

local class

[guerilla guide to CNC machining](#)



<https://lcamtuf.coredump.cx/gcnc/>

https://player.vimeo.com/video/707650918?badge=0&autoplay=0&player_id=0&app_id=58479

<https://thenounproject.com> (not free anymore ☹️)

[How to a make Crystal Clear Ice Sphere](#)

<https://www.smooth-on.com/product-line/mold-max/?quicksearch>

<https://fabacademy.org/2021/labs/kamplintfort/students/mattissen-gerhard/assignments/week15/>

<https://fabacademy.org/2021/labs/kamplintfort/students/mattissen-gerhard/assignments/week18/>



https://fabacademy.org/archives/2015/eu/students/postma.ronald/02_progress/week_09.html



<https://fabacademy.org/2020/labs/leon/students/adrian-torres/week15.html>

[ferris File-A-Wax](#) 148x88x37mm

<https://youtu.be/wMRSPXt48CI?si=QapaiAiej4CBpQQa>

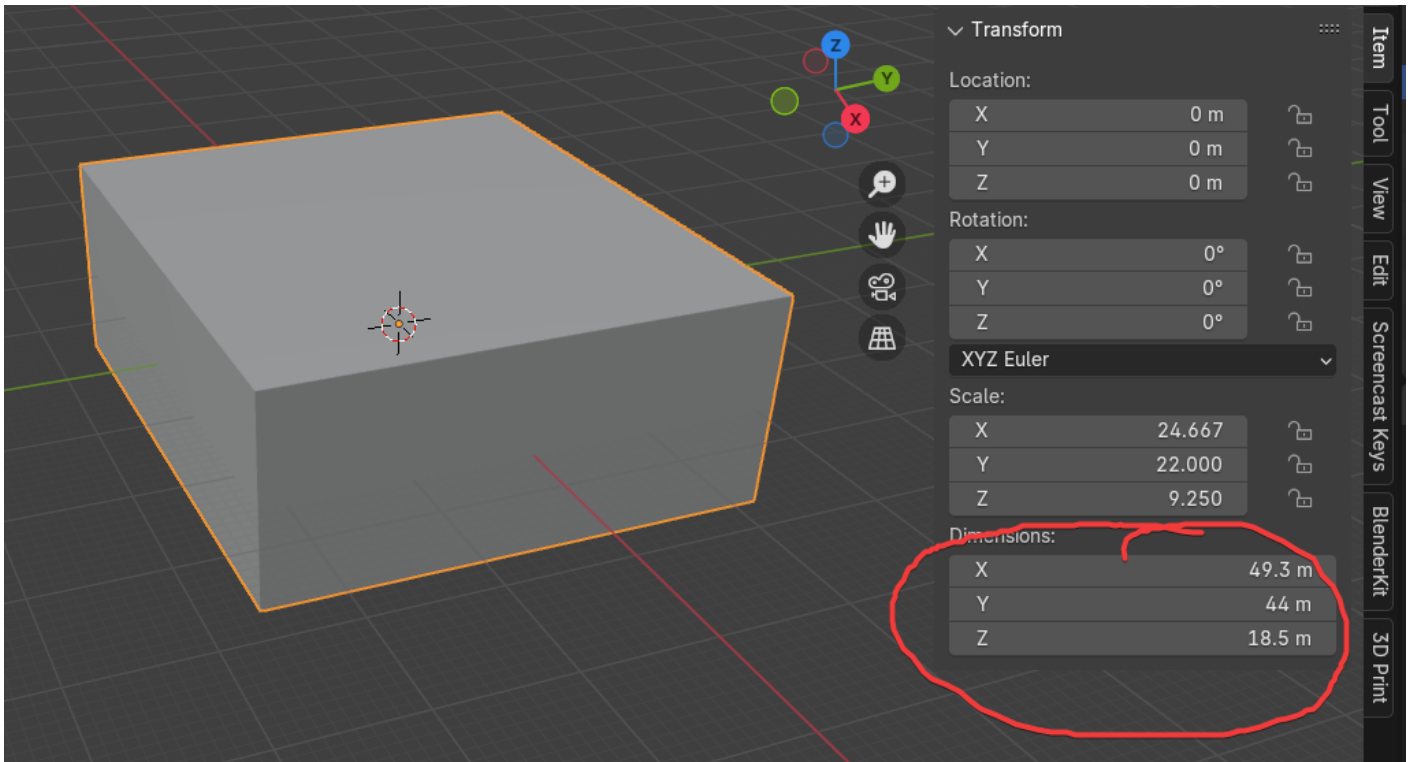
[3D Printed Injection Molds - The Craftsman Steady Craftin](#)

Lifecasting:

