



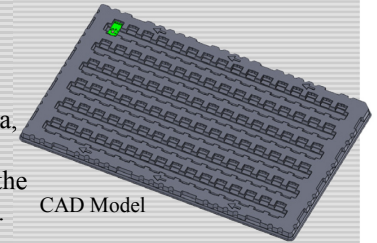
Thermoforming... What is it, and what can it do for me?

Thermoforming is the process of heating a sheet plastic in an oven to a specific forming temperature, then removing it from the oven, sealing it around a mold, and applying vacuum and/or pressure to cause the plastic to form and take on the shape of the mold. Once cooled, it may be removed from the mold, and the process is repeated with the next sheet.

The Thermoforming Design and Manufacturing Cycle

1. Design a mold.

Molds are typically designed using a CAD software tool. The mold needs to meet specific criteria, which allows the part to be formed correctly, and to be removed easily from the mold. Typically, the material to be formed is also selected at this time, as characteristics of the material will affect the design of the mold. Typical materials are ABS, Styrene, PETG, Lexan, or Acrylic, to name a few.



CAD Model

2. Create the mold.

Typically, molds are machined using a CNC router, directly from the CAD design. Molds can be made from a variety of materials, depending on the expected service life of the mold, and other various requirements. Typical materials used for molds are low or medium-density board, aluminum, or other composites. While molds used for injection molding are typically made of steel and are very expensive, thermoforming molds are far more economical.



Aluminum Mold

3. Form the part.

Once the mold has been created, you're ready to form parts. This involves installing the mold, and programming the thermoforming machine to the desired characteristics, such as oven temperature and heating time. Then, a plastic sheet is placed into the oven and heated. Once at forming temperature, it is removed from the oven, placed over the mold, a vacuum applied, and allowed to cool. For a new part, several test cycles are typically run, making adjustments to various parameters, such as temperature, cycle time, and other forming adjustments. Initial parts are carefully inspected to ensure that it is formed cleanly and to specification.



Finished Part

Why Thermoform?

Thermoforming offers many advantages over other processes and manufacturing techniques:

- Very small investment in tooling – molds often cost under \$1000
- Quick turnaround – from design to prototype can often take only a week or two
- Viability – many parts which are not feasible to injection mold, too labour intensive and costly to make with fibreglass or steel can be economically thermoformed
- Repeatable – every part is formed on the same mold, so is exactly the same shape
- Practical – thermoformed parts can be shaped in ways that couldn't be formed with other processes
- Aesthetics – thermoformed parts can be made from textured or coloured plastics, and can even include your company logo!

Call Waveform!

Waveform Plastics Technologies offers a full design and quick prototyping service, and can work with your design team to create the perfect part. We can create the design, produce the mold, and create prototype and production parts.

Call on us today, and put our expertise on YOUR team!



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Waveform Plastics respects the environment. We recycle waste whenever possible. Plastic waste from our manufacturing process is ground and returned to our suppliers for reprocessing.