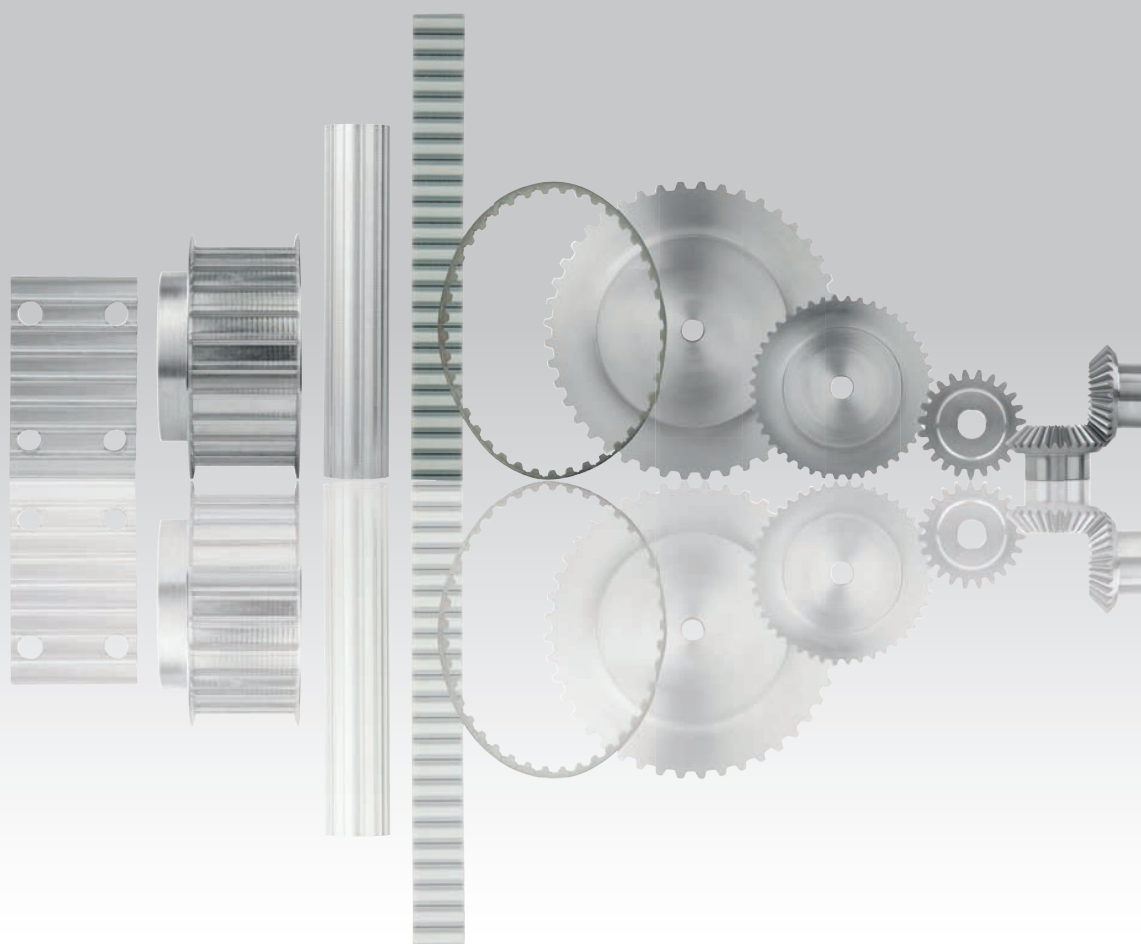


22000

## Drive technology



# Technical Information for timing belts 22052, 22054, 22057 and 22059

## General

Polyurethane timing belts are made of abrasion-resistant polyurethane and high-tensile reinforced steel cording. They allow for a smooth and synchronous transmission of power. They are maintenance-free and extremely cost-efficient as a result.

## Drive installation

Diagrams and performance tables are available on these pages for selecting the size. The axles must be parallel to one another. It is possible to align the serrated washer very precisely using an alignment ruler or a laser. Use the largest washer diameters possible. Make sure that at least one toothed belt pulley has flanged wheels. When installing the timing belts, never forcefully lever using the flanged wheels. Possible adjustments should be specified for the installation and setting the correct belt tension.

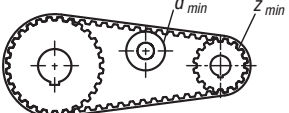
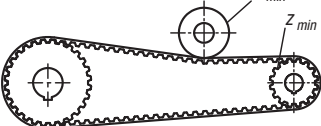
## Belt tension

In order to guarantee a long service life and low-noise operation, correct alignment and pretensioning of the drive are absolutely necessary. Idlers are often used on drives with fixed centre distances in order to be able to set the belt tension accurately. A serrated washer on the slack side of the belt is preferred for a smooth back idler. Smooth back idlers produce counterbending which reduces the service life of the drive. If it is not possible to do without them, the reel should be at least 1.25 times as large as the drive's small toothed belt pulley and fitted as close as possible to the small toothed belt pulley in order to maximise the number of teeth in mesh.

## Belt storage

Never bend the timing belt. When storing, prevent bend radii, direct solar radiation and chemical influences.

## Minimum number of teeth and minimum diameter

	T5	T10	AT5	AT10
without reverse bending 	10	12	15	15
with reverse bending 	15	20	25	25
	30	60	30	50
	30	60	60	120

# Technical information for timing belts 22052 and 22057

## Specific tooth force

Output „P“ and torque „M“ to be transferred via the belt are calculated using the following formulas:

- P = Power in [kW]
- M = Torque in [Nm]
- P<sub>spez</sub> = specific power
- M<sub>spez</sub> = specific torque
- Z<sub>e</sub> = Number of engaging teeth of the small tooth lock washer
- Z<sub>emax</sub> = 12 for calculating maximum permissible number of engaging teeth
- Z<sub>k</sub> = Number of teeth of the small tooth lock washer
- b = Belt width in [cm]
- A = Centre distance in [mm]

$$P \text{ [kW]} = P_{spez} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{spez} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k}{180} \cdot \arccos \cdot \left[ \frac{t \cdot (Z_g - Z_k)}{2 \cdot \pi \cdot A} \right]$$

Division T 5

Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]	Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]	Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]
0	2,523	0,000	1200	1,607	2,019	3400	1,248	4,444
20	2,458	0,051	1300	1,580	2,151	3600	1,229	4,632
40	2,403	0,101	1400	1,555	2,279	3800	1,209	4,812
60	2,354	0,148	1440	1,545	2,330	4000	1,191	4,988
80	2,312	0,194	1500	1,532	2,406	4500	1,149	5,414
100	2,276	0,238	1600	1,510	2,529	5000	1,111	5,818
200	2,135	0,447	1700	1,489	2,651	5500	1,078	6,206
300	2,032	0,638	1800	1,470	2,770	6000	1,046	6,571
400	1,951	0,817	1900	1,451	2,888	6500	1,017	6,924
500	1,884	0,987	2000	1,433	3,001	7000	0,991	7,262
600	1,829	1,149	2200	1,400	3,226	7500	0,966	7,588
700	1,781	1,306	2400	1,371	3,445	8000	0,943	7,897
800	1,738	1,456	2600	1,342	3,654	8500	0,920	8,191
900	1,701	1,603	2800	1,317	3,860	9000	0,900	8,480
1000	1,667	1,745	3000	1,306	3,940	9500	0,880	8,758
1100	1,635	1,884	3200	1,292	4,059	10000	0,862	9,027

Division T 10

Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]	Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]	Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]
0	8,244	0,000	1200	4,808	6,042	3400	3,460	12,318
20	8,009	0,168	1300	4,708	6,409	3600	3,385	12,761
40	7,805	0,327	1400	4,614	6,764	3800	3,312	13,179
60	7,627	0,479	1440	4,577	6,902	4000	3,245	13,592
80	7,472	0,626	1500	4,526	7,109	4500	3,088	14,549
100	7,339	0,768	1600	4,444	7,445	5000	2,946	15,424
200	6,804	1,425	1700	4,366	7,771	5500	2,817	16,224
300	6,411	2,014	1800	4,292	8,090	6000	2,701	16,969
400	6,105	2,557	1900	4,222	8,401	6500	2,593	17,646
500	5,857	3,066	2000	4,157	8,706	7000	2,492	18,269
600	5,648	3,549	2200	4,033	9,291	7500	2,398	18,836
700	5,467	4,007	2400	3,920	9,851	8000	2,311	19,359
800	5,306	4,445	2600	3,815	10,386	8500	2,228	19,832
900	5,163	4,866	2800	3,718	10,901	9000	2,150	20,264
1000	5,034	5,271	3000	3,680	11,097	9500	2,077	20,661
1100	4,916	5,663	3200	3,626	11,389	10000	2,007	21,015

Division AT 5

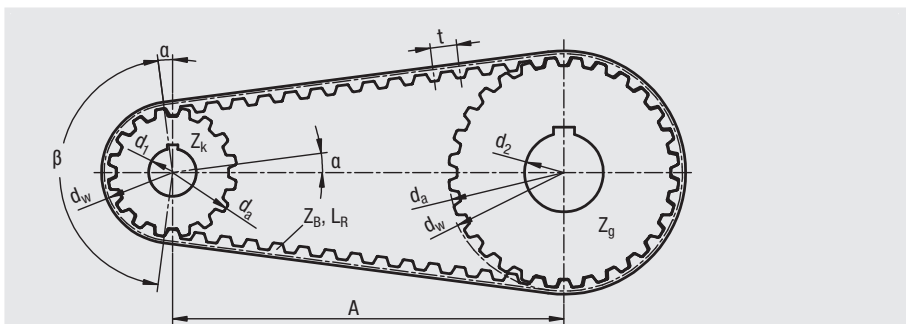
Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]	Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]	Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]
0	3,813	0,000	1200	2,668	3,352	3400	1,993	7,096
20	3,758	0,079	1300	2,620	3,566	3600	1,954	7,368
40	3,708	0,155	1400	2,574	3,773	3800	1,917	7,627
60	3,663	0,230	1440	2,557	3,855	4000	1,881	7,879
80	3,623	0,304	1500	2,531	3,975	4500	1,799	8,479
100	3,586	0,376	1600	2,491	4,173	5000	1,725	9,032
200	3,448	0,722	1700	2,452	4,365	5500	1,658	9,549
300	3,343	1,050	1800	2,416	4,554	6000	1,596	10,029
400	3,235	1,355	1900	2,381	4,737	6500	1,539	10,473
500	3,137	1,642	2000	2,348	4,918	7000	1,485	10,887
600	3,050	1,916	2200	2,285	5,265	7500	1,436	11,278
700	2,972	2,178	2400	2,229	5,601	8000	1,389	11,635
800	2,900	2,430	2600	2,175	5,923	8500	1,346	11,980
900	2,834	2,671	2800	2,125	6,231	9000	1,304	12,289
1000	2,775	2,905	3000	2,106	6,352	9500	1,264	12,576
1100	2,719	3,132	3200	2,079	6,531	10000	1,228	12,854

Division AT 10

Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]	Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]	Speed [min <sup>-1</sup> ]	M <sub>spez</sub> [Ncm/cm]	P <sub>spez</sub> [W/cm]
0	15,903	0,000	1200	10,174	12,785	3400	7,019	24,898
20	15,670	0,328	1300	9,945	13,538	3600	6,838	25,778
40	15,452	0,647	1400	9,731	14,266	3800	6,664	26,516
60	15,246	0,958	1440	9,649	14,550	4000	6,500	27,225
80	15,053	1,261	1500	9,529	14,968	4500	6,120	28,837
100	14,870	1,557	1600	9,340	15,649	5000	5,777	30,248
200	14,103	2,954	1700	9,160	16,305	5500	5,464	31,470
300	13,483	4,236	1800	8,990	16,944	6000	5,179	32,536
400	12,927	5,414	1900	8,828	17,563	6500	4,916	33,460
500	12,439	6,513	2000	8,672	18,162	7000	4,670	34,232
600	12,008	7,545	2200	8,380	19,305	7500	4,441	34,878
700	11,626	8,522	2400	8,113	20,390	8000	4,227	35,409
800	11,282	9,451	2600	7,866	21,414	8500	4,023	35,808
900	10,969	10,337	2800	7,632	22,378	9000	3,832	36,113
1000	10,683	11,186	3000	7,544	22,751	9500	3,651	36,322
1100	10,418	12,000	3200	7,416	23,296	10000	3,479	36,429

# Technical information for timing belts 22052 and 22057

b	(cm)	Belt width
$L_R$	(mm)	Belt length
$Z_R$	-	Number of belt teeth
B	(mm)	Serrated washer width
A	(mm)	Centre distance
$A_{eff}$	(mm)	Effective centre distance
d	(mm)	Diameter of drill hole
$d_a$	(mm)	Outer diameter
$d_{ak}$	(mm)	Outer diameter of the small washer
$d_{ag}$	(mm)	Outer diameter of the large washer
$d_w$	(mm)	Effective diameter
$d_{wk}$	(mm)	Effective diameter of the small washer
$d_{wg}$	(mm)	Effective diameter of the large washer
$F_{Wsta}$	(N)	Static shaft power
$F_{TV}$	(N)	Pretensioning force per side of belt
$F_{Tzul}$	(N)	Maximum permissible belt tension
$F_U$	(N)	Peripheral force
M	(Nm)	Torque
P	(kW)	Output
$t_{ab}$	(s)	Acceleration time
$t_{av}$	(s)	Deceleration time
v	(m/s)	Speed / peripheral speed
$Z_e$	-	Number of teeth in mesh
$Z_k$	-	Number of teeth on the small washer
$Z_g$	-	Number of teeth on the large washer
i	-	Speed ratio $n_1 : n_2$
$\rho$	(kg/dm <sup>3</sup> )	Thickness
J	(kgm <sup>2</sup> )	Mass moment of inertia
t	(mm)	Pitch
n	(min <sup>-1</sup> )	Speed
$n_1$	(min <sup>-1</sup> )	Drive pulley speed
$\omega$	(s <sup>-1</sup> )	Angular speed
$\beta$	(°)	Wrap angle

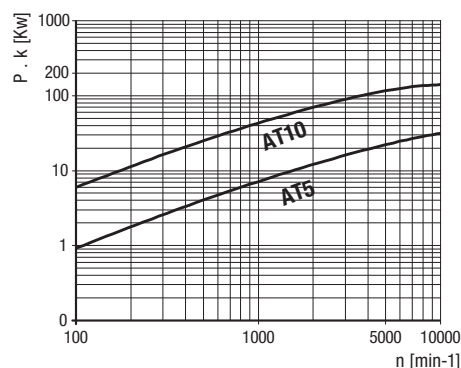
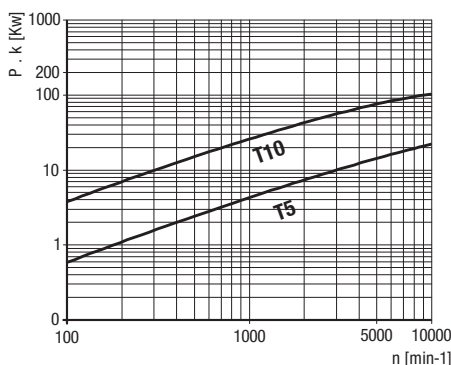


## Formulary

Power	Circumferential force	Torque
$P = \frac{M \cdot n}{9550}$	$F_u = \frac{19100 \cdot P \cdot 10^3}{n \cdot d_w}$	$M = \frac{F_u \cdot d_w}{2000}$
$P = \frac{F_u \cdot d_w \cdot n}{19100 \cdot 10^3}$	$F_u = \frac{2000 \cdot M}{d_w}$	$M = \frac{9550 \cdot P}{n}$
Angular velocity	Circumferential speed	Acceleration torque
$\omega = \frac{\pi \cdot n}{30}$	$v = \frac{d_w \cdot n}{19100}$	$M_{ab} = \frac{J \cdot \Delta n}{9,55 \cdot t_{ab}}$
Moment of inertia	Revolution	Effective circular diameter
$J = 98,2 \cdot 10^{-15} \cdot B \cdot \rho \cdot (d_a^4 - d^4)$	$n = \frac{19100 \cdot v}{d_w}$	$d_w = \frac{z \cdot t}{\pi}$
Belt length for $i=1$		
$L_R = 2 \cdot A + \pi \cdot d_w$		
$L_R = 2 \cdot A + z \cdot t$		
Belt length for $i \neq 1$ (simplified)	Belt length for $i \neq 1$ (for greater accuracy)	
$L_R \approx \frac{t}{2} \cdot (Z_g + Z_k) + 2A + \frac{1}{4A} \cdot \left[ \frac{(Z_g - Z_k) \cdot t}{\pi} \right]^2$	$L_R \approx 2A \cdot \sin \frac{\beta}{2} + \frac{t}{2} \cdot \left[ Z_g + Z_k + \left( 1 - \frac{\beta}{180} \right) \cdot (Z_g - Z_k) \right]$	

## Selection diagram

The selection diagrams make it possible to select the belt profile for the drive task in advance. In doing so, the c safety factors resulting from the assignment of tasks and the speed of the small serrated washer must be taken into account.



