



Vase Mode Boxes (customizable w\ *.f3d)

b bequ3

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Summary

A break-through in printed storage box development

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Tags: [box](#) [storage](#) [customizable](#) [storagebox](#) [useful](#)

One may think that these are just a copy of the [boxes designed by alch](#), or similar found here in Thingiverse – They are not^^

I saw alch's video back in 10/20 and got myself a copy of those neat*.stl files - I was not fully satisfied with the design, did some searching for alternatives and found none that satisfy all my requirements; So I think there is room for improvement. This thing is the result of my work on an even better box.

The*_beta.f3d file contains additional parameters to calculate box size based on drawer dimensions. This file is just a draft and not yet tested thoroughly.

Key Features

Consistent Wall Thickness*: First and foremost, I dislike thin-walled models that force the slicer to lay down fractions of a line width when printing perimeters. This is mostly caused by a shell

operation along a face normal (as in Fusion 360). The problem is that the 3D print is not sliced along a faces normal but along the global z-axis.

No Infill: The labelling area on similar designs are generally flatter than mine, which may make it easier to be read on from above and get labels stick to it. But the tilted section allows for more vertical height at the same horizontal expansion and has the benefit of being printable without any infill structure. **Printable in Vase-Mode: An added benefit of the consistent-thickness and no infill design goals is, that these boxes are printable in vase-mode. Vase-mode will limit you to print only four (at an ender 3 or similar) at once but gets you the most consistent surface finish.

Added rigidity*: I like the aesthetics of dukedoks' design without the notch below the top edge. But through my iterations I had to realize, that it is necessary in order to get enough handling stability in a print with 0.4mm wall thickness.

Stackable: This model is as well as most the other designs out there stackable. The attached.f3d file utilizes Fusion 360's parameterized design capabilities and may be used to generate Boxed of full, half, third heights at various grid expansions. All these are stackable on each other; They index nicely through with each other an the provided base-grid. *Scalable: The design is based on a solid box that is printed with 0% infill. This has the advantage, that the model itself is scalable without any issues regarding wall thickness.

How to print

A thicker nozzle is of course beneficial for this type of application. I printed mine with a 0.8mm nozzle at 0,9mm line width in vase mode. But also tested a 0.4mm nozzle with 0.4mm extrusion width in vase-mode and 2-perimeter prints in normal mode. The clearance at the bottom of the box is somewhat related to the line width, re-export from Fusion in case of uncertainty.

The layer height is limited by the overhang, with a 0.8mm nozzle I got good results with 0.3mm.

Vase-mode

Most slicers will get the settings right when you turn on vase-mode, just use your default printing profile, tick vase-mode and adjust the bottom thickness to something above 1mm + 2x layer height. In order to print multiple boxes at once review your gantry height/width/depth settings and enable "Complete individual objects" (may be named differently in your slicer). You may choose an extrusion width greater than your nozzle diameter, e.g. 0.5mm extrusion width with a 0.4mm nozzle - I think +25% is fine in this case.

Normal

Just as you would print in vase-mode but set infill to 0%. Some “artifacts” may occur when printing boxes that are bigger than 1x1 due to the inconsistent bottom thickness. In that case I would sacrifice aesthetics for rigidity and live with the imprint of the separation between the two box parts on the inside of the floor.

Variations: 80% Size

This design has a grid size of 55x55 mm. If the stuff you are planning to store is lost in boxes of that size try decreasing the size. Due to the solid-block approach you won't get any issues with wall thickness. Keep an eye on the clearance of the bottom to its counter part in the grid or other boxes when scaling up or down.

Troubleshooting

Changing user parameters crashes design file

First of all it's not the file! So if you made changes before this crash, they are not lost. Just use 'Undo' a parameter change and everything will be back to normal.

For some reason Fusion 360 struggles to recalculate changed models under specific circumstances. Try to decrease the value by which you changed the parameter. E.g. Changing the boxWidth from 55mm to 200mm - Try 55mm to 100mm to 200mm.

If you still have problems get in touch via the comment section.

Model files



box_1x1_third.stl



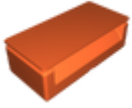
box_grid_3x3.stl



box_1x1_half.stl



box_1x1_full.stl



box_2x1_half.stl



vase_mode_boxes_v17.f3d

[Find source .stl files on Thingiverse.com](#)

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