Panel Movement

Overview
Tafco Manufacturing Company (often referred to as TMP) provides walk-in coolers and freezers. Our job is to move these refrigeration panels around the shop floor more efficiently and safely. These panels are roughly 92 pounds in weight and are currently being carried and maneuvered by two workers. Our objective is to allow these workers to pick-up, drop, and carry the panels in a safer way.

Objectives
- Understand the main implications the effects of lifting the refrigerator panels have while loading and unloading into temporary storages or the wrapping machine
- Perform Static Strength Analysis on the worker’s lifting positions and ensure the lifts and positions are within NIOSH standards
- Develop and fabricate a cart model to plan the functionality of the ergonomic features incorporated to reduce worker strain
- Analyze and show the improvements the new ergonomic cart provides for the worker’s strain while lifting the panels at different positions

Approach
- Visited TMP on multiple occasions to collect data
- Used existing cart to build off of
- 3DSSPP Strength analysis
- Used NIOSH lifting equation
- Created SolidWorks computer models
- 3D printed a model cart
- Showed a decrease in stress on workers
- Showed that with improved cart, heavier lifts can be done

Outcomes
- Workers will reduce the stress in pounds on their back by up to 65%
- Move more panels effectively
- Separate the sheet metal for later use and easy retrieval
- Determined optimal lifting heights
- Determined that gloves with grip should be worn
- Effectively designed a movement cart which is multipurpose and safe