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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FEMFAT Software Weld Fatigue Analysis



ENGINSOFT







Weld Fatigue Analysis

Method

Welds are defined with the help of a simple modeling guideline based on a shell element model (node and element attributes) and solid element models (group attributes). This welding definition can be performed either before or after the FEM analysis. Two different concepts have been implemented, enabling an assessment of welds with the focus on forces or stresses:

Stress-based Assessment

During the analyses process the structural stresses are scaled using direction-dependent notch factors originally determined using "RADAJ" models and then enhanced, including test bench results. These notch stress results are used for further weld fatigue life predictions, taking into consideration mean stress, sheet thickness, load flow, material strength and statistical influence. A valuable option for defining seam welds for fatigue prediction is provided using FEMFAT visualizer. The welds can be defined automatically by a few mouse clicks. Small thumbnails are displayed inside the FE-model to prevent errors. The latest feature in FEMFAT weld in combination with the module ChannelMAX is a simplified SolidWELD method, which makes a fast and precise evaluation possible. Weld seams are defined on the basis of a relatively coarse volume mesh, without radii, reducing big modelling effort.

Force-based Assessment

A second method based on nodal forces is available in addition to the standard method. The benefit of this method is that different situations can be quickly computed. Parameters such as the weld seam thickness or the penetration length can be modified, thus allowing the impact on damage or safety factors to be studied.

Your Benefits

- specimens
- ✓ Fast definition of welding lines using the VISUALIZER
- ✓ Results practically independent of element size

- ✓ Interfaces to all common FEM codes
- ✓ Supports standards like Eurocode, DVS and British Standard

Arc-welded components have a considerably reduced ability to sustain dynamic loads; hence, numerical simulation of welded components is an important issue in CAE. To solve this problem, concepts for the automatic assessment of dynamically stressed welds have been developed and implemented in FEMFAT weld. Results are damage/life or endurance safety factors. Detailed results are available in the report file after analysis,

or in the FEMFAT visualizer for post

processing.



FEMFAT Spot is a product **MAGNA**

Methods verified by numerous tests on components and

- Open database structure applicable to new weld types
- ✓ Supports shell and solid elements
- ✓ Assessment of the complete weld seam (start, mid, end)
- ✓ Thermo influence due to weld process assessable