RecycleHub

A mobile workstation for circular makers

by Olivier Decru

RecycleHub

Plastic is everywhere and so is the waste it leaves behind. While recycling holds promise, the reality in many community labs and makerspaces is far from ideal. Scattered tools, inefficient workflows and limited space make the process harder than it should be. What if recycling could be smarter, simpler and more engaging from the ground up?

That question sparked the creation of the **RecycleHub**: a compact mobile workstation designed to make plastic recycling not only more efficient but also more inviting.

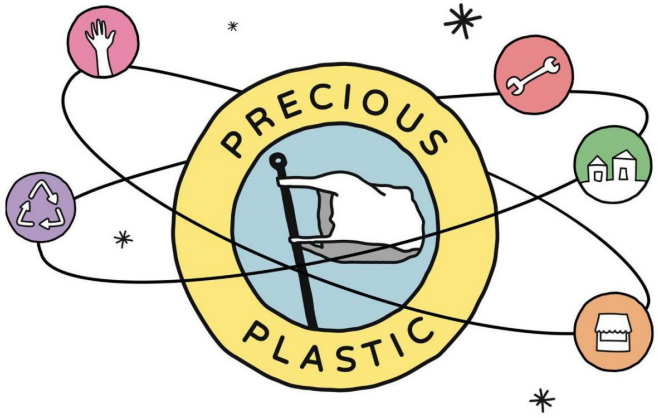
Who is Ingegno

Ingegno is an innovative company that **promotes prototyping as a driving force for STEM literacy** for all. Guided by this vision, we support **organizations, schools, companies, and individuals** in developing or integrating **tailored STE(A)M programs**.

We design **cutting-edge STEM labs and educational tools** that connect making, thinking, and doing. Our expertise includes **digital fabrication, electronics, physical computing**, and hands-on **prototyping**.

Ingegno supports the **Ingegno Maker Space in Drongen**, a place where access to knowledge, technology, and unique tools is democratized. We believe in **accessible maker culture** as a catalyst for creativity, confidence, and technological literacy.

What is Presious Plastics



Precious Plastic's mission is to **reduce plastic waste** by creating **open source machines**, **sharing knowledge** and **building global communities** that empower people to **recycle and reuse plastic locally**. The initiative gives individuals and groups the tools and techniques to **turn plastic waste into valuable new products** and take part in the circular economy.

Ingegno brings this mission to life through its own **Precious Plastic lab in Drongen**. By offering **workshops and open access to recycling tools**, Ingegno helps people explore new ways of working with plastic in creative and sustainable ways. Both share a vision of **a world where plastic is not thrown away but used again with purpose**. Through hands-on action and shared knowledge, they invite more people to rethink plastic from the ground up.

Goal

The goal of this project is to **support plastic recycling in a more efficient, practical and sustainable way** by developing a **smart and compact workstation**. Created **for and by makers**, the RecycleHub is designed for clarity and functionality, made from **durable materials** that withstand daily use in a recycling environment. It features a **heat-resistant surface** for safely handling hot molds and freshly formed objects, and **integrated storage** keeps tools and materials organized and within reach.

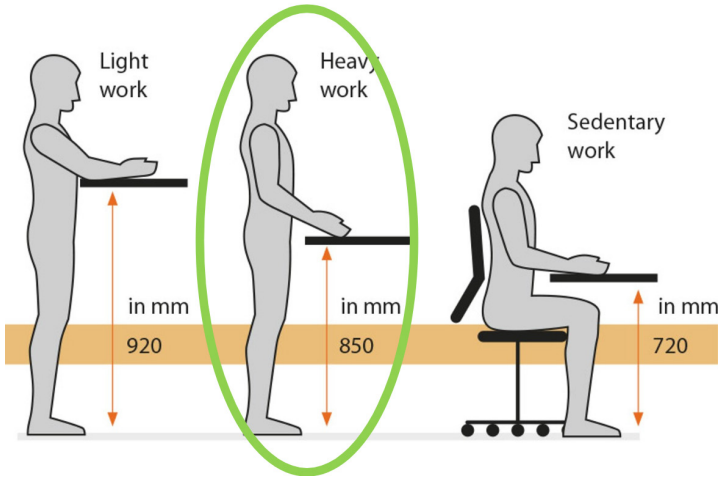
Although the recycling itself happens on separate machines, the RecycleHub **supports every step around the process**. It turns any location into a functional workspace, moves with ease and fits into limited areas. **Built to be produced in makerspaces** with accessible tools and materials, it empowers educators, students, makers and small-scale entrepreneurs. More than a piece of furniture, it is a practical, maker-driven tool that brings order to creative work and invites wider participation in circular making.

