KISSsoft and GEMS®
System Design Data Interface

KISSsoft
Drivetrain Design Solutions

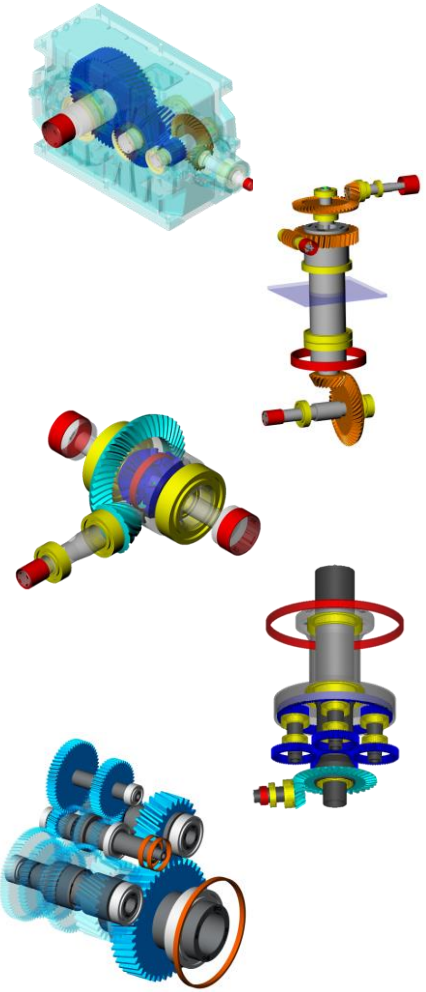
GEMS®
Gleason Engineering & Manufacturing System

KISSsoft

Two Software Solutions: One Common Goal

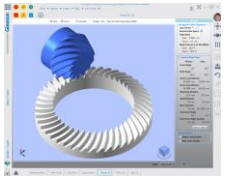
KISSsys: Design of Transmissions

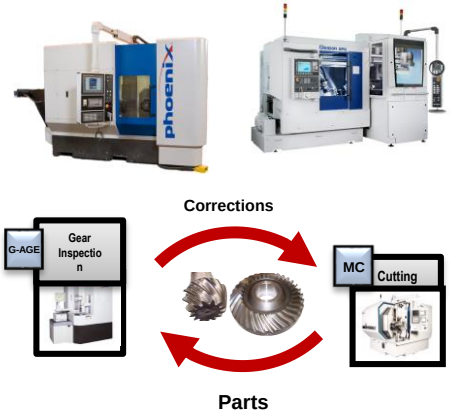
- Kinematic calculation of shifted transmissions, differentials and power split
- Load Capacity of Transmission, using load spectra
- Efficiency and Thermal Rating, power losses
- Housing compliance considered by stiffness matrix
- Dynamics of Shaft Systems



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





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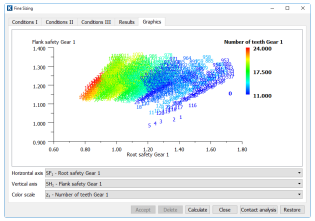
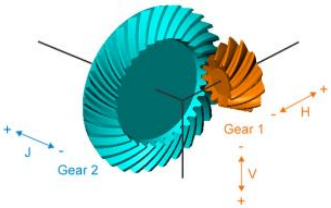
Two Software Solutions: Complimentary Process for Bevel and Hypoid Design

KISSsoft: Bevel Gear Design

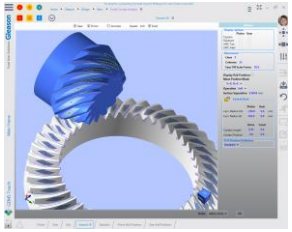
- Geometry and strength calculation according to ISO, AGMA, DIN, DNV, ...
- Sizing and variation of macro geometry such as pressure angle, spiral angle, offset, ...
- Bevel gears in systems and calculation of EPG (VHJ) misalignment from pinion and wheel shafts
- Misalignment are including shaft bending,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

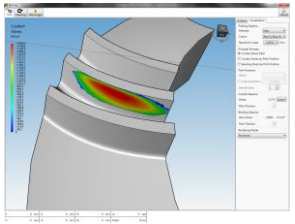


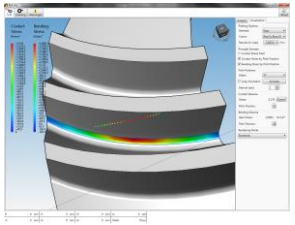


GEMS: Bevel Gear Design

- 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





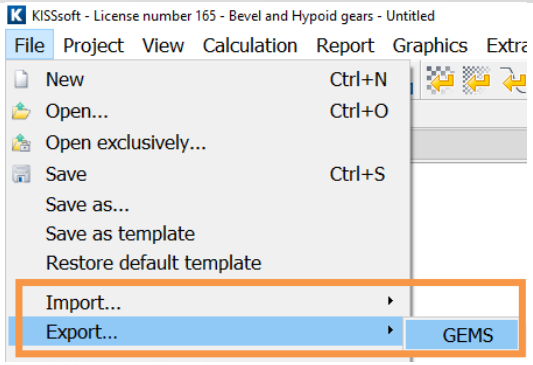


KISSsoft

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)

