



CAS SERVES A WIDE RANGE OF MARKETS, ALL OF WHICH REQUIRE A TREMENDOUS AMOUNT OF TECHNOLOGY AND ENGINEERING EXPERTISE.

HEATING UP

CAS INVESTS IN A NEW R&D FACILITY TO SUPPORT ITS ONGOING INNOVATION. **BY JANICE HOPPE-SPIERS**

Innovation and out-of-the-box thinking are the hallmarks that have made Cast Aluminum Solutions (CAS) the go-to niche component supplier for industries looking to solve their most complex thermal challenges. “Everything we do is custom and has a thermal component to it,” General Manager and COO Rick Ahern says. “We are a vertically integrated niche provider that engineers and manufactures specialized products for our customers’ complex industrial processes.”

Based in Batavia, Ill., CAS specializes in custom engineered cast-in thermal parts for a variety of industries, including semiconductor, medical and pharmaceutical, industrial gas, food and beverage, oil and gas, and aerospace. About 75 percent of its products are cast-in aluminum, resulting in heating or cooling components that are sold to OEMs. The remaining 25 percent have stainless steel or special alloy substrates that

can be used to solve thermal challenges where aluminum might not be appropriate, such as operating temperatures between 400 C and 900 C.

CAS products are critical to the phones we use every day, the breakthrough medicines that keep people healthy and the spacecraft making pathways to tomorrow. “CAS products fit into very sophisticated processes – creating microchips, sending space vehicles into orbit and heating blood products – so as those processes continually evolve, our products must continually evolve,” Marketing Director Jeff Awe says.

Although 90 percent of its components are custom-made and proprietary to those customers, CAS does offer a standard product line, CAST-X Circulation Heaters. CAST-X Heaters can heat a wide range of liquids and gases, including flammable media such as jet fuel. “Many companies in the aerospace industry purchase our CAST-X products to preheat fuels and

propellants,” Ahern notes. “As new markets emerge, there is a need for heating new fluids. It’s our responsibility to stay on top of emerging industries so we can make those connections and show future customers what we bring to the table.”

From Concept to Production

CAS serves a wide range of markets, all of which require a tremendous amount of technology and engineering expertise. In the semiconductor industry, for example, companies like Intel make and process silicon wafers that become the substrate for the microchips that run smartphones and computers. CAS provides heaters that are integral to the most critical functions of those silicon wafer processing machines. “The temperature uniformity required drives a lot of discipline and R&D activity,” Vice President of Engineering and Quality Eric Hostert says.

Before a new product goes into production, a significant amount of application research and component development work is conducted by the CAS Engineering Department. Finite Element Analysis is used to analyze the thermal and structural properties of CAS parts in computerized process simulations, allowing engineers to optimize designs before a prototype is made.

“There is a lot of collaboration upfront with our customer’s engineering department as we work to dial in their parameters and the optimal thermal profile,” Hostert explains. “From that point, once we have the specs and a roadmap, we will make prototypes, then go through a multi-phase testing regime, and lock down all processes before going into production mode.”

As a vertically integrated manufacturer, CAS operates a large in-house

"OUR CUSTOMERS LOOK TO CAS TO SOLVE COMPLEX PROCESS CHALLENGES." - Rick Ahern

foundry. Aluminum is poured into molds in the shape of customer's parts; heaters, flow-tubes and other components are integrated within the casting. This produces a "near net shape." From there, CAS performs machining operations using nearly 50 on-site CNC machine centers. Precise assembly and quality inspection activities work to complete the final products.

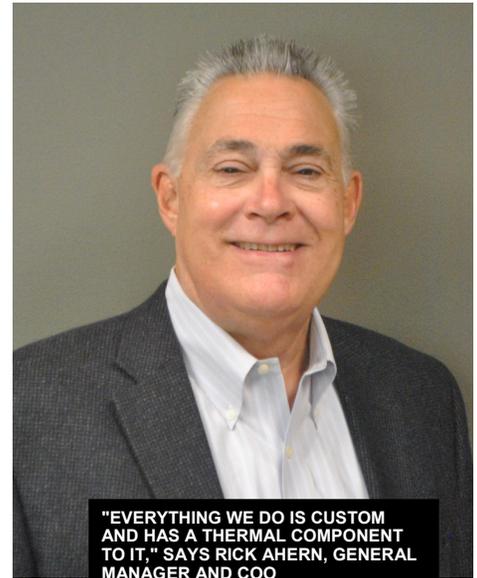
"We have a critical focus on quality," Hostert says. "Our customers look to us to provide meticulously-engineered components that solve complex process challenges. To meet those requirements, the CAS Team devises robust solutions upfront and throughout the manufacturing process. We have process controls in place, and utilize Lean and Six Sigma methodologies to drive improvement

activities and manage risk. The company is also ISO 9001:2015 Certified."

EXPANDING ITS FOOTPRINT

CAS recently opened a new 25,000-square-foot Research & Development Technical Center, near its headquarters and primary manufacturing facility, to expand its new product development capabilities and prepare for further growth.

"At the new tech center, we do a wide range of product performance and reliability testing, depending on the market and application requirements," Hostert says. "A common requirement is around temperature uniformity, which is vital to our customers. There are a variety of tools we employ in the lab, including infrared cameras and vacuum chamber testing. We also utilize instrumented silicon wafers, which can monitor temps in up to 21 zones across a heated surface, then record and log that data over extended test periods. Each product has a lot of complexity and data behind it. Uneven heat across the surface of a product



"EVERYTHING WE DO IS CUSTOM AND HAS A THERMAL COMPONENT TO IT," SAYS RICK AHERN, GENERAL MANAGER AND COO

could potentially create an issue within a customer's process, so factors such as thermal uniformity and component reliability are critical."

CAS also added an ISO Class 6 Cleanroom to its R&D Technical Center, to perform prototype testing and assembly in a controlled environment. "We added more space and upgraded our capabilities," Ahern says. "If a customer wants specific tests or data sets, we view those as opportunities to expand the lab and potentially purchase the additional equipment and technology required to capture that data. It's a matter of customers coming to us with opportunities and challenges in the thermal arena, and CAS providing solutions for them."

Moving forward, CAS plans to advance relationships with current customers and expand with new customers as a niche component supplier.

"There is a lot of demand for heated components," Ahern explains. "We will continue to leverage our outstanding team and the latest technologies to penetrate deeper into existing bases, and expand our presence in new markets." **mt**

VICE PRESIDENT OF ENGINEERING AND QUALITY ERIC HOSTERT (RIGHT) AND TONY MEADORS, VP OF SALES, SEMICONDUCTOR MARKET, REVIEW A CUSTOMER'S SCHEMATIC

