Waterjet Cutter

- Supersonic water/grit jet
  - 0.75mm OD jet
  - Cuts through material
    - No complex machining
- Material clamped to table
  - Sheet
  - Submerged
Waterjet Cutting

Advantages

• Many materials & gauges
  – Al
  – Fe
  – Plywood
  – Plastic
  – Glass
  – Tile
• Complex cut paths

Disadvantages

• Dangerous
  – You don’t have DIRECT access
• Flat parts only
• Med to large parts only
• 1 machine only
  – Downtime
• Larger setup time than 3D printer

Additional Information

Sheet Metal Thickness

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<th>Gauge</th>
<th>inch</th>
<th>mm</th>
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Material / Quotas

• List of available materials posted soon.
• Provide machinist with custom material.
  – Max Size = 2ft x 4ft
• Job cost
  – Overhead cost (setup)
  – Part cost (cut time)
• Quota: To be announced

Order Parts

• Have part files inspected and approved.
• Email 3d@ece.ubc.ca
• Subject
  – Course / Group / Waterjet
• Body
  – Material & Thickness
  – # Copies (refer to each part by name)
  – Outside dimensions (refer to each part by name)
  – Optional
    • Slow cut speed for smoother finish
    • Instruction for where material is if provided by you
• Attach all associated .dxf files
• Parts left with TA in MCLD 306
Example

• Subject
  – ELEC 391 / Grp C7 / Waterjet

• Body
  – Material: 12Ga Fe
    – ring.dxf: 1 copy (OD = 350mm x 350mm)
  
  – Material: 12Ga Brass (provided by me)
    – pinion.dxf: 4 copies (OD = 100mm x 100mm)
  
  – Please use the brass sheet metal with my group number marked on it for the pinions. The material was dropped off with Mark in the machine shop on Jan 12.

• Attachment
  – ring.dxf
  – pinion.dxf

Specify Material Dimensions

• Flatten Part

• Use Measure Tool in Evaluate Bar to measure Bounding Box

• Round up
Water-Jet Cutting Width

Convex corners are SHARP
Concave corners are ROUND

Jet-Width Compensation

Jet width is compensated for accurate part

Software identifies part & scrap
Impossible Parts: DXF with Nodes

- Node = 3 or more lines converging at a point
- What is the part and what is the scrap?

Part cannot be made by Water-Jet cutter

Optimize Cut Time

- Minimize sharp corners
  - Fillets
- Minimize number of cut paths
- High cut speed (default)
- Same material for all parts
3D Parts

**FE**
- Cut
- Bend
  - Brake
- Spot-weld
- Sand-blast
- Paint / Powder Coat

**AL**
- Cut
- Bend
  - Brake
- Drill
  - Mate hole
- Rivet / tap / screw
- Finish
  - Sand-blast
  - Polish

Design Considerations

- Stiffening rib
- Brace
- Spot-weld-able Fasteners
  - Material too thin to tap / countersink
- Bend indicator
- Perforation
- Pilot hole