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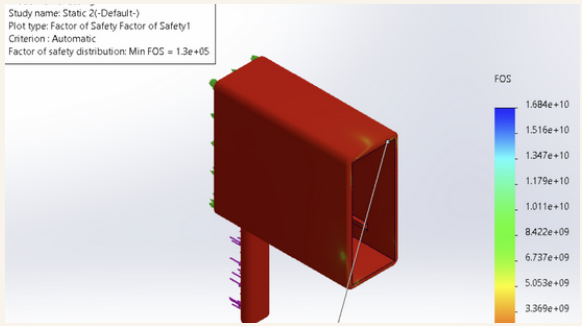
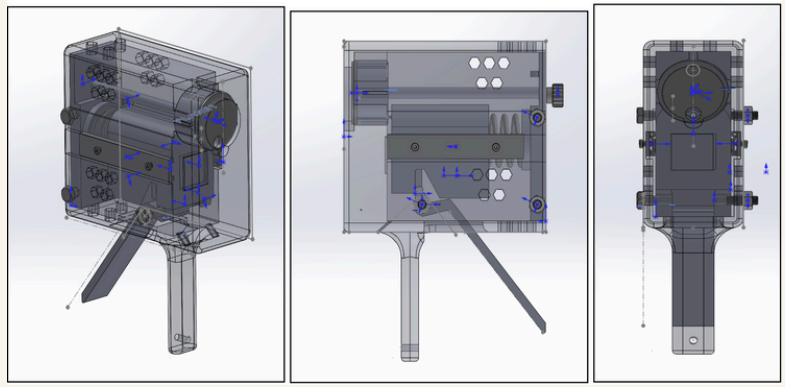
NASA Micro-g NExT Challenge - University of California





Objective

- Challenged to create a device that externally **attaches 2 pieces of multilayer insulation** underwater for **Extravehicular Activities** with **Astronaut ergonomics**.
- Finalized to create a handheld **spring-loaded** push-in rivet **deployment device.**

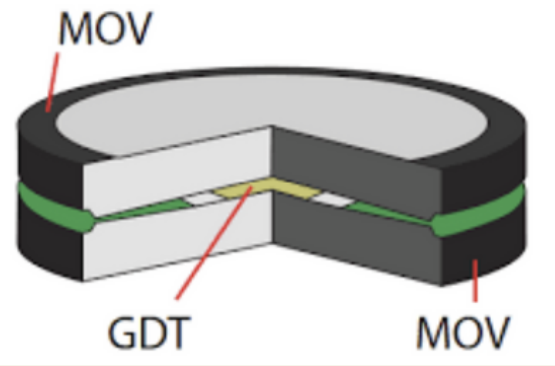
Action

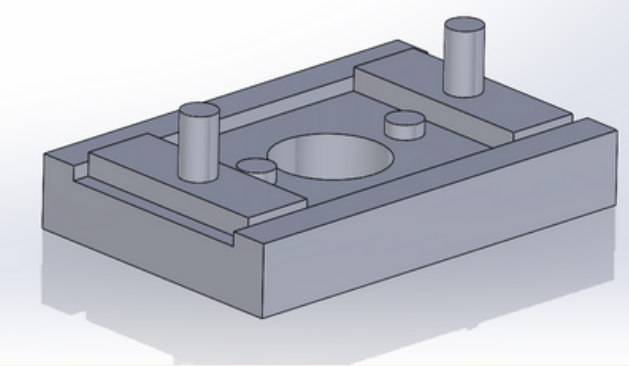
- Conceptualized final designs and modeled on **SolidWorks CAD**, and measured **factor and safety and load factors** using **SolidWorks Simulation.**
- Fabricated parts using **3D printing** and assembled with **compression and torsional springs.**

Result

- Deployed rivets into the insulation platform **in and out of water**. Applied a light tug (about **5 lbf**) onto connection point.
- Device had a **factor of safety>2**, and rivet **withstood 20 lbs of grip** force before rivet/fabric failure.

Surge Protector - Bourns Inc.





Objective

- Conceptualized a method to **mass manufacture** a **surface mounted** version of a **electronic surge protector**.
- Integrating the different components (**PCBs, wires, and surge protector**) of the product along with exterior casing.

Action

- Used **SolidWorks CAD** to design assembly **fixtures**.
- **Fabricated** fixtures using **SLA 3D printing**. Then thermally cured.
- **Soldered** all components to the PCB. Fixtures were used to thermally cure **5 models** through a **soldering oven**.

Result

- Encased in an **epoxy exterior.**
- Finished **15 models** of a **5 mm version and 10 mm** version.
- Trial products were sent off to another facility for **shock testing.**

Micro-g Liquid Rocket

- Supported **hands-on fabrication** and **assembly** of a **liquid rocket** engine, contributing to 3 spacecraft **sub-system and multiple static testing trials**

- Working along a 10+ team of students and aerospace professionals for the construction of the rocket.

- Constructing the rocket exterior by **metal fabrication.**
- Conducted **testing** on subsystems and valve actuation (**LOX, Fuel, and MVA) .**