Parametric Seed Starter

Quint

VIEW IN BROWSER

updated 9. 12. 2023 | published 9. 12. 2023

Summary

Start your garden with an easy-to-print Seed Starter kit - no assembly required and fully reusable!

10.20 hrs	12 pcs	0.30 mm	0.40 mm 0.60 mm	PET	244 g	Prusa MK3/S/S+

Household > Outdoor & Garden

Tags: parametric selfwatering flowerpot plants blender3d seeds seedstarter parametricdesign transplanting

Updates

- 09-12-2023: Fixed several basin parameters & updated to Blender 4.0.
  Updated Files
  - Parametric Seed Starter.blend
- 18-07-2023: Added a mid-section to the air-pruning strips in the cups.
 **Updated Files**
  - SeedStarter_0.4n
  - SeedStarter_0.6n

- Parametric Seed Starter.blend
- 05-07-2023: Added Air-Pruning Strips option to the cups.
  New Parameters
  - Use Air-Pruning Strips
  - Air-Pruning Height Ratio
  Updated Files
  - SeedStarter_0.4n
  - SeedStarter_0.6n
  - Parametric Seed Starter.blend
- 15-03-2023: Removed linked library in blend file & unused parameter drivers.
  Updated Files
  - Parametric Seed Starter.blend
- 11-03-2023: Added new parameters for the basin & added wall holes for the enclosed cover.
  New Parameters
  - Remove the fill port
  - Round or square fill port
  - Depth of the square fill port
  Updated Files
  - All BasinCovers(Enclosed)
  - Parametric Seed Starter.blend
- 01-03-2023: First upload

Parts

The seed starter consists of 4 different parts. The main parts are the basin and the growing cups. The covers for the basin and the reservoir are optional. I recommend printing the main parts first to start growing your seeds.
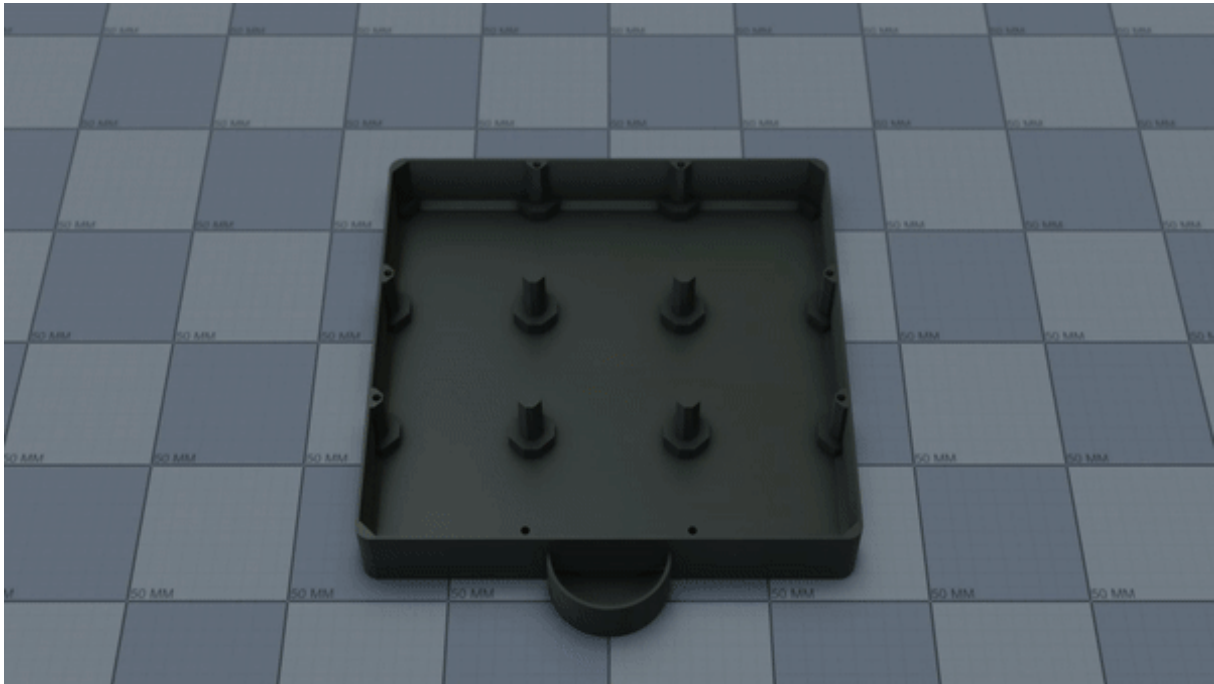
You can find the blend file I used to create this parametric design with the files. This design is made using the new geometry nodes functionality in Blender 3.4. To adjust the parts to fit your needs, you'll need **Blender 4.0** and up.

