Super Customizable Rugged Box in OpenSCAD

Iceman

VIEW IN BROWSER

updated 20. 11. 2024 | published 20. 11. 2024

Summary

Super Customizable Rugged Box in OpenSCAD With 60+ Settings

[Hobby & Makers](#) > [Organizers](#)

Tags: parametric water box case container super stackable customizable feet custom openscad size settings rugged resistant sizes ruggedbox

Custom Rugged Box OpenSCAD

What

This rugged box is loosely based off "https://www.printables.com/model/258431-rugged-box parametric" but completely written from scratch in OpenSCAD. So, it can be customized either in the OpenSCAD software (downloadable here) or in the Bambu Labs customizer found at "https://makerworld.com/en/models/788747" (I'm sorry Prusa, but the Bambu customizer is really nice! You should add one!). I've also pre-rendered a bunch of versions so anyone can quickly download a version and print it, just to get started.

With this rugged box you can customize almost anything...

- Polygon Level (Extra Low Poly, Low Poly, or Curved corners and chamfers)
- Dimensions
- Non-Gasket and TPU Gasket versions
- Add Stackable Feet
- Rim Size
- Rib Size
- Number of Ribs
- Hinge Size
- Number of Hinges
- Latch Size
- Number of Latches
- Dynamic Internal Separators
- Screw Size and Length
- Chamfer Radius
- And MORE... 62+ parameters of possibility

See the uploaded "CustomRuggedBoxSettingDocumentation.pdf" for a description and examples of ALL the settings.

When generating the STL files, you can generate 1 or all the object that make up the box via the setting (Box Bottom, Box Top, Latches, Feet, Water Resistant Gasket, Bottom Box TPU inert Template, and Top Box TPU insert Template). If you generate multiple objects at the same time, you can split them in the slicer via the "Split into Object" button in Prusa, Bambu, or your slicer of choice. This will separate the objects into independent items.
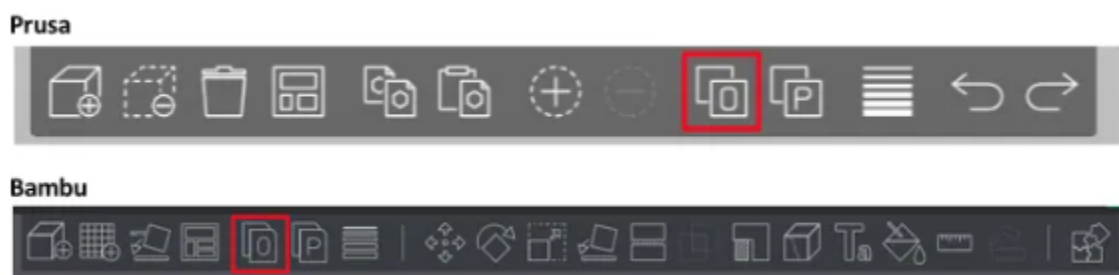
Quick NOTES:

NOTE 1:
You may need to update some of the tolerances depending on how good your printers are. I test printed these on my Ender 3 V2 and Sovol SV01, so it's likely your tolerances may need be tighter than that are for my pre-generated models. They should all still work well for most if not all printers, but you could tune them if you want to.

NOTE 2:

I did not pre-generate any modes with TPU gaskets. If you want to use the TPU gasket versions, I recommend first printing the gasket test objects to tune your gasket for your printer (see "TPU Gasket Recommendations" section).

NOTE 3:

I have not added a lot of protections to the parameters. You can do almost anything, but that also means that if you make a parameter to big or too small in relation to the other parameters you may get something that doesn't even look like a box. Unfortunately, this is just one of the side affects of a very very dynamic model.

Why Another Rugged Box?

Well, I guess a couple of reasons...

1. I'm a control freak! I wanted a version of the rugged box where I could make any change that I wanted. Which is why there are LOTS of parameters (62 to be exact).
2. I wanted to be able to change ANYTHING by just changing the settings.
3. I wanted to publish something anyone could have access to and use. I assume most of us out here are 3D printing for a hobby and don't have thousands of dollars a year to spend on ridiculously expensive CAD software. So, I wanted to publish something **OPEN** to anyone. Hence OpenSCAD!
4. I just wanted to see if I could do it.
5. I have future plans for this model, so stat tuned!!! ☺

Quick OpenSCAD Code Apology :-/

Designing models with OpenSCAD is... well... let's say challenging, and sometimes really really frustrating. This is especially true when making parametric models that can have conflicting settings. This model (at the time of writing) has 62 user adjustable settings!! That's A LOT!!! So, I'm sure there are some settings that can be set in a way that conflict with other settings. I've done my best to validate that most reasonable settings will work together. If you find something that doesn't work that you feel should, feel free to let me know. I will try to prioritize fixing it along with all my other personal responsibilities. But I cannot make any promises (sorry, life gets in the way sometimes).

