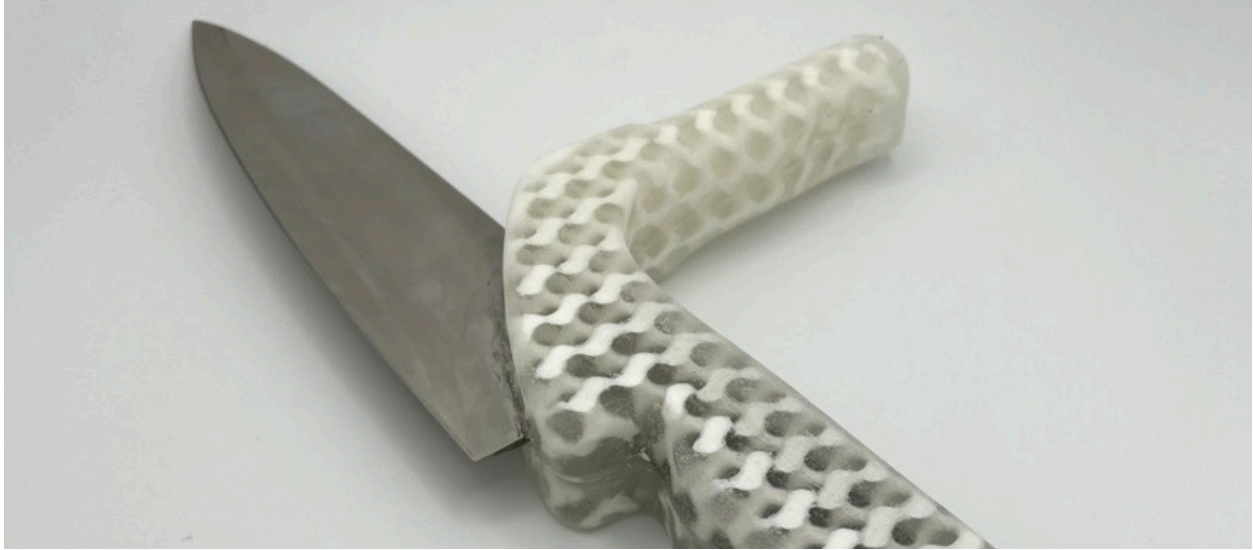


Adaptive Chef Knife

Version 1.0



Limited options are available for a chef with arthritis to continue cutting comfortable. Most commonly available knives with adaptive handles have neither quality blades nor handles strong enough for repetitive usage.

One of the original design requirements was that the handle be removable for cleaning. However, combining an easy-to-remove handle with something strong, safe and sanitary proved challenging, but we were able to satisfy the design challenges by creating a knife specifically for this purpose that can be replicated easily for future clients. The result is a strong, high-quality adaptive chef's knife that can be easily reproduced for others with similar needs.

We placed a handle along the back of the knife blade to allow forearm leverage as opposed to using the wrist. A traditional, wider handle is added to blade to accommodate those needing wider grips.

The body of the handle uses a tessellated PLA form to reduce the amount of resin necessary as well as to add structural stability to the handle.

The use of resin over a 3D-form creates a clean, non-porous surface that will last as long as the blade.

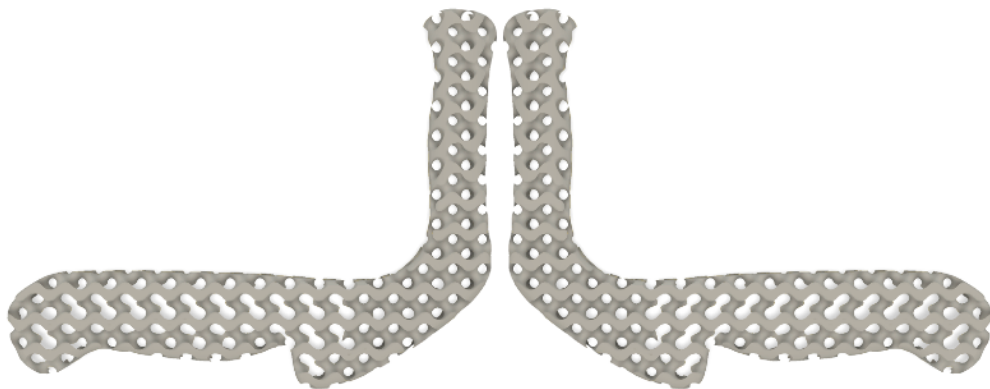
Bill of Materials

Name	Link	# of Pieces	Price	Price per Unit
Knife Tang (without Handle)	Amazon	1	\$20.00	\$20.00
Handle Form (3D Printed)		2	\$0.75	\$1.50
Knife Mould (3D Printed)		2	\$5.00	\$10.00
Vacuum Form Mould (3D Printed)		2	\$0.75	\$1.50
EVA Inner Mould (Vacuum-Formed)		2	\$10.00	\$20.00
Weather Stripping		1	\$0.20	\$0.40

