Customized Hitchiner Service

Hitchiner customers interested in stretching the state-of-the-art—those who, for example, buy parts the failure of which could have extreme safety or economic consequences, parts having requirements well beyond normal industry standards and parts for which the overall economy may be better served by casting in a more expensive method—hold special appeal for Hitchiner and the research company Metal Casting Technology, Inc., a joint venture of Hitchiner and General Motors Corp. The parts such customers buy often require the utmost in one or more of the following: soundness, metal cleanliness, microstructural control, surface finish after polishing, process control, mechanical properties, dimensional accuracy, hot isostatic pressing and heat treat control. Those needs challenge Hitchiner's leadership in investment casting and provide a fertile ground for new projects at MCT.

Metal Casting Technology, Inc.

MCT occupies a 24,000 ft^2 (2230 m^2) building located near Hitchiner's headquarters in Milford, New Hampshire. Some 25 engineers and technicians with an annual budget of around $3 million work to meet the needs of Hitchiner's more technically demanding customers as well as to extend Hitchiner's exclusive technologies to all types of product and advancing investment casting technology in general.

The high level of technical complexity required by Hitchiner's more challenging customers means that engineers from both companies must work together continuously. This is necessary not only to assure complete understanding on current orders, but also on improvements that will be needed in the future. In recent years, such needs have resulted in many process improvements in production as well as positive results from MCT projects.

For example, the use of gas (conventional) hot isostatic pressing is well justified for many aerospace applications, but high cost prohibits its use for automotive parts. MCT consequently developed a dramatically lower-cost alternative HIP process suitable for automotive parts using hot liquids (Hitchiner Technical Update 3D4) instead of gas. In fact, by proper gating of sand-cast aluminum automotive safety parts, it appears that the cost of manufacture might even be competitive with non-HIPped parts made conventionally. This process may also have applications for aluminum and other metal castings for aerospace.

In another case, Hitchiner extended its countergravity low-pressure vacuum (CLV) melt process in two ways. First, to reduce the cost of CLV, MCT invented the countergravity low-pressure inert (CLI) gas process. CLI enables the casting of reactive alloys such as nickel base superalloys and maraging steels at significantly lower costs than CLV, which is already much lower in cost and wider in capability than conventional gravity vacuum pouring. Hitchiner can also use CLI to cast titanium and titanium aluminide castings for commercial applications.

Second, the CPV process was devised by

Hitchiner's Gas Turbine Division to provide the ultimate in part cleanliness for highly critical applications. Metal is countergravity cast into molds in a very high vacuum, achieving even better fillout of thin castings and fewer small oxides than with either CLV or CLI (Hitchiner Technical Update 3D3).

MCT likewise extended the range of application of countergravity casting greatly with the check valve (CV) process (Hitchiner Technical Update 3D1). While CLA, CLV, and CPV are pretty much restricted to parts having a maximum wall thickness of about 0.5 inch (13 mm), CV, which can also be used with the CLI process to cast reactive alloys, has been used to cast parts up to 6 inches (152mm) in wall thickness and large parts weighing 450 pounds (204 kg) and up to 35 inches (890mm) in diameter. The world's largest aerospace investment casting company, Howmet, is setting up facilities to take advantage of the large size capability of the CV process.

While it is essential that Hitchiner and your engineers work together closely, it is equally important that our salesmen and your buyers communicate regularly so all orders are processed to your needs. Since all orders are processed through our shops using online reporting, the status of all orders is constantly known. Please call if you need status reports at any time. We will be happy to furnish you status reports weekly or on whatever routines you desire. Our order processing and production control groups will respond quickly to any request for changes or improvements in schedule. Hitchiner is dedicated to meeting your requirements in all ways to assure the success of your product.

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