KISSsoft Release 2019

Module List

NEW

HIGHLIGHTS

▪ Intuitive concept design on system level
▪ Rolling bearing calculation with connection to SKF cloud
▪ Contact pattern analysis of asymmetric gears
▪ Calculation of crossed helical gear with rack
▪ Feasibility assessment for "Power Skiving"
▪ and much more…
Offer

The software KISSsoft has a modular structure: a variety of calculation modules are available. You can limit the amount of modules to suit your requirements.

Get to know

Our free 30 days test version enables you to evaluate and select the modules independently before purchasing a license.

Table of Contents

Offer ......................................................................................................................... 2
Get to know ............................................................................................................... 2

Base packages .......................................................................................................... 4
Base packages ........................................................................................................... 4
Base package Gearbox ............................................................................................. 6
Base packages complete ........................................................................................... 6

System Modules ....................................................................................................... 6
KISSsys..................................................................................................................... 6
Gearbox configurations ............................................................................................. 7
KISSsys Web ............................................................................................................. 7

KISSsys Expert Modules .......................................................................................... 7
Extended development environment for KISSsys ..................................................... 7
Gearbox variant Generator ....................................................................................... 7
KISSsys Efficiency calculation ................................................................................ 8
KISSsys Modal analysis ........................................................................................... 8
KISSsys housing deformation ................................................................................... 8
KISSsys Reliability .................................................................................................. 8

KISSsys Export Interfaces ......................................................................................... 9
KISSdesign .............................................................................................................. 9

Expert Modules Gears ............................................................................................. 9
Cylindrical gears...................................................................................................... 9
Configuration / Dimensioning ............................................................................... 9
Strength calculation methods ............................................................................... 11
Calculation with load distribution ......................................................................... 12
Contact analysis package ..................................................................................... 13
Contact analysis package complete ....................................................................... 13
Master gears .......................................................................................................... 13
Gear pumps ........................................................................................................... 13
Bevel gears ............................................................................................................ 14
Worms (Globoid) ................................................................................................. 15
Crossed helical gears or Worm gears (Cylindrical-Worm gear) ............................... 16
## Base packages

### Base packages

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| **ZPK** | Cylindrical gear package  
Geometry, control measures (DIN 3960, DIN 3962, DIN 3963, DIN 58400)  
Tolerances as specified in updated ISO 1328-1:2013  
Reference profiles according to JIS 1701-1  
Calculation and presentation 2D and 3D of the tooth form for external and internal  
tothing with tooth flank modification  
Graphical display of specific sliding  
One strength calculation for a cylindrical gear, either as specified in DIN 3990, ISO 6336,  
AGMA 2001, VDI 2545, VDI 2736 or GOST 21354-87  
Input of speed for epicyclic gears configuration  
Tooth friction / power loss acc. to Niemann  
Extended range for possible profile shift  
Deep tooth form/short cut tooth form, tools and final machining **NEW**  
Grinding the tooth root  
Flash temperature course  
Scuffing according to DIN 3990 and ISO TS 6336-20/21  
Micropitting according to ISO TR 15144-1:2014 (Method B)  
Input of Individual modifications per tooth **NEW**  
Arc of circle and spline approximation for 2D export (requires CA1)  
Extended 2D and 3D tooth form display  
Animation of gears when meshing, simultaneous display of more than one manufacturing  
step, measuring function in the graphics, function for saving data for A – B comparison  
Manual input of active tip and active root diameters in the single gear calculation  
Tooth form and tool in normal section  
Collision check, marking of contact point, marking of collision  
Manufacturing drawings  
Rights: Z01, Z02 (Z02a, Z13, Z14, Z14a, Z2e), Z05, Z5x, Z5i, Z5j, Z5k, Z19e, Z19m, Z1z |
| **WPK** | Shafts and bearing standard package  
Calculation of deformations also for statically overdetermined systems / multiple  
supports, and line loads, Input of linear bearing stiffness,  
Shaft rough sizing  
3D display of forces and diagrams of bending also during shaft modeling **NEW**  
Pressure angle and transverse shear  
Mirror shaft  
Read-in of a background drawing and show millimeter grid  
Plain bearings for shaft support  
Rolling bearing service life (ISO281, L10), Sizing of bearings with price indication **NEW**  
Bearing power loss  
One shaft strength calculation, either as specified in DIN 743, in FKM Guideline,  
Hänchen&Decker, AGMA 6101-E08 or AGMA 6001-E08  
Smith and Haigh diagram  
Extensive bearings database, with and without internal geometry **NEW**  
Rights: W01, W01c, W01f, W03, W03a, W05, W06a (or W06b, W06c, W6d), W12, K07b |
| **MPK** | Shaft-hub connections  
Cylindrical interference fit  
Conical interference fit  
Keys and Woodruff key  
Multi-Spline, Polygonal connection  
Involute splined shaft according to DIN5480, ANSI/B92, ISO4156, DIN5482, AGMA 6123-B06, AGMA 6123-C16  
AGMA 6123 incl. calculation of axis misalignment and crowning and verification of the rim fracture  
Serration shaft with notch flanks according to DIN 5481:2019-4 **NEW**  
Go and no-go gauges according to DIN 5480 5480-15  
Bolts and pins, welded, glued and soldered joints  
Clamped connections according to Roloff/Matek, Snaprings  
Arc of circle and spline approximation for 2D export (requires CA1)  
Rights: M01a, M01x, M01b, M01c, M02a, M02e, M02b, M02d, M02c, Z09, M03a, M08, M09a, Z5i, Z5n, M05 |
| **SPK** | Bolt calculation according to VDI 2230, Sheet 1, 2015 and Sheet 2, 2014  
Single bolt with axial and shearing force  
Cylindrical flange  
General connections with user-defined screw configurations (Sheet 2)  
Calculation according to input FEM results (Sheet 2)  
Considers high and low temperatures, temperature differences  
Rights: M04, M04a, M04b |
| **APK** | Automotive  
Friction clutches  
Synchronization as specified by Borg/Warner  
Allows for the calculation of either time or force during gear shifting  
Rights: A10, A20 |
| **FKP** | Springs  
Tension springs, compression springs incl. cylindrical and conical compression springs, disc springs (DIN EN 16984:2017, DIN EN 16983:2017 **NEW**), leg springs, torsion springs  
Rights: F01, F02, F03, F04, F05, F06 |
| **RPK** | V-belts, toothed belts, chain drives  
Strength and dimensioning, roller diameter, distance between axes, number of belts, with or without tensioning pulley  
Rights: Z90, Z91, Z92 |
| **LPK** | Stress analysis with local stresses according to FKM Guideline 2012, 6th edition  
Consideration of support effect, for fatigue and static load  
For calculation of safety factor and service life on basis of an external FEM calculation  
Rights: K12 |
| **VPK** | Linear drive train and Spindles according to Roloff/Matek  
Calculation of safeties against buckling, flank pressure and more, for the operation modes tightening and loosening  
Rights: K15 |
| **TPK** | Chain of tolerances  
Maximum- minimum dimension analysis, statistic analysis, tolerances: ISO / own input,  
Rights: K10 |
Hardness conversion
Hardness conversion according to DIN EN ISO 18265: 2014
from and to HB, HRC, HV, Rm, etc.
Rights: K09

