

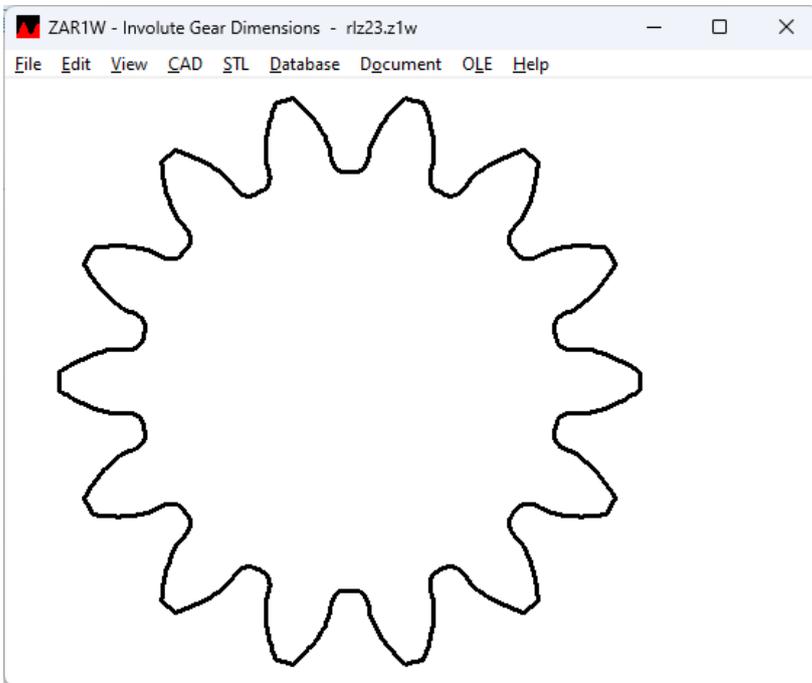
# ZAR1W



## Spur and Helical Gears Dimensions, Tolerance, Tooth Profile

for Windows

© Copyright 2014-2024 by HEXAGON Software, Kirchheim, Berlin, Neidlingen



### Application

ZAR1W calculates dimensions and tolerances of externally and internally toothed spur and helical gear wheels.

ZAR1W generates a true-scale drawing of the involute profile, ready to be used with CAD, CNC, profile projector, wire-cutting system, 3D plotter. Input data are pressure angle, helix angle, number of teeth, normal module or normal pitch and profile shift coefficient.

### Calculation Base

ZAR1W calculates dimensions and profile of involute gears or involute splines according to DIN 3960. Tooth profile can be displayed on screen, printed, or exported to CAD.

### Tooth Thickness Tolerance

You can select tolerance field according to DIN 3967, or directly input tolerances Asne and Asni. ZAR1W calculates generated profile shift factors (xemin and xemax) and measurement dimensions (tooth thickness, dimensions over/between pins/balls and span width).

### Tooth Flank Tolerances

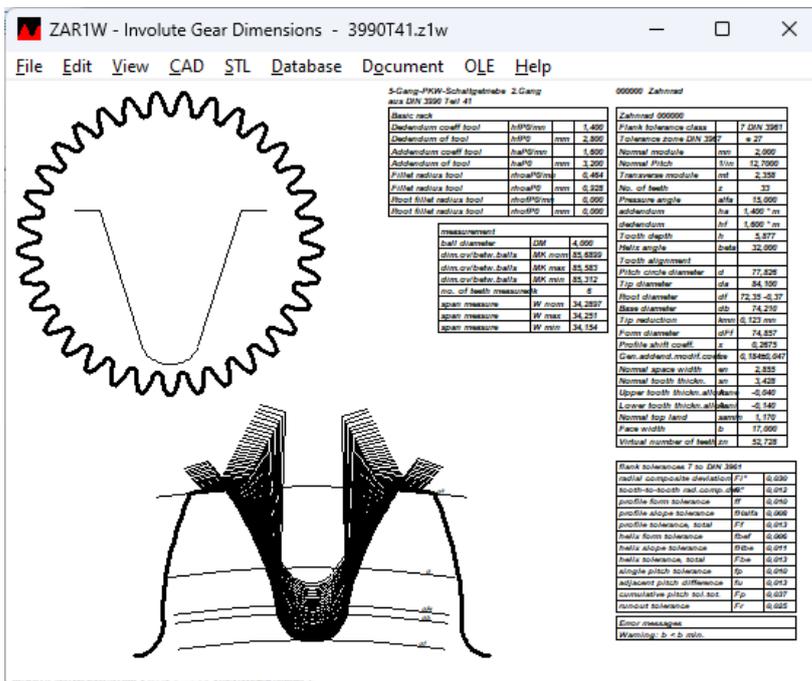
ZAR1W calculates tooth flank tolerances and permissible errors according to ISO 1328-1:2013, or to DIN 3961:1978.

### Measuring Dimensions

ZAR1W calculates span measurement, dimensions over or between pins or pins. Number of teeth measured and pin/ball diameter can be modified.

### Reference Profile (Rack Profile)

Addendum and dedendum coefficients can be entered or selected from database. ZAR1W handles also tool profiles with protuberance and chamfer (tooth tip breakage).



