

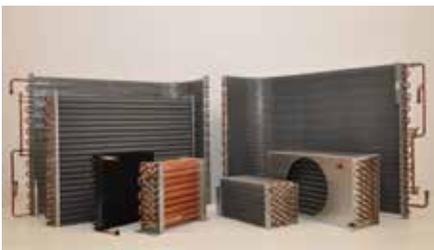
Smaller Diameter Copper Tubes Expand Into Large Applications

MicroGroove technology is expanding into all sizes of heat exchanger coils from the very small to very large. Not many years ago there were just a handful of MicroGroove applications but that's no longer the case. MicroGroove smaller-diameter copper tubes can be found in a myriad of products, with tube lengths ranging from a few inches to several meters; and capacities ranging from hundreds of watts to hundreds of kilowatts.

MicroGroove heat exchangers enable high efficiency to be realized in diverse and dissimilar products, from cold vending machines and cold display cases to clothes drying heat pumps and mobile refrigeration systems; and MicroGroove tubes are being used in large commercial and industrial systems, too.

Once the small diameter tubes are interlaced with aluminum fin plates and mechanically expanded, the ruggedness of the round tube plate fin (RTPF) heat exchangers is remarkable. Such are highly valued for their corrosion resistance. Unlike systems made from aluminum tubes, the high nobility of copper compared to aluminum results in the sacrificial corrosion of aluminum fins rather than the copper tubes. Consequently, there is scant chance of a leak even under harsh environmental conditions. That means MicroGroove designs are favored in outdoor condensers and process cooling equipment.

Spirotech established its MicroGroove processing line in 2012 and has been producing diverse heat exchangers



These diverse coils all use 5-mm diameter copper tubes. (Courtesy of Spirotech, New Delhi, India)



This refrigeration system for process cooling at a brewery uses 5-mm diameter copper tubes in its condenser coils. (Courtesy of PRO Refrigeration, Auburn, Washington)

ever since. Lordan was one of the first companies to adopt 7-mm copper tube technology and it continues to set trends in product development with its Lord-Five (5-mm copper tube) product line. These companies design and build coils of all sizes from the small to midsize to very large.

Coils and Condensers

Tommy Gaubatz of Innovative Cooling & Equipment Inc. (ICE) recognized that MicroGroove could easily become a game changer for the large condensers used in process cooling and commercial refrigeration. Having spent much of his career at Carrier in various marketing and engineering roles, he witnessed the move toward smaller-diameter copper tubes in both residential air conditioning as well as refrigerated transport. He realized that smaller-diameter copper tubes could be a game changer in the design of process cooling equipment, too.

Gaubatz teamed up with PRO Refrigeration, a company with extensive experience in building industrial-sized refrigeration equipment. Along with the engineers at PRO Refrigeration, Gaubatz helped to apply ICE's new

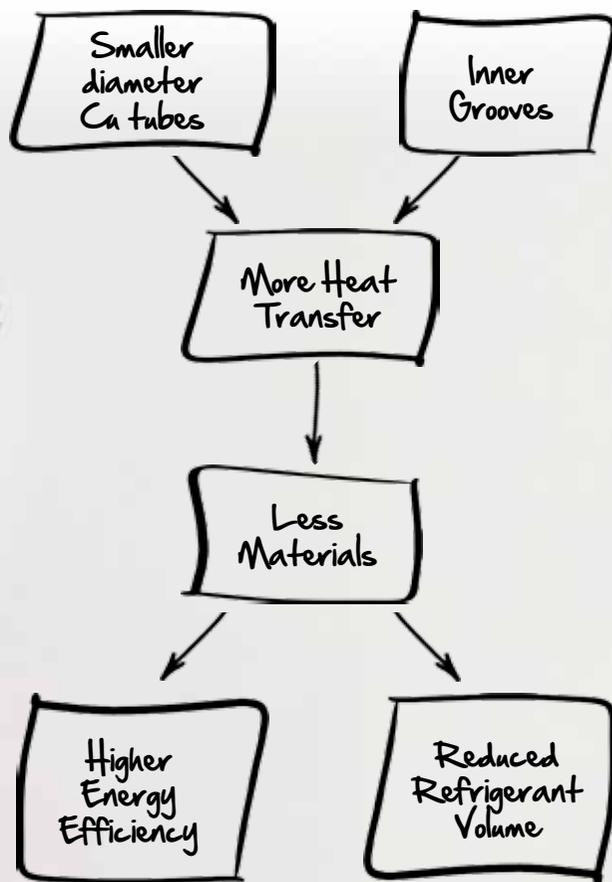
condenser constructed with smaller diameter copper tubes. This condenser turned out to be a perfect fit for the process cooling systems that PRO Refrigeration builds for breweries.

Companies such as Lordan, LU-VE, Spirotech and Super Radiator Coils have developed expertise in the manufacture of large coils and condensers that use small-diameter copper tubes. These condensers typically are used in the air conditioning of commercial buildings or in process cooling.

LU-VE for example offers a standard line of condensers made from 5-mm coils, including three basic classes based on fan diameters of 350 mm, 500 mm and 630 mm. The NanoGiant LCM 350 uses one to four fans for capacities from 9.3 to 44.0 kilowatts; LCM 500 uses one to three fans for 17.5 to 105.9 kW; and LCM 630 uses one to four fans for 24.8 to 247.2 kW.

For more information, visit www.microgroove.net. Join the MicroGroove Group on LinkedIn to share your ideas about research directions and product development. www.linkedin.com/groups/Microgroove-4498690.

the microgroove™ advantage



IT'S A GAME CHANGER

MicroGroove™ technology is changing the game of air conditioning and refrigeration (ACR) OEM product design.

OEMs are going back to their drawing boards. They are designing ACR products with high energy-efficiency, while minimizing materials usage and reducing refrigerant volume.

The resulting ACR products are smaller and lighter yet can be produced using familiar manufacturing methods.

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