

# ZM 1



www.hexagon.de

## Roller Chain Drives to ISO 606

Software for Windows

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ZM1 Chain Drive Design - DECKER1e.zm1

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Ritzel 000000  
Kettenrad 000000  
Berechnungsbeispiel  
aus Decker - Maschinenelemente

Ritzel 000000		Kettenrad 000000	
no. of teeth	z	no. of teeth	z
no. of teeth	17	no. of teeth	58
pitch	16.500	pitch	16.500
roller diameter	20	roller diameter	45
face width	21	face width	22,22 - 22,42
face width total	22	face width total	22
pitch diameter	27	pitch diameter	94
root diameter	25	root diameter	89,2 - 89,27
pitch angle	21,78	pitch angle	2,20
tip diameter	29	tip diameter	94,7 - 95,4
dimeter groove	26	dimeter groove	77,7 - 78,4
roller root radius	1	roller root radius	11,22 - 11,42
tooth flank radius	2	tooth flank radius	185,7 - 187,2
tooth chamfer radius	2	tooth chamfer radius	38,1
chamfer	4,762	chamfer	4,762
roller root angle	114,7 - 114,7	roller root angle	114,7 - 114,7
flank angle	72,06 - 72,06	flank angle	18,07 - 18,07

Chain 24A-3 - DIN 8188 - 17B	
z	pitch
17	16,500
58	16,500
22,22 (0,8725)	
22,22 (0,8725)	

Drive	
z	pitch
17	16,500
58	16,500
22,22 (0,8725)	
22,22 (0,8725)	

Chain wheel 2	
z	pitch
17	16,500
207,2	165,0
21	165,0
22,22 (0,8725)	
22,22 (0,8725)	

Safety factor	
SF	value
SF	19,22
SF	7,22
SF	101,62 n

### Application

ZM1 calculates dimensions and strength of chain gears according to Niemann/Winter and in accordance with ISO 606. Roller chains to ISO 606 and also to the withdrawn DIN 8187/8188 can be selected from the data base provided.

### Dimensioning

ZM1 searches the data base and suggests an appropriate chain based on transmission ratio, power and drive speed. ZM1 determines the next even number of links for the chain and calculates the exact dimensions based on the approximate center distance.

### Re-Calculation

The required chain is selected from the data base. ZM1 calculates center distance and all dimensions for chain and sprockets, if you enter number of teeth of the sprockets and the approximate center distance.

### Strength Calculation

ZM1 calculates the static and dynamic breakage safety margin as well as the safety against permissible surface pressure. ZM1 determines the standard value of the joint surface pressure for roller chains in accordance with ISO 606. The life expectancy (Lv) of the chain is calculated (according to Niemann) from the joint surface pressure.

### Roller Chains

ZM1 calculates single, double or triple roller chains. The data base supplied with the program contains the necessary dimensions and strength values for all sizes in accordance with ISO 606, and also for the withdrawn DIN 8187 and DIN 8188.

### Efficiency

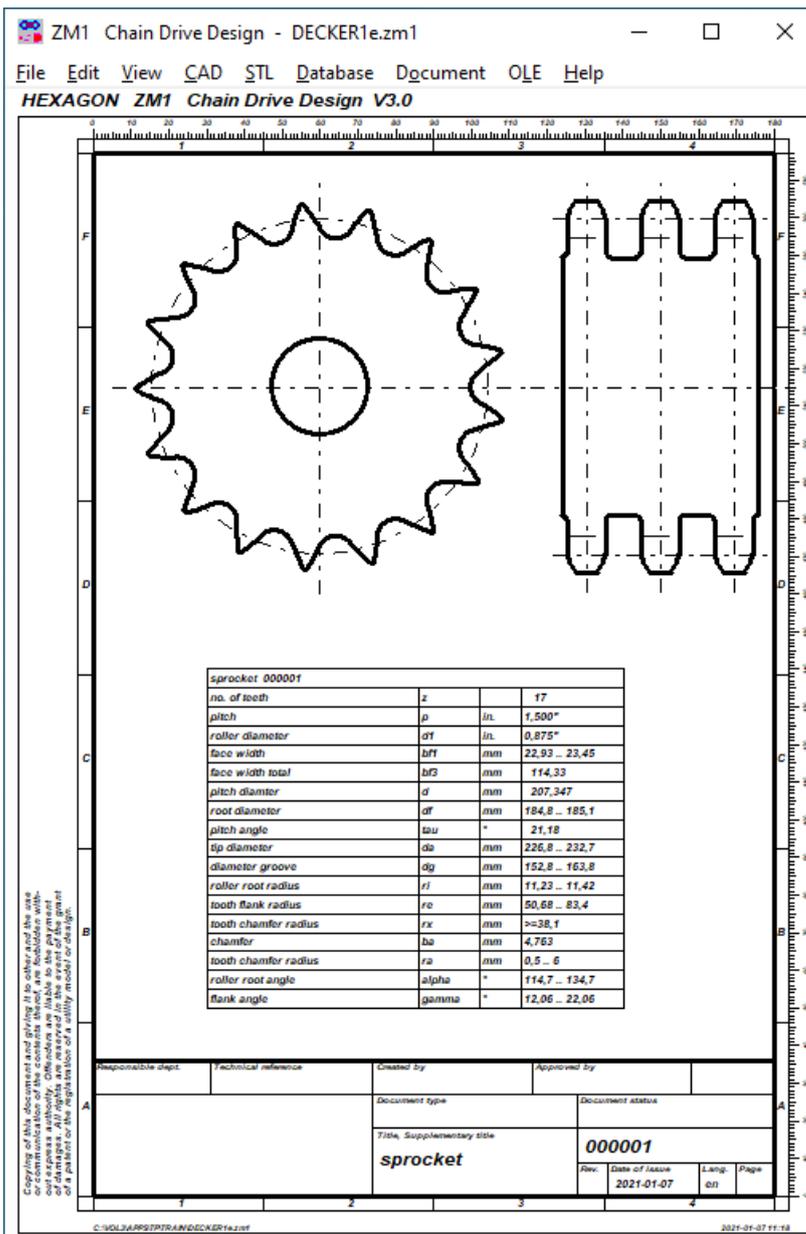
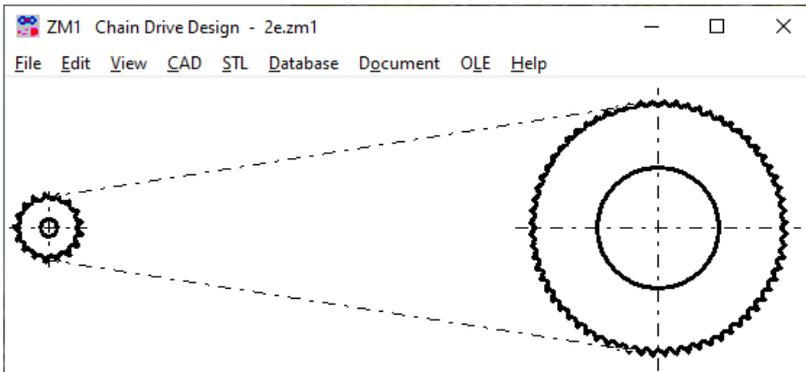
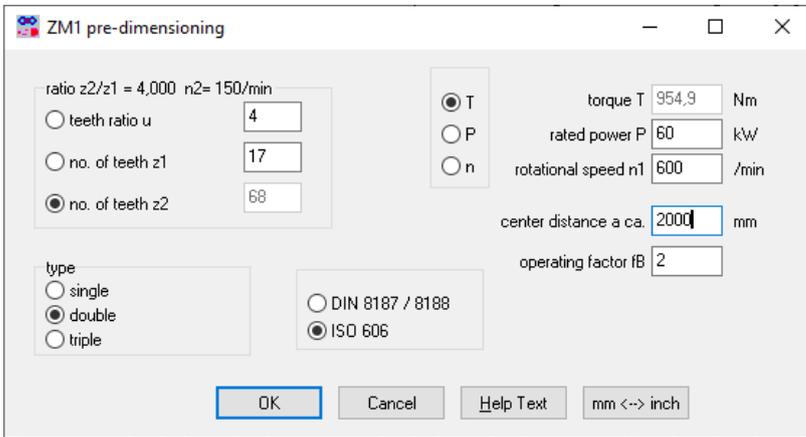
Loss of power and efficiency are calculated from joint friction and dimensions.

