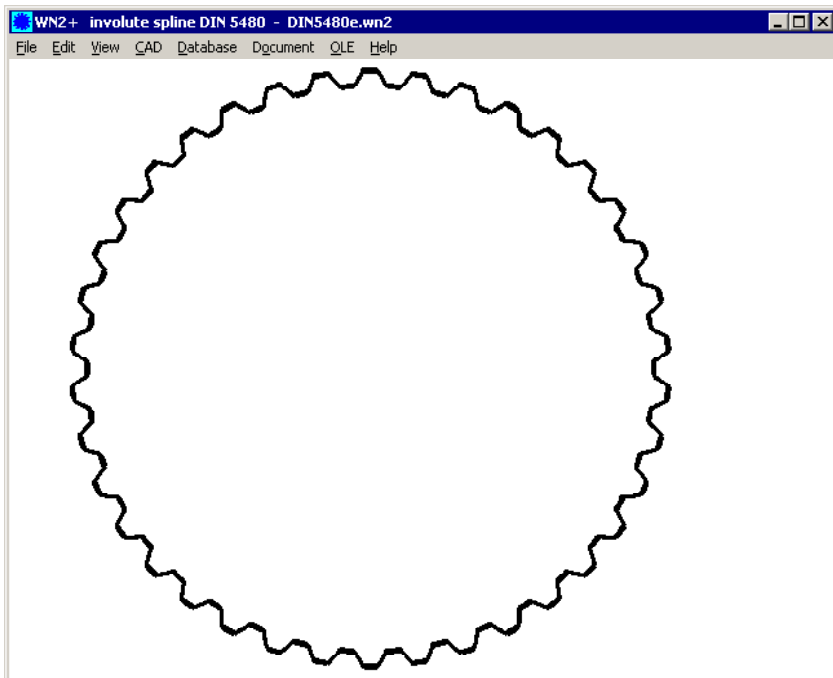# WN2 / WN2+

HEXAGON

www.hexagon.de

Software for Involute Splines according to DIN 5480

for Windows

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Involute Splines to DIN 5480

WN2 software calculates dimensions and transferable torque of involute splined shaft/hub joints according to DIN 5480.The plus version WN2+ provides additionally the calculation of non-standard splines by input of tooth height factors and profile shift or measured dimensions over/between pins.

Dimensions

From reference diameter, pressure angle, module, number of teeth and DIN 5480 tolerance zone, WN2 calculates the involute spline dimensions. Profile drawing and data table can be displayed on screen, printed or exported to CAD.
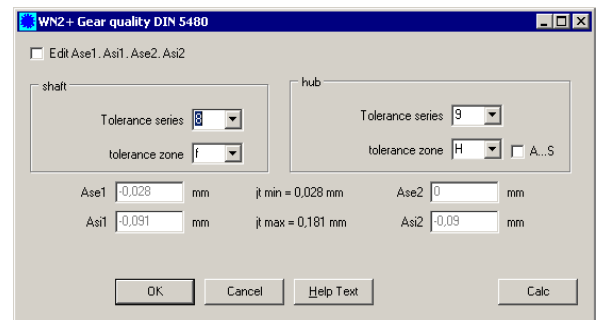
Data Base

WN2 includes a data base which contains all combinations of DIN 5480 standard sizes (700 data records). The database file may be modified and extended by the user. Material properties can be selected from included material database.
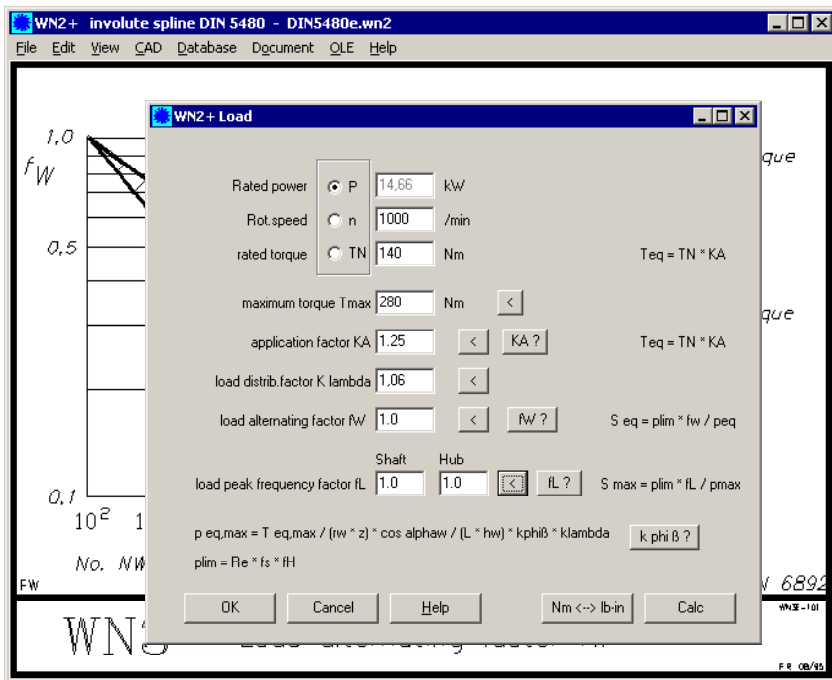
Tolerances

Select DIN 5480 tolerance series and tolerance row, and WN2 calculates tolerances and permissible deviations of shape, angle and run-out.