HPK
Hertzian Pressure
Calculation of hertzian pressure for rolls, balls and planes
Rights: K14

Base package Gearbox

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPK-G</td>
<td>ZPK, WPK, MPK, TPK, HPK</td>
</tr>
<tr>
<td></td>
<td>Hardness conversion</td>
</tr>
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</table>

Base packages complete

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPK</td>
<td>ZPK, WPK, MPK, SPK, APK, FPK, RPK, LPK, TPK, HPK, VPK</td>
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<tr>
<td></td>
<td>Hardness conversion</td>
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System Modules

KISSsys

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
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<tbody>
<tr>
<td>SYS</td>
<td>KISSsys&lt;br&gt;Software extension for the calculation of complete systems with Power flow transmission calculation, administration of variants and integrated programming language&lt;br&gt;Group-based modeling with new assemblies (e.g. Wolfrom, Ravigneaux)&lt;br&gt;Import of CAD data, collision check&lt;br&gt;Assistant for input of parallel shafts and planetary stages&lt;br&gt;Automated 3D modeling&lt;br&gt;Adding complete stages to an existing model&lt;br&gt;Damage calculation results displayed in tables&lt;br&gt;Template for taking into account help results (moment of inertia, etc.)&lt;br&gt;Call the planet carrier deformation calculation in KISSsys&lt;br&gt;Interface to GEMS® (requires CD3)&lt;br&gt;Template for bevel gear displacements (EPG, VHJ)&lt;br&gt;Includes GPK&lt;br&gt;The corresponding KISSsoft modules (minimum WPK, ZPK) are needed&lt;br&gt;Rights: K11, K11a, K11c</td>
</tr>
</tbody>
</table>
### Gearbox configurations

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
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<tbody>
<tr>
<td>GPK</td>
<td>Package for sizing and rating of complete gearboxes (bearings, shafts, gears) based on KISSsys&lt;br&gt;One to five stage cylindrical gearbox&lt;br&gt;One to four stage bevel and cylindrical gear unit (requires at least ZC1)&lt;br&gt;One to four stage worm and cylindrical gear unit (requires at least ZD1)&lt;br&gt;One and two stage planetary gear unit (requires ZA1), also with coaxial shafts (requires WA1)&lt;br&gt;Load spectra (requires ZZ1, WA8)&lt;br&gt;The corresponding KISSsoft modules (minimum WPK, ZPK) are needed&lt;br&gt;Rights: K11, K11c</td>
</tr>
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### KISSsys Web

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
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<tbody>
<tr>
<td>SYSweb</td>
<td>Software platform with configurable web interface for accessing KISSsys models, designed for easy gear unit sizing using only the principal data&lt;br&gt;The corresponding KISSsoft modules (minimum WPK, ZPK) are needed&lt;br&gt;The price excludes the necessary KISSsoft and KISSsys modules. Services will be invoiced at cost.</td>
</tr>
</tbody>
</table>

### KISSsys Expert Modules

**Extended development environment for KISSsys**

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSE</td>
<td>Interface Eclipse shareware&lt;br&gt;Development environment for KISSsys functions, including debugging and breakpoints&lt;br&gt;Requires KISSsys&lt;br&gt;Rights: K11e</td>
</tr>
</tbody>
</table>

### Gearbox variant Generator

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>KS1</td>
<td>KISSsys model for the sizing of Gearbox variants&lt;br&gt;Automatically generates gear unit variants with different stages and transmission ratios from the overall transmission ratio and the torque&lt;br&gt;Results are displayed in 3D&lt;br&gt;For cylindrical gear units with first stage as a cylindrical, bevel, worm or crossed helical gear stage, and for planetary gear units&lt;br&gt;This function needs a KISSsys or GPK license and requires the appropriate KISSsoft modules (at least WPK, ZPK)&lt;br&gt;Rights: K11f</td>
</tr>
</tbody>
</table>
### KISSsys Efficiency calculation

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
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</thead>
</table>
| KS2     | Calculation of efficiency and thermal power  
|         | Power losses can be changed by predefined factors.  
|         | Range of options for evaluating thermal power etc.  
|         | Transferring meshing losses from the contact analysis  
|         | Power loss and efficiency for plain bearings  
|         | This function needs a KISSsys or GPK license and requires the appropriate KISSsoft modules (at least WPK, ZPK)  
| Rights: | K11h        |

