

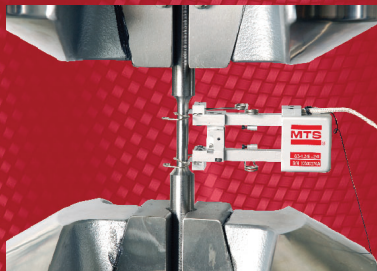
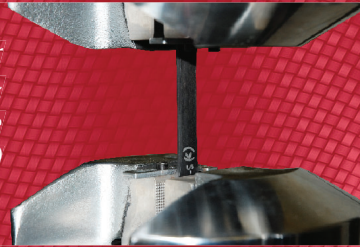
## Fatigue Testing

Fatigue testing offers you much better predictability for how your materials and products will perform over a lifetime. Material fatigue is the leading cause of failure. IMR Test Labs provides clear, accurate and reliable data when you need it.

Let our experienced lab personnel, technicians, and experts develop a fatigue test program to meet the manufacturing needs of verifying product and material properties.

If further analyses are necessary, our chemical analysis, metallurgical, and failure analysis experts will offer the insights and explanations you needed to evaluate actionable steps to prevent failure in future applications.

*PEEK polymer  
fatigue (right) &  
titanium fatigue  
(bottom)*



### IMR Test Labs

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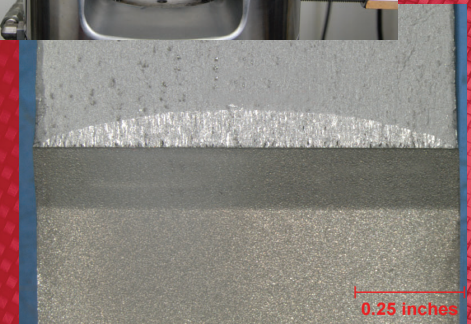
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**Nadcap Accreditation:** Ithaca (MTL, NMTL), Louisville (MTL), Portland (MTL), Singapore (MTL), Suzhou (MTL)

**A2LA Accreditation:** Ithaca (1140.01 / 1140.02), Louisville (1140.03/1140.04), Portland (1140.07), Singapore (1140.10), Suzhou (1140.09)

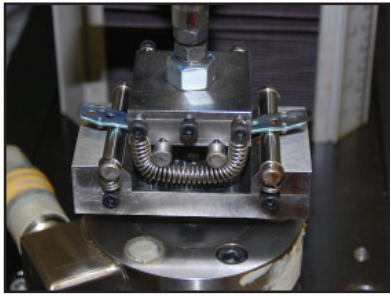
**CURTISS -  
WRIGHT**  
IMR TEST LABS

## Fatigue & Fracture Mechanics Testing Services



[www.imrtest.com](http://www.imrtest.com)





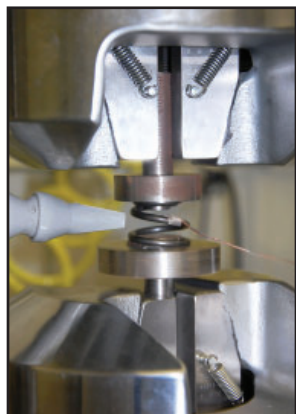
*3 Point Bend  
Fatigue of an  
Orthopedic  
Support Sample*

## Sample of ASTM Methods Offered

- E466 - Axial Load Controlled Fatigue Testing
- E606 - Strain Controlled Fatigue Testing
- F399 - Fracture Toughness
- F1160 - Coating Shear
- F1440 - Cyclic Fatigue of Hip Joints without Torsion
- F1612 - Cyclic Fatigue of Hip Joints with Torsion
- F1800 - Cyclic Fatigue of Knee Joints



*Spring Fatigue &  
Fatigue of Pre-Dented  
Panels*



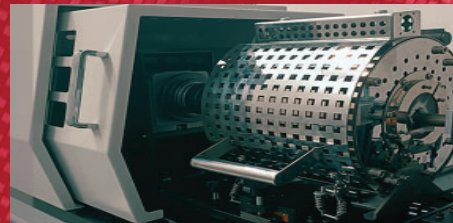
*Coating  
Shear  
Fatigue*



## Fatigue Testing Services Available

- Axial Fatigue (Room Temp. to 1800°F)
  - Displacement Controlled
  - Strain Controlled
  - Load Controlled
- High Cycle
- Low Cycle
- Fracture Mechanics Testing
- Fracture Toughness Testing ( $K_{1c}$ )
- Rotating Beam (up to 1000°F)
- Coating Shear Fatigue
- Specimen Conditioning
- In-House Machine Shop & Specimen Preparation
- Polymer Fatigue (Not climate controlled)
- Composite Fatigue
- Thermal Spray Coating Fatigue

*Rotating  
Beam  
Fatigue*



## Fracture Mechanics Testing ( $K_{1c}$ )

Fracture mechanics testing is used to predict crack formation, propagation, and ultimately, provide quantitative results regarding the structural integrity of the materials and/or components.

Criteria such as material behavior, stresses and loading conditions, flaws, and operational requirements are all considered to determine performance of components in-service, and to prevent devastating failures and accidents.

IMR's Fracture Mechanics experts utilize state-of-the-art equipment, along with years of experience and many successful investigations to help analyze crack initiation, crack growth and crack instability. We can do this as part of a failure analysis, or as fracture mechanics testing to support product design and development efforts.



*Low Temperature  
Fracture Mechanics  
Testing*

