Introduction

- Current endoscopes are unable to resist strong compressive forces.
- The bending section (backbone) needs to be redesigned to withstand compressive forces specified by Biomersics.
- The bending requirement is 60° unidirectional articulation, although 90° bidirectional articulation is preferred.
- Size requirements are 35 mm in length and a diameter of 19 French (~6.5 mm).
- This project has been divided into three parts.
  1. Solution Design
  2. Preliminary Testing
  3. Prototype testing
- Potential design materials
  - Stainless Steel
  - NiTinol
  - Plastics

Design Ideas

Figure 1: Vertebral Backbone:

Figure 2: Lock & Key Laser Cut Backbone:

Figure 3: Extrusion Molded Laser Cut Backbone:

(Additional designs have been excluded for intellectual property reasons.)

Testing

- Bending tensile strength testing with Instron

Future Testing

- More bending testing using Instron
- Prototyping

Acknowledgements/Contact

Biomersics, LLC
• Industry Advisor - David Van Ness

USU Biological Engineering
• Faculty Advisor - Dr. Anhong Zhou

tyson.barnes@usu.edu  emily.brothersen@usu.edu
e Ellie.siddoway@usu.edu jessica.papenfuss@usu.edu
Dillon.weatherston@usu.edu