# Technical information for timing belts 22052 and 22057

## Drive calculation

The following data are required for the calculation:

- drive output to be transferred = P [kW]
- drive speed =  $n_1$  [min<sup>-1</sup>]
- motor starting torque =  $M_{ab}$  [Nm]
- centre distance required = A [mm]
- max. permissible drive pulley diameter =  $d_{w1}$  [mm]

## Safety factor

Belts are selected for uniform loads. A c1 safety factor must be anticipated for peak and dynamic loads.

drive with uniform load  $c1 = 1.0$

drive with peak or dynamic load:

light  $c1 = 1.4$

medium  $c1 = 1.7$

heavy  $c1 = 2.0$

For speed step-up ratios a c2 acceleration factor must be anticipated:

$i =$  from 0.66 to 1.0  $c2 = 1.1$

$i =$  from 0.40 to 0.66  $c2 = 1.2$

$i < 0.40$   $c2 = 1.3$

The overall service factor is:

$$C_0 = c_1 \times c_2$$

## Belt and washer selection

You use the selection diagram for belt preselection. Selecting the largest washer permissible for the belt washer is recommended.

## Calculating speed ratio i

$$i = \frac{n_1}{n_2}$$

## Calculation example

- motor output to be transferred 10 kW
- drive speed  $n_1$  2600 1/min
- drive speed  $n_2$  2600 1/min
- motor starting torque 50 Nm
- centre distance required A 400 mm
- max. permissible drive pulley diameter  $d_w$  130 mm
- safety factor  $c_1$  1.4

## Calculating the speed ratio

$$\frac{n_1}{n_2} = 1$$

## Belt selection:

Belt pitch T10 is selected from the selection diagram taking into account safety factor 1.4 for calculated output PB of 14 kW corrected as a result.

## Calculating the number of washer teeth z:

The number of teeth is calculated from the maximum permissible washer diameter and the selected belt pitch T10. On the basis of speed ratio  $i = 1$ , driving and driven washer are the same size.

$$z = \frac{130 \cdot \pi}{10} = 40.84 - \text{selected } z = 40 \text{ with } d_w = 127.32 \text{ mm.}$$

The maximum permissible diameter was selected in order to minimise the belt width.

$$z_1 = 40, z_2 = 40$$

## Calculating the belt length

$$L_R = 2 \cdot A + \pi \cdot d \cdot w = 2 \cdot A + z \cdot t$$

$$L_R = 2 \cdot 400 + 40 \cdot 10 = 1200 \text{ mm}$$

## Calculating the number of teeth in mesh

$$z_e = \frac{\beta}{360} \cdot z_k$$

with  $\beta$  [°] = wrap angle

$$\beta = 2 \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]$$

## Determining the belt width

$$b = \frac{P \cdot 1000 \cdot c_0}{z_k \cdot z_e \cdot P_{spez}} \quad b = \frac{100 \cdot M \cdot c_0}{z_k \cdot z_e \cdot M_{spez}}$$

## Checking the permissible belt tension

The permissible belt tension must be greater than the maximum peripheral force anticipated.

$$F_{Tzul} > c_0 \cdot F_U \quad \text{with} \quad F_U = \frac{2000 \cdot M}{d_w}$$

## Static shaft power

$$FW_{sta} = 2 \times FTV \times \cos \alpha \times \beta$$

$$FW_{sta} = 2 \times FTV \quad (\text{for } \alpha = 1)$$

## Determining the pretension

The belt is pretensioned correctly if the slack side remains tensioned under every operating condition that occurs. In order to achieve the lowest shaft load possible, care must be taken, though, not to tension more than is required. The correct belt tension also depends on the belt length LR (number of belt teeth zR).

The following pretensioning forces per side are recommended:

2 shaft drives

$$z_R < 75$$

$$F_{TV} = 1/3 F_U$$

$$75 < z_R < 150$$

$$F_{TV} = 1/2 F_U$$

$$z_R > 150$$

$$F_{TV} = 2/3 F_U$$

multi-shaft drives

$$F_{TV} > F_U$$

Use of an applicable measurement device is recommended to set the pretension correctly.

## Number of teeth in mesh

When  $i = 1$  a number of teeth in mesh of  $z_e = 20$  results on both washers.

## Determining belt width b:

$$b = \frac{1000 \cdot 10 \cdot 1,4}{40 \cdot 12 \cdot 10,386} = 2,81 \text{ cm} = 28,1 \text{ mm}$$

The next largest standard belt width of 32 mm is selected. The belt width selected is checked based on the motor starting torque for speed  $n = 0$ .

$$b = \frac{100 \cdot 50}{40 \cdot 12 \cdot 3,815} = 2,73 \text{ cm} = 27,3 \text{ mm}$$

The next largest standard width of 32 mm is selected.

## Checking the permissible belt tension $F_{Tzul}$ :

$$F_U = \frac{2000 \cdot 50}{127,32} = 785,4 \text{ N}$$

Pretensioning force via number of belt teeth

$$z_R = \frac{1200}{10} = 120 \text{ teeth}$$

Belt pretensioning force FTV per side is:

$$F_{TV} = \frac{1}{2} \cdot F_U = 392,7 \text{ N with } z_R = 120$$

## Flexibility:

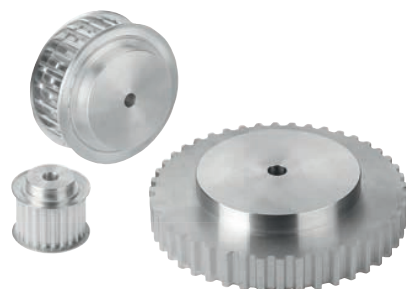
The requisite minimum diameters are maintained.

## Belt selected:

32 T10 - 1200

## Toothed belt pulleys,

T profile



**Material, version:**

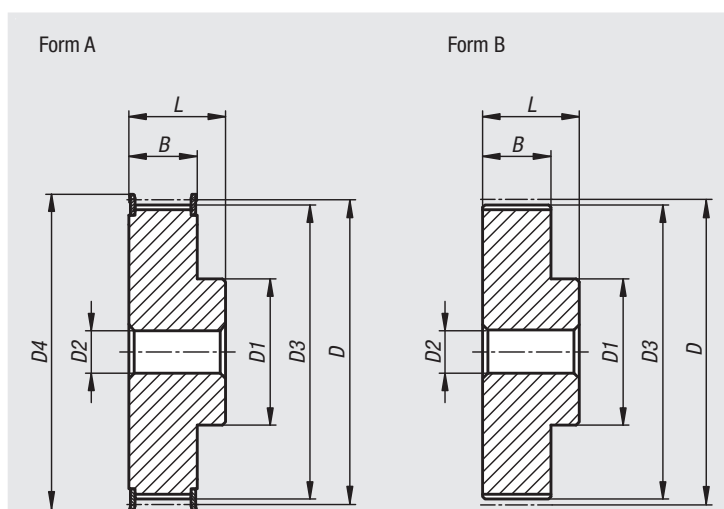
Aluminium, natural finish.  
Flanged wheels, galvanized steel.

**Sample order:**

nlm 22002-051010

**Note:**

Standard T-profile to DIN 7721 T2 with metric pitch (trapezoidal toothing). At least one toothed belt pulley must have flanged wheels. The toothed belt pulleys have a locating hole or are pre-drilled.



### Toothed belt pulleys, T5 profile

Order No. for belt width of 10 mm	Order No. for belt width of 16 mm	Order No. for belt width of 25 mm	Form	No. of teeth	D	D1	D2 max.	D3	D4	B	L
22002-051010	22002-051610	22002-052510	A	10	15,92	8	5	15,05	19,5	15/21/30	21/27/36
22002-051012	22002-051612	22002-052512	A	12	19,01	10	6	18,25	23	15/21/30	21/27/36
22002-051014	22002-051614	22002-052514	A	14	22,29	13	8	21,45	25	15/21/30	21/27/36
22002-051015	22002-051615	22002-052515	A	15	23,88	16	10	23,05	28	15/21/30	21/27/36
22002-051016	22002-051616	22002-052516	A	16	25,47	18	11	24,6	32	15/21/30	21/27/36
22002-051018	22002-051618	22002-052518	A	18	28,65	20	12	27,8	30	15/21/30	21/27/36
22002-051019	22002-051619	22002-052519	A	19	30,25	22	12	29,4	36	15/21/30	21/27/36
22002-051020	22002-051620	22002-052520	A	20	31,83	23	14	31	36	15/21/30	21/27/36
22002-051022	22002-051622	22002-052522	A	22	35,12	24	15	34,25	38	15/21/30	21/27/36
22002-051024	22002-051624	22002-052524	A	24	38,21	26	15	37,4	42	15/21/30	21/27/36
22002-051025	22002-051625	22002-052525	A	25	39,8	26	15	39	44	15/21/30	21/27/36
22002-051026	22002-051626	22002-052526	A	26	41,47	26	16	40,6	44	15/21/30	21/27/36
22002-051027	22002-051627	22002-052527	A	27	42,98	30	18	42,2	48	15/21/30	21/27/36
22002-051028	22002-051628	22002-052528	A	28	44,62	32	18	43,75	48	15/21/30	21/27/36
22002-051030	22002-051630	22002-052530	A	30	47,76	34	18	46,95	51	15/21/30	21/27/36
22002-051032	22002-051632	22002-052532	A	32	50,94	38	22	50,1	54	15/21/30	21/27/36
22002-051036	22002-051636	22002-052536	A	36	57,31	38	22	56,45	63	15/21/30	21/27/36
22002-051040	22002-051640	22002-052540	A	40	63,66	40	23	62,85	66	15/21/30	21/27/36
22002-051042	22002-051642	22002-052542	A	42	66,87	40	24	66	71	15/21/30	21/27/36
22002-051044	22002-051644	22002-052544	B	44	70,07	45	26	69,2	-	15/21/30	21/27/36
22002-051048	22002-051648	22002-052548	B	48	76,42	50	28	75,55	-	15/21/30	21/27/36
22002-051060	22002-051660	22002-052560	B	60	95,52	65	35	94,65	-	15/21/30	21/27/36

## Toothed belt pulleys,

T profile



## Toothed belt pulleys, T10 profile

Order No. for belt width of 16 mm	Order No. for belt width of 25 mm	Order No. for belt width of 32 mm	Form	No. of teeth	D	D1	D2 max.	D3	D4	B	L
22002-101612	22002-102512	-	A	12	38,2	28	16	36,35	42	21/30	31/40
22002-101614	22002-102514	-	A	14	44,56	32	18	42,7	48	21/30	31/40
22002-101615	22002-102515	-	A	15	47,75	32	18	45,9	51	21/30	31/40
22002-101616	22002-102516	-	A	16	50,93	35	20	49,05	54	21/30	31/40
22002-101618	22002-102518	22002-103218	A	18	57,29	40	22	55,45	60	21/30/37	31/40/47
22002-101619	22002-102519	22002-103219	A	19	60,48	44	22	58,6	66	21/30/37	31/40/47
22002-101620	22002-102520	22002-103220	A	20	63,66	46	24	61,8	66	21/30/37	31/40/47
22002-101622	22002-102522	22002-103222	A	22	70,03	52	28	68,15	75	21/30/37	31/40/47
22002-101624	22002-102524	22002-103224	A	24	76,39	58	30	74,55	83	21/30/37	31/40/47
22002-101625	22002-102525	22002-103225	A	25	79,58	60	30	77,7	83	21/30/37	31/40/47
22002-101626	22002-102526	22002-103226	A	26	82,76	60	30	80,9	87	21/30/37	31/40/47
22002-101627	22002-102527	22002-103227	A	27	85,95	60	30	84,1	91	21/30/37	31/40/47
22002-101628	22002-102528	22002-103228	A	28	89,13	60	30	87,25	93	21/30/37	31/40/47
22002-101630	22002-102530	22002-103230	A	30	95,49	60	30	93,65	97	21/30/37	31/40/47
22002-101632	22002-102532	22002-103232	A	32	101,86	65	32	100	106	21/30/37	31/40/47
22002-101636	22002-102536	22002-103236	A	36	114,59	70	35	112,75	119	21/30/37	31/40/47
22002-101640	22002-102540	22002-103240	A	40	127,32	80	40	125,45	131	21/30/37	31/40/47
22002-101644	22002-102544	22002-103244	B	44	140,06	88	46	138,2	-	21/30/37	31/40/47
22002-101648	22002-102548	22002-103248	B	48	152,78	95	48	150,95	-	21/30/37	31/40/47
22002-101660	22002-102560	22002-103260	B	60	190,98	110	60	189,1	-	21/30/37	31/40/47

## Toothed belt pulleys,

AT profile

**Material, version:**

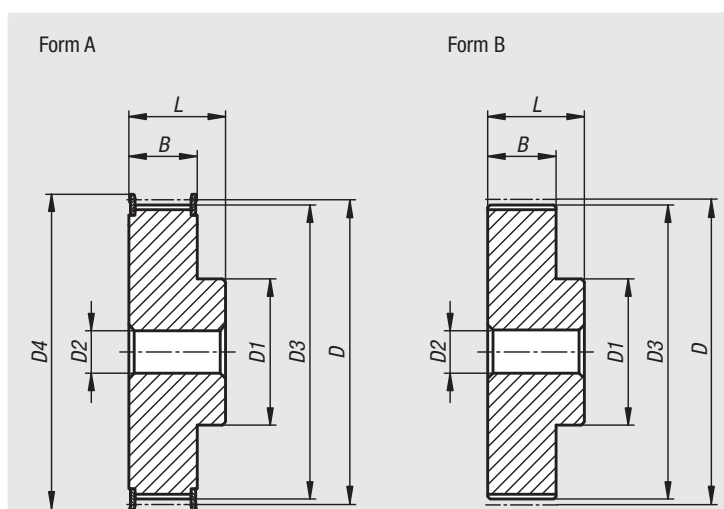
Aluminium, natural finish.  
Flanged wheels, galvanized steel.

**Sample order:**

nlm 22003-051012

**Note:**

Standard AT-profile with metric pitch (trapezoidal toothing). At least one toothed belt pulley must have flanged wheels. The toothed belt pulleys have a locating hole or are pre-drilled.