ZAR1W - Involute Gear Dimensions - protub.z1w

File Edit View CAD STL Database Document OLE Help

0.048.033 Idler Z51  
Hidr. Pump = 579 N.m a 1500 rpm - Vide Load Spectrum

Basic rack			
Dedendum coeff tool	hfP0/mm		1,300
Dedendum of tool	hfP0	mm	3,302
Addendum coeff tool	haP0/mm		1,346
Addendum of tool	haP0	mm	3,419
Fillet radius tool	rhoaP0/mm		0,250
Fillet radius tool	rhoaP0	mm	0,635
Root fillet radius tool	rhoIP0/mm		0,300
Root fillet radius tool	rhoIP0	mm	0,508
Protuberance	prP0/mm		0,046
Protuberance	prP0	mm	0,116
Protuberance angle	al,prP0	°	10,000
Machin.allowance	q	mm	0,077
Tolerance machin.allowance	q tol	mm	+0,0774

measurement	prmach. fin.		
ball diameter	DM	5,000	5,000
dim.ovibow.balls	MK nom	144,2438	
dim.ovibow.balls	MK max	144,927	144,199
dim.ovibow.balls	MK min	144,585	144,087
no. of teeth measured	k	6	6
span measure	W nom		43,8888
span measure	W max	44,279	43,970
span measure	W min	44,125	43,923

Idler Z51 0.048.033		
Flank tolerance class		9 DIN 3961
Tolerance zone DIN 3967		
Normal module	mn	2,540
Normal Pitch	1/in	10,0000
Transverse module	mt	2,630
No. of teeth	z	51
Pressure angle	alfa	20,000
addendum	ha	1,300 * m
dedendum	hf	1,346 * m
Tooth depth	h	6,588
Helix angle	beta	15,000
Tooth alignment		
Pitch circle diameter	d	134,110
Tip diameter	da	143,475
Root diameter	df	130,30 -0,45
Base diameter	db	125,496
Tip reduction	kmn	0,133 mm
Form diameter	dFf	131,175
Profile shift coeff.	x	0,4285
Gen.addend.modif.coef.	xe	0,404±0,014
Normal space width	en	3,198
Normal tooth thicken.	sn	4,782
Upper tooth thicken.allow	Asne	-0,020
Lower tooth thicken.allow	Asni	-0,070
Normal top land	samin	0,653
Face width	b	23,000
Virtual number of teeth	zn	56,119

### Calculation Results

ZAR1W offers various possibilities: tables with toothing data, measuring dimensions and tolerances, drawings of gear wheel, tooth gap and reference profile, Quick views with tables and drawings on one page, production drawings A3 and A4, production sheet.

### Tooth Profile

Drawings of tooth gap, gear wheel and reference profile can be printed, or generated as true-scale CAD drawing.

### Production Drawing

A production drawing with ISO 7200 data field can be printed or exported to CAD as DXF or IGES file.

### Quick View

Quick View displays tables with all dimensions of the involute profile. Quick3 additional with drawings of tooth profile, tooth gap and reference profile. Quick4 views all drawings and tables in an A3 drawing frame with ISO 7200 data field.

ZAR1W - Involute Gear Dimensions - protub.z1w

File Edit View CAD STL Database Document OLE Help

mn = 2,54 mm  
alpha = 20°  
hfP0 = 1,3 \* mn = 3,302 mm  
haP0 = 1,346 \* mn = 3,419 mm  
hP0 = 2,646 \* mn = 6,72 mm  
raP0 = 0,25 \* mn = 0,635 mm  
rIP0 = 0,2 \* mn = 0,508 mm  
prP0 = 0,0457 \* mn = 0,116 mm  
alpha prP0 = 10°

### CAD Interface

A true-scale drawing of the calculated gear profile can be used in CAD or CNC. Profile shift or tooth thickness (min/max/mean tolerance) and resolution of involute and tooth root fillet can be configured. ZAR1W generates true-scale drawings and tables as DXF or IGES file.

### HEXAGON Help System

As with all HEXAGON programs ZAR1W can provide you with help text and auxiliary picture for each input dialogue window. Help texts and auxiliary pictures can be modified and extended by the user as required. When error messages appear you can have a description and remedy suggestion displayed.

### Units

ZAR1W can be switched between metric units (mm) and imperial units (inch).

### Export Formats

DXF, IGES, STL, HTML, TXT, DBF, Excel, Z1W.

### Import Formats

TXT, DBF, Excel, Z1W.

### System Requirements

ZAR1W 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.

### Guarantee

HEXAGON gives a 24 month guarantee on full functionality of the software. We provide help and support by email without extra charge. HEXAGON Software is continuously improved and updated. Registered users are regularly kept informed of updates and new editions.

ZAR1W - Involute Gear Dimensions - protub.z1w

File Edit View CAD STL Database Document OLE Help

HEXAGON ZAR1W - Involute Gear Dimensions V2.7

mn = 2,54 mm  
alpha = 20°  
hfP0 = 1,3 \* mn = 3,302 mm  
haP0 = 1,346 \* mn = 3,419 mm  
hP0 = 2,646 \* mn = 6,72 mm  
raP0 = 0,25 \* mn = 0,635 mm  
rIP0 = 0,2 \* mn = 0,508 mm  
prP0 = 0,0457 \* mn = 0,116 mm  
alpha prP0 = 10°