### KISSsys Modal analysis

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| KS3     | Calculation of the drives eigenfrequencies and vibration modes in shaft systems,  
|         | Three-gear chains, four-gear chains and planetary systems  
|         | Takes into account the contact stiffness of the gears  
|         | Outputs of torsional and coupled (torsional, flexural and axial) vibrations  
|         | Vibration calculation with unbalance response and amplitude using speed  
|         | Calculation of the Campbell diagram for shaft systems  
|         | This function needs a KISSsys or GPK license and requires the appropriate KISSsoft modules (at least WPK, ZPK, WA1)  
| Rights: | K11i1, K11i2, K11i3 |

### KISSsys housing deformation

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
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</table>
| KS4     | Calculation of housing deformation using the bearings’ reaction forces  
|         | Calculates and modifies the bearings offset and tilting  
|         | The housings’ stiffness matrix is used to perform the calculation. This matrix is derived from an FE calculation. (ANSYS, ALTAIR OptiStruct. etc.)  
|         | This function needs a KISSsys or GPK license and requires appropriate KISSsoft modules (at least WPK, ZPK)  
| Rights: | K11j; K20a, K20b, K20c, K20d, K20e |

### KISSsys Reliability

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| KLR     | Calculation and display according to Bernd Bertsche, with 3-parameter Weibull distribution.  
|         | Input of Weibull shape parameter and coefficient for failure free time  
|         | For cylindrical gears, planetary gear stages NEW, bevel gears and rolling bearings  
| Rights: | K18        |
## KISSsys Export Interfaces

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| KS10    | MSC Adams Gear AT Integration  
          Export of KISSsys data into Gear AT. Exports data of the system, bearings, shafts, connecting elements, loads and cylindrical gears (macro and micro geometry)  
          Rights: K11k1, K11k |
| KS20    | REXS export  
          Export of system data (gear pairs, shafts and rolling bearings) with positioning in REXS format  
          Rights: K11k, K11k7 |

## KISSdesign

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
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</thead>
</table>
| KSD     | KISSdesign  
          Intuitive concept design on system level using Sketcher functionality  
          Kinematics for spur and planetary gears, as well as bevel and hypoid gears  
          Kinematics for gear shift transmission with sizing of shift matrix  
          Assistant for fast model building with group modelling  
          Sketch representation provides a schematic overview of the entire transmission system  
          3D Viewer for quick concept evaluation  
          REXS import (requires KS20)  
          Price for existing KISSsys users  
          Rights: S20 |

## Expert Modules Gears

### Cylindrical gears

## Configuration / Dimensioning

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| ZA1     | Planetary gear, Three gears, Four gears  
          Rights: Z01a, Z19g |
| ZA2     | Rack  
          Rights: Z01b |
| ZA3     | Rough sizing  
          Cylindrical gear pre-sizing (gear pairs, planetary trains)  
          Sizing acc. to required safeties, determination of the possible range for center distance and tooth thickness for solutions with the same torque capacity, Display of several suggestions with indication of the total weight (cost optimization)  
          Rights: Z03 |
Fine sizing (macro geometry)
Gear pairs, planetary trains, three gears chain, four gears chain

The optimization produces a list of all possible variants with various parameters; varying of gear module, number of teeth, profile shift, pressure angle, helix angle, center distance

Considers assembly conditions
For each solution a separate strength calculation is performed
Automatic sizing of deep tooth form (requires module ZA5)
Calculation of transmission error for all variants (requires module ZA30)
Varying the reference profile
Individual definition of cutter and pinion type cutter list for each gear
All feasible solutions regarding geometry are listed
All solutions are classified as to various criteria
Display of results in tables and graphics
Rights: Z04, Z04a

Fine sizing (micro geometry) Profile and width modifications

Geometry sizing functions and special calculations
Sizing of profile shift related to various criteria
Calculation of profile shift based on measured tooth geometry
Calculation of tooth thickness allowances based on measured tooth geometry
Pre-machining tools with grinding allowance, Topping tools
Sizing for tooth height regarding transverse contact ratio
Sizing of linear profile modification
Crowning and helix angle modification sized whilst taking into account axis inclinations as specified in ISO 6336-1, Appendix E (requires ZA35)
Report for tolerances In accordance with ISO 1328, DIN 3961, DIN 58405, BS 436, AGMA 2001, AGMA 2015
Calculation with manufacturing profile shift
Sizing of center distance regarding balanced specific sliding
Sizing of helix angle regarding various criteria
Profile and tooth trace diagram (K diagrams)
Rights: Z01x, Z15, Z19a, Z19d, Z19f, Z19h, Z19l, Z19n

Profile modifications with worm grinding wheels and dressing wheels
You can check whether a required gear with tip relief can be generated with an available worm grinding wheel/dressing wheel
Includes the available grinding worms / dressing wheels from a user-defined file.
Displays the suitable grinding worms / dressing wheels in a table
Rights: Z19j

Asymmetric gears
Sizing of asymmetric tooth forms for all cylindrical gear configurations
Strength calculation as defined in ISO 6336, VDI 2545, VDI 2736: 2014 (requires ZA10, or ZA17, or ZA21)
Sizing of root rounding / tool with different radii
Rights: Z1y

Power skiving, check for feasibility
Estimation of the collision of tool and gear, for internal and external gears
Fine sizing of the gears with assessment of the collision risk (needs ZA4)
Consider tool shank
Rights: Z19p
Double pinion planetary stage calculation
Kinematics as double pinion planetary configuration in a four gears chain (needs ZA1)
Check for collision
Sizing of center distances (needs ZA4)
Rights: Z1c