## Toothed belt pulleys, AT5 profile

Order No. for belt width of 10 mm	Order No. for belt width of 16 mm	Order No. for belt width of 25 mm	Form	No. of teeth	D	D1	D2 max.	D3	D4	B	L
22003-051012	22003-051612	22003-052512	A	12	19,01	10	6	17,85	23	15/21/30	21/27/36
22003-051014	22003-051614	22003-052514	A	14	22,29	13	8	21,05	25	15/21/30	21/27/36
22003-051015	22003-051615	22003-052515	A	15	23,88	16	10	22,65	28	15/21/30	21/27/36
22003-051016	22003-051616	22003-052516	A	16	25,47	18	11	24,2	32	15/21/30	21/27/36
22003-051018	22003-051618	22003-052518	A	18	28,65	19	12	27,4	32	15/21/30	21/27/36
22003-051019	22003-051619	22003-052519	A	19	30,25	22	12	29	36	15/21/30	21/27/36
22003-051020	22003-051620	22003-052520	A	20	31,83	23	14	30,6	36	15/21/30	21/27/36
22003-051022	22003-051622	22003-052522	A	22	35,12	24	15	33,85	38	15/21/30	21/27/36
22003-051024	22003-051624	22003-052524	A	24	38,21	26	15	37	42	15/21/30	21/27/36
22003-051025	22003-051625	22003-052525	A	25	39,8	26	15	38,6	44	15/21/30	21/27/36
22003-051026	22003-051626	22003-052526	A	26	41,47	26	16	40,2	44	15/21/30	21/27/36
22003-051027	22003-051627	22003-052527	A	27	42,98	30	18	41,8	48	15/21/30	21/27/36
22003-051028	22003-051628	22003-052528	A	28	44,62	32	18	43,35	48	15/21/30	21/27/36
22003-051030	22003-051630	22003-052530	A	30	47,76	34	18	46,55	51	15/21/30	21/27/36
22003-051032	22003-051632	22003-052532	A	32	50,94	38	22	49,7	54	15/21/30	21/27/36
22003-051036	22003-051636	22003-052536	A	36	57,31	38	22	56,05	63	15/21/30	21/27/36
22003-051040	22003-051640	22003-052540	A	40	63,66	40	23	62,45	66	15/21/30	21/27/36
22003-051042	22003-051642	22003-052542	A	42	66,87	40	24	65,6	71	15/21/30	21/27/36
22003-051044	22003-051644	22003-052544	B	44	70,07	45	26	68,8	-	15/21/30	21/27/36
22003-051048	22003-051648	22003-052548	B	48	76,42	50	28	75,15	-	15/21/30	21/27/36
22003-051060	22003-051660	22003-052560	B	60	95,52	65	35	94,25	-	15/21/30	21/27/36



## Toothed belt pulleys,

AT profile

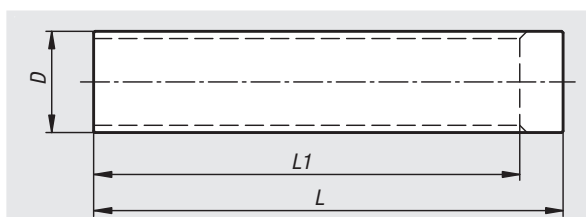


## Toothed belt pulleys, AT10 profile

Order No. for belt width of 16 mm	Order No. for belt width of 25 mm	Order No. for belt width of 32 mm	Form	No. of teeth	D	D1	D2 max.	D3	D4	B	L
22003-101615	22003-102515	-	A	15	47,75	32	18	45,9	51	21/30	31/40
22003-101616	22003-102516	-	A	16	50,93	35	20	49,05	54	21/30	31/40
22003-101618	22003-102518	22003-103218	A	18	57,29	40	22	55,45	60	21/30/37	31/40/47
22003-101619	22003-102519	22003-103219	A	19	60,48	44	22	58,6	66	21/30/37	31/40/47
22003-101620	22003-102520	22003-103220	A	20	63,66	46	24	61,8	66	21/30/37	31/40/47
22003-101622	22003-102522	22003-103222	A	22	70,03	52	28	68,15	75	21/30/37	31/40/47
22003-101624	22003-102524	22003-103224	A	24	76,39	58	30	74,55	83	21/30/37	31/40/47
22003-101625	22003-102525	22003-103225	A	25	79,58	60	30	77,7	83	21/30/37	31/40/47
22003-101626	22003-102526	22003-103226	A	26	82,76	60	30	80,9	87	21/30/37	31/40/47
22003-101627	22003-102527	22003-103227	A	27	85,95	60	30	84,1	91	21/30/37	31/40/47
22003-101628	22003-102528	22003-103228	A	28	89,13	60	30	87,25	93	21/30/37	31/40/47
22003-101630	22003-102530	22003-103230	A	30	95,49	60	30	93,65	97	21/30/37	31/40/47
22003-101632	22003-102532	22003-103232	A	32	101,86	65	32	100	106	21/30/37	31/40/47
22003-101636	22003-102536	22003-103236	A	36	114,59	70	35	112,75	119	21/30/37	31/40/47
22003-101640	22003-102540	22003-103240	A	40	127,32	80	40	125,45	131	21/30/37	31/40/47
22003-101644	22003-102544	22003-103244	B	44	140,06	88	46	138,2	-	21/30/37	31/40/47
22003-101648	22003-102548	22003-103248	B	48	152,78	95	48	150,95	-	21/30/37	31/40/47
22003-101660	22003-102560	22003-103260	B	60	190,98	110	60	189,1	-	21/30/37	31/40/47

## Splined shafts,

T profile

**Material, version:**

Aluminium, natural finish.

**Sample order:**

nlm 22007-05010

**Note:**

Standard T-profile to DIN 7721 T2 with metric pitch (trapezoidal toothing). For manufacturing your own toothed wheels

**Splined shafts, T5 profile**

Order No.	Profile	No. of teeth	D	L	L1	Approx. weight kg
22007-05010	T5	10	15,05	140	125	0,060
22007-05011	T5	11	16,65	140	125	0,070
22007-05012	T5	12	18,25	140	125	0,090
22007-05013	T5	13	19,85	140	125	0,100
22007-05014	T5	14	21,45	140	132	0,120
22007-05015	T5	15	23,05	140	132	0,140
22007-05016	T5	16	24,6	140	140	0,160
22007-05017	T5	17	26,2	140	140	0,190
22007-05018	T5	18	27,8	140	140	0,210
22007-05019	T5	19	29,4	140	140	0,240
22007-05020	T5	20	31	160	160	0,310
22007-05021	T5	21	32,7	160	160	0,330
22007-05022	T5	22	34,15	160	160	0,360
22007-05023	T5	23	35,85	160	160	0,390
22007-05024	T5	24	37,4	160	160	0,430
22007-05025	T5	25	38,95	160	160	0,470
22007-05026	T5	26	40,6	160	160	0,510
22007-05027	T5	27	42,2	160	160	0,550
22007-05028	T5	28	43,75	160	160	0,600
22007-05029	T5	29	45,35	160	160	0,650
22007-05030	T5	30	46,95	160	160	0,700
22007-05032	T5	32	50,1	160	160	0,800
22007-05034	T5	34	53,25	160	160	0,910
22007-05035	T5	35	54,85	160	160	0,980
22007-05036	T5	36	56,45	160	160	1,020
22007-05037	T5	37	58,06	160	160	1,080
22007-05038	T5	38	59,65	160	160	1,140
22007-05040	T5	40	62,85	160	160	1,270
22007-05042	T5	42	66	160	160	1,410
22007-05044	T5	44	69,2	160	160	1,550
22007-05045	T5	45	70,8	160	160	1,630
22007-05046	T5	46	72,4	160	160	1,690
22007-05048	T5	48	75,55	160	160	1,850
22007-05050	T5	50	78,75	160	160	2,020
22007-05060	T5	60	94,65	160	160	2,950
22007-05072	T5	72	113,75	160	160	4,280
22007-05080	T5	80	126,48	160	160	5,390
22007-05090	T5	90	142,4	160	160	6,760
22007-05100	T5	100	158,31	160	160	8,340

## Splined shafts,

T profile

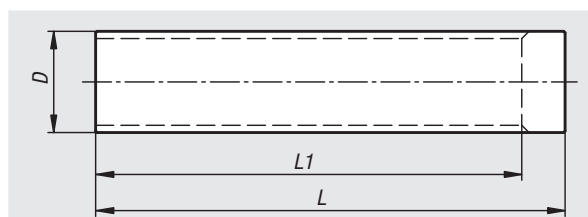
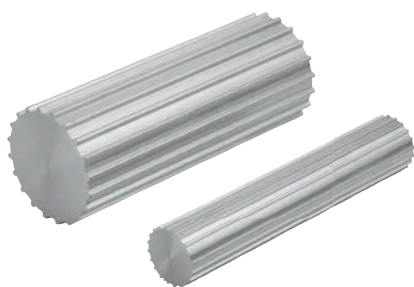


## Splined shafts, T10 profile

Order No.	Profile	No. of teeth	D	L	L1	Approx. weight kg
22007-10010	T10	10	29,98	140	140	0,220
22007-10011	T10	11	33,16	140	140	0,290
22007-10012	T10	12	36,35	140	140	0,340
22007-10013	T10	13	39,5	140	140	0,420
22007-10014	T10	14	42,7	160	160	0,550
22007-10015	T10	15	45,9	160	160	0,640
22007-10016	T10	16	49,1	160	160	0,740
22007-10017	T10	17	52,25	160	160	0,850
22007-10018	T10	18	55,45	160	160	0,960
22007-10019	T10	19	58,65	160	160	1,070
22007-10020	T10	20	61,8	160	160	1,200
22007-10021	T10	21	65	160	160	1,290
22007-10022	T10	22	68,2	160	160	1,430
22007-10023	T10	23	71,35	160	160	1,580
22007-10024	T10	24	74,55	160	160	1,730
22007-10026	T10	26	80,9	160	160	2,050
22007-10028	T10	28	87,25	160	160	2,390
22007-10030	T10	30	93,65	160	160	2,760
22007-10032	T10	32	100	160	160	3,180
22007-10034	T10	34	106,4	160	160	3,610
22007-10036	T10	36	112,75	160	160	4,060
22007-10038	T10	38	119,1	160	160	4,620
22007-10040	T10	40	125,45	160	160	5,130
22007-10045	T10	45	141,4	160	160	6,500
22007-10048	T10	48	150,95	160	160	7,390
22007-10060	T10	60	189,1	160	160	11,760
22007-10072	T10	72	227,29	160	160	17,030

## Splined shafts,

AT profile

**Material, version:**

Aluminium, natural finish.

**Sample order:**

nlm 22008-05012

**Note:**

Standard AT-profile with metric pitch (trapezoidal toothing).  
For manufacturing your own toothed wheels

**Splined shafts, AT5 profile**

Order No.	Profile	No. of teeth	D	L	L1	Approx. weight kg
22008-05012	AT5	12	17,85	140	125	0,080
22008-05013	AT5	13	19,45	140	125	0,100
22008-05014	AT5	14	21,05	140	132	0,120
22008-05015	AT5	15	22,65	140	132	0,140
22008-05016	AT5	16	24,2	140	140	0,150
22008-05017	AT5	17	25,8	140	140	0,180
22008-05018	AT5	18	27,4	140	140	0,200
22008-05019	AT5	19	29	140	140	0,230
22008-05020	AT5	20	30,6	160	160	0,300
22008-05021	AT5	21	32,3	160	160	0,330
22008-05022	AT5	22	33,85	160	160	0,360
22008-05023	AT5	23	35,45	160	160	0,400
22008-05024	AT5	24	37	160	160	0,440
22008-05025	AT5	25	38,6	160	160	0,470
22008-05026	AT5	26	40,2	160	160	0,510
22008-05027	AT5	27	41,8	160	160	0,550
22008-05028	AT5	28	43,35	160	160	0,600
22008-05030	AT5	30	46,55	160	160	0,690
22008-05032	AT5	32	49,7	160	160	0,810
22008-05034	AT5	34	52,85	160	160	0,900
22008-05036	AT5	36	56,05	160	160	1,020
22008-05038	AT5	38	59,25	160	160	1,140
22008-05040	AT5	40	62,45	160	160	1,280
22008-05042	AT5	42	65,6	160	160	1,410
22008-05044	AT5	44	68,8	160	160	1,550
22008-05046	AT5	46	72	160	160	1,700
22008-05048	AT5	48	75,15	160	160	1,850
22008-05052	AT5	52	81,55	160	160	2,190
22008-05056	AT5	56	87,9	160	160	2,550
22008-05058	AT5	58	91,1	160	160	2,740
22008-05060	AT5	60	94,25	160	160	2,940
22008-05064	AT5	64	100,65	160	160	3,360
22008-05072	AT5	72	113,25	160	160	4,290

## Splined shafts,

AT profile

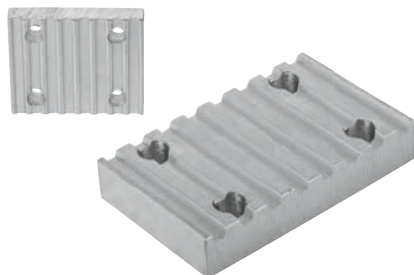


## Splined shafts, AT10 profile

Order No.	Profile	No. of teeth	D	L	L1	Approx. weight kg
22008-10015	AT10	15	45,9	160	160	0,620
22008-10016	AT10	16	49,05	160	160	0,720
22008-10017	AT10	17	52,25	160	160	0,820
22008-10018	AT10	18	55,45	160	160	0,940
22008-10019	AT10	19	58,6	160	160	1,050
22008-10020	AT10	20	61,8	160	160	1,170
22008-10021	AT10	21	65	160	160	1,310
22008-10022	AT10	22	68,15	160	160	1,440
22008-10023	AT10	23	71,35	160	160	1,600
22008-10024	AT10	24	74,55	160	160	1,750
22008-10025	AT10	25	77,7	160	160	1,910
22008-10026	AT10	26	80,9	160	160	2,060
22008-10027	AT10	27	84,1	160	160	2,230
22008-10028	AT10	28	87,25	160	160	2,420
22008-10030	AT10	30	93,65	160	160	2,790
22008-10032	AT10	32	100	160	160	3,200
22008-10034	AT10	34	106,4	160	160	3,650
22008-10036	AT10	36	112,75	160	160	4,090
22008-10038	AT10	38	119,1	160	160	4,590
22008-10040	AT10	40	125,45	160	160	5,160
22008-10042	AT10	42	131,85	160	160	5,650
22008-10044	AT10	44	138,2	160	160	6,220
22008-10046	AT10	46	144,55	160	160	6,840
22008-10048	AT10	48	150,95	160	160	7,450
22008-10052	AT10	52	163,65	160	160	8,930
22008-10056	AT10	56	176,4	160	160	10,390
22008-10058	AT10	58	182,75	160	160	10,960
22008-10060	AT10	60	189,1	160	160	11,780
22008-10070	AT10	70	220,95	160	160	16,180

# Fixing plates for timing belts,

T and AT profiles



**Material, version:**

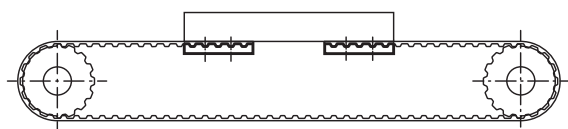
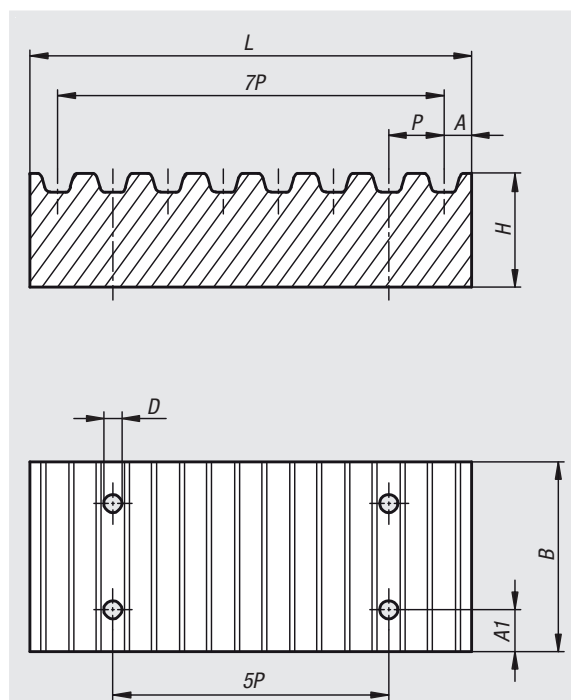
Aluminium, natural finish.

**Sample order:**

n1m 22012-05101

**Note:**

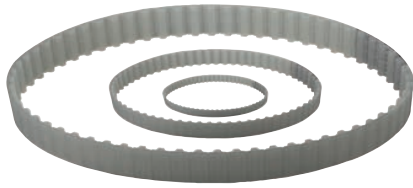
Fixing plates are used to secure the free belt ends mechanically for numerous linear applications. Fixing plates must have a suitable tooth profile in order to apply the clamping force uniformly to the belt and to be secured. For standard applications, at least 7 belt teeth per belt and must be engaged.



