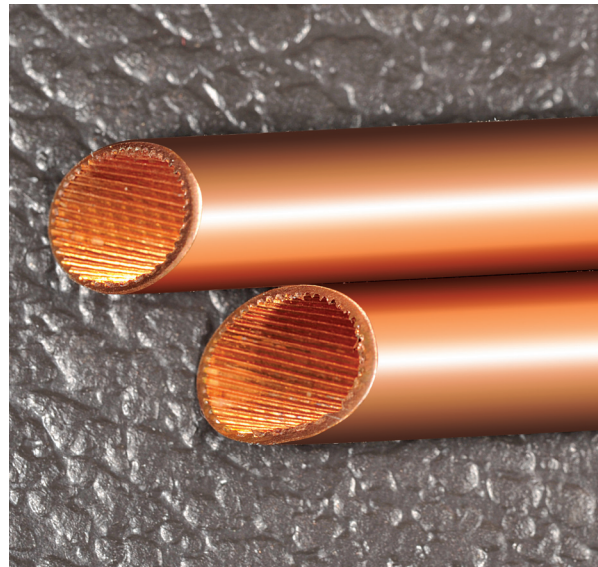
1. "Principle of Designing Fin-And-Tube Heat Exchanger with Smaller Diameter Tubes for Air Conditioner" by Wei Wu, Guoliang Ding, Yongxin Zheng, Yifeng Gao and Ji Song
2. "Simulation-Based Comparison of Optimized AC Coils Using Small Diameter Copper and Aluminum Microchannel Tubes" by John Hipchen, Robert Weed, Ming Zhang, Dennis Nasuta.

(See [www.microgroove.net/events](http://www.microgroove.net/events).)



## THE COPPER ALLIANCE HIGHLIGHTS COMMERCIAL APPLICATIONS OF MICROGROOVE TECHNOLOGY AT THE AHR EXPO

As the Copper Alliance showcases MicroGroove Technology at the AHR Expo for the third consecutive year, the focus will be on commercial applications. Nigel Cotton, the MicroGroove Team Leader for the International Copper Association, explains as follows.



"Smaller diameter, inner-grooved copper tubes have been proven to be well suited for the high-volume production of residential air conditioners," he says. "Now it is time to show that the same benefits that make MicroGroove so attractive for room air conditioners also apply to commercial and industrial systems.

"We would like manufacturers and mechanical systems engineers to come to realize the same benefits in commercial applications that

OEMs of residential products already enjoy," says Cotton. "The MicroGroove concept is applicable across the boards: residential, commercial and industrial refrigeration and air conditioning; and for evaporators and condensers. There are benefits in every case."

The MicroGroove Advantage debuted at the 2011 AHR Expo in Las Vegas and made an encore appearance at the 2012 AHR Expo Chicago. Evaporator and condenser coils from such OEMs as Chigo, Goodman, Gree, Haier, Kelon and Midea were on display those first two years. MicroGroove returns to the AHR Expo in 2013 bringing a new twist, one that focuses on use of smaller diameter copper tubes in commercial air conditioning and refrigeration.

Super Radiator Coils is providing positive proof that the MicroGroove concept is applicable to commercial and industrial systems. The company built three large evaporator coils, which will be on display at three different 2013 AHR Expo booth locations, including booths for Super Radiator Coils (#1737) and Burr Oak Tool Inc. (#2957) as well as the MicroGroove booth (#5525).

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See the sidebar on Super Radiator Coils and see for yourself at the AHR Expo what can be done with MicroGroove smaller diameter copper tubes.

## COME TO THE THEATER AT AHR EXPO

To facilitate technology transfer at the AHR Expo, the Copper Alliance is hosting a series of presentations from innovative industry experts who are active in the development of new applications for copper tubes. The roster includes experts in the design and manufacture of heat-exchangers as well as experts in the manufacture of copper tube and fittings.

Six 20-minute speaking slots have been reserved at the New Product & Technology Theater B at the AHR Expo at the Dallas Convention Center on Tuesday, January 29, from 2 p.m. to 4 p.m. (The full agenda is described in the adjoining table.)

