

Simulation Services for Fatigue Engineering

Global Engineering Services



Industry Experience

Our team of engineers has expertise in fatigue simulation across a wide range of applications and industries. You can rely on us to get the job done right.

Engineering Expertise You Can Trust

Our extremely skilled engineers are experts at utilizing Computer Aided Engineering (CAE) for analyzing fatigue behavior. Our team is highly efficient in applying the MSC Fatigue™ family of software for solving almost any type of fatigue and durability challenge.

Flexible Services Offerings

We provide consulting support based on your specific requirements. This could range from performing analysis for you on a project basis to providing full time staff members to help you create repeatable processes in-house.

MSC's fatigue services team can help your company in a variety of ways:

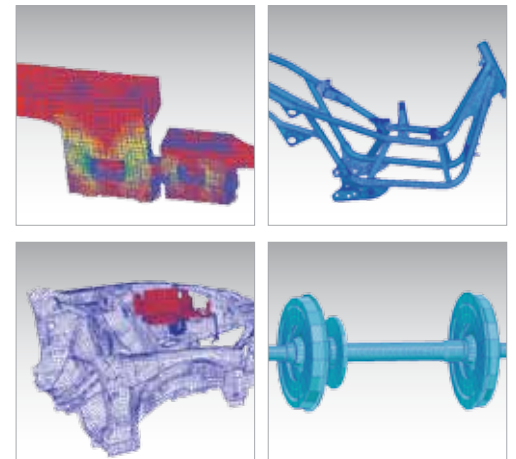
- Quick Start Project
- Knowledge Transfer
- Mentoring
- Staff Augmentation
- On-site Support
- Methods Development
- Training
- Hotline Support

Project Experience & Areas of Expertise

- **Component Design and Fatigue Life Evaluation** of parts subjected to specific load conditions
- **System Durability** of integrated systems including automated processes (SimManager)
- **Fatigue Design** using most solver stress results
- **Full Body Fatigue Simulation** methods in both time and frequency domain.
- **In Service Failure Investigations** for both fatigue & damage tolerance (crack growth) situations
- **Time and Frequency Domain** dynamic systems covered
- **Vibration Fatigue** situations (shaker table fatigue simulation) a specialty

MSC Fatigue™

State of the art fatigue and durability solutions for FE based structural systems that enables users to quickly and accurately predict how long products will last under any combination of time-dependent or frequency-dependent loading conditions.



Materials Characterization and Fatigue Testing

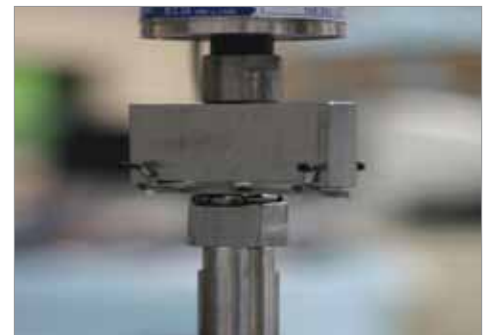
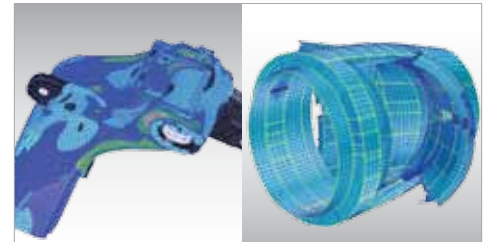
Inappropriate or low quality materials properties are, along with inadequate loading specifications, the 2 most important contributions to poor fatigue design and analysis results. However, material properties can easily be characterized properly with the right testing procedures. MSC Software is offering a low cost, fast turnaround, materials testing service delivering “standard” Stress-Life, Strain-Life materials data sets as well as more advanced bespoke testing services. This service is supplied through a partnership with the nCode division of HBM United Kingdom Limited. This service is intended for material coupon testing and not for larger component testing.

- **Quality Assurance Testing Service** used to check existing material data. A small number of specimens are made, tested, analyzed and compared with the design data being used. A standard report is produced setting out the level of correlation between the test results and the assumed design data. A standard price is available.
- **Strain-Life Fatigue Test Data Curve Production** used where no material information is known and based on a larger number of tests. A Strain-Life (or Stress-Life) material curve and associated statistical parameters are reported. By applying the latest testing procedures and statistical analysis methods design curves of the highest possible quality can be produced. A standard price is available.
- **Bespoke Fatigue Test Properties** Where high temperatures are present, or non-homogeneous materials (like composites), or where special material finishes or treatments are required, a more specialist fatigue testing service can be arranged which would have to be priced on a bespoke basis.
- **Test Coupon Production.** A coupon production service can also be included, or coupons can be provided directly by the customer.
 - Worldwide service fulfilled through state of the art laboratory
 - Metallics, composites, advanced materials catered for
 - Material data and statistical confidence analysis included
 - Full specimen preparation from stock materials or real components
 - Single and multi axis, static & dynamic specimen & component testing
 - Casting of specimens available from a wide range of production processes
 - Strain-life fatigue testing in tension/comp fully-reversed bending & torsion
 - Load controlled fatigue testing for the derivation of Stress-Life parameters
 - Static and cyclic thermal loading from -40°C to 1050°C
 - Tension/compression from 5kN to 250kN. Torsion up to 5,000Nm
 - Isothermal non ambient testing in the range -40°C to +1050 °C

Specialist Training Services

The deployment of fatigue analysis methods within a Finite Element Environment, especially when dynamic response is involved, requires a broad comprehension of the techniques involved. To satisfy this need both standard and bespoke training services are available.

- **Fatigue Analysis with MSC Fatigue – PAT318.** Offers a comprehensive coverage of all aspects of modern fatigue design methods and practical solutions using MSC Fatigue. Methods covered include Stress-Life, Strain-Life, Crack Growth, Component Design (Welds), Wheel Fatigue, Vibration Fatigue and complex stress conditions.
- **Fatigue, Dynamics & FEA – NAS319.** Technology focused (non product specific) coverage of fatigue life estimation techniques for dynamic systems including frequency domain loads and analysis, accelerated testing methods and shaker table fatigue simulation processes.



“ Brought practical meaning to abstract concepts. ”

- VP Engineering, Broadstar Wind

“ Perfect Combination of Theory and Software. ”

- VP Platform Projects, Apex Tool Group

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