ALLOY DIE CASTING
A Sanders Industries Company

CASE STUDY

Customer
Anritsu Company
Location
Morgan Hill, CA

Situation

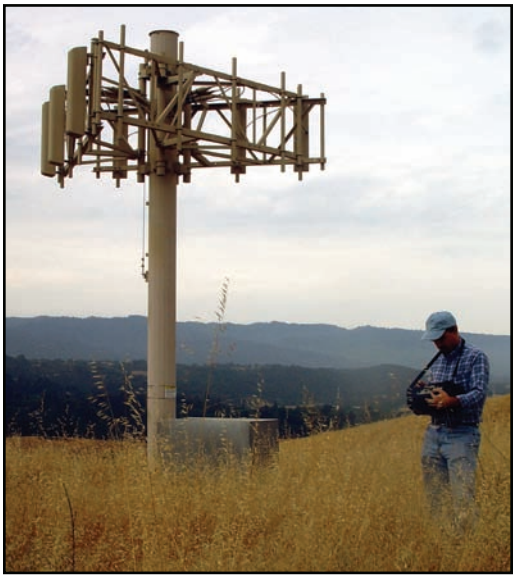
A global innovator of test and measurement devices for more than 100 years, Anritsu Company wanted to reduce the costs of a number of traditionally machined RF shields by replacing them with precision die cast parts. Because of the modest annual quantities, the firm needed a supplier that could deliver cost-efficient production of a number of different short-run designs.

Results

Anritsu selected Alloy Die Casting to supply about a dozen different RF shield designs for its Site Master™ series of analyzers, replacing parts that have been manufactured by hog-out machining techniques. ADC specializes in cost-effective short-run production of complex parts, allowing companies to take advantage of die casting efficiencies even when quantities are lower than traditional die cast volumes..

ANRITSU CUTS RF SHIELD COST WITH DIE CAST PARTS

Anritsu Company, a global innovator of test and measurement instruments for telecommunications, optical and wireless systems based in Morgan Hill, CA, has replaced traditionally machined RF shields in its Site Master™ series of handheld cable and antenna analyzers with precision die cast parts designed and manufactured by Alloy Die Casting. The move is designed to reduce the unit cost of about a dozen different shields across the Site Master product family, an investment on which Anritsu estimates a return within six months.



With capabilities such as precision return loss/ VSWR, cable loss and distance-to-fault (DTF) measurements, the Site Master™ family of analyzers helps field technicians detect problems before they become costly system failures.

"This family of analyzers helps field technicians perform verification and fault location testing on wireless communications systems to detect problems before they become costly, time-consuming system failures," explained Process Engineer Sam Krull. "Their capabilities include precision return loss/ VSWR, cable loss and distance-to-fault (DTF) measurements. The RF shields are an important element in these designs, as they prevent cross-talk within the devices," he said. Site Master Cable and Antenna Analyzers are the leading choice for installation, troubleshooting and maintenance of microwave cables and communication systems in cellular and broadcast industries, as well as aerospace / defense.

"Most of these components are produced by traditional machining from plate or bar stock at first," Krull continued. "Because we're a low-volume, high-mix manufacturer, we sometimes don't have the opportunity to switch to more cost-effective production techniques. But when we do see a chance to make a change, the earlier we take that step, the more we can save over hog-out machining. We've seen payback in these parts in as little as three months."

Anritsu contracted with Alloy Die Casting to develop the replacement designs, which are cast from A380 aluminum. "These shields are fairly complex, which causes some casting firms to shy away from smaller production runs," observed ADC Design Engineer Gary Gray. "But we've developed a process for designing die cast tools and manufacturing techniques for intricate, close-tolerance parts that other shops might avoid in low to medium volumes."

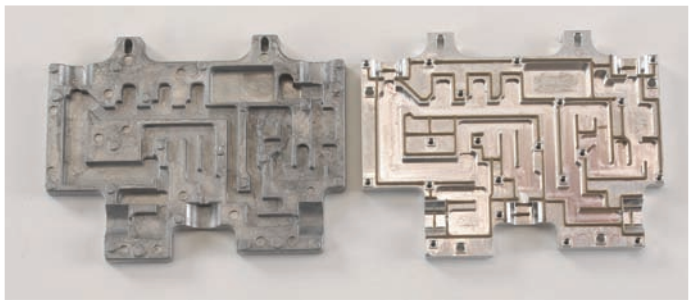
About Alloy Die Casting

Alloy Die Casting, a Sanders Industries company, has been manufacturing complex die castings using aluminum and zinc/aluminum alloys for more than 50 years. Customer-furnished or jointly-developed designs are produced with great precision to satisfy applicable military, aerospace, medical, automotive and industrial requirements. ADC is registered under ISO-9001:2000 and AS-9100B, and meets stringent industrial and military specifications, including MIL-I-45208. The company can furnish castings up to 300 square inches in surface area, with engineering support, custom tool design and fabrication, CNC machining and complete turnkey finishing. ADC also supplies cast-in-place metal inserts and decorative/protective coatings, and even bonds seals and other elastomer components to castings to produce a complete subassembly.

Dimensional Challenges

According to Gray, the shield dimensions were part of his challenge. "These are very thin-walled designs," he said. "Some of them are just .030" thick, with fairly complex geometry. Any time you get below .060" in an aluminum casting, you can run into complications, so it's important to get the right balance of injection speed and venting capacity, as well as very precise temperature control."

The shields are all cast from single-cavity tools, typically on a 250-ton press. Raw ingots are melted in a furnace at approximately 1,200°F. The small 2" plunger size delivers a fill time of about 25 milliseconds (.025 seconds), yet maintains a relatively low gate velocity around 1,200 inches per second.



Anritsu specified precision die castings to replace RF shields that had been manufactured by traditional machining, an investment on which the firm expects payback in about six months.

Depending on the specific shield being cast, shot sizes range from four ounces to about a pound, and ADC usually runs at a conservative speed of 70-80 cycles per hour.

"We want the injection speed to be fast enough to fully atomize the material and give us a quick fill time," Gray continued. "But we have to temper that with the understanding that higher gate velocities will erode the tool steel more quickly, and can shorten die life."

Once the cast parts are removed from the mold, finishing includes a straightening operation and as many as 19 through-holes, two of which are threaded. ADC uses a single-spindle CNC manufacturing center for machining, drilling and tapping, which requires up to 6 minutes apiece.

About Anritsu

Anritsu Company (www.us.anritsu.com) is the American subsidiary of Anritsu Corporation, a global provider of innovative communications test and measurement solutions for more than 110 years. With its acquisition of NetTest (www.nettest.com), Anritsu now delivers technology and services for an extremely wide range of new and emerging wired and wireless communication systems. The company's products include wireless, optical, microwave/RF and digital instruments, as well as operations support systems for R&D, manufacturing, installation and maintenance. Anritsu also supplies precision microwave/RF components, optical devices and high-speed electrical devices for communication products and systems. With offices throughout the world, Anritsu has approximately 4,000 employees serving customers in more than 90 different countries. The firm is registered under ISO 9001-2000.

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