List of demands

Organized	**->** Compartments for molds and accessories
Durable	**->** Sturdy work surface for tools and equipment
Heat-resistant	**->** Safe handling of hot plastic and molds
Practical	**->** Smart storage for tools and materials
Mobile	**->** Wheels for easy movement between workspaces
Transportable	**->** Fits inside a small van
Sustainable	**->** Recyclable materials, supporting circular use
Open-source	**->** Free to build and adapt with tools found in makerspaces
Impactful	**->** The story of recycled plastic is visibly integrated

Ergonomics

CORRECT WORKING HEIGHT



A **working height of 85 cm** strikes the ideal **balance between comfort, stability and mobility**. It keeps the workstation practical to use, easy on the body and ready to roll whenever the workflow demands it.

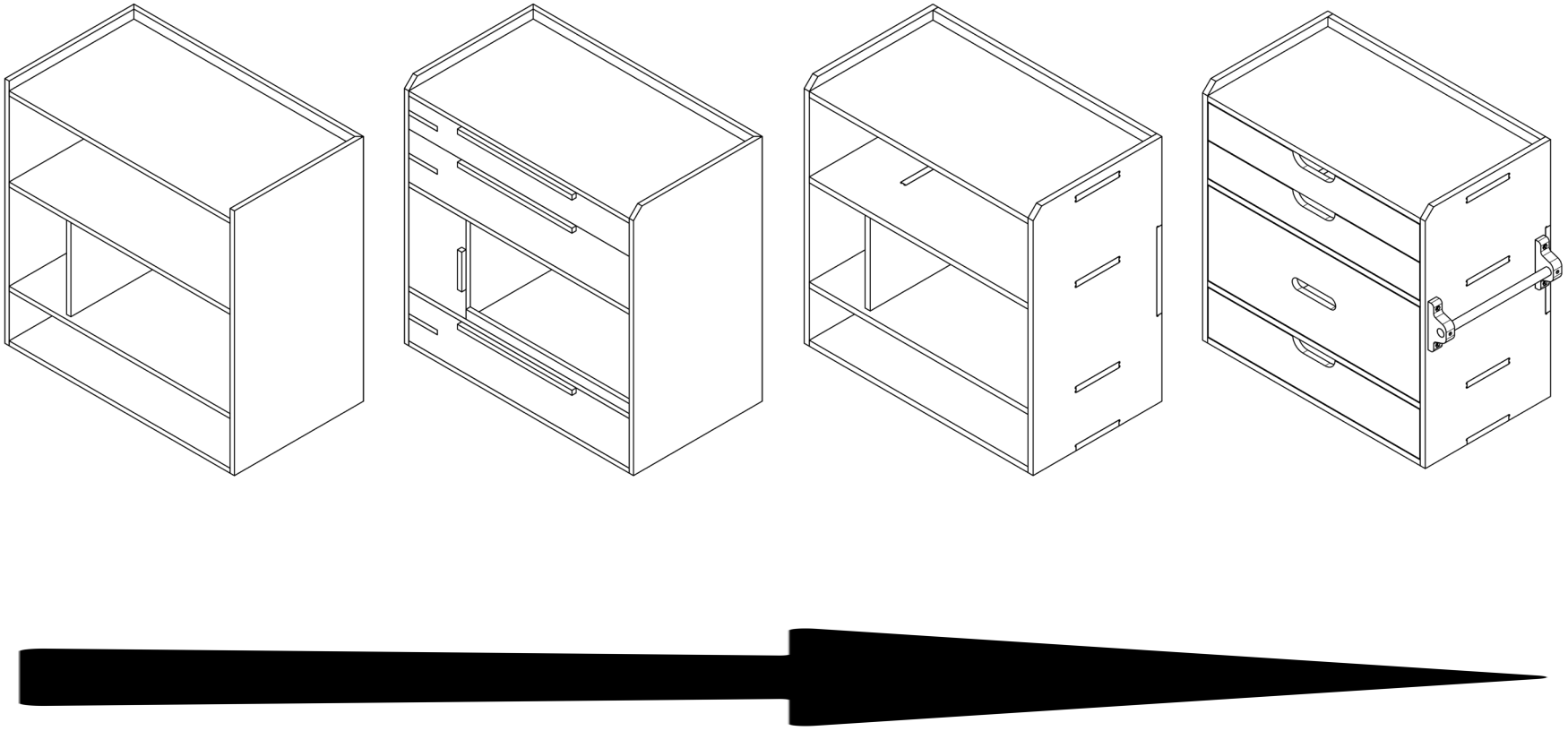
A **work surface of 80 by 45 cm** offers the **sweet spot between compactness and usability**, making it **perfect for tight spaces and mobile setups** alike. It delivers just the right amount of room to stay productive with tools and small machines, without overwhelming the workspace or sacrificing mobility. Every square cm pulls its weight, keeping the station lean, efficient and ready to move.