roller chains acc.to ISO 606

File View Help

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NR	INFO	P	D1	B1	D2	H2	PT	B3
20B		31,75	19,05	19,56	10,19	26,42	36,45	29
100H		31,75	19,05	18,9	9,54	30,17	39,09	29
100HE		31,75	19,05	18,9	9,54	30,17	39,09	29
▶ 120	24A	38,1	22,23	25,22	11,11	36,2	45,44	35
24B		38,1	25,4	25,4	14,63	33,4	48,36	38
120H		38,1	22,23	25,22	11,11	36,2	48,87	37
120HE		38,1	22,23	25,22	11,11	36,2	48,87	37
140	28A	44,45	25,4	25,22	12,71	42,23	48,87	37
28B		44,45	27,94	30,99	15,9	37,08	59,56	46
140H		44,45	25,4	25,22	12,71	42,23	52,2	38
140HE		44,45	25,4	25,22	12,71	42,23	52,2	38
160	32A	50,8	28,58	31,55	14,29	48,26	58,55	45
32B		50,8	29,21	30,99	17,81	42,29	58,55	4
160H		50,8	28,58	31,55	14,29	48,26	61,9	46
160HE		50,8	28,58	31,55	14,29	48,26	61,9	46
180	36A	57,15	35,71	35,48	17,46	54,3	65,84	5
180H		57,15	35,71	35,48	17,46	54,3	69,16	52



## Lubrication

ZM1 determines the recommended type of lubrication from speed-pitch chart according to Niemann. The calculated operating point is marked in the diagram.

## Text Printout

The calculation results and input data can be printed on any Windows printer. Alternatively, ZM1 can generate a HTML or TXT file, or directly load the results with MS-Excel.

## Quick View

Quick views show calculation results with drawings and diagrams altogether on one screen.

## True-Scale Drawings

Drawings of sprockets can be displayed on screen, printed out or exported as true-scale drawings to CAD via DXF or IGES interfaces.

## Production Drawings

ZM1 generates a complete manufacturing drawing of the sprockets with drawings and tables and ISO 7200 data field. Drawing info and modifications can be entered in the program. The drawings may be printed directly, or loaded into CAD via DXF or IGES interface.

## CAD Interface

Drawings and diagrams can be exported to CAD via the DXF or IGES interfaces.

## STL Interface

Profile of sprockets can be generated as STL file and printed with your 3D printer.

## HEXAGON Help System

As with all HEXAGON programs ZM1 can provide you with a help text and auxiliary picture for each input. Help texts and auxiliary pictures can be modified and appended by the user as required. When error messages appear you can have a description and remedy suggestion displayed.

## Units

ZM1 can be switched between metric units (mm, N,MPa) and imperial units (inch, lbf, psi).

## System Requirements

ZM1 is available as 32-bit app or as 64-bit app for Windows 7, 8, Windows 10.

## Scope of Delivery

Software with user manual (pdf), non-expiring perpetual license 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. HEXAGON Software is continuously improved and updated. Registered users are regularly kept informed of updates and new editions.