Durability Testing and Analysis at
The University of Alabama

The Structural Durability and Fatigue Performance Group was established by Dr. M. E. Barkey and associated students at the University of Alabama in 1996.

The group focus is on all aspects of structural durability and material fatigue, and places particular emphasis on ground vehicle applications.
Specializing in Testing and Analysis of Automotive Joints

• Manufacturing of Specimens with a Thompson 100 KVA spot welder
• Strain Gage and Microscopy Facilities
• Data Acquisition and Control Systems
Selected Automotive Projects

• DaimlerChrysler Corporation:
  Strength Characterization of Welded and Weld-Bonded Joints
  Fatigue Analysis of Spot Welds under Combined Tension and Shear

• Ford Motor Company:
  Fatigue Characterization of Riveted Aluminum Joints
  Fatigue Characterization of Adhesively Bonded Joints

• General Motors Corporation:
  Multiaxial Plasticity Modeling for Fatigue Analysis
Facilities

The servo-hydraulic lab capabilities include uniaxial specimen testing in load, displacement, or strain control, and structural actuators for component testing.

- MTS 30 GPM Silentflo pump
- Two 11 kip MTS structural fatigue actuators
- MTS 810 and Satec Uniaxial Test frames, each with 50 kip capacity
- MTS 5.5 kip actuator with load frame
- MTS FlexTest SE controller upgrade for 50 kip MTS frame for 2005
X-Ray Evaluation of Joints

- Mini-Shot X-Ray Cabinet
- Spot Weld Inspection for Fatigue Cracks
Computational Durability

• Elastic and Non-Linear Finite Element Analysis, Fatigue Analysis
• ABAQUS, HyperMesh for Windows 2000, SOMAT LifeEst, MatLab
• Various other programming languages and software
Selected Publications


