DuraGrain Maker Plan Library: Boxes and Organizers

5 projects · Laserbox and CNC router · inches · Recommended Finish: DuraGrain Hardwax Oil & Pure Walnut Oil

Projects

#	Project	Machine	Stock
1	Finger-Joint Catch-All	Laser	1/4" (6 mm) Baltic birch, one 14" x 10" sheet
2	Lidded Keepsake Box	Laser	1/4" (6 mm) Baltic birch, two 14" x 10" sheets
3	Drawer Organizer Trays	Laser	1/4" (6 mm) Baltic birch, two 14" x 10" sheets
4	Living-Hinge Box	Laser	1/8" (3 mm) Baltic birch, one 14" x 10" sheet
5	Carved Keepsake Box	CNC router	8/4 hardwood planed to 1-3/4" for the body, 3/4" for the lid, each 8" x 5"

Before you cut

Measure your plywood. Finger lengths and slot sizes come from PLY_T and THIN_T at the top of *boxes.py*. Baltic birch sold as 1/4" is usually 6 mm (0.236") but varies sheet to sheet.

Kerf and fit. Laser outlines are offset outward by half the kerf (KERF), so parts come out at nominal size. JOINT_FIT fine-tunes the finger joints; the joint-test pair on the catch-all sheet tells you which way to adjust it.

CNC files for VCarve (DXF, inches)

Import: create the job in inches with Z zero on the material surface, then File > Import Vectors and pick the DXF. The layers come in by name.