Strength calculation methods

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZA10</td>
<td>ISO 6336: 2006</td>
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<tr>
<td></td>
<td>Rights: Z02a</td>
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<tr>
<td>ZA11</td>
<td>DIN 3990: 1988</td>
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<td></td>
<td>Rights: Z02</td>
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<tr>
<td>ZA12</td>
<td>AGMA 2001, AGMA 2101</td>
</tr>
<tr>
<td></td>
<td>Rights: Z13</td>
</tr>
<tr>
<td>ZA13</td>
<td>VDI 2737: Calculate the tooth root load capacity of internal teeth with the influence of the rim thickness, edition 2016</td>
</tr>
<tr>
<td></td>
<td>Rights: Z23</td>
</tr>
<tr>
<td>ZA14</td>
<td>FVA (output of analogue results like Stplus)</td>
</tr>
<tr>
<td></td>
<td>Rights: Z10</td>
</tr>
<tr>
<td>ZA15</td>
<td>Graphical method for calculating the tooth root stress</td>
</tr>
<tr>
<td></td>
<td>Rights: Z19i</td>
</tr>
<tr>
<td>ZA16</td>
<td>AGMA 925: 2003, lubrication gap and flash temperature course according to AGMA</td>
</tr>
<tr>
<td></td>
<td>Rights: Z19k</td>
</tr>
<tr>
<td>ZA17</td>
<td>VDI 2545: 1981, for plastics, wear calculation with safety against shearing according to Fürstenberger</td>
</tr>
<tr>
<td></td>
<td>Rights: Z14</td>
</tr>
<tr>
<td>ZA18</td>
<td>Static strength (metal and plastic)</td>
</tr>
<tr>
<td></td>
<td>Rights: Z02x</td>
</tr>
<tr>
<td>ZA19</td>
<td>BV-RINA for military vessels, RINA 2010 for commercial vessels, Lloyds Register: 2013, DNV41.2, DNVGL-CG-0036 (2015), (requires ZA10)</td>
</tr>
<tr>
<td></td>
<td>Rights: Z02b, Z02d</td>
</tr>
<tr>
<td>ZA20</td>
<td>AGMA 6011, AGMA 6014, AGMA 6011-J14, AGMA 6004, API 613, AGMA 6015 NEW</td>
</tr>
<tr>
<td></td>
<td>Rights: Z13b</td>
</tr>
<tr>
<td>ZA21</td>
<td>VDI 2736: 2014, for plastics (Sheet 2), wear calculation with safety against shearing according to Fürstenberger</td>
</tr>
<tr>
<td></td>
<td>Rights: Z14a</td>
</tr>
<tr>
<td>ZA22</td>
<td>GOST 21354-87: 1987, including manufacturing tolerances and tooth thickness allowances</td>
</tr>
<tr>
<td></td>
<td>Rights: Z02e</td>
</tr>
<tr>
<td>ZA23</td>
<td>ISO13691: 2001, for „High speed, special purpose gear units”.</td>
</tr>
<tr>
<td></td>
<td>Rights: Z02f</td>
</tr>
<tr>
<td>ZA24</td>
<td>Tooth root stresses with 2D FEM</td>
</tr>
</tbody>
</table>
Calculation of the tooth root stresses for cylindrical gears (with straight or helical teeth) using 2D-FEM
Rights: Z38a

### Calculation with load distribution

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZA30</td>
<td>Contact analysis for cylindrical gears, taking into account tooth profile and tooth flank modifications, and shaft deformation&lt;br&gt;Flank fracture according to ISO/DTR 19042 19042-1 (July 2016) (requires ZZ4)&lt;br&gt;Calculation of the excitation force according to FVA-No. 487&lt;br&gt;Path of contact under load&lt;br&gt;Graphical display of results in groups: excitation, efficiency, forces and stresses, safeties <strong>NEW</strong>&lt;br&gt;Calculation and display of Hertzian pressure, of Contact patterns <strong>NEW</strong> and tooth root stresses along the actual tooth flank&lt;br&gt;Calculation of tooth mesh stiffness and transmission error under load based on the actual tooth form&lt;br&gt;Display of specific sliding, sliding velocity and sliding factors for gears under load from actual tooth form&lt;br&gt;Display of friction loss and local heat generation along the meshing&lt;br&gt;Calculates wear for plastics (dry run) and steel (cold wear)&lt;br&gt;Calculation and display of progression of wear&lt;br&gt;Calculation of safety against micropitting according to ISO TR 15144,&lt;br&gt;Calculation of lubrication gap according to ISO 15144 and AGMA 925 with actual normal force&lt;br&gt;Rights: Z24, Z25, Z27, Z30, Z31, Z31a, Z32, Z36, Z39a, Z39b, Z39c, Z39d</td>
</tr>
<tr>
<td>ZA34</td>
<td>Contact analysis for planetary gears, taking into account tooth profile and tooth flank modifications, and shaft deformation&lt;br&gt;Floating sun wheel&lt;br&gt;Flank fracture according to ISO/DTR 19042-1 (July 2016) (requires ZZ4)&lt;br&gt;All other functionalities as described in ZA30.&lt;br&gt;Rights: Z24, Z25, Z27, Z30, Z31, Z31a, Z34, Z36, Z39a, Z39b, Z39c, Z39d</td>
</tr>
<tr>
<td>ZA33</td>
<td>Optimization of tooth flank and tooth profile modifications&lt;br&gt;Optimized options for varying and combining data, for example, cross variations of amounts and coefficients&lt;br&gt;All solutions are classified as to various criteria&lt;br&gt;Graphical display of the classification&lt;br&gt;Enhanced graphical representation according to the fine sizing method (requires at least ZA30 or ZA34)&lt;br&gt;Rights: Z33</td>
</tr>
<tr>
<td>ZA35</td>
<td>Load distribution coefficient KHbeta acc. to ISO 6336 Annex E&lt;br&gt;Gapping and load distribution with shaft deformation and for every variation of tolerances with (+/-)fma and (+/-)fhb displayed as a graphics and listed in the report. Also for individual planets&lt;br&gt;Rights: Z02c</td>
</tr>
<tr>
<td>ZA36</td>
<td>Planet carrier deformation, with open-source FE library Code_Aster for parametrized geometry, import of planet carrier data in STEP format&lt;br&gt;Import of calculation results from ABAQUS, Rights: Z37 (requires at ZA35 or ZA34)</td>
</tr>
<tr>
<td>Module</td>
<td>Description</td>
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</table>
| **ZA37** | Tooth root stresses with 3D FEM  
Taking into account of the load distribution across the facewidth **NEW**  
Calculation of local tooth root stresses  
Rights: Z38b (requires ZA24 and ZA30 or ZA34) |
| **ZA38** | Contact analysis for asymmetric gears  
contact stiffness according to Weber/Banaschek  
**NEW**  
Rights: Z32a (requires ZA30 or ZA34 and ZA7) |

