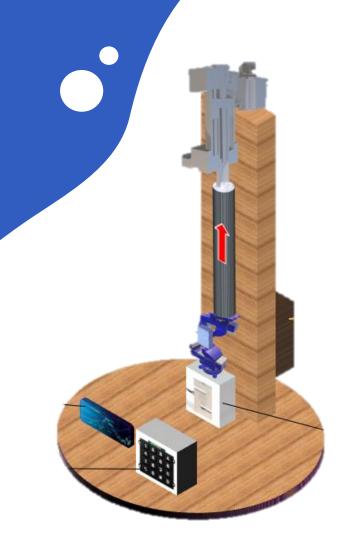
Automated Tensile Tester

Mazin Chater Youssef Jalwaj-Soubai Jaden Pharoah



Overview

01

Abstract

Summary of system functionality

04

Website

A guide for prospective users



System Features

How requirements influenced the design



Data

Live test results & discussion



Budget

Cost of individual components



Q/A

Time to answer any questions

Abstract

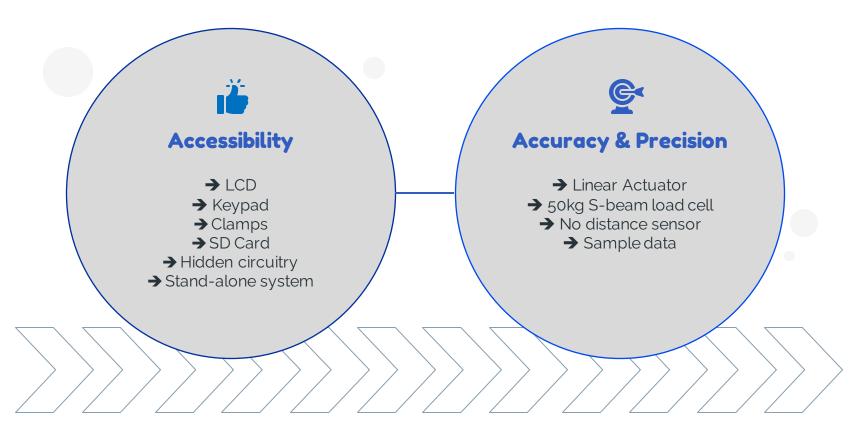
Our design revolves around these key design aspects:

- Linear actuator
- S-beam load cell
- LCD & keypad
- SD card

The system is entirely stand-alone. No software or laptop is required.



System Requirements



LCD & Keypad

Shown is the base menu state.

Users can either calibrate the load cell or immediately run a test.

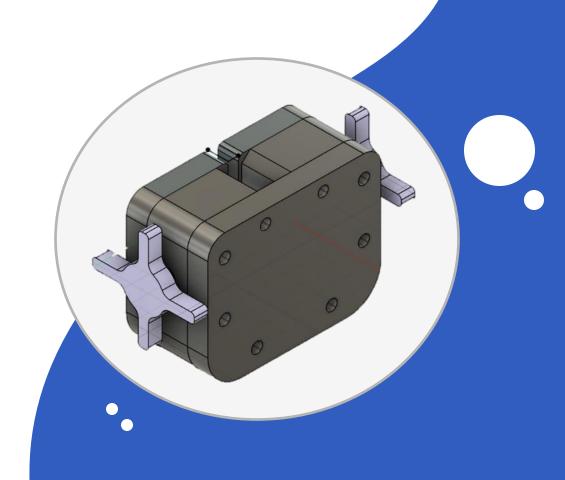






Strong grip clamps provide easy material placement and uniform sample strain.

Users mount the material in place and return to the LCD interface when ready.

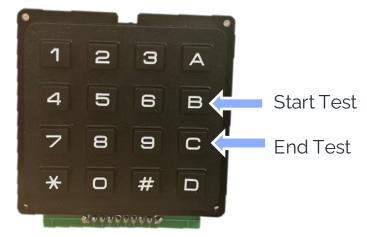


LCD & Keypad

After a user starts a test by pressing the 'b' button, the system begins collecting data.

Once the sample breaks, the user presses 'c' to end the test.







SD Card

Users can choose to run another test or simply take the SD card and extract the data.



Hidden Circuitry & Stand-Alone System

Essentially all wires are hidden on the backside of the system.

Users simply see the LCD and keypad interface along with the sample stretching.

No specific software necessary. No laptop required.

→ Simply plug-in and start collecting data.

