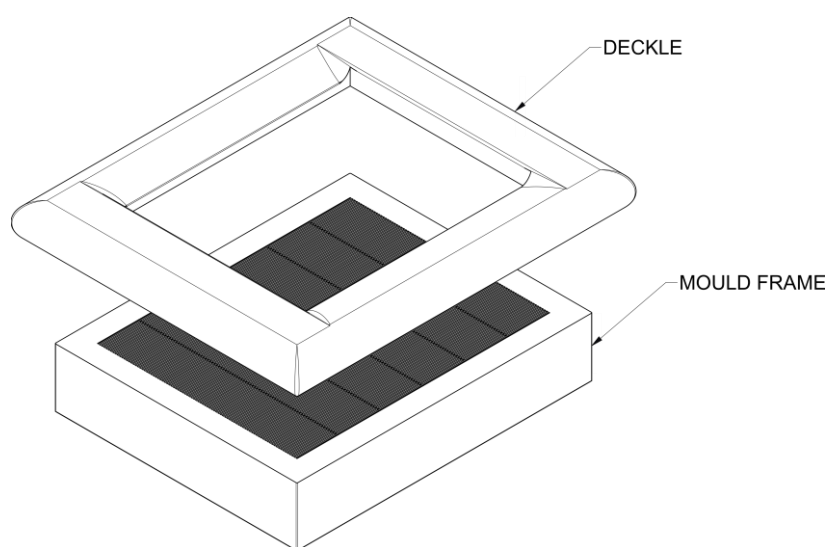


## 3D Printed Papermaking Mould Version 2

Presented here is Version 2 of a 3D printed hand papermaking mould creating a 4 ¼ x 5 ½” sheet of paper. While the size of sheet this mould produces is small the mould frame, its ribs and the deckle are full size as found in larger traditional European papermaking moulds. Although there is no standard for the construction of a papermaking mould the profiles used here mirror those used in Great Britain and parts of Europe over the last two centuries.

### Orientation

When describing the orientation of a part to be printed we refer to its natural orientation during use.



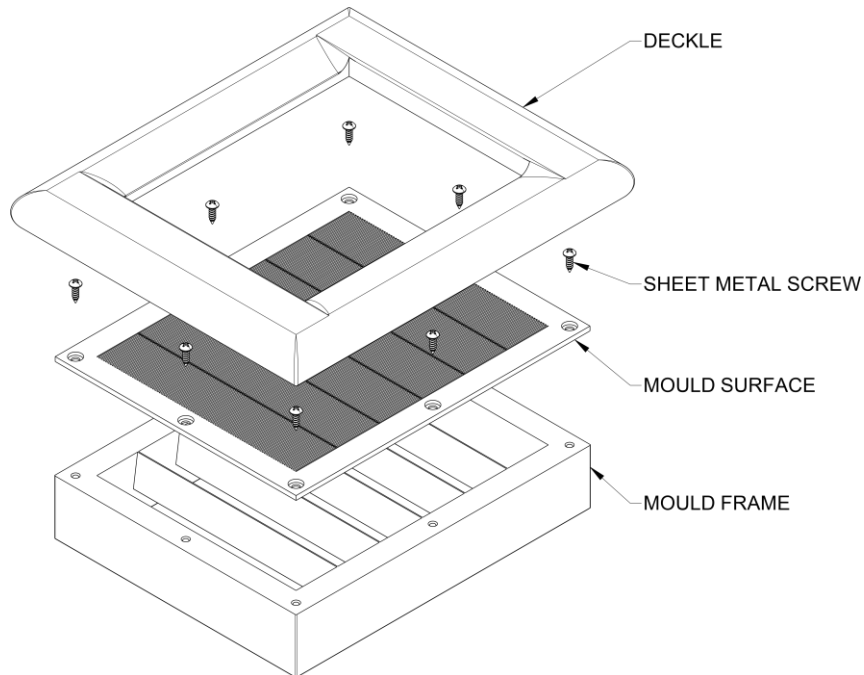
This illustration shows the orientation of a papermaking mould except the deckle is floating above the mould frame for clarity. If a part is described as being printed right side up its orientation will be as pictured as above. If a part is to be printed upside down it is rotated 180 degrees.

### Printer Settings

All versions of these models have been successfully printed on an Ultimaker S5 printer using a 0.4mm nozzle and 0.2mm layer height.

## Version 2

*Three Part Set*



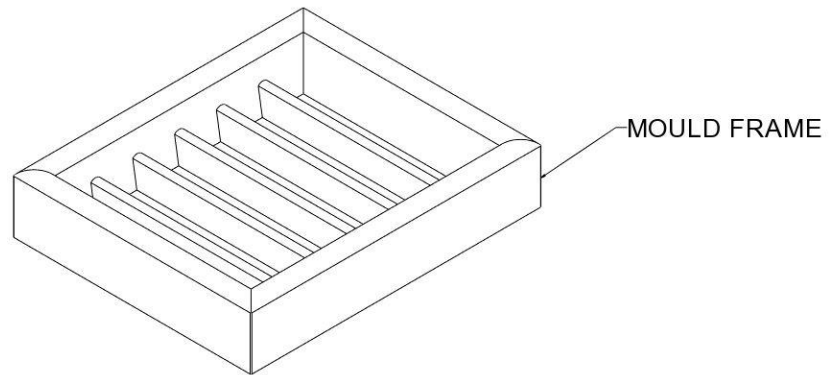
In Version 2 the mould surface is printed separately from the mould frame. There are a couple of advantages to doing this. First the mould surface can be printed with a finer layer height, at a slower speed or utilizing a smaller diameter nozzle, basically any settings or hardware required to achieve a higher level of detail. The paper drains on this surface so it's the most important part of a papermaking mould. Its only .1" (2.5 mm) in height so one can afford a longer build time here.

