

SPLIT HOPKINSON PRESSURE BAR SYNOPSIS (Team 6)

The Split Hopkinson pressure bar project consists on the redesign of the striking system of an existing Hoppy bar. This Project is funded and mentored by the Air Force Research Laboratory. At the behest of the Air Force Research Lab's (AFRL), Munitions Directorate, the goals for our team in this Senior Design are to develop a more effective striking system, as well as, improve the overall set up and the implementation of a better data acquisition system.

Key Project Actions:

- Design of a compressed gas striking mechanism, consisting of a compressed gas tank, solenoid valve with rapid release actuator, three feet barrel and ten inches striker bar.
- Installation of new Strain Gages mounted on each bar, using the half bridge configuration.
- Implementation of new strain gage conditioners to improve and data acquisition results.
- Upgrade of the base support for the entire mechanism, making it more stable and experiment friendly since its elevated from the ground.
- Implementation of LED speed sensors and a tachometer at the end of the barrel, enabling precise data acquisition of the striker velocity.

Expected Results:

- Accurate and Consistent striking force and velocity for every time the experiment is setup
- Acquiring striker bar velocity of about 100 ft/s, Measured by two LED sensors and a tachometer.
- Correct Outputs of data from Strain gages in order to create the curves for Stress vs. Strain.

Project Budget: Total budget is \$ 6,999.00, 100% funded by AFRL.

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Project Timeframe: September 2012 to April 2013.