

EXECUTIVE *Report*

Young Touchstone Leverages Benefits of Copper/Brass Brazing for Heavy-Duty Markets

Young Touchstone, a Wabtec company (NYSE:WAB), recently unveiled its new CuproBraz® production facility in Jackson, Tennessee thereby becoming a leading manufacturer of CuproBraz products in North America.

The company began looking carefully at CuproBraz technology eight years ago, and the advantages were immediately apparent in concept. After years of product development and testing, it has taken a giant step forward by opening a dedicated CuproBraz production line, including a continuous brazing furnace large enough and flexible enough to process virtually any heat exchanger product.

Young Touchstone identified CuproBraz as a critical technology for developing superior products at lower costs for its many OEM customers in a wide variety of heavy-duty markets. To understand how CuproBraz fits into its growth strategy, it is necessary to examine how it serves current OEM customers in these markets.

Heavy-Duty Markets

Young Touchstone is established as a leader in its markets, as its hundreds of OEM customers, large and small, can attest. Founded by Fred Young in 1927, Young Radiators merged in 2000 with Touchstone Inc., a railroad locomotive parts supplier founded by Roy Touchstone in 1969 in Jackson,

Tennessee. Also in 2000, Young Touchstone became a Wabtec company. Wabtec Corporation (www.wabtec.com) is North America's largest provider of value-added, technology-based products and services for the rail industry.

Consequently, Young Touchstone now has several rich heritages of innovation. Young Touchstone historically has set the standards in the industries that it serves; moreover, Wabtec is a corporation that supports new product development through its

product development system (PDS), which is a systematic process for developing new products to ensure success.

Young Touchstone designs, manufactures, and markets a wide range of quality industrial heat-exchanger cores. For radiator applications, these heat exchanger cores can range in size from 4 sq ft to 115 sq ft face areas. Depending on the specific application, they typically have 8 to 12 fins per inch and the complete assembly may contain 2 to 8 rows. It also developed charge air coolers, oil coolers and other types of heat exchangers.

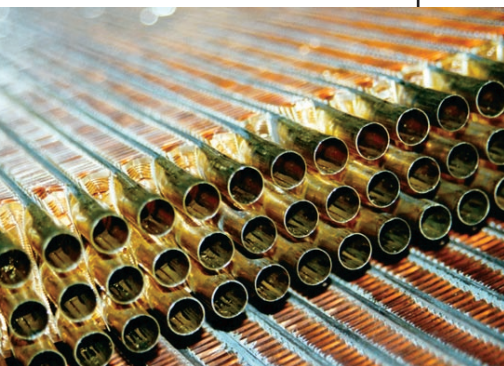
Young Touchstone recently introduced the DS2 line of FLAT-ROUND® CuproBraz radiators at POWER-GEN International held in Las Vegas in December 2003. Its modular design and production system quickly pulls together the needed pre-configured components to build unique cooling systems for diesel & gas engines in the power generation market.

Jim Jenkins, President of Young Touchstone explains, "Young Touchstone believes product innovation is essential to long-term competitiveness. CuproBraz will allow us to increase our pace of innovation with respect to cooling system weight, cost, size and durability."

Decisive Benefits

When Young Touchstone began looking at CuproBraz, there were already at least three competitive core technologies: soldered copper/brass plate fin; soldered copper/brass serpentine fin; and brazed aluminum serpentine fin. Each had some advantages, depending on the particular application in the specific market served. However, it quickly became clear that FLATROUND CuproBraz could lead to the development of new brazed serpentine-fin designs that would have decisive advantages over each of these other technologies.

For example, brazed copper/brass serpentine-fin designs could be made less expensively than sol-



High efficiency and extreme durability result from ICA's CuproBraz technology and Young Touchstone's FLAT-ROUND technology.

The International Copper Association, Ltd. (ICA)

is the leading organization for the promotion of the use of copper worldwide. The Association's twenty-nine members represent about 80 percent of the world's refined copper output, and its six associate members are among the world's largest copper and copper alloy fabricators. ICA is responsible for guiding policy, strategy and funding of international initiatives and promotional activities.

With headquarters in New York City, ICA operates in 28 worldwide locations through a network of regional offices and copper development associations.

For general mailing information about the CuproBrazed process or ICA's CuproBrazed consulting services, please contact International Copper Association at mrosario@copper.org.

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Young Touchstone will be exhibiting at
POWER-GEN International from
November 30 to December 2, 2004.

dered plate-fin designs; they would be more durable than soldered serpentine-fin designs; and, compared to aluminum, they would hold the advantage of greater cooling efficiency as well as being more rugged. Moreover, aluminum may have durability issues at the higher temperatures and pressures necessary to meet more-stringent emissions requirements around the world.

According to Geoff Smith, VP of Engineering and Product Development, it has long been a goal to replace plate-fin designs with serpentine-fin designs. In the past, customers' requirements for durability could not be met with soldered serpentine-fin designs. Now, things are different. The CuproBrazed products provide a stronger joint between the fins and the flat tubes, finally allowing customers to switch to the more efficient serpentine-fin design. "Our customers have been waiting for this breakthrough for a long time. We anticipate that many will change over to CuproBrazed products immediately," he explains.

FLAT or ROUND?

Heat exchanger designers today often question whether tubes should be round or flat. The argument in favor of round tubes is that they can provide a strong joint at the header plates. On the other hand, because of their low surface-to-volume ratios, round tubes are notoriously inefficient at transferring heat from the internal fluid to the inside surface of the tube walls.

The surface-to-volume ratio can be dramatically increased using flat tubes. Again, the best size and shape of tubes is dictated by the special applications. Much depends on the heat exchanger design and on the fluid, including whether it is a liquid or a gas, and the pressure, temperature and flow rate of the fluid.

Young Touchstone offers its customers the best of both worlds with its patented FLAT-ROUND technology. It uses brass tubes that are flat in the core and round at the headers. It has developed unique processes for machining header holes and o-ring grooves, transforming tubes from flat to round, annealing and sizing tubes, and mechanically bonding tubes into headers.

This FLAT-ROUND design combines the superior airflow and heat transfer of flat tubes with reliable tube-to-header mechanical bond-

ing for exceptional durability. Combining the proven FLAT-ROUND technology with CuproBrazed technology results in the toughest, most efficient cooling systems in the industry.

Cooling Solutions

Young Touchstone now has a framework in place to develop specific products for specific markets and specific applications. Presently, important markets are those in which cooling efficiency and space savings are important considerations. Examples are the rail market, where there is an immediate demand for more compact heat exchangers to cool the on-board diesel engines; and the stationary power generation market, where compact design is also important.

Various commercial vehicle diesel applications are also candidates for CuproBrazed heat exchangers, because of their durability and cooling efficiency. New EPA Tier emissions standards are drawing attention to CuproBrazed because increases in operating temperatures and pressures are widely anticipated, necessitating new technologies and making aluminum products obsolete.

Young Touchstone's product development system guided the process of identifying the appropriate market segments to target, specifying product features that were important to the customer and determining the financial returns necessary to justify the capital investment.

"Our plans are specific for each market," says Jim Jenkins. "We have technology roadmaps for the rail, power generation, and commercial vehicle markets. In some cases we are in the education phase with our customers. Once our OEM customers realize there are benefits that they can't realize using conventional technologies, they become very interested in learning more about FLAT-ROUND CuproBrazed."

"We are pleased that Young Touchstone has entered into the manufacturing phase and has become an important champion of CuproBrazed technology in North America," said Nigel Cotton, Automotive Manager for the International Copper Association. "It joins a growing number of manufacturers worldwide who acknowledge the benefits of this new technology." ■

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