**Smaller-Diameter Copper Tubes Contribute to Climate of Innovation, Says International Copper Association from AHR Expo in Chicago**

*Coils Made with MicroGroove Tubes Allow for Lighter, More Compact, More Energy Efficient ACR Products*

**Chicago, IL (January 20, 2012)** — According to the International Copper Association, the use of smaller diameter copper tubes in coil design is contributing to a climate of innovation. The ICA is highlighting the use of smaller diameter, inner-grooved round copper tubes in air conditioning and refrigeration (ACR) applications this year at the AHR Expo being held at the McCormick Place from January 23-25 in Chicago.

Interest in ACR product design has intensified in recent years and new designs of heat pumps, air conditioners and refrigerators are flourishing. The regulation of the ozone depletion potential (ODP) and global warming potential (GWP) of refrigerants continues to challenge researchers to search for new refrigerants and challenge product designers to use natural and alternative refrigerants more effectively. Furthermore, the demand for energy efficiency has eliminated poorly designed products from the marketplace. ACR manufacturers have become highly motivated to reduce the cost of their products and one way to reduce costs is to reduce the materials content of their products.

All else being equal, the highest coefficients of performance (COPs) are realized by more efficient cooling of refrigerant in the condenser and more efficient warming of refrigerant in the evaporator. Thus, energy efficient coils made from smaller diameter, inner-grooved, copper tubes are essential components in the redesign of ACR units in the new climate of innovation at the AHR Expo.

**Use of Simulations**

Heat exchanger coils facilitate two key thermodynamic processes in the vapor-compression refrigeration cycle. With the availability of more sophisticated software programs and increasing numbers of engineers proficient in modeling, a new era of design now allows for many products to be tested without soldering a single elbow joint. Software now allows for computational fluid dynamics to be combined with heat transfer calculations. These simulations can be run for different refrigerants and different coil designs, sampling a vast design space as quickly as the parameters can be changed in the software. In this manner, ACR designers can settle on optimized designs of innovative products after sampling a very large design space.

**Antimicrobial Materials**

Another factor that is influencing the design of air conditioning and refrigeration systems is new published research on copper’s efficacy against the spread of fungi in air conditioning systems. ACR companies such as the Chinese air-conditioning giant Chigo and Hydronic in France have already developed all-copper products expressly for their antimicrobial properties. Chigo launched the world’s first antimicrobial copper room air conditioner in 2010, pioneering a new trend towards healthier home appliances. Today, Hydronic manufactures the first large scale antimicrobial copper coils air handling units in Europe, designed for off-shore, hospital, industrial and commercial applications.

**Conclusion**

In summary, there are many factors influencing the climate of innovation in the ACR industry today. These factors include

* Phase out of high-ODP and high-GWP refrigerants
* Eco-friendly refrigerants
* Energy efficiency standards
* Sustainable development
* Computer simulation of components and system performance
* Responsiveness to needs and wants in the marketplace

Specifically for coil design, product development will be especially influenced by the following factors:

* Smaller diameter copper tubes
* Inner-grooved copper tubes
* Antimicrobial properties of copper in coils and air handlers

“End-users will enjoy healthy, eco-friendly products that deliver cooling capacity with high energy efficiency when as well as where it is most desirable,” says Nigel Cotton, MicroGroove OEM Team Leader for ICA. For more information on MicroGroove technology, visit www.microgroove.net.

**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.

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