

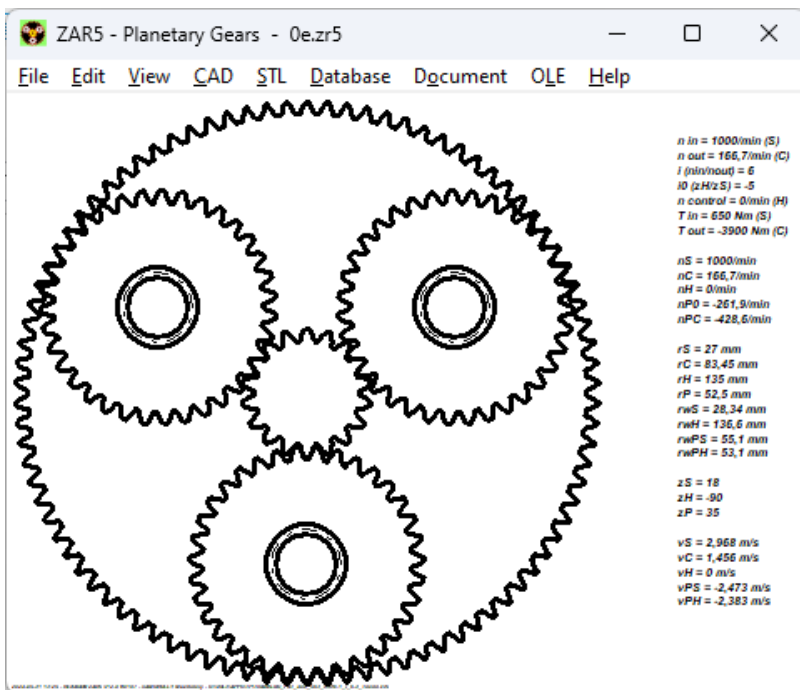
# ZAR5



## Planetary Gear Design

for Windows

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### Calculation Base

ZAR5 calculates geometry and strength of planet gears with spur or helical involute cylindrical gear wheels. ZAR5 calculates gear pairs sun with planet and planet with ring gear. Dimensions are calculated according to DIN 3960, permissible deviations according to ISO 1328 or DIN 3961, tooth thickness tolerances according to DIN 3967, and load capacity according to ISO 6336 or DIN 3990. Calculation method is configurable.

### Pre-Dimension

Enter just input/output speed and power, ZAR5 suggests planet gear dimensions.

### Input Dimensions

Pressure angle, helix angle, normal module or diametral pitch, number of teeth, face width, center distance, profile shift coefficients can be edited and optimized in dimensions dialogue window.

### Reference Profile (Cutting Tool)

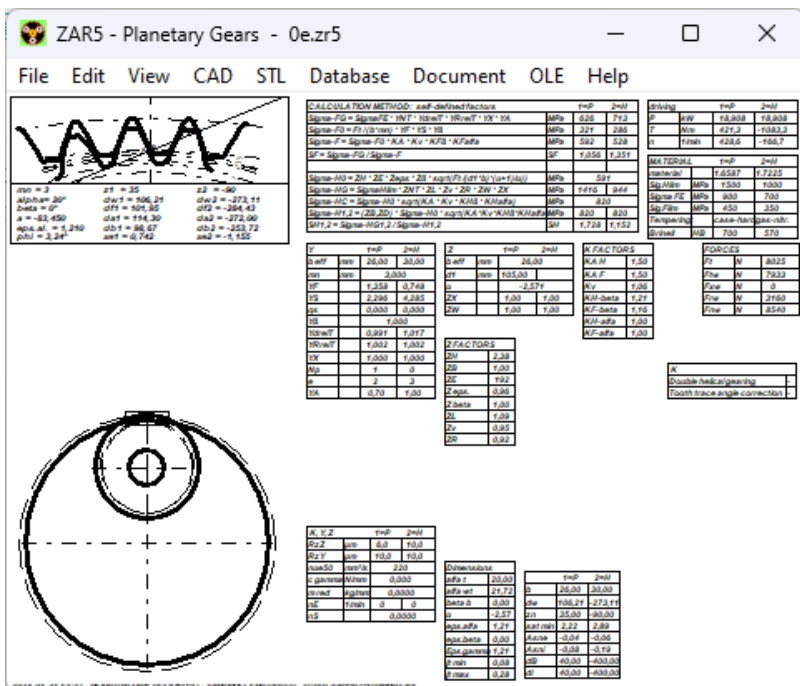
As reference profile you can select the standard profile according to ISO 53 / DIN 867, or you can specify a special profile by input of tooth height coefficients (addendum, dedendum) and fillet radius. Optional you can define rack profiles with tip edge breakage (chamfer) and/or protuberance.

