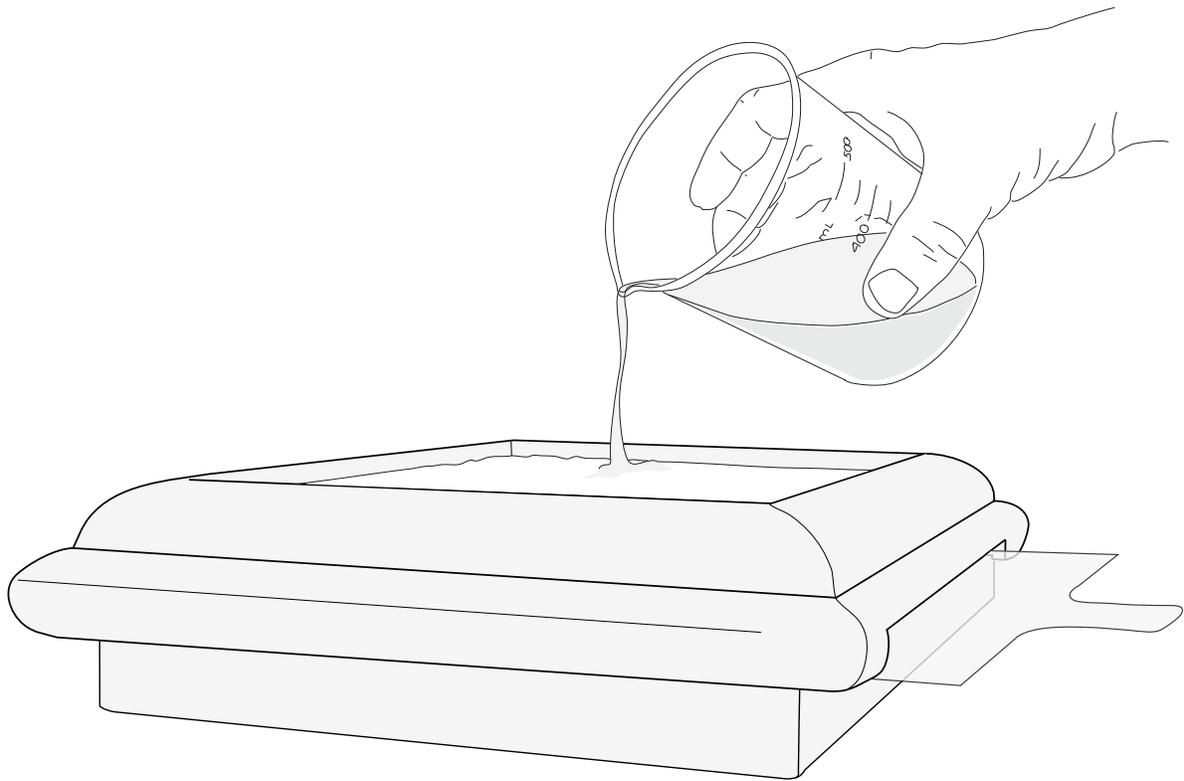


Determinate Hand Papermaking

VIII

Sheet Formation without a Vat

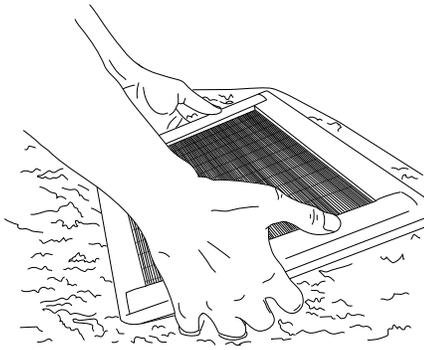
with a predetermined quantity of furnish



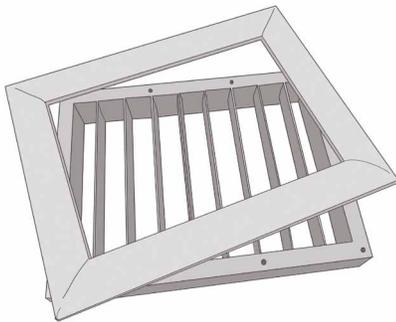
Text and illustrations by
Donald Farnsworth
2017

