

## Project Goal

To make a backpack or set of backpacks which can hold 25 lbs. of college textbooks with a safety factor of 2.0.

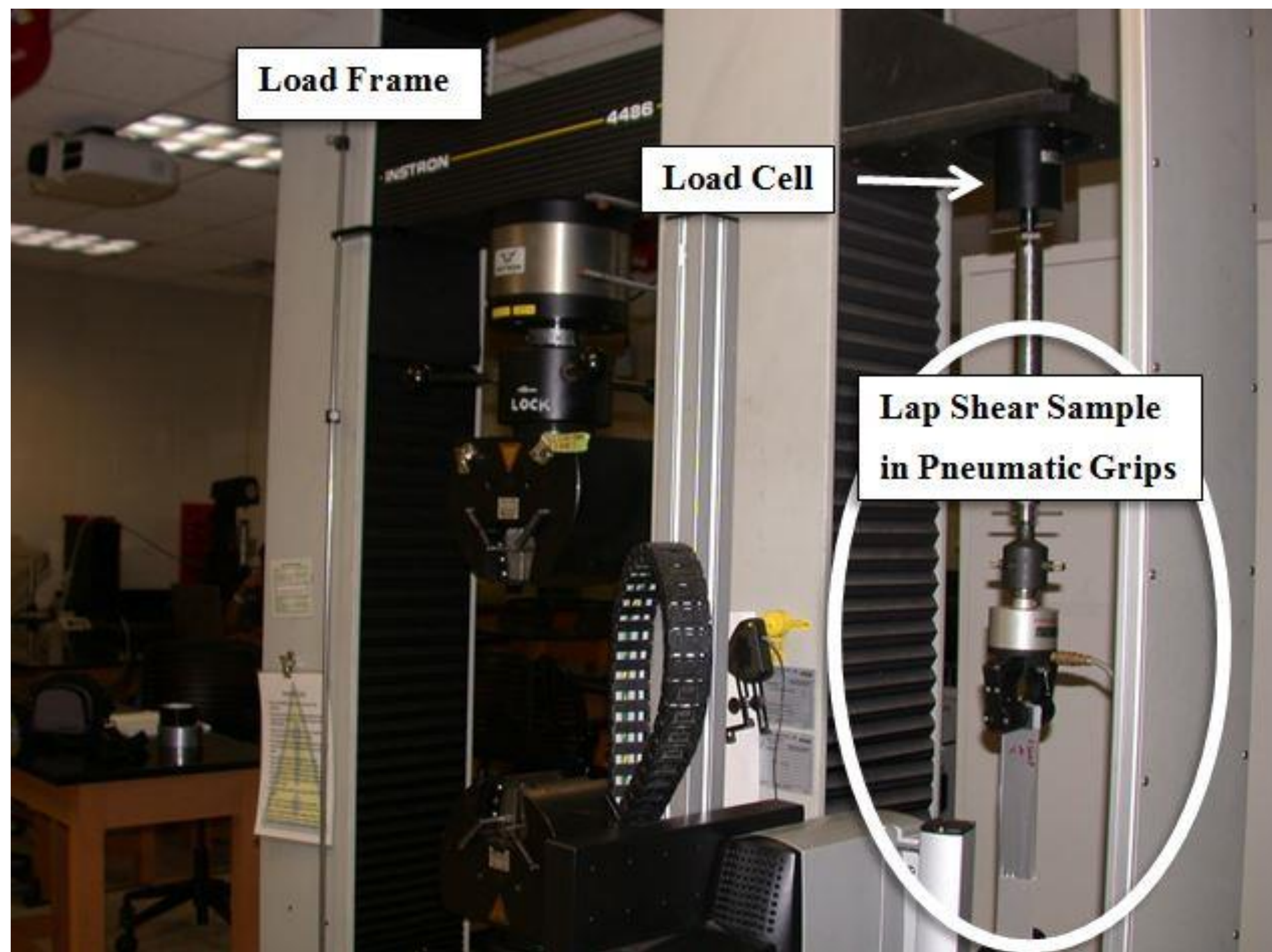
## Testing Objectives

To determine the:

- Tensile strength of duct tape
- Adhesive strength of duct tape
- Force on the straps of a backpack with a 25 lb. load when it is lifted to shoulder height

## Testing Methods

- Conducted tensile testing on five types of tape in three sample configurations in an Instron load frame.
- Lifted three loaded backpacks with a force gage and recorded the maximum load for each static load.