Measurement

The program calculates span width and dimensions over / between pins (min, max & nom. values). Number of teeth measured and pin diameter can be modified.

WN2+ Load window

Rated power · P 14,66 kW
Rot.speed · n 1000 /min
rated torque · TN 140 Nm   Teq = TN * KA

maximum torque Tmax 280 Nm [<]

application factor KA 1.25 [<] [KA ?]   Teq = TN * KA

load distrib.factor K lambda 1,06 [<]

load alternating factor fW 1.0 [<] [fW ?]   S eq = plim * fw / peq

Shaft Hub
load peak frequency factor fL 1.0   1.0 [<] [fL ?]   S max = plim * fL / pmax

p eq,max = T eq,max / (rw * z) * cos alphaw / (L * hw) * kphiß * klambda   [k phi ß ?]

plim = Re * fs * fH

[OK] [Cancel] [Help]   [Nm <--> lb-in] [Calc]

Tooth contact drawing data

mn = 3   z1 = 38   z2 = -38
alpha= 30°   dw1 = 114,00   dw2 = -114,00
beta = 0°   df1 = 113,30   df2 = -120,08
a = 0,000   da1 = 119,30   da2 = -114,08
x1 = 0,450   db1 = 98,73   db2 = -98,73
phi = 0,00°   xe1 = 0,433   xe2 = -0,463

WN2+ Dimensions window

Pressure angle alpha 30 ° [<]
Normal module mn 3 mm
Number of teeth z 38

☐ DIN 5480

Nominal Diameter dB 120 mm

	1 (extern.)	2 (intern.spline)	
Addendum ha/m	0.45	0.45	[<]
Dedendum hfp/mn=haP0/mn	0,55	0,55	[<]
Root fillet radius rf/m	0.16	0.16	[<]
Profile shift coeff. x nom	0,45	-0,45	
Profile shift coeff. xe min	0,424	-0,476	☑ Edit xe min/max
Profile shift coeff. xe max	0,442	-0,45	

[DM, k] [Ase, Asi] [s1min][W1min][M1min][M2min][e2min][W ?]
                     [s1max][W1max][M1max][M2max][e2max][M ?]
[OK] [Cancel] [Help] [Aux. Image] [mm <--> inch] [Calc]

Production drawing tables

External spline — Skizt DIN 5480 - W 120 x 3 x 38 x 8f

no.of teeth	z	38
module	m	3
pressure angle	alpha	30 °
tip diameter	da1	119,35 h11
tooth form diameter	dFf1	113,91 max
rootdiameter	dff1	113,4 -0,76
tooth thickness max. eff.	s max	6,243
tooth thickness max. act.Ref.	s	6,220
tooth thickness min. actual	s min	6,180
no. of teeth meas.	k	7
span measurement (k=7)	W1max	59,666
span measurement (k=7)	W1min	59,632

Internal spline — Nab DIN 5480 - N 120 x 3 x 38 x 9H

no.of teeth	z	38
module	m	3
pressure angle	alpha	30 °
rootdiameter	df2	120,00 +0,76
tooth form diameter	dFf2	119,49 min
tip diameter	da2	114 H11
tooth gap max. actual	e max	6,361
tooth gap min. act. Ref.	e min	6,305
tooth gap min. eff.	e min	6,271
Pin diameter	DM	6,280
Measurement between pins	M2max	109,266
Measurement between pins Ref.	M2min	109,169

Strength Calculation
WN2 calculates transmissibe torque or safety according to Niemann/Höhn (2005, as in DIN 3892) or according to Roloff/Matek.