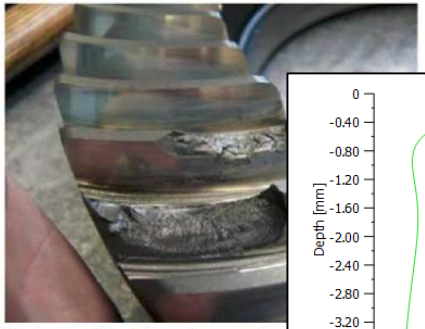
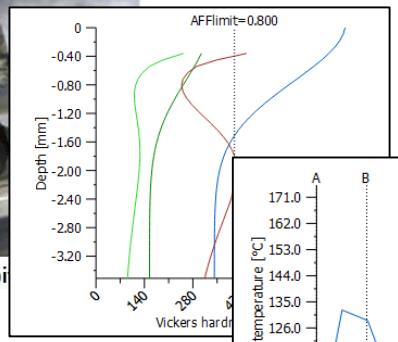
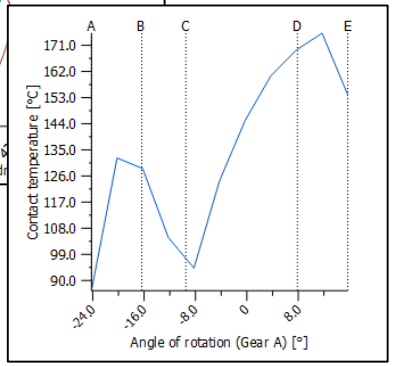


Figure 1 Flank breakage and pi



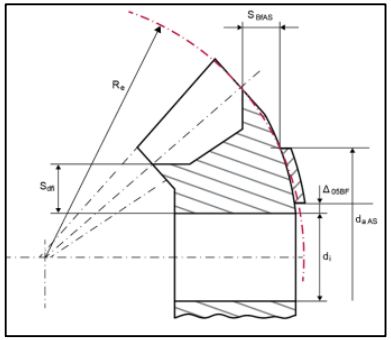
Scuffing for bevel and hypoid gears

- as per Draft ISO 10300-20 (edition 2018)



Differential bevel gears

- sizing of alterations due to bores, required webbing thickness, etc.



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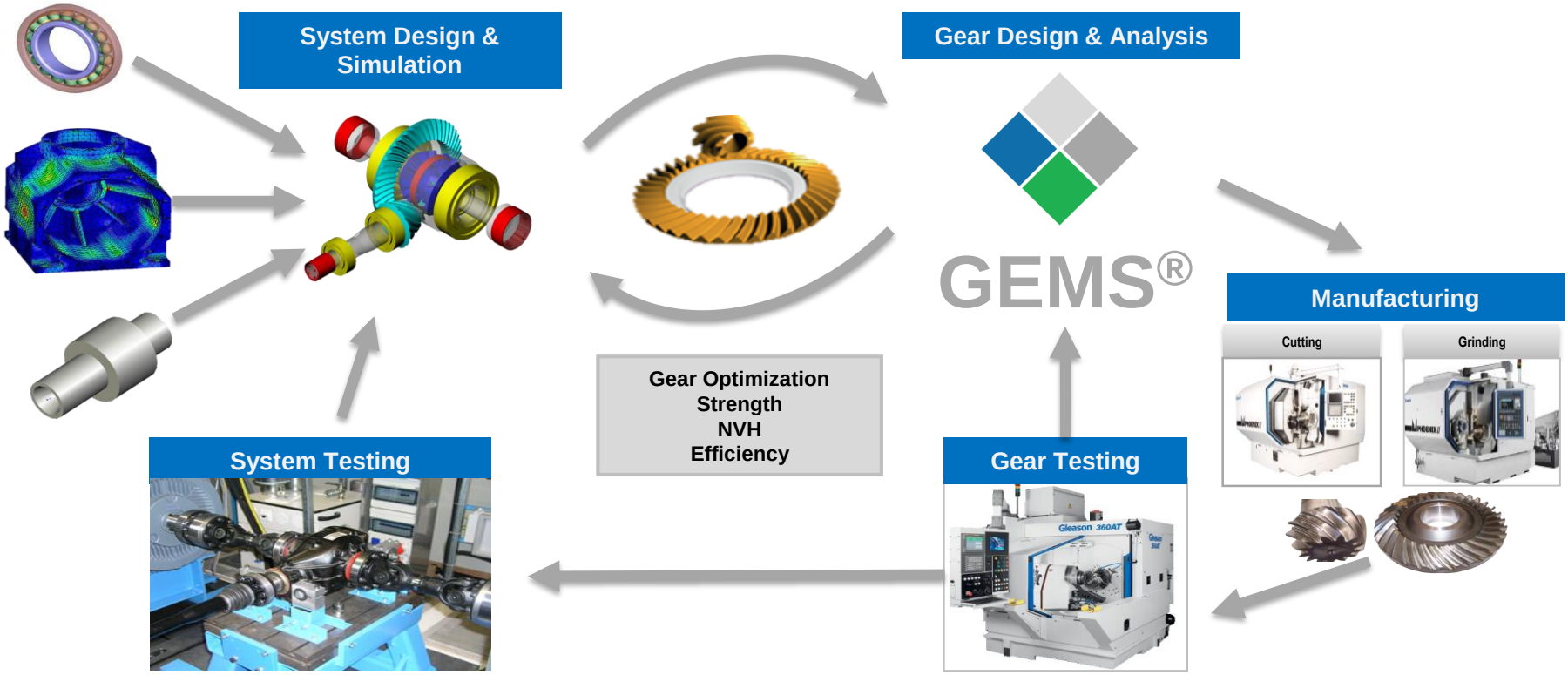
System Design Loop: KISSsys using GEMS



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Workflow 1: Gear design calculation

Workflow 2: System calculation

KISSsoft
Drivetrain Design Solutions

GEMS®
Gleason Engineering & Manufacturing System

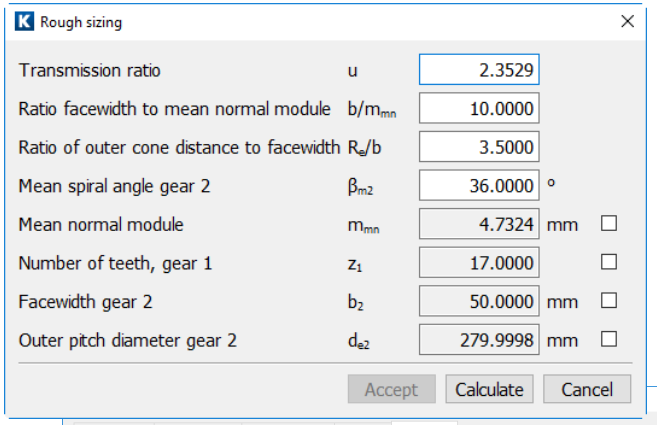
STEP 1: Sizing in KISSsoft using the rough and fine sizing

