**Indian OEMs Discover the Advantages of Smaller-Diameter Copper Tubes**

*MicroGroove Penetrates the Indian HVAC-R Market*

**Mumbai, India (27 February 2019)** — According to the International Copper Association, smaller diameter copper tubes increasingly are used in air conditioning and refrigeration applications in South Asia. A round tube, plate fin heat exchanger provides superior drainage and is easier to clean than a microchannel heat exchanger with serpentine fins sandwiched between ribbon-like multichannel tubes.

“A MicroGroove heat exchanger is made from smaller-diameter copper tubes,” explains Avinash Khemka, Chief Manager at International Copper Association India. “MicroGroove offers numerous advantages. MicroGroove is now emerging as preferred alternative to microchannel.

“MicroGroove usage continues to grow in India. It is a preferred tube for India because of its corrosion resistance,” Khemka continues. “It is true that a decade ago larger-diameter copper tubes began to lose market share to aluminium. Although a low point was reached in 2014, the corrosion resistance of copper prevailed and copper heat exchangers are now recapturing market share. The trend back toward copper has been dramatic in the last four years, as end users of aluminium microchannel experienced many cases of failure and leakage. Now end users have an energy-efficient copper alternative. MicroGroove copper has emerged as an easy-to-maintain, reliable and durable option, well suited for the tropical climate of India.

“The industry is rapidly switching to MicroGroove as a practical, economical, eco-friendly alternative to MicroChannel,” Khemka emphasized.

**HTCs and Star Labels**

India is among the largest and fastest growing markets globally for room air conditioners (RACs) with about six million units sold in 2018. Increased infrastructural development, urbanization, higher standards of living and rising disposable income have all contributed to the heightened demand for air-conditioning.

Since the revision of Star Labeling by the Bureau of Energy Efficiency in 2018, AC manufacturers are specifying condensers and evaporators that transfer heat efficiently. Laboratory experiments show that heat transfer coefficients (HTCs) are highest for smaller diameter inner-grooved copper tubes compared to larger diameter tubes and smooth tubes. Higher HTCs result in more efficient RAC systems. These systems also use less material and less refrigerant.

MicroGroove coils made from smaller diameter inner-grooved copper tubes deliver an unprecedented combination of reliability and energy efficiency. They are more affordable than traditional designs because they use less material. Typical MicroGroove copper tube outer diameters are 7 mm, 6.35 mm (0.25 inch) and 5 mm.

**New Production Lines Specialize in MicroGroove**

Many coil manufacturers have added MicroGroove heat exchanger production lines to their plants or even built new facilities dedicated to the production of MicroGroove heat exchangers.

SPIROTECH (LU-VE Group) was among the first companies to adopt MicroGroove five years ago. Based in Bhiwadi, Rajasthan (about 60 km south of New Delhi), it makes MicroGroove heat exchangers for heat pumps, air conditioners and refrigeration systems, including MicroGroove heat exchangers for R744 systems.

Indus ([www.indusair.com](http://www.indusair.com)) is another company that has invested in the manufacture of Microgroove coils. It recently split into two companies, including Indus in Dubai and Danvita India in Mumbai ([www.danvita.com](http://www.danvita.com)).

Danvita uses five millimeter “Micro Tube” copper tube coils that reduce refrigerant charge by one third compared to seven millimeter copper tube coils. According to the company, Micro Tube coils are a perfect substitute for multichannel heat exchangers because they are lighter, offer reduced refrigerant charge, and they are serviceable in the field.

Danvita’s Quantum™ Fin design provides high system efficiency. With its use of CFD technology and in-depth knowledge of fluid flow, Danvita developed an innovative fin surface that provides heat transfer capacities much higher than other fin surfaces using the same footprint. Danvita serves commercial, industrial and residential HVAC and refrigeration markets as well the mobile HVAC industry and it is well equipped with the latest technologies.

The Amber Group India ([www.ambergroupindia.com/heat-exchanger/](http://www.ambergroupindia.com/heat-exchanger/)) recently collaborated with the International Copper Association India and Optimized Thermal Systems (Beltsville, Maryland, USA, [www.optimizedthermalsystems.com](http://www.optimizedthermalsystems.com)) to optimize MicroGroove heat exchangers for an AC application that uses R32 as a refrigerant. OTS and ICA previously developed a series of educational webinars on the design and manufacture of MicroGroove heat exchangers.

“Coil makers and OEMs in India have been quick to recognize the role of MicroGroove in meeting efficiency standards and transitioning to eco-friendly refrigerants without compromising on reliability and durability,” says Nigel Cotton, MicroGroove Team Leader in Brussels, Belgium.

ICA continues to support research projects leading to technical presentations at major conferences. Papers have been delivered on many topics, such as software programs for developing commercial heat exchangers; reducing refrigerant volume for use with new refrigerants and natural refrigerants; and the use of smaller diameter tubes in heat pump applications.

For information on MicroGroove, also visit www.microgroove.net.

**About ICA**

ICA brings together the global copper industry to develop and defend markets for copper and to make a positive contribution to society’s sustainable-development goals. Headquartered in New York, the organization has offices in four primary regions: Asia, Europe and Africa, Latin America and North America. Copper Alliance® programs and initiatives are executed in nearly 60 countries through its regional offices. For additional information please visit copperalliance.org.

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