

# ZAR7

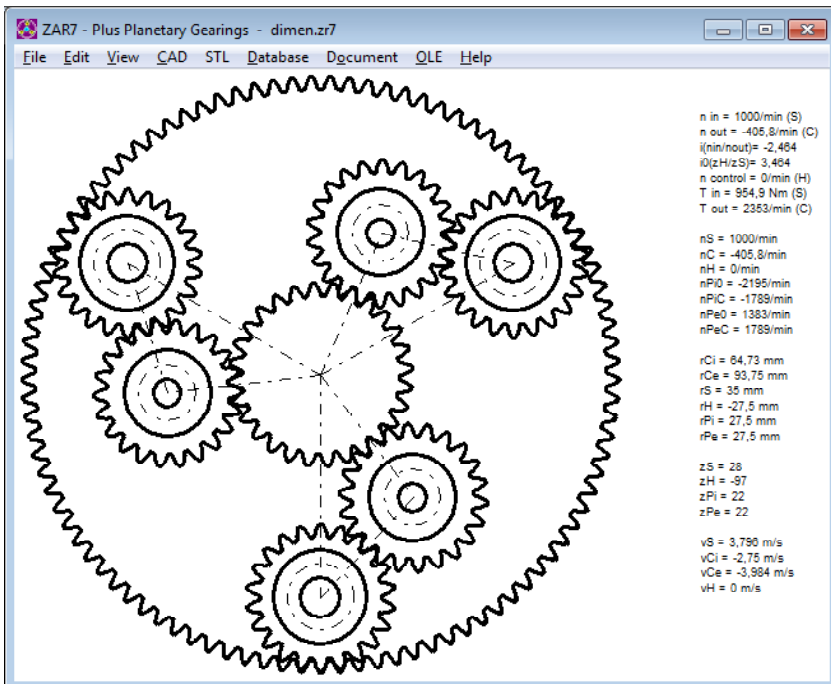


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## Plus Planetary Gears

Software for Windows

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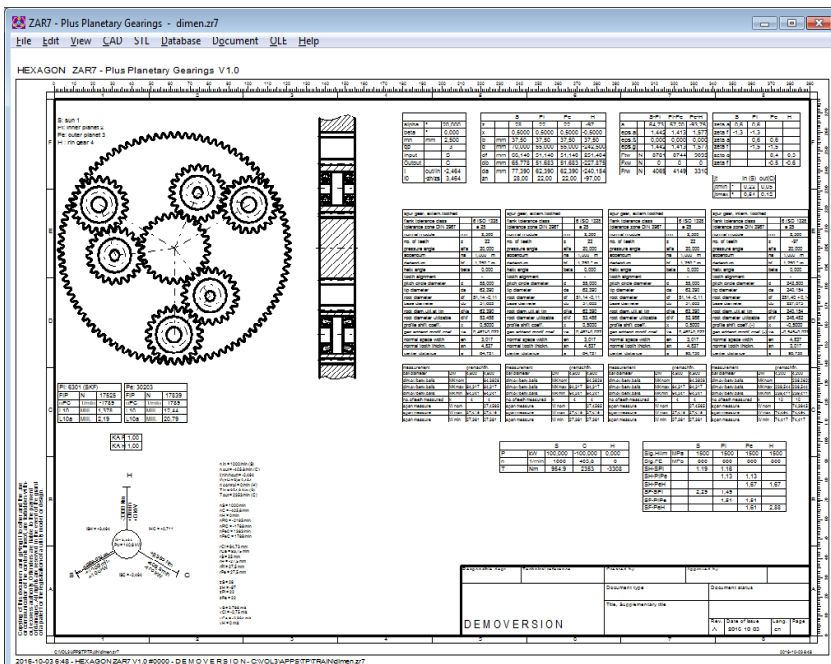


### Calculation Base

Difference between simple (minus) planetary gears and plus planetary gears are planet gear pairs instead of planet gears. This makes stationary ratio positive, speed directions are inverse compared with simple planetary gear. ZAR7 calculates dimensions and strength of plus planetary gears. To calculate tooth meshing and strength of the involute gear wheels, plus planetary gear set is separated into three gear pairs: sun wheel (S) with inner planet wheel (Pi), inner planet wheel (Pi) with outer planet wheel (Pe), outer planet wheel (Pe) with hollow wheel (H). Dimensions are calculated according to DIN 3960, deviations according to ISO 1328 or DIN 3961, tooth thickness tolerances according to DIN 3967, and strength according to ISO 6336.

### Pre-Dimension

In Pre-Dimension, you enter input speed, output speed, and power. ZAR7 calculates and suggests dimensions of a plus planetary gear.