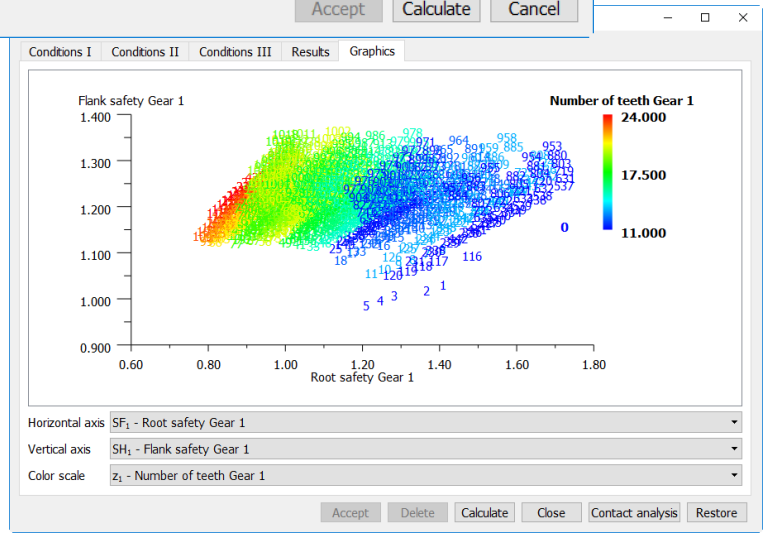
1. Entering the load data in KISSsoft

   → 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

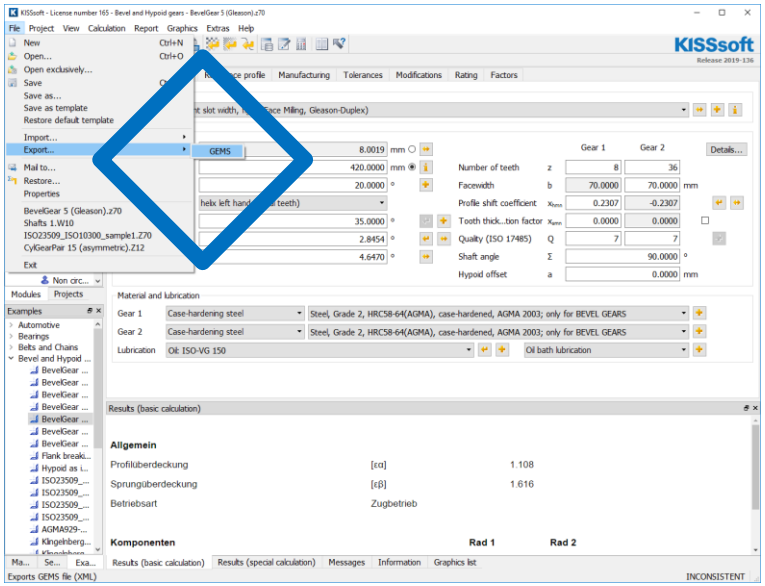


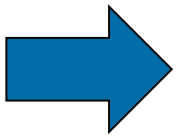


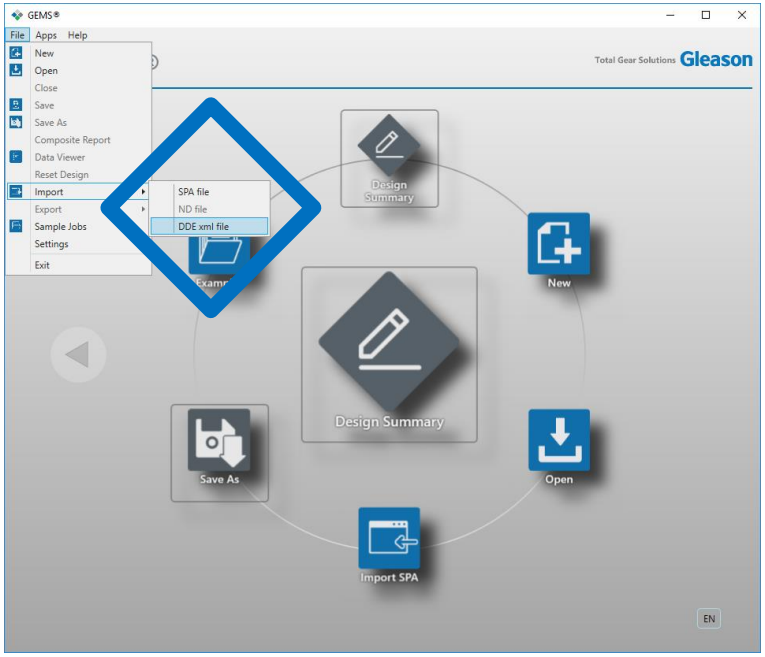
KISSsoft

Gear design calculation: Export Gear Geometry from KISSsoft to GEMS®

STEP 2: Export from KISSsoft and Import in GEMS







