PARAMETRIC SALT & PEPPER GRINDER CADDY

Fuzzy Skin Edition - Build Book V0.1.1



Default: 55 mm grinders -> 58 mm pockets | 12 mm deep | dual-side S/P

V0.1.0 passed functional physical testing. V0.1.1 applies small usability refinements and is the next confirmation-print candidate.

1. Project summary

This release refines the physically tested V0.1.0 concept into a practical, one-piece, parametric FDM caddy. Two recessed wells catch residual salt, pepper and grinder dust that would otherwise land on the table. The centre feature is retained as a low-profile grip/slide tab rather than a full-height loaded carry handle, preserving the compact proportions and filament efficiency.

Release	V0.1.1 print candidate
Default grinder diameter	55.0 mm
Default pocket diameter	58.0 mm
Pocket depth	12.0 mm
Overall envelope	144 x 68 x 87 mm
Primary material	Black PLA / PLA+
Print orientation	Base-down, as supplied
Supports	Off
Design source	Parametric OpenSCAD

Design goals

- Catch grinder residue without adding removable trays or extra parts.
- Provide 1.5 mm radial clearance around a nominal 55 mm grinder by default, retaining the physically validated 58 mm pocket diameter.
- Remain stable when slid along a table and provide a useful centre grip for repositioning without requiring a tall, filament-heavy carry handle.
- Use an integrated handle while avoiding a flat unsupported bridge inside the handle opening.
- Keep functional pocket surfaces and label regions smooth while using subtle fuzzy skin primarily on exposed external walls.
- Expose a small, controlled parameter set suitable for a future website generator.



V0.1.1 print candidate - V0.1.0 functionally validated

Concept render - front

Concept render - top

Marketing renders communicate the intended finish and product language; the OpenSCAD/STL/3MF files are the dimensional authority.

2. Geometry and mechanical design

Spill-catching pockets

Each well remains 58.0 mm in diameter at the functional wall, with a small entry chamfer at the top. At the default 55.0 mm grinder diameter this provides 3.0 mm diametric clearance. V0.1.1 increases well depth from 11.0 to 12.0 mm and increases base height from 15.0 to 16.0 mm, preserving the proven 4.0 mm floor while adding retention, debris capacity and a small amount of useful mass.

Base

The base keeps the proven capsule footprint and slight outward taper. Plan dimensions remain 144 x 68 mm; only height changes by 1 mm. The new envelope is 144 x 68 x 87 mm, comfortably inside the 300 x 300 mm K2 Pro build area.

Handle

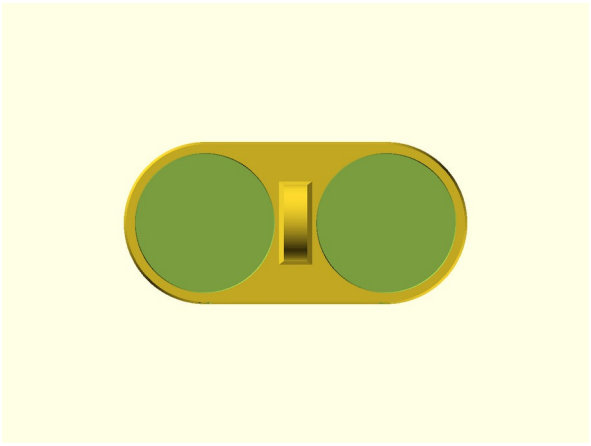
The centre grip is integrated into the bridge and reinforced by a compact root flare. The external top remains rounded while the internal opening terminates in a pointed 45-degree roof, avoiding an unsupported flat bridge. Physical testing showed it is not tall enough for comfortable loaded carrying; that is now accepted by design. It remains useful for sliding/repositioning and avoids the bulk and filament cost of a full-height handle.

Markings and underside

S and P are now negative-etched into both long sides so either side of the table can identify the grinders without lifting them. V0.1.1 increases character size from 8.0 to 9.5 mm and engraving depth from 1.2 to 1.6 mm. Four 10 mm underside recesses remain available for optional felt, silicone, TPU or grip dots and are deepened from 0.6 to 0.9 mm.



Actual CAD preview - 3/4



Actual CAD preview - top

3. Parametric model

The model is driven from a single OpenSCAD source. The default pocket diameter is calculated rather than hard-coded:

pocket_diameter = grinder_diameter + 2 x radial_clearance

grinder_diameter	Measured outside diameter of the grinder at the section that enters the caddy.
radial_clearance	Clearance on each side; default 1.5 mm.
pocket_depth	Depth of the residue-catching well.
centre_gap	Material gap between the two circular pockets; also reserves space for the handle root.
handle_height	Grip/slide tab rise; default 72 mm. Not intended as a full-height loaded carry handle.
labels_enabled	Enable/disable negative S/P text; V0.1.1 defaults to both sides.
pad_recesses_enabled	Enable/disable four underside pad recesses; V0.1.1 default depth 0.9 mm.

For the website implementation, grinder diameter and clearance should be the primary user-facing values. Pocket depth and handle height can be placed under an Advanced section. Structural wall thickness and handle root parameters should remain controlled unless there is a strong reason to expose them.

4. FDM print plan

Nozzle	0.4 mm
Layer height	0.20 mm default; 0.16 mm for finer finish
Walls	4
Top / bottom layers	5 / 5
Infill	12-18% gyroid or cubic
Supports	Off
Orientation	Flat base on build plate
Material	PLA / PLA+

Fuzzy skin

The fuzzy texture is intentionally a slicer treatment, not modelled geometry. That keeps the CAD clean and parametric, avoids huge mesh files, and allows the same source model to produce smooth or textured variants.