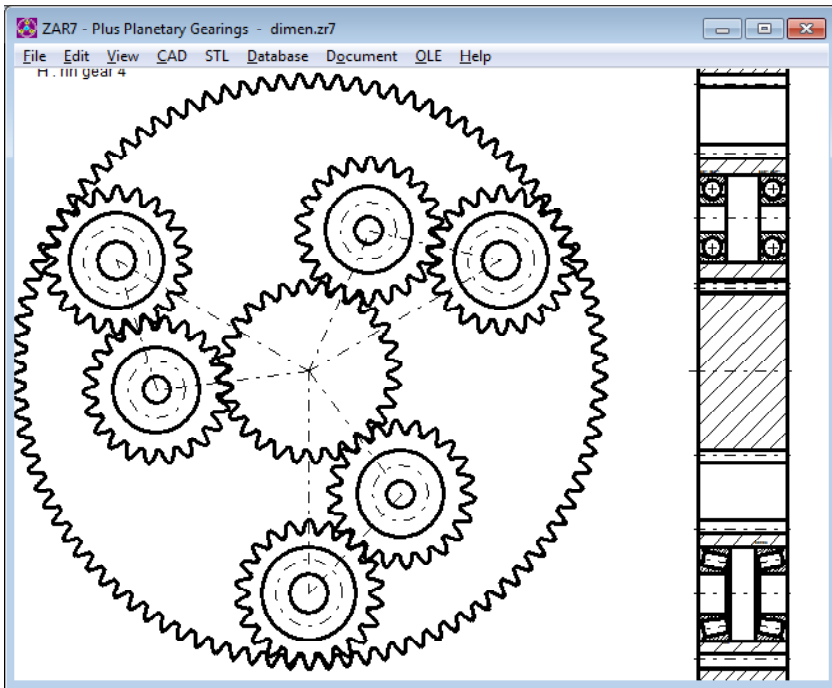


### Gear Dimensions

Pressure angle, helix angle, normal module or normal pitch, number of teeth, face width, profile shift and center distance can be modified and optimized in a dialogue window. Reference profile can be standard tool according to ISO 53 (DIN 867), or you can define a profile by input of tooth height coefficients and fillet radius. Even chamfer and protuberance profiles can be calculated. ZAR7 calculates tooth thickness, clearance, span width and dimensions over/between pins and balls from tooth quality and tolerance zone. Diagrams show specific sliding along the tooth contact line.

### Strength Calculation

Load-bearing capacity with safety factors SF for tooth root fracture and SH for pitting according to ISO 6336 for each gear pair: sun wheel (S) with inner planet wheel (Pi), inner planet wheel (Pi) with outer planet wheel (Pe), outer planet wheel (Pe) with hollow wheel (H). If safety factors less than 1.0, ZAR7 calculates time until tooth root fracture or pitting.



### Roller Bearing Calculation

ZAR7 calculates life expectation of groove ball bearings, needle bushes, needle bearings, cylindrical roller bearings, tapered roller bearings and self-aligning roller bearings if used as planet wheel bearing. Database files with roller bearing properties are delivered with ZAR7.

### Load Spectrum

If you define a load spectrum by input of torque spectrum and load cycle shares, ZAR7 calculates safety factors and life expectation.

### Kutzbach Chart

Kutzbach chart shows speed vectors of sun, planets, ring gear and carrier.

### Wolf Chart

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

### Animation

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

### Production Drawing

For each gear wheel (S, Pe, Pi, H) you can generate a production drawing with ISO 7200 header, ready to print or for use in CAD.

### Quick View

Quick View shows drawings, diagrams and tables altogether on one screen.

### Planet Gear Combinations

ZAR7 calculates 6 possible input/output combinations and transmissions, if ring wheel, sun wheel, or planet carrier is blocked.

### CAD and STL Interface

Drawings, tables and diagrams can be generated as DXF or IGES files and used with CAD. Sun wheel, planet wheels, ring wheel (if spur gears) and carrier can be generated as STL file and printed on 3D printer.

### Databases

ZAR7 includes dbf database files with gear materials, tooth profiles and roller bearings.

### HEXAGON Help System

Auxiliary text and images are available. If error messages, you get description and remedy.

### System Requirements

ZAR7 is available as 32-bit app or as 64-bit app for Windows 10, Windows 8, Windows 7, Windows XP.

### Scope of Delivery

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

### Guarantee

HEXAGON gives a 24 month guarantee on full functionality of the software. We provide help and support by email and hotline without extra charge. ZAR7 is constantly being improved and updated.