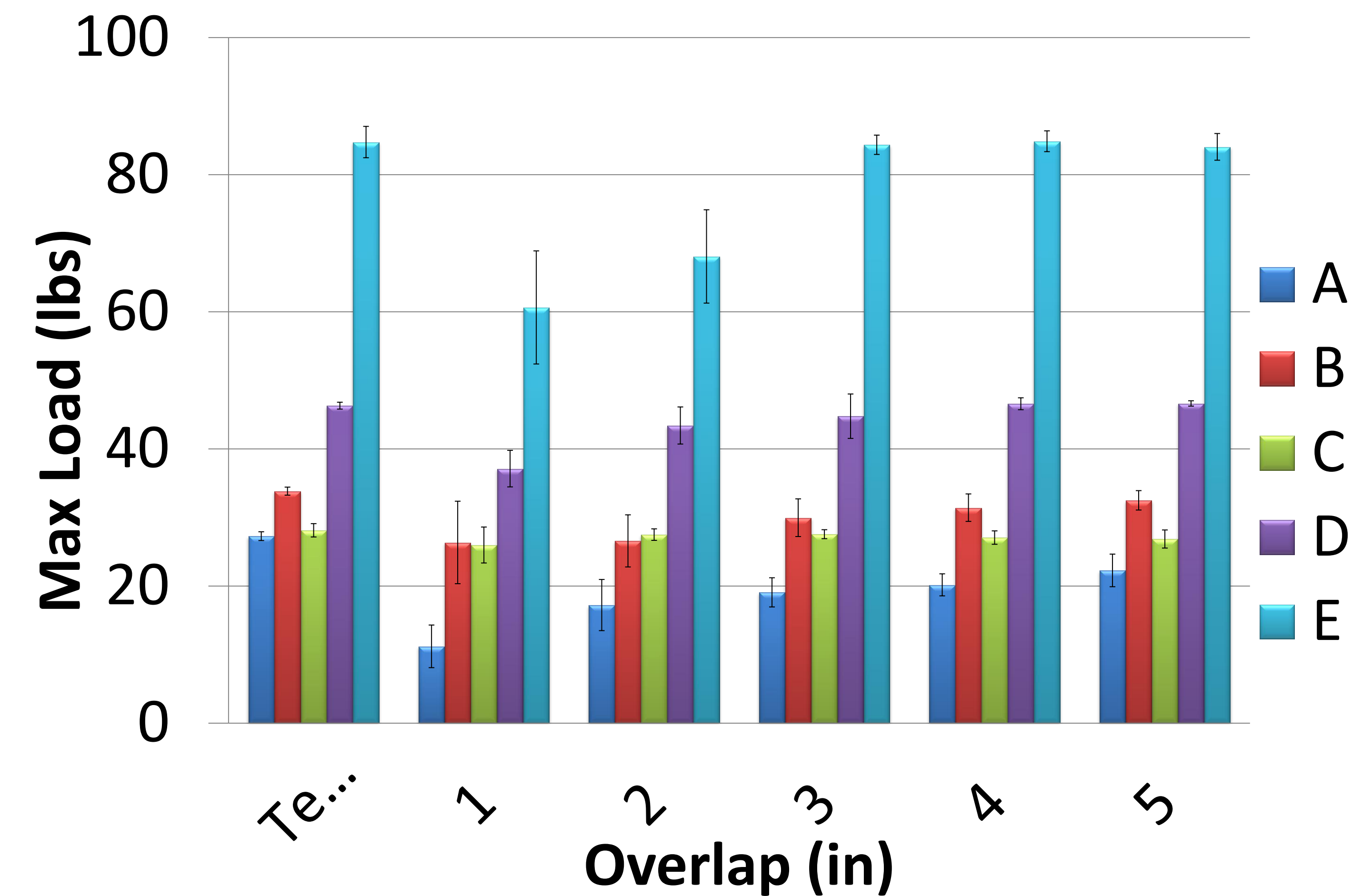
## School-Books on Tape:

