

# Advanced Prototyping Center

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The Advanced Prototyping Center (APC) is a new state-of-the-art facility where researchers can design and construct scientific instrumentation. It is a Yale core facility open to the entire Yale community. To access the APC contact James Nikkel, who holds regular office hours to help users.

## Water Jet Cutter



The Flow Nano Jet Abrasive water jet cutter is the most powerful machine in the APC, cutting through almost any material.

### Capabilities:

- Cuts material up to 10 cm thick
- ~10  $\mu\text{m}$  positioning accuracy
- 1.2 m x 0.65 m cutting area
- Nozzle rises up to 15 cm vertically
- 0.02 mm / 0.3 m linear straightness accuracy

## Laser Cutter



The Coherent Meta2C is a 250 W laser that cuts and engraves quickly and easily on materials such as acrylic, paper, wood, and thin steel.

### Capabilities:

- Cuts up to 2.5 cm thick acrylic
- ~25  $\mu\text{m}$  positioning accuracy
- 1.23 m x 1.23 m cutting area
- Platform lowers 30 cm vertically
- Onboard camera for alignment and tracking

## 3D Printers



Two Formlabs Form2 SLA printers and a Dremel 3D20 FDM printer enable rapid prototyping of complicated plastic parts.

### Form2 Capabilities:

- 25  $\mu\text{m}$  layer thickness
- 14.5 x 14.5 x 17.5 cm build volume
- Resins of diff. strength, flexibility, and color

### Dremel Capabilities:

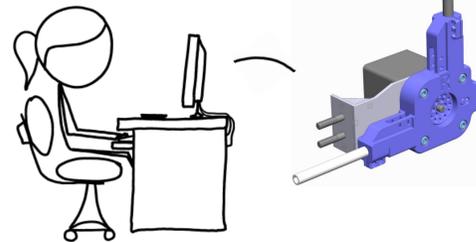
- FDM (filament) printer
- 100  $\mu\text{m}$  resolution
- Minimal post-processing of printed object is required

## Rapid Prototyping: Start to finish

1. Have an idea. → 2. Make a design.



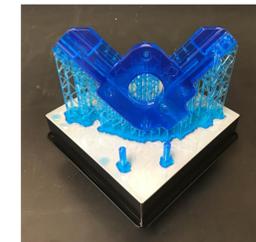
The APC welcomes researchers from all departments!



Computers with CAD software such as Solidworks as well as machine-specific CAM software are available at the APC.

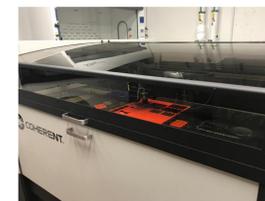
3. Start prototyping. Use different tools to fit your project's needs.

3D print complex plastic shapes.



Cut structural metal parts on the water jet.

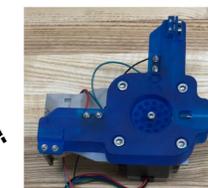
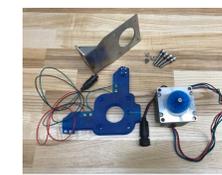
4. Assemble and test your prototype.



Engrave or cut acrylic parts with the laser cutter.



Work safely!



5. Iterate till it works.

Repeat steps 2-4 until you get it right!



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