Drawing Tables
Drawing tables with dimensions and results can be printed or exported to CAD.
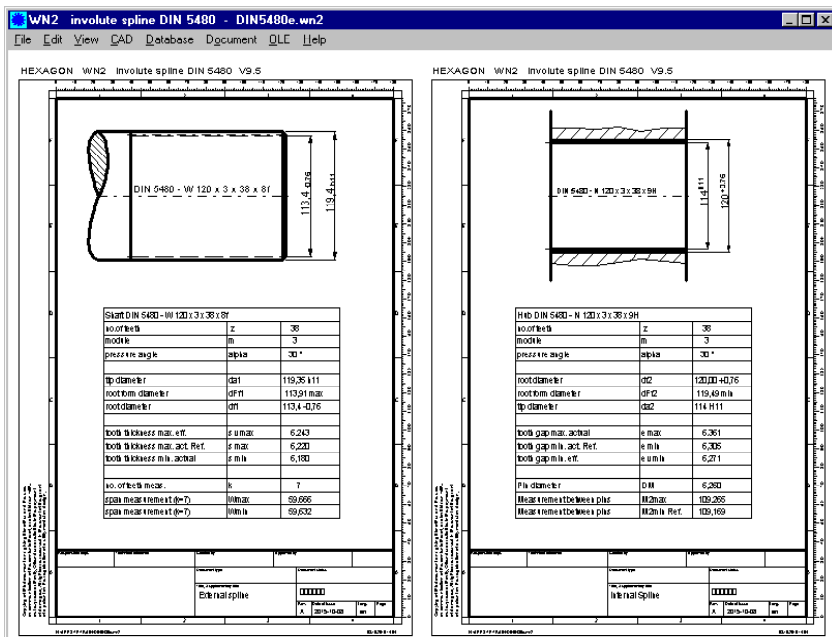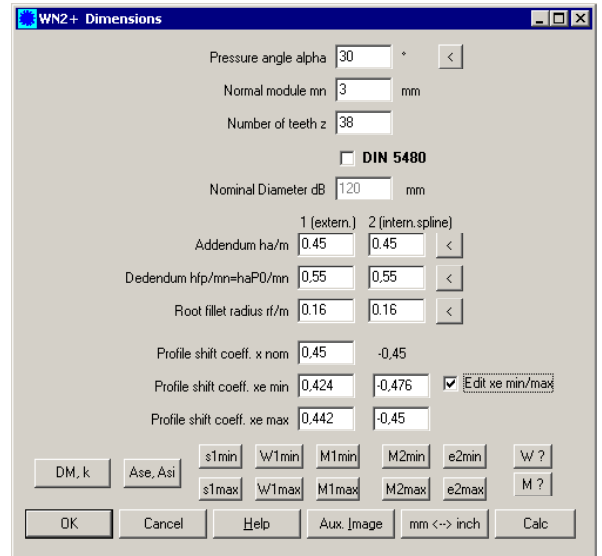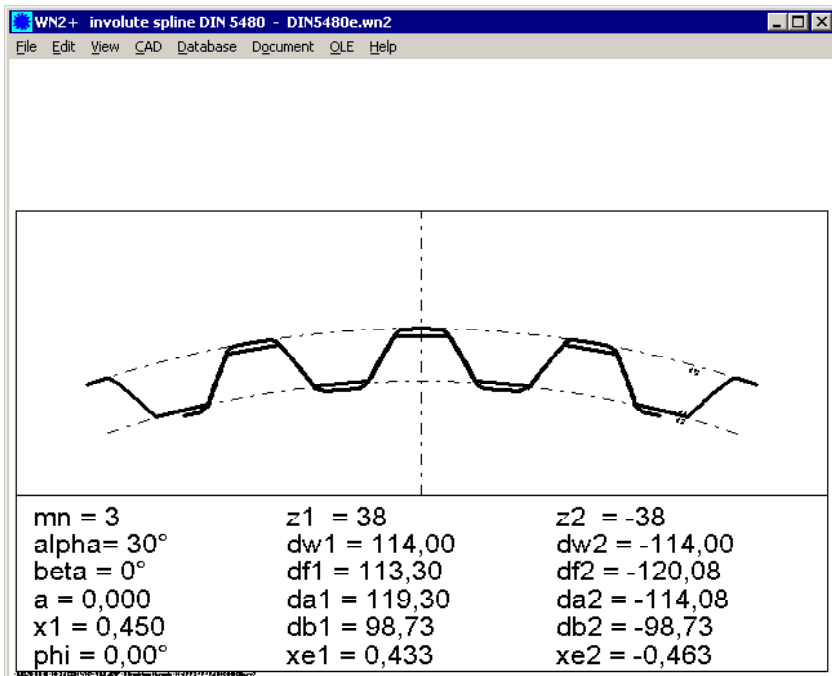
Tooth Contact
Drawings of involute spline profile, tooth gap, tooth contact, tooth shape and reference profile can be printed or exported as true-scale drawing to CAD .

Production Drawing
Drawing and table with dimensions may be generated by WN2 with ISO 7200 drawing header.

WN2+ for Non-Standard Splines
The extended version WN2+ provides an additional input window for tooth height factors and profile shift coefficients. This enables you to design non-standard splines. Reference diameter dB is calculated from profile shift x for this case. Profile shift coefficients can be entered, or calculated from span width or over-pin-dimension. This eases the design of a partner profile for an existing internal/external spline.

CAD Interface
A true-scale drawing of the involure splines can be exported to CAD via DXF or IGES files.

Hard and Software Requirements
WN2 / WN2+ is available as 32-bit app or 64-bit app for Windows 7, 8, Windows 10.

Scope of Delivery
Program with user manual (pdf), database files, example applications, declaration of conformity, non-expiring license for unlimited time use with update rights.

Guarantee
HEXAGON gives a 24 month guarantee on full functionality of the software. HEXAGON Software is continuously improved and updated. Registered users are kept informed of updates and new editions.