TMP 4 Manufacturing – Personal Door Testing

Overview
Our sponsored project was to design a testing device that can open and close a walk-in refrigerator door. The test is to be designed to determine the life cycle of the hinges on the door because when the door breaks it occurs in the hinge, and the company wanted to know a rough estimation of when the door needs to be replaced. The testing device needed to open two types of latching mechanisms, a standard bar latch and a lever style latch. Additionally, the door had to open a full 110°.

Objectives
Our objective was to design a testing device that could open and close a walk-in refrigerator door to determine how long the life cycle of the hinges on the door are.

Approach
● Gathered customer needs and door specification
● Everyone then came up with their own ideas and we combined the best aspects from each one
● Did some research and calculations to determine the required motor strength
● Researched materials and parts for cost effectiveness and material properties
● Create several different CAD models
● Modified our design because of Learning Factory size limitations
● Designed several prototypes to test material and determine what materials would hold up best
● Tested the device on doors around campus because we were unable to go to the site and test

Outcomes
● The design effectively opened the door
● The original desired cycle length was not met, ended up being longer than expected
● Determined a bigger motor was need to achieve the full 10,000 cycles