Smooth the curves: curves are exported as fine polylines. Select all and run *Fit Curves to Vectors* (arcs, tolerance about 0.002") before toolpathing for smoother cuts and shorter G-code.

Toolpath by layer: in the Layers panel, select a layer's vectors and create the toolpath listed for it on the project page. Each project page lists the toolpaths in cutting order.

Layer names give the operation and depth: **PROFILE_OUTSIDE_0.750** (cut outside the line, through 0.750"), **PROFILE_INSIDE_0.750** (cut inside, through), **POCKET_0.375** (pocket to that depth), **DRILL_...**. Paths are on the line; leave tool offset to the CAM.

Parts are nested on a 38" x 38" area to leave room for hold-downs, and keep the orientation they are drawn in, with the grain running left to right. Parts from different stock thicknesses go in separate files (named with the thickness): each is its own VCarve job.

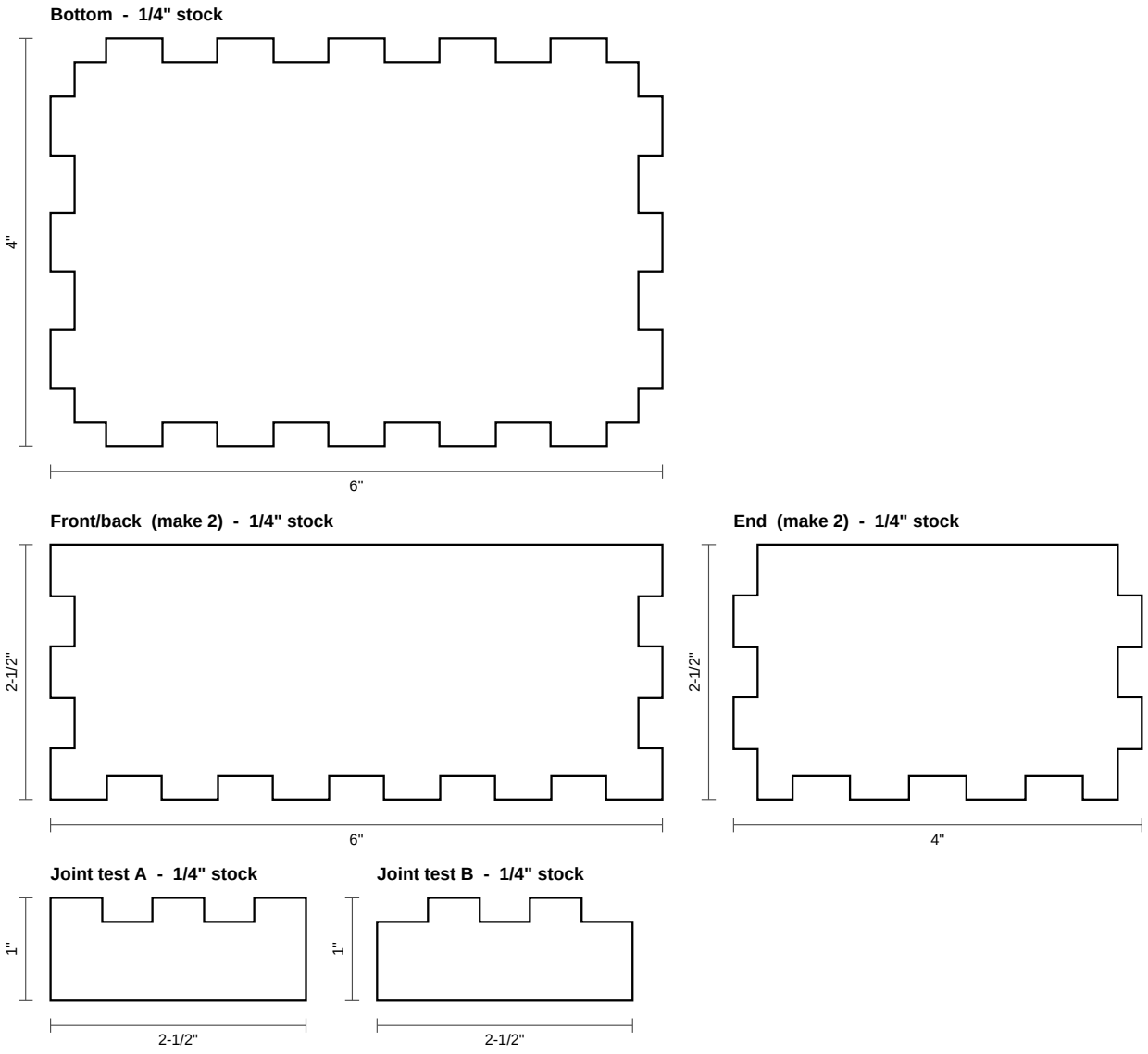
Underside operations come as a separate **-underside** file, mirrored as you'll see the part after flipping it, with the part outline on a REFERENCE layer for registration.

