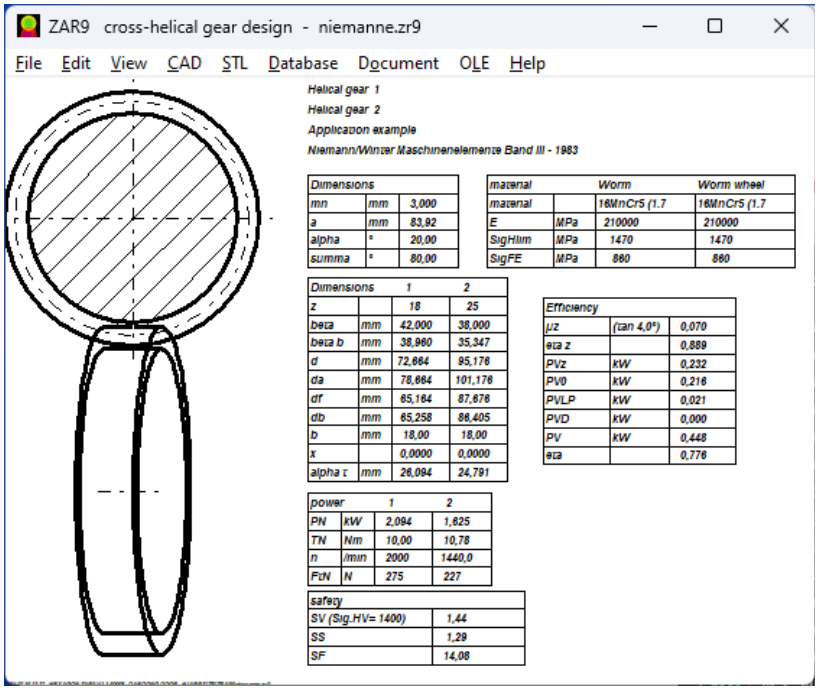
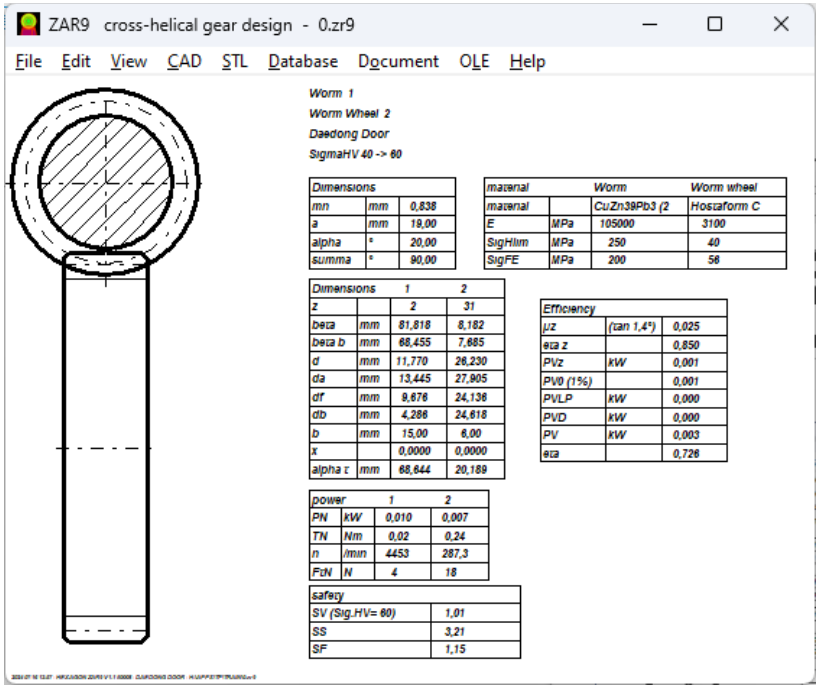
Z A R 9