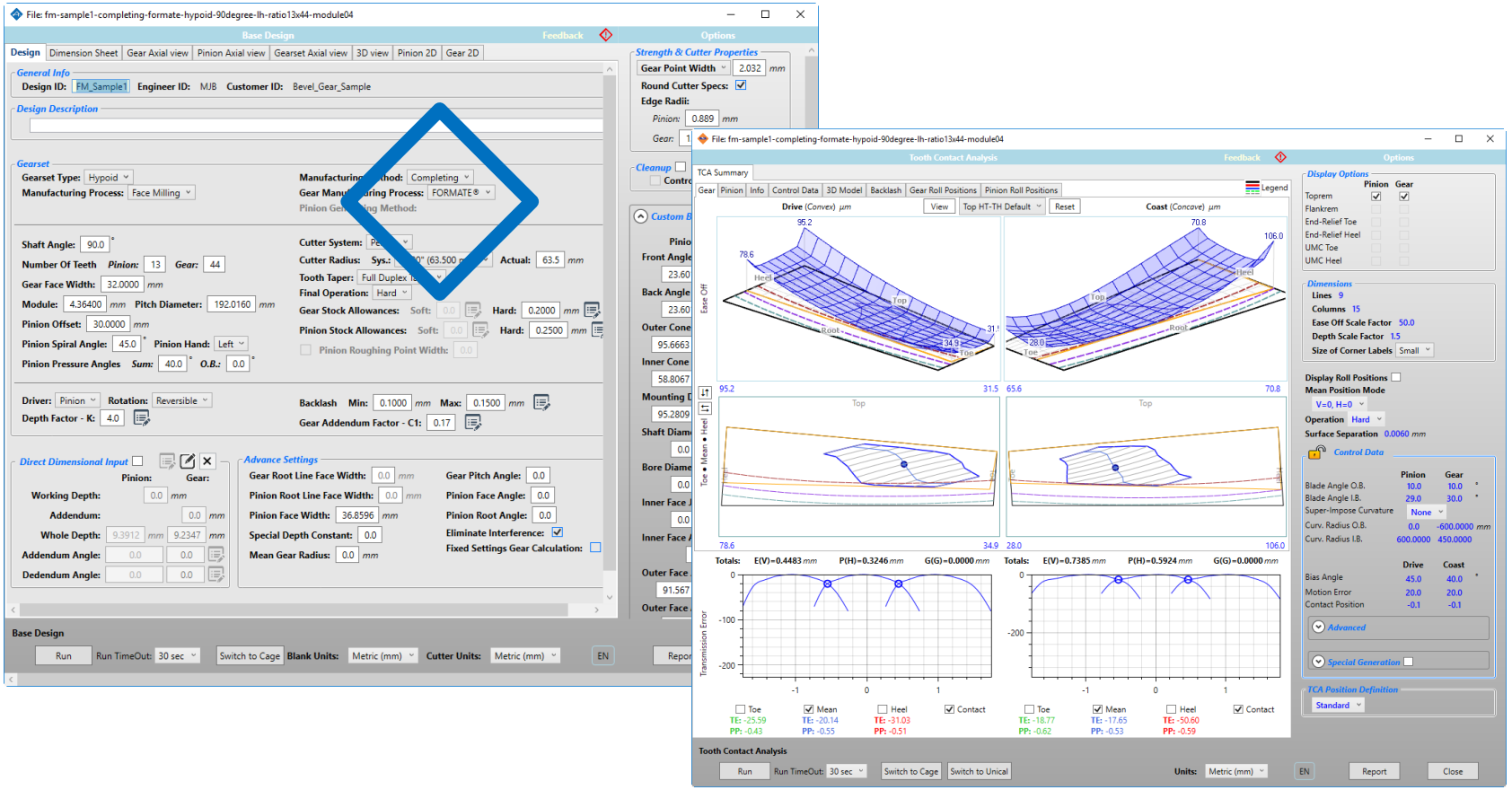
KISSsoft

Gear Design Calculation: Design and Manufacturing Analysis 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.



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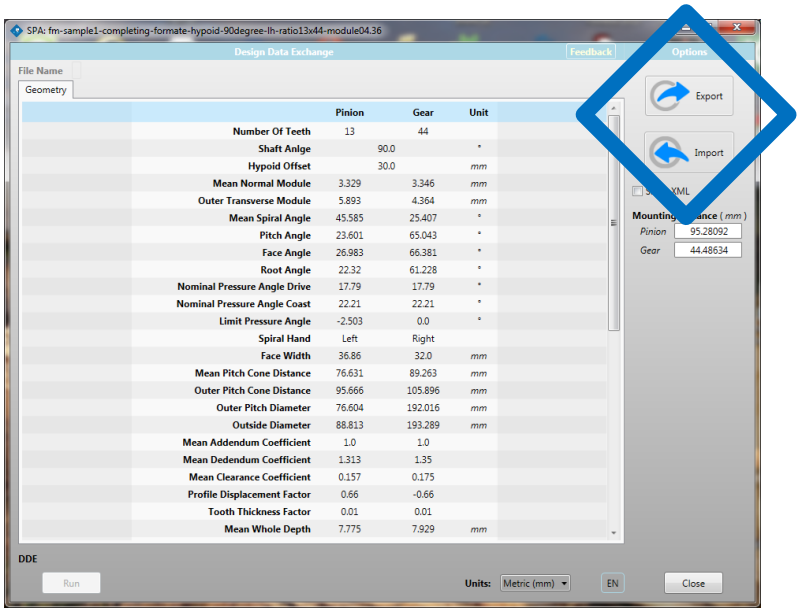
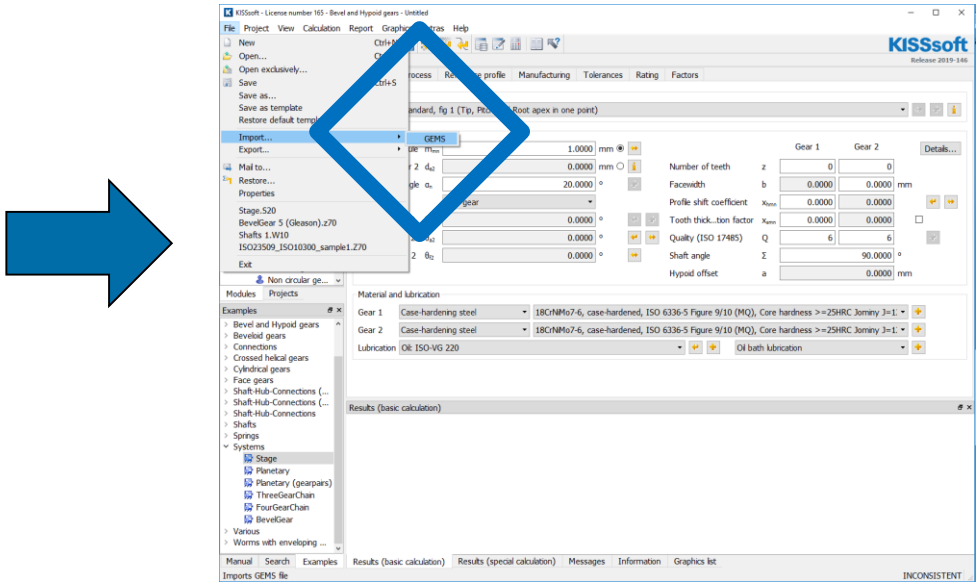
STEP 4: Export Gear Geometry from GEMS ® to KISSsoft

