

# M2.04 – Makerspace Cutting Safety

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## Problem Statement

- In the Ingram Hall Makerspace, the Torchmate 4400 and the Waterjet E1515 are currently able to run without any safety features in place
- Difficulty moving UV screen around the Torchmate 4400

## Project Purpose

- Design a better safety system for the Torchmate 4400 that can be easily stored and better screened off when in use, while also having the most visibility when not in use.
- Incorporate cutoff switches that stop both machines when safety features are not in place.

## Current Setup

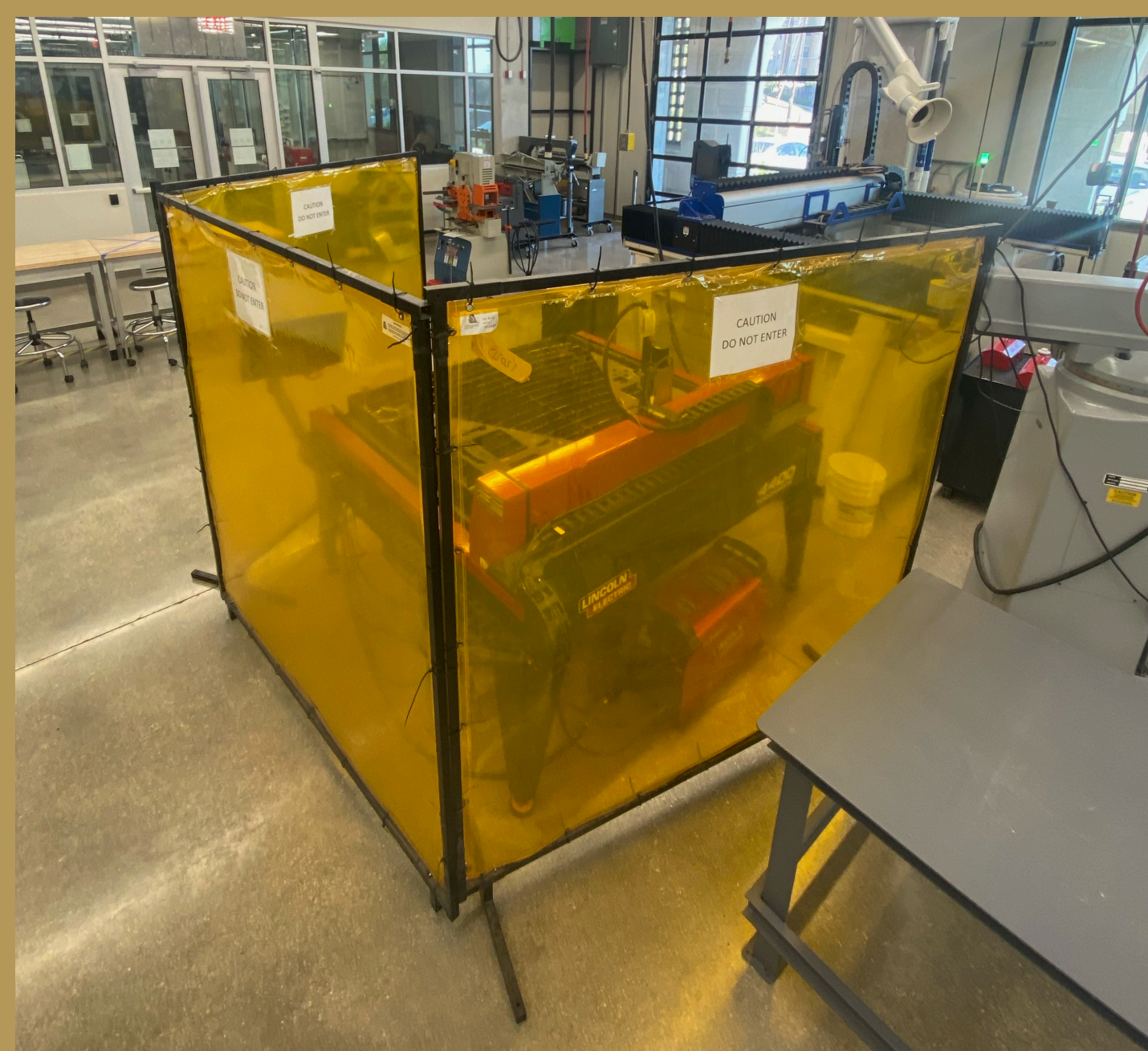


Figure 1. Torchmate 4400 Current Setup



Figure 2. WaterJet E1515

## Final Design

### Torchmate 4400

- Curtain Track System that operates like a shower curtain.
- Guide poles installed on every corner with mounts.
- The guide pole on the front right corner will be where the screens will latch by using the guard switch.
- Safety feature will be a guard switches that is connected to the computer corner guide pole with the key being connected to the end of the UV screen.
- UV welding screen color will be a shade 8 to accommodate to the amperage used.

### WaterJet E1515

- A guard switch will be placed vertically on the inside of the left side of the machine and the key will be connected to the door. When the door is shut, the key will go directly into the guard switch.
- Once the door opens the key will disconnect from the guard switch, causing the machine to automatically shut off.



Figure 3. Torchmate 4400 Design Set Up



Figure 5. Guard Switch



Figure 6. Guard Switch Casing



Figure 7. Guard Switch Placement For Torchmate 4400



Figure 4. Torchmate 4400 Final Design



Figure 8. Guard Switch placement For Waterjet E1515

## Customer Needs

- UV screen is not in the way of loading/unloading
- UV screen maintains eye safety
- Easily portable
- Aesthetically pleasing
- Safety mechanism for both machines are not easily bypassed or triggered
- Override electronics must have the ability to be integrated
- Product easy to use
- Accommodate to the 99th percentile of male height
- No operation without safety

## Fabrication



Figure 9. Cardboard Mount Models



Figure 10. Mount Testing



Figure 11. Welding



Figure 12. Welded Washers

## Design Team



Top left:  
Tatiyanna Bardwell  
Top Right: Michigan Bell  
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## Sponsors

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