Cross-Axle Helical Gear

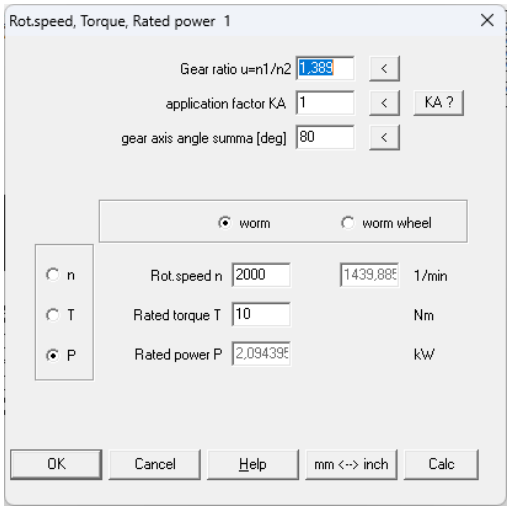
for Windows





ZAR9 calculates dimensions and load-bearing capacity of helical gears with crossed axis. Axis angle may be 90 degrees or any other input value. Sum of helical angle of the gear pair is axis angle. For example, it may be a screw gear with 45+45 degrees, or a worm and worm wheel with 80+10 degrees. ZAR9 calculates efficiency, forces and safety against sliding abrasion, tooth root breakage and seizure.

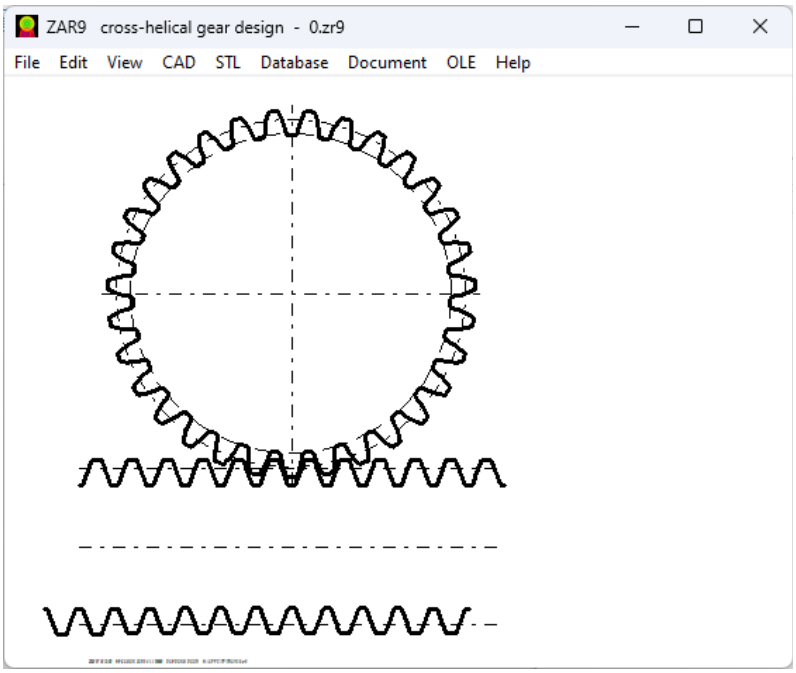
Pre-Dimensioning
In Pre-dimensioning you enter axis angle, transmission ratio,input or output speed and power or torque. Recommendations are made for center distance, module and teeth numbers.The recommendations can be used or modified in the following geometry and strength calculations.