GEMS®





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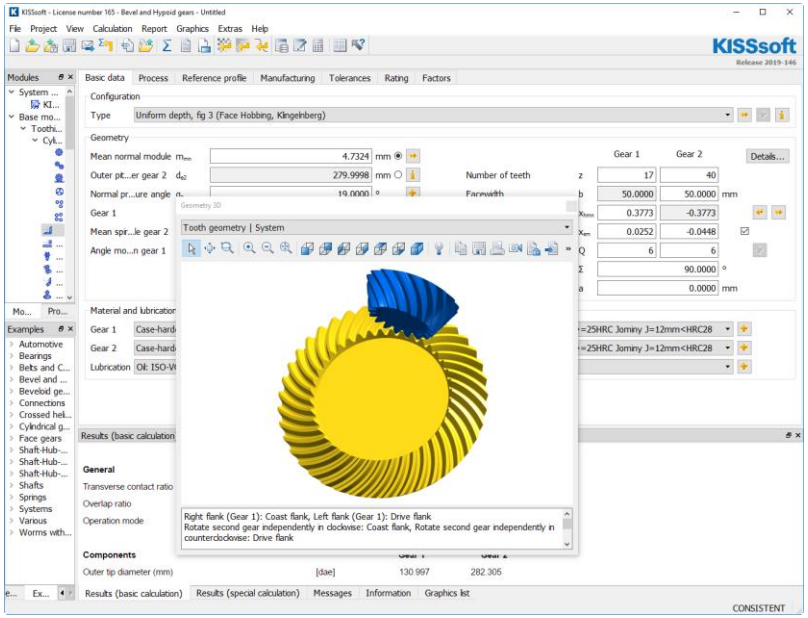
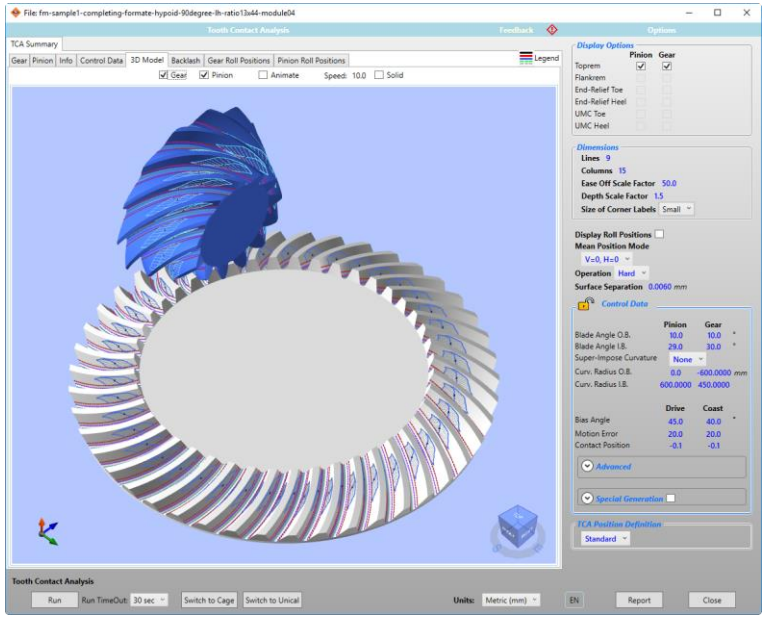
STEP 5: the calculation in GEMS and KISSsoft are consistent





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Workflow 1: Gear design calculation

