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Project: Capstone Tensile Tester
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Wookey Design Studio Capstone Project Proposal

Objective:

Design, develop and test an apparatus (hereinafter called the “Tester") capable of measuring the tensile strength of various materials, with the ability to output and capture the results in a digital force/time graph.

Product Requirements:

The Tester must be able to:

- Make pull strength up to 500 lbf.
- Pull apart, compression is not necessary.
- Have an adjustable pulling speed.
- Interface with various load cells.

The Tester must have:

- Jaws capable of gripping a variety of materials.
- Simple control interface.

We already possess a load cell and DATAQ data acquisition module, and software capable of plotting the time/force graph. It would be nice to couple the movement of the Tester with the software so that hitting the “record” button in the software triggers motion on the Tester, or hitting the “go” button on the Tester would trigger the software to record.

Background:

We have a backpack design and prototyping business and want to be able to test sewn construction, fabric types and record the results. For example, we would like to be able to sew a strap to fabric in 4 different ways, and use the Tester to tear and break the attachment, and record the results. We have the ability to support the project with welding (TIG, both aluminum and steel), 3d molded part design, and 3d printing, all of which we have in-house. We anticipate that we would start the project with a group meeting in which we drafted a design brief that sets the goals and timeline for the project. We feel that it is likely that the Tester would use a Raspberry Pi or similar as the “brain”.

Photos of commercially available products: