

# WN10

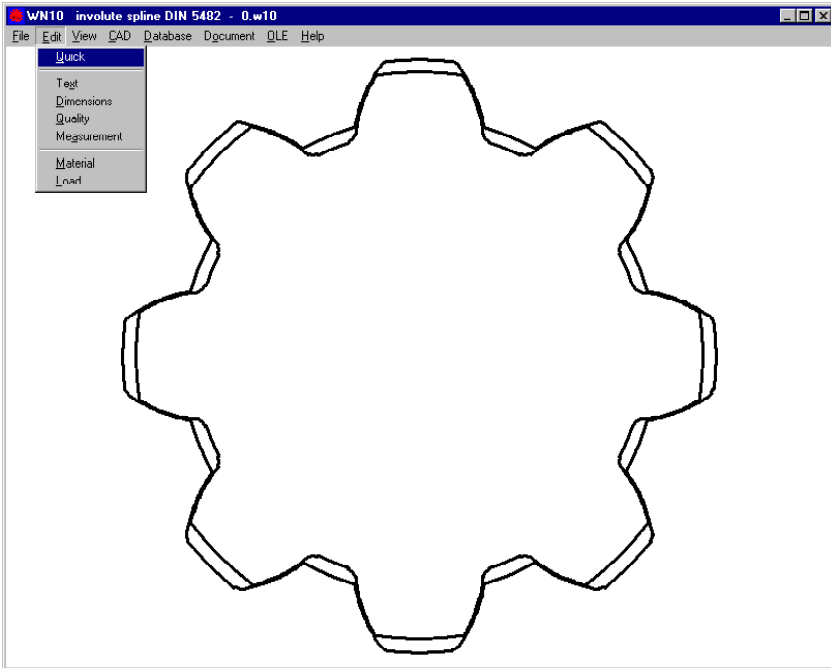


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## Involute Splines according to DIN 5482

for Windows



### Calculation of Involute Splines to DIN 5482

WN10 software calculates dimensions and strength of an involute spline joint according to DIN 5482 (Release 1950).

WN10 also calculates self-defined non-standard splines: you can enter tooth tip diameters and tooth root diameters of external and internal spline, and WN10 calculates tooth height coefficients.

WN10 calculates strength of the joint according to Niemann (2005).

WN10 provides generation of true-scale tooth profile drawings with CAD interfaces DXF and IGES.

### Dimensions

You can select DIN 5482 sizes from database, or input all dimension data.

### Profile Database

Database includes DIN 5482 standard dimensions of internal and external spline. Database may be extended and modified by the user.

External involute spline 000000			Internal involute spline 000000		
tip diameter d3	14.5		root diameter d1	16	
root diameter d4	11.5		tip diameter d2	12	
module m	1.6		module m	1.6	
pressure angle alpha	30		pressure angle alpha	30	
no. of teeth z	8		no. of teeth z	8	
basic rack	15x12	DIN 5482	basic rack	15x12	DIN 5482
profile shift x*mm	+0.500		profile shift x*mm	-0.500	
tooth depth h	1.500		tooth depth h	1.500	
normal tooth thick. sw	3.091		normal space width lw	3.091	
tooth thickness tolerance field	DIN 5480 - 8e		gap width tolerance field	DIN 5480 - 9H	
Meas. Dim. Mi (DM=4) nom	20.424		Meas. Dim. Mi (DM=3) nom	9.085	
Meas. Dim. Mi (DM=4) max	20.389		Meas. Dim. Mi (DM=3) min	9.135	
Meas. Dim. Mi (DM=4) min	20.336		Meas. Dim. Mi (DM=3) max	9.218	
Complement. part	000000		Complement. part	000000	

Load	1	2	
rated torque	TN	Nm	100
maximum torque	Tmax	Nm	300
application factor	KA		1.75
equival. torque	Teq	Nm	175
load alternating factor	KW		1.00
load distrib. factor	K lambda		1.53
equiv. eff. surface pressure	peq	MPa	318
max. eff. surface pressure	pmax	MPa	464

STRENGTH	1	2	
material	1.7707	0.6020	
Yield Point	Re	600	150
Supp. Factor	FS	1.20	2.00
Hardness factor	FS	1.16	1.00
Perm. surface pressure	psdm	828	300
load peak frequency factor	FL	1.37	1.16
safety marg. H*padm/peq	Sq	2.60	0.04
safety marg. H*padm/pmax	Smax	2.46	0.74

NOM	D1	D2	D3	D4	D5	Z	M	X	M	R1
15x12	15	12	14.5	11.5	12.8	8	1.6			0.5
17x14	17	14	16.5	13.5	14.4	9	1.6			0.7
18x15	18	15	17.5	14.5	16	10	1.6			0.4
20x17	20	17	19.5	16.5	19.2	12	1.6			-0.2
22x19	22	19	21.5	18.5	20.8	13	1.6			0
25x22	25	22	24.5	21.2	22.4	14	1.6			0.55
28x25	28	25	27.5	24.5	26.2	15	1.75			0.302
30x27	30	27	29.5	26.3	28	16	1.75			0.327
32x28	32	28	31.5	27.6	29.8	17	1.75			0.102
35x31	35	31	34.5	30.5	31.5	18	1.75			0.676
38x34	38	34	37.5	33.5	36.1	19	1.9			0
40x36	40	36	39.5	35.5	38	20	1.9			0.049
42x38	42	38	41.5	37.5	39.9	21	1.9			0.099
45x41	45	41	44.5	40.6	44	22	2			-0.181
48x44	48	44	47.5	43.2	46	23	2			0.119
50x45	50	45	49.5	44.6	48	24	2			0.181
52x47	52	47	51.5	46.5	50	25	2			-0.231
55x50	55	50	54.5	49	52	26	2			0.019
58x53	58	53	57.5	52	54	27	2			0.518
60x55	60	55	59.5	54.5	56	28	2			0.768
62x57	62	57	61.5	56.5	60.9	29	2.1			-0.434
65x60	65	60	64.3	59.5	63	30	2.1			0.015
68x62	68	62	67.3	61.5	65.1	31	2.1			-0.034
70x64	70	64	69.3	63.5	67.2	32	2.1			-0.084
72x66	72	66	71.3	65.5	69.3	33	2.1			-0.134
75x69	75	69	74.3	68.5	71.4	34	2.1			0.315
78x72	78	72	77.3	71.5	73.5	35	2.1			0.765
80x74	80	74	79.3	73.5	75.6	36	2.1			0.715

Abmessungen nach DIN 5482 Passverzahnung nach DIN 5482

NOM	D1	D2	D3	D4	D5	Z	M	X	M	R1	R2	K
15x12	15	12	14,5	11,5	12,8	8	1,6	0,5	0,15	0,25	0,3	
17x14	17	14	16,5	13,5	14,4	9	1,6	0,7	0,15	0,25	0,3	
18x15	18	15	17,5	14,5	16	10	1,6	0,4	0,15	0,25	0,3	
20x17	20	17	19,5	16,5	19,2	12	1,6	-0,2	0,15	0,25	0,3	
22x19	22	19	21,5	18,5	20,8	13	1,6	0	0,15	0,25	0,3	
25x22	25	22	24,5	21,2	22,4	14	1,6	0,55	0,15	0,25	0,3	
28x25	28	25	27,5	24,5	26,2	15	1,75	0,302	0,15	0,25	0,3	
30x27	30	27	29,5	26,3	28	16	1,75	0,327	0,15	0,25	0,3	
32x28	32	28	31,5	27,6	29,8	17	1,75	0,102	0,15	0,25	0,3	
35x31	35	31	34,5	30,5	31,5	18	1,75	0,676	0,15	0,25	0,3	
38x34	38	34	37,5	33,5	36,1	19	1,9	0	0,15	0,25	0,3	
40x36	40	36	39,5	35,5	38	20	1,9	0,049	0,15	0,25	0,3	
42x38	42	38	41,5	37,5	39,9	21	1,9	0,099	0,15	0,25	0,3	
45x41	45	41	44,5	40,6	44	22	2	-0,181	0,25	0,35	0,4	
48x44	48	44	47,5	43,2	46	23	2	0,119	0,25	0,35	0,4	
50x45	50	45	49,5	44,6	48	24	2	-0,181	0,25	0,35	0,4	
52x47	52	47	51,5	46,5	50	25	2	-0,231	0,25	0,35	0,4	
55x50	55	50	54,5	49	52	26	2	0,019	0,25	0,35	0,4	
58x53	58	53	57,5	52	54	27	2	0,518	0,25	0,35	0,4	
60x55	60	55	59,5	54,5	56	28	2	0,768	0,25	0,35	0,4	
62x57	62	57	61,5	56,5	60,9	29	2,1	-0,434	0,35	0,45	0,5	
65x60	65	60	64,3	59,5	63	30	2,1	0,015	0,35	0,45	0,5	
68x62	68	62	67,3	61,5	65,1	31	2,1	-0,034	0,35	0,45	0,5	
70x64	70	64	69,3	63,5	67,2	32	2,1	-0,084	0,35	0,45	0,5	
72x66	72	66	71,3	65,5	69,3	33	2,1	-0,134	0,35	0,45	0,5	
75x69	75	69	74,3	68,5	71,4	34	2,1	0,315	0,35	0,45	0,5	
78x72	78	72	77,3	71,5	73,5	35	2,1	0,765	0,35	0,45	0,5	
80x74	80	74	79,3	73,5	75,6	36	2,1	0,715	0,35	0,45	0,5	
82x76	82	76	81,3	75,5	83,2	37	2,25	-2,425	0,35	0,45	0,5	

## Tolerances

From tolerance series and tolerance zone, WN10 calculates measuring dimensions and backlash or interference.

