Formech
Perfectly formed

Tooling Materials - Issue 1

Wood/MDF - Fabricated

Preparing tools for vacuum forming can be costly and time consuming depending on the method.

Wooden tools are sometimes used for smaller production runs.

Standard woodworking equipment e.g. table saw, bandsaw, disc sander and table routers can be used working from sketches and 2D drawings.

Remember -

Wooden tools show joins and tend to wear out quickly, which can result in poor quality vacuum formings.

Cast or moulded tool

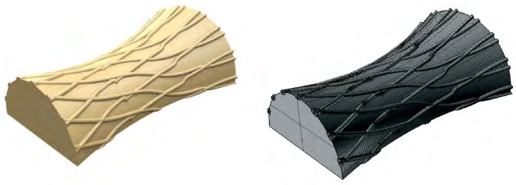
Plaster of Paris - very fragile, difficult to mount and moisture/powder can damage the vacuum pump.

Fibre-glass - can result in good quality tools but beware of the tool overheating and it will need internal support to stop the tool collapsing.

Cast resin - epoxy resins are ideal for production runs. These can be cast up in-house and the resin tools sanded to a very smooth finish

Remember -

Cast resin is the best out of the three, followed by fibre-glass and then Plaster of Paris



3D Printing / Rapid prototyping / Additive manufacturing

Requires 3DCAD drawing ability to create the CAD file, which can be expensive if outsourced.

Cast aluminium

Traditional patternmaking can be used to produce your wooden pattern. The pattern is then sent to the foundry for the casting of the aluminium.

You can scan existing products to create a 3D CAD file which is then sent to the 3D printer.

Surface of the tools depends on the type of 3D printer selected and the time taken to produce the part.

Remember -

3D printed models vary in strength and resilience and are generally more suited to prototypes and small runs; although 3D technology is changing rapidly, with new materials and processes being introduced continually.

Cast aluminium tools may require some finishing in order to achieve a blemish free surface. The finished tool is very strong and will produce 100,000 or more parts. Some large tools are cast and then often CNC machined to the exact size because it is more cost effective than machining solid aluminium.

Remember -

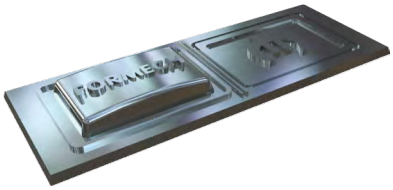
Casting can take a few weeks depending on when the foundry can find a slot in their production for your job.

3D CAD Model

Requires 3D CAD drawing ability which can be expensive. More complex designed are usually saved as STL, IGES or STL files using 3D CAD software e.g. SolidWorks, ProE, Catia or Rhinoceros. Some 2D drawing packages can be used to create simple 3D designs e.g. V-Carve.

CNC machined tooling board

There are a range of tooling boards available starting with low density foam used for rapid machining when quick block models are required to harder high density - high heat boards for production runs. Try a density of 650 kg/m3 for most applications. Porous resins (Metapor & Alwapor) are also available that do not require vacuum holes.



CNC machined aluminium

Aluminium is the best material - hard wearing and produces fine detailed vacuum formings. Typical grades of aluminium suitable for machining would be: HE15 also known as 2014 or HE30 which is also known as 6082.

Remember -

What you draw in CAD is what you get. Check and check again before you start machining.

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