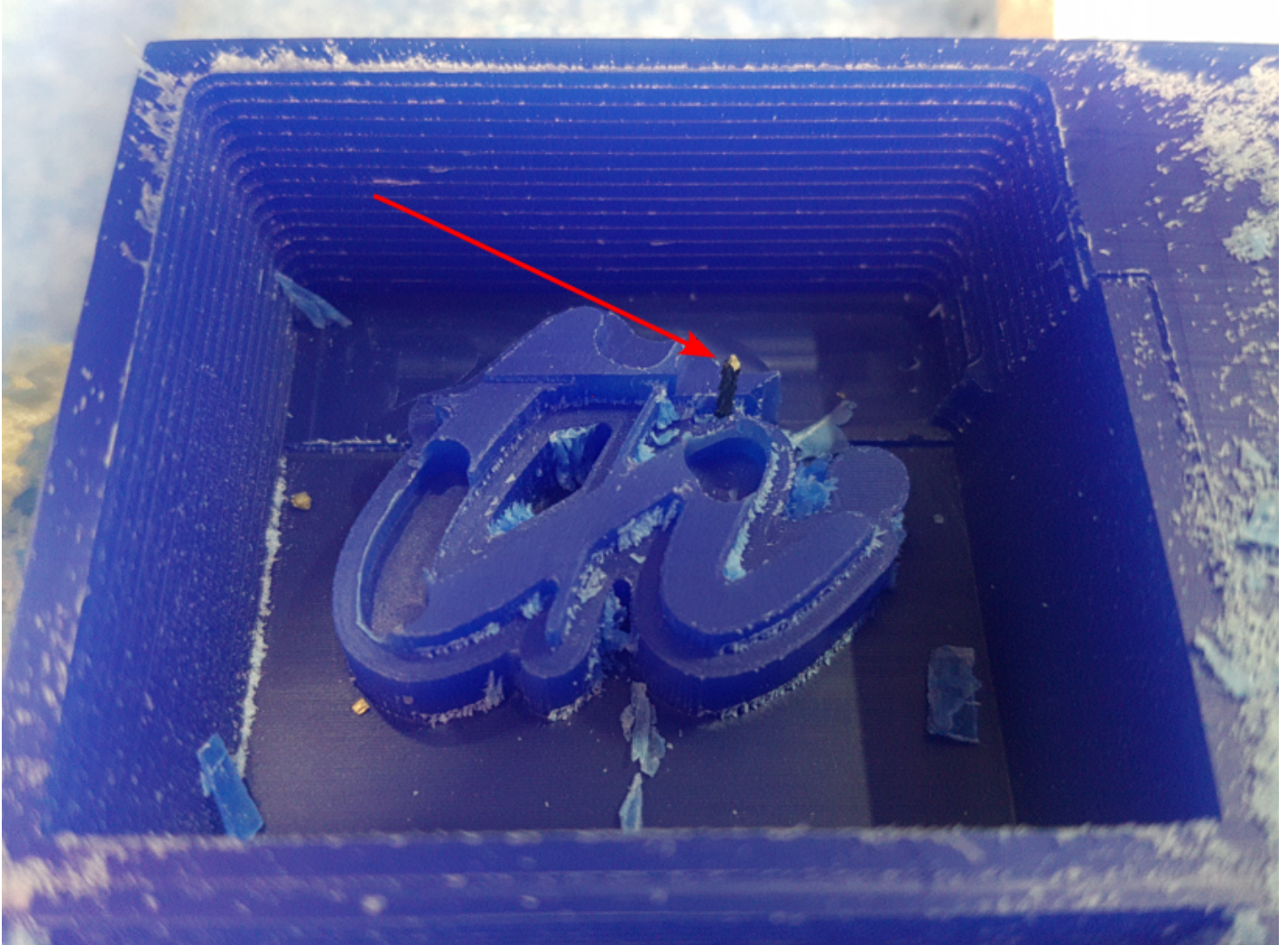


Blender - mods

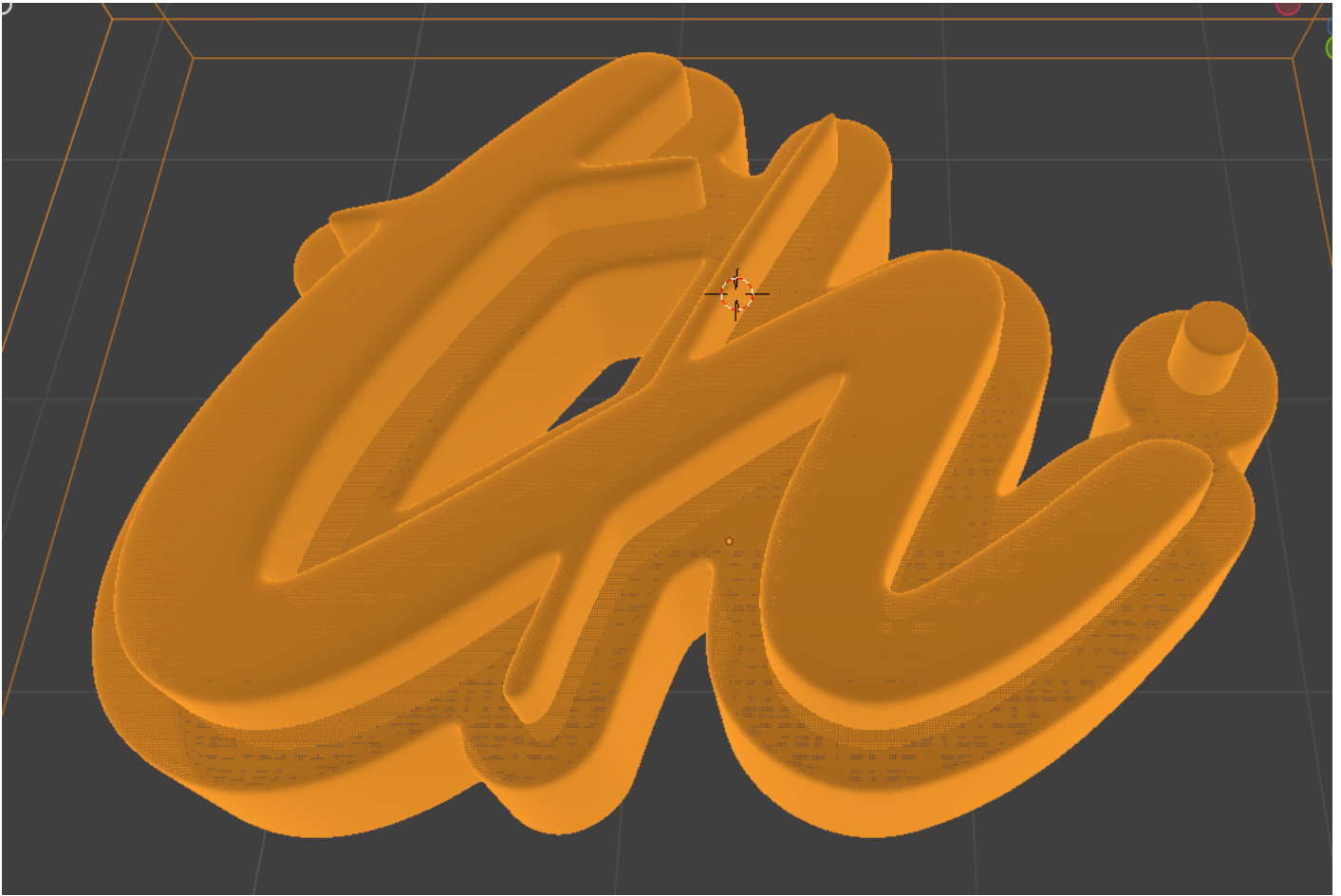
If you model your part in blender, you should start with a cube 49.3333 m x 44 m x 18.5 m in size.