Also, some of this code (or a lot of it) was written really late at night and maybe after a few (many) beverages. Yeah, now you know why my

grammar and spelling sux!! Plus, yes, I realize the code is not as organized/clean/etc. as it should be… But let's face it… no one is likely to actually read it 😊

Anyway, I will do my best to fix and update the model as I find issues.

TPU Gasket Recommendations!

If you are going to print the TPU gasket version of this model, I highly recommend that you print the test gasket rim and TPU gasket via the **generateGasketTestObjects** option. This will allow you to print a sample gasket in TPU and a sample box rim to test the fit of your selected tolerances. Then you can adjust the tolerances and re-print until you find the gasket settings that you think will work best. This will minimize the waste (and time) if your tolerances are tighter or looser than mine.

Also, when using the gasket version you may need to loosen up the latches a bit by either of the following:

1. Make the latchScrewLargeRadiusMm larger
   OR
2. Make the latchClipCutoutAngle larger
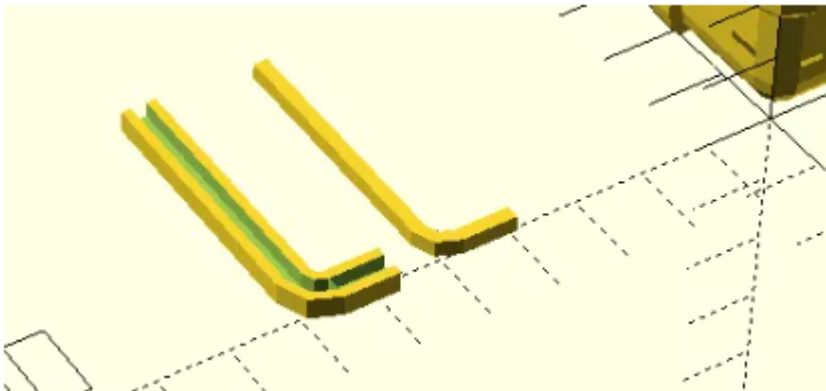
Pre-Generated STLs

I have pre-generates a set of STLs that I thought might be useful and **demonstrate the possibilities of this OpenSCAD model**.

In this model I have mostly pre-generated a set of boxes that are mostly Low-Poly, stackable (with feet), and have a 4mm chamfer. Plus, a few other smaller boxes just to prove that almost any size/shape box can be generated.

As I mentioned above, the gasket's tolerances should be tested on your specific printer, so I did NOT pre-generate any gasket cases.

The settings for all the pre-generated models has been uploaded vis a "RuggedBoxV1.json" or "RuggedBoxV1.txt" depending on if you are on the Prusa or Bambu Site.
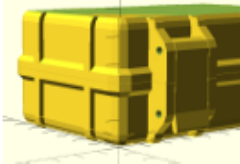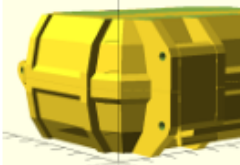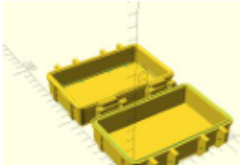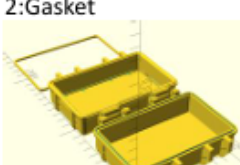
General file naming scheme:

[Object(s)]_[PolyLevel]_[InternalWidthX]x[InternalLengthY]x[InternalBoxBottomZ]x[Inte

Settings Documentation

See the attached **"CustomRuggedBoxSettingDocumentation.pdf"** file in the documentation for a description of all the settings and examples of what they do.