Laser files (SVG and DXF)

Laid out for a 14-1/2" x 10-1/2" area, inside the Laserbox bed. Red lines cut, blue lines and text engrave. Projects that don't fit on one sheet come as numbered sheets.

1. Finger-Joint Catch-All

Open box 6" x 4" x 2-1/2" outside. Desk tray, valet box or a first finger-joint project.



Machine & stock

Laserbox 40W CO2, cut only.

Drawn for 0.236" plywood with a 0.008" kerf; outlines are already kerf-compensated.

Steps

1. Cut the two joint-test pieces first and press them together. They should go together with firm hand pressure. Too tight: raise JOINT_FIT by 0.003". Too loose: lower it. Regenerate.

2. Cut the box parts.

3. Dry fit: the front and back own the corners, the ends slot between them, and the bottom's fingers fill the gaps along the bottom edges.

4. Glue with a thin bead of wood glue on the fingers, clamp or tape, and wipe squeeze-out.

5. Sand the scorch off the faces and finish with DuraGrain Hardwax Oil (12 fl oz) using the included #0000 white palm pad and buff dry after 15 minutes with the grey microfiber cloth.

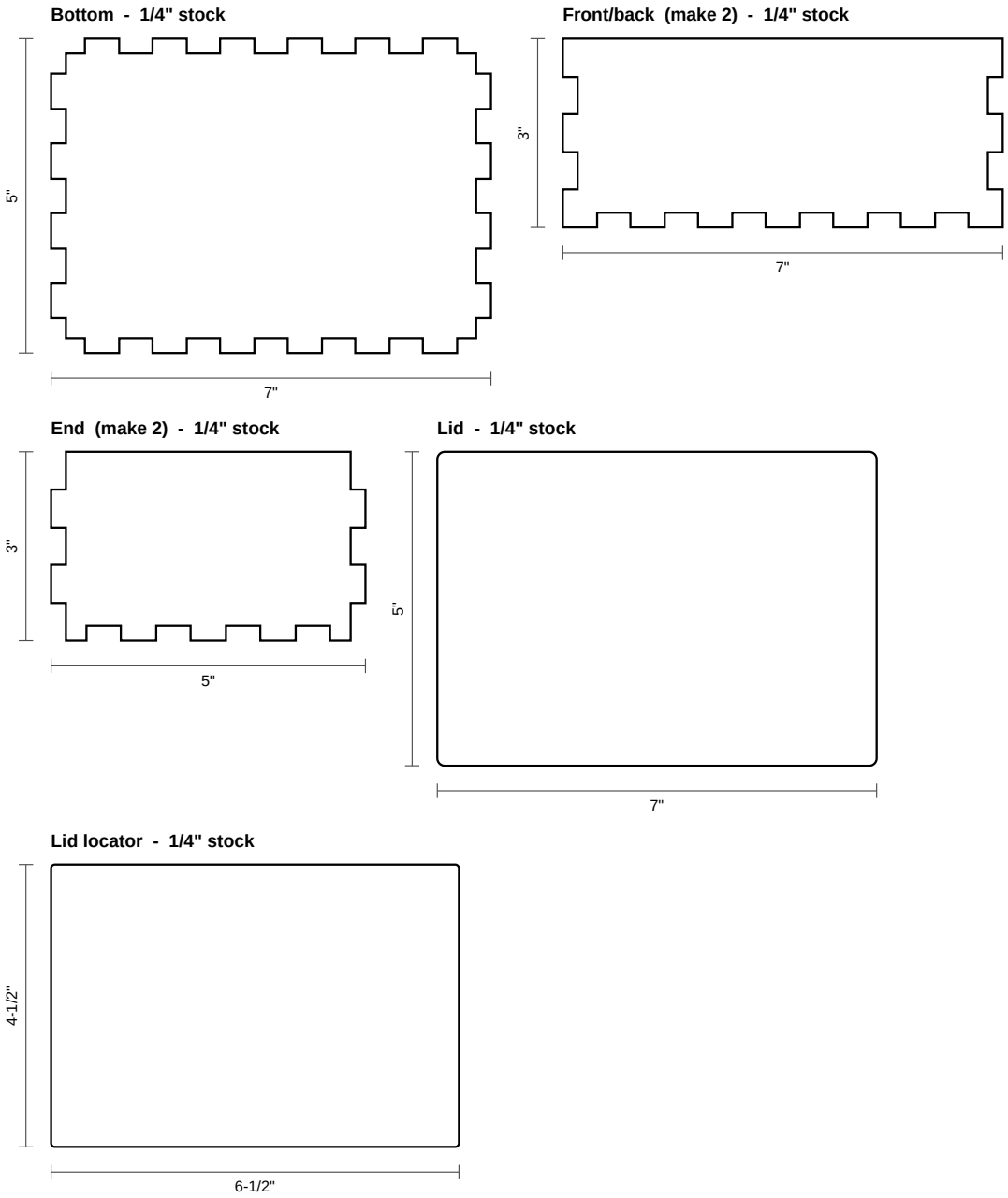
Files

dxf/finger-joint-catch-all.dxf, svg/finger-joint-catch-all.svg

Plan view, drawn at about 1:1.7. Grey = pocket (depth noted), dashed = underside pocket, light fill = through cut. Cut files are full size.

2. Lidded Keepsake Box

7" x 5" x 3" finger-joint box with a lift-off lid that self-locates.



Plan view, drawn at about 1:2.9. Grey = pocket (depth noted), dashed = underside pocket, light fill = through cut. Cut files are full size.

Machine & stock

Laserbox 40W CO2. Cut the joint test on the catch-all sheet first if you haven't.

The lid is the full outside size; the locator plate glued under it drops into the box opening with 1/64" clearance per side.

Steps

1. Cut both sheets. Assemble the box as for the catch-all.

2. Center the locator on the underside of the lid (set the lid on the box with the locator in the opening, then glue and press).

