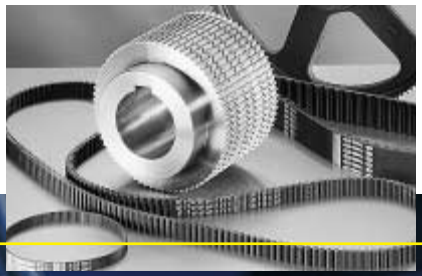
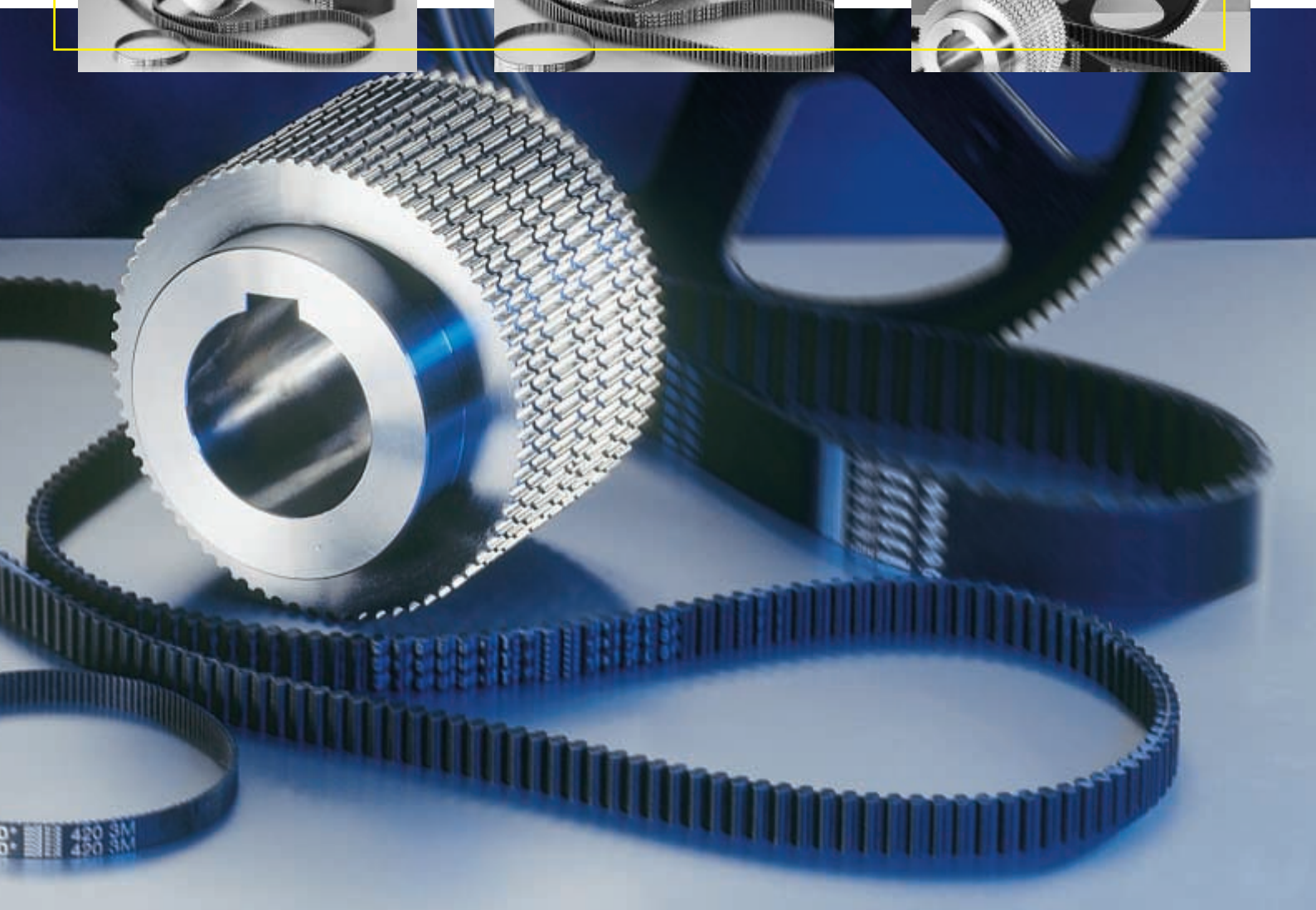
WALTHER FLENDER®

PowerGrip® HTD®





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Drives must be covered by suitable means to avoid accidents!