This size also **supports a natural and ergonomic workflow**, where everything stays within easy reach. It is **wide enough to work comfortably** without feeling cramped, yet small enough to keep the station agile and easy to store. In fast-paced, space-conscious environments, this dimension proves to be a smart, flexible foundation for hands-on, day-to-day making.

CMF

Moodboard

Timeline



Prototyping

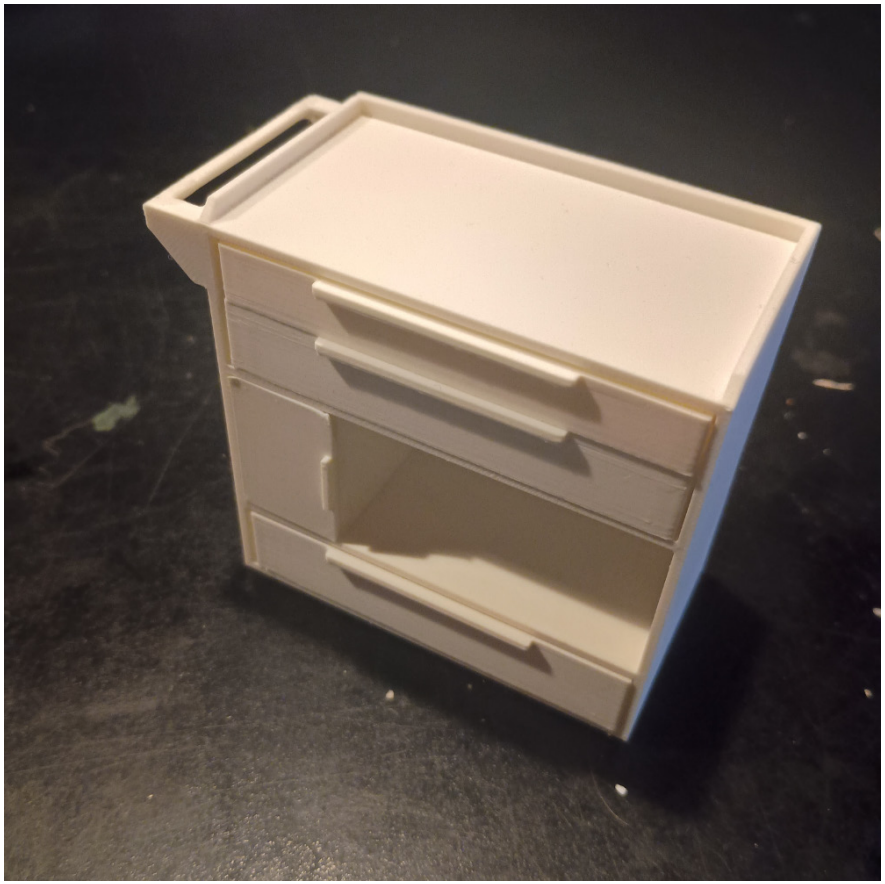
This first prototype of the RecycleHub shows strong potential with its practical layout, and well-defined storage. Still, a few smart adjustments will take it from good to great.

