

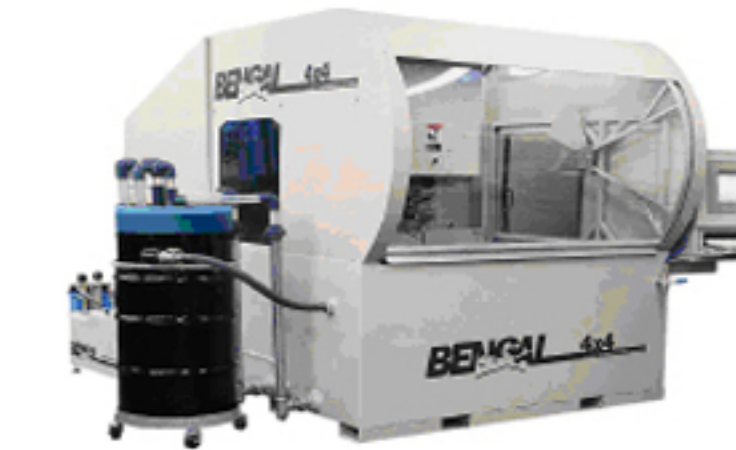
Laser & Waterjet Technology Capability

Challenge

- The objective of IPRO 323 is to understand the functioning of waterjet and laser technologies.
- In addition, the IPRO seeks to investigate the possibility of small industries employing these technologies and benefitting from their efficiency.

Solution

- In order to accomplish these objectives, the team conducted extensive research to gain background information on laser and waterjet technologies.
- We also examine the roles that lasers and waterjets currently have in the manufacturing industry and what more can be done to use these technologies more extensively in small businesses.



- The word LASER is an acronym for Light Amplification by Stimulated Emission of Radiation.
- Lasers are devices that amplify light and radiate coherent light beams in a straight line.
- Coherent light beams propagate in step with one another. It is this highly directional property of Laser beams that make them extremely useful for precision cutting.

- Waterjets use highly pressurized water stream to cut through materials.
- Filtered water is pressurized by an intensifier pump and channeled to mixing tube.
- Mix of abrasive and water exits the mixing tube as a coherent stream and cuts the material.

Uses

- Laser cutting and Waterjet work by directing a high power pulsed laser or pressurized water at a specific location on the material to be cut.
- Laser and Waterjet are accurate cutting tools for manufacturing materials.
- Laser and Waterjets are used for rapid prototyping and provide a cost effective solution for short run production.
- Waterjet are used in the food industry for rapid cutting of food products.
- Lasers are also used for welding and drilling.



Figure 1: High speed laser machining of composite plastic, fiberboard, rubber, paper, etc.
 Figure 2: Wooden box precisely cut and decorated from one flat piece of wood using one simple graphics file.

Website



www.iit.edu/~ipro323s06

Team



Ali Gowani, Bennett Ingvaldstat, Hyung Choe, Hassaan Nasir, Jimmy Lie, Trevor Waller, Sangmin An, Prof. Keith McKee



Water Jet factory visit at JDA Aqua Cutting, Inc.