Basin

The basin holds all the cups and serves as a reservoir. At the front is a fill port for the bay. This allows you to refill the reservoir as needed. It includes a water level indicator showing the cup standoffs' height. This helps prevent overwatering by ensuring the water level in the basin doesn't reach the growing medium of the cups, which can cause damage to your seedlings. An optional reservoir cover can be printed to prevent water from evaporating.

The parameters for the basin will let you change the following features:

- Amount Width
- Amount Length
- Height
- Wall Thickness
- Wall Tolerance (Distance between the cups and the inner wall)
- Fill Height
- Fill Port Height

I recommend a minimum of 3 perimeters of wall thickness for the basin to ensure everything is watertight. So if you use a nozzle size of 0.4 mm, a minimum of 1.2 mm would be thick enough to make it rigid and waterproof.

Cup

The cup is elevated by its four corners for better root access to the water and improved aeration. This method depends on the evaporation of water to allow enough moisture to reach the growing medium, to keep the seedlings happy and encourage the growth of roots.

I recommend thinning the walls to ensure flexibility, making transplanting the seedlings easier. Around 1mm with a 0.4mm nozzle should do the trick.

Each of the cups can easily be removed individually.

The parameters for the cups will let you change the following features:

- Width
- Length
- Height
- Thickness
- Min Hole Radius
- Max Hole Radius
- Hole Density
- Use Air-Pruning Strips (Cuts holes in the four corners)
- Air-Pruning Height Ratio

Covers (Optional)

For the basin cover, you can choose between two variants.

The **enclosed cover** will completely cover the basin and should be printed with a transparent filament so the seedlings can enjoy the extra light and heat.

The other option is the **open cover**. You can cover and enclose the frame using some basic plastic wrap, and this option also keeps moisture but leaks more heat because of the plastic wrapping—however, printing costs around 25% less plastic than the enclosed cover.
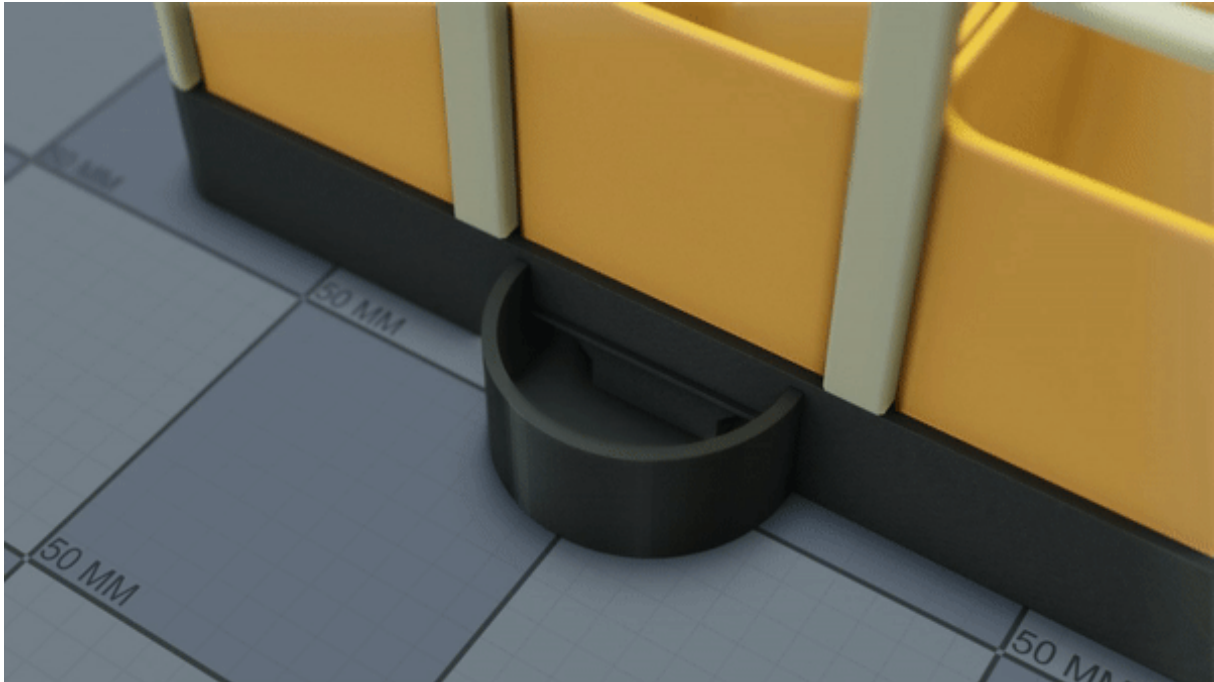
The parameters for the Basin Cover will let you change the following features:

- Enclosed / Open
- Height

- Thickness
- Frame Width

Fill Port Cover (Optional)

This cover is mainly cosmetic but prevents the exposed water from evaporating.