Order No.	Profile	Belt width	P	A	A1	B	D	H	L	Approx. weight kg
22012-05101	T5	10	5	3,4	6	29	5,5	8	41,8	0,025
22012-05161	T5	16	5	3,4	6	35	5,5	8	41,8	0,03
22012-05251	T5	25	5	3,4	6	44	5,5	8	41,8	0,036
22012-10161	T10	16	10	5	8	41	9	15	80	0,115
22012-10251	T10	25	10	5	8	50	9	15	80	0,14
22012-10321	T10	32	10	5	8	57	9	15	80	0,16
22012-05102	AT5	10	5	3,4	6	29	5,5	8	41,8	0,019
22012-05162	AT5	16	5	3,4	6	35	5,5	8	41,8	0,024
22012-05252	AT5	25	5	3,4	6	44	5,5	8	41,8	0,031
22012-10162	AT10	16	10	5	8	41	9	15	80	0,11
22012-10252	AT10	25	10	5	8	50	9	15	80	0,135
22012-10322	AT10	32	10	5	8	57	9	15	80	0,155

# Timing belts,

T profile



### Material, version:

Polyurethane (PU) with steel cord reinforcement.

### Sample order:

nIm 22052-0510X0165

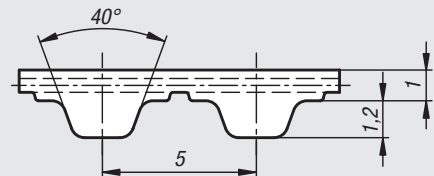
### Note:

Continuous timing belt with trapezoidal profile to DIN 7721 T1 with metric pitch. Ideal for drives with high belt flexibility Permits smallest pulley diameters. The timing belts are intended for drives where precision is a requirement, safety is important and the effects of chemicals are a concern.

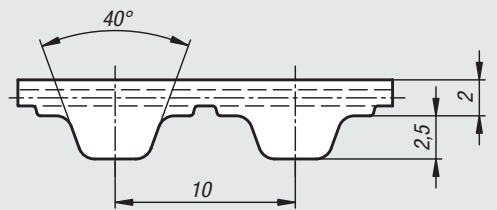
### Properties

- maintenance-free
- high-power transmission
- minimal belt extension
- accurate positioning and angles
- very good chemical resistance, especially to oils, greases and fuels
- extremely high abrasion resistance
- transmits power up to 30 kW
- reliable speed up to 10,000 rpm
- Temperature range from -30°C to +90°C

Profile T5



Profile T10



## Timing belts, T5 profile

Order No. Belt width 10	Order No. Belt width 16	Order No. Belt width 25	No. of teeth	Effective length
22052-0510X0165	22052-0516X0165	22052-0525X0165	33	165
22052-0510X0185	22052-0516X0185	22052-0525X0185	37	185
22052-0510X0200	22052-0516X0200	22052-0525X0200	40	200
22052-0510X0215	22052-0516X0215	22052-0525X0215	43	215
22052-0510X0220	22052-0516X0220	22052-0525X0220	44	220
22052-0510X0225	22052-0516X0225	22052-0525X0225	45	225
22052-0510X0245	22052-0516X0245	22052-0525X0245	49	245
22052-0510X0250	22052-0516X0250	22052-0525X0250	50	250
22052-0510X0255	22052-0516X0255	22052-0525X0255	51	255
22052-0510X0260	22052-0516X0260	22052-0525X0260	52	260
22052-0510X0270	22052-0516X0270	22052-0525X0270	54	270
22052-0510X0275	22052-0516X0275	22052-0525X0275	55	275
22052-0510X0280	22052-0516X0280	22052-0525X0280	56	280
22052-0510X0295	22052-0516X0295	22052-0525X0295	59	295
22052-0510X0300	22052-0516X0300	22052-0525X0300	60	300
22052-0510X0305	22052-0516X0305	22052-0525X0305	61	305
22052-0510X0325	22052-0516X0325	22052-0525X0325	65	325
22052-0510X0330	22052-0516X0330	22052-0525X0330	66	330
22052-0510X0340	22052-0516X0340	22052-0525X0340	68	340
22052-0510X0350	22052-0516X0350	22052-0525X0350	70	350
22052-0510X0355	22052-0516X0355	22052-0525X0355	71	355
22052-0510X0365	22052-0516X0365	22052-0525X0365	73	365
22052-0510X0375	22052-0516X0375	22052-0525X0375	75	375
22052-0510X0390	22052-0516X0390	22052-0525X0390	78	390
22052-0510X0400	22052-0516X0400	22052-0525X0400	80	400
22052-0510X0410	22052-0516X0410	22052-0525X0410	82	410
22052-0510X0420	22052-0516X0420	22052-0525X0420	84	420
22052-0510X0425	22052-0516X0425	22052-0525X0425	85	425
22052-0510X0450	22052-0516X0450	22052-0525X0450	90	450
22052-0510X0455	22052-0516X0455	22052-0525X0455	91	455
22052-0510X0475	22052-0516X0475	22052-0525X0475	95	475

01000  
02000  
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21000  
22000  
23000

## Timing belts,

T profile



## Timing belts, T5 profile

Order No. Belt width 10	Order No. Belt width 16	Order No. Belt width 25	No. of teeth	Effective length
22052-0510X0480	22052-0516X0480	22052-0525X0480	96	480
22052-0510X0500	22052-0516X0500	22052-0525X0500	100	500
22052-0510X0510	22052-0516X0510	22052-0525X0510	102	510
22052-0510X0525	22052-0516X0525	22052-0525X0525	105	525
22052-0510X0545	22052-0516X0545	22052-0525X0545	109	545
22052-0510X0550	22052-0516X0550	22052-0525X0550	110	550
22052-0510X0560	22052-0516X0560	22052-0525X0560	112	560
22052-0510X0575	22052-0516X0575	22052-0525X0575	115	575
22052-0510X0600	22052-0516X0600	22052-0525X0600	120	600
22052-0510X0610	22052-0516X0610	22052-0525X0610	122	610
22052-0510X0620	22052-0516X0620	22052-0525X0620	124	620
22052-0510X0630	22052-0516X0630	22052-0525X0630	126	630
22052-0510X0640	22052-0516X0640	22052-0525X0640	128	640
22052-0510X0650	22052-0516X0650	22052-0525X0650	130	650
22052-0510X0660	22052-0516X0660	22052-0525X0660	132	660
22052-0510X0690	22052-0516X0690	22052-0525X0690	138	690
22052-0510X0700	22052-0516X0700	22052-0525X0700	140	700
22052-0510X0720	22052-0516X0720	22052-0525X0720	144	720
22052-0510X0750	22052-0516X0750	22052-0525X0750	150	750
22052-0510X0780	22052-0516X0780	22052-0525X0780	156	780
22052-0510X0815	22052-0516X0815	22052-0525X0815	163	815
22052-0510X0840	22052-0516X0840	22052-0525X0840	168	840
22052-0510X0850	22052-0516X0850	22052-0525X0850	170	850
22052-0510X0900	22052-0516X0900	22052-0525X0900	180	900
22052-0510X0990	22052-0516X0990	22052-0525X0990	198	990
22052-0510X1000	22052-0516X1000	22052-0525X1000	200	1000
22052-0510X1075	22052-0516X1075	22052-0525X1075	215	1075
22052-0510X1100	22052-0516X1100	22052-0525X1100	220	1100
22052-0510X1215	22052-0516X1215	22052-0525X1215	243	1215
22052-0510X1380	22052-0516X1380	22052-0525X1380	276	1380
22052-0510X1440	22052-0516X1440	22052-0525X1440	288	1440

## Timing belts, T10 profile

Order No. Belt width 16	Order No. Belt width 25	Order No. Belt width 32	No. of teeth	Effective length
22052-1016X0260	22052-1025X0260	22052-1032X0260	26	260
22052-1016X0370	22052-1025X0370	22052-1032X0370	37	370
22052-1016X0400	22052-1025X0400	22052-1032X0400	40	400
22052-1016X0410	22052-1025X0410	22052-1032X0410	41	410
22052-1016X0440	22052-1025X0440	22052-1032X0440	44	440
22052-1016X0450	22052-1025X0450	22052-1032X0450	45	450
22052-1016X0500	22052-1025X0500	22052-1032X0500	50	500
22052-1016X0530	22052-1025X0530	22052-1032X0530	53	530



## Timing belts,

T profile

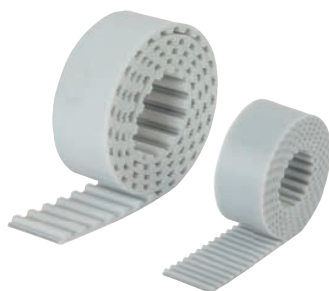


## Timing belts, T10 profile

Order No. Belt width 16	Order No. Belt width 25	Order No. Belt width 32	No. of teeth	Effective length
22052-1016X0560	22052-1025X0560	22052-1032X0560	56	560
22052-1016X0610	22052-1025X0610	22052-1032X0610	61	610
22052-1016X0630	22052-1025X0630	22052-1032X0630	63	630
22052-1016X0660	22052-1025X0660	22052-1032X0660	66	660
22052-1016X0690	22052-1025X0690	22052-1032X0690	69	690
22052-1016X0700	22052-1025X0700	22052-1032X0700	70	700
22052-1016X0720	22052-1025X0720	22052-1032X0720	72	720
22052-1016X0750	22052-1025X0750	22052-1032X0750	75	750
22052-1016X0780	22052-1025X0780	22052-1032X0780	78	780
22052-1016X0810	22052-1025X0810	22052-1032X0810	81	810
22052-1016X0840	22052-1025X0840	22052-1032X0840	84	840
22052-1016X0880	22052-1025X0880	22052-1032X0880	88	880
22052-1016X0890	22052-1025X0890	22052-1032X0890	89	890
22052-1016X0900	22052-1025X0900	22052-1032X0900	90	900
22052-1016X0920	22052-1025X0920	22052-1032X0920	92	920
22052-1016X0960	22052-1025X0960	22052-1032X0960	96	960
22052-1016X0970	22052-1025X0970	22052-1032X0970	97	970
22052-1016X0980	22052-1025X0980	22052-1032X0980	98	980
22052-1016X1010	22052-1025X1010	22052-1032X1010	101	1010
22052-1016X1080	22052-1025X1080	22052-1032X1080	108	1080
22052-1016X1110	22052-1025X1110	22052-1032X1110	111	1110
22052-1016X1140	22052-1025X1140	22052-1032X1140	114	1140
22052-1016X1150	22052-1025X1150	22052-1032X1150	115	1150
22052-1016X1210	22052-1025X1210	22052-1032X1210	121	1210
22052-1016X1240	22052-1025X1240	22052-1032X1240	124	1240
22052-1016X1250	22052-1025X1250	22052-1032X1250	125	1250
22052-1016X1300	22052-1025X1300	22052-1032X1300	130	1300
22052-1016X1320	22052-1025X1320	22052-1032X1320	132	1320
22052-1016X1350	22052-1025X1350	22052-1032X1350	135	1350
22052-1016X1390	22052-1025X1390	22052-1032X1390	139	1390
22052-1016X1400	22052-1025X1400	22052-1032X1400	140	1400
22052-1016X1420	22052-1025X1420	22052-1032X1420	142	1420
22052-1016X1440	22052-1025X1440	22052-1032X1440	144	1440
22052-1016X1450	22052-1025X1450	22052-1032X1450	145	1450
22052-1016X1460	22052-1025X1460	22052-1032X1460	146	1460
22052-1016X1500	22052-1025X1500	22052-1032X1500	150	1500
22052-1016X1560	22052-1025X1560	22052-1032X1560	156	1560
22052-1016X1610	22052-1025X1610	22052-1032X1610	161	1610
22052-1016X1750	22052-1025X1750	22052-1032X1750	175	1750
22052-1016X1780	22052-1025X1780	22052-1032X1780	178	1780
22052-1016X1880	22052-1025X1880	22052-1032X1880	188	1880
22052-1016X1960	22052-1025X1960	22052-1032X1960	196	1960
22052-1016X2250	22052-1025X2250	22052-1032X2250	225	2250

# Timing belts by the metre,

T profile



**Material, version:**

Polyurethane (PU) with steel cord reinforcement.

**Sample order:**

nIm 22054-0510X0500  
(length L also stated)

**Note:**

Timing belt with trapezoidal profile to DIN 7721 T1. Intended especially for drive subject it to a high bending load. May be used for pulleys with a very small diameter. Generally used for linear drives, low-power transmission and transport applications. Polyurethane belts may be welded. The power transmission rating of welded belts drops by about 50%.

Width tolerance:  $\pm 0.5$  mm

Thickness tolerance:  $\pm 0.2$  mm

**On request:**

Other lengths.

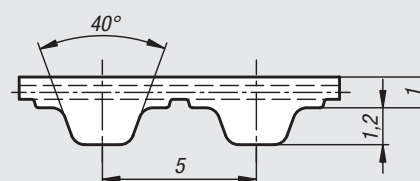
With T5 pitch, in 5 mm increments.

With T10 pitch, in 10 mm increments.

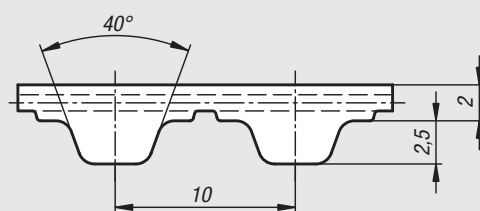
Maximum belt length 100 metres.



Profile T5



Profile T10



Order No.	Profile	Belt width	Tension max. N	Length	corresponding fixing plate
22054-0510X	T5	10	320	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-05101
22054-0516X	T5	16	540	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-05161
22054-0525X	T5	25	900	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-05251
22054-1016X	T10	16	1610	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-10161
22054-1025X	T10	25	2650	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-10251
22054-1032X	T10	32	3450	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-10321

# Timing belts by the metre,

T profile



## Specific tooth force

The specific tooth force  $F_{Uspez}$  is the maximum force that a single engaged belt tooth 1 cm wide can transmit.

This force depends on the speed of the drive pulley. To calculate the transmissible longitudinal force  $F_U$  for the belt cross-section, the number  $z_e$  of engaged teeth is multiplied by the specific tooth force  $F_{Uspez}$  and the belt width  $b$ .

$$F_U = F_{Uspez} \cdot z_e \cdot b$$

$F_U$  = transmissible longitudinal force

$F_{Uspez}$  = specific tooth force

$z_e$  = number of engaged teeth

$z_{emax}$  = for the calculation, perm. maximum number of engaged teeth = 12

$b$  = belt width in cm

## Pitch T5

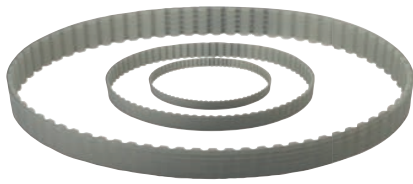
rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)
0	24,70	800	17,02	1900	14,21	4500	11,25
20	24,07	900	16,65	2000	14,03	5000	10,88
40	23,53	1000	16,32	2200	13,71	5500	10,55
60	23,05	1100	16,01	2400	13,42	6000	10,24
80	22,64	1200	15,73	2600	13,14	6500	9,96
100	22,28	1300	15,47	2800	12,89	7000	9,70
200	20,90	1400	15,22	3000	12,65	7500	9,46
300	19,89	1440	15,13	3200	12,43	8000	9,23
400	19,10	1500	15,00	3400	12,22	8500	9,01
500	18,45	1600	14,78	3600	12,03	9000	8,81
600	17,91	1700	14,58	3800	11,84	9500	8,62
700	17,44	1800	14,39	4000	11,66	10000	8,44

## Pitch T10

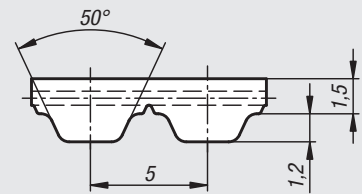
rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)
0	51,80	800	33,34	1900	26,53	4500	19,40
20	50,32	900	32,44	2000	26,12	5000	18,51
40	49,04	1000	31,63	2200	25,34	5500	17,70
60	47,92	1100	30,89	2400	24,63	6000	16,97
80	46,95	1200	30,21	2600	23,97	6500	16,29
100	46,11	1300	29,58	2800	23,36	7000	15,66
200	42,75	1400	28,99	3000	22,78	7500	15,07
300	40,28	1440	28,76	3200	22,25	8000	14,52
400	38,36	1500	28,44	3400	21,74	8500	14,00
500	36,80	1600	27,92	3600	21,27	9000	13,51
600	35,49	1700	27,43	3800	20,81	9500	13,05
700	34,35	1800	26,97	4000	20,39	10000	12,61

# Timing belts ,

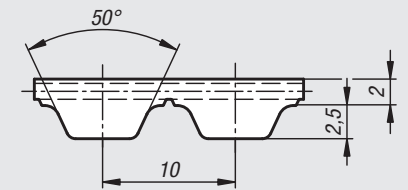
AT profile



Profile AT5



Profile AT10



### Material, version:

Polyurethane (PU) with steel cord reinforcement.

