



Here's a video of some cool vacuum-forming:

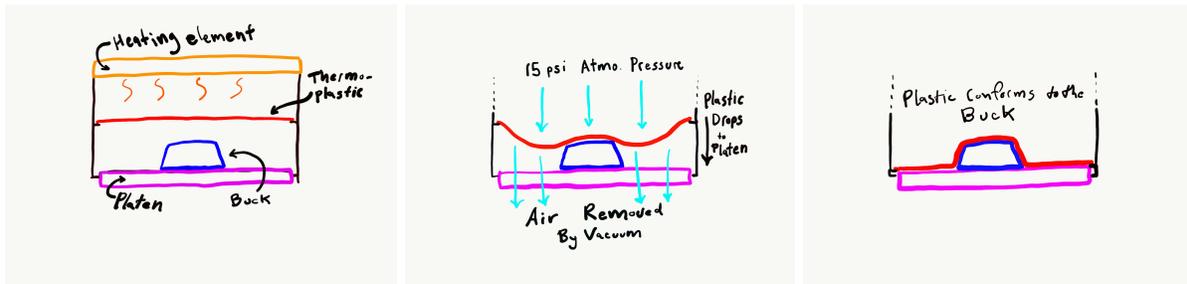
<https://www.youtube.com/watch?v=YJ2khPSVYoo>

Adam Savage of Mythbusters fame has a vacuum former almost exactly like ours (slightly smaller, slightly different controls): <https://www.youtube.com/watch?v=Cacr1WeKOzY>

#### **How it works:**

The Vacuum Former works by heating a sheet of amorphous thermoplastic until it becomes pliable, and then forming that plastic over an object, commonly referred to as a "buck," by removing the air between the plastic and the buck. This causes the weight of the atmosphere,

15 psi, to squeeze the plastic against the buck from all directions, creating a very tight skin over the buck.



### Best Materials For Vac Forming:

- Styrene\*
- Polycarbonate
- PETG
- ABS\*

\*Both Styrene and ABS(particularly) release noxious chemicals and particles when heated, so they should be used sparingly. If planning large runs, please consider PC or PET/G.

### Best Materials for Bucks (forms to mold plastic over):

- Wood
- Plaster

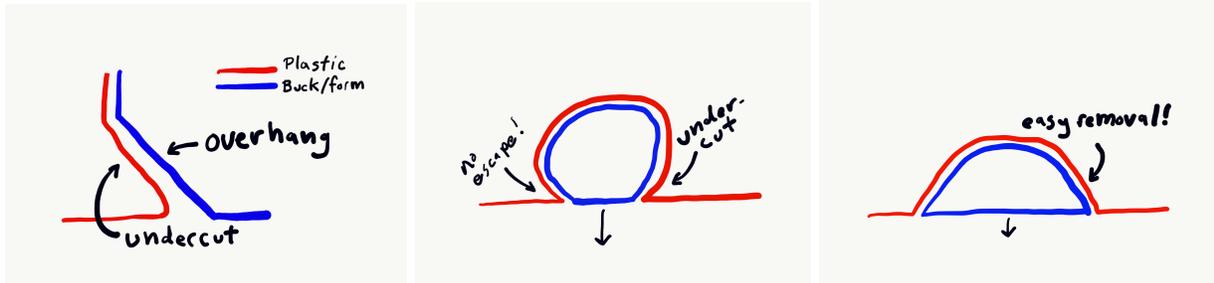
If machining your bucks on the CNC, solid wood is the best choice. Pine is economical and can easily handle the heat of the process, although it does not allow for the most detailed bucks due to grain structure and the tendency of the fibers to fray. Hardwoods like maple or cherry, which have very fine grain structure and are very hard (so they resist fraying) make excellent bucks, but are more expensive.

If 3d printing your buck, be prepared to make a plaster cast, as 3d prints cannot generally withstand the heat and pressure of the vacuum forming process. We recommend hydrocal, an extra-strong and heat resistant form of plaster, and a brush-on silicone for making the initial mold from your print. Please consult with your professor or a tech for guidance on making effective molds.

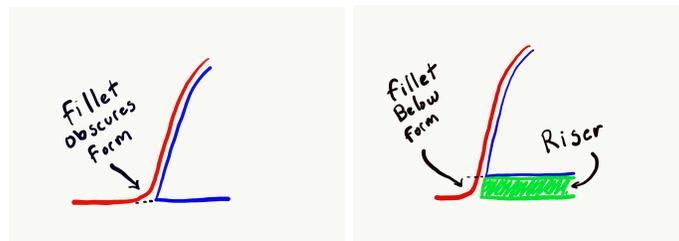
### Other Random Thoughts and Pointers (TBO):

Modeling

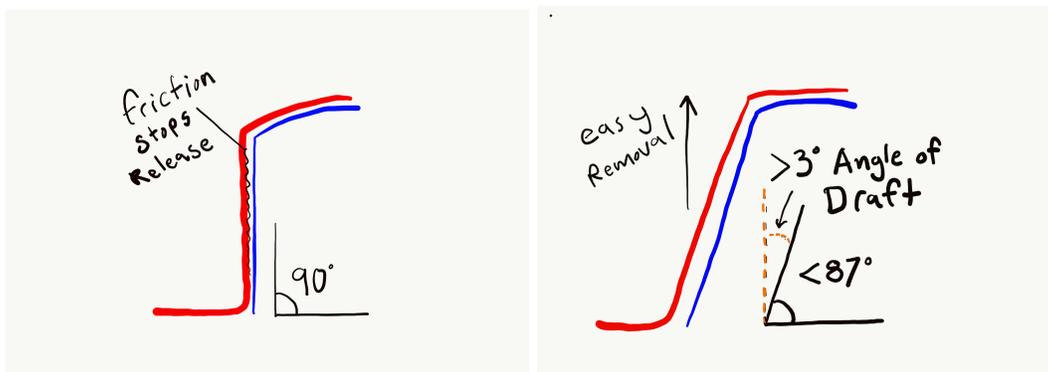
- Undercuts/Overhangs - such features (with very few exceptions) will cause your buck to become entrapped in the molded plastic. Unless you plan on cutting your buck out (a messy process that generally defeats the purpose of using the former to begin with) avoid these features.



- Risers - depending on the type and thickness of plastic you are using, plan to add a riser to the base of your mold. This will help avoid a bevel or fillet where the base of the buck meets the vacuum former platen.



- Draft - The maximum angle between the side of the buck and the platen must be less than 90 degrees. Greater than 90 degrees will create an Undercut/Overhang, and 90 degrees exactly will create a surface with so much friction that it impedes buck removal. The ideal angle is at least 3 degrees below 90 (referred to as degrees of draft), although 2, or even 1 degree of draft is sometimes okay depending on the model and the materials used.



### Materials Cost

- Certain plastics can be very expensive! Usually the best looking ones are the costliest. We recommend testing your models with cheaper plastics in order to troubleshoot any problems before wasting costly materials. We also recommend splitting plastic sheets with your classmates to defer costs.

### Machine Capacity

- Our large former cannot process sheets smaller than 24x24 inches, and our small formers can only process 10x12" sheets.
- The smaller formers are also not powerful enough to process plastics thicker than 1/32 of an inch, and cannot accommodate bucks taller than 3 inches.
- All plattens are 2" shorter in both dimensions than the sheet size.