The parameters for the fill port will let you change the following features:

- Thickness
- Lip With
- Lip Length
- Wall Tolerance

Printing Difficulty: I

I: Novice printing knowledge

- Basic understanding of 3D printing principles and processes.
- Familiarity with operating a 3D printer.
- Able to follow step-by-step instructions for printing simple designs.
- Limited experience troubleshooting common printing issues.

II: Intermediate understanding

- Proficient in 3D printing principles and processes.
- Comfortable with various 3D printer settings and parameters.
- Capable of handling more complex designs and making necessary adjustments.

- Able to troubleshoot common printing issues and optimize print quality.

III: Experienced

- Extensive knowledge and expertise in 3D printing.
- Proficient in advanced printing techniques, such as multi-material or multi-colour printing.
- Skilled in fine-tuning printer settings for optimal results.
- Capable of handling complex and intricate designs.
- Experienced in troubleshooting and resolving various printing challenges.

Related Designs

If you want more prints to improve your gardening skills, check out the following design for helping your plants vertically in tight spaces and making compost using worms. https://www.printables.com/model/499011-flexigrowth-hooks

https://www.printables.com/model/140786-parametric-vermicomposter

Other Design

This is a redesign of an older self-watering seed starter kit. The new design improved a lot of aspects compared to the old one.

These are the most significant changes:

- The cup standoffs are moved to the corners and are integrated with the cup separators.
- The fill port holes are aligned to the cup standoffs, making them less prone to leaks.
- Added more chamfers to make it easier to clean

The old design can be found here:
https://www.printables.com/model/61902-small-self-watering-seed-starter

Filaments

For my print, I used the following filaments.

- PETG Recycled for the basin.
- PETG Prusament Terracotta Light for the cups.
- PVB Prusament Natural for the enclosed basin cover.
- PLA Prusament Vanilla White for the open basin cover.

This remix is based on

Small Self-Watering Seed Starter

by Quint

Model files

📁 **3x3 Parts 0.4mm Nozzle**   6 files

basin_3x3_04n.stl

cup_50x50x50_04n.stl

cup_pruningstrips_50x50x50_04n.stl

📝 Optional

basincoverenclosed_3x3_04n.stl
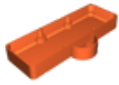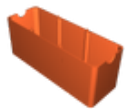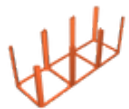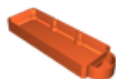
📝 Optional

basincoveropen_3x3_04n.stl

📝 Optional

fillportcover_04n.stl

📝 Optional

3x1 Parts 0.4 Nozzle

6 files

basin_3x1_04n.stl

cup_50x50x50_04n.stl

cup_pruningstrips_50x50x50_04n.stl
Optional

basincoverenclosed_3x1_04n.stl
Optional

basincoveropen_3x1_04n.stl
Optional

fillportcover_04n.stl
Optional

1x3 Parts 0.4 Nozzle
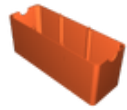
6 files

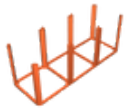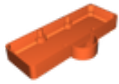**basin_1x3_04n.stl**

cup_50x50x50_04n.stl

cup_pruningstrips_50x50x50_04n.stl

basincoverenclosed_1x3_04n.stl

basincoveropen_1x3_04n.stl

fillportcover_04n.stl

📂 **3x3 Parts 0.6mm Nozzle**   6 files

basin_3x3_06n.stl

cup_50x50x50_06n.stl

cup_pruningstrips_50x50x50_06n.stl

basincoverenclosed_3x3_06n.stl

basincoveropen_3x3_06n.stl

📝 Optional

fillportcover_06n.stl

📝 Optional

📁 **3x1 Parts 0.6 Nozzle**   6 files

basin_3x1_06n.stl
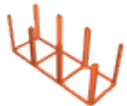
cup_50x50x50_06n.stl

cup_pruningstrips_50x50x50_06n.stl

📝 Optional

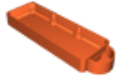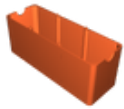**basincoverenclosed_3x1_06n.stl**