Robin Ker

Advisor: Margaret Pinnell

## Results

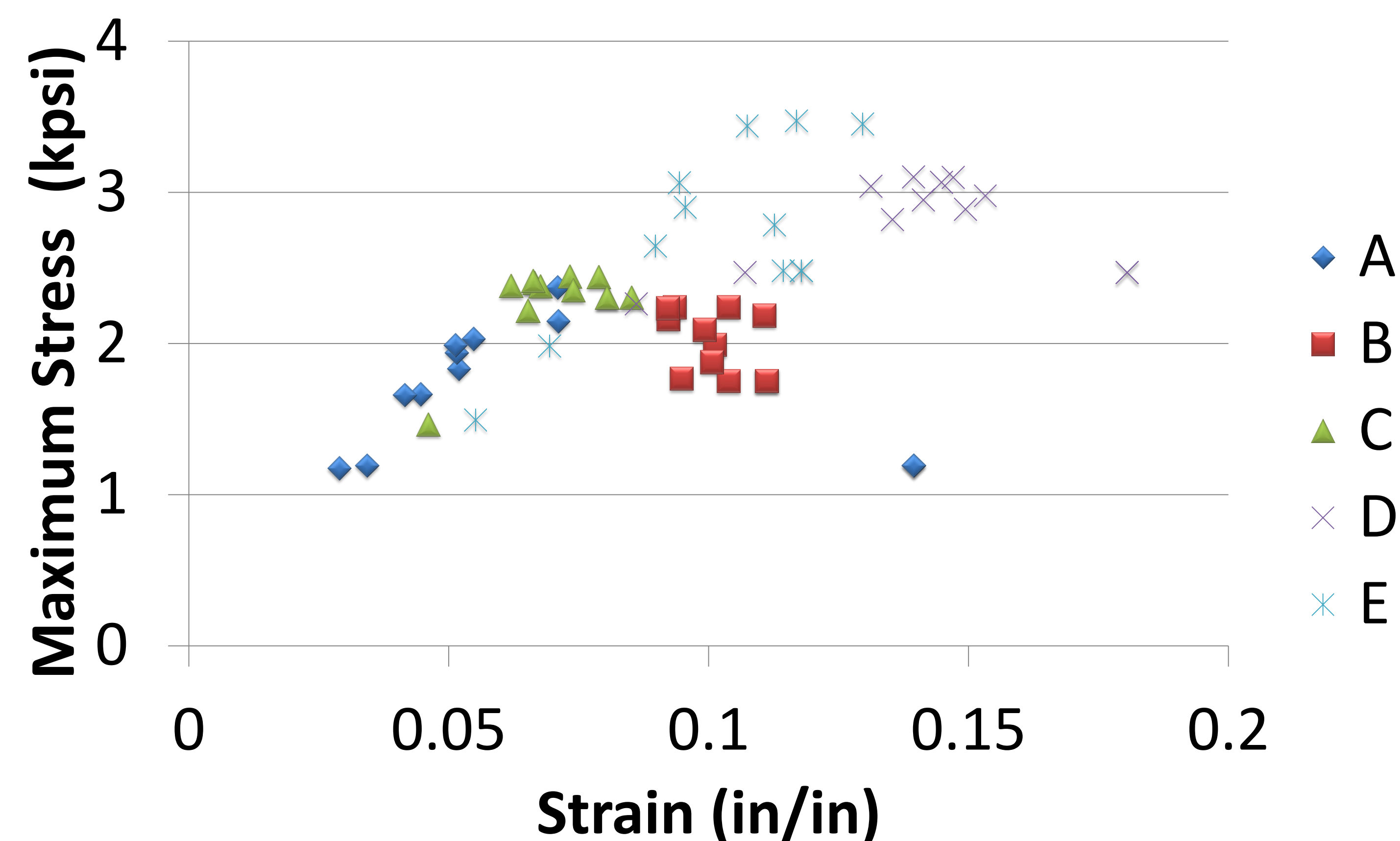
### Maximum Load vs. Overlap, LSA



Tapes D and E held the highest load and withstood the highest stress. Tape E underwent the highest strain.

A backpack with a 25 lb. load will undergo a 40 lb. load when lifted to shoulder height.

### Stress vs. Strain



## Conclusion

The final backpacks were made from Tapes D and E. The Tape D backpack was lighter and more flexible.

Tape D is recommended for future backpack construction.



Tape D Backpack (3M 3900)