Determinate papermaking with a traditional ribbed mould and deckle

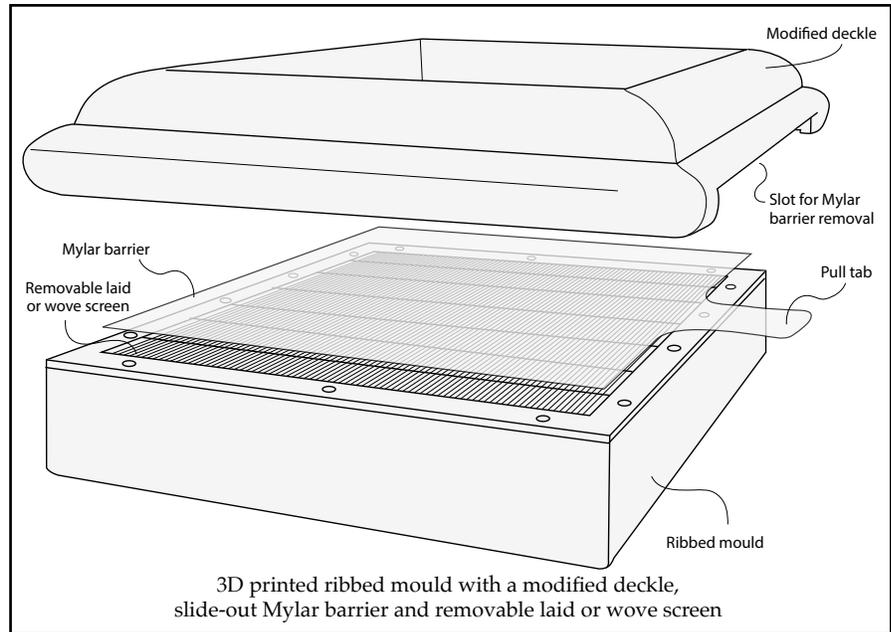
Forming a sheet on a traditional Western mould involves dipping the mould into a vat of furnish, scooping an estimated quantity into the boundaries of the deckle, and forming sheets; experience increases the likelihood of making a sheet that hews to an intended weight. To make a determinate, known-gsm-weight paper on this type of mould requires a re-design of the deckle in a somewhat modified “deckle box” technique.



Traditional vat sheet forming

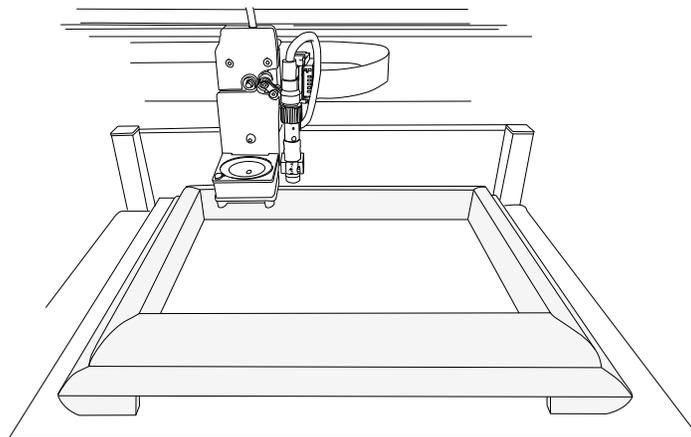


3-D printed traditional mould and deckle



Using a 3-D printer we printed a 14.5 cm x 21.5 cm (5.75" x 8.5") standard ribbed mould and a modified deckle. We increased the height of the inner wall of the deckle to create a confined area, enabling us to pour and trap a measured quantity of furnish for each sheet of paper. Additionally, a slot was created on the long side of the deckle's bottom edge.

Our modified mould, deckle and laid screen were printed on a Type A (PLA) printer. Our design is based on a 3-D model design generously provided to us by hand papermaking inventor Brian Queen. Brian modeled his mould using Geomagic. Magnolia Master Printer Nicholas Price imported Brian's .Stl file into Fusion 360 and made the necessary modifications.



Printing a "tall" (1 liter) deckle with a slot for mylar barrier

Determinate papermaking with a traditional ribbed mould and deckle (continued)