Hmm...I was just about to document the blender - mods - workflow when this happened:



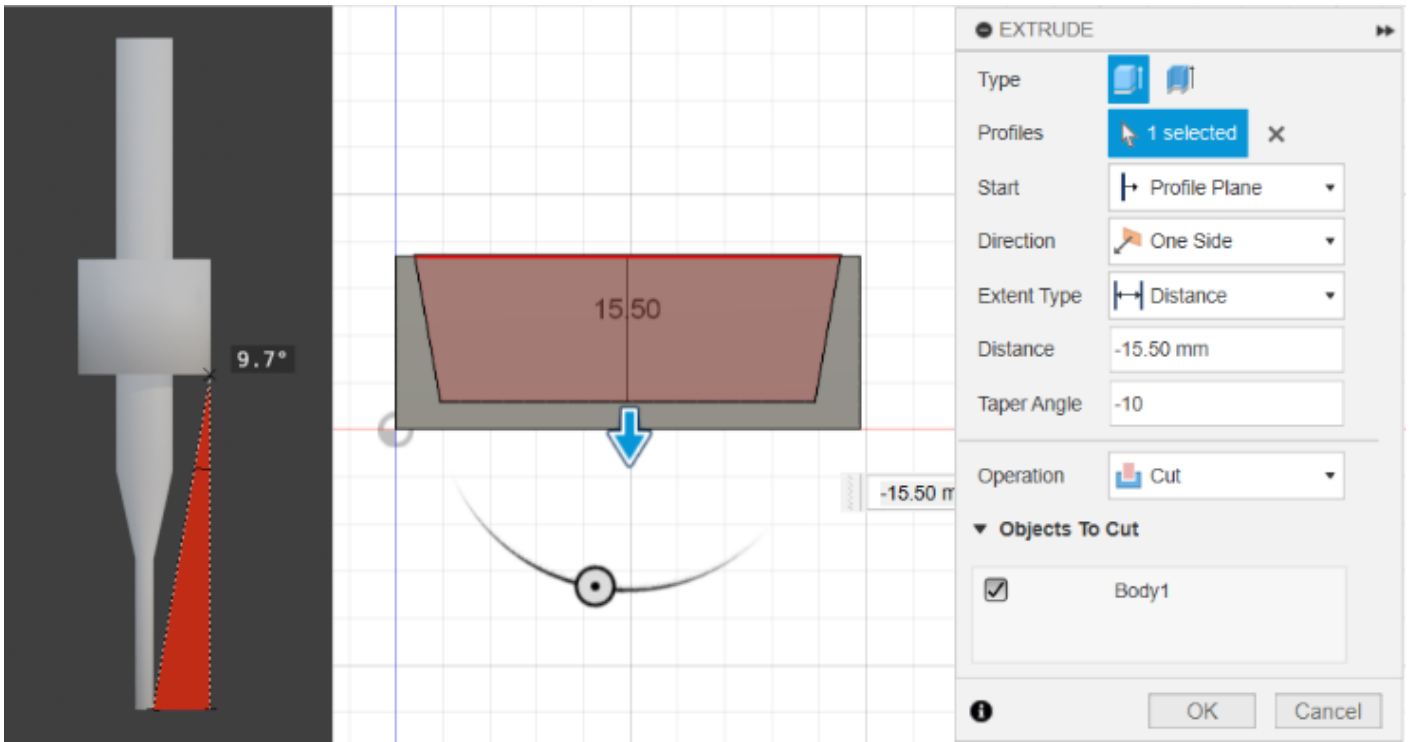
If the roughing doesn't enter in a hole and the finishing is 5 mm deeper, the tool breaks.