Larger wheels (75mm) will improve movement across workshop floors. Reducing the height of the **top edge trim to 30 mm** makes the surface easier to use while keeping its shape intact. Adding a **door to the jack compartment** helps keep tools secure and the appearance tidy. A **small front edge on the bottom shelf** will prevent bins from sliding out during use. With the **overall height set at 800 mm** including the trim, the design remains compact and ergonomic.

Prototyping

This scale model highlights some important lessons for the next iteration of the RecycleHub. While the core design shows promise, a few practical adjustments are needed to ensure it performs well during transport and daily use.

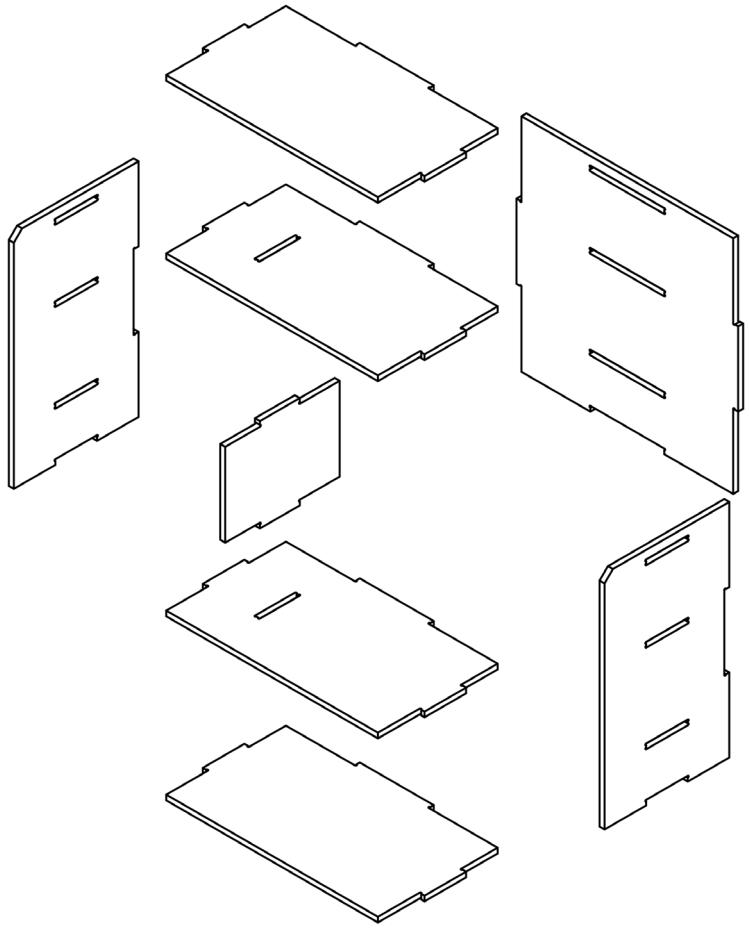
The current **handle sits too high**, making it awkward to lift the unit into a van. **Lowering the grip point would improve control and ergonomics** when loading. The **drawer handles extend outward**, which can catch on surfaces or become damaged in tight spaces. Using recessed or integrated handles would offer a cleaner and safer design. Open compartments allow **bins to slide out during transport**, and **drawers may shift or open on their own**.



Prototyping

The design was **optimized for CNC production**, making it easy to fabricate with digital precision in any makerspace.

By choosing **screw-based assembly instead of glue**, the construction remains fully reversible and repairable, **supporting sustainable use and future reuse of all materials**.



