

DYNAMIC PUNCH SHEAR TESTING OF KEVLAR FABRIC

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OBJECTIVES

- Test mechanical properties of Kevlar



- Design more protective, flexible body armor



EXPERIMENTATION

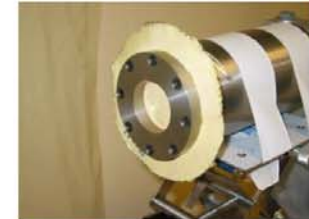
- Hopkinson Bar Test

- Gas gun
- Striker bar
- Incident bar
- Strain gage
- Specimen



EXPERIMENTAL PREPARATION

- Attach Kevlar sample
- Adjust incident bar and striker bar
- Pressurize the gun
- Check strain gage
- Fire



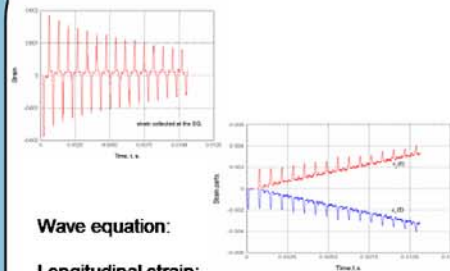
ANALYSIS



Visual Inspection

- Gun fired at 25 psi
- Slight damage to Kevlar – shearing of fabric
- Damage to attachment holes along principle axes
- Deformation approximately 0.5 in

ANALYSIS

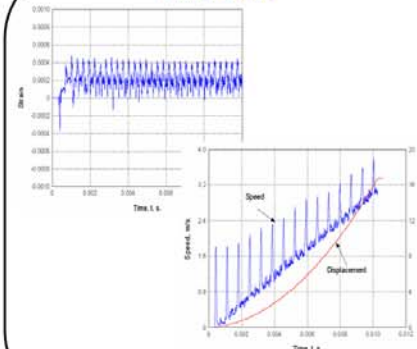


Wave equation:

Longitudinal strain:

Use boundary conditions, change of variables

ANALYSIS



• Conditions at Kevlar interface

CONCLUSIONS

- More tests to be performed
- More friction required on grips
 - ◊ epoxy
 - ◊ rough surface

ACKNOWLEDGEMENTS

This work is supported by the Army Research Laboratory through the Composite Materials Technology program.

- Dr. Libo Ren
- Dr. Michael Keefe
- Mike Larson
- Curt Cichanowski