Introduction

HTD synchronous belt drives are technically refined products used around the world. They have demonstrated their utility in more than 20 years of service. The **H**igh **T**orque **D**rive belt exhibits all transmit of the conventional synchronous belt drive and is further distinguished by its capability to greater torque loads. The semicircular tooth shape, the glass-fiber tensile element and the nylon finish on the teeth have brought a considerable increase in power transmission capabilities compared with drives using conventionally belts.

Building on the standard program, a broad line of types has been created for an extensive range of applications for the HTD belts. With five tooth pitch dimensions, from 3 mm to 20 mm, the engineer will find a suitable pitch for every performance range.

The special designs for HTD belts cover a wide spectrum of specially requested properties. Heat- and cold-resistant material compounds ensure that the HTD drives will run trouble-free at temperatures from -50°C to +130°C. Static conductive versions are available for special applications. Belts with a hard rubber compound to transmit even higher power levels have been developed especially for use in conveyor and transport systems.

Numerous other modifications, such as double-sided toothing for opposing directions of rotation or open ended (LongLength) designs for linear movements, demonstrate the variety with HTD belts. When producing belts for machinery to be built in larger numbers these options make it possible to match the drive parameters exactly to the operating conditions.

The diversity found in HTD belts is further enhanced with individually engineered sprockets. Their designs can be matched precisely to the prevailing installation situation, following customer drawings. Further optimization of the HTD system, *e.g.* with modified tooth geometry (special tooth design), makes for superior positioning accuracy. Special treatment of the materials or the surface or applying corrosion and wear-protection of the surfaces can significantly increase the functionality of the overall drive systems.

When manufacturing units in series, employing plastic, sintered metal or die cast sprockets will guarantee a technically sophisticated and economical drive solution. Our application engineers can draw upon a wealth of experience which you should be sure to make use of. We have also included a project data sheet on page 54; you can forward it to our application engineering department as the first step in developing an ideal solution.

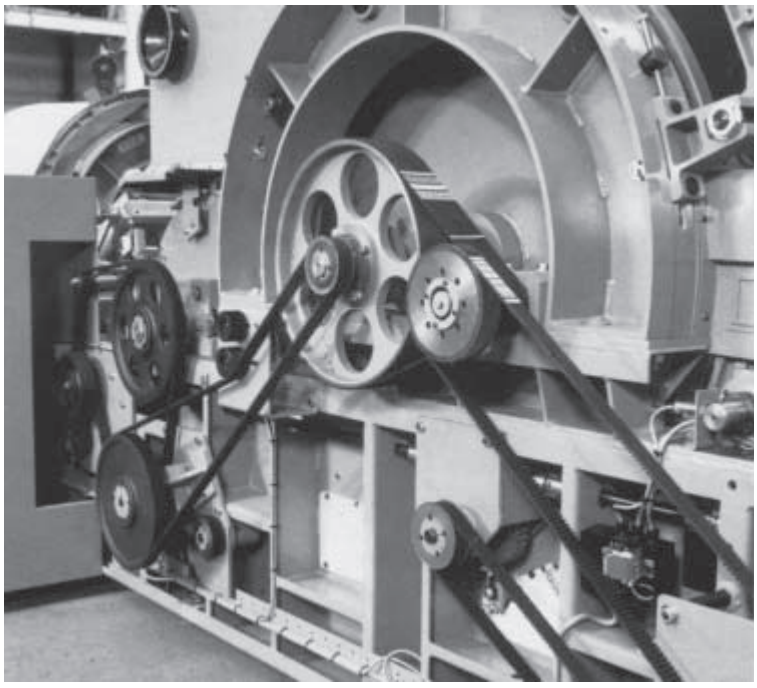


Figure 1: Example for use of synchronous belts in a textile machine

General properties

Positive power transmission

Positive engagement of the HTD teeth with the grooves of the drive sprocket guaranties a synchronous power transmission. Slippage is eliminated and with it any variations in rotation speed.

Constant angular velocity

The HTD synchronous belts describe a circle instead of a polygon when wrapping around the sprocket, making it impossible for periodic fluctuations and, as a consequence, vibrations.

High efficiency

The flexible belt design, low belt tension and low friction between the belt and the sprocket keep both creep and heat generation to a minimum. The result is superb efficiency for the HTD synchronous drive, coming to about 98% in two-sprocket configurations.