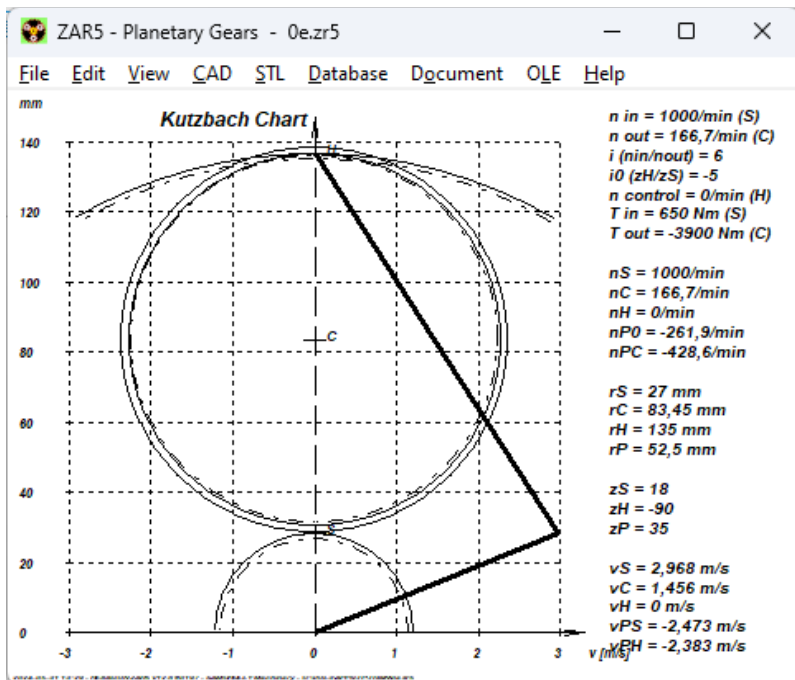
### Calculated Dimensions

ZAR5 calculates dimensions of gear wheels, tooth dimensions and contact ratio. By input of gear quality and tolerance zone or tolerances, ZAR5 calculates tooth thickness, clearance, backlash, over-pin-dimensions, span width and permissible deviations. Diagrams display specific sliding along the tooth contact line.

### Strength Calculation

The load-bearing capacity with respect to tooth root fatigue fracture and pitting can be calculated for gear pairs sun-planet and planet-ring gear in conformance with either ISO 6336 or DIN 3990. If not fatigue-strength safe, ZAR5 calculates life expectation until tooth breakage and pitting.





### Kutzbach Chart

Kutzbach charts shows speed vectors and relative speed of sun gear, ring gear and planet carrier.

### Wolf Chart

The gear chart to Wolf shows the torque distribution to 3 shafts (2 differential shafts and 1 sum shaft), as well as the relative transmission ratios.

### Animation

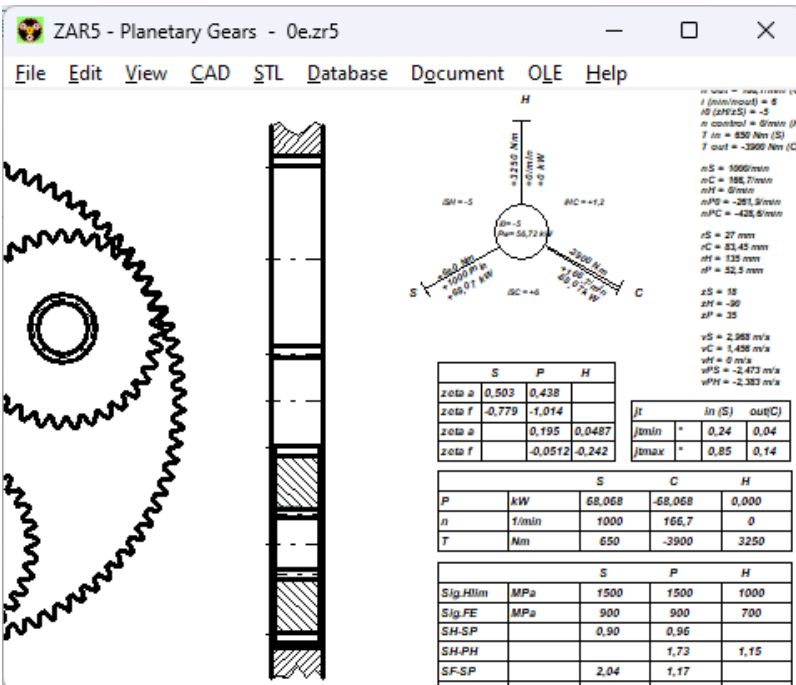
Animation rotates the planetary gear on screen. You can define start/end position and number of steps.