### Sample order:

nIm 22057-0510X0225

### Note:

Continuous timing belt with trapezoidal profile and stronger steel cord reinforcement (compared to T-Series) with metric pitch. Optimised tooth profile for more uniform force distribution and lower tooth deformation under load. Reduced polygon effect for quieter belt operation. The timing belts are intended for drives where precision is a requirement, safety is important and the effects of chemicals are a concern.

### Properties

- maintenance-free
- high-power transmission
- minimal belt extension
- accurate positioning and angles
- very good chemical resistance, especially to oils, greases and fuels
- extremely high abrasion resistance
- transmits power up to 70 kW
- reliable speed up to 10,000 rpm
- Temperature range from -30°C to +90°C

## Timing belts , AT5 profile

Order No. Belt width 10	Order No. Belt width 16	Order No. Belt width 25	No. of teeth	Effective length
22057-0510X0225	22057-0516X0225	22057-0525X0225	45	225
22057-0510X0255	22057-0516X0255	22057-0525X0255	51	255
22057-0510X0280	22057-0516X0280	22057-0525X0280	56	280
22057-0510X0300	22057-0516X0300	22057-0525X0300	60	300
22057-0510X0340	22057-0516X0340	22057-0525X0340	68	340
22057-0510X0375	22057-0516X0375	22057-0525X0375	75	375
22057-0510X0390	22057-0516X0390	22057-0525X0390	78	390
22057-0510X0420	22057-0516X0420	22057-0525X0420	84	420
22057-0510X0455	22057-0516X0455	22057-0525X0455	91	455
22057-0510X0500	22057-0516X0500	22057-0525X0500	100	500
22057-0510X0545	22057-0516X0545	22057-0525X0545	109	545
22057-0510X0600	22057-0516X0600	22057-0525X0600	120	600
22057-0510X0610	22057-0516X0610	22057-0525X0610	122	610
22057-0510X0660	22057-0516X0660	22057-0525X0660	132	660
22057-0510X0720	22057-0516X0720	22057-0525X0720	144	720
22057-0510X0750	22057-0516X0750	22057-0525X0750	150	750
22057-0510X0780	22057-0516X0780	22057-0525X0780	156	780
22057-0510X0825	22057-0516X0825	22057-0525X0825	165	825
22057-0510X0975	22057-0516X0975	22057-0525X0975	195	975
22057-0510X1050	22057-0516X1050	22057-0525X1050	210	1.050
22057-0510X1125	22057-0516X1125	22057-0525X1125	225	1.125
22057-0510X1500	22057-0516X1500	22057-0525X1500	300	1.500

## Timing belts ,

AT profile

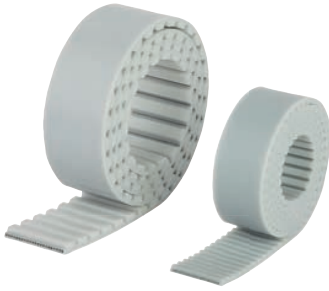


## Timing belts, AT10 profile

Order No. Belt width 16	Order No. Belt width 25	Order No. Belt width 32	No. of teeth	Effective length
22057-1016X0500	22057-1025X0500	22057-1032X0500	50	500
22057-1016X0560	22057-1025X0560	22057-1032X0560	56	560
22057-1016X0610	22057-1025X0610	22057-1032X0610	61	610
22057-1016X0660	22057-1025X0660	22057-1032X0660	66	660
22057-1016X0700	22057-1025X0700	22057-1032X0700	70	700
22057-1016X0730	22057-1025X0730	22057-1032X0730	73	730
22057-1016X0780	22057-1025X0780	22057-1032X0780	78	780
22057-1016X0800	22057-1025X0800	22057-1032X0800	80	800
22057-1016X0840	22057-1025X0840	22057-1032X0840	84	840
22057-1016X0890	22057-1025X0890	22057-1032X0890	89	890
22057-1016X0920	22057-1025X0920	22057-1032X0920	92	920
22057-1016X0960	22057-1025X0960	22057-1032X0960	96	960
22057-1016X0980	22057-1025X0980	22057-1032X0980	98	980
22057-1016X1010	22057-1025X1010	22057-1032X1010	101	1.010
22057-1016X1050	22057-1025X1050	22057-1032X1050	105	1.050
22057-1016X1080	22057-1025X1080	22057-1032X1080	108	1.080
22057-1016X1150	22057-1025X1150	22057-1032X1150	115	1.150
22057-1016X1210	22057-1025X1210	22057-1032X1210	121	1.210
22057-1016X1250	22057-1025X1250	22057-1032X1250	125	1.250
22057-1016X1320	22057-1025X1320	22057-1032X1320	132	1.320
22057-1016X1400	22057-1025X1400	22057-1032X1400	140	1.400
22057-1016X1500	22057-1025X1500	22057-1032X1500	150	1.500
22057-1016X1600	22057-1025X1600	22057-1032X1600	160	1.600
22057-1016X1700	22057-1025X1700	22057-1032X1700	170	1.700
22057-1016X1800	22057-1025X1800	22057-1032X1800	180	1.800

## Timing belts by the meter,

AT profile



**Material, version:**

Polyurethane (PU) with steel cord reinforcement.

**Sample order:**

nIm 22059-0510X0500  
(length L also stated)

**Note:**

Timing belt with trapezoidal profile and stronger steel cord reinforcement (compared to T-Series). Optimised tooth profile for more uniform force distribution and lower tooth deformation under load. High-performance steel cord reinforcement for high breaking strength and low belt extension. Reduced polygon effect for quieter belt operation. Especially well-suited for linear drives and low power transmission where exact axial and angular positioning are required. Polyurethane belts may be welded. The power transmission rating of welded belts drops by about 50%.

Width tolerance:  $\pm 0.5$  mm

Thickness tolerance:  $\pm 0.2$  mm

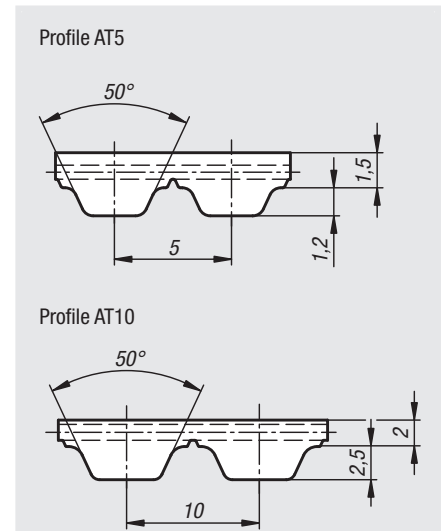
**On request:**

Other lengths.

With AT5 pitch, in 5 mm increments.

With AT10 pitch, in 10 mm increments.

Maximum belt length 100 metres.



Order No.	Profile	Belt width	Tension max. N	Length	corresponding fixing plate
22059-0510X	AT5	10	640	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-05102
22059-0516X	AT5	16	1120	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-05162
22059-0525X	AT5	25	1840	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-05252
22059-1016X	AT10	16	2450	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-10162
22059-1025X	AT10	25	4170	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-10252
22059-1032X	AT10	32	5390	500/1000/1500/2000/2500/3000/3500/4000/5000	22012-10322

# Timing belts by the meter,

AT profile



## Specific tooth force

The specific tooth force  $F_{Uspez}$  is the maximum force that a single engaged belt tooth 1 cm wide can transmit. This force depends on the speed of the drive pulley. To calculate the transmissible longitudinal force  $F_U$  for the belt cross-section, the number  $z_e$  of engaged teeth is multiplied by the specific tooth force  $F_{Uspez}$  and the belt width  $b$ .

$$F_U = F_{Uspec} \cdot z_e \cdot b$$

$F_U$  = transmissible longitudinal force

$F_{Uspec}$  = specific tooth force

$z_e$  = number of engaged teeth

$z_{emax}$  = for the calculation, perm. maximum number of engaged teeth = 12

$b$  = belt width in cm

## Pitch AT5

rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)
0	36,40	800	27,69	1900	22,73	4500	17,18
20	35,88	900	27,06	2000	22,42	5000	16,47
40	35,40	1000	26,49	2200	21,82	5500	15,83
60	34,97	1100	25,96	2400	21,28	6000	15,24
80	34,59	1200	25,47	2600	20,77	6500	14,69
100	34,24	1300	25,01	2800	20,29	7000	14,18
200	32,92	1400	24,57	3000	19,85	7500	13,71
300	31,92	1440	24,41	3200	19,43	8000	13,26
400	30,89	1500	24,16	3400	19,03	8500	12,85
500	29,95	1600	23,78	3600	18,66	9000	12,45
600	29,12	1700	23,41	3800	18,30	9500	12,07
700	28,37	1800	23,07	4000	17,96	10000	11,72

## Pitch AT10

rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)	rpm	$F_{Uspec}$ (N/cm)
0	75,70	800	53,70	1900	42,02	4500	29,13
20	74,59	900	52,21	2000	41,28	5000	27,50
40	73,55	1000	50,85	2200	39,89	5500	26,01
60	72,57	1100	49,59	2400	38,62	6000	24,65
80	71,65	1200	48,43	2600	37,44	6500	23,40
100	70,78	1300	47,34	2800	36,33	7000	22,23
200	67,13	1400	46,32	3000	35,30	7500	21,14
300	64,18	1440	45,93	3200	34,33	8000	20,12
400	61,53	1500	45,36	3400	33,41	8500	19,15
500	59,21	1600	44,46	3600	32,55	9000	18,24
600	57,16	1700	43,60	3800	31,72	9500	17,38
700	55,34	1800	42,79	4000	30,94	10000	16,56

# Spur gears in steel, module 1

toothing milled, straight teeth, engagement angle 20°



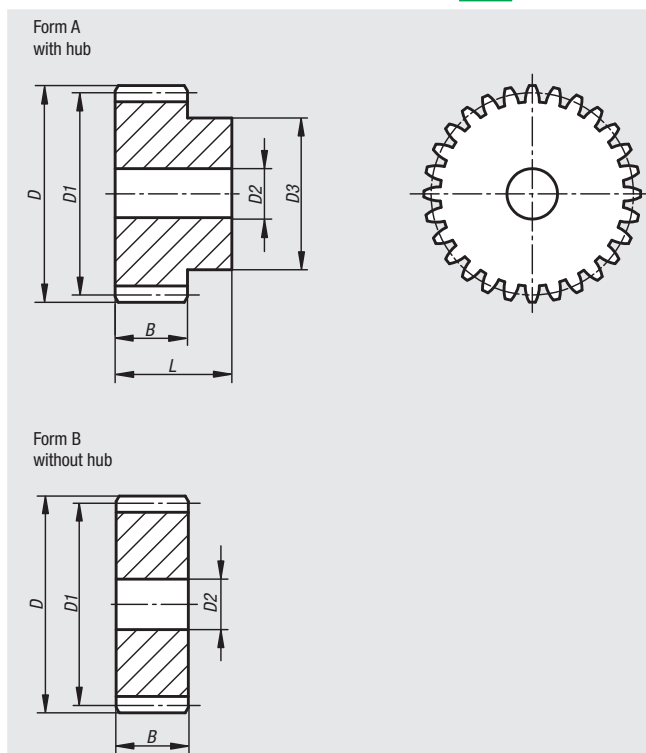
**Material:**  
Steel 1.0503 (C45).

**Version:**  
Milled toothing, straight teeth  
engagement angle 20°, natural finish.

**Sample order:**  
nlm 22400-0110150012

**Note:**  
Up to 70 teeth with hub, from 72 teeth disc form.

**On request:**  
Spur gears pre-bored with keyway.



Order No.	Form	No. of teeth	D	D1	D2	D3	B	L	Approx. weight kg
22400-0110150012	A	12	14	12	-	9	15	25	0,01
22400-0110150013	A	13	15	13	-	10	15	25	0,02
22400-0110150014	A	14	16	14	-	11	15	25	0,02
22400-0110150015	A	15	17	15	-	12	15	25	0,02
22400-0110150016	A	16	18	16	-	13	15	25	0,03
22400-0110150017	A	17	19	17	-	14	15	25	0,03
22400-0110150018	A	18	20	18	8	15	15	25	0,03
22400-0110150019	A	19	21	19	8	15	15	25	0,04
22400-0110150020	A	20	22	20	8	16	15	25	0,04
22400-0110150021	A	21	23	21	8	16	15	25	0,05
22400-0110150022	A	22	24	22	8	16	15	25	0,05
22400-0110150023	A	23	25	23	8	18	15	25	0,06
22400-0110150024	A	24	26	24	10	20	15	25	0,06
22400-0110150025	A	25	27	25	10	20	15	25	0,07
22400-0110150026	A	26	28	26	10	20	15	25	0,07
22400-0110150027	A	27	29	27	10	20	15	25	0,08
22400-0110150028	A	28	30	28	10	20	15	25	0,08
22400-0110150029	A	29	31	29	10	20	15	25	0,09
22400-0110150030	A	30	32	30	10	20	15	25	0,09
22400-0110150031	A	31	33	31	10	25	15	25	0,11
22400-0110150032	A	32	34	32	10	25	15	25	0,12
22400-0110150033	A	33	35	33	10	25	15	25	0,12
22400-0110150034	A	34	36	34	10	25	15	25	0,13
22400-0110150035	A	35	37	35	10	25	15	25	0,14
22400-0110150036	A	36	38	36	10	25	15	25	0,14
22400-0110150037	A	37	39	37	10	25	15	25	0,15
22400-0110150038	A	38	40	38	10	25	15	25	0,16
22400-0110150039	A	39	41	39	10	25	15	25	0,16



# Spur gears in steel, module 1

toothing milled, straight teeth, engagement angle 20°



Order No.	Form	No. of teeth	D	D1	D2	D3	B	L	Approx. weight kg
22400-0110150040	A	40	42	40	10	25	15	25	0,17
22400-0110150041	A	41	43	41	10	30	15	25	0,19
22400-0110150042	A	42	44	42	10	30	15	25	0,2
22400-0110150043	A	43	45	43	10	30	15	25	0,21
22400-0110150044	A	44	46	44	10	30	15	25	0,22
22400-0110150045	A	45	47	45	10	30	15	25	0,23
22400-0110150046	A	46	48	46	10	30	15	25	0,23
22400-0110150047	A	47	49	47	10	30	15	25	0,24
22400-0110150048	A	48	50	48	10	30	15	25	0,25
22400-0110150049	A	49	51	49	10	30	15	25	0,26
22400-0110150050	A	50	52	50	12	30	15	25	0,26
22400-0110150051	A	51	53	51	12	40	15	25	0,32
22400-0110150052	A	52	54	52	12	40	15	25	0,33
22400-0110150053	A	53	55	53	12	40	15	25	0,33
22400-0110150054	A	54	56	54	12	40	15	25	0,34
22400-0110150055	A	55	57	55	12	40	15	25	0,36
22400-0110150056	A	56	58	56	12	40	15	25	0,37
22400-0110150057	A	57	59	57	12	40	15	25	0,38
22400-0110150058	A	58	60	58	12	40	15	25	0,39
22400-0110150059	A	59	61	59	12	40	15	25	0,4
22400-0110150060	A	60	62	60	12	40	15	25	0,41
22400-0110150061	A	61	63	61	12	50	15	25	0,47
22400-0110150062	A	62	64	62	12	50	15	25	0,49
22400-0110150063	A	63	65	63	12	50	15	25	0,5
22400-0110150064	A	64	66	64	12	50	15	25	0,51
22400-0110150065	A	65	67	65	12	50	15	25	0,52
22400-0110150066	A	66	68	66	12	50	15	25	0,53
22400-0110150067	A	67	69	67	12	50	15	25	0,55
22400-0110150068	A	68	70	68	12	50	15	25	0,56
22400-0110150069	A	69	71	69	12	50	15	25	0,57
22400-0110150070	A	70	72	70	12	50	15	25	0,58
22400-0210150072	B	72	74	72	12	-	15	-	0,46
22400-0210150075	B	75	77	75	12	-	15	-	0,51
22400-0210150076	B	76	78	76	12	-	15	-	0,52
22400-0210150080	B	80	82	80	12	-	15	-	0,58
22400-0210150085	B	85	87	85	12	-	15	-	0,65
22400-0210150090	B	90	92	90	12	-	15	-	0,73
22400-0210150095	B	95	97	95	12	-	15	-	0,82
22400-0210150100	B	100	102	100	12	-	15	-	0,91
22400-0210150110	B	110	112	110	12	-	15	-	1,1
22400-0210150114	B	114	116	114	12	-	15	-	1,19
22400-0210150120	B	120	122	120	12	-	15	-	1,32
22400-0210150127	B	127	129	127	12	-	15	-	1,47