Workflow 2: System calculation

STEP 1: Create system model in KISSsys and define load cases

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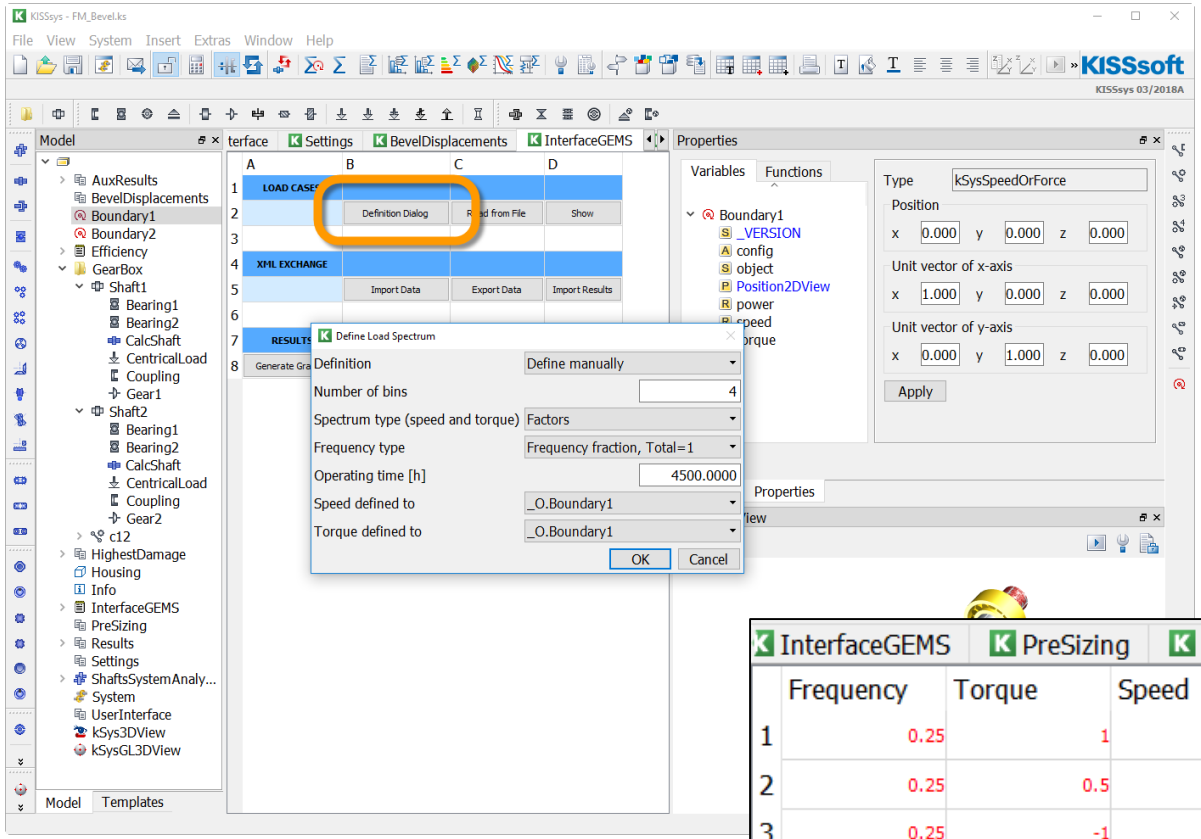

InterfaceGEMS | PreSizing | kSys3DView | LoadCases

	Frequency	Torque	Speed	Name	E_mm
1	0.25	1	1	Drive 100%	
2	0.25	0.5	0.5	Drive 50%	
3	0.25	-1	-1	Coast 100%	
4	0.25	-0.5	-0.5	Coast 50%	

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STEP 2: Calculate misalignment values EPG and export to GEMS

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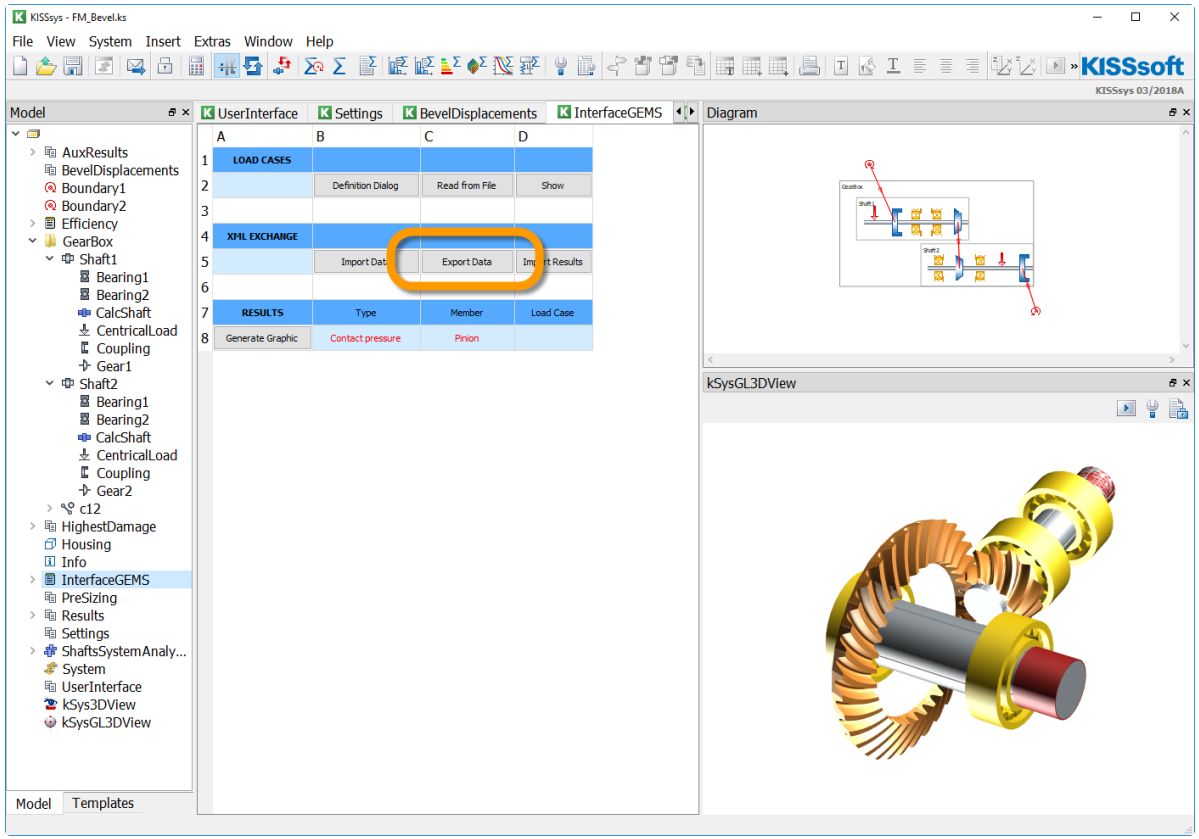