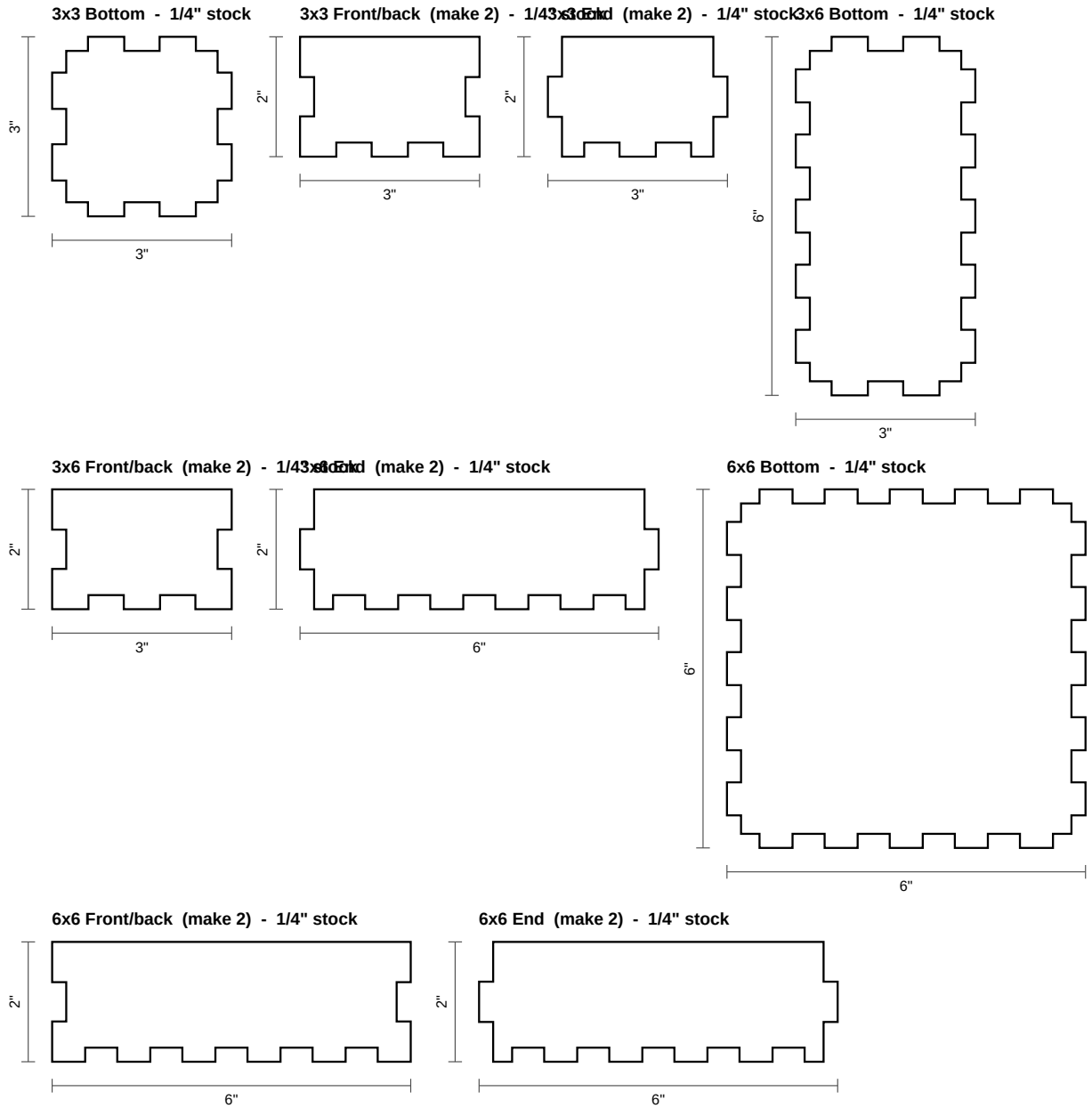
3. Optional: engrave a name or pattern on the lid before gluing; add it in the Laserbox software as a blue engrave layer.

Files

dxf/lidded-keepsake-box-sheet1.dxf,
svg/lidded-keepsake-box-sheet1.svg,
dxf/lidded-keepsake-box-sheet2.dxf,
svg/lidded-keepsake-box-sheet2.svg

3. Drawer Organizer Trays

Three open trays on a 3" grid (3x3, 3x6, 6x6, all 2" tall) that tile together in a drawer.



Machine & stock

Laserbox 40W CO2, cut only.

Every size is a multiple of 3", so any mix of trays fills a drawer in a neat grid. Change the sizes list in boxes.py to suit your drawer.

Steps

1. Measure the inside of the drawer and decide how many of each tray you want; cut that many sets.

2. Assemble each tray as for the catch-all; glue is optional because the trays are held by the drawer and each other.

3. Leave the trays unfinished or finish with DuraGrain Hardwax Oil (12 fl oz) using the included #0000 white palm pad and buff dry after 15 minutes with the grey microfiber cloth.

