

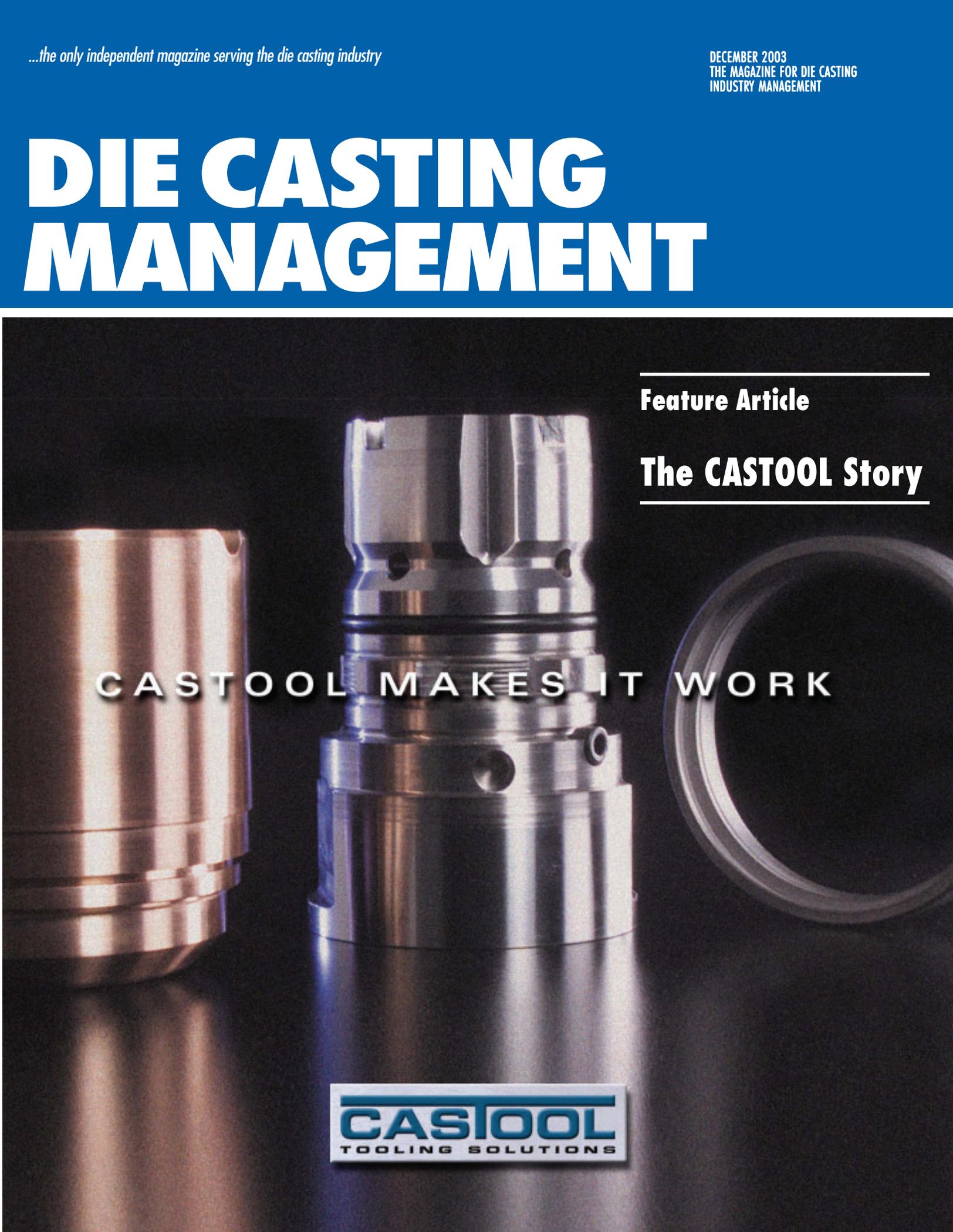
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Feature Article

The CASTOOL Story



CASTOOL MAKES IT WORK

CASTOOL
TOOLING SOLUTIONS

How did a small job shop evolve into a world-class global supplier in such a relatively short period of time? The company was in fact reinvented, and over time, Castool became what is now known as a “knowledge-based” company.

