**MicroGroove Technology Case Study Presented at ATMOsphere America Shows How to Reduce Charge of HC Refrigerants in Next Generation ACR Products, says International Copper Association**

*The Use of Smaller Diameter Copper Tubes in the Heat-Exchanger Coils of New AC and Refrigeration System Designs Maximizes Performance of Eco-Friendly Refrigerants*

**New York, NY (31 July 2013)** — According to the International Copper Association (ICA), a technology case study on MicroGroove presented at the Second Annual ATMOsphere America Conference held in Washington DC in June shows how to keep performance levels up while reducing refrigerant charge.

The technology case study titled “Developing a Low Charge R290 Air Conditioner Using Smaller Diameter Copper Tubes” was presented by John Hipchen, President of Exel Consulting on behalf of Wenson Zheng, Deputy Director of Technology for ICA. The ICA-sponsored research project involved the development of a split air-conditioning systems with 5-mm MicroGroove copper tubes in the evaporator and 7-mm MicroGroove copper tubes in the condenser.

As a result of using the smaller diameter copper tubes, the refrigerant charge in the evaporator was only a fraction of the total refrigerant charge. Furthermore, without compromising the performance, the total charge was substantially reduced compared to product designs using larger diameter copper tubes. The ICA-sponsored research results were of special interest to product design engineers from companies looking ahead toward the adoption of hydrocarbons and carbon dioxide as refrigerants.

Several case studies presented at ATMOsphere researched the use of R290 in applications such as bottle coolers, plug-in units, light commercial freezers and air conditioners. The current 150-gram maximum allowable propane charge limit recently became permissible in the US for certain domestic and light commercial refrigeration applications. Approaches for complying with these charge limits were also outlined by Douglas Schmidt of Embraco North America and Vicente Guilabert Hernandez, from Huayi Compressor Barcelona S.L.

“Heat transfer engineers at the major OEMs are discovering that smaller is better when it comes to air-conditioners, heat pumps and refrigeration systems operating efficiently with eco-friendly refrigerants. ICA members are ready to deliver MicroGroove tubes in volume just as the design engineers seek to overcome barriers to the adoption of economical and eco-friendly refrigerants,” says Nigel Cotton, MicroGroove Team Leader for the International Copper Association.

The ICA presentation by John Hipchen as well as all other conference presentations can be downloaded directly from the ATMO website at [www.atmo.org/media.presentation.php?id=282](http://www.atmo.org/media.presentation.php?id=282). The ICA presentation as well as photographs from the event can also be found online at microgroove.net.

**ATMOsphere America 2013 summary**

From 18-19 June 2013, around 200 HVAC&R stakeholders gathered at ATMOsphere America 2013 in Washington, D.C. to discuss the business case for natural refrigerants in the U.S. and Canada and the game-changing role North America could assume in the mainstreaming of natural refrigerant technologies. For two days, representatives from over 100 different companies and organizations engaged in lively discussions and debates about the latest natural refrigerant market developments, as well as the regulatory and economic barriers that still need to be overcome. Leading suppliers presented their latest technology case studies, consumer goods brands and industrial end-users spoke about their experiences with CO2, ammonia and hydrocarbons, and representatives from different governmental bodies addressed recent regulatory developments in both the U.S. and Canada. One of the main conclusions drawn from ATMOsphere America 2013 was that natural refrigerants are not just beneficial for the environment; they can also be very efficient, safely operable and economically viable, and they are ripe for expansion in the North American market.

**# # #**