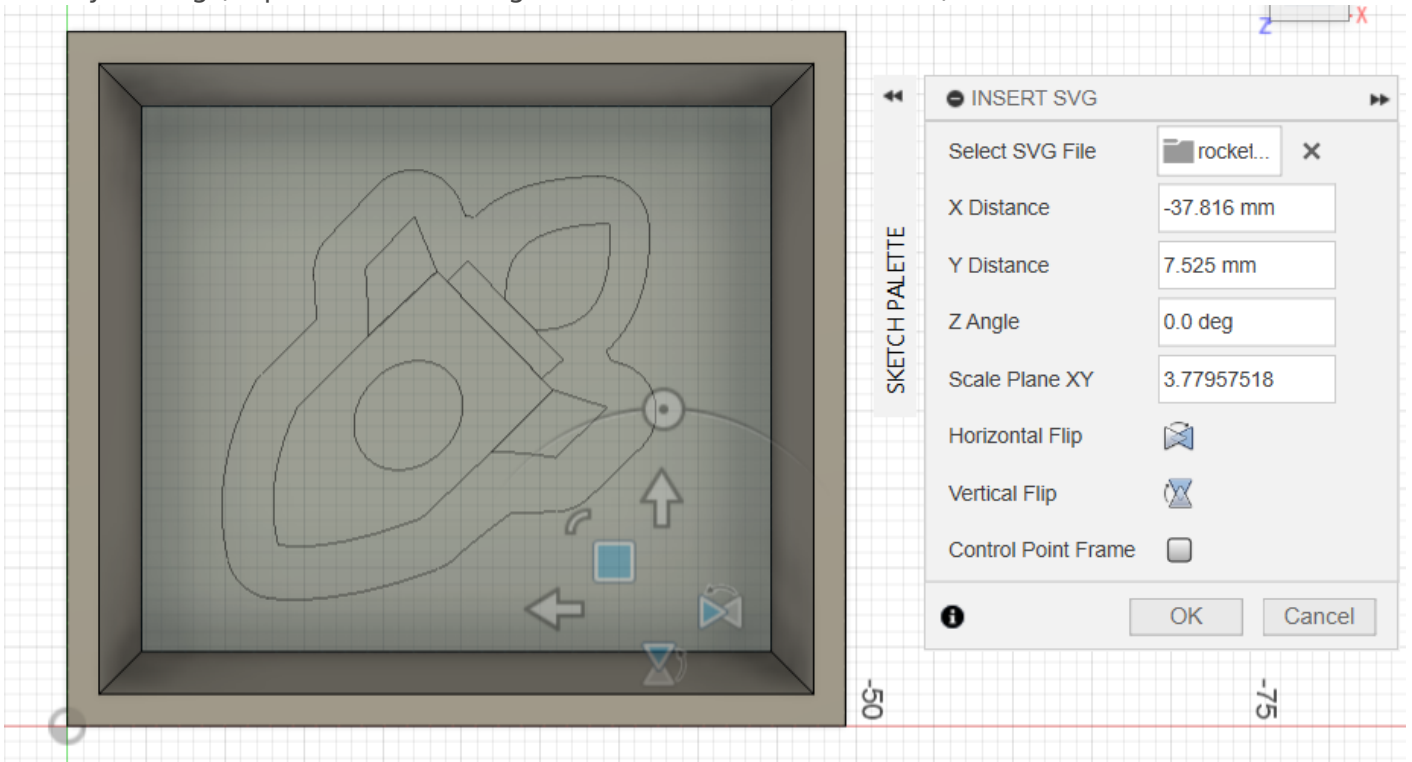
Let's use Fusion

Fusion

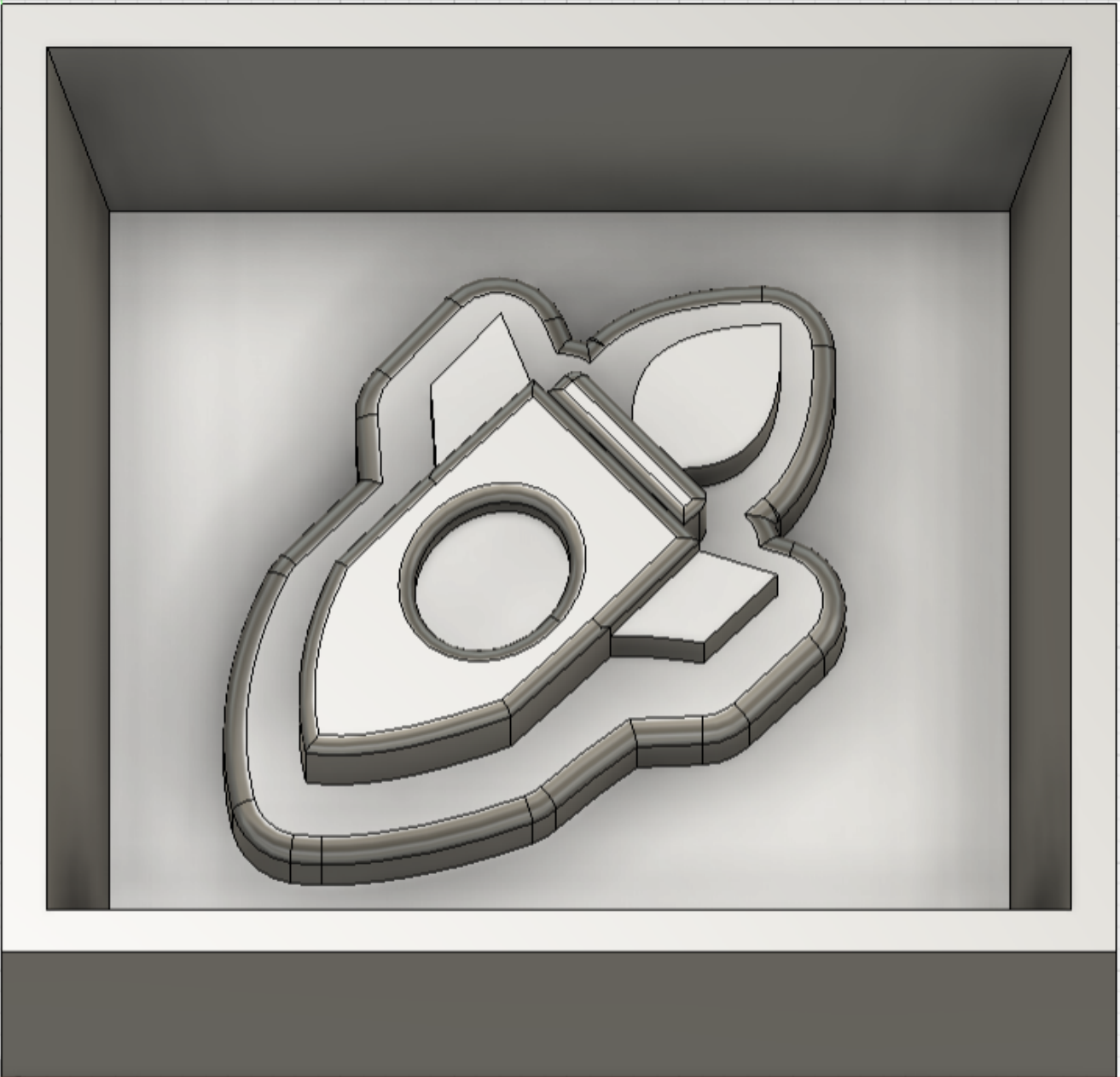
Extrude a box 49,3333 mm x 44 mm x 18,5 mm Create a cavity 2mm from the edge, 15,5 mm deep. If you give the sidewalls a 10° draft angle, you won't be able to hit it with the 1mm mill.