Below is an example from the documentation file...

boxChamferRadiusMm	4 mm	The chamfer radius of the boxes corners. **NOTE1**: the floor/top radius is slightly differentthan the sides to eliminate the need for supports. **NOTE2**: If you want square inside corners, the boxWallWidthMm must be >= the boxChamferRadiusMm.	4 mm 18 mm
boxSealType	1:Circular Non-Gasket	The type of seal for the case. 1 = Circular Non-Gasket (less water resistant) 2 = Gasket type seal (more water resistant)	1: Non-Gasket 2:Gasket

This remix is based on

Rugged Box (Parametric)

by Whity

Model files

📁 **Customizable OpenSCAD Rugged Box File**　　　　1 file

ruggedboxv1.scad

📁 **LowPoly_20x20x15x5_12x2mmScrews**　　　　1 file

lowpoly_20x20x15x5_12x2mmscrews.stl

📁 **LowPoly_50x30x30x20_30x3mmScrews_15mmChamfer**　　　　1 file

lowpoly_50x30x30x20_30x3mmscrews_15mmchamfer.stl

📁 **LowPoly_100x60x20x20_25x3mmScrews_Feet**　　　　6 files

box_lowpoly_100x60x20x20_25x3mmscrews_empty_feet.stl
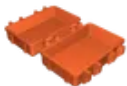
feet_lowpoly_100x60x20x20_25x3mmscrews_feet.stl

latchesextraloose_lowpoly_100x60x20x20_25x3mmscrews.stl
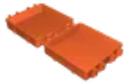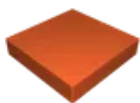

latchesloose_lowpoly_100x60x20x20_25x3mmscrews.stl
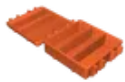

latchestight_lowpoly_100x60x20x20_25x3mmscrews.stl
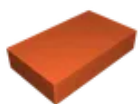
topandbottomboxtpuinsert_lowpoly_100x60x20x20_25x3m... .stl

📁 **LowPoly_100x60x24x08_25x3mmScrews_Feet**   13 files
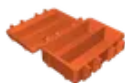
box_lowpoly_100x60x24x08_25x3mmscrews_1x2sections_f... .stl
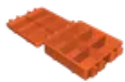

box_lowpoly_100x60x24x08_25x3mmscrews_2x1sections_f... .stl

box_lowpoly_100x60x24x08_25x3mmscrews_2x2sections_f... .stl
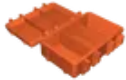
box_lowpoly_100x60x24x08_25x3mmscrews_3x1sections_f... .stl

box_lowpoly_100x60x24x08_25x3mmscrews_3x2sections_f... .stl
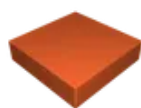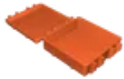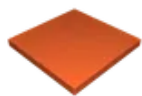
box_lowpoly_100x60x24x08_25x3mmscrews_3x2sections-1... .stl

box_lowpoly_100x60x24x08_25x3mmscrews_empty_feet.stl
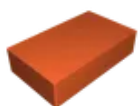
boxbottomtpuinsert_lowpoly_100x60x24x08_25x3mmscrew... .stl
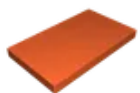
boxtoptpuinsert_lowpoly_100x60x24x08_25x3mmscrews_e... .stl

feet_lowpoly_100x60x24x08_25x3mmscrews_feet.stl

latchesextraloose_lowpoly_100x60x24x08_25x3mmscrews.stl

latchesloose_lowpoly_100x60x24x08_25x3mmscrews.stl

latchestight_lowpoly_100x60x24x08_25x3mmscrews.stl

📁 **LowPoly_100x60x60x10_25x3mmScrews_Feet**   7 files
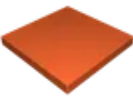

box_lowpoly_100x60x60x10_25x3mmscrews_empty_feet.stl

boxbottomtpuinsert_lowpoly_100x60x60x10_25x3mmscrew… .stl

boxtoptpuinsert_lowpoly_100x60x60x10_25x3mmscrews_e… .stl

feet_lowpoly_100x60x60x10_25x3mmscrews_feet.stl

latchesextraloose_lowpoly_100x60x60x10_25x3mmscrews.stl

latchesloose_lowpoly_100x60x60x10_25x3mmscrews.stl

latchestight_lowpoly_100x60x60x10_25x3mmscrews.stl

LowPoly_100x100x20x20_25x3mmScrews_Feet   6 files

box_lowpoly_100x100x20x20_25x3mmscrews_empty_feet.stl

feet_lowpoly_100x100x20x20_25x3mmscrews_feet.stl

latchesextraloose_lowpoly_100x100x20x20_25x3mmscrews .stl

latchesloose_lowpoly_100x100x20x20_25x3mmscrews.stl

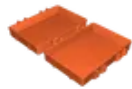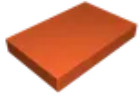latchestight_lowpoly_100x100x20x20_25x3mmscrews.stl