Low belt tension and bearing load

In contrast to V-belt drives which depend on friction the positive force transmission design used in the HTD synchronous drive concept permits far lower belt tension values. This reduces the load on the bearings; machine components can consequently be engineered so as to be lighter in weight and thus lower in cost.

Maintenance-free, long-life operation

The glass fiber elements in the HTD synchronous belts are stable in length, even after extended service. That does away with the need for adjustments. What's more, metal-to-metal contact is eliminated, making lubricating systems, oil seals, etc. unnecessary. The advantage here is that the area around the drive, in which sensitive production goods may be located, is not contaminated.

Wide power and speed ranges

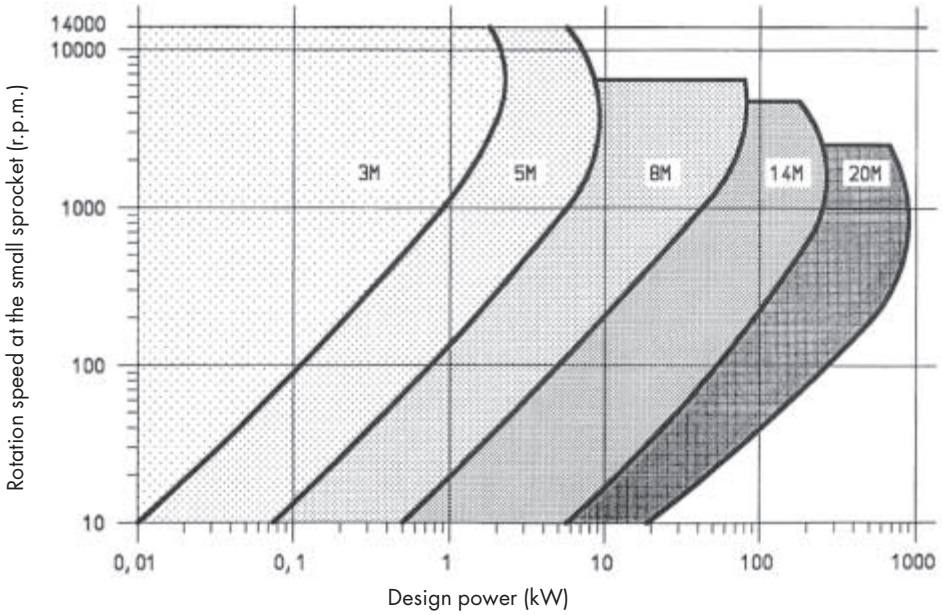
The power and speed ranges offered by the HTD synchronous belt drives are indeed broad. They extend from mini-drives through to large units handling several hundred kilowatts, from slow-running equipment with almost static torque transmission through to high belt velocities. The chart below is provided to help you in selecting the correct belt.

High performance in limited space and at low weight

The high power transmission capacities of HTD belt, along with their compact dimensions and low weights, offer clear advantages compared with other drive concepts.

Economy

The high degree of economy for the HTD synchronous belt drives is the product of the properties mentioned above – including ideal power transmission, a variety of types, compact design, minimum energy requirements, environmental acceptability, freedom from maintenance requirements, etc.
In addition, the standard line, with its products manufactured in volume using the most efficient techniques, is your guarantee of favorable engineering costs.
Special designs can be offered, selecting just the right manufacturing processes, giving a persuasively affordable drive solution. Make use of our consulting service.



