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 synergetic 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.





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ENGINSOFT

DATA SHEET

FEMFAT Software **Random Response Fatigue** Accurate and efficient, Compatible concepts to BASIC and MAX

Accurate and efficient **Compatible concepts to BASIC and MAX**

Method

represent the unit load cases. probability models like Rayleigh or Dirlik.

Your Benefits

- bodies, ...)
- PSDs within FEMFAT

- ✓ Compatible with FEMFAT weld









FEMFAT spectral module is designed for fatigue analysis (damage, life) of multiaxially, stochastically loaded systems. Loading is defined by power spectral density functions (PSDs) for correlated and uncorrelated loading behavior. SPECTRAL operates completely in frequency domain.

The consideration of time signals with a strong random character leads to high computational effort. If the time signal is stochastic and the mechanical system linear the fatigue analysis can be directly done in frequency domain. The calculation with FEMFAT spectral is very effective with a speed-up factor of up to 100 compared to time signals.

> FEMFAT Spectral is a product **MAGNA**

FEMFAT spectral uses a unit-load based approach which is comparable to a ChannelMAX simulation. Modal Stresses from the Eigenfrequency Analysis and Modal Transfer Functions

The loading of the structure is described by power spectral densities (PSDs). PSDs are derived from the time signal using, e.g., FEMFAT LAB or from testing standards. Auto- and cross-PSDs can be defined for the stochastic loading,

additionally a constant stress can be superimposed.

For the subsequent damage analysis stresses from unit load-cases are multiplied by PSDs. Reliable cutting plane methods and equivalent stresses are used together with

This forms the basis for accurate damage analysis.

Additionally several influence factors – as already known from

other modules - can be considered for fatigue analysis.

✓ Very fast and reliable fatigue analysis for stochastically loaded systems (electronic boxes, add-on parts, car

✓ FE analysis in frequency domain (modal frequency response analysis for unit load cases)

✓ Load spectra definition in FEMFAT - simple and flexible consideration of different load situations by change of load

✓ Different probability models (Rayleigh, Dirlik, ...)

✓ Influence factors, e.g. stress gradient, ...