Files

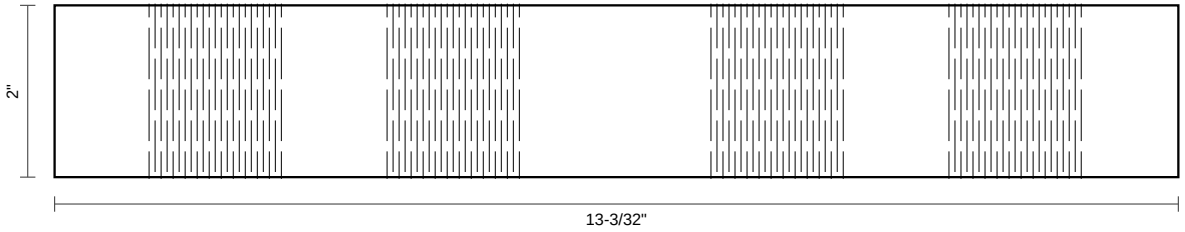
dxf/drawer-organizer-trays-sheet1.dxf,
svg/drawer-organizer-trays-sheet1.svg,
dxf/drawer-organizer-trays-sheet2.dxf,
svg/drawer-organizer-trays-sheet2.svg

Plan view, drawn at about 1:2.9. Grey = pocket (depth noted), dashed = underside pocket, light fill = through cut. Cut files are full size.

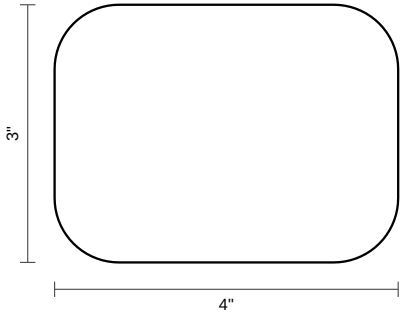
4. Living-Hinge Box

4" x 3" x 2" round-cornered box. One kerf-cut strip bends around all four corners.

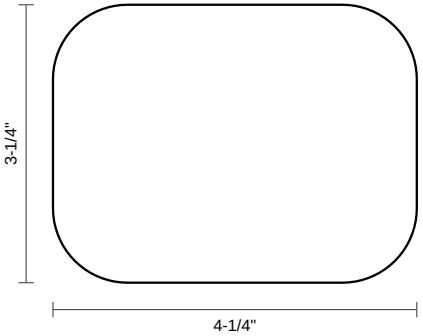
Wrap strip - 1/8" stock



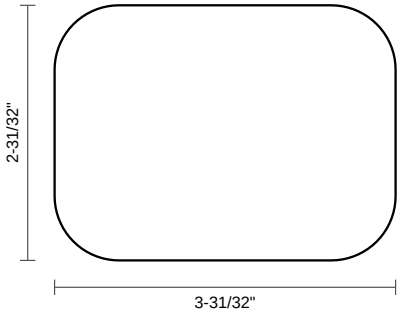
Bottom - 1/8" stock



Lid - 1/8" stock



Lid locator - 1/8" stock



Machine & stock

Laserbox 40W CO2. Use 1/8" plywood: 1/4" is too stiff to bend this tight.

The strip is 13-3/32" long, sized to wrap the bottom plate. The slit pattern (0.07" pitch, 0.12" bridges) covers each corner plus 0.15" either side.

Slits are single cut lines (red, open paths).

Steps

1. Cut the sheet. Flex the strip gently at each hinge zone a few times to loosen it.

2. Glue the strip around the edge of the bottom plate, starting at the middle of a long side so the seam lands there. Wrap tape around it while the glue sets.

3. Glue the locator under the lid, centered, so it drops inside the strip.

4. Finish with DuraGrain Hardwax Oil (12 fl oz) using the included #0000 white palm pad and buff dry after 15 minutes with the grey microfiber cloth.

Files

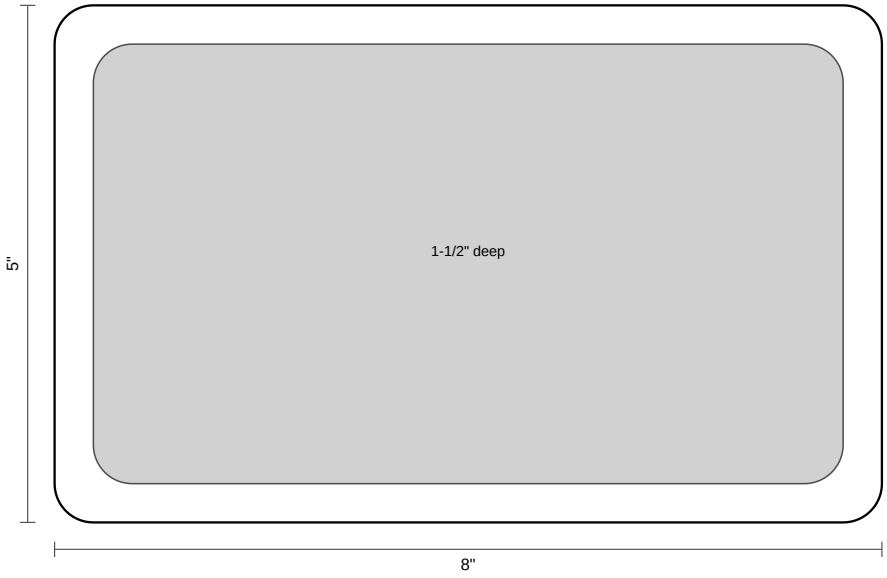
dxf/living-hinge-box.dxf, svg/living-hinge-box.svg