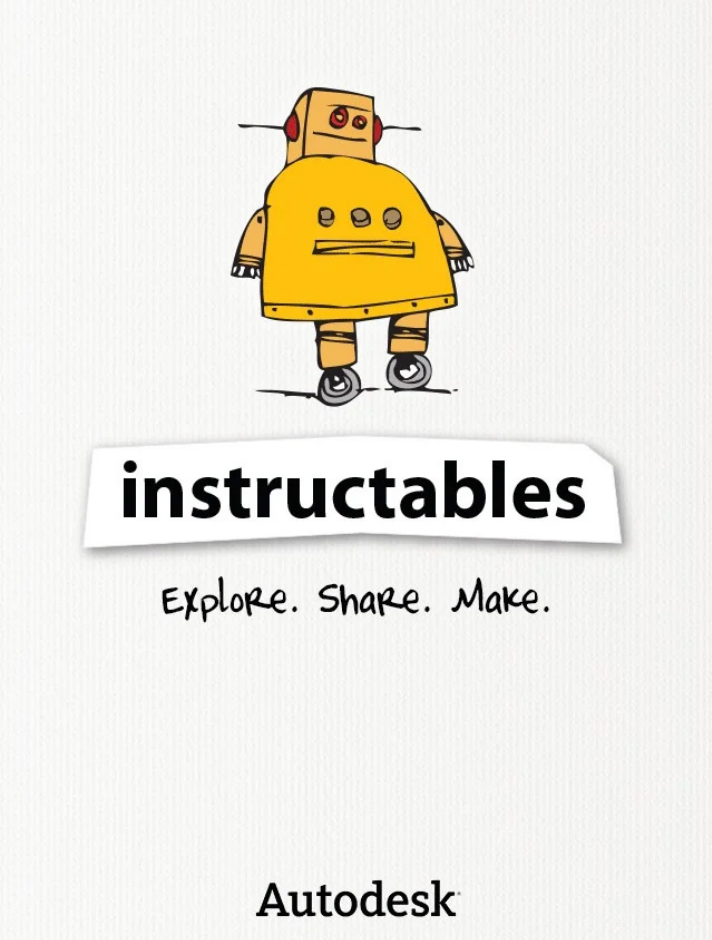
The RecycleHub design

This final design is **practical and straightforward**. With **recessed handles**, a **lower grip bar** and a **heat-resistant top**.

The RecycleHub

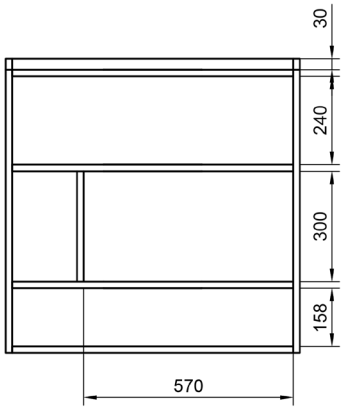
Simple and solid, this final version of the **RecycleHub** is made to **support everyday work**. It **keeps tools within reach**, **materials well-organized** and moves easily through any workspace. Built from **durable plywood** with recessed grips and smooth wheels, it is designed for practical use without unnecessary extras.

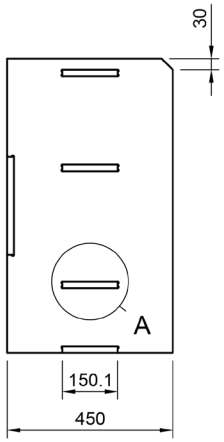
Instructables

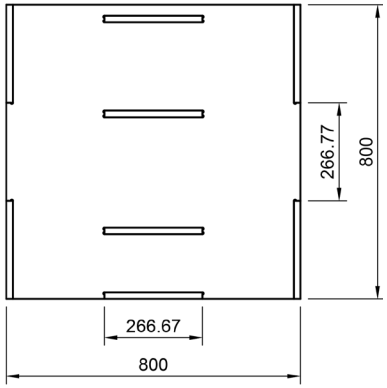


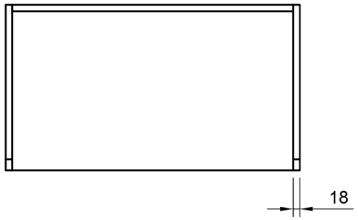
As part of the project's **open-source approach**, a detailed Instructable was created. This guide **walks users through the full building process** of the RecycleHub. It enables anyone to **build, adapt or improve** the workstation. By sharing this knowledge openly, the project **aligns with the philosophy of Precious Plastic** and supports wider adoption of circular solutions.