### Contact analysis package

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
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<tr>
<td>KAP</td>
<td>ZA30 and ZA34</td>
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### Contact analysis package complete

<table>
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<th>Modules</th>
<th>Description</th>
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<tbody>
<tr>
<td>KAPK</td>
<td>ZA30, ZA33, ZA34, ZA35, ZA36, ZA37, ZA38</td>
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### Master gears

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<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| ZA40 | Master gears  
Master gear analysis and design  
Rights: Z29 |

### Gear pumps

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| ZB1 | Gear pumps, Basic calculation  
Calculation of the transported volume of oil for gear pumps (without consideration of any feed-back volume)  
for internal and externally geared pumps  
for both standard involute and non-involute profiles  
can be combined with fine sizing  
Rights: Z26 |
| ZB2 | Gear pumps, Enhanced calculation  
Calculation and presentation of the pump characteristics during contact for detailed analysis and optimization  
Enclosed volume during mesh (feed-back volume), volume under critical in-flow speed at the narrowest point in entry chamber, total volume under entry pressure, torque on both gears (including option for calculation with or without Hertzian Pressure consideration), sliding velocity, wear number  
Alternatively, the Hertzian flattening due to tooth contact can be considered  
Rights: Z26a, Z32 |
### Bevel gears

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| **ZC1** | Bevel and hypoid gears geometry  
Geometry according to DIN 3971 and ISO 23509  
dimensions of bevel gears (measurements for manufacturing), for straight, helix- and spiral bevel gears,  
Conventional production, Klingelnberg or Gleason  
Conversion of Gleason Dimension Sheet for bevel-gear geometry data to DIN 3971 and vice versa  
Conversion of Gleason Dimension Sheet for parallel tooth height (Klingelnberg, Oerlikon)  
Rough sizing  
Verification of the tooth form separately for inside and outside (toe/heel)  
Rights: Z07, Z07d, Z07m, Z7s1 |
| **ZC10** | Generation of a 3D model for exporting straight and helical toothed bevel gears with modifications (apexes not in one point), and spiral bevel gears with modifications, for export. Load-free visual examination of the tooth contact by rotating either one, or both, gears (requires CB1)  
Rights: Z07p |
Calculate scuffing for bevel gears according to ISO/DTS 10300-20:2018 (draft) **NEW**  
Rights: Z07e |
| **ZC3** | Strength according to DIN 3991  
Rights: Z07g |
| **ZC4** | Strength according to AGMA 2003-B97 and AGMA 2003-C10  
Rights: Z07 |
| **ZC5** | Strength calculation according to Klingelnberg KN3030 1.2 (Spiral bevel gear, palloid and cyclo-palloid gears)  
Rights: Z07a |
| **ZC6** | Strength calculation according to Klingelnberg KN3030 1.2 (hypoid bevel gear, palloid and cyclo-palloid gears)  
Rights: Z07b |
| **ZC7** | Strength according to VDI 2545  
Rights: Z07h |
| **ZC8** | Static strength bevel gears / differentials  
Rights: Z07i |
| **ZC9** | Strength acc. to ISO 10300:2014 Method B for Hypoid gears  
Calculate scuffing for Hypoid gears according to ISO/DTS 10300-20:2018 (draft) **NEW**  
Rights: Z07f |
| **ZC11** | Strength acc. to DNV 41.2, root and flank strength, flank breaking, safety hardening depth  
Rights: Z07i |
| **ZC12** | Fine sizing for bevel, hypoid and differential bevel gears  
Rights: Z07n |
Sizing of topological modifications
Only sold together with engineering services performed by KISSsoft AG. Specific instructions on how to use this tool are supplied with this package.
Rights: Z7s3

Sizing of the webbing for differentials
For forged steel bevel gears, based on inner diameter, pressing of the thrust washer
Fine sizing of the webbing (requires ZC12)
Rights: Z71

Contact analysis under load for bevel gears with straight, helical and spiral teeth. Takes into account microgeometry
Graphical display of results in groups: excitation, efficiency, forces and stresses, safeties **NEW**
Calculation of contact lines, transmission error and stress ratios
Calculation of wear
Flank fracture according to ISO/DTR 19042 (draft) (requires ZZ4)
Calculation of the relative positions VHJ and axis angle errors directly from the shaft deformation
Calculation of the excitation force according to FVA-No. 487 1.2.3

Modification sizing for bevel gears with straight, helical and spiral teeth.
Optimization of tooth flank and tooth profile modifications
Optimized combinations and different variations (cross-variations of amounts and coefficients, etc.) works also with topological modifications
Classification of all solutions relative to different criteria
Graphical display of the classification
Rights: Z70

Worms (Globoid)

