

# WN3



www.hexagon.de

## Software for Parallel Key Joints according to DIN 6892

for Windows

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**Dimensions:**  
 shaft diameter  $d=60\text{mm}$   
 hub outer diameter  $D=120\text{mm}$   
 slid.key: AB18x11x100 DIN 6885-1

**Load:**  
 nom.torque:  $T_{nom}=1950\text{ Nm}$   
 max.torque:  $T_{max}=3900\text{ Nm}$

**Material:**  
 shaft(heat-treat.): 1 C 45  
 hub(case-hard.): 17CrNiMo6  
 slid.key (case-hard.): 17CrNiMo6

1ST\_APPL Source: DIN 6892

WN3 Application Example

### Parallel Key Joints - Calculation and Design

WN3 software calculates the load-bearing capacity of a parallel key joint in accordance with DIN 6892. The dimensions for the parallel key in accordance with DIN 6885 or ANSI B17.1, as well as material values for parallel key, shaft and hub can easily be taken from the integrated data base. As a result, WN3 issues text printout, tables and drawings of sliding key, shaft groove and hub groove.

### Pre-Dimension

In pre-dimensioning, the shaft diameter can be calculated from nominal torque, yield point of the shaft and hub material and application factor, and then you can select an appropriate parallel key from the database.

rated torque TN: 4000 Nm  
 application factor KA: 1,5  
 material shaft: 1 C 60  
 material hub: GG-25  
 shaft diameter d: 120 mm

slid.key:  
 DIN 6885  
 ANSI B17.1

Buttons: OK, Cancel, Help, mm <-> inch

**slid.key 1-1/4 ANSI B17.1-1998**

shaft diameter d1	80 H6/r6
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**Load**

rated torque TN	1950
maximum torque Tmax	3900
add. bending moment Mbmax	0
application factor KA	1,75
load alternating factor fW	0,32

**Error messages:**

Warning: ltr > 1.3\*d  
 Error : Seq<1 (0,99 slid.key)  
 Warning: D outside DIN !

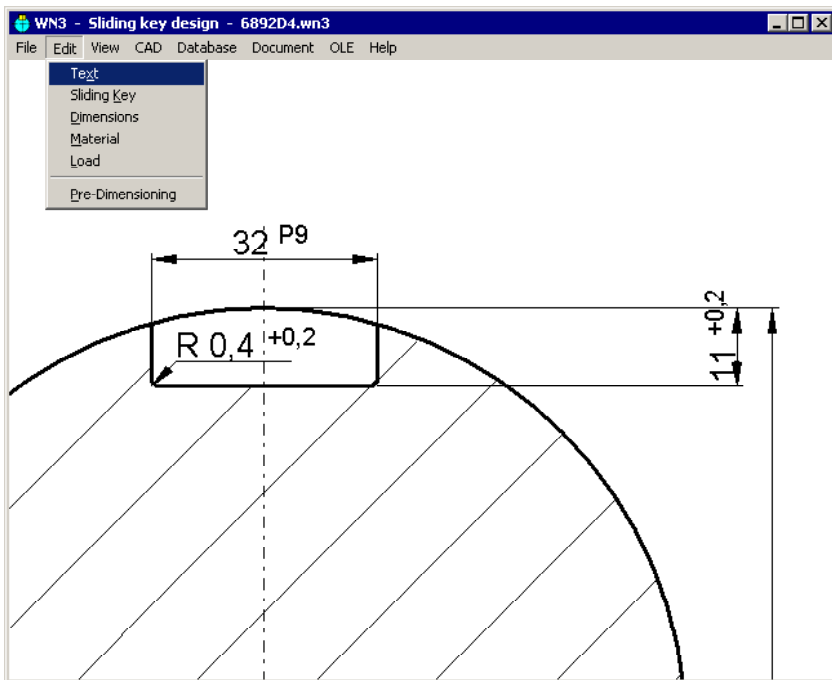
MATERIAL	shaft	hub	slid.key
material	1 C 45	17 CrNiMo 6	E335 (St 60)
yield point Re	370	685	340
permissible surface pressure padm	444	1182	391

Calculation	shaft	hub	slid.key
equival. eff. surface pressure peg	126	115	126
Max. eff. surface pressure pmax	107	97	107
Min. support. height tr	13,62	14,93	28,55

Safety Margins	shaft	hub	slid.key
safety marg. fW*padm/peg	1,13	3,29	0,99
safety marg. fL*padm/pmax	6,25	18,22	5,50

### Strength Calculation

In recalculation, in accordance with DIN 6892, the following data are taken into account: maximum torque, load distribution factor, adhesive force factor (for press fits), additional bending moment, load alignment change factor and load peak frequency factor. The support factor and hardness influence factor for shaft, hub and sliding key are automatically selected from the data base by WN3. Safety margins against breakage due to maximum and equivalent torque for sliding key, shaft and hub are calculated.