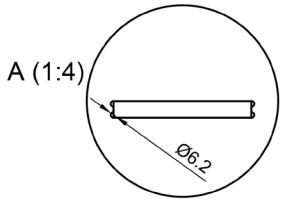
Drawing Corpus



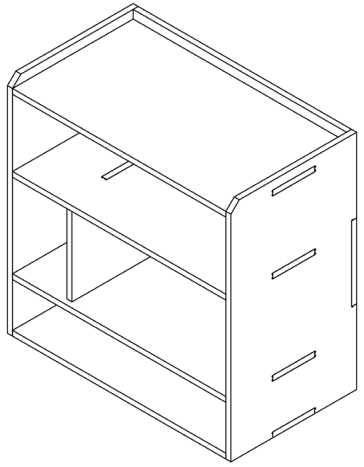




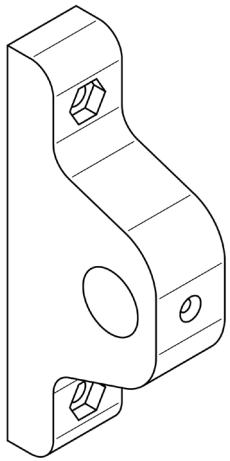




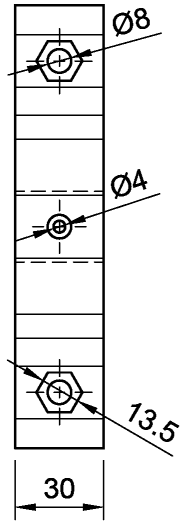
The body is designed for precise CNC cutting, ensuring easy fabrication and consistent quality