# Spur gears in steel, module 1.5

toothing milled, straight teeth, engagement angle 20°



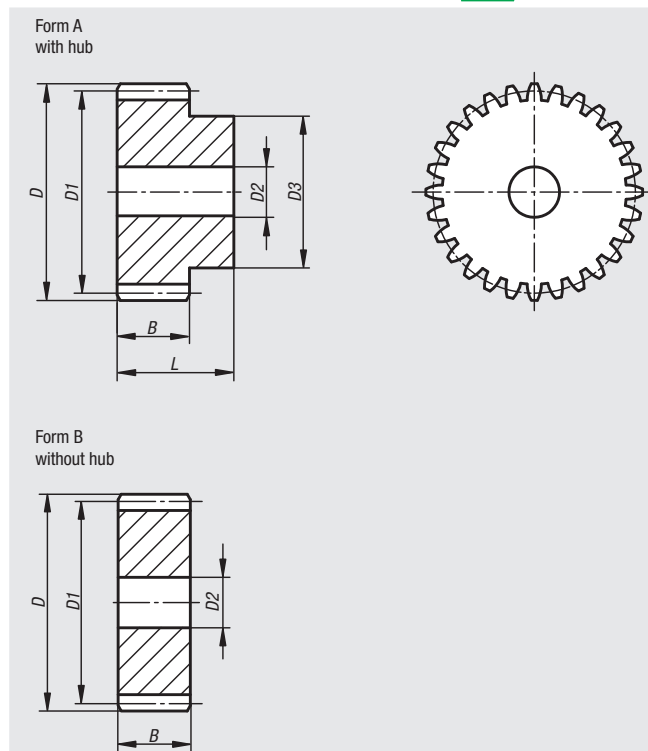
**Material:**  
Steel 1.0503 (C45).

**Version:**  
Milled toothing, straight teeth  
engagement angle 20°, natural finish.

**Sample order:**  
nlm 22400-0115170012

**Note:**  
Up to 70 teeth with hub, from 72 teeth disc form.

**On request:**  
Spur gears pre-bored with keyway.



Order No.	Form	No. of teeth	D	D1	D2	D3	B	L	Approx. weight kg
22400-0115170012	A	12	21	18	8	14	17	30	0,04
22400-0115170013	A	13	22,5	19,5	8	15	17	30	0,05
22400-0115170014	A	14	24	21	8	17	17	30	0,06
22400-0115170015	A	15	25,5	22,5	8	18	17	30	0,07
22400-0115170016	A	16	27	24	8	19	17	30	0,08
22400-0115170017	A	17	28,5	25,5	8	20	17	30	0,09
22400-0115170018	A	18	30	27	8	20	17	30	0,1
22400-0115170019	A	19	31,5	28,5	8	20	17	30	0,1
22400-0115170020	A	20	33	30	8	25	17	30	0,13
22400-0115170021	A	21	34,5	31,5	10	25	17	30	0,13
22400-0115170022	A	22	36	33	10	25	17	30	0,14
22400-0115170023	A	23	37,5	34,5	10	25	17	30	0,16
22400-0115170024	A	24	39	36	10	25	17	30	0,17
22400-0115170025	A	25	40,5	37,5	10	25	17	30	0,18
22400-0115170026	A	26	42	39	12	30	17	30	0,2
22400-0115170027	A	27	43,5	40,5	12	30	17	30	0,22
22400-0115170028	A	28	45	42	12	30	17	30	0,23
22400-0115170029	A	29	46,5	43,5	12	30	17	30	0,24
22400-0115170030	A	30	48	45	12	30	17	30	0,26
22400-0115170031	A	31	49,5	46,5	12	35	17	30	0,3
22400-0115170032	A	32	51	48	12	35	17	30	0,31
22400-0115170033	A	33	52,5	49,5	12	35	17	30	0,33
22400-0115170034	A	34	54	51	12	35	17	30	0,34
22400-0115170035	A	35	55,5	52,5	12	35	17	30	0,36
22400-0115170036	A	36	57	54	12	35	17	30	0,37
22400-0115170037	A	37	58,5	55,5	12	40	17	30	0,42
22400-0115170038	A	38	60	57	12	40	17	30	0,44
22400-0115170039	A	39	61,5	58,5	12	40	17	30	0,46

# Spur gears in steel, module 1.5

toothing milled, straight teeth, engagement angle 20°



Order No.	Form	No. of teeth	D	D1	D2	D3	B	L	Approx. weight kg
22400-0115170040	A	40	63	60	12	40	17	30	0,48
22400-0115170041	A	41	64,5	61,5	12	40	17	30	0,5
22400-0115170042	A	42	66	63	12	50	17	30	0,59
22400-0115170043	A	43	67,5	64,5	12	50	17	30	0,61
22400-0115170044	A	44	69	66	12	50	17	30	0,63
22400-0115170045	A	45	70,5	67,5	12	50	17	30	0,65
22400-0115170046	A	46	72	69	14	50	17	30	0,66
22400-0115170047	A	47	73,5	70,5	14	50	17	30	0,7
22400-0115170048	A	48	75	72	14	50	17	30	0,7
22400-0115170049	A	49	76,5	73,5	14	50	17	30	0,73
22400-0115170050	A	50	78	75	14	50	17	30	0,76
22400-0115170051	A	51	79,5	76,5	14	60	17	30	0,86
22400-0115170052	A	52	81	78	14	60	17	30	0,89
22400-0115170053	A	53	82,5	79,5	14	60	17	30	0,91
22400-0115170054	A	54	84	81	14	60	17	30	0,94
22400-0115170055	A	55	85,5	82,5	14	60	17	30	0,96
22400-0115170056	A	56	87	84	16	60	17	30	0,98
22400-0115170057	A	57	88,5	85,5	16	60	17	30	1
22400-0115170058	A	58	90	87	16	60	17	30	1,03
22400-0115170059	A	59	91,5	88,5	16	60	17	30	1,06
22400-0115170060	A	60	93	90	16	60	17	30	1,09
22400-0115170061	A	61	94,5	91,5	16	70	17	30	1,22
22400-0115170062	A	62	96	93	16	70	17	30	1,25
22400-0115170063	A	63	97,5	94,5	16	70	17	30	1,28
22400-0115170064	A	64	99	96	16	70	17	30	1,31
22400-0115170065	A	65	100,5	97,5	16	70	17	30	1,34
22400-0115170066	A	66	102	99	16	70	17	30	1,37
22400-0115170067	A	67	103,5	100,5	16	70	17	30	1,4
22400-0115170068	A	68	105	102	16	70	17	30	1,43
22400-0115170069	A	69	106,5	103,5	16	70	17	30	1,46
22400-0115170070	A	70	108	105	16	70	17	30	1,5
22400-0215170072	B	72	111	108	16	-	17	-	1,19
22400-0215170075	B	75	115,5	112,5	16	-	17	-	1,3
22400-0215170076	B	76	117	114	16	-	17	-	1,33
22400-0215170080	B	80	123	120	16	-	17	-	1,48
22400-0215170085	B	85	130,5	127,5	16	-	17	-	1,67
22400-0215170090	B	90	138	135	16	-	17	-	1,88
22400-0215170095	B	95	145,5	142,5	16	-	17	-	2,09
22400-0215170100	B	100	153	150	16	-	17	-	2,32
22400-0215170110	B	110	168	165	16	-	17	-	2,82
22400-0215170114	B	114	174	171	16	-	17	-	3,03
22400-0215170120	B	120	183	180	16	-	17	-	3,36
22400-0215170127	B	127	193,5	190,5	16	-	17	-	3,77

# Spur gears in steel, module 2

toothing milled, straight teeth, engagement angle 20°



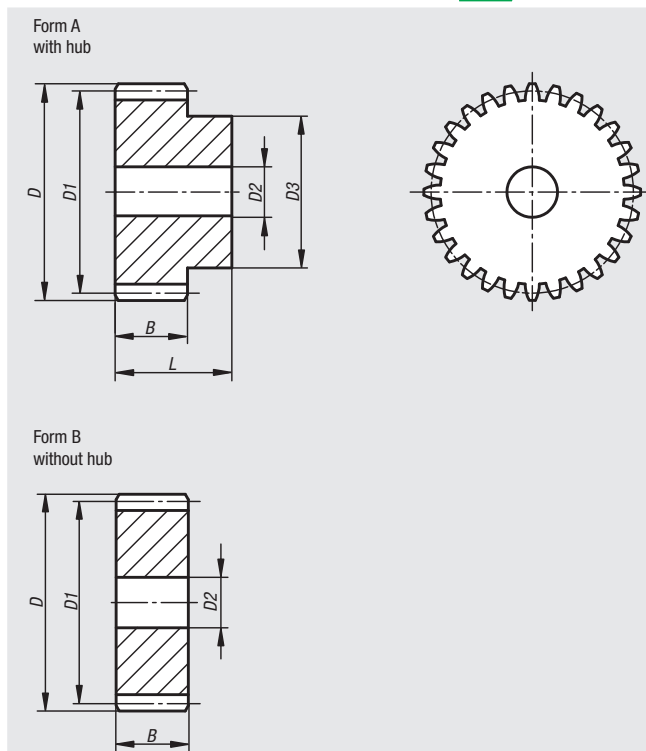
**Material:**  
Steel 1.0503 (C45).

**Version:**  
Milled toothing, straight teeth  
engagement angle 20°, natural finish.

**Sample order:**  
nlm 22400-0120200012

**Note:**  
Up to 70 teeth with hub, from 72 teeth disc form.

**On request:**  
Spur gears pre-bored with keyway.



Order No.	Form	No. of teeth	D	D1	D2	D3	B	L	Approx. weight kg
22400-0120200012	A	12	28	24	10	18	20	35	0,08
22400-0120200013	A	13	30	26	10	20	20	35	0,1
22400-0120200014	A	14	32	28	10	22	20	35	0,12
22400-0120200015	A	15	34	30	10	24	20	35	0,14
22400-0120200016	A	16	36	32	10	25	20	35	0,16
22400-0120200017	A	17	38	34	10	25	20	35	0,18
22400-0120200018	A	18	40	36	10	25	20	35	0,19
22400-0120200019	A	19	42	38	10	25	20	35	0,21
22400-0120200020	A	20	44	40	10	30	20	35	0,26
22400-0120200021	A	21	46	42	12	30	20	35	0,27
22400-0120200022	A	22	48	44	12	30	20	35	0,29
22400-0120200023	A	23	50	46	12	30	20	35	0,31
22400-0120200024	A	24	52	48	12	35	20	35	0,36
22400-0120200025	A	25	54	50	12	35	20	35	0,39
22400-0120200026	A	26	56	52	12	40	20	35	0,45
22400-0120200027	A	27	58	54	12	40	20	35	0,47
22400-0120200028	A	28	60	56	12	40	20	35	0,5
22400-0120200029	A	29	62	58	14	40	20	35	0,52
22400-0120200030	A	30	64	60	14	40	20	35	0,55
22400-0120200031	A	31	66	62	14	45	20	35	0,61
22400-0120200032	A	32	68	64	14	45	20	35	0,65
22400-0120200033	A	33	70	66	14	45	20	35	0,68
22400-0120200034	A	34	72	68	14	45	20	35	0,71
22400-0120200035	A	35	74	70	14	45	20	35	0,74
22400-0120200036	A	36	76	72	14	45	20	35	0,78
22400-0120200037	A	37	78	74	14	50	20	35	0,86
22400-0120200038	A	38	80	76	14	50	20	35	0,9
22400-0120200039	A	39	82	78	14	50	20	35	0,93

# Spur gears in steel, module 2

toothing milled, straight teeth, engagement angle 20°



Order No.	Form	No. of teeth	D	D1	D2	D3	B	L	Approx. weight kg
22400-0120200040	A	40	84	80	14	50	20	35	0,97
22400-0120200041	A	41	86	82	16	55	20	35	1,05
22400-0120200042	A	42	88	84	16	55	20	35	1,09
22400-0120200043	A	43	90	86	16	55	20	35	1,13
22400-0120200044	A	44	92	88	16	60	20	35	1,23
22400-0120200045	A	45	94	90	16	60	20	35	1,27
22400-0120200046	A	46	96	92	16	60	20	35	1,31
22400-0120200047	A	47	98	94	16	70	20	35	1,48
22400-0120200048	A	48	100	96	16	70	20	35	1,53
22400-0120200049	A	49	102	98	16	70	20	35	1,57
22400-0120200050	A	50	104	100	16	70	20	35	1,62
22400-0120200051	A	51	106	102	16	70	20	35	1,67
22400-0120200052	A	52	108	104	16	70	20	35	1,72
22400-0120200053	A	53	110	106	16	70	20	35	1,78
22400-0120200054	A	54	112	108	16	70	20	35	1,83
22400-0120200055	A	55	114	110	16	70	20	35	1,88
22400-0120200056	A	56	116	112	16	70	20	35	1,94
22400-0120200057	A	57	118	114	16	70	20	35	1,99
22400-0120200058	A	58	120	116	16	70	20	35	2,05
22400-0120200059	A	59	122	118	16	70	20	35	2,11
22400-0120200060	A	60	124	120	16	70	20	35	2,16
22400-0120200061	A	61	126	122	16	80	20	35	2,36
22400-0120200062	A	62	128	124	16	80	20	35	2,42
22400-0120200063	A	63	130	126	16	80	20	35	2,48
22400-0120200064	A	64	132	128	16	80	20	35	2,55
22400-0120200065	A	65	134	130	16	80	20	35	2,61
22400-0120200066	A	66	136	132	16	80	20	35	2,67
22400-0120200067	A	67	138	134	16	80	20	35	2,74
22400-0120200068	A	68	140	136	16	80	20	35	2,81
22400-0120200069	A	69	142	138	16	80	20	35	2,87
22400-0120200070	A	70	144	140	16	80	20	35	2,94
22400-0220200072	B	72	148	144	16	-	20	-	2,5
22400-0220200075	B	75	154	150	20	-	20	-	2,71
22400-0220200076	B	76	156	152	20	-	20	-	2,79
22400-0220200080	B	80	164	160	20	-	20	-	3,09
22400-0220200085	B	85	174	170	20	-	20	-	3,5
22400-0220200090	B	90	184	180	20	-	20	-	3,93
22400-0220200095	B	95	194	190	20	-	20	-	4,39
22400-0220200100	B	100	204	200	20	-	20	-	4,87
22400-0220200110	B	110	224	220	20	-	20	-	5,9
22400-0220200114	B	114	232	228	20	-	20	-	6,34
22400-0220200120	B	120	244	240	20	-	20	-	7,03
22400-0220200127	B	127	258	254	20	-	20	-	7,89

# Spur gears in steel, module 2.5

toothing milled, straight teeth, engagement angle 20°



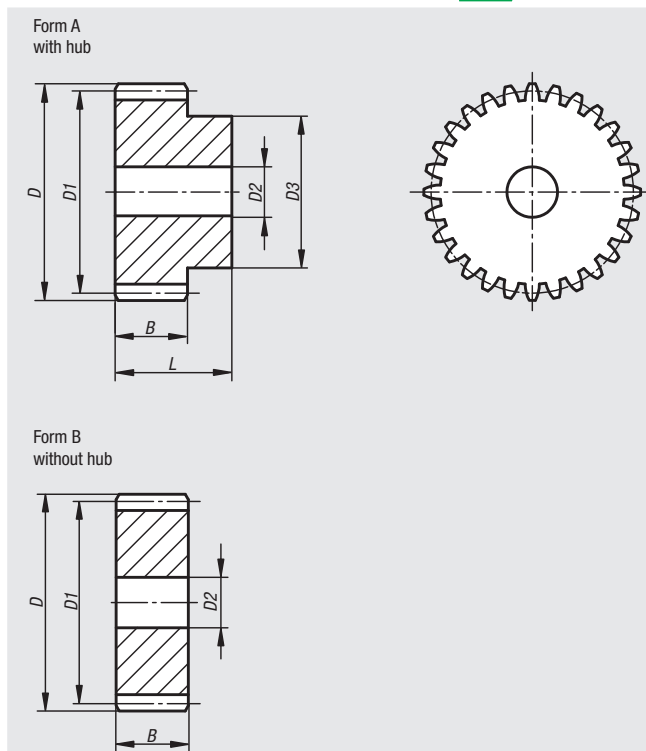
**Material:**  
Steel 1.0503 (C45).

