

SAFETY

ACCURACY

FUNCTIONALITY



Industry partner Healthcraft specializes in the unique ergonomic design of mobility assistive devices. With innovative “pivot and lock” technology, offset rails for superior stability, and their flagship SuperPole system, Healthcraft ensures the utmost security necessary for their home and commercial bar and rail safety products.



ALGONQUIN
COLLEGE

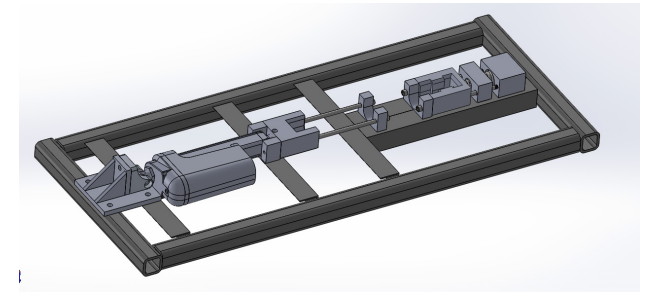
The Mechanical Engineering Technology program equips students with the tools to apply scientific and engineering principles to solve mechanical engineering design problems. Graduates are prepared to find employment in the manufacturing, healthcare, aerospace and transportation industries.

Team members

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Instructors

Jim Catton



HEALTHCRAFT SUPERPOLE PRESS

A Collaborative project between
Healthcraft and Algonquin College's
Mechanical Engineering Students

Problem

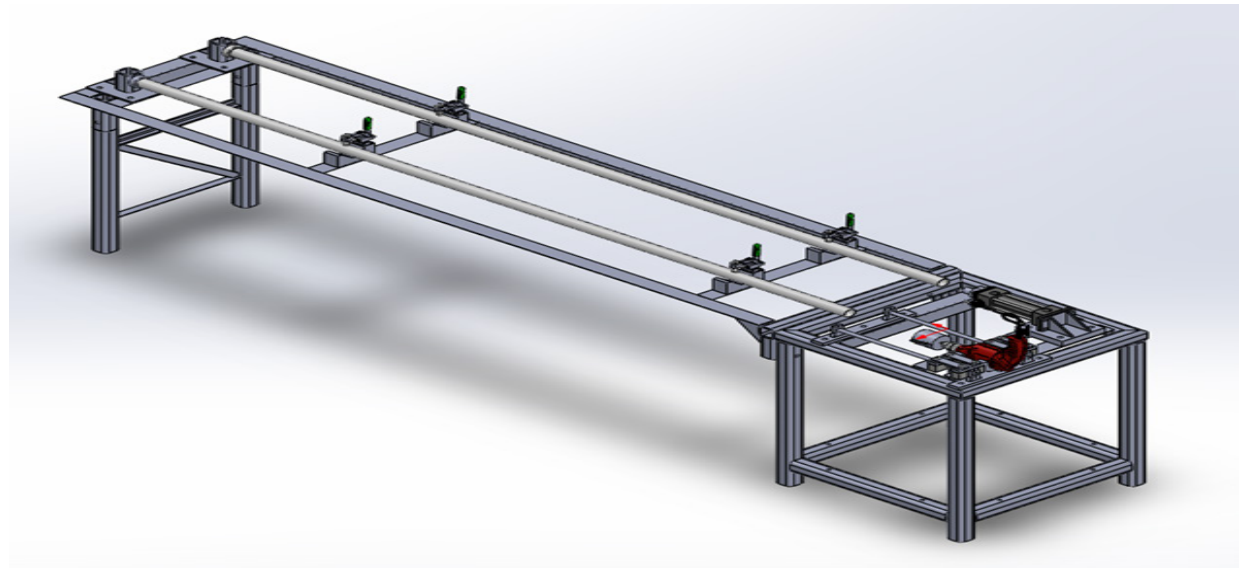
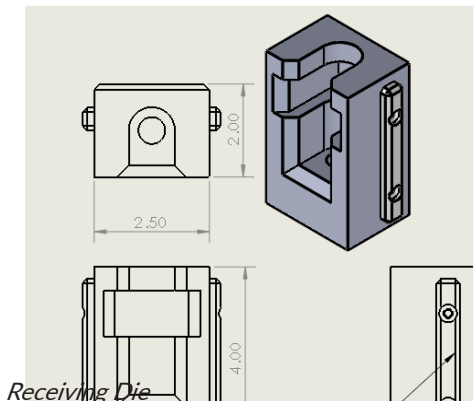
HealthCraft requested an automated assembly solution that would improve accuracy and eliminate or reduce the defect percentage to below 1 percent. The company also requested the assembly process involve less manual labour without increasing manufacturing costs.

Project Plan

Tasked with creating an automated solution to eliminate or reduce HealthCraft's defect percentage for their SuperPole product, the mechanical engineering team has offered a solution in the form of the SuperPole Assembly Press. The overall assembly budget is set at CAN\$350.

Solution

The SuperPole assembly press is a tool designed on the basis of ease of use and accuracy for manufacturing purposes. It is a hydro-electric powered, ram assembly that inserts a threaded bushing into a 90 in. long steel tube with retaining fasteners and piloted dowel pins to ensure correct alignment. The assembly press is 132 x 24 in., a working height of 31 in.. The power source required to operate the system is a normal 120-volt outlet with a current capacity of 20 amperes.



PROCESS

The team initially favored an air-over-hydraulic pump with a hydraulic cylinder; however, after consulting with HealthCraft, the decision was made to not move forward with the initial prototype due to concerns over possible leaks and increased maintenance. An electric linear actuator was offered as an alternate solution to



The electric linear actuator has the following benefits:

- Common in manufacturing applications
- Can be implemented to perform pressing functions
- No issues with possible leakage

DESIGN CRITERIA

Automated

An electric linear actuator is used to press the threaded collar into the with sensors being used at the end of the pole to detect the forces applied by linear actuator.

Repeatable

The process is repeatable and consistent in its insertion force and depth without losing accuracy.

Safe

The last safety system consists of a safety cover linked to a switch, thus preventing the operation of the system if the protective cover is not lowered.

Easy to Use

The press requires minimal training to use and will always provide the same results.