

CASE APPLICATION:

How General Plastics' Tooling Boards and Machining Services Help Pool Feature Manufacturer Make a Big Splash



GENERALPLASTICS
MANUFACTURING COMPANY

VERSATILITY, DURABILITY & MACHINABILITY OF FR-4515 TOOLING BOARDS LEADS TO LIGHTER, STRONGER, BOWLS AT LOWER COST

THE APPLICATION:



Pebble Technology International® (PTI), known as The World's Most Trusted Pool Finishes™, has been the originator and leading provider of pebble aggregate surfaces for swimming pools for about 30 years, attracting customers who want to mimic nature with natural-looking finishes.

They offer five distinct textures of superior-quality pool finishes in a wide spectrum of eye-catching, nature-inspired colors. These pool surface products are complemented by aesthetic pool enhancements such as glass tiles and sparkling additions to finishes. PTI's products are sold through pool builders or authorized applicators working with clients who are building or remodeling their pool or outdoor living spaces. The pool finish installation is only performed by a select network of authorized applicators licensed by PTI. A few years ago, PTI wanted to expand its product offering and capitalize on one of the fastest-growing segments of the pool and spa industry, fire and water products. The company launched its Fire & Water Elements division, which supplies fire and water features for outdoor living areas. These products include hammered copper fire bowls, fire and water bowls, water bowls, fire pits and copper scuppers, which are installed in the wall of a pool and create a dramatic cascading sheet of water. In addition to its handcrafted hammered copper metal bowls, PTI planned to introduce mold-cast concrete bowls.

THE CHALLENGE:

KEY REQUIREMENTS:

- Excellent machinability
- Long-term dimensional stability
- Strength and durability
- Thermal stability for fiberglass molding processes
- Ease of mold release and reuse

The division product manager, Oliver Stickroth, needed to take existing industry designs for concrete bowl products to the next level. Creating a better bowl meant making it stronger, more durable and better-looking, while keeping in mind that it has to be cost-effective and easy to manufacture. Optimizing the manufacturing process of these bowls would stem from the concept and design first, then from the properties of the materials used.

To develop these products, Stickroth needed a prototype mold plug from which to cast several prototype concrete bowls. The bowls they designed would be cast in concrete in several different colors and shapes that can be mounted above or near a pool. They would hold a gas burner and plumbing, and covered with decorative rocks or glass for the fire feature.

What PTI needed was machined plugs from which they could cast a fiberglass mold, then pour concrete repetitively to make the final manufactured bowls. These machined plugs would



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- Oliver Stickroth, Division Product Manager

be dimensional replicas of the desired round, square and cone-shape bowls that would be used to create production bowls. This required a material with dimensional stability for outputting a repeatable cast that would enable PTI to make more bowls as manufacturing demand increases.

In terms of physical requirements, the material needed thermal stability under fiberglass molding temperatures. And, it had to machine well, so that it would produce the right lines and surfaces from which to cast a good fiberglass mold. “If you want a good-quality end product, your tooling has to be X-amount higher quality than that,” Stickroth said.

And, he knew exactly where to find the ideal material and expert machining: General Plastics.

FR-4500 BENEFITS:

- Long-term durability and dimensional stability
- Superb material consistency and uniformity
- Easily finished with nearly any resin or coating
- Flat, stable sheets will not warp, bow or twist
- Anti-static foam boards create shavings instead of dust

Contact us today to learn more about our FR-4500 tooling board series.



THE SOLUTION:

Stickroth quickly zeroed in on LAST-A-FOAM® FR-4500 Tooling Board in the 15-pound density – and General Plastics' CNC machining department to deliver ready-to-use mold plugs. From past experience, he knew he could get the results he needed from this material.

"I selected the FR-4500 series tooling foam because it's strong, it maintains dimensional stability, and I can mold fiberglass and gel coat on it, release parts and reuse it. We went with the 15-pound material specifically because it provided enough structural stability in our bowl shapes at a reasonable cost," he said. Heavier densities really weren't necessary for what they were doing.

