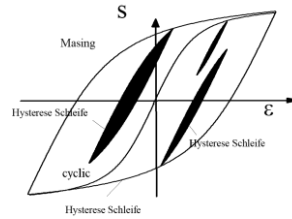




## Invitation to our Seminar



# Introduction to Computer-Aided Fatigue Life Calculations

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 Terms and Definitions
- Component behaviour under static and dynamic load, characteristics of a cycle, fatigue limit, finite life fatigue strength, low-cycle fatigue strength, SN-Curves, elastic and plastic behaviour, recognising uniaxial and multiaxial problems, statistical failure patterns, scatter of SN-Curves, conversion to other failure probabilities, risk factors.
- 10.30 Break
- 10.45 Rainflow-Count
- Material memory and connections with rainflow matrix, simple exercises to be solved by the participants, practice exercises for complex stress-time functions.
- 11.45 Nominal Stress / Notch Strain Concepts
- SN-Curves, time and endurance strength diagrams, diametric quotient, surface finish, technology influence, mean stress sensitivity, SN-Curve transformation, amplitude transformation, synthetic SN-curves according to Hück, FKM guide lines, damage accumulation hypotheses, and calculation of weld seams.
- 12.45 Lunch (included in the price)
- 13.45 Practice examples with winLIFE nominal stress concept, calculations for pure alternating loads, determining the mean stress influence by SN-curve transformation and amplitude transformation, using real stress-time functions, generating SN-curves (synthetic SN-curves), example from FKM guide lines, practice example: the user's "shaft".
- 14.30 Break
- 14.45 Local Concept
- Material memory, stabilised cyclic stress-strain curve, masing behaviour, ascertaining the stress-strain path from a stress-time function, damage parameter SN-curves, damage parameters, calculating with examples according to the local concept with winLIFE, connection between rainflow-count and stress-strain path, generating SN-curves from simple static material characteristics, practice example: the user's "shaft".
- 15.45 Links to FE-Programs e.g. NASTRAN and IDEAS
- Calculating real components with FE and transferring the data to winLIFE. Overlapping several load calculations, defining the scope of application.
- 16.30 Break
- 16.40 Discussion time
- 17.00 Seminar ends

11.12.2019



## Organisational Details:

**Time:** from 9 AM to 5 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 winLIFE-Modules

The winLIFE-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.

**winLIFE 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)

**winLIFE BASIC** is for the basic procedures of fatigue life analysis.

**winLIFE 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.

**winLIFE 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.

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

**winLIFE RANDOM FATIGUE** Based on a given acceleration of a component in g<sup>2</sup>/Hz (PSD-spectrum) the stress PSD is calculated and a fatigue calculation performed.

## Applications

winLIFE has been sold to more than 250 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>



## 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

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 \_\_\_\_\_