**System-Wide Copper Tube Weight Is Less Thanks to Smaller Diameter Copper Tubes in New Coil Designs, Says International Copper Association**

*Several OEMs Optimize Small-Tube Coil Designs with ICA*

**New York, NY (December 5, 2011)** — The International Copper Association has recently cooperated with several major OEMs in projects to replace evaporator and condenser coils in existing residential air conditioning with optimized coil designs that use smaller diameter, inner-grooved MicroGroove tubes.

In separate projects with Kelon and Midea, for examples, the ICA and the Institute of Refrigeration and Cryogenics at Shanghai Jiao Tong University, Shanghai, China have redesigned existing products to provide the same cooling capacity and coefficients of performance (for cooling) while using smaller diameter tubes in the evaporator coils and the condenser coils.

Questions asked by the researchers were as follows:

* Could coils with smaller diameter copper tubes replace coils with larger diameter tubes without changing the overall system cooling capacity?
* How could such coils be optimized to maximize performance?
* What benefits are realized from using smaller diameter tubes?

Simulations were run to optimize the coils with many different combinations of tube circuitry and fin designs. In one OEM design study, tube diameter was reduced from 7 mm to 5 mm for the evaporator; and from 9.52 mm to 5 mm for the condenser. Tube length was approximately unchanged for the evaporator but was increased by about 50 percent for the condenser. In another OEM design study, the tube diameter was reduced from 7 mm to 5 mm for both the evaporator and condenser. Tube length was increased about one meter for the evaporator and three meters for the condenser. Indeed, these OEM studies demonstrated that tube diameters could easily be reduced without using more space or significantly changing the product design or system performance.

The use of smaller diameter tubes in the optimized designs resulted in a dramatic reduction in tube weight for the same cooling capacity. Part of the reason for the weight reduction is that the tube wall thickness could be reduced from 0.28 mm to 0.20 mm for the smaller diameter coils.

In the first OEM design study (R22, 2600 W, EER 12), the total tube weight was reduced by 855 grams from 3.119 kg to 2.264 kg. In the second OEM design study (R22, 2550 W, EER 10), the tube weight was reduced by 898 grams from 2.684 kg to 1.786 kg.

“OEM design studies such as these demonstrate the ease of implementing the MicroGroove advantage,” says Nigel Cotton, Global OEM Team Leader for ICA. “Whether the OEMs goal is to increase cooling capacity or EER, MicroGroove allows the system designer to reach that goal using less material.”

For more information on this study or MicroGroove technology, visit [www.microgroove.net](http://www.microgroove.net). More information about these OEM design studies is provided in the MicroGroove Webinar titled “Boost ACR Energy Efficiency with Copper MicroGroove Tubes” which can be viewed free-of-charge with registration at [www.microgroove.net/webinars](http://www.microgroove.net/webinars).

**About ICA**

The International Copper Association, Ltd. (ICA) is the leading organization for promoting the use of copper worldwide. ICA’s mission is to promote the use of copper by communicating the unique attributes that make this sustainable element an essential contributor to the formation of life, to advances in science and technology, and to a higher standard of living worldwide. Visit [www.copperinfo.com](http://www.copperinfo.com) for more information about ICA.

**# # #**