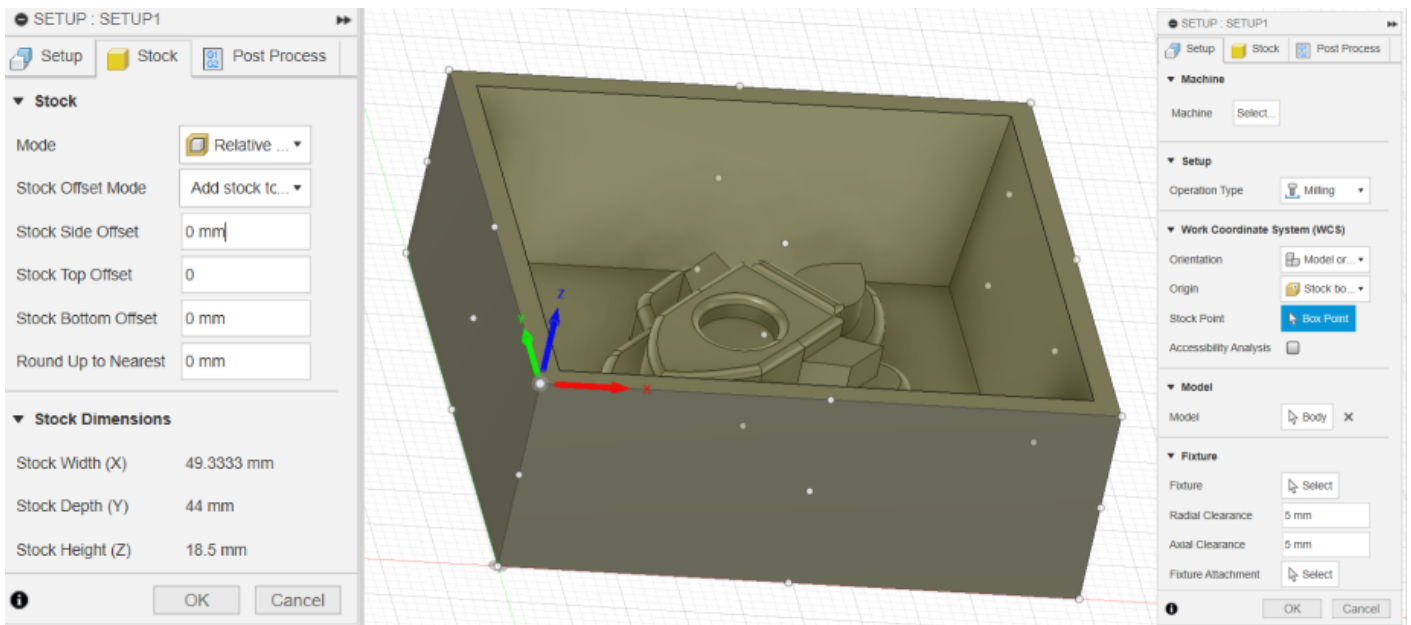
Place your svg (imported with the right scale factor of 3,77957518)



and extrude it.



In the Manufacturing workbench we create a setup, with a stock of 0-offset and the origin bottom-left at the upper corner:



For the roughing I use "Adaptive Clearing" with the following settings:

ADAPTIVE : ADAPTIVE1

Tool

Tool: Select...
#5 - Ø3.175mm...

Coolant: Flood

Feed & Speed

Preset: Default pres...
Spindle Speed: 5000 rpm
Surface Speed: 49.8728 m/min
Ramp Spindle Speed: 5000 rpm
Cutting Feedrate: 1000 mm/min
Feed per Tooth: 0.2 mm
Lead-In Feedrate: 1000 mm/min
Lead-Out Feedrate: 1000 mm/min
Transition Feedrate: 1000 mm/min
Ramp Feedrate: 333.333 mm/min
Plunge Feedrate: 333.333 mm/min
Plunge Feed per Re...: 0.0666667 mm

Shaft & Holder

ADAPTIVE : ADAPTIVE1

Geometry

Machining Boundary: None

Stock Definition

Define Stock By: Stock bo...

Model

Avoid/Machine Surfaces

View Absolute Values:

