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Materials Testing Needs***

ADMET helps BarronCast bring testing in-house

BarronCast Inc. (BCI) of Oxford, Michigan, provides engineered metal products. The privately-held company traces its roots back to 1923 when it started as a sand casting foundry in Detroit. In 1983, Paul Barron and his son, Bruce, acquired an investment casting company and BCI was established in its present form.

Today, BarronCast's two plants comprise 65,000 square feet. The company has 85 employees and supplies cast, machined, assembled and painted components to the defense, automotive, glass, material handling, medical, printing press, combustion turbine, pump, valve and other commercial markets. BCI is a Tier 1 supplier to GM, Ford and Chrysler, as well as an approved supplier to companies such as McDonnell-Douglas, Westinghouse and General Dynamics.

Until recently, most of its materials and product testing was outsourced to local testing labs. However, in order to better control quality and reduce testing time, BCI now conducts much of its testing in-house. Greg Barron, Manager of Engineering and Quality Assurance, turned to ADMET for its tensile testing equipment. The result has been a smooth startup, more control over the process and quicker turnaround time.

BarronCast Inc. (BCI) provides investment castings and machined parts in a competitive environment to demanding customers in defense, automotive, medical and other industries. It is ISO/TS 16949 and ISO 14001 certified. It produces cast iron, carbon, stainless and tool steels, aluminum and copper alloys.

Quality control is a critical part of its production process for all customer industry sectors. BCI recently moved most of its quality testing in-house in order to reduce turnaround time and manage the process. Commented Greg Barron, BCI Manager of Engineering and Quality Assurance, "We found that we can do the testing, certify and ship ourselves – we didn't have to wait for outside test results."

One of the tests that BCI is now conducting in-house is tensile testing. Barron's original thought was that a

used, retrofitted machine would be the most cost-effective path. The main components of testing machines rarely wear out and the controllers, hydraulics, indicators and motors can be upgraded to bring the machine up to current standards.

BCI began its search on the Internet. There, it found several universal test machine (UTM) providers, including ADMET. Barron checked into new and retrofitted Instron, Tinius Olsen and other manufacturers' test frames. He noticed that ADMET controllers and indicators were often used in the retrofits. He contacted ADMET and discovered that, for the price of a retrofitted machine, about \$25,000, he could buy a new machine.

After discussing his needs with ADMET to make sure that its machine could handle testing BCI's highest

SOLUTION OVERVIEW

Industry: Investment castings

ADMET Product: ExPress universal testing machine with MTESTWindows Materials Testing System

Customer: BarronCast Inc. (BCI)

Application: Testing steel castings

tensile strength material, hardened 17-4-PH Martensitic Stainless with ultimate tensile psi strengths of over 200,000, he ordered an ADMET ExPress servo-hydraulic, dual column test frame equipped with the MTESTWindows materials testing system for use in both R&D and production testing.

Testing moves in-house

The new machine was delivered in about eight weeks. An ADMET sales engineer visited and helped set up the software. "I had to work a little bit to figure out what I wanted to do with the software – there are many different options," commented Barron.

All test bars are cast the same size and have threads that fit into fixtures on the ExPress frame. Four specimens are cast for tensile testing along with chemistry slugs; they are retained for 10 years.

"The bar is cast close to the shape with threads on the ends. Then we turn it on a lathe to the final dimensions and chase the threads. The grippers are really threaded sockets on each end of the tester and we screw the test bar into them," he said.

BarronCast tests to the ASTM A370 specification using a single tensile testing program for all of its materials. "The operator aligns the specimen and follows the written procedures. Then he does a little bit of interpreting of the data to make sure that it's accurate," explained Barron.

The MTESTWindows personal computer-based system stores the test procedure and controls the ExPress machine's hydraulics to ensure that the load rate meets the ASTM specifications. It also records and stores test results.

BarronCast reports tensile, yield and elongation, and enters the dimensions for the reporting of reduction of area in the MTESTWindows test system. Test results are printed and the report is filed as backup to the certification that is sent to customers. A separate report is generated for customers that require raw data. Now that BarronCast conducts its own tests, Barron has plans to consolidate the data from multiple tests into

spreadsheets in order to do statistical studies of tensile strength results on alloys over time.

Flexibility opens doors to future uses

Since the machine uses standard fixture pin mounts, virtually any fixture can be mounted. For instance, BCI has run some push out tests on pressed fittings and

bushings that are installed in castings. Other useful applications would be for bend and compression tests.

Said Barron, "We see a lot of possibilities. Part of the investment casting process is to build a ceramic shell. Periodically, we send them out for a four-point bend test. With the proper fixturing we could use the ExPress to test our ceramic shells in-house.



For More Information

For more information about ADMET products or services, please call us at 800-667-3220 or 781-769-0850, email sales@admet.com or visit our Web site at <http://www.admet.com>.

For additional information on BarronCast Inc., visit <http://www.barroncast.com>, call 248-628-4300 or email sales@barroncast.com.

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