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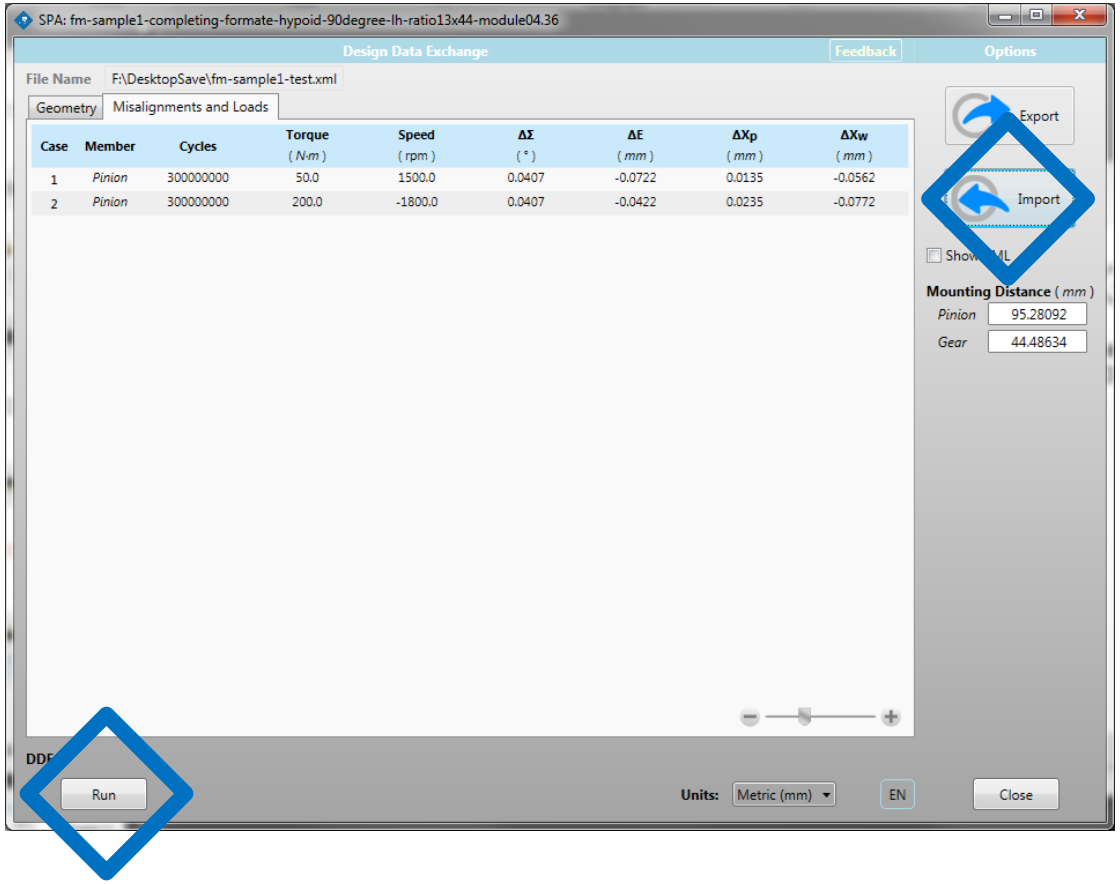
STEP 3: Import Load Cases and Press RUN to perform the FEA calculation



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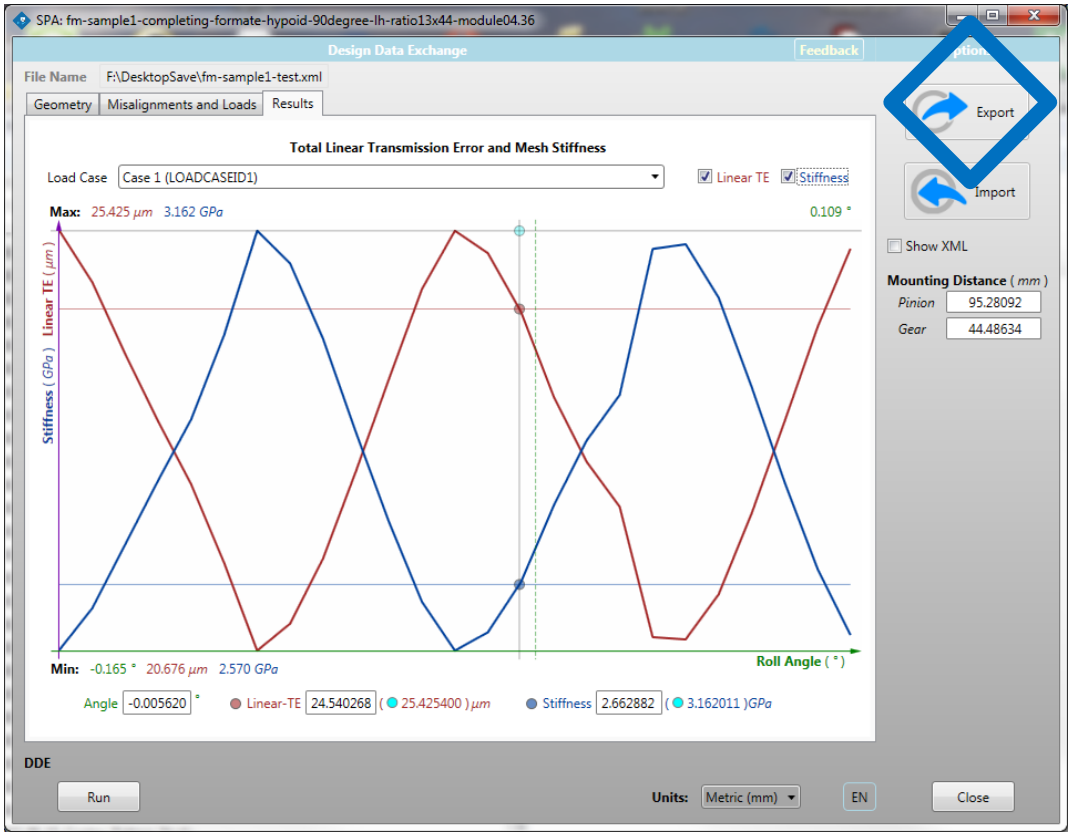
STEP 4: Results generated. Export to display in KISSsys