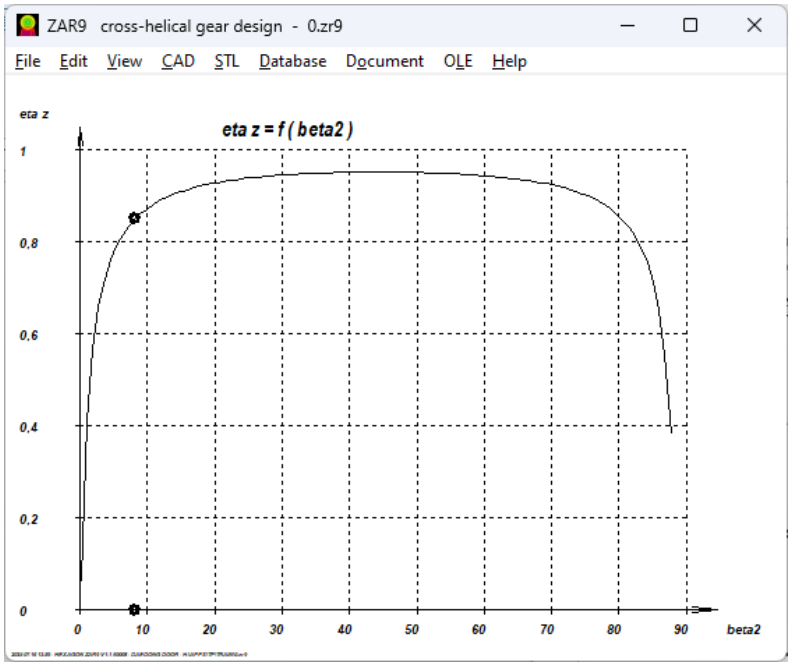


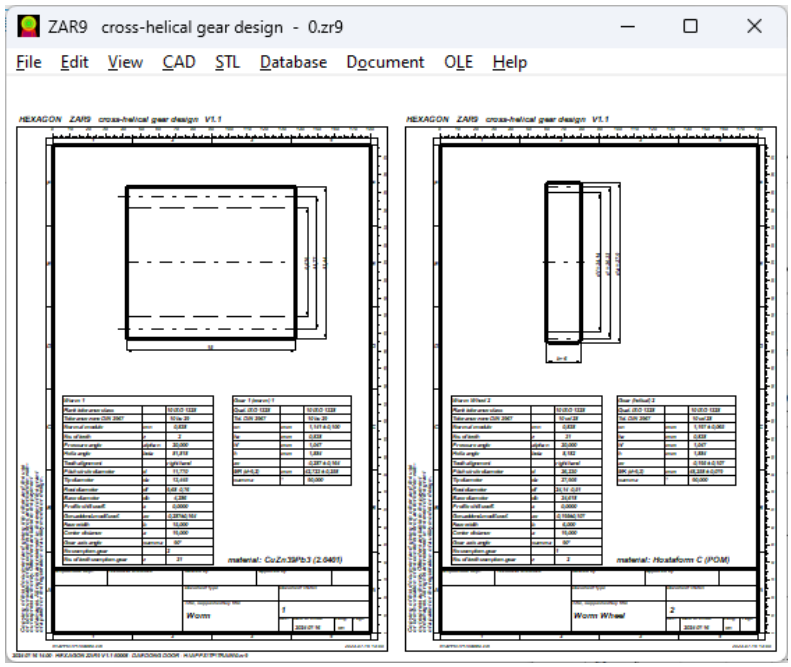
Dimensioning
In Dimensioning input, you enter center distance and number of teeth, and ZAR9 calculates normal module and helix angles.

Recalculation
In Recalculation input you enter number of teeth, module and helix angle, and ZAR9 calculates center distance.

Load-bearing capacity
ZAR9 calculates safety against sliding abrasion, tooth root breakage and seizure accord. to Niemann.







Efficiency
ZAR9 calculates efficiency and loss of power by tooth friction, idling, bearing and seals. The program provides a diagram with tooth friction efficiency as function of helix angles.

Material Data Base
The program includes a data base containing the most important gear materials and their properties. Database can be modified by the user.

Drawings and Tables
ZAR9 generates drawings and tables of the gear pair, ready to be used with CAD.

Tooth profile and tooth contact
True-scale tooth profile and tooth contact can be shown in various views on screen.

Tooth flank tolerance and measurement
ZAR9 calculates tooth thickness and over pin/ball diameters. You can input flank tolerances, or select from DIN 3967 tolerance zone.

Animation
ZAR9 animates rotation of gear wheels on screen in axial or radial cross section.

Production Drawing
ZAR9 generates a production drawing of worm and worm wheel with ISO 7200 data field.

Produce a model gear with your 3D printer
ZAR9 generates STL files for printing the gears together with a carrier or case to build a true-size model gear.

Data Exchange
Interface to ZAR3+ (worm gear) and ZAR1+ (helical gear) allows import/export of gear dimensions.

CAD Interface
Drawings and diagrams can be saved as DXF or IGES file to be loaded into CAD.

Units
ZAR9 can be switched between metric units (mm, N, MPa) and imperial units (inch, lbf, psi).

System Requirements
ZAR9 is available as 32-bit app or as 64-bit app for Windows 11, Windows 10, Windows 7.

Scope of Delivery
Software with perpetual license with update rights and user manual (pdf).

Guarantee
HEXAGON gives a 24 month guarantee on full functionality of the software