**Version:**  
Milled toothing, straight teeth  
engagement angle 20°, natural finish.

**Note for ordering:**  
22400-0125250012

**Note:**  
Up to 60 teeth with hub, from 65 teeth disc form.

**On request:**  
Spur gears pre-bored with keyway.



Order No.	Form	No. of teeth	D	D1	D2	D3	B	L	Approx. weight kg
22400-0125250012	A	12	35	30	10	22	25	45	0,17
22400-0125250013	A	13	37,5	32,5	10	25	25	45	0,21
22400-0125250014	A	14	40	35	10	28	25	45	0,25
22400-0125250015	A	15	42,5	37,5	10	30	25	45	0,3
22400-0125250016	A	16	45	40	12	32	25	45	0,33
22400-0125250017	A	17	47,5	42,5	12	35	25	45	0,38
22400-0125250018	A	18	50	45	12	35	25	45	0,42
22400-0125250019	A	19	52,5	47,5	12	35	25	45	0,45
22400-0125250020	A	20	55	50	12	40	25	45	0,54
22400-0125250021	A	21	57,5	52,5	14	40	25	45	0,56
22400-0125250022	A	22	60	55	14	45	25	45	0,66
22400-0125250023	A	23	62,5	57,5	14	45	25	45	0,7
22400-0125250024	A	24	65	60	14	45	25	45	0,74
22400-0125250025	A	25	67,5	62,5	14	50	25	45	0,85
22400-0125250026	A	26	70	65	14	50	25	45	0,9
22400-0125250027	A	27	72,5	67,5	14	50	25	45	0,95
22400-0125250028	A	28	75	70	14	50	25	45	1
22400-0125250029	A	29	77,5	72,5	14	50	25	45	1,06
22400-0125250030	A	30	80	75	14	55	25	45	1,18
22400-0125250031	A	31	82,5	77,5	16	55	25	45	1,22
22400-0125250032	A	32	85	80	16	55	25	45	1,28
22400-0125250033	A	33	87,5	82,5	16	55	25	45	1,34
22400-0125250034	A	34	90	85	16	55	25	45	1,41
22400-0125250035	A	35	92,5	87,5	16	60	25	45	1,54
22400-0125250036	A	36	95	90	16	60	25	45	1,61
22400-0125250037	A	37	97,5	92,5	16	60	25	45	1,68
22400-0125250038	A	38	100	95	16	60	25	45	1,75
22400-0125250039	A	39	102,5	97,5	16	60	25	45	1,83

## Spur gears in steel, module 2.5

toothing milled, straight teeth, engagement angle 20°



Order No.	Form	No. of teeth	D	D1	D2	D3	B	L	Approx. weight kg
22400-0125250040	A	40	105	100	16	70	25	45	2,06
22400-0125250041	A	41	107,5	102,5	16	70	25	45	2,14
22400-0125250042	A	42	110	105	16	70	25	45	2,22
22400-0125250043	A	43	112,5	107,5	16	70	25	45	2,3
22400-0125250044	A	44	115	110	16	70	25	45	2,38
22400-0125250045	A	45	117,5	112,5	16	70	25	45	2,47
22400-0125250046	A	46	120	115	20	70	25	45	2,52
22400-0125250047	A	47	122,5	117,5	20	80	25	45	2,8
22400-0125250048	A	48	125	120	20	80	25	45	2,88
22400-0125250049	A	49	127,5	122,5	20	80	25	45	2,98
22400-0125250050	A	50	130	125	20	80	25	45	3,07
22400-0125250051	A	51	132,5	127,5	20	80	25	45	3,17
22400-0125250052	A	52	135	130	20	90	25	45	3,48
22400-0125250053	A	53	137,5	132,5	20	90	25	45	3,58
22400-0125250054	A	54	140	135	20	90	25	45	3,68
22400-0125250055	A	55	142,5	137,5	20	90	25	45	3,78
22400-0125250056	A	56	145	140	20	100	25	45	4,13
22400-0125250057	A	57	147,5	142,5	20	100	25	45	4,23
22400-0125250058	A	58	150	145	20	100	25	45	4,34
22400-0125250059	A	59	152,5	147,5	20	100	25	45	4,46
22400-0125250060	A	60	155	150	20	100	25	45	4,57
22400-0225250065	B	65	167,5	162,5	20	-	25	-	3,99
22400-0225250070	B	70	180	175	20	-	25	-	4,64
22400-0225250072	B	72	185	180	20	-	25	-	4,91
22400-0225250075	B	75	192,5	187,5	20	-	25	-	5,33
22400-0225250076	B	76	195	190	20	-	25	-	5,48
22400-0225250080	B	80	205	200	25	-	25	-	6,04
22400-0225250085	B	85	217,5	212,5	25	-	25	-	6,84
22400-0225250090	B	90	230	225	25	-	25	-	7,68
22400-0225250095	B	95	242,5	237,5	25	-	25	-	8,57
22400-0225250100	B	100	255	250	25	-	25	-	9,51
22400-0225250110	B	110	280	275	25	-	25	-	11,53
22400-0225250114	B	114	290	285	25	-	25	-	13,39
22400-0225250120	B	120	305	300	25	-	25	-	13,74
22400-0225250127	B	127	322,5	317,5	25	-	25	-	15,4

# Spur gears in steel, module 3

toothing milled, straight teeth, engagement angle 20°



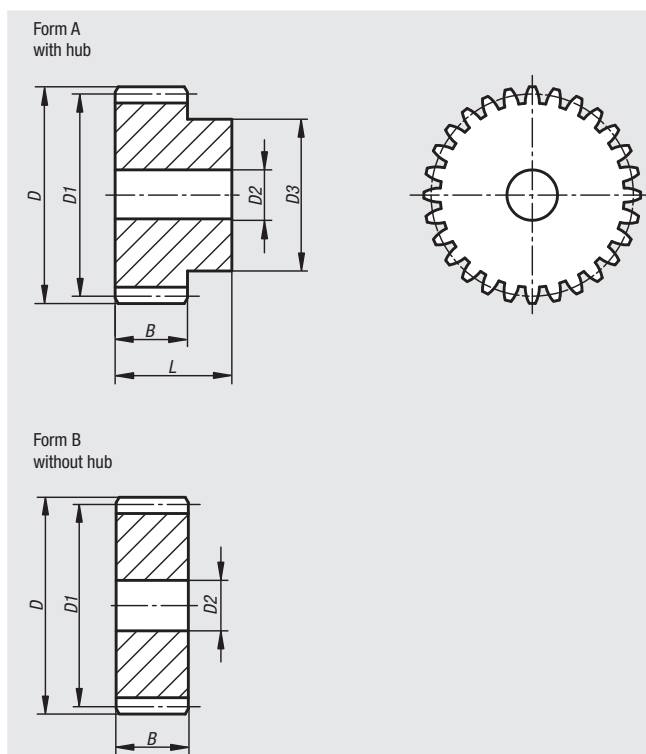
**Material:**  
Steel 1.0503 (C45).

**Version:**  
Milled tothing, straight teeth  
engagement angle 20°, natural finish.

**Sample order:**  
nlm 22400-0130300012

**Note:**  
Up to 48 teeth with hub, from 50 teeth disc form.

**On request:**  
Spur gears pre-bored with keyway.



Order No.	Form	No. of teeth	D	D1	D2	D3	B	L	Approx. weight kg
22400-0130300012	A	12	42	36	12	27	30	50	0,28
22400-0130300013	A	13	45	39	12	30	30	50	0,34
22400-0130300014	A	14	48	42	12	33	30	50	0,41
22400-0130300015	A	15	51	45	12	35	30	50	0,47
22400-0130300016	A	16	54	48	14	38	30	50	0,54
22400-0130300017	A	17	57	51	14	42	30	50	0,63
22400-0130300018	A	18	60	54	14	45	30	50	0,72
22400-0130300019	A	19	63	57	14	45	30	50	0,78
22400-0130300020	A	20	66	60	14	45	30	50	0,84
22400-0130300021	A	21	69	63	16	45	30	50	0,89
22400-0130300022	A	22	72	66	16	50	30	50	1,02
22400-0130300023	A	23	75	69	16	50	30	50	1,1
22400-0130300024	A	24	78	72	16	50	30	50	1,18
22400-0130300025	A	25	81	75	16	60	30	50	1,39
22400-0130300026	A	26	84	78	16	60	30	50	1,48
22400-0130300027	A	27	87	81	16	60	30	50	1,56
22400-0130300028	A	28	90	84	16	60	30	50	1,66
22400-0130300029	A	29	93	87	16	60	30	50	1,75



# Spur gears in steel, module 3

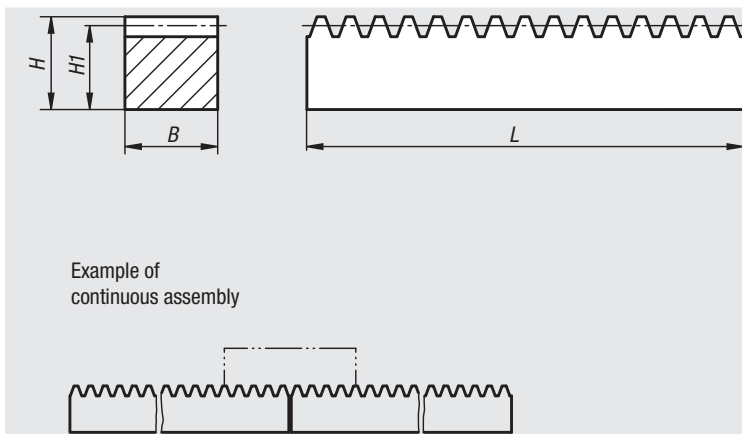
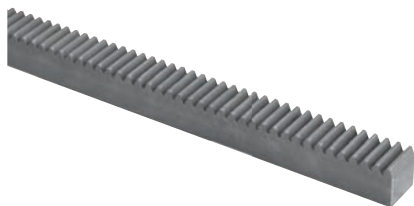
toothing milled, straight teeth, engagement angle 20°



Order No.	Form	No. of teeth	D	D1	D2	D3	B	L	Approx. weight kg
22400-0130300030	A	30	96	90	16	60	30	50	1,85
22400-0130300031	A	31	99	93	16	60	30	50	1,95
22400-0130300032	A	32	102	96	16	70	30	50	2,21
22400-0130300033	A	33	105	99	16	70	30	50	2,32
22400-0130300034	A	34	108	102	16	70	30	50	2,43
22400-0130300035	A	35	111	105	16	70	30	50	2,55
22400-0130300036	A	36	114	108	20	70	30	50	2,62
22400-0130300037	A	37	117	111	20	70	30	50	2,74
22400-0130300038	A	38	120	114	20	80	30	50	3,05
22400-0130300039	A	39	123	117	20	80	30	50	3,18
22400-0130300040	A	40	126	120	20	80	30	50	3,31
22400-0130300041	A	41	129	123	20	80	30	50	3,44
22400-0130300042	A	42	132	126	20	80	30	50	3,58
22400-0130300043	A	43	135	129	20	80	30	50	3,72
22400-0130300044	A	44	138	132	20	90	30	50	4,07
22400-0130300045	A	45	141	135	20	90	30	50	4,22
22400-0130300046	A	46	144	138	20	90	30	50	4,37
22400-0130300047	A	47	147	141	20	100	30	50	4,76
22400-0130300048	A	48	150	144	20	100	30	50	4,92
22400-0230300050	B	50	156	150	20	-	30	-	4,06
22400-0230300052	B	52	162	156	20	-	30	-	4,4
22400-0230300055	B	55	171	165	20	-	30	-	4,93
22400-0230300057	B	57	177	171	20	-	30	-	5,3
22400-0230300060	B	60	186	180	20	-	30	-	5,89
22400-0230300065	B	65	201	195	20	-	30	-	6,92
22400-0230300070	B	70	216	210	25	-	30	-	8
22400-0230300072	B	72	222	216	25	-	30	-	8,47
22400-0230300075	B	75	231	225	25	-	30	-	9,21
22400-0230300076	B	76	234	228	25	-	30	-	9,46
22400-0230300080	B	80	246	240	25	-	30	-	10,49
22400-0230300085	B	85	261	255	25	-	30	-	11,86
22400-0230300090	B	90	276	270	25	-	30	-	13,32
22400-0230300095	B	95	291	285	25	-	30	-	14,86
22400-0230300100	B	100	306	300	25	-	30	-	16,48
22400-0230300110	B	110	336	320	25	-	30	-	19,97
22400-0230300114	B	114	348	342	30	-	30	-	21,4
22400-0230300120	B	120	366	360	30	-	30	-	23,74
22400-0230300127	B	127	387	381	30	-	30	-	26,61

# Gear racks in steel

toothing milled, straight teeth, engagement angle 20°


**Material:**

Steel 1.0503 (C45).

**Version:**

Milled toothing, straight teeth  
engagement angle 20°, natural finish.

**Sample order:**

nIm 22420-010150X500

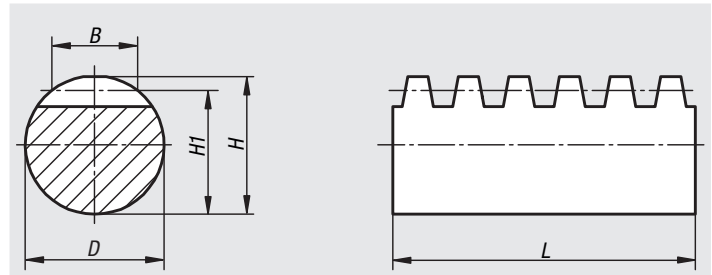
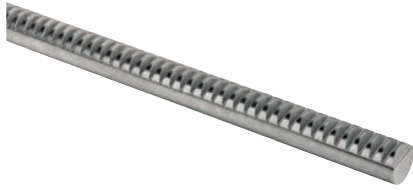
**Note:**

The gear racks are suitable for continuous assembly.

Order No.	Module	B	H	H1	L Nom. length	L Actual length	Approx. weight kg
22420-010150X500	1	15	15	14	500	499,51	0,8
22420-010150X1000	1	15	15	14	1.000	1.002,17	1,6
22420-010150X2000	1	15	15	14	2.000	2.001,19	3,3
22420-015170X500	1,5	17	17	15,5	500	504,22	1
22420-015170X1000	1,5	17	17	15,5	1.000	1.003,74	2,1
22420-015170X2000	1,5	17	17	15,5	2.000	2.002,77	4,1
22420-020200X500	2	20	20	18	500	502,65	1,4
22420-020200X1000	2	20	20	18	1.000	1.005,31	2,8
22420-020200X2000	2	20	20	18	2.000	2.004,34	5,6
22420-025250X500	2,5	25	25	22,5	500	502,65	2,2
22420-025250X1000	2,5	25	25	22,5	1.000	1.005,31	4,4
22420-025250X2000	2,5	25	25	22,5	2.000	2.002,77	8,7
22420-030300X500	3	30	30	27	500	508,94	3,2
22420-030300X1000	3	30	30	27	1.000	1.008,45	6,3
22420-030300X2000	3	30	30	27	2.000	2.007,48	12,6

# Gear racks in steel

toothing milled, straight teeth, engagement angle 20°



### Material:

Steel 1.0503 (C45).