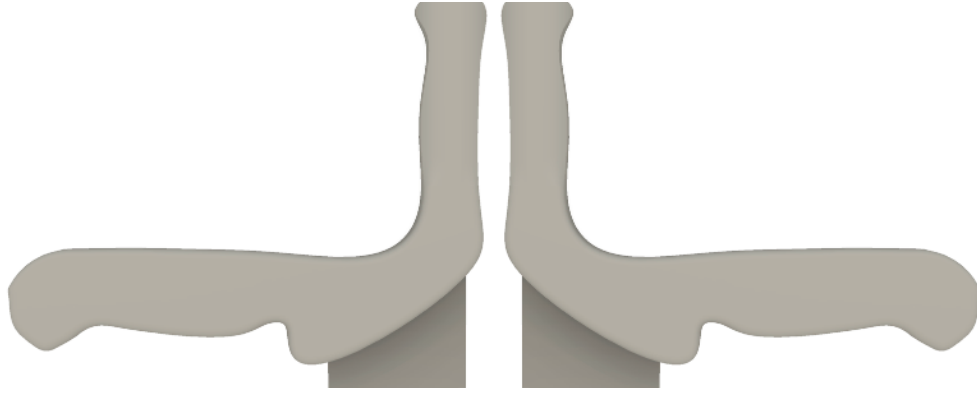
Parts List



Left & Right Knife Outer Moulds (3D-Printed)



Left & Right Knife Handle Forms (3D-Printed)



Left & Right Pressure Form Moulds (3D-Printed)



Knife Tang (without Handle)



1/4" Weather Stripping

Tools

- 3" C-Clamps - x4
- 4" Vice (or similar to secure mould during during pouring/curing)
- Plastic bin for catching resin
- Glue Gun
- 3D FDM Printer
- Vacuum/Pressure Former

Assembly Instructions

3D Printing Instructions

Download all parts from the IATP Maker Website.

The Outer Mould can be printed in PLA and does not require high resolution or high strength.

The Pressure Form Moulds are printed on a dual extruder FDM printer using Varioshore infill with Nylon CF walls. It is advisable to increase the increase the wall layers (3-5) to help resist warping during the pressure-forming process.

Vacuum/Pressure-Forming Instructions

Vacuum forming is the process of warming a piece of polymer until it's pliable then using a vacuum to mould the polymer around an object. Because the polymer is hot, when it makes contact with the model, the heat dissipates through the model. For this reason, we recommend using something stronger than PLA when printing the Pressure Form Moulds.

We used our [Mayku Multiplier](#) pressure former with EVA to create a flexible, removable inner mould allowing the resin part to be easily removed once cured. Pressure forming is similar to vacuum forming, except it pushes the polymer against the object rather than using a vacuum to pull the polymer. The Multiplier exerts 60 psi / 4 ba of pressure, resulting in a highly detailed, accurate mould.

We chose this method over a silicon mould as it allowed us to quickly iterate during the design process with an an easy to replicate template to work with.



Resin Casting Instructions

Use a knife guard to prevent injury!

Place the weather stripping along the channel in either side of the outer mould.

Fit the flexible EVA mould in the outer mould that with the weather stripping.

Insert the corresponding knife handle form into the EVA.

Before placing the knife tang, run a bead of hot glue along the EVA where the handle will meet the blade. Place the knife tang against the assembled form and run a second bead of hot glue along the exposed blade side. *The hot glue helps prevent leakage along the blade.*

Repeat assembly with the opposite side, but without the weather stripping.

Fit both sides together carefully (align channels) and secure using the c-clamps, distributing the tightening process.

Be sure knife guard is in place. Suspend assembled mould so the funnel is facing up. *Place a disposal bin beneath mould to catch spillage.*

Slowly pour prepared resin into funnel until full. Wait until fully cured before disassembling mould.

**Using a vacuum chamber will help remove the bubbles from the resin, creating a more translucent finish.*



Finishing



Carefully disassemble mould and remove knife. With guard still in place, use a Dremel or file to remove excess resin. Sand until smooth. Fill any air pockets with additional resin. Sand until smooth then coat with wax.