Problem Statement

- Having used the same design since 1947, Dampp – Chaser Corporation tasked Team 5 with a design/process improvement of their dehumidifier.
- There were three issues with their current design:
  - (I) Dealing with the splice band failing.
  - (II) The resistance wire has become hard to source.
  - (III) Increase in product cost.
- The new design must not cost any more than a 10% increase of their current design shown below.

Requirements

- Risk Matrix

<table>
<thead>
<tr>
<th>Risk</th>
<th>Likelihood</th>
<th>Probability</th>
<th>Impact</th>
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<tbody>
<tr>
<td>Low</td>
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<td>2</td>
<td>3</td>
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<tr>
<td>Medium</td>
<td>3</td>
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<td>6</td>
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<tr>
<td>High</td>
<td>5</td>
<td>6</td>
<td>9</td>
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</tbody>
</table>

- Initial concepts that led to our final design

  - Figure 2. Concept 1
  - Figure 3. Concept 2
  - Figure 4. Concept 4
  - Figure 5. Concept 6

- Analysis of Alternatives

<table>
<thead>
<tr>
<th>Element</th>
<th>Concept 1</th>
<th>Concept 2</th>
<th>Concept 3</th>
<th>Concept 4</th>
<th>Concept 5</th>
<th>Concept 6</th>
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<tbody>
<tr>
<td>Feasibility of Studied Requirements</td>
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<td>3</td>
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<tr>
<td>Cost</td>
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<td>4</td>
<td>5</td>
<td>6</td>
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<td>Size of Existing Structure</td>
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<td>6</td>
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<td>4</td>
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<td>6</td>
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<tr>
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<td>2</td>
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<td>4</td>
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<td>29</td>
<td>27</td>
<td>26</td>
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Final Design

- Figure 6. New resistance wire
- Figure 7. First iteration with new resistance wire
- Figure 8. Underside overhead view of 3D-printed cap/strain relief bushing
- Figure 9. Underside angled view of 3D-printed cap/strain relief bushing
- Figure 10. Topside view of 3D-printed cap/strain relief bushing
- Figure 11. Topside angled view of 3D-printed cap/strain relief bushing
- Figure 12. Final prototype with new resistance wire and 3D-printed cap/strain relief bushing implemented
- Figure 13. Overhead physical image of 3D-printed cap/strain relief bushing
- Figure 14. Underside physical image of 3D-printed cap/strain relief bushing
- Figure 15. Wire frame display of 3D-printed cap/strain relief bushing

Results

- Our snap-in bushing still requires slight adjustment, but overall will make the production process much easier to complete.
- The new resistance wire eliminates many expensive pieces within the current dehumidifier design.
- The final design improved the product and decreased the overall price.

Summary

- With the completion of this design/process improvement, Team 5 will have increased the efficiency of Dampp-Chaser Corporation’s manufacturing process.
- Alongside increased efficiency in manufacturing, Team 5 has been able to reduce the overall cost by over 5%.

Team & Acknowledgements

- Lucas Morgan – Mechanical Engineer
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