KISSdesign, analysis

Calculations in KISSdesign

Integrated strength and lifetime calculation:

- With integrated KISSsoft calculation modules
- System deflection is considered in tooth
- contact analysis
- Calculations with load spectra for all machine elements in the model
- Integrated programming language for implementation of special functions
- Animation of gear movement
- Cut view and deformed systems display
- Wizards, libraries, and toolboxes for quick modelling

Machine element library

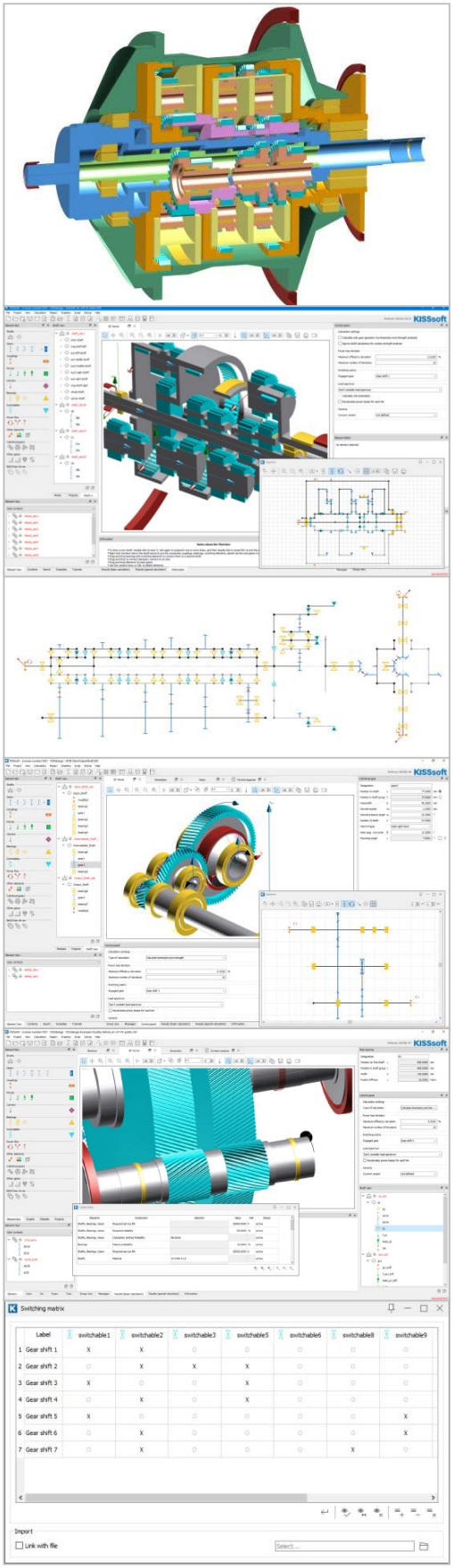
- Spur / helical gear pair and chain of gears
- Planetary gears, compound planetary gears
- Bevel and hypoid gears
- Worm gears, crossed axis helical gears
- Face gears with and without offset
- Shaft-bearing systems, coaxial shafts
- Shaft-hub connections
- Synchronizer

3D representation

- Automatic 3D-display (based on the data defined in KISSsoft)
- 3D-model export to CAD platforms, gearbox housing import, *.step file
- Collision check with imported CAD geometry

Typical applications

- Analyze wind turbine gearboxes for different loading conditions
- Check that of a plastic gear set for an automotive actuator fits into the design space
- Calculate power flow in CVT transmission
- Maintain a database of geared motor gears
- Compare different transmission layouts with respect to efficiency
- Estimate the manufacturing cost of a gearbox even during the design phase
- Optimize bearing lifetime by variation of the gear's positions on a shaft
- Create specific reports e.g., for certification
- And many more …



Housing stiffness matrix import
The housing stiffness and the housing deformation may be considered for the loaded tooth contact analysis in KISSdesign by means of

- Import of housing stiffness matrix / reduced stiffness matrix from supported FEM codes
- ABAQUS
- ANSYS
- NASTRAN

Features

- Node mapping: connect master nodes of stiffness matrix to KISSdesign model bearings
- Deformation vector is calculated inside KISSdesign using bearing forces and stiffness matrix
- Automatic alignment of stiffness matrix coordinate system to KISSdesign model coordinate system

Modal analysis

- System natural modes and natural frequencies
- Considers bearing operating stiffness matrix
- Considers gear mesh stiffness
- Considers shaft stiffness, inertias and masses
- Animation of modes on system level
- Comprehensive report

Thermal rating

- Calculates power losses due to gear meshes, bearing friction, churning and seal friction torque
- Based on ISO/TS 14179-1 / ISO/TS 14179-2
- For oil bath or forced lubricated systems
- Calculates and lists individual power losses and system efficiency
- Sizing of cooler, calculation of thermal equilibrium, calculation of required oil flow

Gleason GEMS® interface

- Export EPGΣ data from KISSsoft
- Interface to GEMS® and GAMA® through KISSsoft modules