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

Thermo-Mechanical Low Cycle Fatigue

The objective of the FEMFAT heat module is to facilitate low-cycle fatigue analysis of components where a combined thermal and mechanical load occurs. Typical components are engine parts such as cylinder heads, pistons, exhaust manifolds or turbine blades which must satisfy design criteria with regards to economy and fatigue resistance.

FEMFAT heat combines temperature-dependent material behavior with component related properties such as geometry for each combination of thermal and mechanical loads. The aim of computation is primarily to identify a damage distribution for each of the component‘s finite element nodes.

FEMFAT Heat is a product

MAGNA

Thermo-Mechanical Low Cycle Fatigue

Method Sehitoglu

This established method according to Professor Sehitoglu of the University of Illinois is provided as an option to FEMFAT max. The aim is to compute damage results for components subject to very high temperatures, e.g. turbochargers or cylinder heads. This method facilitates time-dependent elasto-plastic stress, strain and temperature distributions, which must be analyzed using FEM, into account and uses them for FEMFAT heat Sehitoglu.
The main advantage of this method is that it takes three relevant damage mechanisms into account:

- ✔ Mechanical damage
- ✔ Environmental damage (e.g. oxidation, elevated temperature)
- ✔ Creep damage

The FEMFAT material database has been extended by all necessary material parameters for a limited number of frequently used materials.
Additionally a Maple tool was developed to generate new material data for such analyses. This tool computes the required material data based on isothermal and thermomechanical tests results.
Our specialists have good experience for the required specimen tests and can offer to perform the tests together with a renowned test institute.

Your Benefits

- ✔ Uses established method for TMF-LCF fatigue analysis
- ✔ Different damage effects can be accounted for and are available for results interpretation
- ✔ Finite Element code independent solution
- ✔ Advanced consulting available for material model definition and test program setup