You can configure tolerance system according to DIN 5482-3:1973, or according to DIN 5480-1:2006

## Measurement

The program calculates span width and dimension over/between pins (min, max & nom. values) for dimensions and selected tolerance fields. Whereby no. of teeth meas. and pin diameter can be altered.

## Material Database

Material properties can be selected from the integrated database (> 900 records)

## Strength Calculation

WN10 calculates transferable torque or safety against permissible flank pressure according to Niemann/Winter/Höhn (2005).

## Drawing Tables

Table drawings with dimensions may be printed or exported to CAD.

## Tooth Profile Drawings

True-scale drawings of tooth profile, tooth contact, reference profile may be exported to CAD or printed on screen.

## Production Drawing

WN10 generates production drawings of external spline and internal spline with ISO 7200 data field.

## CAD Interface

True-scale tooth drawings, production drawing and drawing tables can be generated as DXF or IGES file, and imported by any CAD software.

## User Interface

The dialogue windows of WN10 allow even the less experienced PC user to find his way around the program quickly. WN10 provides users with a help text wherever they are in the program. When the demo mode is selected, WN10 runs through a demo program in which an example calculation is performed.

## System Requirements

WN10 is available as 32-bit app or as 64-bit app for Windows XP, Vista, Windows 7, 8, Windows 10.

## Scope of Delivery

WN10 Software with user manual (pdf), non-expiring license for unlimited time use with update rights.

## Software Maintenance

HEXAGON Software is continuously improved and updated. Registered users are regularly kept informed of updates and new editions.

## Guarantee

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

WN10 Passverzahnung DIN 5482 - 15x12.w10

ZAHNWELLE 000000		ZAHNABE 000000	
Kopfkreisdurchmesser d3	14,5	Fußkreisdurchmesser d1	15
Fußkreisdurchmesser d4	11,5	Kopfkreisdurchmesser d2	12
Modul m	1,6	Modul m	1,6
Eingriffswinkel alpha	30	Eingriffswinkel alpha	30
Zähnezahl z	8	Zähnezahl z	8
Bezugsprofil	15x12 DIN 5482	Bezugsprofil	15x12 DIN 5482
Profilverchiebung x*m	+0,500	Profilverchiebung x*m	-0,500
Zahnhöhe h	1,500	Zahnhöhe h	1,500
Nurmalzahndicke sw	3,091	Nurmalzahndicke sw	3,091
Zahndicken-Toleranzfeld	DIN 5480 - 9h	Lückenweiten-Toleranzfeld	DIN 5480 - 10H
Zahnweite (k=2) Wnom	7,626	Prüfmaß Mi (DM=2,9) nom	9,424
Zahnweite (k=2) Wmax	7,806	Prüfmaß Mi (DM=2,9) min	9,491
Zahnweite (k=2) Wmin	7,571	Prüfmaß Mi (DM=2,9) max	9,598
Gegenstück	000000	Gegenstück	000000

Last		FESTIGKEIT	
Nenn Drehmoment	TN Nm 95,49	Werkstoff	1 2 30CrMoVGG-30
Maximales Drehmoment	Tmax Nm 286,5	Streckgrenze	Re 1050 230
Anwendungsfaktor	KA 1,00	Stutzfaktor	rS 1,20 2,00
Äquivalentes Drehmoment	Teq Nm 95,49	Härteeinflussfaktor	fH 1,00 1,00
Lastrichtungswechselfaktor	fW 1,00	Zul.Flächenpressung	pzul 1260 460
Lastverteilungsfaktor	K lambda 1,00	Lastspitzenhaftigkeitsfaktor	fL 1,00 1,00
äquiv.wirks.Flächenpressung	peq MPa 240	Sicherheit Seq	5,25 1,91
max.wirks.Flächenpressung	pmax MPa 601	Sicherheit fL*pzul/pmax	Smax 2,10 0,77

WN10 Passverzahnung DIN 5482 - 0.w10

ZAHNWELLE 000000		ZAHNABE 000000	
Kopfkreisdurchmesser d3	14,5	Fußkreisdurchmesser d1	15
Fußkreisdurchmesser d4	11,5	Kopfkreisdurchmesser d2	12
Modul m	1,6	Modul m	1,6
Eingriffswinkel alpha	30	Eingriffswinkel alpha	30
Zähnezahl z	8	Zähnezahl z	8
Bezugsprofil	15x12 DIN 5482	Bezugsprofil	15x12 DIN 5482
Profilverchiebung x*m	+0,500	Profilverchiebung x*m	-0,500
Zahnhöhe h	1,500	Zahnhöhe h	1,500
Nurmalzahndicke sw	3,091	Nurmalzahndicke sw	3,091
Zahndicken-Toleranzfeld	DIN 5480 - 9h	Lückenweiten-Toleranzfeld	DIN 5480 - 10H
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Gegenstück	000000	Gegenstück	000000