Highlights in KISSsoft Release 03/2017

System calculation with KISSsys

- Reliability evaluation
- Predefined gear stages
- Handling of model tree

A new function in KISSsoft Release 03/2017 enables you to evaluate the reliability of gear units, individual gears and bearings.

The reliability of gears is evaluated using tooth root fracture and pitting as the criteria, whereas the service life methods specified in ISO 281 or ISO 16281 are used to evaluate the reliability of the bearings. The results are displayed as a graphic. The calculation is performed according to Bernd Bertsche, and the 3-Parameter Weibull distribution is used for the statistical evaluation.

KISSsys has a new function, the "Groups box", which lists a selection of predefined gear stages. These gear stages can be added to the model tree structure and combined in any way you like. Gear stages such as a Ravigneaux set or a Wolfrom set are also displayed, to make it easier to model complex wind power or speed change gear units. You can also define your own gear stages and save them in the software. This saves a great deal of valuable time when you are modeling complex drive systems.

The way in which the model tree structure is handled in KISSsys has also been improved, so that there are no limitations on the changes you can make later. Elements can now be deleted, renamed, copied, cut out and pasted in.

Bevel gears

- Modifications sizing
- Optimizing topological modifications

You can now also optimize tooth flank and tooth profile modifications for bevel gears. Options, such as calculating the cross-variations of values and coefficients, and functions for classifying each solution with reference to different criteria and displaying the results as a graphic, all provide an excellent basis for assessing the potential for optimization. You can also optimize topological modifications in KISSsoft.

Cylindrical gears

- Tooth root stresses by 2D FEM

The grinding process may create grinding notches in the root area of cylindrical gears. In an unfavorable situation, a grinding notch can generate significantly higher root stresses than those determined in the standard calculations. A new function in KISSsoft now makes it possible to use a 2D FEM approach to recalculate the root stresses for cylindrical gears (with either straight or helical teeth). This approach can then be used to compare the evaluated tooth root stress with the value calculated according to the standard.
Plastics material manager for gears

- Test procedure acc. to VDI 2736 Sheet 4
- Generating material data

With a new calculation module, you can now generate plastic material files from measurement data taken in test series performed according to VDI 2736 Sheet 4. Here, material properties such as the Young's modulus, yield point, tension and endurance limit can be entered as temperature-dependent values. These new materials can then be saved to the KISSsoft database, along with the automatically generated DAT files.

Bearing calculation

- Stress distribution
- Deformation of the bearing ring
- Rolling bearing fine sizing

A new graphic shows the stresses in the material underneath the contact surface of bearing rings and rolling bodies. The stress curves and their maximum values are also displayed. This information is particularly important for large diameter bearings where the bearing rings are only case-hardened, and the hardness depth has to be estimated on the basis of the load.

The elasticity of the bearing rings can now also be taken into account. To do this, external loads are defined on the outside or inside ring, and the deformation of the bearing ring is determined iteratively with the deflection of the rolling bodies. As this calculation is often performed for planetary gears, the load can be transferred directly from the gear calculation.

A new variation calculation for the bearing's inner geometry is now available when you are sizing rolling bearings. Design parameters, such as the number and diameter of rolling bodies, and bearing parameters, such as osculation or the density of the rolling bodies when cages are used, can all be varied. The results are then displayed in an easy to understand list or graphic, both of which have options for filtering the data.

Shaft calculation

- Rough sizing
- Unbalance response

When you are defining dimensions for a shaft, the software now provides options for sizing the shaft dimensions with regard to strength, and for sizing the bearings with regard to bearing service life. This really cuts down the time you need to design a gear unit. It is possible to specify which priorities are to apply during sizing.

The unbalance response can now be calculated on the basis of an eccentric mass when you are calculating the shaft's vibration. This calculation returns values for the resonating frequencies and the shaft's displacement, along with values for the additional forces to which the bearing is subjected because of the imbalance. To help perform a realistic calculation of vibration, you can enter the damping values individually.

Miscellaneous

- Splined connections AGMA 6123
- Plain hydrodynamic bearings DIN 31652
- Wire diameter standards for springs

If you are interested in acquiring a test license, simply send an e-mail to info@KISSsoft.AG