Belt pitch selection guide

Engineering notes

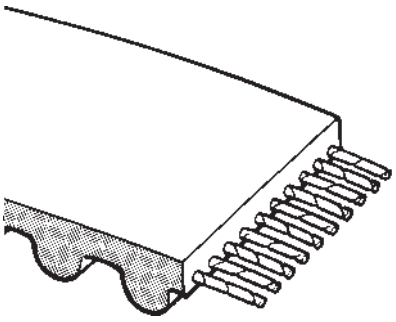
SYNCHRONOUS BELTS

Composition

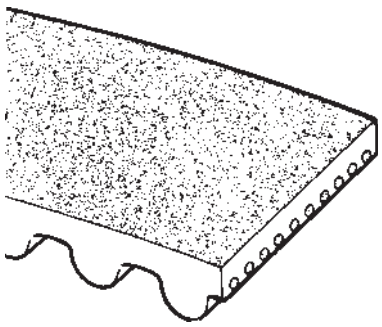
The greater power transmission capacity of the HTD belts is based on the newly developed tooth profile which, thanks to more favorable force distribution, allows a higher loading on the teeth as they engage with the sprocket.
The wear-resistant teeth are finished with a rugged nylon fabric and are unitized with the proven fiberglass tensile members in a vulcanization process.
The high performance of the HTD belt now permits use in wider torque ranges, in a multitude of different applications.
The patented tooth profile for the HTD belt, the product of years of trials and development, ensures engagement of the belt and sprocket grooves without backlash and effects a gentle, rolling engagement sequence. The high tensile strength of the HTD concept is based on the extraordinarily high tear resistance of the fiberglass tensile member, which is the actual working component in the belt.

Components

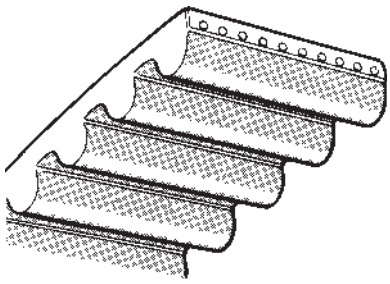
The tensile member
Continuous, helically wound fiberglass cords form the tensile member – the heart in the PowerGrip HTD belt. This power-transmission member is distinguished by great tensile strength, ready flexibility and an extremely low stretch factor.
Besides the standard design incorporating fiberglass cords, there are Aramid and steel cords are available in special designs.



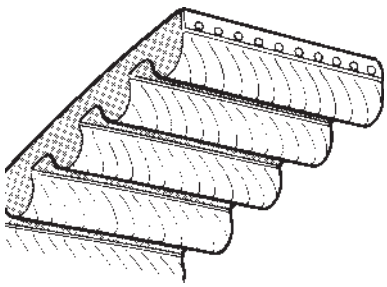
The neoprene backing
The durable and flexible backing which encloses the tensile member is made of tough, high-quality neoprene. It protects the tensile member from external loading. In addition, the neoprene backing is virtually immune to environmental influences and temperatures from -20°C to +100°C (and intermittently from -30°C to +120°C). Special compounds can be used to handle extreme temperature ranges.



The neoprene teeth
To guarantee perfect engagement in the sprocket grooves the neoprene teeth on the belt are exact in regard to geometric tooth shape and positioning; the effective pitch line of the synchronous belt aligns precisely with the sprocket pitch diameter. This guarantees engagement in exact alignment with the sprocket.
The material properties are identical to those for the backing.



The nylon facing
A slip resistant nylon fabric covers the belt's running surface and protects the teeth against wear, similar in effect to surface hardening for gears. This nylon fabric has an amazingly low coefficient of friction. After a long period in service the facing looks as mirror polished.



Pitch division

PowerGrip HTD belts are manufactured in a wide variety of lengths and widths, with pitch values of 3 mm, 5 mm, 8 mm, 14 mm and 20 mm.

Numerous special lengths, widths and engineering designs are available to cover one-off and mass-production applications.

Our applications engineers can provide consulting support.

The primary features of the synchronous belt are:

Effective length, pitch, width

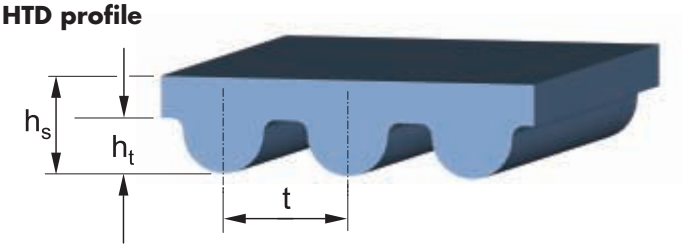
Pitch for the synchronous belt is expressed as the distance between the centers of two adjacent teeth, measured in mm along the pitch line of the synchronous belt. The effective length represents the product of the pitch and the number of teeth. The theoretical pitch line for the HTD toothed belt lies within the tensile member.

The ***order number*** for HTD toothed belts specifies the pitch, effective length and belt width.

