



Quality Control Exceeds Industry Standards

Commercial applications benefit by the more stringent requirements imposed by the military, aeronautical, nuclear and automotive industries

In its *Code of Conduct*, Hitchiner reminds employees and suppliers to “Never Compromise Quality.” As the booklet notes, “Hitchiner has built its reputation on quality. The company produces its goods and services to meet or exceed customer-contracted standards and specifications.”

Some 20 years ago, the Investment Casting Institute (Dallas, TX) set the basic industry standard for commercial investment castings production. Detailed in the pamphlet *Metal Quality Standards for Investment Castings*, this voluntary standard describes the metal quality of commercial grade castings in situations where the purchasers do not provide detailed specifications covering all aspects of metal quality. Updated with new alloys and metric conversions, this standard has withstood the test of time as a useful tool, ensuring designers quotes and subsequently castings of a quality level that would satisfy most commercial applications. It is available from Hitchiner and the ICI (<http://www.investmentcasting.org>).

As the world’s largest supplier of commercial investment castings, Hitchiner, with its ISO 9002/QS-9000 certified facilities, joins other ICI members in quoting to this well-established standard.

Beyond its role as a commercial supplier, however, Hitchiner also supplies castings to the

military, aeronautical, nuclear and automotive industries. The relatively higher performance targets required by these applications call for correspondingly more stringent specifications. These higher standards are imposed by the industries themselves and, in some cases, other standard-setting organizations such as the Inter-

national Organization for Standardization (ISO) and the ASME.

Because Hitchiner processes commercial parts in the same plants that make parts to the more stringent specifications, the higher standards for internal controls and procedures carry over to the commercial applications. Thus, though Hitchiner may quote to the ICI standard, customers receive far more quality assurance than it requires.

For high-volume and thin-walled parts, Hitchiner’s low-cost processes

provide some offset for the added cost of these internal controls and procedures. If you have a part that may need somewhat better controls, but not the full control of a more demanding specification (Hitchiner Technical Update 2D2), then you might want to take advantage of this better quality control.

Here are the important ways in which Hitchiner exceeds the ICI requirements:



1. Hitchiner establishes visual and soundness requirements to meet each customer's needs.
2. In setting up the casting practice, all castings are subject to radiographic (x-ray), and magnetic particle inspection or fluorescent penetrant inspections, even if the customer does not require them. This often results in more gating and thus higher cost to achieve Hitchiner's minimum quality level.
3. Hitchiner uses chemical control ranges that are narrower than those in the ICI standard and have lower impurity levels. All raw materials are purchased to written specifications and checked to assure they meet those specifications prior to use.
4. Hitchiner chemically analyzes every metal melt before and during casting to assure all castings meet the specified chemistry. Castings are not processed until all chemistries have been evaluated, preventing any off-chemistry parts from ever getting to the finishing department.
5. All heat treatment equipment is controlled and operated to the requirements of SAE AMS H 6875. This specification requires

routine furnace probing to assure uniformity, metallographic evaluation after heat treatment as appropriate to the alloy and recording of each lot of heat-treated parts. All carbon and low alloy steels are carbon restored if that is suitable for the alloy. Many stainless steels are vacuum heat treated for the utmost in corrosion resistance.

6. In-process welding is done to a procedure that meets all requirements of SAE AMS STD 1595 and AMS 2694. Welders are also certified in accordance with these specifications.
7. Stainless steels are pickled and passivated to assure the best corrosion resistance for the alloy (**Hitchiner Technical Update 2D4**).

There are many other process controls and inspections in the patternmaking, moldmaking and finishing areas of the plants. These controls contribute significantly to the consistently high quality of surface finish and dimensions. While all of this is costly, it is required to meet Hitchiner's *Code of Conduct* statement and provide the highest quality commercial castings.

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