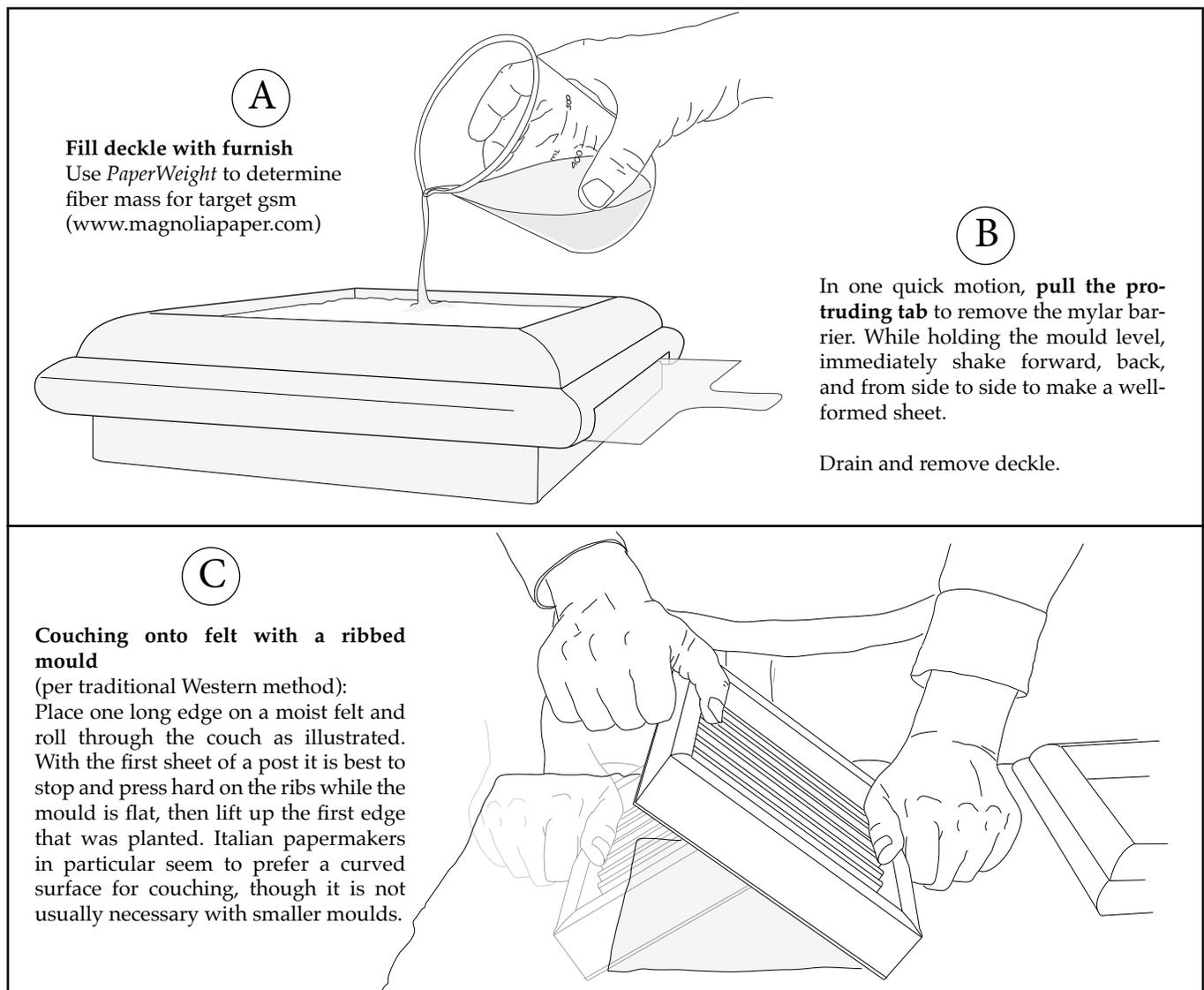
A rectangle of mylar is cut to fit the inner frame of the deckle and sports a tab protruding from the long side. The mylar is placed on the mould and covered by the deckle; the tab protrudes from under the deckle, through the slot, towards the far side of the mould.

With the mylar blocking the drainage of the mould, furnish (with formation aid (tororo-aoi) to slow drainage)* is poured into the deckle, filling the deckle area. Then, like the magic trick where a table setting remains in place when a tablecloth is pulled from the table, the mylar is quickly pulled (via the tab) from the mould, allowing the furnish to drain and the maker to form a sheet.

After draining, the deckle is removed and the paper is couching onto a felt, then pressed and dried as described above.

***Formation aid** slows drainage, allowing more time to make a well-formed sheet. After blending half-stuff for 2 to 3 minutes, add 25 ml of formation aid and blend for another 1 second; with more blending, foam becomes a problem. Stirring, shaking or pouring from beaker to beaker helps agitate the furnish just prior to filling the deckle. It is easy to notice when too much formation aid is used: drainage seems to take forever.

Note: When using PNP (granular) formation aid, mix the solution at least one day in advance. Formation aid has a long shelf life in liquid and granular form.



Supplies & fiber: Carriage House Paper, Brooklyn NY
www.carriagehousepaper.com

Supplies & fiber: Twinrocker, Indiana
www.twinrockerhandmadepaper.com

Evolon (polyester/polyamide microfiber material): Atlantic Papers, Ivyland, PA
www.atlanticpapers.com

Churro felt: Lana Dura
www.lanadura.com

Small mould, pressing block, burnishers: Miguel Mendoza / M Squared Fine
Woodworking, Oakland, CA
Miguel.msquared@gmail.com, (510) 832-2822

Breather Mesh: <http://veneersupplies.com>

Acknowledgments

Text & illustrations: Donald Farnsworth
Editor: Nick Stone

Magnolia Editions Staff:

Directors: Donald & Era Farnsworth
Master printers: Tallulah Terryll & Nicholas Price
Artist in residence: Guy Diehl
Tapestry finishing: Alyssa Minadeo
Interns: Arlene Kim Suda, David Wild, Willem Smith-Clark
PaperWeight coding: Jordan Grelling

with thanks to:

3-D Printed mould files: Brian Queen, Nicholas Price
Consultation: Tim Barrett
Woodworking: Miguel Mendoza
Felt supplier: Lana Dura
Mycologist: Nora Scully
Italian felt making: Cristina Biccheri
Italian research & assistance: Elizabeth Wholey
Consultation: Curators from the Paper Conservation Department,
Sherman Fairchild Center for Works on Paper and Photographic Conservation,
The Metropolitan Museum of Art
Pure linen: Rough Linen, Marin, CA
Pure linen: Jacquard Fabrics, Healdsburg, CA



MAGNOLIA EDITIONS

2527 Magnolia St, Oakland CA 94703

www.magnoliaeditions.com