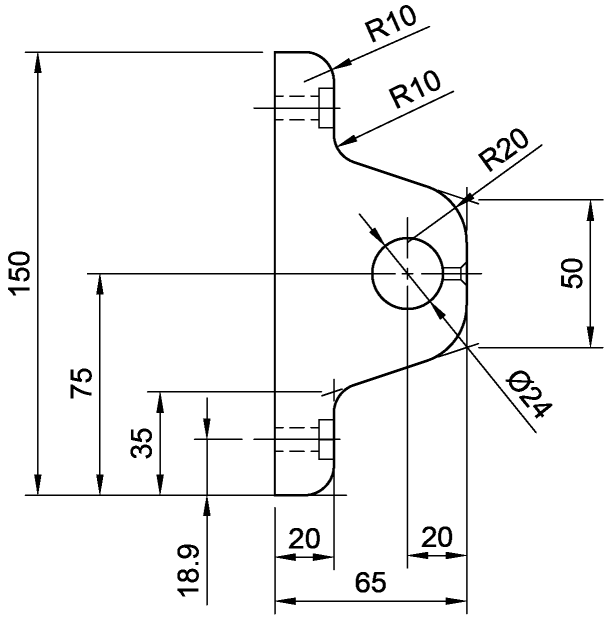


Drawing Handle

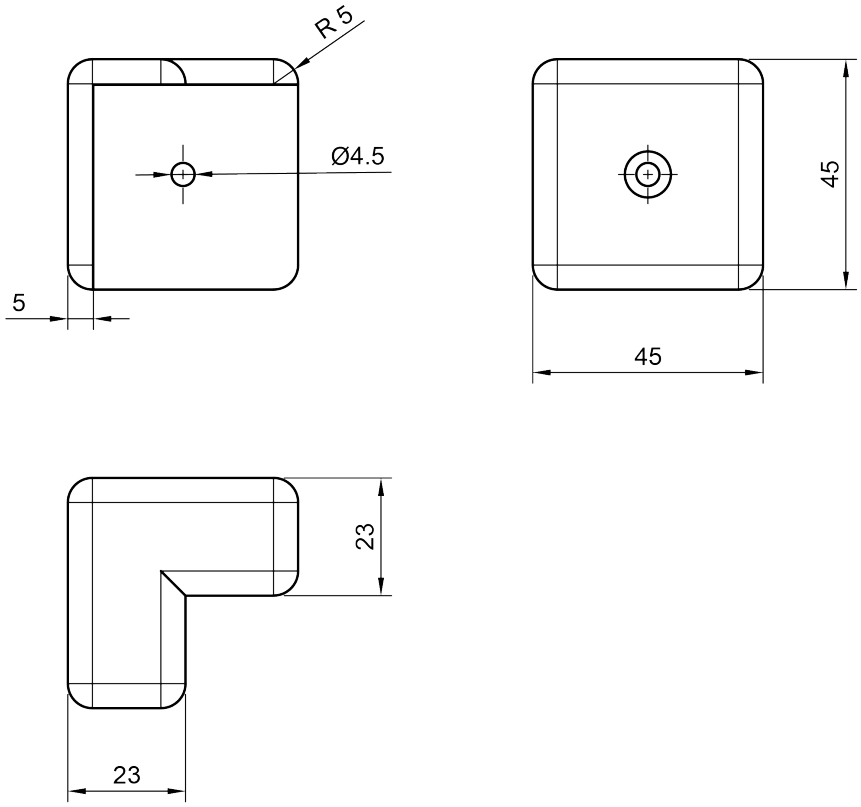


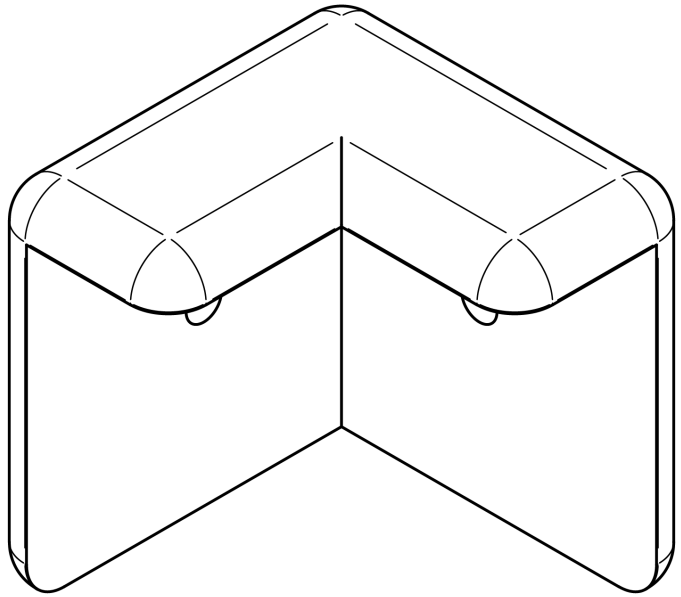
The handle is designed for easy production using CNC-cut recycled plastic sheets or 3D printing with recycled PETG filament





Drawing Corner Protector





The corner protectors are 3D printed using recycled PETG filament

Price

DESCRIPTION	NUMBER	PRICE	TOTAL
Birch plywood 18mm	2	153,00 €	306,00 €
Drawer guides	3	54,40 €	163,20 €
Drawer guide connectors	3	6,13 €	18,39 €
Casters 75mm with brake	4	4,15 €	16,60 €
Locks for drawers	3	13,99 €	41,97 €
Galva plate 764x432x0.6mm	1	23,46 €	23,46 €
CNC hours	2,5	75,00 €	187,50 €
Small matterials	1	50,00 €	50,00 €

TOTAL : 807,13 €

Conclusion

The **RecycleHub** brings **structure to the everyday work** of recycling. What started as a concept to improve workflow has become **a compact and durable workstation** that fits naturally into makerspaces and labs. Every detail has a purpose, from the **recessed handles** to the **sturdy drawers** and **organized layout**. Designed to support hands-on processes, it offers a practical tool for those working with plastic in a thoughtful and accessible way. This final version **reflects a clear focus on function, simplicity and circular use**.