Subtle	~0.12 mm thickness / 0.55 mm point distance

V0.1.1 recommended start	~0.14 mm thickness / 0.45 mm point distance
Bold	~0.16 mm thickness / 0.40 mm point distance

Apply fuzzy skin to the external contour only where the slicer permits. Do not intentionally texture the functional pocket bores: doing so reduces effective clearance and may make the grinders grab during insertion or removal.

Orientation gate

- Base is at Z=0 in all supplied printable geometry.
- No separate or floating objects exist in the holder mesh.
- The handle opening uses self-supporting slopes instead of a horizontal ceiling.
- S/P markings are recesses in the main body rather than decorative floating shells.

5. Physical validation and V0.1.1 confirmation sequence

V0.1.0 completed a successful real-world functional test: fit, retention, residue capture, table sliding and front-label readability passed. V0.1.1 is a small refinement and needs one confirmation print before public release is marked validated.

1. The 58 mm fit coupon does not need to be repeated for the same grinders because pocket diameter is unchanged and already validated. Print the coupon only for different grinders, material shrinkage or substantially different process settings.
2. Print SaltPepper_Caddy_58mm_V0.1.1.3mf base-down with supports disabled. Use aligned/rear seam placement and the V0.1.1 subtle fuzzy-skin starting point.
3. Load both grinders and check retention, table sliding and grip-tab use. Do not treat the centre grip as a full-height carry handle; the V0.1.0 test already established that this height is intentionally better suited to repositioning than loaded carrying.
4. Place the loaded caddy on the intended table surface and slide it gently. Check stability, scratching and whether the revised 0.9 mm pad recesses better suit felt/silicone/TPU/grip inserts.
5. Use the grinders normally, return them to the wells and confirm the additional 1 mm depth still allows easy removal while increasing retention and debris capacity.
6. Inspect S/P from both sides of the table. Confirm the larger/deeper letters remain crisp. Keep fuzzy skin away from the engraving region where slicer modifiers permit.
7. Also inspect the two presentation faces for the V0.1.0 pimple/blob pattern. Move the seam to a rear/hidden area and use wipe/retraction controls before changing geometry. Only after this confirmation print should V0.1.1 become public-ready.

Validation status

Mesh manifold/watertight	PASS
Single connected component	PASS
Overall STL envelope	144 x 68 x 87 mm
300 x 300 mm bed fit	PASS
Geometry 3MF package structure	PASS
Physical pocket fit	PASS - V0.1.0; unchanged 58 mm diameter
Loaded handle test	ACCEPTED FINDING - retained as grip/slide tab
Target fuzzy-skin print	PENDING V0.1.1 confirmation / seam cleanup

6. Package contents and release use

Primary files

- 01_SOURCE/SaltPepper_Caddy_Parametric.scad - V0.1.1 dimensional source of truth and future generator base.
- 02_MODELS/STL/SaltPepper_Caddy_58mm_V0.1.1.stl - revised full caddy.
- 02_MODELS/STL/SaltPepper_Fit_Coupon_58mm.stl - fast fit check.
- 03_PRINT/3MF/SaltPepper_Caddy_58mm_V0.1.1.3mf - pre-oriented geometry 3MF for the next test print. It is not a sliced Creality Print project/profile container.
- 03_PRINT/Print_Profile_Recommendations.txt - baseline print and fuzzy-skin settings.
- 05_MARKETING/*.png - concept/marketing render set.
- 06_VALIDATION/* - mesh report, checklist and actual CAD preview images.
- 07_RELEASE/Creality_Upload_Draft.txt - draft release copy held pending validation.

Marketing asset guidance

Render_01_Fuzzy_Hero.png remains the intended launch-style concept hero. The package now also includes V0.1.0 physical prototype photos and the residue-capture proof image. Add at least one clean V0.1.1 physical photo before final public release where practical.



Recommended hero render



Rear three-quarter render

Release status

V0.1.1 is a print candidate following successful V0.1.0 functional validation. Public release remains staged until the revised 12 mm wells, dual-side labels, deeper pad recesses and seam/fuzzy-skin finish are confirmed on one physical print.

7. Physical evidence from V0.1.0

The first physical print validated the core design intent. The 58 mm wells fit the target grinders, the caddy remained stable in use, and normal grinder testing produced a visible quantity of salt/pepper dust inside the wells rather than on the table. That residue photo is the strongest practical justification for the product.



V0.1.0 loaded with target grinders



Captured grinder residue after testing



Visible face blobs/pimples - slicer seam/start-stop finding



Underside pad recesses before V0.1.1 depth increase

8. V0.1.1 CAD verification views

The revised CAD keeps the validated footprint and 58 mm bores while adding 1 mm well depth, larger/deeper labels on both sides, and 0.9 mm underside pad recesses. Front and rear views below verify the dual-side label mapping before the next print.

V0.1.1 print candidate - V0.1.0 functionally validated



Front: S / P



Opposite side: P / S to the viewer, still mapped to the same physical grinders

V0.1.1 confirmation-print acceptance criteria

- Both grinders insert/remove freely and remain positively retained by the 12 mm wells.
- S/P is legible from both long sides without lifting either grinder.
- Front and rear presentation faces no longer show the concentrated pimple/blob pattern seen on V0.1.0, or the remaining seam is moved to a visually acceptable hidden area.
- Fuzzy skin reads as a fine, uniform matte texture rather than isolated bumps and does not encroach on the 58 mm bores or label recesses.
- Underside 0.9 mm recesses accept the intended grip/felt/TPU solution without weakening or telegraphing through the 4 mm floor.

If these checks pass, V0.1.1 can be promoted from print candidate to physically validated/public-ready without another geometry revision.