The speakers will address such topics as copper tubes for refrigeration; large area coil design; tube benders for small diameter tubes; surface enhancements; and system benefits. While residential air conditioning will be discussed, emphasis will be on the application of MicroGroove in commercial systems for refrigeration, and air conditioning.

Of special note is the presentation by Matt Holland, from Super Radiator Coils, who will describe heat exchanger coils made from 5-mm copper tubing. These compact heat exchangers were developed using SRC's industry-leading wind tunnel test laboratory. Compared to coils made with conventional tubes, coils that use MicroGroove technology offer customers lower cost, reduced refrigerant charge, smaller size and less weight. These benefits are available without compromising the flexibility of the configuration for field serviceability, or other tradeoffs typically incurred using aluminum tubes or microchannel tubes.

The tube supplier point of view will be represented by speakers from Mueller Industries, Luvata and Wieland Werke. They will review, respectively, the limitations of piping systems for containing and conveying refrigerants; new copper alloys for use with various refrigerants; and copper tube advancements for ACR applications.


Newell Franks, Chairman and CEO of Burr Oak Tool Inc., will describe equipment for making coils with smaller diameter tubes, including a new small-diameter hairpin bender that takes up approximately half the space of conventional machines and increases the production rate by two-fold.

## OPEN TO ALL

This technology overview is free-of-charge and open to all AHR Expo attendees. Anybody involved in the design and manufacture of heat exchanger coils or the development of technology road maps is encouraged to attend.

- Meet the presenters before or after the seminars at their booths.
- Join us for one or more of these presentations Tuesday afternoon.
- Download select presentations afterwards from [microgroove.net](http://microgroove.net).

For details about the design and manufacture of residential, commercial and industrial heat exchangers using MicroGroove, visit [www.microgroove.net](http://www.microgroove.net).

There you will find information about smaller diameter copper tubes and where to obtain them. You can also join our group at this address on LinkedIn: [www.linkedin.com/groups/Microgroove-4498690](http://www.linkedin.com/groups/Microgroove-4498690). 

## New Product & Technology Theater B

**2:00 to 2:20 pm**

**The MicroGroove Advantage**

John Hipchen from the Copper Alliance, **Booth #5524**

**2:20 to 2:40 pm**

**Copper Tubing in R410A and CO<sub>2</sub> Applications**

Dr. Charles Stout, PE and Chris Mueller from Mueller Industries, Inc., **Booth #2545**