From Job Shop to Global Supplier: The CASTOOL Story

In the late 1980s, “Castool Precision Turning and Honing” was a very small division of Exco Technologies. It specialized in turning hardened tool steels. It made shot sleeves for die casters, and containers, liners, and stems for aluminum extruders. And it also machined housings for bearing companies. All production was strictly to the customer’s drawings and specifications. It had no proprietary products. At that time, Castool was simply a small job shop.

Today Castool Tooling Solutions is recognized as one of the leading tooling and equipment suppliers to light metal die casters and extruders. For each industry it has the most comprehensive line of products currently available from any single source. It is a respected supplier in the global market, with customers in almost a dozen countries. Castool was the first supplier in its field to qualify for ISO 9000. And again, the first to meet the stringent requirements of QS9000. Its products, quality and service are unmatched.

How did a small job shop evolve into a world-class global supplier in such a relatively short period of time?

About fifteen years ago, the Castool management took a long hard look at the company’s past, present, and probable future, if it continued to follow the same path that it was then on. They weighed their strengths and weaknesses, identified their skills, and resolved first to concentrate on the two core industries they knew best... die casting and extrusion. Castool then stopped selling to any other industries.

At that time, a corporate philosophy was established that was based primarily on two

principles: “Our success depends on the success of our customers;” and, “Anything can be improved, and at Castool, we are committed to a policy of ongoing improvement.”

This marked the starting point in the successful evolution of Castool. The company had in fact been reinvented, and over time, Castool became what is now known as a “knowledge-based” company.

The Beginnings

The spotlight soon focussed on R&D. The attitude then was that there was no reason why Castool couldn’t either develop, or obtain the rights to, the very best products available anywhere. At the time, this certainly appeared rather presumptuous for a company of its size, but optimism and enthusiasm are contagious. The R&D department, and in fact the entire workforce, small as it was, embraced the challenge.

Realizing that for extruders, loose dummy blocks would eventually become a thing of the past, the first major project was to analyze the features of all the fixed dummy blocks then available, and develop a better one.

Meanwhile Castool heard of small engineering design company in Switzerland called Allper, which had evidently patented a unique die cast plunger tip that was getting outstanding results. Soon after confirming that this new tip with its expanding wear ring really was as good as Allper claimed it to be, Castool obtained exclusive rights to manufacture and market it in both North and South America. By then, the company name had been changed to “Castool Preci-

sion Tooling”, to better reflect the change in company policy... that Castool was no longer a simply a job shop, although it would, of course, continue to make tooling to its customers’ specifications.

At about the same time, Castool put its newly patented two-piece expanding dummy block on the market. It was soon adopted by several major US extruders.

These two products, the Castool dummy block and the Allper plunger tip really established Castool as a significant presence in the light metal extrusion and die casting industries.

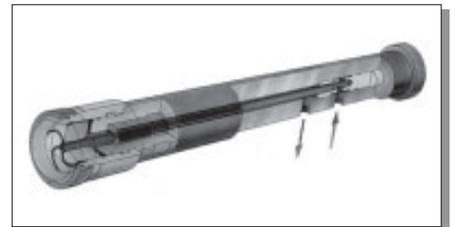


Fig. 1. Thermally controlled plunger with wear ring.

Benchmarks

Castool’s R&D department has produced an impressive body of work since the change in corporate philosophy.

At first, they didn’t have adequate resources in-house to achieve the level of results the company aspired to. What the existing R&D staff lacked was the depth of specialized knowledge that only comes with experience over time. Castool then was very fortunate in obtaining the part-time services of Benchmarks, a small consulting group that includes several of the aluminum processing industry’s best qualified and most

experienced senior engineers who have fairly recently retired from full time executive positions. They provide the highest level of technical assistance on a project basis. This ongoing source of uniquely knowledgeable support has been an important factor in enabling Castool to reach its present level of technological excellence.

The Process

Neither castings nor extrusions are really made by individual products, they are each made by a process. A mold produces castings, and a die produces extrusions. How well each converts aluminum alloy into these useful parts depends on die casting shot end components, and on extrusion tooling. Historically these were considered to be consumables, and some people still treat them as such. But the key to success for any die caster, the place where the opportunity for improvement most often occurs, really lies between the casting machine and the mold. And for extruders, between the press and the die. Each process is holistic, and anywhere near maximum productivity can only be achieved when all components of the process are each operating at close to optimum efficiency.