Secondly the mould surface is printed right side up which allows the addition of watermarks on top of the laid surface although this model does not bear any watermarks.

Finally to be able to switch out the mould surface from a standard laid mould surface to a watermarked mould surface it must be removable. In this version the mould surface is fastened to the mould frame using common sheet metal screws. Holes in the mould frame are sized to allow the threads of the sheet metal screw to cut into the plastic however one must be careful not to overtighten them or they will strip. If you're careful you should be able to exchange the mould surface several times before inevitably the threads will fail. A solution to this problem is to use heat set inserts as used in Version 3.

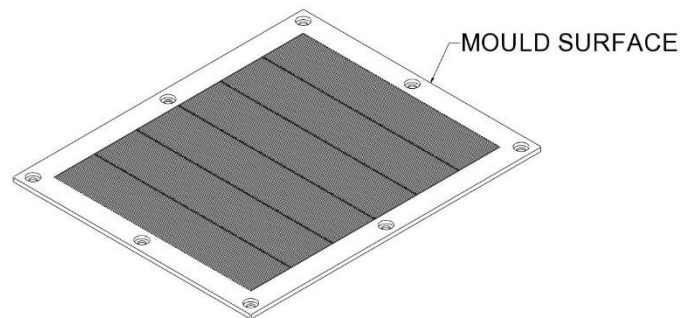
## Mould Frame

The mould frame is printed upside-down as shown below and requires no supports.



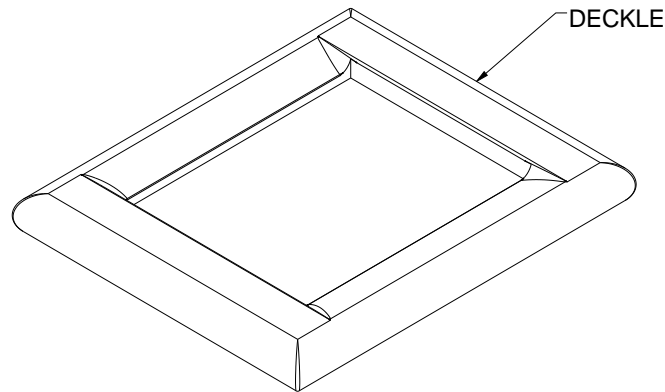
## Mould Surface

The mould surface is printed right side up as shown below and requires no supports.

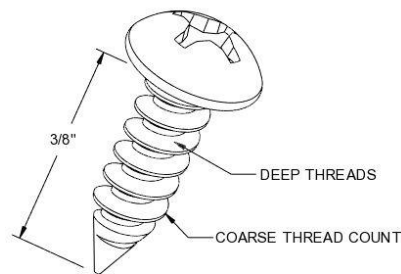


## Deckle

The preferred orientation for printing the deckle is as pictured below, right side up. This requires support for the underside. Printed in this orientation the more finished surface is the topside. Any roughness on the underside resulting from the support structure can be sanded and is hidden during use. The deckle is the same for all three versions of this mould.



## Sheet Metal Screw



#4 X 3/8"  
ROUND HEAD  
SHEET METAL SCREW

Sheet metal screws are designed to fasten together two or more pieces sheet metal allowing the material to deform and tightly hold the screw in place. Sheet metal screws are similar to wood screws but have smaller threads and are not used with nuts or pre-threaded holes. They are meant to be used once, inserted and not removed. They do still require a hole of the appropriate diameter so the threads can cut into the plastic without splitting it.

Small diameter holes in 3D printed parts are notorious for being out of spec, typically they're smaller in diameter than the 3D model. The holes in Version 2 have been designed and tested with this in mind but will still vary from printer to printer.

### Part Numbers and Supplier

The following parts can be purchased from McMaster-Carr, a large supplier of hardware and tools based in Elmhurst, Illinois USA. If it's impracticable to purchase from McMaster-Carr their website can still be useful. Enter the part number in the search bar and then select Product Detail in the highlighted box for that part. Print out the resulting page which includes a drawing of the screw to bring to your local hardware store to see if they have a similar part.

The McMaster-Carr part listed below is made of stainless steel. I recommend this material if the mould is to be used for making paper on an ongoing basis as it will not rust in water but if a stainless steel screw is not available, common zinc or chrome plated screws will suffice for intermittent use.

*McMaster-Carr part number for sheet metal screw used in Version 2*  
92470A108, # 4 Phillips Round Head Sheet Metal Screw 3/8" long