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZD1</td>
<td>Worm gear geometry</td>
</tr>
<tr>
<td></td>
<td>Cylindrical Worms with enveloping worm wheels, geometry according to ISO14521 and DIN 3975</td>
</tr>
<tr>
<td></td>
<td>Control measures for worms (measurement over 3 pins) and worm wheels (measurement over balls)</td>
</tr>
<tr>
<td></td>
<td>Worm sizing with tool module</td>
</tr>
<tr>
<td></td>
<td>Rights: Z08</td>
</tr>
</tbody>
</table>

| ZD10    | Generates a 3D model for export. Load-free visual inspection of tooth contact by rotating either one, or both, gears. |
|         | For flank forms ZA, ZI and ZN, ZC, ZK (requires CB1) |
|         | Rights: Z08p, Z8s |

| ZD2     | Strength according to ISO 14521 |
|         | Rights: Z08b |

| ZD3     | Strength according to DIN 3996 |
|         | DIN 3996: 2018 (draft) **NEW** |
|         | Rights: Z08a |
### Crossed helical gears or Worm gears (Cylindrical-Worm gear)

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| ZE1     | Geometry of crossed helical gears  
          Calculation of crossed helical gear and worm (cylindrical worm and cylindrical worm gear– as e.g. usual in precisions mechanics)  
          Crossed helical gears with external and internal teeth **NEW**  
          Control measures for worms (measurement over 3 pins) and worm wheels (measurement over balls)  
          Collision check  
          Rights: Z17, Z5k |
| ZE2     | Strength calculation on the basis of ISO 6336/Niemann, method Hirn  
          Rights: Z17a |
| ZE3     | Strength calculation for plastics on the basis of VDI 2545, Hoechst method, wear calculation according to Pech  
          Rights: Z17b, Z17c, Z17f |
| ZE4     | Static strength (bending and shearing) for metal and plastic  
          Rights: Z17d |
| ZE5     | VDI 2736 for plastics (Sheet 3), wear calculation according to Pech  
          Rights: Z17e, Z17f |
| ZE6     | Fine sizing for crossed helical gear  
          Rights: Z17n |
| ZE7     | Crossed helical gear with rack  
          Rights: Z17g |

### Face Gears

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| ZF1     | Face gears geometry  
          Calculation module that calculates the geometry of face gears coupled with cylindrical pinion gears. 2D views with tooth form simultaneously on the inside, at the center and on the outside. Checking undercut and pointed tooth tip is performed graphically in the 2D view, while tooth addendum height can be varied to prevent pointed tooth tip (including sizing function). Sizing of optimal facewidth  
          Rights: Z06 |
| ZF10    | Generates a 3D model, with offset and any shaft angle, for export (requires CB1)  
          Load-free visual inspection of tooth contact by rotating either one, or both, gears.  
          Rights: Z06f |
| ZF2     | Strength calculation on the basis of ISO6336 and literature  
          Rights: Z06a |
| ZF3 | Strength calculation on the basis of CrownGear/DIN 3990  
Rights: Z06b |
| ZF4 | Strength on the basis of ISO 10300, Method B  
Rights: Z06c |
| ZF5 | Strength on the basis of DIN 3991, Method B  
Rights: Z06d |
| ZF6 | Static strength  
Rights: Z06e |

## Non-Circular Gears

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| ZG1     | Calculation of non-circular gears  
Only sold together with engineering services performed by KISSsoft AG.  
Specific instructions on how to use this tool are supplied with this package.  
Rights: Z40 |

## Beveloid Gears

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| ZH1     | Beveloid geometry and strength (only for external toothing)  
The strength calculation is covered by a cylindrical gear calculation strength calculation  
Profile and tooth trace modifications, e.g. negative crowning etc.  
Graphical contact analysis  
Rights: Z50 |
| ZH10    | Generate 3D model for export  
(requires CB1)  
Rights: Z50p |

## Tooth form calculation

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| ZY1     | Extended 2D and 3D tooth form display  
Animation of gears when meshing, simultaneous display of more than one  
manufacturing step, measuring function in the graphics, function for saving data for A – B comparison,  
Tooth form and tool in normal section  
Collision check, marking of contact point, marking of collision  
Rights: Z05x, Z05j, Z05k |
| ZY2     | Import of tooth form or tool geometry  
Import of any kind of non-involute tooth shapes or tools (e.g. from CAD or 3D-measuring machine or DXF), Approximation of the normal vectors NEW  
Rights: Z05a |
ZY3 Calculation of milling cutter (hob) and pinion type cutter
Calculation of type cutter reference profile and pinion (also for the design of special tools)
Rights: Z05c

ZY4 Calculation of counter gear’s tooth form by generating with actual gear
Rights: Z05d

ZY5 Addition for moulding
Compensation of shrinking, spark gap, modification of pinion type cutter
Rights: Z05e

ZY6 Topological modifications, Twist due to manufacturing
Progressive profile correction, arc-like running in curve,
Elliptical root radius; Rights: Z05f, Z05g

ZY7 Cycloid- and arc of circle tooth forms, designed Involute,
Straight line flank
Rights: Z05h, Z05n

ZY8 Tool scaling
Scaling the DXF tool or tooth form with the gear’s normal module, Rights: Z05q

ZY9 NEW Elliptical deformation for spur gears
Gear pair, gear 1 as elliptically deformed external gear, gear 2 as circular internal gear.
Input of elliptical half axis ratio, calculation of the shorter half axis.
The 2D graphics shows the elliptically deformed gear 1 in mesh with the circular gear 2.
With this, a meshing interference check can be done. No 3D graphics.
For the development of “Wave Gears” or “Harmonic Drives”
Rights: Z5p

Further gear specific modules

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| ZZ1     | Load spectra, service life, transmissible torque/power
Calculation of transmissible power with and without load spectra
Calculation of service life with and without load spectra
Calculation of safeties with load spectra (for cylindrical, bevel, and cross helical gears)
Taking into account the direction of rotation and load of the individual stages (for cylindrical gears)
Rights: Z16, Z16a, Z18, Z18a |
| ZZ2     | Hardening depth
Proposal of required hardening depth based on Hertzian pressure (for cylindrical gears, bevel gears)
Rights: Z22 |
| ZZ3     | Backlash
Calculation of acceptance-backlash and operating-backlash
Taking into account tooth and shaft bending (requires ZA35)
(for cylindrical-, crossed helical- and worm gears)
Rights: Z12 |
Tooth flank fracture calculation for cylindrical and bevel gears
According to ISO/DTS 6336-4 NEW
For bevel and hypoid gears according to ISO/DTS 10300-4:2019 NEW
Rights: Z07k