**2:40 to 3:00 pm**

**High Efficiency MicroGroove Coils for Commercial and Industrial Applications**

Matt Holland from Super Radiator Coils, **Booth #1737**

**3:00 to 3:20 pm**

**A New Era of Coil Manufacturing**

Newell Franks from Burr Oak Tool Inc., **Booth #2957**

**3:20 to 3:40 pm**

**New Copper Alloys for the ACR Industry**

Ed Rottmann from Luvata, **Booth #1545**

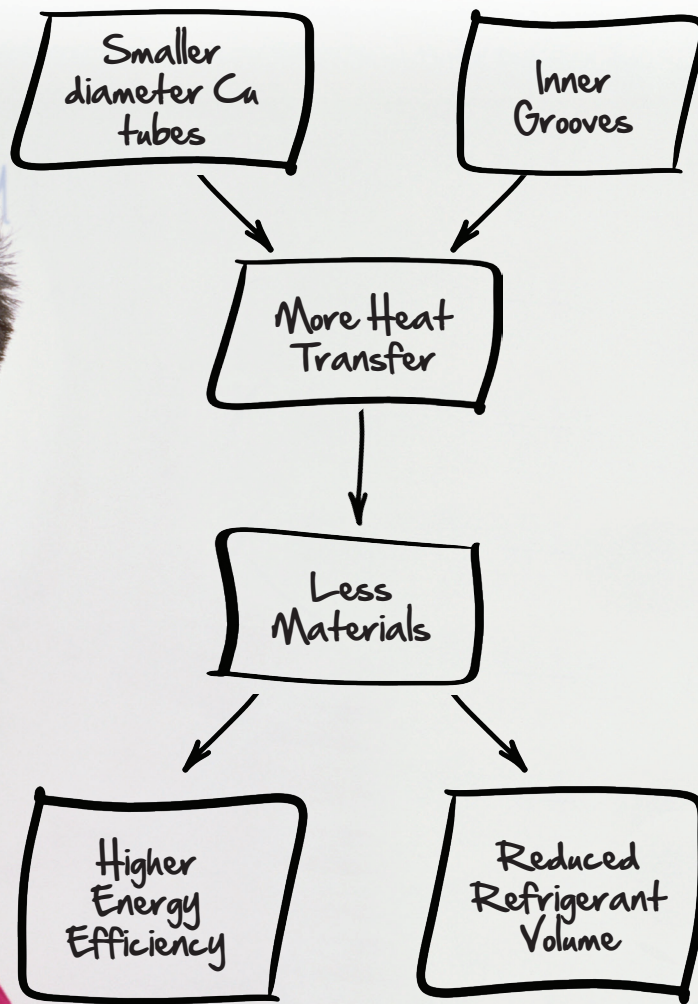
**3:40 to 4:00 pm**

**Optimization of Copper Tubes for ACR Tube Applications**

Steffen Rieger from Wieland-Werke AG, **Booth #4156**



# the microgroove™ advantage



## IT'S A GAME CHANGER

MicroGroove™ technology is changing the game of air conditioning and refrigeration (ACR) OEM product design.

OEMs are going back to their drawing boards. They are designing ACR products with high energy-efficiency, while minimizing materials usage and reducing refrigerant volume.

The resulting ACR products are smaller and lighter yet can be produced using familiar manufacturing methods.

It's a whole new game!

For more information, or to join a free webinar, visit

[www.microgroove.net](http://www.microgroove.net).

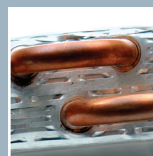
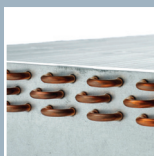
**SEE OUR EXHIBIT**

**AHR EXPO**

Jan. 28-30, 2013  
**Dallas, TX**

**Booth 5524**

**Cu** International Copper Association  
Copper Alliance



Available from a range of suppliers.  
For more information visit:  
[www.microgroove.net](http://www.microgroove.net)

# BIG COILS, TINY TUBES

**SUPER RADIATOR COILS “DOES MORE WITH LESS” USING MICROGROOVE TECHNOLOGY IN ITS NEW COIL DESIGNS.**

Super Radiator Coils now offers new designs of coil products made from smaller-diameter copper tubes. Products made with MicroGroove technology include condenser coils, evaporator coils and water coils. The company will exhibit coils made from smaller diameter MicroGroove tubes at the AHR Expo.

According to Matt Holland, Vice President of Operations at SRC in Richmond, Virginia, MicroGroove Technology offers several compelling benefits such as design flexibility plus size and weight reduction. Copper coils using MicroGroove offer a combination of features unavailable using other materials technologies, including conventional-size round tubes or brazed-aluminum flat tubes.

Holland reports that the manufacture of coils using MicroGroove technology is based on familiar manufacturing techniques. The technology can be readily applied to make coils with tube lengths up to six or eight feet in length and formed easily.

“We gained a lot of experience over the last two years of development with MicroGroove,” says Holland. “We have tested heat exchangers made with MicroGroove technology in our world-class wind tunnel facility in Richmond, Virginia, and we have found our customers like the results.”

“Super Radiator Coils recognizes the advantages MicroGroove technology brings to commercial applications,” says Nigel Cotton, MicroGroove Team Leader for the International Copper Association. “Super Radiator Coils boasts a long history of innovation as well as profound knowledge of heat-exchanger design, testing and manufacture. We are very pleased to have their commitment to MicroGroove and look forward to working with them on this economical and eco-friendly heat exchanger technology.”

When smaller diameter copper tubes are used in the construction of large-area heat exchanger coils, major advantages are realized in terms of energy savings, materials savings, reduced refrigerant charge and smaller footprints.



This commercial-sized evaporator coil from Super Radiator Coils features 5 mm MicroGroove tubes.

For more information visit Super Radiator Coils  
[www.superradiatorcoils.com](http://www.superradiatorcoils.com)

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