CMT
Innovative Tooling **Materials** for Thermoforming

METAPOR GUIDES

Thermoforming Mold Construction Guidelines

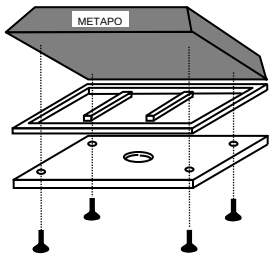
METAPOR Thermoforming Moulds
Like conventional tools, METAPOR molds are firmly mounted on the vacuum table. In order to avoid any damage to the mold, it is essential to preheat it to the require temperature (temperature depends on the forming temperature of the plastic material).

Cooling of METAPOR molds
For molds to be used as production tools, sufficient cooling has to be provided. This can be achieved with different methods.

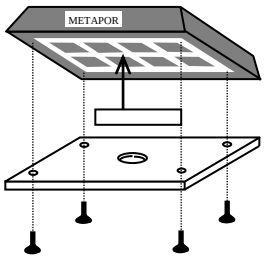
Flat molds have to be placed on a cooling plate; *deep molds* will be equipped with cooling lines made out of a material with high thermal conductivity. The cooling lines should be installed in parallel to the mold surface. Usually, the maximum distance to the mold surface is approximately 30 – 40 mm. When mounting the cooling lines, a close contact to the METAPOR mold is necessary. Air gaps have an isolation effect and need to be filled with a material of high thermal conductivity.

The air permeability of the entire surface of METAPOR tools offers very efficient cooling if compressed air of up to 5 (72.5psi) bar is blown through the METAPOR mold between the thermoforming cycles.

Air Distribution
Air distribution channels on the bottom of the mold have to be provided for perfect thermoforms. The following sketches show the most common procedures. Air distribution channels, machined into a METAPOR mold, could look as follows:



Distance holder or distribution channels on base plate



Distribution channels milled into METAPOR

- *Size of mould: 300 x 400 x 40mm*
- *Size of distribution channel: 15 x 5 mm*
- *Depth of channel: 5mm*
- *Distance from channel center to channel center: 50mm.*

The individual design depends on size and geometry of the mould.

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Design of a Hollow METAPOR Mould

Hollow forming tools can be rapidly and securely manufactured at low cost in using segments of METAPOR slabs. The individual segments can be connected by bonding or screwing. (See also bonding and screwing guidelines)

Construction of Mold

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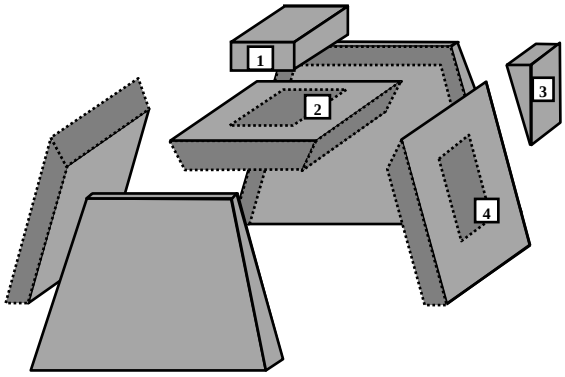

Bonding

For bonding METAPOR® BF 100 and HD 100 products, we recommend ARALDITE 2014 adhesive (available through CMT Materials, Inc.) For high temperature material HD 210, we recommend HYSOL EA 9394/C-2 from DEXTER Corp.

In order to achieve the best bonding results while minimizing witness lines, we recommend preheating of METAPOR® and adhesive to a temperature of 40-50°C.

Available Sizes

METAPOR ® is manufactured in blocks of 500 x 500 x 400 mm, (~20" x 20" x 16"), and cut into slabs of any required thickness. After the cutting process, the air permeability of the slab surface is reduced due to partial closure of the pores. It is essential to **mill both surfaces of the slab** by cutting off approx. 0.5 mm, (0.02"), providing complete air permeability.

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