Measurement grid points for measuring topology, flank and root, for cylindrical, bevel and crossed helical gears, for worms and globoid worm wheels and for splines
For measurement machines: Klingelnberg and Gleason (requires CB1)
Rights: Z05o

Plastics Manager
Easy way to generate plastics material files (DAT files) based on the material properties and measured test bench data according to VDI 2736-4 and VDI 2736 modified NEW (requires module ZA21 or ZE5)
Save the new materials directly to the KISSsoft database in the right format for calculations
Calculation for dry run NEW
Rights: K17

Normal backlash based on the effective tooth form
This calculates the normal backlash for each point of contact for pitch based on the effective tooth form over complete facewidth. This calculation is especially important for the watch manufacturing industry, and for special tooth forms (cycloid, arc of circle or tooth form via DXF), and is available for all cylindrical gear configurations (except for racks)
Rights: Z19v

Expert modules Shafts and Bearings

Shafts

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA1</td>
<td>System of shafts composed of various coaxial shafts</td>
</tr>
<tr>
<td></td>
<td>Calculation of the deformation in the shaft system</td>
</tr>
<tr>
<td></td>
<td>Taking into account the bearing offset, bearing clearance, thermal expansion, linked shafts, nonlinear bearing stiffness calculated from the internal geometry</td>
</tr>
<tr>
<td></td>
<td>Approximation of the internal bearing geometries with optional input of the number of rolling bodies and available data from bearing manufacturers NEW</td>
</tr>
<tr>
<td></td>
<td>Radial bearing can be calculated either with or without an inner or outer ring</td>
</tr>
<tr>
<td></td>
<td>Rights: W01a, W01b, W03b, W03c, W03d</td>
</tr>
</tbody>
</table>

<p>| WA2     | Tooth trace modification |
|         | Calculation of longitudinal deformation |
|         | Load distribution with and without modification |
|         | Sizing of the optimal tooth trace modification |</p>
<table>
<thead>
<tr>
<th>Code</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA3</td>
<td>Buckling (for beams and shafts)</td>
</tr>
<tr>
<td>WA4</td>
<td>Critical speeds and frequencies&lt;br&gt;Torsions-, bending-&lt;br&gt; longitudinal frequencies&lt;br&gt;Campbell diagram</td>
</tr>
<tr>
<td>WA5</td>
<td>Strength calculation according to Hänchen &amp; Decker&lt;br&gt;Shaft design regarding constant equivalent stress and maximal deformation</td>
</tr>
<tr>
<td>WA6</td>
<td>Strength calculation acc. to DIN 743, 2012 edition&lt;br&gt;Shaft design regarding constant equivalent stress and maximal deformation</td>
</tr>
<tr>
<td>WA7</td>
<td>Strength calculation acc. to FKM, 2012 edition&lt;br&gt;Shaft design regarding constant equivalent stress and maximal deformation, Endurance limit calculation for surface treated parts according to section 5.5&lt;br&gt;Options for coefficient Kf according to sections 4.3.2 and 4.3.3, determining of the core hardness from the tensile strength Rm</td>
</tr>
<tr>
<td>WA10</td>
<td>Strength calculation based on AGMA 6101-E08 and AGMA 6001-E08</td>
</tr>
<tr>
<td>WA8</td>
<td>Load spectra for shafts and bearings&lt;br&gt;Calculation for shaft limited life- and endurance strength&lt;br&gt;Bearing calculation with load spectra&lt;br&gt;Setting of separate temperatures for each load bin with consideration in the calculation of bearing clearance and lifetime according to ISO/TS 16281</td>
</tr>
<tr>
<td>WA11</td>
<td>Forced vibration&lt;br&gt;Vibration on the shaft calculated on basis of the unbalance response&lt;br&gt;Compensation for imbalances by defining the angular position in the &quot;eccentric mass&quot; force element</td>
</tr>
</tbody>
</table>

Rights: W10

Rights: W13

Rights: W04, W04x

Rights: W04

Rights: W06a, W12

Rights: W06b, W12

Rights: W06c, W12

Rights: W06d, W12

Rights: W06s, W12

Rights: W14
### Other shaft-specific modules

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| DPK     | Gear body deformation  
For asymmetric gear bodies, the resilience of the gear body is calculated using the integrated FE Software Code Aster (flexibility of gear rims and webs in axial plane).  
Precise determination of the gear flank misalignment.  
Display of the results of the deformation calculation in the software Salome. Output of the stiffness matrix Also for internal toothing.  
Gear body geometry for inclined webs Display the gear body in a preview, and check independently of the FE calculation. |

### Bearings

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| WB1     | Enhanced bearing calculation (L10m, Lnm)  
Influence of lubrication according to ISO 281-1  
Thermally permissible service speed acc. DIN 732  
Definition of the contamination for each rolling bearing individually  
Calculation of bearing rating life and modified rating life using SKF Cloud® NEW |
| WB2     | Reference service life calculation according to ISO 16281 (L10r or Lnmr if combined with Module WB1)  
Diagram of the load distribution in the bearing  
Diagram of the load distribution over the rolling bodies and races  
User specified input of roller profiles  
Works for thrust needle roller bearings  
Graphic showing stresses under the contact surface |
| WB3     | Plain hydrodynamic bearings  
Hydrodynamic radial plain bearings: Oil or grease lubricated, according to DIN 31657,  
DIN 31657-4:2019 NEW, DIN 31652 and Niemann  
Hydrodynamic axial plain bearings: Calculation of pad thrust bearings, tilting-pad thrust bearings, according to ISO 12130 |
| WB4     | Calculation of a single bearing with internal geometry according to ISO/TS 16281  
Own input of the inner and outer ring deformation (possible without the WPK)  
Deformation of bearing rings through external load  
Input loads from the planetary stage calculation  
Tilting of elastic bearing rings is taken into account |
| WB5     | Rolling bearing fine sizing  
Optimization of the internal geometry of bearings through variation calculation  
Variants are displayed in a list, or graphically (needs the WB4 module) |

