Transfemoral Osseointegration Prosthetic Cover

Team AquaSafe

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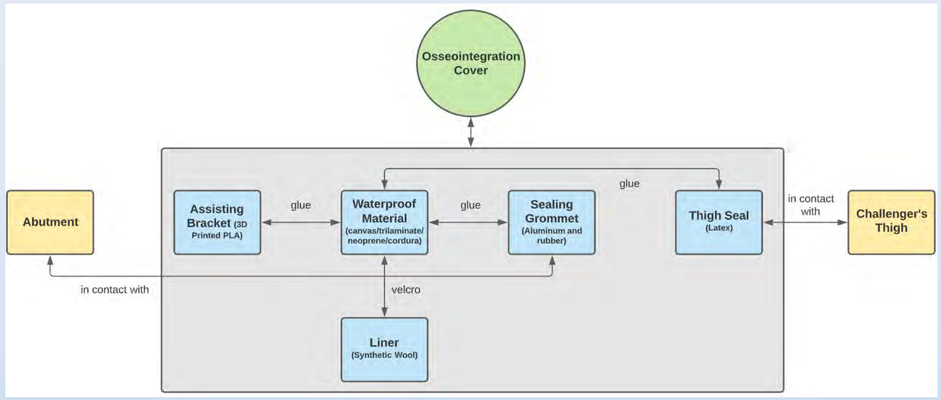
Project Overview

Problem Statement - Osseointegration is an operation that provides amputees with an easy attachment point for a prosthetic. Osseointegration patients are left with an open stoma around the abutment, meaning it cannot be exposed to untreated water.

Need - Design and manufacture a waterproof cover to be worn during physical activity. The cover shall allow Mike to continue his passion for whitewater rafting and swimming with a prosthetic still attached.

Sponsor - Quality of Life Plus
•Website: http://www.qlplus.org/
•QL+ Program Manager: Annemarie Orr

System Level Diagram



Acknowledgments

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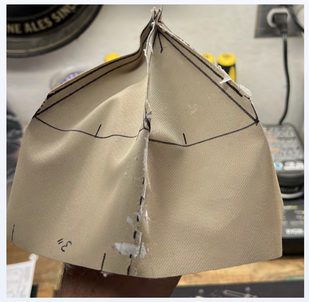
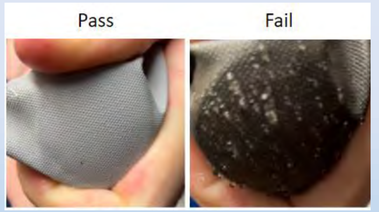
Prototypes



- Using a spiral design process, multiple iterations of prototype were created to test subtle differences in designs in order to decide upon a final design for the cover
- Different prototypes highlighted the flaws and strengths of different material and sealing options

Final Cover

Testing



Fabric testing with hydrostatic column

Lap shear strength testing of adhesives

Revised silicone cast

Initial submersion test

Submersion testing at SDSU Aquaplex

Water intrusion at seam during testing

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