Plan view, drawn at about 1:2.2. Grey = pocket (depth noted), dashed = underside pocket, light fill = through cut. Cut files are full size.

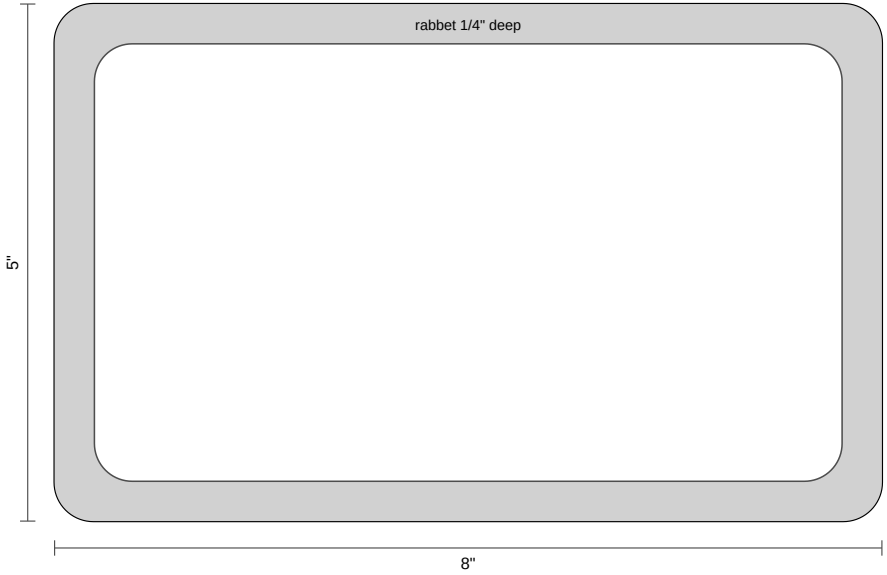
5. Carved Keepsake Box

8" x 5" x 2-1/4" box hollowed from one block, with a lid whose plug fits the opening.

Body - 1-3/4" stock



Lid - 3/4" stock



Plan view, drawn at about 1:1.9. Grey = pocket (depth noted), dashed = underside pocket, light fill = through cut. Cut files are full size.

Machine & stock

Two VCarve jobs: the body (1-3/4" file) and the lid (3/4" file).

CNC router. The body pocket is 1-1/2" deep, so use a 1/4" end mill with at least 1-5/8" of cutting length, or a 1/2" bit for roughing.

Lid: the pocket and the island on POCKET_0.250 make a rabbet around the edge, leaving a plug 1/64" smaller than the opening. Cut it on the face that becomes the lid's underside.

Inside corners are 3/8" radius, so any bit 3/4" or smaller reaches them.

Steps

1. Body: pocket, then profile with tabs. A ball-nose finishing pass along the inside bottom edge gives a nicer corner (optional).

2. Lid: run the rabbet pocket with both vectors selected, then profile with tabs.

3. Test the fit; if the plug is tight, sand its edges rather than recutting.

4. Round over the outside edges, sand, and finish with DuraGrain Hardwax Oil (12 fl oz) using the included #0000 white palm pad and buff dry after 15 minutes with the grey microfiber cloth. Flock or felt the inside if you like.

VCarve toolpaths (in this order)

Pocket, layer POCKET_0.250: cut depth 0.250", 1/4" end mill. Select every vector on the layer together so islands are left standing.

Pocket, layer POCKET_1.500: cut depth 1.500", 1/4" end mill. Select every vector on the layer together so islands are left standing.

Profile, Outside, layer PROFILE_OUTSIDE_0.750: cut depth 0.750" (through), 1/4" end mill, with tabs.

Profile, Outside, layer PROFILE_OUTSIDE_1.750: cut depth 1.750" (through), 1/4" end mill, with tabs.

Files

dxf/carved-keepsake-box-0.750in.dxf,
dxf/carved-keepsake-box-1.750in.dxf