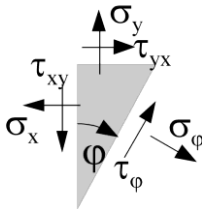
Invitation to our Seminar



Computer-Aided Fatigue Life Calculations for Multiaxial Loads

in Niederstotzingen-Stetten near Ulm

Steinbeis-Transfer Center
Traffic Engineering.Simulation.Software
Tel +49 (0)7325 3306
Fax +49 (0)7325 4992

http://www.stz-verkehr.de

Seminar Program

9.00 Welcome

9.15 Basic Theory
Connections between stress and strain in a plane, Mohr's circle view, stress concentration factor for bending and torsion, characteristics of multiaxial loads, recognising multiaxiality using examples, what happens to the material when there are multiaxial loads, existing hypotheses for multiaxial fatigue life calculations, critical cutting plane procedures, integral procedures, material behaviour in phase displacement, yielding under multiaxial load.

10.45 Break

11.00 Exercises for Users
Using winLIFE to calculate a shaft under push-pull and phase displaced torsion load. The results are analysed bearing in mind the criteria for multiaxial loads. Possibilities of shortening the calculation time with rough analysis. Explanation: multiaxial/biaxial, adding together several results.

12.30 Lunch (included in the price)

13.30 Damage parameter and equivalent stress hypotheses in the range of High Cycle Fatigue.

14.00 Nonlinear Analysis: Rotating Components / Contact
Distribution of the load and load cases in splayed windows followed by scaling of the unit load by the acting load and superposition of the stress tensors. Introductory example: Circulatory bending of a rotating shaft with constant load. Real example: Fatigue life calculation of a wheel hub where 3 forces and 3 moments (taken from test drives) are acting.

15.00 Break

15.15 Nonlinear Analysis: moving load / example: vehicle crossing a bridge
A vehicle is crossing a bridge modelled with shell elements and the fatigue life is predicted.

16.00 Break

16.15 Real Component: Commercial Vehicle Wheel from G-AlSi7 Mg wa (exercise for participants with real data)
Rosette measured results for three positions of the wheel are provided, together with the geometry of the component, detailed material data and laboratory test results. Exercise: Conditioning the rosette strain, entering the material data, calculating the fatigue life: using various fatigue life hypotheses, comparing the calculation with test results.

Either (depending on the participants` previous knowledge):
User example: Fatigue life calculation of a welded pipe flange joint with real load data
Or:
Theory of Welded seams calculation based on nominal stresses, structure stresses and local stresses.

Accuracy of the calculated fatigue life prognosis – what is acceptable, what is not?
We have been involved in the FKM research projects on the accuracy of multiaxial fatigue life prognosis [Research Laboratories: LBF-Darmstadt (Prof. Sonsino) / Technical University Clausthal (Prof. Zenner)] and have carried out extensive calculations on fatigue life prognosis. The comparisons between calculations and tests have proved to be a valuable help for the assessments.

17.00 Discussion time

17.15 Seminar ends After the seminar there will still be further opportunities for individual questions.

21.05.2019

Organisational Details:

Time: from 9 AM to 5.15 PM

Place: Hotel Zum Mohren, Familie Dörflinger, Oberdorfstraße 31, 89168 Niederstotzingen-Stetten, Tel. +49 (0)7325 92247-11, Fax.: +49 (0)7325 92247-12, info@lonetalhotel.de www.lonetalhotel.de

It is also possible to reach us by train. The nearest railway station is Niederstotzingen.

There are enough PCs for all the participants.

Cost: 680 € + VAT

Registration: Due to limited space, we can only accept a maximum of 10 participants. All applications are binding. As soon as we have received your application, we will send you confirmation and an invoice which we would ask you to pay as soon as possible.

Overnight Stays: We recommend the conference hotel where the course is held: Zum Mohren, Oberdorfstraße 31, 89168 Niederstotzingen-Stetten, Tel. +49 (0)7352 92247-11, Fax +49 (0)7325 92247-12, info@lonetalhotel.de, www.lonetalhotel.de

Lecturer: Prof. Dr.-Ing. G. Willmerding

Aims: To provide the participants with knowledge of fatigue life calculations of dynamically loaded components with multiaxial loads. We cover the basic theory of multiaxial fatigue life analysis and calculate examples using winLIFE. Test results exist for all the calculation examples we do and this enables the participant to assess the accuracy.

Requirements*:* The knowledge gained in the winLIFE-BASIC Seminar is essential for this course. This Seminar is therefore only recommended for participants who have already attended the winLIFE-BASIC Seminar.

Seminars:
Three times a year:
- winLIFE–BASIC (2 x German, 1 x English)
- winLIFE-MULTIAXIAL (2 x German, 1 x English)

Once a year
- FKM-guideline: static strength and dynamic fatigue prove (German, English on request)
- Power-User: Effective use of winLIFE for complex problems (German, English on request)
- Crack Growth and Random Fatigue (German, English on request)

The -Modules

The **-Modules** can be used in conjunction with finite element programs such as *NASTRAN* for Windows, *IDEAS, SAMCEF, WTP 2000* and, with the help of *FEMAP,* with all standard FE programs. Measured data can be transferred from several programs (*LMS Roadrunner, winEVA*). The interfaces are documented in such a way that they can be programmed by the customer.

FKM QUICKCHECK static strength analysis and fatigue analysis according to FKM-guideline for non-welded components, welded components can be analysed by a hot spot search (not according FKM)

BASIC is for the basic procedures of fatigue life analysis.

MULTIAXIAL is for calculating special problems where the direction of principal stress is not consistent. This program is an extension to the BASIC module and is for solving the most difficult of problems.

GEARWHEEL&BEARINGS is for calculating gear wheels and bearings according to standard calculation procedures without finite elements. It is designed to transfer data from the program to our drive train simulation program winEVA and the measuring programs winADAM and DIANA.

CRACKGROWTH You can calculate the crack growth of a component according to established theories.

RANDOM FATIGUE Based on a given acceleration of a component in g2/Hz (PSD-spectrum) the stress PSD is calculated and a fatigue calculation performed.

Applications

has been sold to more than 240 customers and is used in the automobile, military and engineering industries, ship building, wind energy, mining industry, planning and universities.

Short Description / Demo-Version

http://www.stz-verkehr.de

Steinbeis-TZ Verkehrstechnik, Rosenstr. 5, 89168 Niederstotzingen
Tel.: 07325 3306 email: guenter.willmerding@t-online.de

Registration

Please send this page by post to: Steinbeis Transfer Center
Rosenstr. 5, 89168 Niederstotzingen
or fax to: +49 (0)7325 4992
or e-mail to: info@stz-verkehr.de

Registration for the Seminar

Computer-Aided Fatigue Life Calculations with winLIFE
for Multiaxial Loads

on _____

This application is binding.

After receiving the registration confirmation and the invoice, the applicant agrees to transfer the seminar fee of 680 € + VAT to our bank account at the VR-Bank Langenau-Ulmer Alb eG, DE71 6306 1486 0102 0350 08, BIC Code: GENODES1LBK

When we receive your registration form we will send you confirmation within three days.

Surname _____

First name _____

Title _____

Company _____

Dept. _____

Street _____

Post code _____ Town _____

Tel _____

Fax _____

Email _____

Date _____ Place _____

Signature _____

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