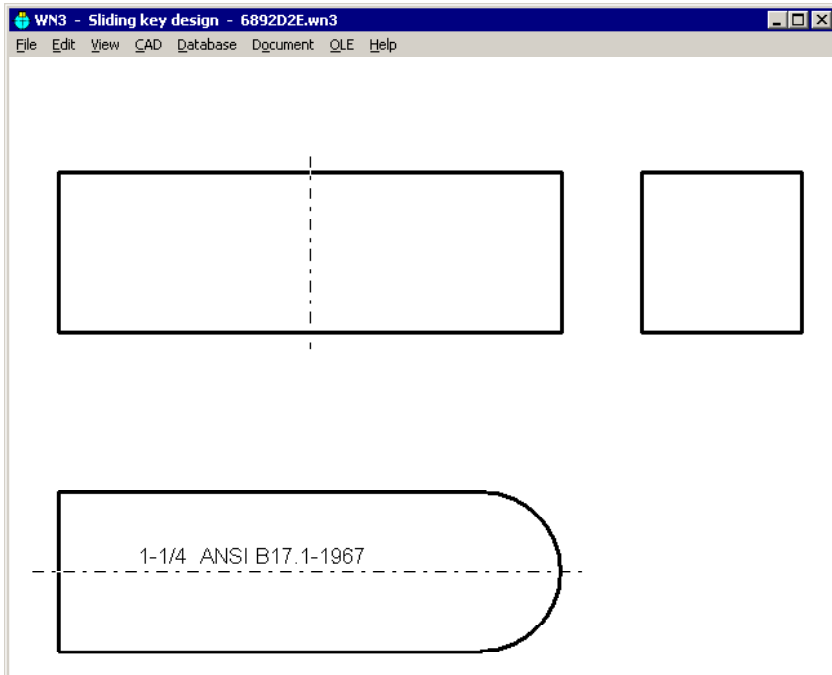


Sliding keys acc.to DIN 6885

TYP	B	H	D1MIN	D1MAX	BW	TW	TOL_TW	BN
3	28	10	95	110	28	6.9	0.2	28
1	28	16	95	110	28	10	0.2	28
2	28	16	95	110	28	11	0.2	28
3	32	11	110	130	32	7.6	0.2	32
1	32	18	110	130	32	11	0.2	32
2	32	18	110	130	32	13	0.2	32
3	36	12	130	150	36	8.3	0.2	36
1	36	20	130	150	36	12	0.2	36
2	36	20	130	150	36	13.7	0.3	36
1	40	22	150	170	40	13	0.2	40
2	40	22	150	170	40	14	0.3	40
1	45	25	170	200	45	15	0.2	45
1	50	28	200	230	50	17	0.2	50
1	56	32	230	260	56	20	0.3	56
1	63	32	260	290	63	20	0.3	63
1	70	36	290	330	70	22	0.3	70
1	80	40	330	380	80	25	0.3	80
1	90	45	380	440	90	28	0.3	90

### Parallel Key Data Base

WN3's scope of delivery includes a data base containing all parallel key dimensions in accordance with DIN 6885 (pages 1, 2 and 3) and ANSI B17.1. The database can be extended by the user.



Material Shaft

IDENT	MATERIAL	MAT_NR	NR	RM	RE	E_MODUL	A5	Z
1.0044	S275JRC (St 44-2)	1.0044	1	430	275	210000	22	
1.0045	Fe 510 B	1.0045	1	510	355	210000	22	
1.0050	F295 (St 50)	1.0050	1	490	295	210000	22	
1.0060	E335 (St 60)	1.0060	1	530	335	210000	15	
1.0070	E360 (St 70)	1.0070	1	630	360	210000	12	
1.0112	P235S	1.0112	1	360	235	210000	26	
1.0114	S235J0	1.0114	1	360	235	210000	26	
1.0116	S235J2G3	1.0116	1	360	235	210000	26	
1.0117	Fe 360 D 2	1.0117	1	360	235	210000	26	
1.0130	P265S	1.0130	1	400	265	210000	26	
1.0143	S275J0	1.0143	1	430	275	210000	22	
1.0144	S275J2G3 (St 44-3)	1.0144	1	430	275	210000	22	
1.0145	Fe 430 D 2	1.0145	1	430	275	210000	22	
1.0149	S275J0H (RoSt44-2)	1.0149	1	430	275	210000	22	
1.0226	DX51 D (St 02 Z)	1.0226	1	300	150	210000	22	
1.0301	C10	1.0301	7	650	390	210000	13	
1.0305	P235G1TH (St 35 R)	1.0305	3	360	230	210000	26	
1.0312	DC05	1.0312	1	300	160	210000	40	

### Material Data Base

The material for shaft, hub and parallel key can be selected from a database with more than 700 material entries (steel and non-iron metals)

### HEXAGON Help System

Auxiliary text and images are available for all dialogue windows. If error messages occur, you can get description and remedy suggestion.

### Interfaces

Drawings and tables can be saved as DXF or IGES file to be loaded with CAD programs. The OLE interface lets you import/export data from/to Excel.

### System Requirements

WN3 is available as 32-bit app or as 64-bit app for Windows XP, Vista, 7, 8, Windows 10.

### Scope of Delivery

WN3 program with user manual (pdf), calculation examples, 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 regularly kept informed of updates and new editions.

WN3E-001

WN3 Perm. Torque to Niemann and DIN 6892 Method C

WN3E-001

Mf. 02/97