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STEP 5: Import Stress and TE results in KISSsys

Future Plan: Continue to run NVH analysis in KISSsys

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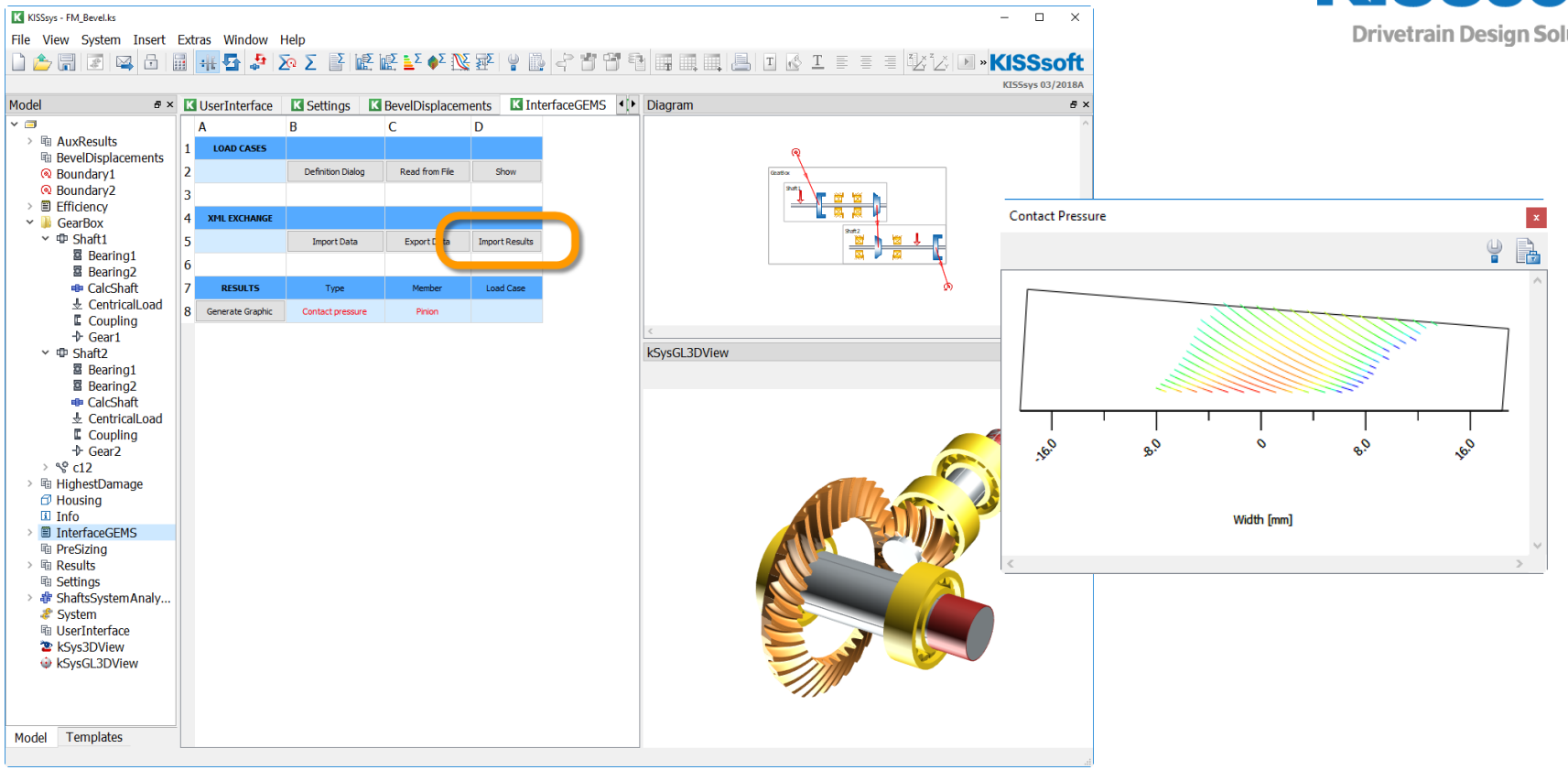


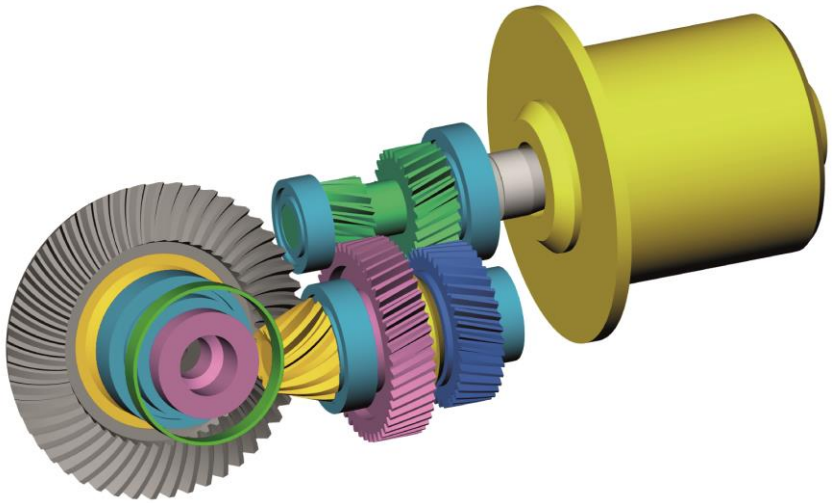
KISSsoft

Let us stay in touch!

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

info@KISSsoft.AG or

sales@Gleason.com



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