

EnginSoft is a premier consulting firm in the field of Simulation Based Engineering Science (SBES) with a global presence. It was founded in 1984, but its founder and initial employees had been working in SBES since the mid '70s. Throughout its long history it has been at the forefront of technological innovation and remains a catalyst for change in the way SBES and CAE technologies in general are applied to solve even the most complex industrial problems with a high degree of reliability.

Today, EnginSoft is comprised of groups of highly qualified engineers, with expertise in a variety of engineering simulation technologies including FEM Analysis and CFD, working in synergic companies across the globe. We are present in Italy, France, Germany, the UK, Turkey and the U.S.A. and have a close partnership with synergic companies located in Greece, Spain, Israel, Portugal, Brazil, Japan and the U.S.A.

EnginSoft works across a broad range of industries that include the automotive, aerospace, defense, energy, civil engineering, consumer goods and biomechanics industries to help them get the most out of existing engineering simulation technologies.



ITALY

info@enginsoft.com

FRANCE

info.fr@enginsoft.com

GERMANY

info.de@enginsoft.com

UNITED KINGDOM

info.uk@enginsoft.com

TURKEY

info.tr@enginsoft.com

USA

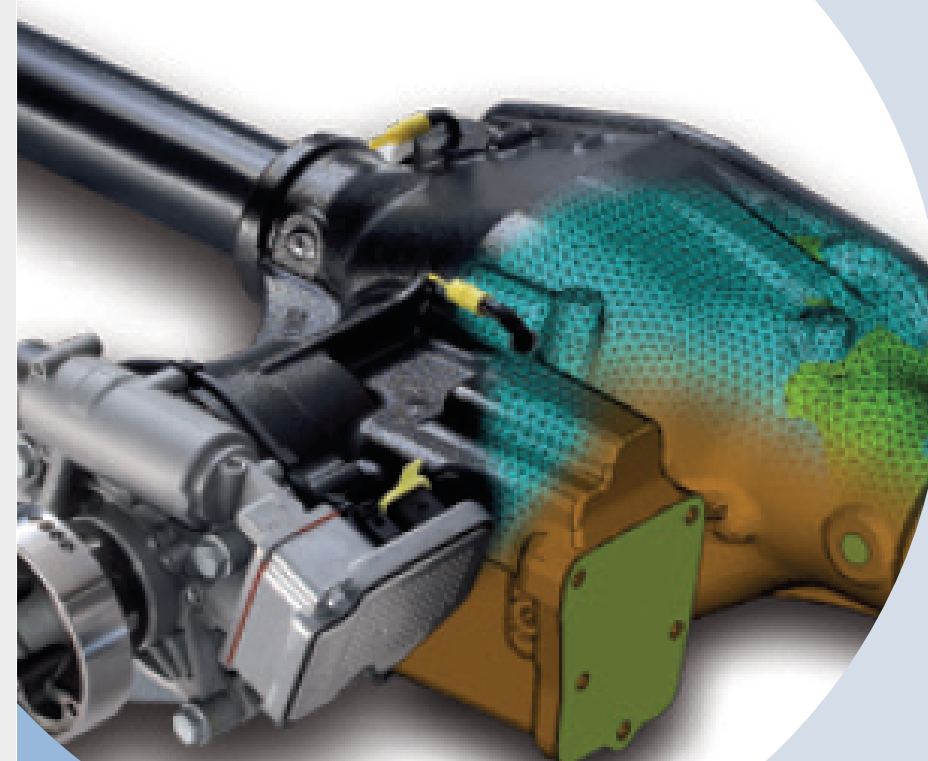
info@enginsoftusa.com



www.enginsoft.com | info@enginsoft.com



DATA SHEET

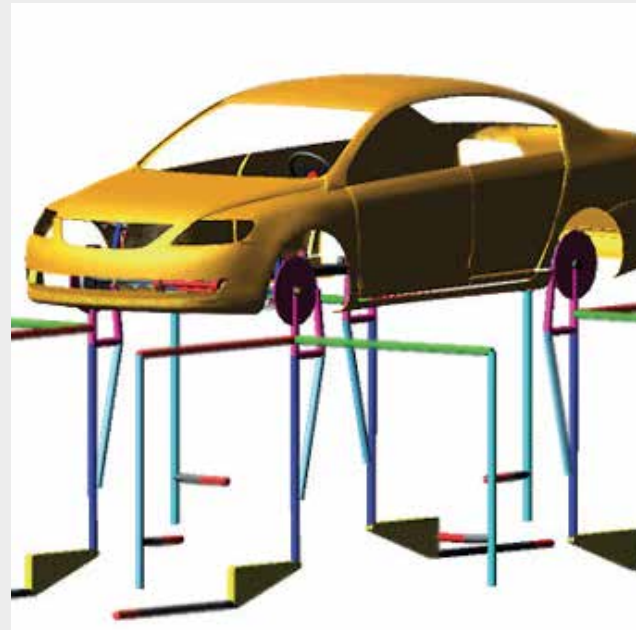


FEMFAT Software
Multiaxial Fatigue Analysis

Multiaxially loaded components such as body in white (BIW), suspension components, frames or crankshafts cannot be investigated by simple methods like equivalent uni-axial loading. FEMFAT max has been developed to assess these complex loading situations in an accurate and efficient way.

The methods applied are taken from the appropriate literature, the latest internal developments, cooperation research studies and are verified by countless engineering projects. Typically multi-axial components (wheel axles, body in white) are loaded in different directions. Simultaneously forces from acceleration/ braking, curve driving and curb weight affect the structure dynamically at different load histories. The load history can be acquired by various means, such as measurements, finite element analysis or multi body simulation.

In FEMFAT channelmax each load case and the associated load history is called a load channel. Stresses for these load channels can either be computed using a quasi-static approach (e.g. „inertia relief“) or using the modal approach (e.g. Craig Bampton), which is more appropriate if vibrational effects occur.



Multiaxial Fatigue Analysis

Method

All load history information is summarized by means of standard (e.g. principal stress) or the critical cutting plane hypothesis, specially developed for multiaxial fatigue analysis.

In order to analyze the interaction of all loads, all stress information is superimposed, transformed to an equivalent stress and rainflow counted. Next the fatigue analysis begins with the help of local S/N curves including relevant influences such as notches, mean stress, isothermal temperature... The results are damage values, endurance or static safety factors.

Data processing in FEMFAT max

Channel based modeling requires the definition of unit loadcases for each loading direction.

- ✓ Endurance safety factors
- ✓ Static safety factor
- ✓ Damage values
- ✓ Life time
- ✓ Degree of multiaxiality

Your Benefits

- ✓ Reliable and effective multiaxial fatigue assessment of axles, suspension systems, frames, engine components, BIWs, ...
- ✓ Interfaces for history data from multibody simulation and measurement data software
- ✓ Channel based or transient load definition
- ✓ Cutting plane and FE node filters for high analysis performance
- ✓ Up-to-date material-sensitive equivalent stress hypotheses
- ✓ Analysis of damage/life, endurance safety factors and degree of multiaxiality
- ✓ Fatigue life prediction of fiber reinforced plastics including orthotropic material data
- ✓ Unlimited number of load channels
- ✓ Option for compressing large time histories
- ✓ Compatible to FEMFAT weld (arc weldings) and FEMFAT spot (spot joints)
- ✓ Continuous fiber-reinforced plastics analyses in combination with FEMFAT laminate in ChannelMAX
- ✓ Add-on tools such as Harmonic and Elastoloads for modeling and analyzing vibrational phenomena or elastomers