### Production Drawing

For sun wheel, planet wheel and ring wheel you can generate a production drawing with gear dimension table and ISO 7200 data field.

### Planet Gear Combinations

ZAR5 calculates the possible input / output combinations and transmissions of the planet gear for fixed ring wheel, sun wheel, or planet carrier.



### CAD Interface

DXF and IGES interfaces allow ZAR5 to be linked to CAD and DTP systems. Gear drawings and tables, production drawings and true-scale tooth profile can be generated and loaded into CAD.

### Database for materials and tooth profiles

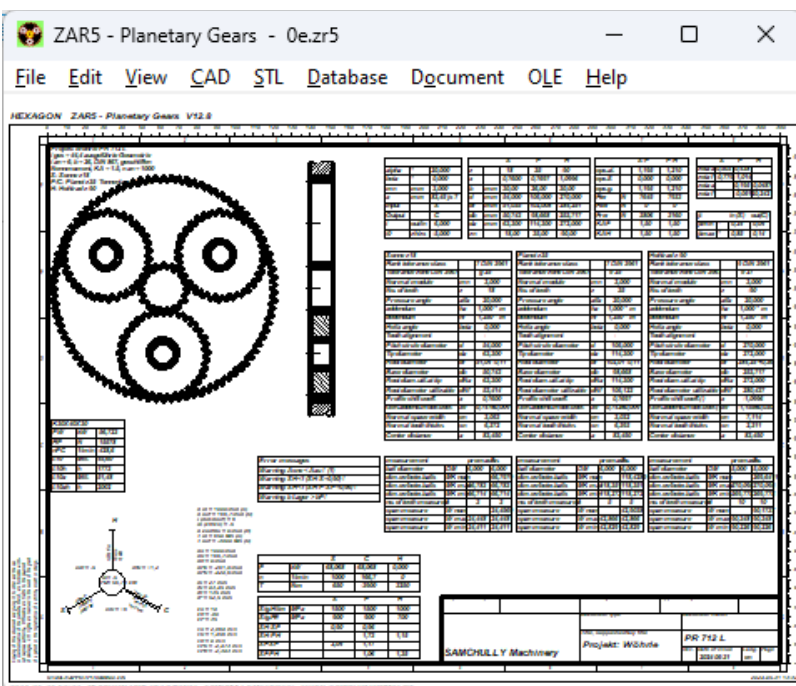
ZAR5 contains databases with material data and tool profiles. Database may be extended by the user.

### Roller Bearing Calculation

If planet wheels are to be mounted with roller bearings, ZAR5 calculates life expectation of groove ball bearings, needle bushes, needle bearings, cylindrical roller bearings, tapered roller bearings and self-aligning roller bearings. Database files with roller bearing properties are delivered with ZAR5.

### Load spectrum

If you define a load spectrum by input of torques and load cycle shares, ZAR5 calculates safety factors and life expectation.



### Multistage Planet Gears

From input torque, input speed and total transmission ratio of a planetary gear train, ZAR5 calculates dimensions of the planetary gear stages.

### System Requirements

ZAR5 is available as 32-bit app or as 64-bit app for Windows 11, Windows 10, Windows 7.

### Scope of Delivery

Software with user manual (pdf), non-expiring license for unlimited time use with update rights.

### Software Maintenance

Registered users are regularly kept informed of updates and new editions.

### Guarantee

HEXAGON gives a 24 month guarantee on full functionality of the software. We provide help and support by email without extra charge.