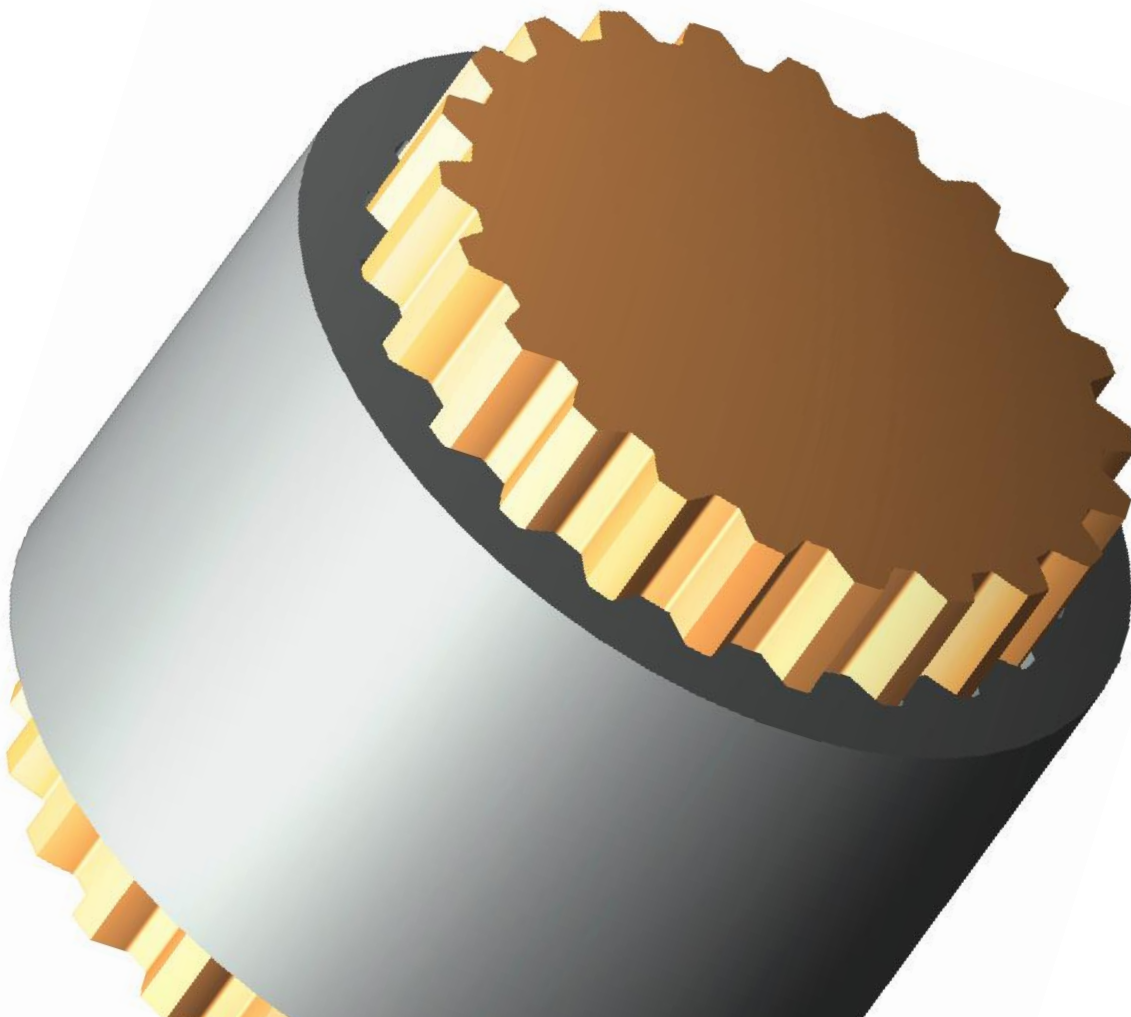


KISSsoft Specifications

Shaft-Hub Connections



Contents

- 1 Shaft-Hub connections..... 3
- 2 Cylindrical interference fit..... 3
- 3 Conical interference fit 3
- 4 Clamped connections 3
- 5 Key 3
- 6 Straight-sided splines..... 4
- 7 Splines 4
- 8 Polygons 4
- 9 Woodruff keys 4

1 Shaft-Hub connections

When calculating the shaft-hub connections, the system checks whether the connection functions as such (for friction-locked connections of cylindrical and conical interference fit) and whether the pressures occurring remain below the permissible material characteristic values.