📝 Optional

basincoveropen_3x1_06n.stl

📝 Optional

fillportcover_06n.stl

📝 Optional

📁 **1x3 Parts 0.6 Nozzle**   6 files

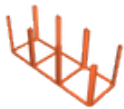**basin_1x3_06n.stl**

cup_50x50x50_06n.stl

cup_pruningstrips_50x50x50_06n.stl

 Optional

basincoverenclosed_1x3_06n.stl

 Optional

basincoveropen_1x3_06n.stl
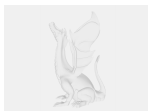
 Optional

fillportcover_06n.stl

 Optional

seedstarter_04n.3mf

seedstarter_06n.3mf

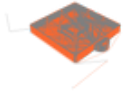**parametric-seed-starter.blend**

 Blender version 4.0.0 or higher
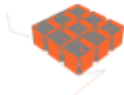
Print files

3x3 Parts 0.4mm Nozzle   6 files

basin_3x3_04n_03mm_petg_mk3s_4h36m.gcode

❀ PET   ⬇ 0.40 mm   ≡ 0.30 mm   ⏱ 4.60 hrs   ⚖ 82 g   🖶 Prusa MK3/S/S+

cups_50x50x50_9x_04n_03mm_petg_mk3s_6h25m.gcode

❀ PET   ⬇ 0.40 mm   ≡ 0.30 mm   ⏱ 6.41 hrs   ⚖ 97 g   🖶 Prusa MK3/S/S+

cups_pruningstrips_50x50x50_x9_04n_03mm_petg_mk3s_6… .gcode

❀ PET   ⬇ 0.40 mm   ≡ 0.30 mm   ⏱ 6.77 hrs   ⚖ 93 g   🖶 Prusa MK3/S/S+

🗋 Optional

basincoverenclosed_3x3_04n_03mm_petg_mk3s_8h6m.gcode

❀ PET   ⬇ 0.40 mm   ≡ 0.30 mm   ⏱ 8.10 hrs   ⚖ 132 g   🖶 Prusa MK3/S/S+

🗋 Optional

basincoveropen_3x3_04n_03mm_petg_mk3s_2h58m.gcode

❀ PET   ⬇ 0.40 mm   ≡ 0.30 mm   ⏱ 2.97 hrs   ⚖ 32 g   🖶 Prusa MK3/S/S+

🗋 Optional

fillportcover_04n_03mm_petg_mk3s_6m.gcode

❀ PET   ⬇ 0.40 mm   ≡ 0.30 mm   ⏱ 0.10 hrs   ⚖ 1 g   🖶 Prusa MK3/S/S+

🗋 Optional

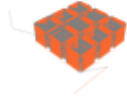## 3x3 Parts 0.6mm Nozzle   6 files

basin_3x3_06n_03mm_petg_mk3s_3h54m.gcode

❀ PET   ⬇ 0.60 mm   ≡ 0.30 mm   ⏱ 3.90 hrs   ⚖ 97 g   🖶 Prusa MK3/S/S+

cups_50x50x50_x9_06n_03mm_petg_mk3s_6h18m.gcode

⊛ PET   ⬚ 0.60 mm   ≡ 0.30 mm   ⊘ 6.30 hrs   ⚖ 147 g   🖶 Prusa MK3/S/S+

cups_pruningstrips_50x50x50_x9_06n_03mm_petg_mk3s_6... .gcode

⊛ PET   ⬚ 0.60 mm   ≡ 0.30 mm   ⊘ 6.76 hrs   ⚖ 139 g   🖶 Prusa MK3/S/S+

🗋 Optional

basincoverenclosed_3x3_06n__03mm_petg_mk3s_6h33m.gcode

⊛ PET   ⬚ 0.60 mm   ≡ 0.30 mm   ⊘ 6.56 hrs   ⚖ 147 g   🖶 Prusa MK3/S/S+

🗋 Optional

basincoveropen_3x3_06n_03mm_petg_mk3s_2h32m.gcode

⊛ PET   ⬚ 0.60 mm   ≡ 0.30 mm   ⊘ 2.53 hrs   ⚖ 35 g   🖶 Prusa MK3/S/S+

🗋 Optional

fillportcover_06n_03mm_petg_mk3s_5m.gcode

⊛ PET   ⬚ 0.60 mm   ≡ 0.30 mm   ⊘ 0.08 hrs   ⚖ 1 g   🖶 Prusa MK3/S/S+

🗋 Optional

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