

Foundry Finds Success, Satisfaction Using Ceramic Media for Lost-Foam Casting

Irish Foundry & Manufacturing, in Seattle, was ready for a change. The company, according to its founder Charles Irish, decided it would "build for the future" by adopting the lost-foam casting process. The shift has allowed the Seattle company to produce "a variety of castings in varying degrees of complexity," Irish says. "Strategically, we have also added brass and bronze to our existing aluminum capabilities, which has opened untapped markets."

At least one casting produced with this new capabilities has earned Irish industry-wide recognition.

It wasn't all as simple as changing plans. "When we started in lost foam we were advised that the media of choice was silica sand," Irish recalls. Uniformity of grain size, availability and cost were the fundamental selling points. But, soon after starting to operate with silica sand, Irish Foundry began to recognize some less-than-satisfactory results.

"Compaction problems quickly surfaced as a major problem resulting in casting mis-runs and burn-in defects," Charles Irish explains. "Needless to say, the overall casting quality suffered when we used silica sand. To add insult to its performance, the generation and human exposure of quartz silica dust in the foundry became a priority concern."

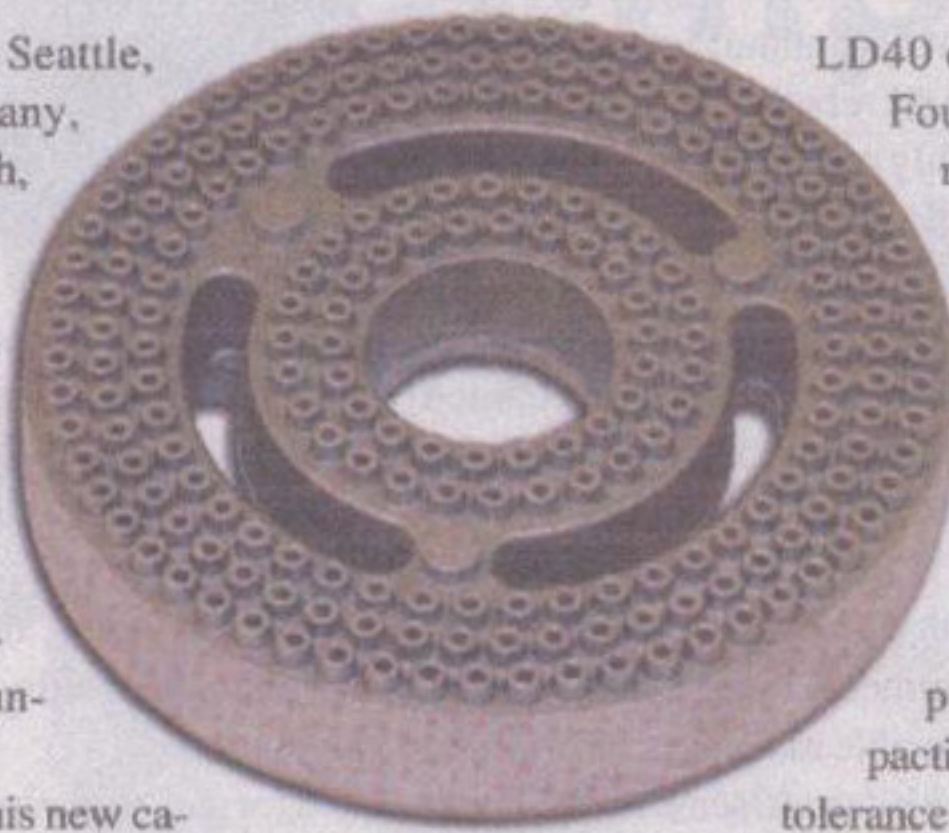
Not all the advice Irish got at that point was helpful. "That's the way it's always been done," is what he recalls being told by several sources familiar with lost-foam operations. "Fortunately," he now says, "we were wise enough to listen to the 'industry leaders' in the lost-foam process."

Irish approached foundry engineers at General Motors Corp. and Mercury Marine, two companies that have demonstrated expertise in the lost-foam process. Both recommended switching from silica sand to an engineered ceramic media — CarboAccuCast™, manufactured by Carbo Ceramics Inc.

"That was enough recommendation for us," according to Charles Irish, "and the rest is history."

It was almost that simple, but not quite. Following those discussions with GM and Mercury Marine, Irish approached Carbo Ceramics in May 2001 about the product they had been recommended by the "leaders." Claude Krause, market development manager for Carbo Ceramics, recalls that Irish Manufacturing contacted him with the recommendations — and the goals to eliminate quartz silica from their foundry, improve finished-product quality, and minimize or eliminate casting quality.

Krause recommended, and Irish ordered, the CarboAccuCast



LD40 ceramic product. In June 2001, Irish Foundry began to implement the ceramic media in its production system. "The first step of the project, to eliminate the silica sand from the system, was achieved immediately upon receipt of the Carbo product," according to Krause. The initial casting produced using LD 40 is an aluminum heat sink used in the manufacturing of medical systems. That design involves numerous pockets, which requires intricate impaction, Charles Irish says. It has dimensional tolerance requirements ± 0.02 for 15 in., and a 0.10 uniform wall-thickness. (An award-winner in its own right, it can be viewed online at www.irishfoundry.com.)

Since the ceramic media was introduced there, Irish operators noted that casting quality showed improvement, with reductions in the number of burn-on defects and mis-runs.

Now, two years later, the results are even clearer. The foundry's lost-foam production line has been completed. Charles Irish explains the CarboAccuCast media is "a successful, ongoing" part of the operation, and that they continue to operate without silica dust, and cast products demonstrate a ceramic grain that does not fracture. "We have been extremely pleased with the overall quality of our castings," he says. "Better surface finish, compactability, and most of all, complexity of design, were all realized immediately."

"Our foundry, and CarboAccuCast, have demonstrated great flexibility in being able to produce quality complex castings in each of the metals poured," according to Irish.

Earlier this year, *Engineered Castings Solutions* magazine recognized Irish Foundry and Manufacturing in its annual "Casting of the Year" contest. A three-pound aluminum burner, designed for home-heating and water-heating systems, earned an Honorable Mention among several dozen designs submitted for consideration in the contest.

In June, Irish Foundry returned to the winners' circle with a design for a complex structure with 211 gas-burner holes, measuring 0.125 in. in diameter and 0.34 in. long. Because it adopted a lost-foam casting process, Irish was able to produce the piece without any cores or chaplets. And, the award marked the third time in four years that Irish Foundry has been recognized in the Casting of the Year contest.

"There is no doubt in our minds that the ability to cast intricate and dimensionally stable castings is greatly enhanced by the use of the CarboAccuCast ceramic media," Charles Irish states.

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