Rights: K16, W05a, W05b, W05c, W07, W07a, W07b, W07c, W07d, W07e, W08, W51, W51a
# CAD Interfaces

## 2D Export

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| CA1     | 2D DXF and IGES Export  
Rights: K05a, K05e |

## 3D Export

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| CB1     | STEP and Parasolid format export in 3D through Parasolid kernel  
Display and export cylindrical gears with modifications, and straight and helical toothed bevel gears (apexes in one point, without modifications), beveloid gears, display as skin model for checking tooth contact, spline (shaft-hub), shafts, rack  
Rights: K05u |
| CB2     | Integration with Solid Edge (versions ST7-ST10): Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub), shafts and racks) directly from the calculation, using the KISSsoft menu in Solid Edge, includes CC1  
Rights: K05d, K04 |
| CB3     | Integration with SolidWorks (versions 2015-2018): Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub), shafts and racks) directly from the calculation, using the KISSsoft menu in SolidWorks, includes CC1  
Rights: K05k, K04 |
| CB4     | Integration with Inventor (versions 2015-2018): Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub), shafts and racks) directly from the calculation, using the KISSsoft menu in Inventor, includes CC1, Rights: K05m, K04 |
| CB5     | Integration with CATIA V5: Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub)) (manufacturer: SWMS), Rights: K05o* |
| CB6     | Integration with Creo Parametric (versions 1-4): Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub)) includes CC1, (manufacturer: Applisoft)  
Rights: K05q*, K04 |
| CB7     | Integration with Siemens NX (versions NX 9- NX 12): Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub), shafts and racks) directly from the calculation, using the KISSsoft menu in NX, includes CC1  
Rights: K05n, K04 |

* please refer to the conditions
COM Interfaces

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| CC1     | COM interface, basic
          | Calls basic KISSsoft functions, such as report creation, CalculateRetVal, and KSoftVersion, via the COM interface
          | On request, can also display KISSsoft messages
          | Usage with Python NEW
          | Rights: K04 |
| CC2     | COM interface, expert (includes CC1)
          | Most of the sizing and optimization functions are provided by the extended COM interface, which is accessed using CallFunc and CallFuncNParam.
          | Contact analysis can now be completely controlled via the COM interface.
          | Rights: K04, K04a |

Scripting

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| CC3     | Scripting
          | Programming language for calculation automation and hooks (preCalc, postCalc, etc.)
          | Access to KISSsoft parameters and functions (within the same KISSsoft module)
          | The script is saved in the KISSsoft calculation file.
          | Rights: K22 |

Interfaces for data exchange

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
</table>
| CD1     | GDE exchange format:
          | Gear Data Exchange GDE in XML format according to VDI 2610: 2014, export available under special reports for cylindrical gears.
          | Rights: K5f |
| CD2     | GAMA exchange format:
          | Gleason Automated Measurement and Analysis GAMA export is now available under special reports for cylindrical gears
          | Rights: K5g |
| CD3     | Interface to GEMS®
          | Data can be exchanged with GEMS® (Gleason's bevel gear manufacturing and analysis software) via KISSsys and KISSsoft NEW! It is now possible to export and import bevel and hypoid gear geometry data and misalignments due to loads. The results of the GEMS® contact analysis under load can then be displayed in KISSsys.
          | Rights: K11k6, K5j |
CD4  Tooth form Export
NEW  Export of tooth form and tool geometry in X, Y coordinates (optionally also with normal vectors and curvature radii)
      Data in transverse, normal or axial section
      Rights: Z5b

### Languages

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA1</td>
<td>German: Software user interface, reports, graphics, messages</td>
</tr>
<tr>
<td>LA2</td>
<td>English: Software user interface, reports, graphics, messages, Rights: K02a</td>
</tr>
<tr>
<td>LA3</td>
<td>French: Software user interface, reports, graphics, messages, Rights: K02b</td>
</tr>
<tr>
<td>LA4</td>
<td>Italian: Software user interface, reports, graphics, messages, Rights: K02c</td>
</tr>
<tr>
<td>LA5</td>
<td>Spanish: Software user interface, reports, graphics, messages, Rights: K02d</td>
</tr>
<tr>
<td>LA6</td>
<td>Russian: Software user interface, reports, graphics, messages, Rights: K02e</td>
</tr>
<tr>
<td>LA7</td>
<td>Portuguese: Software user interface, reports, graphics, messages, Rights: K02f</td>
</tr>
<tr>
<td>LA8</td>
<td>Chinese: Software user interface, reports, graphics, messages</td>
</tr>
<tr>
<td>NEW</td>
<td>Rights: K02g</td>
</tr>
</tbody>
</table>

### Services

#### Customizing

We can tailor our software to suit our customers’ requirements. If you can’t find the functionality you require in the list, please contact us directly. Our team of experts will then work together with you to develop your own specialized solutions.

#### Engineering

KISSsoft AG also provides engineering and consultancy services. Our expertise and experience has been gathered over many years, working on a multitude of different projects in a wide range of industries. We would also be delighted to make you a specific offer.

#### Training courses

Our training courses teach you how to make best possible use of our software and explain the most important theories that lie behind it. You will find more information about public training courses, and also the registration forms, on our website. Please contact us directly if you would like information about company-specific training courses.