

Label Application Device
Caitlyn Collins, Justin Gearing, Dan Miller, Jamon Opgenorth

A device is needed to improve the ergonomics and efficiency of applying a variety of labels to small engine shrouds. Improving the ergonomics of these lines is especially important for a workforce that contains a majority of employees with visual disabilities. The time it takes to develop a product on these lines is too long and the percent of usable products created is too low. We developed a prototype that reduces error, speeds up the process, and allows employees who have severe visual disabilities to operate the line successfully. The device eliminates the need to place the labels onto a shroud with precision; only placement of a label in a general location is required. This device allows users of all kinds to accurately place labels, greatly improving the success rate of usable shrouds. Developmental testing proved this. By timing a completely blind employee, results showed an improvement from 30% to 100% accuracy and a decrease in assembly time from 4.76 to 2.55 minutes per shroud when compared to the old process.

The final design will cost roughly \$8,500 for four lines (\$1,800 per device, \$1,300 for a vacuum to operate multiple devices). It is estimated that our client will see a return on investment within two months of use, assuming the use of only one device. Compared to alternative devices, our device offers an inexpensive option, without sacrificing job availability. Automatic industrial label applicators on the low end cost approximately \$8,000 per line (\$24,000 for four lines). In contrast to our device, these devices don't offer the versatility of applying a variety of labels, nor can they be easily modified to accommodate a change in label design. Finally, the automation of smaller assembly lines is counter-productive to increasing job opportunities for those with disabilities. Therefore, our proposed device has a strong competitive advantage to companies promoting employment for people with disabilities, as well as, for those operating dynamic label applicator lines.