topandbottomboxtpuinsert_lowpoly_100x100x20x20_25x3... .stl

LowPoly_100x100x24x08_25x3mmScrews_Feet

18 files

box_lowpoly_100x100x24x08_25x3mmscrews_1x2sections_... .stl

box_lowpoly_100x100x24x08_25x3mmscrews_1x3sections_... .stl

box_lowpoly_100x100x24x08_25x3mmscrews_2x1sections_... .stl

box_lowpoly_100x100x24x08_25x3mmscrews_2x2sections_... .stl

box_lowpoly_100x100x24x08_25x3mmscrews_2x3sections_... .stl

box_lowpoly_100x100x24x08_25x3mmscrews_3x1sections_... .stl

box_lowpoly_100x100x24x08_25x3mmscrews_3x2sections_... .stl

box_lowpoly_100x100x24x08_25x3mmscrews_3x3sections_… .stl

box_lowpoly_100x100x24x08_25x3mmscrews_3x3sections-… .stl

box_lowpoly_100x100x24x08_25x3mmscrews_3x3sections-… .stl

box_lowpoly_100x100x24x08_25x3mmscrews_3x3sections-… .stl

box_lowpoly_100x100x24x08_25x3mmscrews_empty_feet.stl

boxbottomtpuinsert_lowpoly_100x100x24x08_25x3mmscre… .stl

boxtoptpuinsert_lowpoly_100x100x24x08_25x3mmscrews_… .stl

feet_lowpoly_100x100x24x08_25x3mmscrews_feet.stl

latchesextraloose_lowpoly_100x100x24x08_25x3mmscrews .stl

latchesloose_lowpoly_100x100x24x08_25x3mmscrews.stl
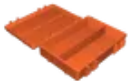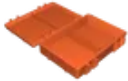

latchestight_lowpoly_100x100x24x08_25x3mmscrews.stl

📁 **LowPoly_100x100x60x10_25x3mmScrews_Feet**   7 files

box_lowpoly_100x100x60x10_25x3mmscrews_empty_feet.stl

boxbottomtpuinsert_lowpoly_100x100x60x10_25x3mmscre… .stl

boxtoptpuinsert_lowpoly_100x100x60x10_25x3mmscrews_… .stl

feet_lowpoly_100x100x60x10_25x3mmscrews_feet.stl

latchesextraloose_lowpoly_100x100x60x10_25x3mmscrews .stl

latchesloose_lowpoly_100x100x60x10_25x3mmscrews.stl

latchestight_lowpoly_100x100x60x10_25x3mmscrews.stl

 LowPoly_150x100x20x20_25x3mmScrews_Feet   *6 files*

box_lowpoly_150x100x20x20_25x3mmscrews_empty_feet.stl

feet_lowpoly_150x100x20x20_25x3mmscrews_feet.stl

latchesextraloose_lowpoly_150x100x20x20_25x3mmscrews .stl

latchesloose_lowpoly_150x100x20x20_25x3mmscrews.stl

latchestight_lowpoly_150x100x20x20_25x3mmscrews.stl

topandbottomboxtpuinsert_lowpoly_150x100x20x20_25x3... .stl

LowPoly_150x100x24x08_25x3mmScrews_Feet 21 files

box_lowpoly_150x100x24x08_25x3mmscrews_1x2sections_... .stl

box_lowpoly_150x100x24x08_25x3mmscrews_1x3sections_... .stl

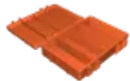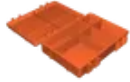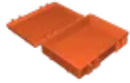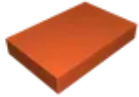**box_lowpoly_150x100x24x08_25x3mmscrews_2x1sections_... .stl**

box_lowpoly_150x100x24x08_25x3mmscrews_2x2sections_... .stl

box_lowpoly_150x100x24x08_25x3mmscrews_2x3sections_... .stl

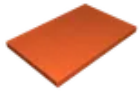**box_lowpoly_150x100x24x08_25x3mmscrews_3x1sections_... .stl**

