Objective
The JELD WEN CELL team’s objective is to optimize the split, paint and stack section in the bi-fold cell for one-piece flow.

Specifications & Deliverables
General Requirements (1)
● COVID-19 compliance
● NEC & OSHA compliance

Performance Specifications (1)
● Throughput of 4 doors/min + 15 - 20%
● NIOSH Lifting Index ≤ 1.0
● Number of Workers ≤ 6
● DPMO = JW Standard

Project Deliverables (2)
● Design Implementation
● Standard Work for Operation
● Time Study & Analysis
● Quality Analysis
● Ergonomic Analysis
● Future Recommendations

Budget Overview
<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positioning Bar</td>
<td>$493.45</td>
</tr>
<tr>
<td>Stacking Table</td>
<td>$758.50</td>
</tr>
<tr>
<td>Travel</td>
<td>$1,800.00</td>
</tr>
<tr>
<td>Total</td>
<td>$3,051.95</td>
</tr>
</tbody>
</table>

Implementation

Improvements to Paint Machine Loading
Figure 1. Door positioning bar for paint loading drawing
- Reduce material handling
- Separation of stacked doors
- Protective silicon between door and aluminum
- Height adjustment for different door width
- 6XXX grade aluminum alloy

Improvements to Stacking Process
Figure 2. Door stacking table for hinge machine loading drawing
- Reduce material handling
- Door stacking
- Reduce stop time
- Adjustable legs
- Aluminum frame
- Sensor attached to sensor mount

Improvements to Sensor Design
Figure 3. AND Gate: OFF
- Two sensors connected by AND Gate
- Conveyor will stop, when both sensors are activated
Figure 4. AND Gate: ON

Results
Before:
- Cycle Time: Paint Loading: 19.2 sec
- Hinge Loading: 31.7 sec
- Throughput: 0.99 doors/min
- NIOSH Lifting Index: Paint Loading: 0.99
- Hinge Loading: 1.95
- Defects: Unknown
- Operators: 6

After:
- Cycle Time: Paint Loading: 9.7 sec
- Hinge Loading: 5.7 sec
- Throughput: 1.17 doors/min
- NIOSH Lifting Index: Paint Loading: 0.50
- Hinge Loading: 0.99
- Defects: Unknown
- Operators: 6

References