Kal Plastics Solves Thorny Problem with B1X

Kal Plastics (Vernon, CA) is an ISO 9001:2008 contract manufacturing company that manufactures an extensive assortment of heavy-gauge plastic parts for a wide variety of applications. In addition to vacuum forming expertise, the company provides a wide range of secondary operations including die cutting, fabrication, and precision 5-Axis CNC trimming and finishing. Heavy-gauge vacuum forming is a versatile process that allows for fast turnaround and inexpensive tooling, especially when compared to injection molding. Syntactic foam is used in limited quantities but provides unique advantages when used in innovative ways. Kal was faced with a new challenge to adapt their tool to last-minute design changes from a large, long-term customer. Facing competitive pressure from a supplier in China and stringent quality demands from the end-user, Kal had to get creative. President Juliet Goff explains:

"The original design of part was fairly simple. It was a translucent tray, designed to sit atop a lightbox and be used as an early childhood education learning tool. We planned to use a female mold design with a textured surface and 0.130" PETG material. Using a decommissioned sandblasted tool from our inventory, we crafted a prototype to allow the customer to see and feel the textured surface, which they liked. We identified a specialist company to etch the mold and began work. So far, so good.

At the last minute, however, the customer decided that they wanted the texture on the inside of the part. This necessitated a significant mold design change from female to male. Given that we had already agreed to minimum thickness requirements, the change to a male mold would result in thin sections. We explained that 0.130" starting thickness on a female tool is very different on a male tool. Still, our customer wanted to hold us to this standard. With the budget already set, we had to think fast.

We had to up-gauge to 0.177" and maintain the previous cost structure. On a 2-up mold, it was difficult to separate the sections while holding uniform material distribution. The formed, textured material was creating an additional challenge, making it hard to move the plastic into the return lip of the part. We were using urethane foam as a pusher which broke down repeatedly, slowing things further. After discussing the technical challenges with other formers in the industry, several of them suggested HYTAC syntactic foam from CMT.

We did not have an extensive history with syntactic, but the team at CMT worked with us on material selection, pusher design and machining elements. Our first attempt did not work as expected, but the second iteration of fixture geometry allowed for optimized material flow into return lip. We created a fixture that will last a long time, will not break down and will provide even material distribution."

Even though HYTAC was initially more expensive than a basic urethane foam, the syntactic foam proved to be a force multiplier in terms of overall savings.

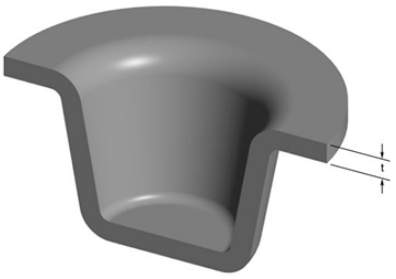
We could not have solved problem without CMT," says Goff. *"They acted like a real partner who had a stake in the outcome. In the end, I received an email from the customer about how beautiful the parts were. They have never done that before."*

Photo of thermoformed PETG tray as created by Kal-Plastics

Syntactic foams are engineered for performance when processing a wide array of polymers. Though primarily used as plug assists to pre-stretch plastic and ensure uniform wall thickness, the unique combination of properties of HYTAC materials mean they can be used for custom solutions. HYTAC B1X is the world's number one choice in plug assist material due to well-known attributes of toughness and durability combined with easy machining that results in no dust during manufacture. This thermoplastic syntactic foam resists chips, dings and breakage that result from even the most abusive production conditions. HYTAC B1X may be machined at up to 3x the speed of typical syntactic foams forming large, non-abrasive chips.

REASON #1: IMPROVE MATERIAL DISTRIBUTION

No one likes thin spots; everyone likes consistent and evenly distributed walls. Using the right plug material, geometry and processing techniques will ensure uniform wall thickness and a quality part.



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