

## MESYS Shaft Calculation

The shaft calculation allows the calculation of displacement, forces, strength according DIN 743 and bearing life for several connected coaxial shafts. The MESYS Rolling Bearing Calculation according ISO/TS 16281 is included in the software and the nonlinear stiffness of rolling bearings is considered.

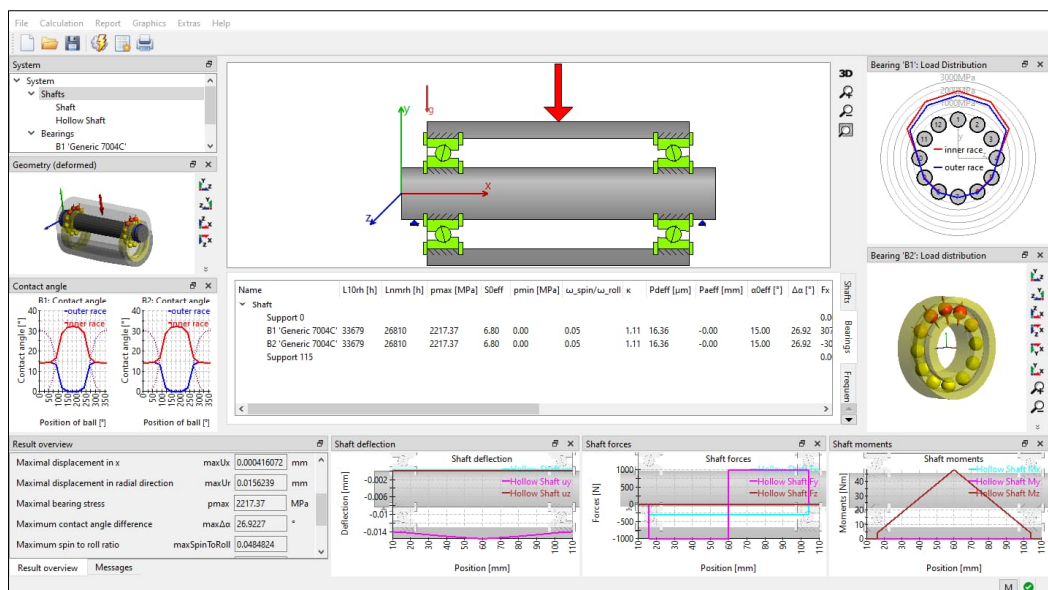
Because of the nonlinear bearing stiffness shafts with more than two bearings can be calculated with accurate bearing forces as result. Pretension of bearings can be considered. Combinations of angular contact bearings can be easily considered as bearing set:



Shaft geometry can be defined using an arbitrary number of cylindrical and conical elements for inner and outer geometry. The geometry input is done using tables.

Loads can be defined as central or eccentric forces, or as complex load elements such as gears.

Boundary conditions can be specified as rigid supports, springs, general constraints with

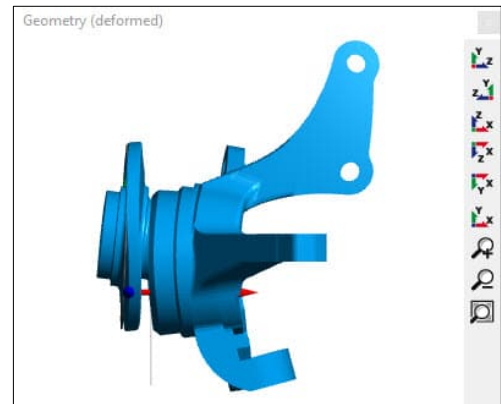


clearance and stiffness, or rolling bearings. An arbitrary number of loads and boundary conditions can be defined.

Multiple coaxial shafts can be defined and connected by rolling bearings or other boundary conditions. Shear and axial deformations are taken into account, and an optional nonlinear shaft model can be used. Shaft stiffness and internal forces can be evaluated at arbitrary positions.

Results are provided in a results overview, an additional table for bearing results, several graphics and a PDF report which also includes graphics.

The shaft calculation can be extended by importing 3D-elastic parts. These parts can be imported as STEP files, meshed, and condensed, allowing a more accurate representation of stiffness.



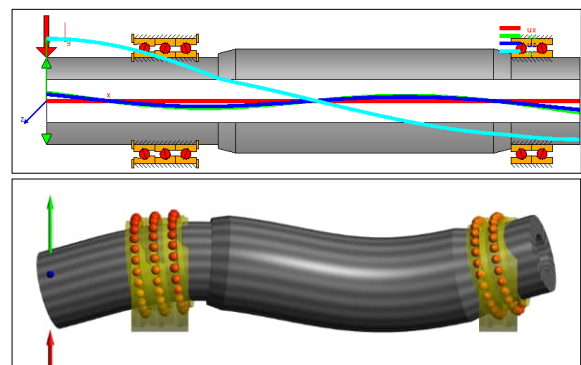
## Load spectra

Calculations with load spectra are supported. The elements of the load spectrum can be freely defined, including parameters such as loads, speeds, and temperatures. In addition to evaluating the complete spectrum, individual load cases can also be analysed separately.

## Natural frequencies and mode shapes

Natural frequencies are calculated considering bending, axial, and torsional modes. These modes can be coupled, like seen here for an axial mode (red) with a bending mode (blue), because of the bearing stiffness.

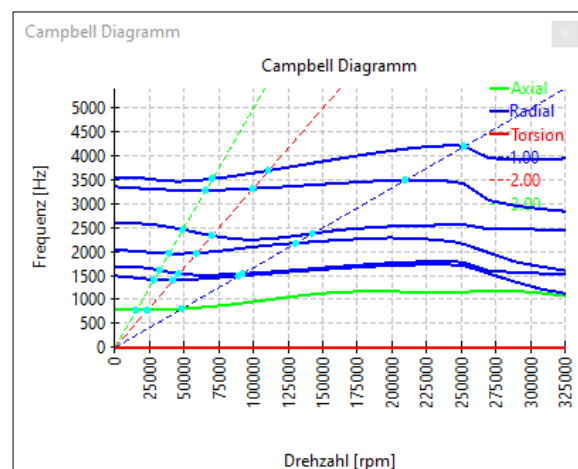
Additional masses can be defined for each shaft. The harmonic response to dynamic loads or unbalance can be calculated. Mode shapes are available as 2D plots and can also be visualized as 3D animations.



## Campbell Diagramm

The speed dependency of frequencies can be shown in a Campbell diagram. Axial, torsional and bending modes are shown in different colour.

The limits and number of calculation steps for generating the diagram can be configured. A separate report for critical frequencies is available.



## Contact

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A demo version and the software documentation are available for download on the website. Please contact us to request a trial version without limitations.