

Use of Smaller Tubes Lowers Refrigerant Usage in Residential Cooling Applications, Says International Copper Association

Midea Compares Refrigerant Usage and Performance of Condenser Coils

New York, NY (January 31, 2011) — The International Copper Association (ICA) today announced research on the benefits of using smaller diameters copper tubes in heat-exchanger coils. As the tube size was reduced in various air conditioners from a major OEM, less refrigerant and less materials were required to deliver the same performance.

The prototype condensers were designed and constructed by Midea Refrigeration Equipment Company, Foshan, Guangdong, China for three types of split air-conditioning products. Nominal cooling capacities and refrigerants for the three products were 2600 watts with R410a refrigerant, 3500 watts with R410a, and 3500 watts with R290 (propane) refrigerant.

Performance was measured for products with condensers made from two sizes of copper tubes. Hence, there were two versions of each of the three products types, for a total of six prototypes. Experimental measurements were made of power consumption and the cooling capacity for each of the six prototypes and the coefficient of performance (COP) was calculated from these measured values.

Results showed that the prototypes performed essentially the same regardless of tube size. More important, the refrigerant charge dramatically dropped in every case. “For every product type, smaller diameter tubes resulted in a substantial decrease in materials and weight without a reduction in performance,” says Nigel Cotton.

Mr. Qingxian Jia, Refrigeration Technical Manager at Midea, commented that the production methods are unchanged for small tube copper and hence Midea is already selling products made with small tube copper all over the world, especially in North America and Europe. “The technology and worker skills for making coils are effectively the same for the larger and smaller tubes,” said Mr. Jia.

More information about this design study is available online at www.microgroove.net. For more information about heat exchanger coils made with small tube copper, 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 for more information about ICA

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