Problem Statement

• Aegis currently uses a vegetable fiber gasket to achieve IP67 standards
• Gaskets are not reusable after routine maintenance and must be replaced
• Current gasket has not been tested under pressure wash conditions

Requirements

<table>
<thead>
<tr>
<th>Req #</th>
<th>Requirement</th>
<th>Description</th>
<th>Verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IP67 Ingress Protection</td>
<td>No ingress of any dust or solids plus waterproofing from a 15cm depth to a 1m depth for up to thirty minutes of submersion</td>
<td>Testing/Demonstration</td>
</tr>
<tr>
<td>2</td>
<td>Withstand High Water Pressure</td>
<td>A PRESSURE achievement/test if there is time available, test the enclosure against a pressure washer.</td>
<td>Testing/Demonstration</td>
</tr>
<tr>
<td>3</td>
<td>Removable</td>
<td>must maintain an IP67 rating after remanufacturing</td>
<td>Inspection</td>
</tr>
<tr>
<td>4</td>
<td>Use of #6 screws</td>
<td>#6 screws are preferred from Aegis (800 degree C5 Screw type)</td>
<td>Application</td>
</tr>
<tr>
<td>5</td>
<td>Cost Effective</td>
<td>Get at least three different quotes for the manufactured product</td>
<td>Lowest quote is chosen</td>
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</tbody>
</table>

Concepts

• 3 Original Gasket Concepts:
  - Flat Gasket
    • A flat gasket that will match the tops of the walls
    • Waste of material
  - Single Groove Gasket
    • A single groove is cut into the walls on both the top and bottom for a gasket to fit in
    • Best overall option
  - Double Groove Gasket
    • A set of double grooves is cut into the walls on the top and bottom for the gaskets to fit in
    • Most expensive to manufacture

Final Design

Single Groove Gasket:

• Screw hole placement is 1 5/8” apart for optimal testing and conforms to military EMD standards
• Prototype was produced in the WCU machine shop for a proof of concept before the final design was sent to Aegis’ machining vendor for production
• A buna-n 50 durometer gasket bonded (at its ends) using Loctite 495 was used in the final product
• Testing proved a hole placement of 3.25” was sufficient for Aegis’ requirements

Results

• Each test that was conducted passed

Summary

• Testing proved that screw hole placement of 3.25" is sufficient for both the submersion and pressure wash test
• The enclosure was tested under normal and extreme conditions of pressure washing
  • Normal: 1 ft of space between the pressure washer and enclosure lid
  • Extreme: ~1 inch between the pressure washer and enclosure lid

Team & Acknowledgements

• Team 19: Clay Bardall, Calvin Johnson, Sumner Renegar, Peter Swanson
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