Accuracy & Precision





Linear Actuator

Provides uniform strain otherwise impossible with manual systems.



50kg S-beam Load Cell

Industrial grade load cell intended for tension testing.



No Reliance on Distance Sensor

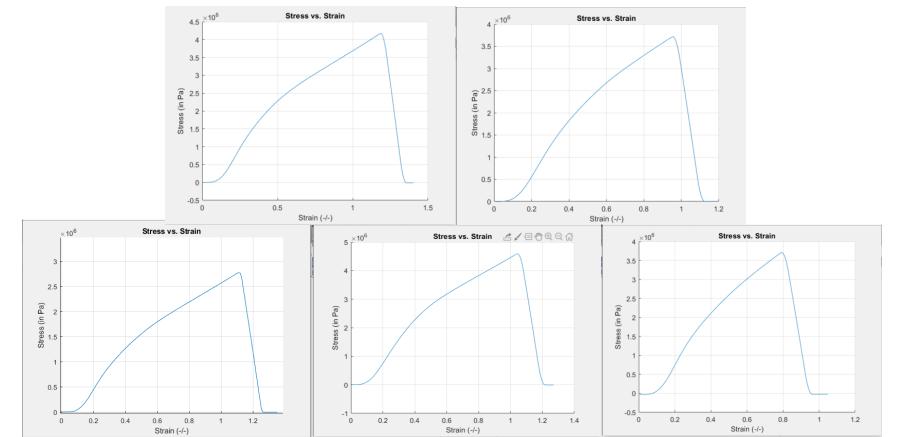
Eliminates error associated with additional readings.



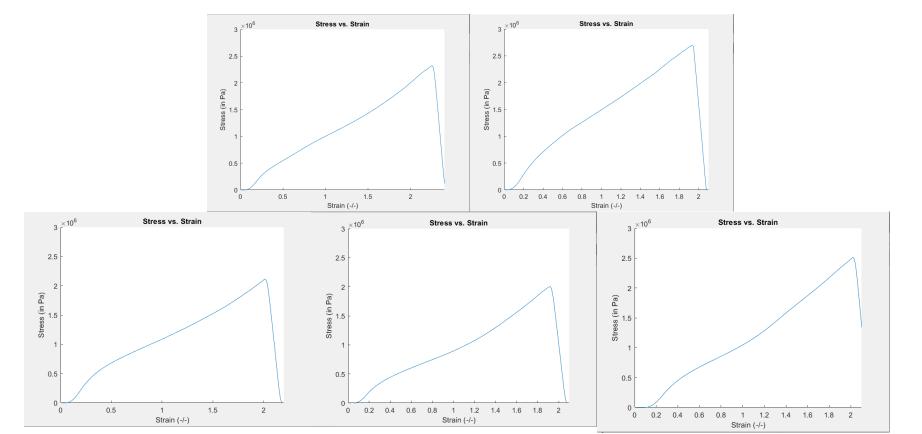
Uniform Stress/Strain Curves

Smooth curves directly mirror commercial equipment.

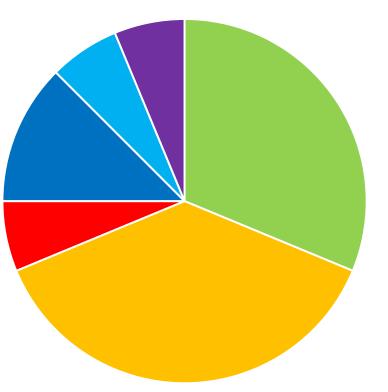
Sample Plots: Nitrile



Sample Plots: Latex



Budget



\$50

Load Cell

\$60

Linear Actuator

\$10

LCD Screen

\$20

Clamp Parts

\$10

SD Card

\$10

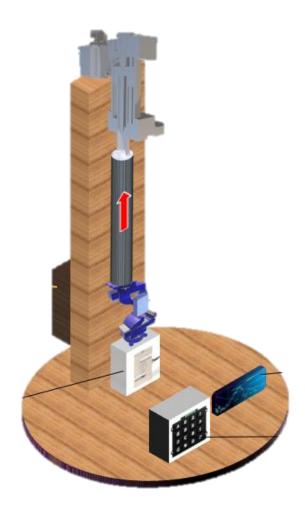
Keypad



Website

A simple intuitive interface for prospective users to familiarize themselves with our system.

https://uni-axial-automated-tensile-system.webflow.io/



Thank you

Any questions?

