



Category: ENGINEERING
School of Mechanical and Aerospace Engineering
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Poster Title: Vertically to Horizontally Challenged – Design and Build
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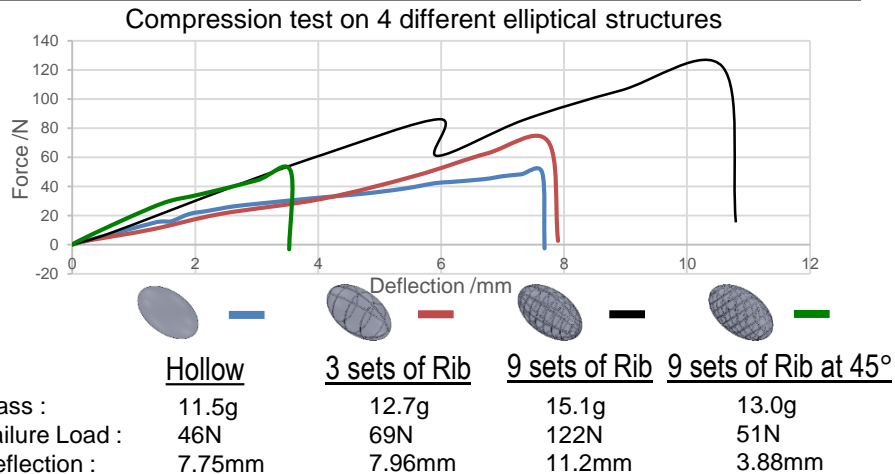
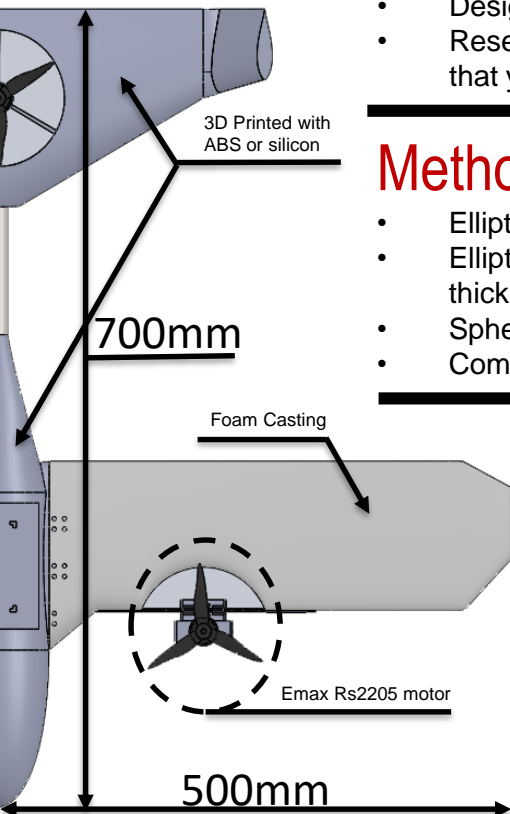
A tough egg to crack

Research motivation

- Design and build a UAV of mass less than 1kg.
- Research is required on different body structures to determine a design that yields highest strength with least amount of material.

Methodology

- Elliptical and spherical structures were made using 3D printer.
- Elliptical shape structures with radius of 30mm, length of 120mm and thickness of 3mm.
- Spherical shape structures with radius of 30mm and thickness of 3mm
- Compression tests were carried out on different designs.



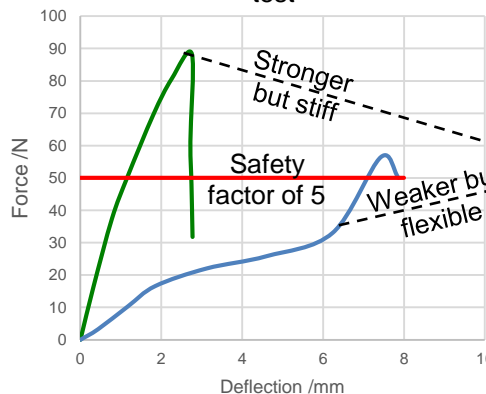
Conclusion

- Adding ribs increase the failure load while adding less than proportional mass to the structure.
- If safety is not a concern for the UAV, design with higher loading will be preferred.
- If precious cargo is present in the UAV, design that is more flexible is preferred.

In the future

- Model these tests with finite element analysis.
- Build the plane

Anisotropic mechanical properties test



3D printer building orientation of the spheres