All calculation modules offer sizing functions for the strength-relevant geometric dimensions and the maximum transmittable torque. The strength verification of the shaft is not included in these calculations; the shaft calculation is to be used for this purpose.

2 Cylindrical interference fit

The calculation for cylindrical interference fit according to DIN 7190-1 as well as the calculation of the maximum torque for a slip-free fit, safety against sliding, yield point, and flow limit is available. Furthermore, a database with the most important materials, the representation of the stress curve, and a tolerance design based on the desired safety against sliding and the permissible material stress is available.

In addition to the calculation according to DIN 7190-1, multi-part interference fits can be calculated. Further rings, which are connected, can be defined. The pressure is then calculated on the outside diameter of the hub of the innermost shaft-hub connection.

3 Conical interference fit

In KISSsoft, the calculation for conical press-fit seats (conical interference fit connection) according to F. G. Kollmann or to E DIN 7190-2 is available, as well as the calculation and sizing of a conical interference fit connection for transmitting torques in the elastic working state. It is also possible to join conical interference fits axially with a screw or press them together (only according to Kollmann). The calculated values then result in the safeties against slippage and against the yield point.

4 Clamped connections

The calculation of safety against sliding and surface pressure is done in accordance with Roloff Matek. The bending calculation is done as specified by Decker.

Two configurations are possible for the clamped connection: split or slotted hub. The hub is connected to the shaft by clamping together.

Furthermore, it is possible to determine how many screws are necessary so that the connection can withstand the loads.

5 Key

The keys are calculated according to DIN 6892, Methods B and C. The safeties for the surface pressure of shaft and hub and the shearing of the keys are tested. The calculation includes the profiles according to DIN 6885-1, DIN 6885-2, DIN 6885-3, ANSI B17.1 Square, and ANSI B17.1 Rectangular. You can also enter your own key geometry data. In KISSsoft, the load-bearing length of the key and the transmittable torque can be sized.

6 Straight-sided splines

The geometries of the multi-groove profiles can be selected according to the standards DIN ISO 14, DIN 5464, DIN 5471 and DIN 5472. In the "Own input" option, you can also define any dimensions you require.

The calculation of the load placed on the shaft and hub (surface pressure), together with determining the safeties, is performed in accordance with the "classic technical literature" (Niemann, Machine Elements I, 4th Edition, 2005). A scale graphic representation is also available.

7 Splines

The geometry and control measurements (spline and hub) are calculated in KISSsoft according to DIN 5480 (edition 2006), ISO 4156 (2005), ANSI B92.1 (1996), or ANSI B92.2 (1980). The selection lists with all possible or only recommended standard dimensions make the selection easier. In the "Own input" option, you can also define any other dimensions you require. The system includes all the tolerance systems (allowances and manufacturing tolerances) listed in the standards. The strength calculation is carried out according to Niemann (Machine Elements I, 4th edition, 2005), AGMA 6123-C16, or DIN 5466 (this standard was only published as a draft, but has already been withdrawn).

8 Polygons

The polygons are defined in accordance with the standards DIN 32711-1 (P3G profile) and DIN 32712-1 (P4C profile). For polygon shafts, the load on the shaft and hub (surface pressure) can be calculated. Further standards can be added. The calculation of the load placed on the shaft and hub (surface pressure), together with determining the safeties, is performed in accordance with the classic technical literature (Niemann, Machine Elements I, 5th Edition, 2005) or the standards DIN 32711-2 (P3G profile) and DIN 32712-2 (P4C profile). A scale graphic representation is also available.

9 Woodruff keys

Selection of Woodruff keys according to DIN 6888 series A (high pinion groove) and DIN 6888 series B (low pinion groove). By selecting "Own input," you can also define arbitrary profiles.

The calculation of the surface pressure placed on the shaft and hub, together with determining the safeties, in accordance with the classic technical literature (Niemann, Machine Elements I, 4th Edition, 2005). Further standards can be added.

The following sizings can be made:

- Determine the load bearing length of the shaft or hub, based on target safety
- Determine the transmittable torque