box_lowpoly_150x100x24x08_25x3mmscrews_3x2sections_... .stl

box_lowpoly_150x100x24x08_25x3mmscrews_3x3sections_... .stl

box_lowpoly_150x100x24x08_25x3mmscrews_4x1sections_... .stl

box_lowpoly_150x100x24x08_25x3mmscrews_4x2sections_... .stl

box_lowpoly_150x100x24x08_25x3mmscrews_4x3sections_... .stl

box_lowpoly_150x100x24x08_25x3mmscrews_4x3sections-... .stl

box_lowpoly_150x100x24x08_25x3mmscrews_4x3sections-… .stl

box_lowpoly_150x100x24x08_25x3mmscrews_4x3sections-… .stl

box_lowpoly_150x100x24x08_25x3mmscrews_empty_feet.stl

boxbottomtpuinsert_lowpoly_150x100x24x08_25x3mmscre… .stl

boxtoptpuinsert_lowpoly_150x100x24x08_25x3mmscrews_… .stl

feet_lowpoly_150x100x24x08_25x3mmscrews_feet.stl

latchesextraloose_lowpoly_150x100x24x08_25x3mmscrews .stl

latchesloose_lowpoly_150x100x24x08_25x3mmscrews.stl

latchestight_lowpoly_150x100x24x08_25x3mmscrews.stl

📂 **LowPoly_150x100x60x10_25x3mmScrews_Feet**   3 files

allobjects_lowpoly_150x100x60x10_25x3mmscrews_feet.stl

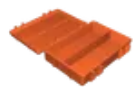**latchesextraloose_lowpoly_150x100x60x10_25x3mmscrews .stl**
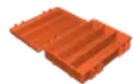

latchesloose_lowpoly_150x100x60x10_25x3mmscrews.stl
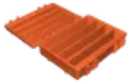
📂 **LowPoly_200x130x24x08_25x3mmScrews_Feet**   29 files

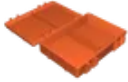**box_lowpoly_200x130x24x08_25x3mmscrews_1x2sections_... .stl**

box_lowpoly_200x130x24x08_25x3mmscrews_1x3sections_... .stl
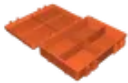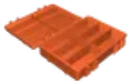
box_lowpoly_200x130x24x08_25x3mmscrews_1x4sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_2x1sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_2x2sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_2x3sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_2x4sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_3x1sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_3x2sections_... .stl

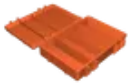**box_lowpoly_200x130x24x08_25x3mmscrews_3x3sections_...** .stl

box_lowpoly_200x130x24x08_25x3mmscrews_3x4sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_4x1sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_4x2sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_4x3sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_4x4sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_5x1sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_5x2sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_5x3sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_5x4sections_... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_5x4sections-... .stl
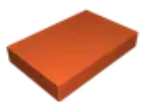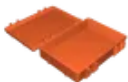
box_lowpoly_200x130x24x08_25x3mmscrews_5x4sections-... .stl
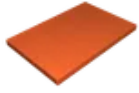
box_lowpoly_200x130x24x08_25x3mmscrews_5x4sections-... .stl

box_lowpoly_200x130x24x08_25x3mmscrews_empty_feet.stl

boxbottomtpuinsert_lowpoly_200x130x24x08_25x3mmscre... .stl

boxtoptpuinsert_lowpoly_200x130x24x08_25x3mmscrews_... .stl

feet_lowpoly_200x130x24x08_25x3mmscrews_feet.stl

latchesextraloose_lowpoly_200x130x24x08_25x3mmscrews .stl

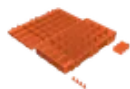**latchesloose_lowpoly_200x130x24x08_25x3mmscrews.stl**

latchestight_lowpoly_200x130x24x08_25x3mmscrews.stl

📁 **LowPoly_216x116x23x07_25x3mmScrews_Feet** 1 file

lowpoly_216x116x23x07_25x3mmscrews_8x4sections-2_fe... .stl

Other files

customruggedboxsettingdocumentation.pdf

ruggedboxv1.txt

🗋 Rename this to RuggedBoxV1.json and place next to the RuggedBoxV1.scad file to use.

License ©