When considering potential materials for prototyping, Stickroth briefly considered hand molding out of clay, but given their time constraints and requirements, quickly ruled out that option. "It made sense to go straight to the high-quality mold plugs to make sure we were getting exactly what we needed the first time," he said. These decisions were based on the requirements for their product design, the level of detail needed and the machinability of the 4500-series tooling foam.

"The resulting products are of better quality than those of any foam provider I have worked with," he stated. "There are other companies that offer similar foam products and machining, but I haven't worked with any that are even close to what General Plastics can do. Your foam is just far superior to what I've used before."

MASTERFUL, MORE AFFORDABLE MACHINING SERVICES

PTI also relied on General Plastics' machining capabilities to produce the mold plugs from which they cast fiberglass prototype and production molds. Stickroth explained that compared to their local resource, General Plastics' costs were lower, its tooling was large enough to handle

the large work envelope, and it offered machining/CNC capabilities and expertise right on-site. He said the high quality of the machining services was clearly reflected in the produced mold plugs.

"The products were beautiful. I had given a 1/8-inch dimensional tolerance, and the product delivered was much less than that," he marveled. "There were some inserts where we had to swap out some molding and they fit perfectly, as well."

AN OPTIMIZED PRODUCT BY DESIGN

From the beginning, the particular properties of the FR-4500 series tooling foam were incorporated into the overall project design to optimize the manufacturing process and the thickness and shape of the resulting concrete bowls. The foam and precise machining of the mold plugs allow PTI to use less concrete material more efficiently to achieve a thinner and lighter-weight yet more compact and durable bowl. This cuts down their material costs and creates a better line all around.

Because of the FR-4500 material's versatility, PTI was able to design a plug with an insert supporting a full-rim bowl for a fire bowl. It also accommodated a second insert with a water scupper protrusion, out of which water flows through a guided trough, then down into the water. It can be plumbed with a copper insert in that spot to where the water egresses, which is directly in front of the fire in the bowl. This supports the dramatic fire and water elements effect.

"The quality afforded by General Plastics' material and machining translates into top-quality product that is clearly superior to existing concrete bowls in our industry," Stickroth stated. "In the past, concrete bowls have had low-quality production. But by going from a higher-quality tool to product, we can get a better compaction and better

cast, and that translates into clearly better product in the market for which customers will pay more.”

PTI took prototypes of its mold-cast concrete bowls to trade shows, where industry buyers could see and feel the quality of the surface and shapes, as well as the quality and durability. Responses were very positive compared to competitors, spurring early orders.

Stronger, lighter bowls also mean lower shipping costs because they can stack bowls together without the risk of them cracking or breaking in transit. This reduces the number of pallets and crates, and the amount of packing material needed for multiple-bowl orders, further reducing costs.

See page 6 for FR-4500 technical data information.





LAST-A-FOAM® FR-4500 Tooling Board Technical Data

Product	Density (pcf)	Height	Width	Length
FR-4512	12	21	20	80
FR-4512	12	21	30	80
FR-4512	12	24	48	98
FR-4515	15	24	48	98
FR-4515	15	14	60	120
FR-4515	15	23	20	80
FR-4515	15	23	30	80
FR-4515	15	24	48	120
FR-4515	15	24	48	96
FR-4518	18	12	60	120
FR-4518	18	14	60	96
FR-4518	18	16	48	120
FR-4518	18	24	48	96
FR-4520	20	16	32	80
FR-4520	20	18	48	96
FR-4520	20	20	20	80
FR-4520	20	20	30	80
FR-4530	30	18	48	80
FR-4530	30	16	20	80
FR-4530	30	16	30	80
FR-4540	40	14	24	60
FR-4540	40	14	24	80
FR-4550	50	10	20	80
FR-4550	50	12	15	50
FR-4550	50	12	16	60

This data is subject to revision and changes due to development of and changes to the material. The data is derived from tests and historical usage. The data is averaged data and should be treated as such. Calculations should be verified by actual tests. The data is furnished without liability for the company and does not constitute a warranty or representation in respect to the material or its use. The company reserves the right to release new data sheets in replacement.