

Waste & Recyclables Dual Compactor

Dr. Maziar Ghazinejad
ME 164

Jesus Gonzalez, Hugo Martinez, Miguel Ortiz, Jose Pulido

FRESNO STATE

Lyles College of Engineering

Abstract

The main objective of the project is to optimize the space that a typical trash bin occupies for residential or commercial application. To optimize the trash bin space consumption, a scissor jack with a compression plate was designed to compress the trash in the bin compartment, which results in reduction of the trash volume. The system is fully automated and only requires the user to push a button to begin the compression process. This benefits the user by minimizing the amount of trips to empty the trash bin, which in a commercial application means less service cost. Moreover, the compactor optimizes the compartment usage and reduces the environmental impact by requiring up to 1/3 less trash bags. It is anticipated that the final price will be up to 50% less, in comparison to current models in the market. The compactor also has the potential to tap into a market that has little to no solutions to the problem of efficiently reducing trash volume.

Design Approach

A dual compartment mechanism will allow the user to have a device that may be environmental friendly. Two electrical scissor jack systems will provide the force necessary to compact waste and recyclables to optimal compression.

Market

Intended market for waste and recyclables dual compactor:
Residential ~ Restaurants ~ Offices

Fabrication

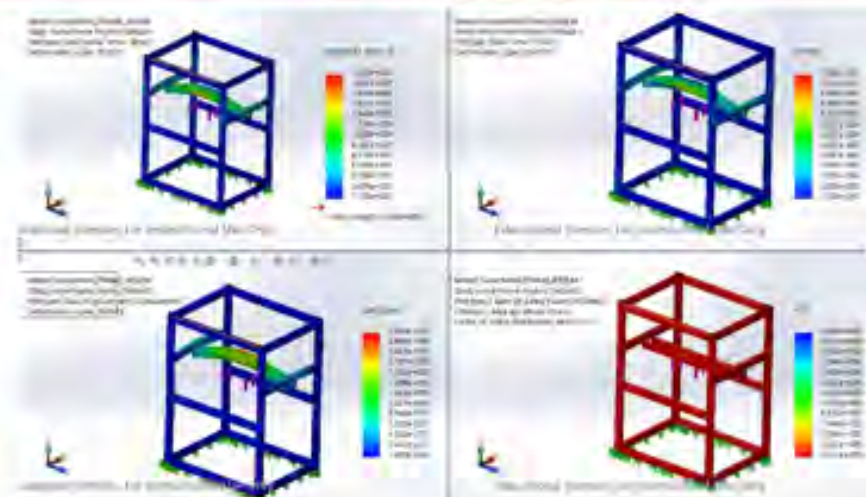
- Welded frame construction
- B-line channel beam
- Aluminum flashing
- Dual electric scissor compactor



Final Design Prototype Vs. Competition



Results and Conclusion



- Max Stress – 201.5 MPa
- FOS – 1.012
- Deflection – 2.93 mm
- Strain – 7.984

The concept has been tested and proven to deliver its capability. Scissor compactor exceeded its expectations under worst case scenario.

2016