

Modular Filament Shelf Print & Assembly Guide

A stackable, expandable rack for vacuum-sealed bags, resealed bags and open spools.

No Supports

Two Sizes Included

Pre-Configured 3MF



Built by MakerX Designs · Virginia Beach, VA · makerxdesigns.com · © 2026

This shelf takes the geometry of a classic office paper tray and rebuilds it around the 3D-printing workflow. A spool lies in flat, the arched deck carries the load, and locating pegs on top let you stack unit on unit as tall as your collection demands. No hardware, no glue, no supports.

In the download

File	What it is
<code>makerx-filament-storage-shelf.3mf</code>	Start here. A Creality Print project holding two ready-to-slice plates — full-size and small — on the tested profile.
<code>makerx-filament-storage-shelf.stl</code>	The raw mesh, for your own slicer or profile. Already oriented — no rotation needed.

1 · Choose your size

The 3MF holds two named plates. Slice whichever matches your spools — or slice both.

Plate	Fits	Footprint	Filament	Time
1 · Standard "Standard - 1k spool"	Standard 1 kg spools, bagged or open	240 × 205 × 87 mm	121 g PLA	3 h 50 m
2 · Smaller "Smaller - 250k spool"	Small 250 g sample spools	168 × 144 × 61 mm	55 g PLA	1 h 53 m

Both sizes are the same model

Plate 2 is the same geometry scaled to 70 %. To fit another spool, scale the STL — **X, Y and Z together**, so the cradle keeps its shape.

Sliced on a Creality Hi in PLA at the profile overleaf — 40.7 m / 18.5 m of filament.

2 • Slice it

- 1 Open `makerx-filament-storage-shelf.3mf` in Creality Print — or any slicer that imports 3MF project files.
- 2 When you are asked whether to load the project's print settings, **say yes**. That is the whole point of the 3MF: the profile below travels with it.
- 3 Pick your plate — *Standard - 1k spool* or *Smaller - 250k spool* — in the plate selector.
- 4 Confirm your printer and filament are selected, then slice. Nothing else needs touching.

★ Leave supports off

The deck is a self-supporting arch and the side cutouts are bridged — that redesign is exactly why there is no support material in this print. Switching supports on won't improve anything; it will scar the visible faces and cost you the cleanup.

3 • The profile baked into the 3MF

Using your own profile instead? Match these — all sliced and print-tested on a Creality Hi with a 0.4 mm nozzle.

Quality	
Layer height	0.20 mm (first layer 0.20)
Nozzle	0.4 mm
Walls	2 loops
Top / bottom	5 / 3 layers
Infill	10 % gyroid
Seam	Aligned, to the rear

Plate adhesion	
Supports	Off
Brim	Outer + inner, 3 mm
Brim gap	0.5 mm

Material & speed	
Filament	PLA (tested on Hyper PLA)
Nozzle temp	220 °C (first layer 220)
Bed temp	60 °C · 45 °C eng. plate
Outer wall	150 mm/s
Inner wall	300 mm/s
Infill	270 mm/s

Other materials

PLA is all this part needs — the load sits in compression on the arch, not in tension. PETG works if the rack lives somewhere warm: slow the outer wall and keep the brim.

4 • Before you hit print

- ☐ Bed clean and the first layer squashing properly — this part has a long, thin footprint.
- ☐ Supports confirmed **off**.
- ☐ Brim present. It does real work on the two narrow side walls; skipping it is the most common way to lose this print to a lifted corner.
- ☐ Enough filament loaded for the whole plate — 121 g full size, 55 g small.

5 • Build the rack

Nothing to assemble, nothing to glue. Each unit is one printed piece; a rack is units on units.

- 1 Peel the brim off and check the bottom edges are clean — anything left makes the stack rock.
- 2 Set the first unit on a flat, level surface — it carries everything above it.
- 3 Lower the next unit straight down onto it. The **locating pegs** drop into the recesses underneath, keeping the column square and stopping it walking.
- 4 Repeat. Add a unit whenever you buy filament.
- 5 For a wider rack, stand columns side by side; their walls sit flush and read as one cabinet.



One unit. The pegs on the top edge are what the next shelf sits on.

Keep tall stacks honest

A loaded column gets top-heavy fast. Build against a wall or the back of a bench rather than free-standing, and put your heaviest, least-used spools at the bottom.

6 • Loading a shelf

One spool per shelf, laid in flat. The cradle handles all three states filament lives in:

- **Factory vacuum-sealed bags** — bag and desiccant go in sealed with the spool, and come back out the same way.
- **Resealed bags** — a home-resealed spool keeps its bag and stays in rotation.
- **Open spools** — drop straight in; the open front means no unstacking to pull one out.

7 • The rest of the family

All of these are built around this same shelf, and all live on the MakerX Designs profile.



Four columns, six shelves each — bagged and open spools in the same system.

Model	What it is
Filament Storage Shelf	This model — the tray itself, in 1 kg and 250 g sizes.
Filament Storage Top Labels	A wide bar that caps a column, naming the material in that stack.
Filament Storage Insert Labels	Small labels that sit inside a tray with the spool.
Filament Storage Side Labels	Friction-fit tags for each tray's side wall, readable when stacked high.

Where precision meets the printer

Thanks for printing this one. If it earned a permanent spot on your bench, that is exactly what it was designed to do.

For years my design world existed entirely behind a screen. As a mechanical engineer I spent countless hours building complex CAD models, but there was always a missing link — the ability to hold an idea in my hands. That changed in January 2026, when I went headfirst into 3D printing. The moment that first layer stuck to the bed, the gap between concept and reality vanished.

Coming from a background where precision is everything, tolerances aren't suggestions to me — they are a religion. I didn't want to print trinkets; I wanted to apply industrial engineering discipline to desktop manufacturing. Every wall count, every layer height and every infill percentage in this guide is a deliberate decision backed by testing. If a part can't handle the environment it was built for, it goes back to the drawing board.

Three principles behind every print

01

Functional Engineering

High-utility, real-world solutions rather than purely decorative models. If it doesn't solve a practical problem, it doesn't leave the workstation.

02

Rigorous Tolerances

Designed in professional CAD with mechanical intent — press-fits that click and assemblies that work straight off the build plate. No sanding, no filing, no guesswork.

03

Bridging the Gap

Industrial structural integrity at maker speed. Proving a desktop printer can produce parts worthy of real engineering applications is what drives every release.

The workshop

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A note on sharing

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IF THIS ONE EARNED ITS SPOT

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Got a spool size or a storage setup this rack doesn't cover? Leave a comment on the model — both of the sizes in this download started as somebody's comment.

Happy organizing. — MakerX Designs · makerxdesigns.com · © 2026