

# Laser Slug Detection and Removal System



## Team

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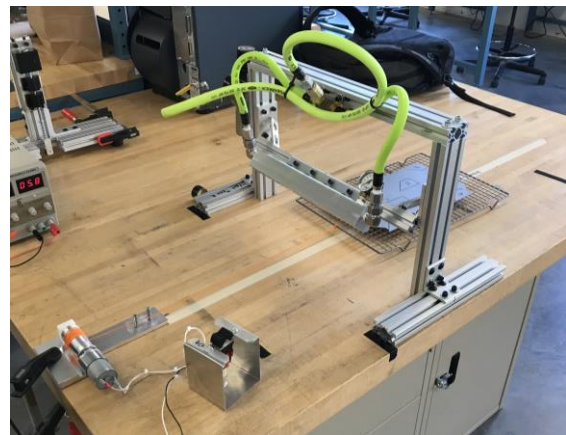


## Project Summary

nVent has contacted Senior Design Team A to develop a solution for the existing problem with their fiber laser cutter on their electrical box production line. Currently, scrap metal (called slugs) can land on the surface or weld themselves to the sheet metal, which causes crashes in the machinery down the line if not removed. High-skill technicians currently remove the slugs by hand, and the new design will allow the technicians to be placed in more relevant roles.

## Design Goal

nVent would like this design to focus on removing the slugs that are not welded to the surface of the sheet metal and detect the remaining slugs that are not able to be easily removed. At the end of the project, the senior design team will be giving nVent a small-scale prototype of both their detection and removal systems, a full bill of materials, and a complete design of the full-scale system that nVent can implement.



*Removal System Initial Prototype – Air Knife*

## Design Constraints

- The design must be able to remove 95% of the slugs, and detect 100% of the remaining slugs
- The detection process must be able to detect welded slugs on both the top and bottom of the sheets
- If a slug is found by the detection system, it must be flagged for removal by an on-site technician
- The design must not damage the surface finish of the sheet metal
- The device cannot slow down the current production rate of one part per forty seconds.
- Would ideally fit into the current lock-out safety area