Surface Groups: Group

Name	Radial	Axial
Model	0 mm	0 mm

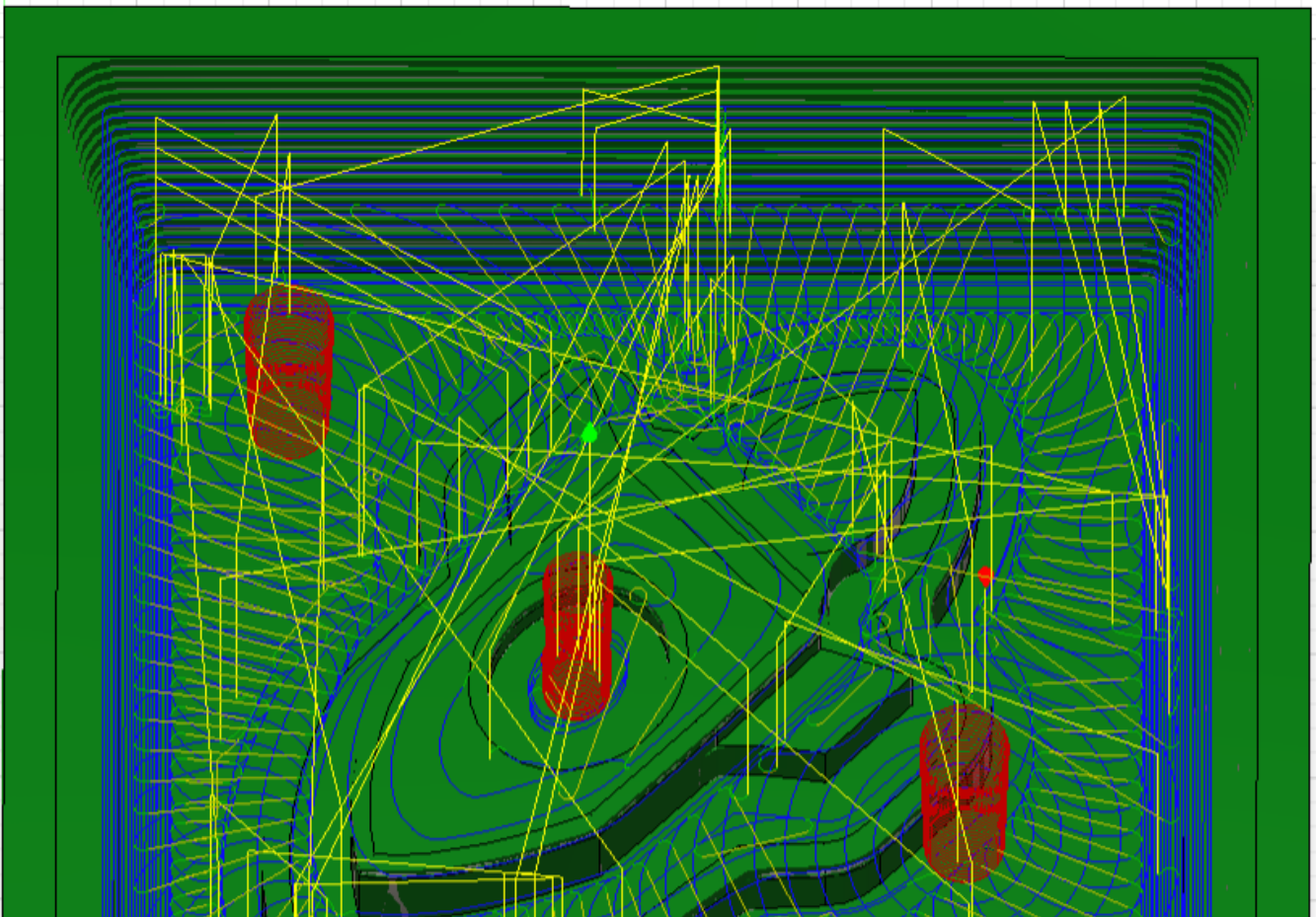
Total Radial Stock Tr...: 0.5 mm
Total Axial Stock To L...: 0.5 mm

ADAPTIVE : ADAPTIVE1

Passes

Tolerance: 0.1 mm
Machine Shallow Areas:
Optimal Load: 1.27 mm
Both Ways:
Minimum Cutting Radi...: 0.3175 mm
Machine Cavities:
Use Slot Clearing:
Direction: Climb
Maximum Roughing S...: 7.9375 mm
Fine Stepdown: 0.79375 mm
Flat Area Detection:
Minimum Stepdown: 0.0001 mm
Minimum Axial Engag...: 0 mm
Order by Depth:
Order By Area:

Stock to Leave
 Fillets



For the finishing I use Parallel:

The image displays three parallel milling operation settings in a CAD software interface, all titled "PARALLEL : PARALLEL1".

Left Panel (Tool & Feed & Speed):

- Tool:** Select...
#3 - Ø1mm flat...
- Coolant:** Disabled
- Feed & Speed:**
 - Preset: PCB/Carbor...
 - Spindle Speed: 12000 rpm
 - Surface Speed: 37.6991 m/min
 - Ramp Spindle Speed: 12000 rpm
 - Cutting Feedrate: 500 mm/min
 - Feed per Tooth: 0.0208333 mm
 - Lead-In Feedrate: 500 mm/min
 - Lead-Out Feedrate: 500 mm/min
 - Transition Feedrate: 500 mm/min
 - Ramp Feedrate: 333.333 mm/min
 - Plunge Feedrate: 333.333 mm/min
 - Plunge Feed per Re...: 0.0277778 mm
- Shaft & Holder:** (unchecked)