### Version:

Milled toothing, straight teeth  
engagement angle 20°, natural finish.  
Outside diameter ground, tolerance h6.

### Sample order:

nIm 22425-010060X500

### Note:

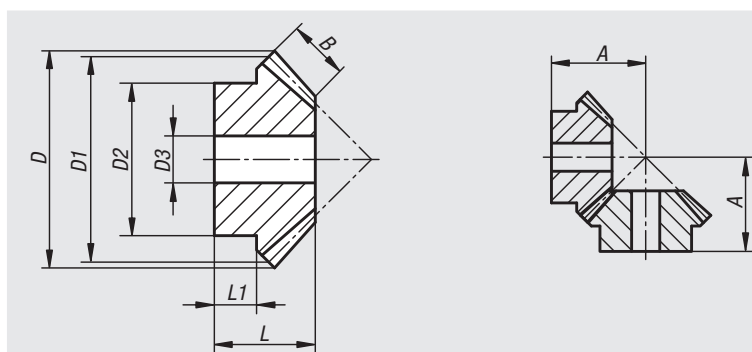
The gear rack teeth are cut using a hob mill.  
This results in minus tolerances for dimensions H and H1:  
up to module 2: -0.2 mm.  
module 2.5 to 3: -0.3 mm.

Order No.	Module	B	D	H	H1	L	Approx. weight kg
22425-010060X500	1	6	10	10	9	500	0,28
22425-010060X1000	1	6	10	10	9	1.000	0,56
22425-010060X2000	1	6	10	10	9	2.000	1,12
22425-015090X500	1,5	9	15	15	13,5	500	0,64
22425-015090X1000	1,5	9	15	15	13,5	1.000	1,28
22425-015090X2000	1,5	9	15	15	13,5	2.000	2,56
22425-020120X500	2	12	20	20	18	500	1,14
22425-020120X1000	2	12	20	20	18	1.000	2,28
22425-020120X2000	2	12	20	20	18	2.000	4,52
22425-025150X500	2,5	15	25	25	22,5	500	1,78
22425-025150X1000	2,5	15	25	25	22,5	1.000	3,56
22425-025150X2000	2,5	15	25	25	22,5	2.000	7,2
22425-030180X500	3	18	30	30	27	500	2,59
22425-030180X1000	3	18	30	30	27	1.000	5,14
22425-030180X2000	3	18	30	30	27	2.000	10,28

01000  
02000  
03000  
04000  
05000  
06000  
07000  
08000  
09000  
20000  
21000  
22000  
23000

# Bevel gears in steel, ratio 1:1

toothing milled, straight teeth, engagement angle 20°



### Material:

Steel 1.0503 (C45).

### Version:

Milled tothing, straight teeth  
engagement angle 20°, natural finish.  
Axis angle = 90°.

### Sample order:

nIm 22430-010110016

### Note for ordering:

Bevel gears are supplied singly. To obtain a pair of bevel gears, please order the specified mating gear as well.

### On request:

Bevel gears pre-bored with keyway.

Order No.	Transmission ratio	Module	No. of teeth	A	B	D	D1	D2	D3	L	L1	matching opposing gear	Approx. weight kg
22430-010110016	1:1	1	16	16	4	17,4	16	13,3	4	11,2	6,7	22430-010110016	0,02
22430-010110019	1:1	1	19	18	4	20,4	19	15,3	4	11,8	6,6	22430-010110019	0,02
22430-010110022	1:1	1	22	20	4,7	23,4	22	16,3	5	12,8	6,1	22430-010110022	0,02
22430-010110026	1:1	1	26	22	5,5	27,4	26	20,3	5	13,3	7	22430-010110026	0,04
22430-010110030	1:1	1	30	26	6,4	31,4	30	20,3	5	16	8	22430-010110030	0,05
22430-015110016	1:1	1,5	16	26	6	26,1	24	20,3	8	18,9	12,2	22430-015110016	0,04
22430-015110019	1:1	1,5	19	30	7	30,6	28,5	20,3	8	21,3	11,6	22430-015110019	0,05
22430-015110022	1:1	1,5	22	33	7,5	35,1	33	25,3	8	22,5	12,7	22430-015110022	0,09
22430-015110026	1:1	1,5	26	36	8,5	41,1	39	28,3	8	23,2	12	22430-015110026	0,12
22430-015110030	1:1	1,5	30	42	10	47,1	45	30	12	27,2	12,1	22430-015110030	0,17
22430-020110016	1:1	2	16	33	8	34,8	32	25,3	8	23,5	13,6	22430-020110016	0,08
22430-020110019	1:1	2	19	36	9	40,8	38	25,3	8	24,2	12	22430-020110019	0,11
22430-020110022	1:1	2	22	42	10	46,8	44	30,3	10	27,9	14	22430-020110022	0,18
22430-020110026	1:1	2	26	48	12	54,8	52	35,3	12	31,4	13,7	22430-020110026	0,28
22430-020110030	1:1	2	30	54	13	62,8	60	40,3	12	34,1	17	22430-020110030	0,41
22430-025110016	1:1	2,5	16	40	10	43,5	40	30,3	12	28,1	15,2	22430-025110016	0,14
22430-025110019	1:1	2,5	19	42	11	51	47,5	35,3	12	27,1	13	22430-025110019	0,21
22430-025110022	1:1	2,5	22	48	12	58,5	55	45,3	12	30,1	15,7	22430-025110022	0,36
22430-025110026	1:1	2,5	26	54	15	68,5	65	45,3	15	33,2	16	22430-025110026	0,47
22430-025110030	1:1	2,5	30	64	16	78,5	75	50,3	15	39	20	22430-025110030	0,74
22430-030110016	1:1	3	16	46	12	52,2	48	40,3	12	31,7	18,1	22430-030110016	0,28
22430-030110019	1:1	3	19	54	13	61,2	57	40,3	14	36	17,1	22430-030110019	0,39
22430-030110022	1:1	3	22	58	15	70,2	66	50,3	15	36,9	17,1	22430-030110022	0,59
22430-030110026	1:1	3	26	64	17	82,2	78	50,3	15	38,4	18	22430-030110026	0,77
22430-030110030	1:1	3	30	74	19	94,2	90	60,3	20	43,8	22	22430-030110030	1,19

# Bevel gears in steel, ratio 1:2

toothing milled, straight teeth, engagement angle 20°



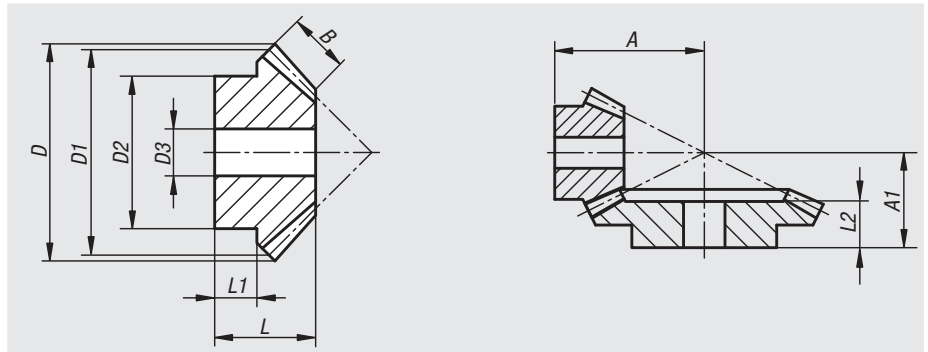
**Material:**  
Steel 1.0503 (C45).

**Version:**  
Milled toothing, straight teeth  
engagement angle 20°, natural finish.  
Axis angle = 90°.

**Sample order:**  
nlm 22430-010120015

**Note for ordering:**  
Bevel gears are supplied singly. To obtain a pair of bevel gears, please order the specified mating gear as well.

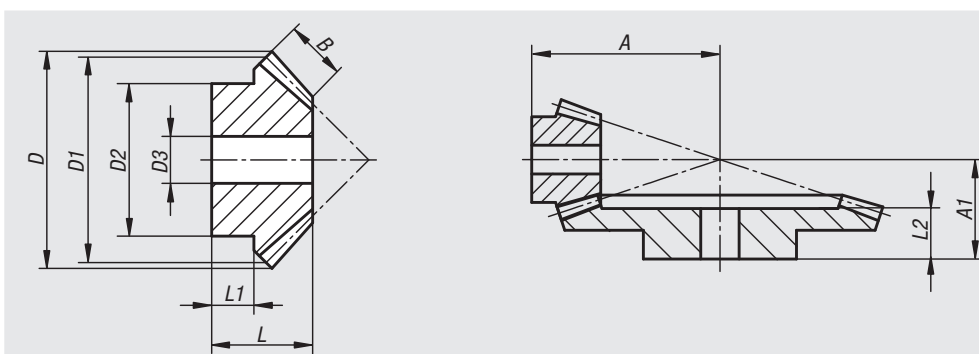
**On request:**  
Bevel gears pre-bored with keyway.



Order No.	Transmission ratio	Module	No. of teeth	A	A1	B	D	D1	D2	D3	L	L1	L2	matching opposing gear	Approx. weight kg
22430-010120015	1:2	1	15	22	-	5	17,4	15	13,3	4	11,9	6,6	-	22430-010120030	0,02
22430-010120030	1:2	1	30	-	20	5	30,6	30	20,3	5	15,1	9	14	22430-010120015	0,05
22430-015120015	1:2	1,5	15	35	-	9	26,1	22,5	20,3	8	21,1	12	-	22430-015120030	0,04
22430-015120030	1:2	1,5	30	-	32	9	45,9	45	32,3	8	25,2	16	23	22430-015120015	0,17
22430-020120015	1:2	2	15	45	-	11,5	34,8	30	25,3	8	26	13,8	-	22430-020120030	0,09
22430-020120030	1:2	2	30	-	39	11,5	61,2	60	40,3	12	29,8	18	27	22430-020120015	0,32
22430-025120015	1:2	2,5	15	55	-	15	43,5	37,5	32,3	12	31,8	16,2	-	22430-025120030	0,17
22430-025120030	1:2	2,5	30	-	45	15	76,5	75	45,3	15	33,7	20	30	22430-025120015	0,5
22430-030120015	1:2	3	15	66	-	17	52,2	45	40,3	12	37,3	19,8	-	22430-030120030	0,33
22430-030120030	1:2	3	30	-	56	17	91,8	90	55,3	15	42,1	25	38	22430-030120015	0,96

## Bevel gears in steel, ratio 1:3

toothing milled, straight teeth, engagement angle 20°



### Material:

Steel 1.0503 (C45).

### Version:

Milled toothing, straight teeth  
engagement angle 20°, natural finish.  
Axis angle = 90°.

### Sample order:

nIm 22430-010130015

### Note for ordering:

Bevel gears are supplied singly. To obtain a pair of bevel gears, please order the specified mating gear as well.

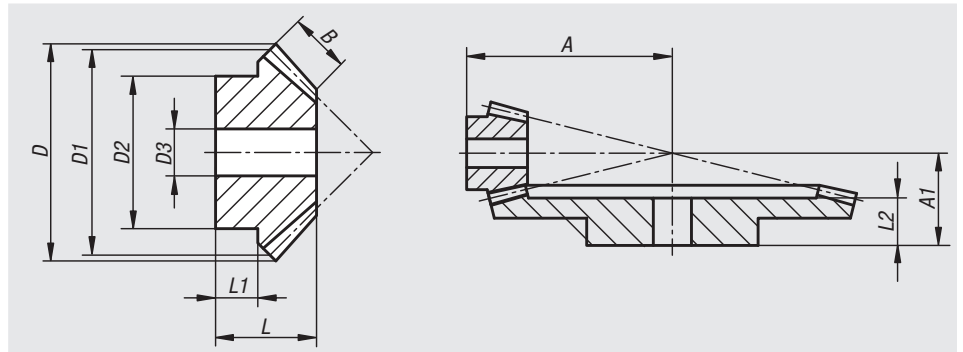
### On request:

Bevel gears pre-bored with keyway.

Order No.	Transmission ratio	Module	No. of teeth	A	A1	B	D	D1	D2	D3	L	L1	L2	matching opposing gear	Approx. weight kg
22430-010130015	1:3	1	15	32	-	7,1	17,7	15	13,3	4	16,6	9,3	-	22430-010130045	0,02
22430-010130045	1:3	1	45	-	22	7,1	45,3	45	25,3	8	17,1	10	15	22430-010130015	0,09
22430-015130015	1:3	1,5	15	46	-	10,5	26,5	22,5	19,3	8	22,6	11,7	-	22430-015130045	0,04
22430-015130045	1:3	1,5	45	-	37	10,5	68,1	67,5	45,3	14	29,6	20	27	22430-015130015	0,4
22430-020130015	1:3	2	15	60	-	14	35,4	30	25,3	8	28,9	14,2	-	22430-020130045	0,11
22430-020130045	1:3	2	45	-	42	14	90,8	90	45,3	15	32,1	20	29	22430-020130015	0,62
22430-025130015	1:3	2,5	15	73	-	18	44,2	37,5	32,3	12	34,6	15,9	-	22430-025130045	0,2
22430-025130045	1:3	2,5	45	-	52	18	113,4	112,5	60,3	20	39,7	25	36	22430-025130015	1,23
22430-030130015	1:3	3	15	88	-	21	53	45	40,3	15	41,3	19,7	-	22430-030130045	0,35
22430-030130045	1:3	3	45	-	62	21	136,1	135	60,3	20	47,2	30	42,5	22430-030130015	1,83

# Bevel gears in steel, ratio 1:4

toothing milled, straight teeth, engagement angle 20°



**Material:**  
Steel 1.0503 (C45).

**Version:**  
Milled toothing, straight teeth  
engagement angle 20°, natural finish.  
Axis angle = 90°.

**Sample order:**  
nlm 22430-010140015

**Note for ordering:**  
Bevel gears are supplied singly. To obtain a pair of bevel gears, please order the specified mating gear as well.

**On request:**  
Bevel gears pre-bored with keyway.

Order No.	Transmission ratio	Module	No. of teeth	A	A1	B	D	D1	D2	D3	L	L1	L2	matching opposing gear	Approx. weight kg
22430-010140015	1:4	1	15	38	-	9,3	17,8	15	13,3	4	17,2	7,7	-	22430-010140060	0,02
22430-010140060	1:4	1	60	-	22	9,3	60,3	60	30,3	8	17,1	10	15	22430-010140015	0,16
22430-015140015	1:4	1,5	15	57	-	11	26,7	22,5	20,3	8	23	11,7	-	22430-015140060	0,05
22430-015140060	1:4	1,5	60	-	42	11	90,4	90	50,3	15	34	25	31	22430-015140015	0,63
22430-020140015	1:4	2	15	75	-	16	35,6	30	25,3	8	31	14,4	-	22430-020140060	0,12
22430-020140060	1:4	2	60	-	48	16	120,6	120	60,3	16	37,6	25	34	22430-020140015	1,28
22430-025140015	1:4	2,5	15	94	-	19	44,5	37,5	32,3	14	38,1	18,4	-	22430-025140060	0,21
22430-025140060	1:4	2,5	60	-	58	19	150,7	150	60,3	20	44,8	30	40	22430-025140015	1,92
22430-030140015	1:4	3	15	115	-	23	53,3	45	40,3	15	48,1	24,5	-	22430-030140060	0,42
22430-030140060	1:4	3	60	-	69	23	180,8	180	80,3	20	53,2	35	48	22430-030140015	3,75

01000  
02000  
03000  
04000  
05000  
06000  
07000  
08000  
09000  
20000  
21000  
22000  
23000