

Shafts, coaxial shaft systems

General

- Graphical shaft editor for fast modelling
- Calculates stress concentrations from feature geometry
- Add force elements like gears, pulleys or couplings for simple load definition
- Materials, bearings, lubricants databases
- Automatic identification of critical sections

Configurations

- Single shaft or coaxial shaft systems
- Static deformation, modal analysis
- General supports or rolling element bearings, pilot bearings, internal bearings
- Linear or non-linear calculation with Euler or Timoshenko beam model considering temperature effects

Strength rating

- Strength rating along DIN 743, FKM guideline, Hänchen & Decker or AGMA 6101
- For static and fatigue strength, for single load case or load spectrum
- Using material database or own definition for S-N curve, different Miner rules
- Independent load factors and stress ratios for static and fatigue rating

Modal and forced response analysis

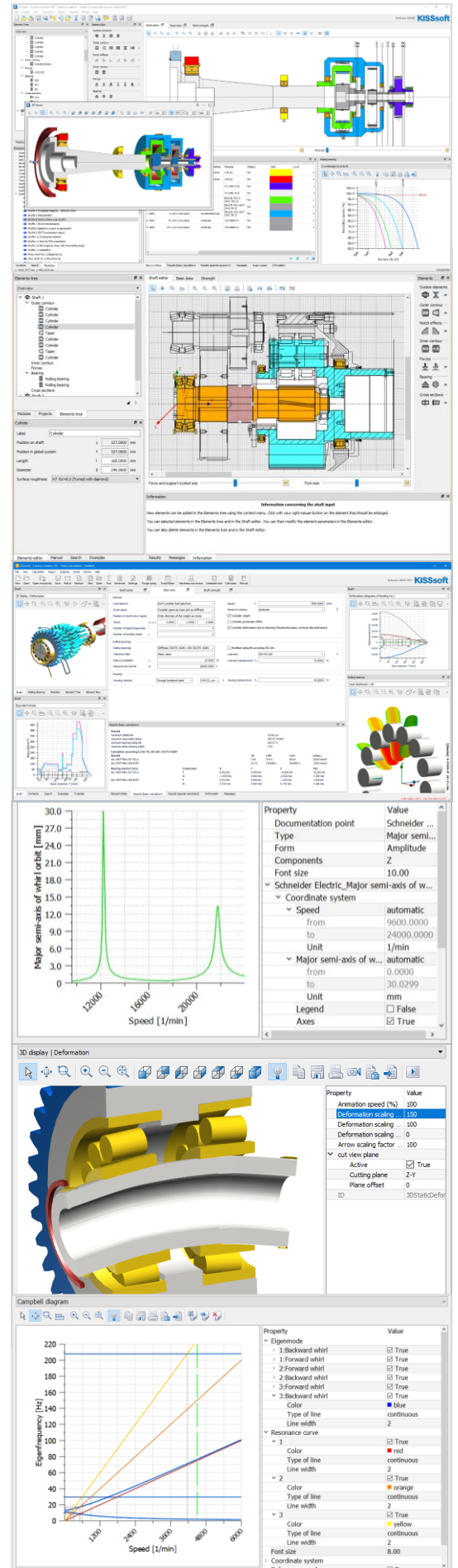
- Modal analysis
- Forced response analysis, with damping
- Considers bearing stiffness

Deformation and stiffness calculation

- Non-linear bearing stiffness is calculated based on inner bearing geometry
- Housing deformation, machining errors and similar may be defined as initial bearing offset
- Any number of loads may be added

Tooth trace calculation

- Calculation of shaft deformation of pinion shaft, calculation of necessary lead modification
- Housing stiffness, bearing stiffness and shaft stiffness may be considered



Bearings Configuration

- Calculation of single bearing or bearing-shaft system, any number of bearings in system
- With single load or load spectrum
- Sizing function for bearing selection

Bearing life rating

- Basic rating using load capacity numbers
- Modified rating considering lubricant properties
- Reference rating considering load distribution
- Modified reference rating
- Along ISO 281, ISO/TS 16281, ISO 76

Bearing stiffness and clearance

- Based on bearing inner geometry
- Shaft-bearing interaction for shaft and bearing systems
- Considers operating clearance / pre-tension
- Considers bearing, shaft, hub tolerances

Load distribution calculation

- Load distribution among rolling elements
- Contact stresses for balls
- Contact stresses for rollers, considering roller geometry modification (logarithmic)
- Contact stress distribution on raceway

Thermal rating

- Along DIN 732

Bearing database

- Bearing data from different bearing suppliers
- For different bearing types
- Basic bearing properties
- Bearing inner geometry, user editable
- Separate database for lubricants, lubricant purity definitions along ISO 4406

Hydrodynamic bearings

- Axial bearings DIN 31653, ISO 12130, DIN 31654
- Radial bearings ISO 7902, DIN 31652, DIN 31657, Niemann and Spiegel for grease lubricated bearings

The screenshot displays a comprehensive software interface for bearing analysis. At the top, there are tabs for 'Basic data', 'Rolling bearing', 'Shaft strength', and 'Roller'. The 'Rolling bearing' tab is active, showing various input parameters such as 'Calculation method', 'Tolerance field', 'Axial clearance', 'Radial clearance', 'Required service life', 'Grease filling', 'Oil level', 'Lubrication', 'Substrate temperature', and 'Contamination'. Below these fields are checkboxes for 'Use proprietary bearing internal geometry data' and 'Use SKF standard'. A 'Wälzlager' (Rolling bearing) section contains a bar chart titled 'Auswertung | Wälzlager Lebensdauer (Stunden)' showing 'Lagerlebensdauer [h]' for six different roller bearings (1-6). The chart compares three calculation methods: L10h (blue), Lm1h (green), and Lm1h (yellow). Below the chart is a 3D visualization of rollers with a color-coded stress distribution, labeled 'Hertzische Pressung [N/mm²]' with a scale from 0.000 to 1769.00. Two diagrams illustrate contact stress distributions on a raceway, showing parameters like $-x/L_{10h}$, $+x/L_{10h}$, $-f \cdot f_{mod,j}$, $+f \cdot f_{mod,j}$, $-f \cdot f_{mod,o}$, and $+f \cdot f_{mod,o}$. Below these is a graph of 'Hertzian stress [N/mm²]' vs 'Depth [mm]' for different stress components (σx, σy, σz, σmax). A 'Property' table on the right lists various parameters like 'Coordinate system', 'Depth', 'Hertzian stress', 'Line width', 'Rolling element no.', 'Section', 'Stress', and 'Contact on inner race'. At the bottom, a 'Force [N]' diagram shows a color-coded force distribution on a bearing raceway, with a scale from 0.000 to 2859.356.

Bearing designer

- Sizing function for bearing inner geometry
- Define ranges e.g., for rolling element diameter, pitch diameter, no. of rolling elements and others
- Software calculates possible bearing designs
- For each design, load capacity and properties of inner geometry are calculated
- Allows for specific, optimized design of bearings, in particular slewing bearings

Load distribution with elastic rings

- Elastic or stiff rings
- Ring deformation influencing load distribution

Calculation by SKF® and TIMKEN®

- Cloud based calculation
- Bearing forces are transmitted from KISSsoft to SKF cloud-based tool
- Bearings are rated by SKF, and results are sent back to KISSsoft