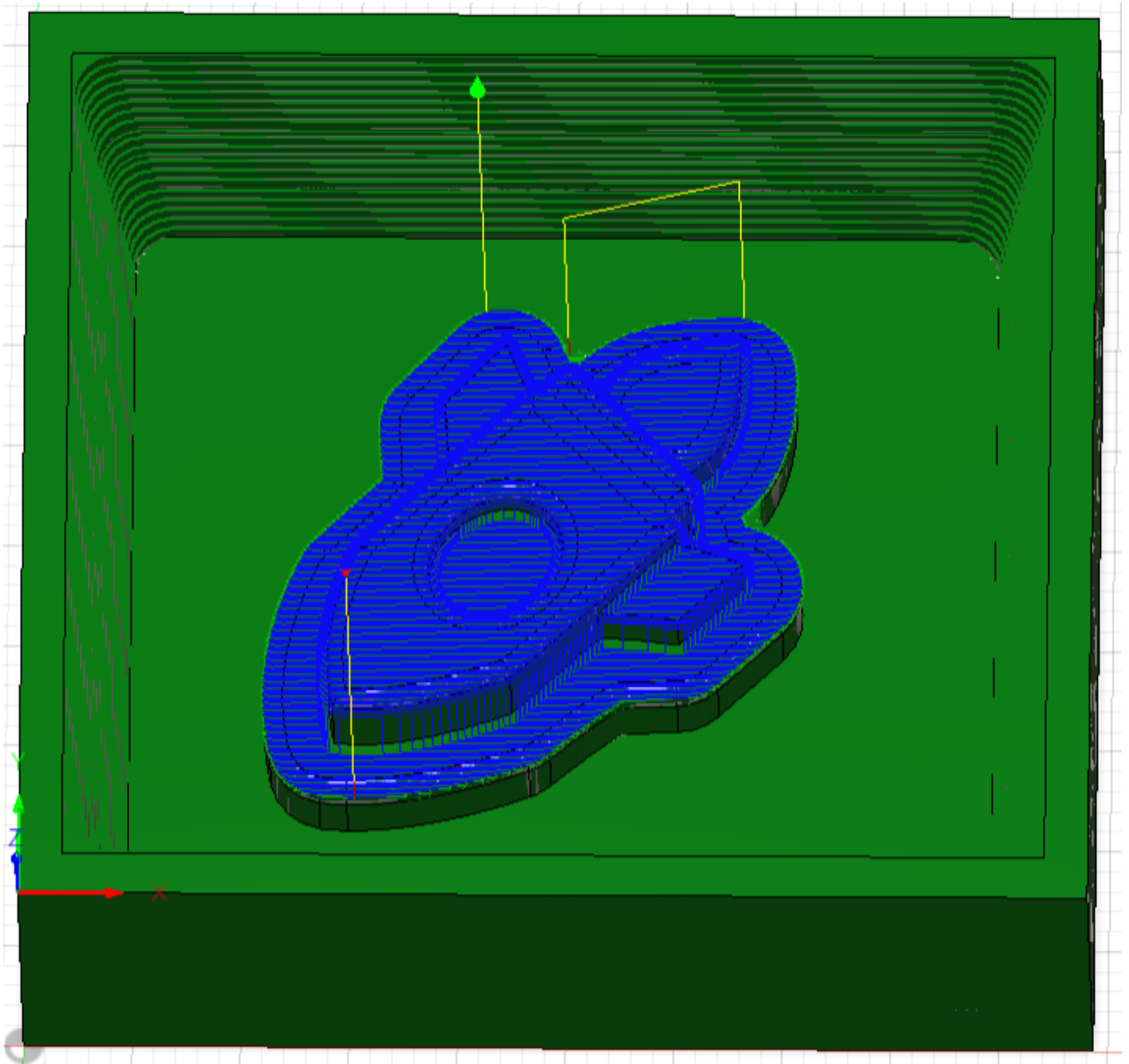
Middle Panel (Geometry):

- Machining Boundary:** Selection
- Machining Boundary...:** Select
- Closed Chain 1:** (highlighted)
- Tool Containment:** Tool cent...
- Additional Offset:** 0 mm
- Contact Point Bounc...:** (unchecked)
- Contact Only:** (checked)
- Slope:** (unchecked)
- Rest Machining:** (unchecked)
- Model:** (unchecked)

Right Panel (Passes):

- Tolerance:** 0.01 mm
- Machine Steep Areas:** (unchecked)
- Add Perpendicular Pa...:** (unchecked)
- Simple Ordering:** (unchecked)
- Pass Direction Referenc...:** Select
- Pass Direction:** 0 deg
- Stepover:** 0.1 mm
- Cusp Height:** 0.07071 mm
- Direction:** Both w...
- Up/Down Milling:** Both
- Multiple Depths:** (unchecked)
- Stock to Leave:** (unchecked)
- Fillets:** (unchecked)
- Smoothing:** (unchecked)
- Feed Optimization:** (unchecked)

Central Preview: A 2D view of a part with a highlighted machining boundary. The preview window includes "OK" and "Cancel" buttons.



Total time is 23:27

Revision #16

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