

KISSsoft AG - +41 55 254 20 50
 Uetzikon 4 - +41 55 254 20 51
 8634 Hombrechtikon - info@KISSsoft.AG
 Switzerland - www.KISSsoft.AG

Advanced Training Seminars in Switzerland

These are the next opportunities to get practical training in English:

You'll learn about the theory behind the calculations carried out by KISSsoft and how to best use the numerous functions to reach your particular aim in design and optimization. Please read about the details in this program.

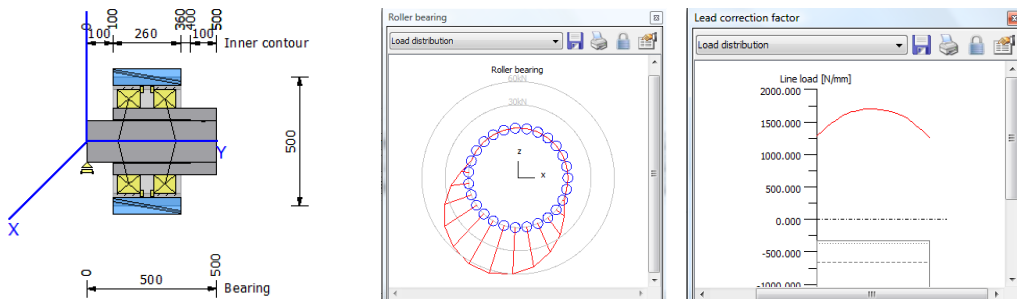
1. day Shaft/bearing calculation and graphical shaft editor

Shafts and Bearings

- Shaft modelling in graphical shaft editor
- Calculation of deflection, stress courses, reaction forces
- Calculation of static and fatigue strength according to DIN743
- Calculation of roller bearing using capacity numbers, influence of lubrication

Advanced-level topics

- Calculation of critical speeds and natural frequencies (bending, torsion)
- Buckling under axial load
- Comparison between DIN743 and Hänchen and Decker / FKM directive
- Equivalent design loads, finite life analysis
- Calculation with bearing stiffness defined by inner bearing geometry
- Bearing calculation with inner geometry, reference life according ISO/TS16281 ("Rolling bearings – Methods for calculating the modified reference rating life for universally loaded bearings, Edition 2008-06-15")
- Enhanced bearing life according ISO 281
- Consideration of bearing stiffness and bearing offset, statically overdefined systems
- Calculation of systems of several coaxial shafts (for example planet carrier with planet gear)



Practical calculation examples on PC for all participants

2.- 4. day - Advanced Gear calculation, Gear Design and Optimization

This seminar offers the first day a comprehensive view of the most important fundamental geometric properties of gears. The basis for strength calculations according to ISO6336 will be explained. The second and third day offers a more in-depth look at the current state of technology and the latest working practices in the field of gear calculation and optimisation. More specialist themes will be covered in which it will be also being shown how complex problems can be solved efficiently using calculation software.

Theory

Gear Geometry, tolerances, inspection, strength, material properties, optimisation:

Geometry of gears (cylindrical) with involute profiles

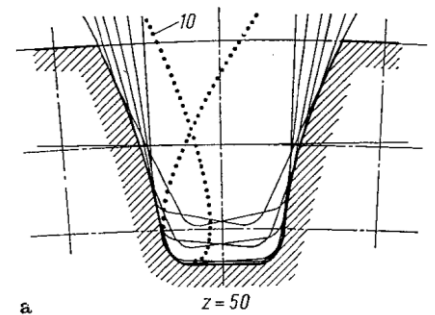
- Profile shift, optimisation of profile shift, undercut
- Grinding allowance, manufacturing profile shift
- Backlash, Tip clearance
- Reference profiles (normal profile, stubbed and deep tooth forms)
- Contact line, useable tip circle and useable root circle (SAP characteristics and problems, EAP)
- The most frequent errors found in the design of gear pairs
- Profile correction
- Internal tooth forms

Manufacturing Tolerances

- The various methods for inspection of gears
- Tolerances and allowances
- Calculation with grinding stock allowance.

Non-Involute Tooth Forms

- Theory, advantages and disadvantages, manufacturing



Strength Calculations for Gears (with involute tooth forms)

- Calculation of the root strength, theory, important formulae
- Calculation of the flank strength, theory, important formulae
- Scuffing (according to flash-temperature criteria and integral temperature)
- Static strength calculation for gears
- Woehler Line
- Load spectra
- Differences between various standards (ISO6336, DIN3990, AGMA2001)
- Crowning / Surface modification
- Safety factors (theoretical)
- Measures against gear damage

Strength calculation of non-involute tooth forms:

- Selection of materials and surface treatment (nitriding, hardening,..)
- Definition of material data for strength calculations.

Bevel, Worm, Crossed-Helical, and Face Gears

- Specific geometry, specific strength calculations
- Manufacturing Processes for bevel gears (Gleason, Klingelnberg, Cyclopaloid)

Gear Design and Optimization

Short overview about some important features of KISSsoft calculation programs

- Reports and modification possibilities
- Functions common to all modules
- Help functions
- New database management tool

Introduction using a Cylindrical (Spur/Helical) Calculation

Course of a successful gear design project:

- Draft parameter definition
- Geometry optimisation: Optimisation of design parameters
- Profile modification and crowning

Commonly Used Strategies for Optimisation of gears

- Modern strategies for the determination of noise and vibration reducing tooth forms
- Deep tooth forms
- Contact stiffness, contact of a gear pair under load
- Transmission error and Impact shock
- Profile corrections
- Well balanced root and flank strength
- Reduced and removed backlash
- Surface modifications (definition of the optimum crowning)

Cylindrical Gear Configurations (epicycles, racks, gear trains)

- Validation to standards
- Geometry and strength optimisation
- Special problems (assembly, etc.)

Manufacturing

- Assessment of the manufacture of a tooth form
- Manufacture of a tooth form using several different tools
- Design and checking of master gears

Expert Topics

- Identifying required safety factors
- Duty cycles
- Micropitting
- Optimal case hardening depth (for case hardening or nitriding)
- Further calculation options.

Topics treated on request

Additional themes which are treated in specialist seminars are briefly covered on request

- Gear pumps (inner, outer)
- Plastic gears
- Sintered gears
- Precision mechanics (small modules)
- Master gear lay out

Calculation of gear trains (short overview on KISSsys if required)

Presentation of KISSsys, the extension to KISSsoft for the calculation of entire systems of machine elements. KISSsys calculates the power transmission and manages the interactions between system elements.

