

# Thermoforming Molds

— by Michael P. Alongi —

From epoxy tools on single stations to water-cooled aluminum tools on three station rotaries and four station twin sheet pressure formers, cut-sheet thermoformers require a wide variety of molds for the parts and products they produce.

There is no standard type of material from which molds are manufactured. With low pressure and/or low volume applications, wood or epoxy molds may be acceptable, whereas with high pressure and/or high production applications, cast or machined aluminum molds with temperature controls would usually render the best performance.

Before forming a new part, the thermoformer must consider several criteria in order to determine which mold material is best for the job. What type of plastic material will be formed? What forming technique will best suit the product? Will it require a male or female mold? What is the amount of production required from the



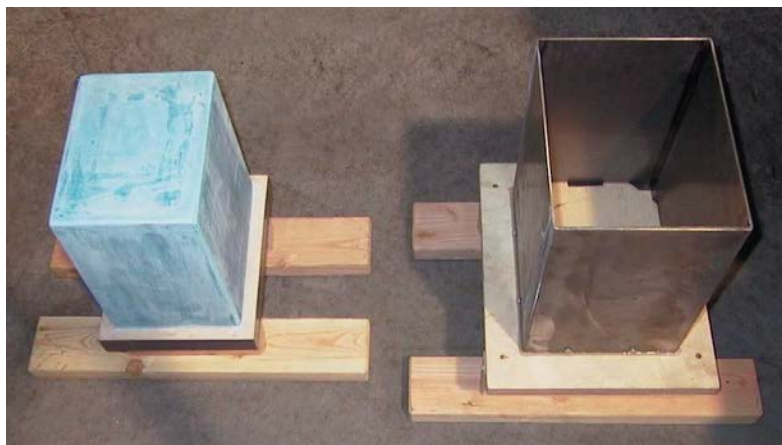
*Aluminum water cooled mold (bathtub)*

mold? Is the finished product too complex for simple mold materials? Does the overall part size justify an expensive mold material or does the parts configuration change from year to year? These are just a few of the factors to consider before determining which type of mold material to utilize.

In addition to selecting the best material, thermoformers must then determine shrinkage rates for the different types of thermoplastic materials they will be forming. They must also determine whether or not the mold must be temperature controlled, or even multi-zoned temperature controlled.

Your cut-sheet thermoforming machinery suppliers should work with the thermoformer to develop and design their machinery and/or sequencing of their machinery based on a customer's specific mold and its characteristics.

With the machinery manufacturer involved, cycle times (parts per hour) can be guaranteed, along with a



*Epoxy prototype tool with a pre-draw box.*

proven timed forming sequence and a finished product that meets the specification. This is usually accomplished concurrent within the machinery build time. Machine, mold and part approval can then be done concurrently at the machinery manufacturer at time of training. This has become more and more popular with clients because it eliminates the very costly and very timely learning curves that come with new machinery, new tooling, new material and new sequencing.

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*Pictures provided by: Thermoform Tooling Works, Carol Stream, IL*