Castool can now provide any component, or the complete system, and will take responsibility for it. For a die caster, for example, Castool can design a shot sleeve to meet his individual needs, with thermal regulation by either water or oil; plunger tip and plunger rod with controlled water flow for cooling; lubricant and applicator for both shot sleeve and plunger; die spraying system; vacuum system; and so on.

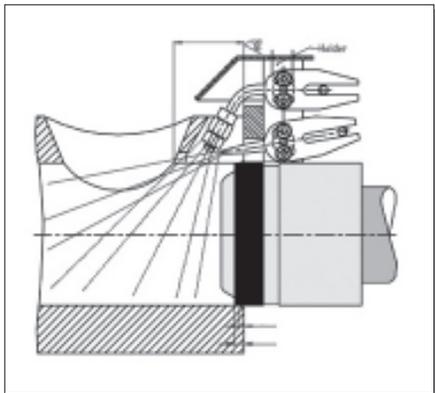


Fig. 2. Shot sleeve/plunger lubrication.

For the extruder, Castool has patented dummy blocks; state of the art thermal controlled containers; stems; single-cell die ovens; boron nitride billet lubricators; remote pyrometers; even an easy to use alignment device, plus many other aids to help the user approach maximum productivity.

Castool is the only supplier that can provide and support such complete systems that are designed to meet the specific and unique needs of its customers.



Fig. 3. Allper vacuum system and valves.

Meeting Customers' Needs

What a customer first wants is not always what he actually needs. Castool often will not immediately give a customer simply what he asks for. It will determine precisely what he needs, then explain to him why he needs it, how to measure the results, and how to use it most effectively. Emphasis is on the use of products that will profit the customer most in the long term. Cost-effectiveness over time is certainly the best yardstick to measure the ultimate worth of any production component.

By consistently providing both technical assistance and sound counsel, over the years Castool has attained an enviable reputation in the two industries it serves.

In 2001, the company again changed its name, this time to Castool Tooling Solutions, making clear the fact that Castool doesn't just supply tooling, it provides solutions to its customers' problems.

Going Global

Castool now has customers in both Eastern and Western Europe, Africa, and Japan. And it is currently negotiating with several major potential customers in China and India.

An advantage of globalization is not just to increase the available market, but also to learn first-hand what is being done in other countries in the industries you are supplying. For example, some large extruders in Japan were using single-cell die ovens more than twenty years ago, at a time when few extruders in North America had even heard of them.

Most Americans still use graphite-based products to lubricate shot sleeves, whereas in Europe graphite has long been viewed with disfavor due to the difficulty it creates in maintaining cleanliness in the plant. Part quality is also a factor. Whenever excess lubrication actually gets into the part, it causes a non-metallic inclusion that can result in rejection. And if any graphite remains on the part, welding is prevented.

The application of graphite is very difficult to control. Someone once said, "Anything that hits the floor didn't do its job." Usually more than half of the graphite-based lubricant being applied to shot sleeves hits the floor, and with long shot sleeves, the lubricant often doesn't coat the interior surface completely.

There is much still to be learned from some of Castool's large offshore customers.

A Knowledge-Based Company

The latest management style, currently being taught in most business schools in America, is that of the 'knowledge-based company'.

This methodology or management technique was first described in a seminal article by Stanley Davis in the Harvard Business Review in 1994, but has only recently been adopted by many companies as an antidote to the last major downturn in the US economy. A knowledge-based system very closely parallels the priorities successfully and consistently adhered to by Castool management for most of the past fifteen years. They realized that to become a leading global supplier, something more was necessary than just giving the customer

Castool...

what he asked for at the lowest possible price. More value must be added to the product. This is also, by definition, one of the major objectives of a knowledge-based company.

Two things that are common to most products that are designed and made by knowledge-based companies are that they are "smart" and interactive, and also that they are customized. Good examples of this are Castool's temperature controlled die casting shot sleeves, and temperature controlled extrusion containers. These are both the result of extensive R&D, and added value has been considerably increased. The time and money Castool has spent in developing products like these has certainly been returned many times over.

Davis said, "Smart products and services will turn companies into educators, and consumers into lifelong learners."

