VERIFICATION OF FEA ANALYSIS FOR KEVLAR FABRIC

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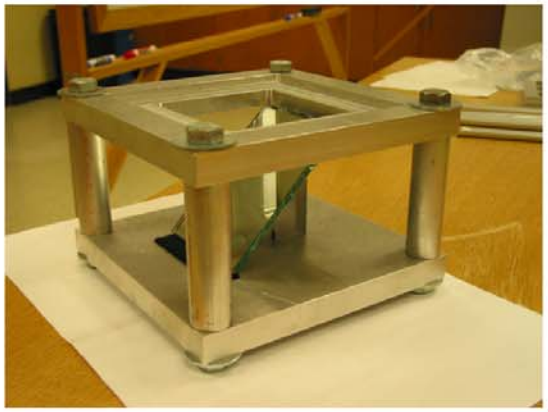
MATERIALS

- Clamps to hold fabric
  - Fixed boundary conditions
  - 2"x2" and 3"x3"
- Stand to hold clamps in Instron
  - Visual image necessary
  - Different sized clamps
- Punchers
  - Flat
  - Round

STAND

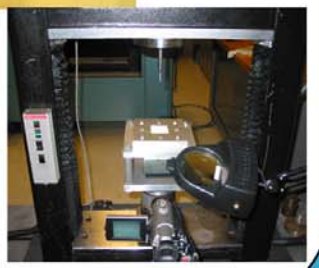


PUNCHERS

(Both have a ¼" diameter)

TESTS

- Run in "TestWorks" compression program on Instron machine
- All tests run at 5 mm/min



RESULTS

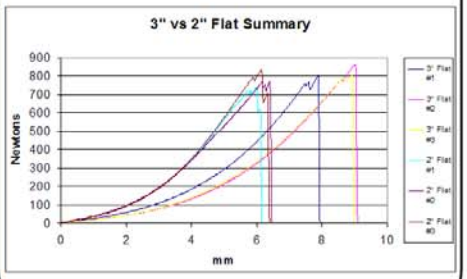
Results Were Obtained for All of the Following Tests:

- Aperture, Puncher, Friction Medium

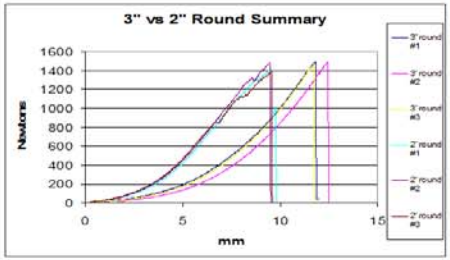
2"x2", ¼" Flat Tip
2"x2", ¼" Round Tip with ¼" radius of curvature
2"x2", ¼" Round Tip with ¼" radius of curvature, water

3"x3", ¼" Flat Tip
3"x3", ¼" Round Tip with ¼" radius of curvature
3"x3", ¼" Round Tip with ¼" radius of curvature, water

2"X2" VS 3"X3" FLAT



2"X2" VS 3"X3" ROUND



CONCLUSIONS

- 2"x2" vs 3"x3"
  - All tests fail at the same load when the size of the aperture is the only variable
  - However, 3"x3" has a larger elongation to failure
- Wet vs Dry
  - Whether the fabric is wet or dry doesn't seem to change the results
- Round Tip vs Flat Tip
  - Flat Tip cuts through fabric cleaner, with less pullout
  - Fabric fails at a higher load with Round Tip

ACKNOWLEDGEMENTS

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