The Single-Mold Stool

A study in manufacturing efficiency and monomaterial design.

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Designer

Daechan Kim

Daechan Kim is a multidisciplinary product designer based in Boston, MA. With a background spanning Industrial Design (B.F.A.) and Experience Design (M.S.), his practice bridges the gap between tangible craft and human behavior.

Daechan approaches design as a form of communication, utilizing rigorous observation and research to create intuitive objects that transcend their medium. His work aims to elevate daily experiences by balancing manufacturing efficiency with the emotional satisfaction of the user.

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Objective

To design a furniture piece using laminated veneer bending that maximizes manufacturing efficiency.

The goal was to fulfill a fundamental functional purpose while minimizing tooling requirements to a single, repetitive form.

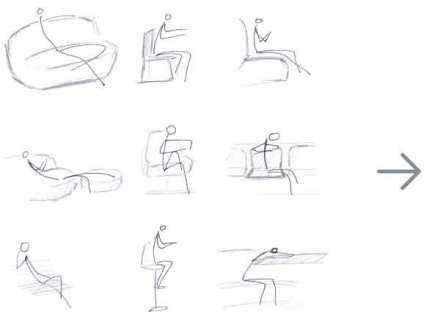
The challenge was to explore simple manufacturing for a simple action.

By embracing the constraints of the material, the project seeks to eliminate excess labor and waste. The result is a system where sustainability is not an additive feature, but the core logic of the form itself.

Observation and Ideation

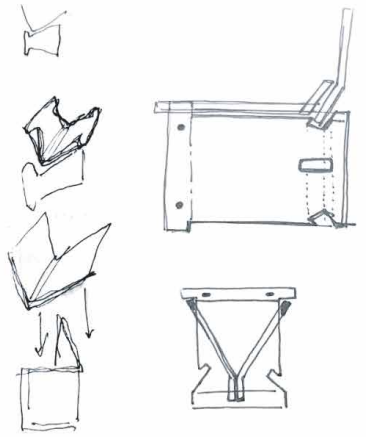
Designing for the body begins with observation.

Early observations focused on how people naturally sit across different environments, capturing variations in posture and informal ergonomics. These insights drove the search for a surface-based form that supports the body without complex decoration.



Sketches from Observation

Captured Postures



Ideation Sketches

Early Concept

Process & Iteration

Early 1:1 Chair Prototype

Pivoted Stool Prototype

Early iterations explored constructing an entire chair from four identical parts.

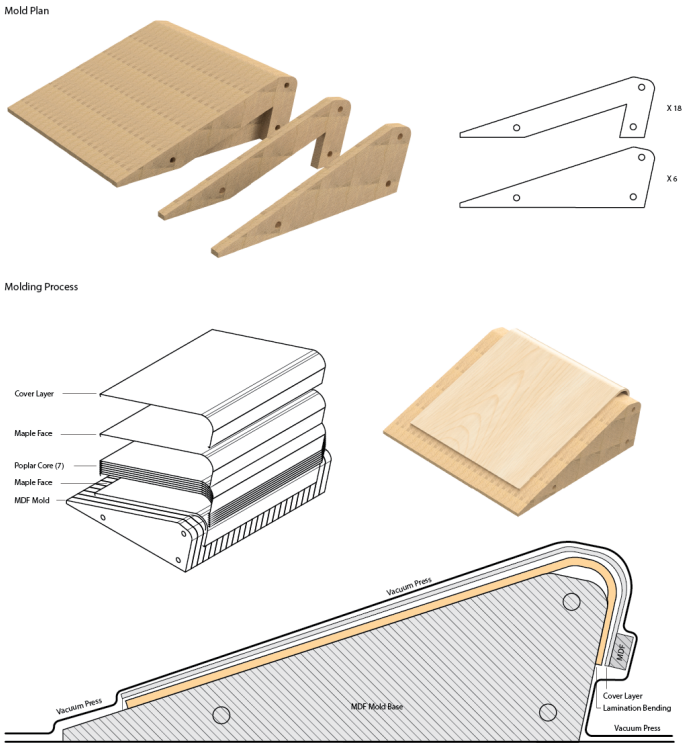
However, the strict constraint of a single repetitive form initially limited the object's ergonomic potential.

By simplifying the design into a stool, the form was allowed to breathe. This pivotal shift opened the space to experiment with strategic cuts and joinery that honored the mold's limits while enabling a stronger, more functional structure

Materiality & Craft

The components are formed using a reusable MDF mold and vacuum press system, ensuring consistent geometry for every part.

The structure relies on a nine-ply lamination process, sandwiching a flexible seven-poplar core between durable maple faces. This composition allows for tight bending radii while maintaining structural rigidity.



Details of MDF Mold and Vacuum Form Setup

Vacuum Press Process

Final Design Concept

The stool highlights the natural materiality of veneer wood and the expressive capability of the bent-lamination process. Its curved form carries a distinct visual identity while serving multiple functional roles across the structure.

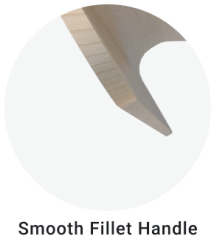
The curve acts as the structural joint that connects the two leg components, while also functioning as a handle integrated into the seat. It introduces a gentle, natural curvature behind the knees, creating a more comfortable seating experience.

Final Design Concept

All three components are crafted from the same mold, differentiated only by their joint-hole placement. This repetition streamlines manufacturing, reduces material waste, and gives the stool a unified and recognizable visual character.

By embracing a system of three identical parts, the stool can be assembled and disassembled using seven pairs of screws and set screws with common household tools. This allows the product to be flat-packed for convenient transportation and storage when needed.

Design Details

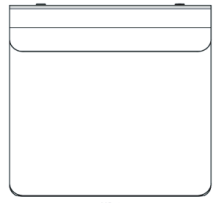


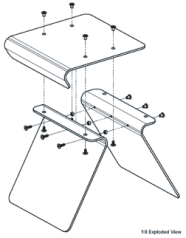
Smooth Fillet Handle

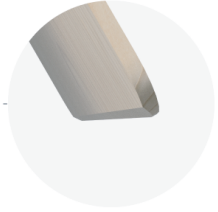
Stackable 3 Parts

Front

Right







Chamfered Feet

The Single-Mold Stool

The stool’s curve is not merely aesthetic.
It is the structural joint, the seat profile, and the interface for the human hand.

The stool proves that strict manufacturing constraints, when respected, can yield objects of singular character and utility.

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