For most companies, seeing customers as learners requires a major change in thinking. Castool, however, has made educating its clients a priority for many years. Its policy of "partnering" with its customers so that they will share Castool's much broader technical experience, and also benefit from the synergy created by both working together in a common cause, predated the popularity of the "knowledge-based company" by several years.

Knowledge vs. Perception

Perception should never be confused with knowledge.

In extrusion, as in any other industry, there are many commonly accepted theories that seem so logical that they are perceived as factual, and remain unquestioned. Here is an example:

"If a heated die is exposed to atmospheric air for an extended period the bearings will oxidize. It naturally follows, therefore, that if the heating occurs in an inert atmosphere, such as commercially pure nitrogen, oxidation will be minimized, or eliminated."

Wrong.

Castool commissioned a series of trials at the Institute for Microstructural Sciences at Canada's National Research Council to measure the growth of oxide on nitrided and un-nitrided H13 extrusion die bearings, and specifically to measure the effect on oxide

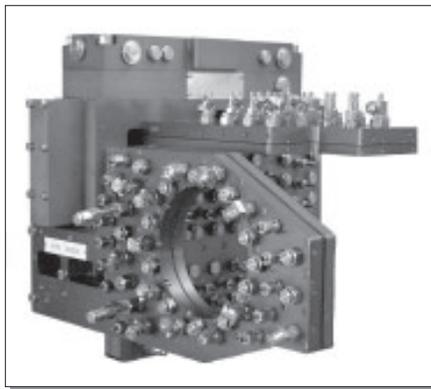


Fig. 4. Gerlieve die spray system.

growth of heating bearings for 2 hours in an inert atmosphere before exposing the samples to air.

All measurements followed parabolic curves, with oxidation proceeding rapidly in the first hour.

Samples heated for 2 hours in commercial grade nitrogen containing less than 5ppm of oxygen, followed by exposure to air for 10 minutes, were proven to have gained the same amount of oxidation as those exposed to atmospheric air throughout the heating cycle.

The appearance of the samples was different; possibly causing previous observers to believe that oxidation had been eliminated or considerably reduced. Precise measurement, however, proved that there is no practical advantage to heating dies in an inert atmosphere.

In a knowledge-based company, nothing can be assumed. Everything must be questioned, tested, and confirmed, before it is accepted as truth.

In the North American light metal die casting and extrusion industries today, through finite element analysis and computer modeling, we can now envisage products that previously could never have been even imagined. We already have far more technology available to us that is designed to measure and predict, than most suppliers are currently using. It is in this field that knowledge-based companies such as Castool excel, and pioneer innovative technology that benefits the industries they serve.

Corporate Characteristics of a Knowledge-Based Company

- Emphasis is on change, not on stability.
- Effort is made to customize work, rather than standardize it.

- Human capital rather than financial capital is considered a scarce and valuable resource.
- Employees are considered an investment, not an expense.
- Governance is distributed, both internal and external, rather than the usual internally focused top-down administration.
- Information is open and freely distributed, rather than simply on a 'need to know' basis.

The Future

The future for Castool is bright. Completing its lines of products for both die casters and extruders coincides with a market that is expanding at a greater rate than ever before. The automotive industry just now wants to use light metal alloys wherever it can to reduce the weight of its vehicles, and thus reduce fuel consumption. Most of the aluminum now being used by automakers, and projected for use in the future, is in the form of castings.

Through acquisitions and mergers, the market for both castings and extrusions is also consolidating. Customers are becoming fewer but larger. Taking their lead from the automotive industry, they are also reducing their number of suppliers. This change is, of course, primarily to get cheaper prices due to efficiencies of scale. A second reason, however, is to benefit from the synergy that results from a strong bond between customer and supplier. It is impossible, for example, for any company to have a close and productive relationship with six or seven different suppliers.

This trend benefits Castool, because it has a much broader range of products to offer than any other supplier in the two industries it serves, and can also provide undivided responsibility for complete process systems.

Castool also promotes a close association with its customers by often offering technical assistance that is not limited to only its own products. In this, Castool functions as a classic example of a knowledge-based company, and increasingly benefits from the policies it has consistently followed as it continues to grow.

At the present time, Castool is singularly well positioned to profit from both the expansion and the consolidation of its markets. It just now has the products and the momentum to move confidently into the future.

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