

# Indexer

Mechanical Engineering

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### Abstract

The scope of the project is to create a conveyor belt system that would accept product at random spacing and properly synchronize the space and time between the products. The system must be built for a robust application, meaning the system should be able to perform its functions with product sizes ranging from 4 inches to 12 inches. Given that the upstream machine has a variable product output rate, the Automatic Inline Indexer (A.I.I.) will have an output rate up to 150 products per minute. The A.I.I. will be feeding into a flighted belt system, so the design must not introduce any type of rotation to the product to ensure a smooth transition.

### Obstacles

- The conveyor must be able to process 150 products per minute and must be able to do so with the spacing of the incoming products being random.
- Therefore, the conveyor design must be able to compensate.
- Also, the conveyor must be able to feed into the parent machine with out adding anymore skew to the orientation of the product.

### Solution

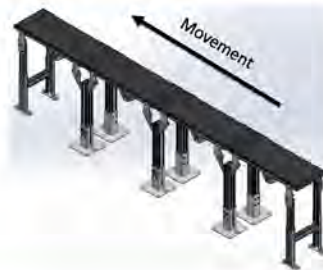
- The design is a multi-belt conveyor with three actuators.
- The multi-belt system will run at varying speed to introduce spacing in between the incoming products.
- The three actuators will push the products into the parent machine.
- If the product has a different orientation, the actuators will let it continue down the line.
- The actuators will be on sliders that will match the speed of the products, allowing the actuator to move parallel with the conveyor system.

### Design



The design utilizes 4 conveyer belts and three actuators on sliders. Three of the belts have an actuator mounted on a slider on each one. This design will be able to achieve the required functions.

### Multi-Belt



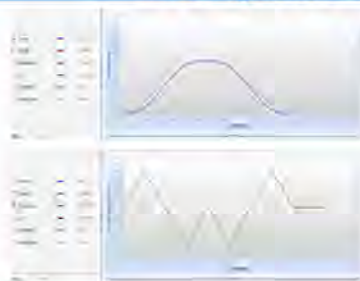
The multi-belt system is used to increase spacing between incoming products. This is done by having the belts run at varying speeds.

### Actuators



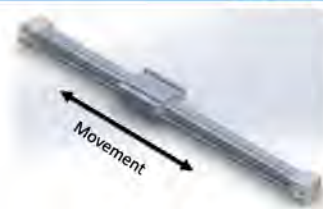
Actuators are mounted on the sliders. This gives the actuators the ability to move with the incoming product while pushing the product into the parent machine.

### Time Diagrams / Results



Time diagrams were created in order to visually see the conditions the machine will be under, and what actuators must be used. The top diagram represents the speed, while the bottom represents the acceleration.

### Sliders



Sliders will match the speed of the incoming product, allowing the actuators mounted on them to push the product into the parent machine

### Sponsors/Conclusion

Overall, the design was successful. Using the values gained from the time diagrams, an animation was created and shows that the design is able to carry out its needed purpose.

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