SURE-TEST SYSTEMS
HIGH STRAIN RATE EQUIPMENT & TESTING

SPLIT-HOPKINSON PRESSURE BAR
IMPACT TESTING
DYNAMIC HARDNESS INDENTATION
QUASI-STATIC

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REL, INC.™
SPLIT-HOPKINSON PRESSURE BAR™
IMPACT TESTING™
DYNAMIC HARDNESS INDENTATION™
QUASI-STATIC™

SURE-FLAT™
POLLUTION
SURE-TRACK™
DATA ANALYSIS
SURE-BRIGHT™
LIGHTING SYSTEMS
SURE-TRACK™
VIDEO ANALYSIS

Innovation | Automation | Integration
www.relinc.net
Expandable Modules • Dependable Testing

Many materials experience strain-rate dependence, but high strain-rate is often overlooked because of its testing complexity.

SURE-Test Systems equipment and software to make high strain-rate testing easy, repeatable and dependable.

Testing Problem

SURE-Solution

Application  →  Material  →  Test  →  Results

• Automotive  
  • Aerospace  
  • Structural  
  • Ballistic  
  • Medical  
  • R & D  
  • Bio-Materials

• Metals  
  • Ceramic  
  • Polymer  
  • Rock  
  • Foam  
  • Composite  
  • Bio-Tissue

• Split-Hopkinson Pressure Bar  
  • Compression  
  • Tension  
  • Shear  
  • Impact Loading  
  • Dynamic Hardness  
  • Quasi-Static

• Stress vs. Strain  
  • Stress vs. Time  
  • Strain vs. Time  
  • Strain Rate  
  • High Speed Video (5 Mfps)  
  • Digital Image Correlation (DIC)

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SURE-Flat™ is a highly engineered ‘super-flat’ expandable base platform that has been engineered for test repeatability and is the result of a decade worth of testing and system optimization.

The apparatus is designed to mount multiple material testing systems such as high strain rate, quasi-static, and dynamic hardness.

The completely flat design allows for convenient adjustments and a variety of different test set-ups while only requiring the set-up to be aligned one time throughout the testing process. The system’s symmetric base allows for newly designed options and custom test accessories.
Fixed Focus Lights for Easy Set-Up and Test Repeatability

SURE-Bright™ is a tailored lighting system designed for proper sample lighting during low, mid, and high strain rate testing. The lighting system of 50,000+ Lumens allows for videos to be taken at a speed of up to 5 million frames per second with no compromise in resolution.

The lighting system was designed for high speed camera testing with fixed focus lights through the use of specialty lenses. Mobility of the apparatus along the bar rails ensures easy and consistent set-up insuring test repeatability. The lighting system mounts to a variety of high speed cameras.
SURE-Pulse™ is an industry leading data collection and processing software that makes SHPB testing as commonplace as quasi-static, compression, or tensile testing. The software is designed to analyze oscilloscope waveforms to determine high strain rate testing results, such as Stress, Strain, and Strain Rate. SURE-Track, an additional feature of SURE-Pulse, is an integrated high-speed camera (capabilities of up to 5 million frames per second) and processing system to perform digital image analysis (DIC) and feature tracking to be able to visually see and plot strain profiles in a sample.
SURE-DAQ™ is a combination of data acquisition equipment to achieve optimal Split Hopkinson Pressure Bar testing results using a convenient sensor application. Equipment included in the system are, dynamic strain gages, strain conditioner and amplifiers, analog to digital converter, and a computer to store the signal data. This is packaged into a sliding cabinet that can be positioned conveniently along the test bed.

Highly Reliable Testing Results
SURE-TEMP™ Module is non-contact specimen heater and cooling system including built in controls and cooling system that can mount directly onto the SURE-Flat base. The Heating Module heats the specimen efficiently and consistently up to 1000 degrees Celsius, while the cooling environmental chamber can bring samples to -40 degree Celsius.
SURE-SERVO™ is a servo driven testing module to compliment high strain rate material testing. The system has been designed to mount on the same SURE-Flat Base as the Split-Hopkinson pressure bar.
SURE-SPEED™ is a precisely packaged, highly accurate speed sensor for velocity measurement of striker bars during high strain rate testing up to 1200 feet per second.

The SURE-SPEED™ system includes an auxiliary voltage output trigger to BNC for triggering high speed cameras.
SURE-LAUNCH™ is highly repeatable launcher equipment used to consistently accelerate striker bars to precise velocities for high strain rate testing.

The tension set-up includes momentum trapping for single impulse loading. Highly engineered tensile grips are impedance matched to the incident and transmission bars for consistent, clean signals with minimal reflection.
Integrated Kirana High Speed Camera

924 x 768px / 180 frames @ 5,000,000 FPS

Digital Image Correlation

Available Integrated with

SURE-pulse™
DATA ANALYSIS

SURE-bright™
LIGHTING SYSTEMS

SURE-track™
VIDEO ANALYSIS