KISSsoft and GEMS®
System Design Data Interface
Two Software Solutions: One Common Goal

KISSsys: Design of Transmissions

- Kinematic calculation of shifted transmissions, differentials and power split
- Load Capacity of Transmission, using load spectra
- Efficiency and Thermal Rating, power losses
- Housing compliance considered by stiffness matrix
- Dynamics of Shaft Systems

GEMS: Calculation and Manufacturing of Bevel and Hypoid Gears

- Design and analysis of spiral bevel & hypoid gears
- Establishment of data for Gleason gear production machines
- Establishment of data for Gleason blade grinding machines
- Closed Loop to manage manufacturing processes
Two Software Solutions: Complimentary Process for Bevel and Hypoid Design

KISSsoft: Bevel Gear Design

- Geometry and strength calculation according to ISO, AGMA, DIN, DNV, ...
- Sizing and variation of macro geometry such as pressure angle, spiral angle, offset, ...
- Bevel gears in systems and calculation of EPG (VHJ) misalignment from pinion and wheel shafts
- Misalignment are including shaft bending, bearing stiffness, housing deformations ...

GEMS: Bevel Gear Design

- Open Design, Seamless Connectivity
- Import design data files from CAGE and UNICAL
- Interface with GEMS through touchscreen or conventional mouse/keyboard
- 3D gear and pinion graphics with animation
- Interactive tooth surface and ease-off correction and optimization
- Real blank geometry for both pinion and gear
- 2D/3D loaded TCA, including interactive root bending stress and contact stress output with S-N Curves
- Interactive tool design with graphical slot and blade output
New Features in KISSsoft Release 2019

Import and export of GEMS DDE files
- helps for transferring data between SW’s.
- no micro geometry is transferred

Flank fracture for bevel and hypoid gears
- as per Draft ISO 10300-4 (edition 2019)

Scuffing for bevel and hypoid gears
- as per Draft ISO 10300-20 (edition 2018)

Differential bevel gears
- sizing of alterations due to bores, required webbing thickness, etc.
System Design Loop: KISSsyst using GEMS

- System Design & Simulation
- Gear Design & Analysis
- Gear Optimization
  - Strength
  - NVH
  - Efficiency
- Manufacturing
  - Cutting
  - Grinding
- System Testing
- Gear Testing
Design Processes: Workflow 1

Workflow 1: Gear design calculation

Workflow 2: System calculation
STEP 1: Sizing in KISSsoft using the rough and fine sizing

1. Entering the load data in KISSsoft
   → the **rough sizing** gives a first design

2. Design variation with **fine sizing** (DOE, Run many cases) entering the variation for spiral angle, pressure angle, number of teeth, tooth height
   → the best macro geometry is determined
STEP 2: Export from KISSsoft and Import in GEMS
STEP 3: check and optimize for manufacturing:
cutter head system, blade edge radius, tooth thickness, undercut, strength (Q-number, ..),
TCA (nominal position), etc.
Gear Design Calculation: Export Gear Geometry from GEMS® to KISSsoft

STEP 4: Export Gear Geometry from GEMS® to KISSsoft

GEMS®
STEP 5: the calculation in GEMS and KISSsoft are consistent
Design Processes: Workflow 2

Workflow 1: Gear design calculation
Workflow 2: System calculation
STEP 1: Create system model in KISSsys and define load cases
System Calculation: EPG Values in KISSsys

STEP 2: Calculate misalignment values EPG and export to GEMS
STEP 3: Import Load Cases and Press RUN to perform the FEA calculation
STEP 4: Results generated. Export to display in KISSsys
STEP 5: Import Stress and TE results in KISSsys

Future Plan: Continue to run NVH analysis in KISSsys
Let us stay in touch!

If you are interested in testing and acquiring the interface, contact us at

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