Example: **640 - 8M - 20**

Effective length mm	Pitch mm	Width mm
640	8M	20

HTD profile



Belt dimensions and weights

Pitch	Standard widths in mm	Weight per meter* Fiberglass cord	t (mm)	h_s (mm)	h_t (mm)
3M	6 9 15	74	3	2.41	1.22
5M	9 15 25	110	5	3.81	2.06
8M	20 30 50 85	156	8	5.99	3.38
14M	40 55 85 115 170	245	14	10.00	6.02
20M	115 170 230 290 340	314	20	13.21	8.38

* grams per 25 mm of belt width

The weights per meter may vary slightly, depending on the belt design and the tolerances.

Aramid and steel cord available on request.

Belt width tolerance for all pitch values

Belt width in mm	Belt lengths of from 0 to 800	from 800 to 1600	above 1600 mm
up to 35	+0.8 –0.8	+0.8 –1.2	+0.8 –1.2
over 35 up to 50	+0.8 –1.2	+1.2 –1.2	+1.2 –1.2
over 50 up to 60	+1.2 –1.2	+1.2 –1.6	+1.6 –1.2
over 60 up to 75	+1.2 –1.6	+1.6 –1.6	+1.6 –1.2
over 75 up to 100	+1.6 –1.6	+1.6 –2.0	+2.0 –1.2
over 100 up to 175	+2.4 –2.4	+2.4 –2.8	+2.4 –1.2
over 175			+4.8 –6.4

Narrower tolerances on request.

Belt length tolerances for all pitch values

(referenced to belt length)

Belt length mm	Tolerance mm
127 to 254	± 0.40
255 to 381	± 0.46
382 to 508	± 0.50
509 to 762	± 0.60
763 to1016	± 0.66
1017 to1270	± 0.76
1271 to1524	± 0.82
1525 to1778	± 0.86
> 1779	± 0.86 + 0.05 per 254 mm

Length controlled belts, including those with narrower length tolerances, are available; inquire at our applications engineering department.

Special designs

Standard-design PowerGrip HTD synchronous belts (standardized dimensions, structure and materials) will in most cases satisfy the requirements dictated by functional needs and environmental influences and by the space available in the application. Years of experience in the field of mechanical drive technology have shown again and again that standard belts of appropriate dimensions can often also be employed even where the operating parameters at first made their use seem questionable. That is why you should draw upon our vast knowledge, since standard designs, available from stock at short notice, mean significant time savings.

Some applications cannot be realized with the items found in the standard range. Custom designs are available and we would be glad to provide details about their capabilities. Take advantage of our technical consulting services before making your selection and finalizing your design.

Economic at reasons make the manufacture of special designs subject to certain minimum order quantities. We would appreciate your contacting us early in your planning work.

Application ranges for specially designed PowerGrip HTD synchronous belts

Special design	Applications	Comments
Width and/or length of the synchronous belt does not correspond to standard dimensions.	Where space utilization is critical and under extreme conditions, for large quantities.	Please inquire
Cold-resistant design	For temperatures of from -50°C to +80°C in a low-humidity atmosphere.	
Heat-resistant design	For temperatures of from -20°C to +130°C.	
Oil-resistant design	For exposure to petroleumbased oils. The resistance to swelling will depend on the oil compound. Temperature range of from -20°C to +100°C.	Please inquire in special cases; conduct resistance testing in critical situations. Oil-resistant belts should not be allowed to run dry.
Static conductive design	For drives in areas subject to explosion and fire hazard.	Not approved for use in underground mining operations; qualification testing is required.
Polished backing	For very quiet drives running at high speeds, using deflection or compensation sprockets located at the outside.	Please contact our technical consultants.
Hard rubber blend, reinforced fabric	Drives in conveyor technology, subject to high start-up and braking loads, such as skid conveyor rollers.	Please contact our technical consultants.

Special designs available on request

1. PowerGrip HTD synchronous belts with standard HTD pitch but in non-standard widths and pitch lengths

All standard-design belts are available in special widths.

There is a large number of moulds available for making up special-length belts incorporating the HTD standard pitch range. You can save yourself a great deal of time by informing us about your needs during the project planning stage.

We would be happy to assist you in special cases when selecting suitable belt dimensions; a new mould can, if necessary, be made for use in volume production.

2. PowerGrip HTD synchronous belts with special properties

The table above provides a survey of the special designs available for typical applications. As a rule, modifications affecting the materials used in the synchronous belt can be carried out while retaining the tooth geometries, making it possible to use standard sprockets here, too. Please note that the properties listed, such as oil resistance and static conductivity, can generally not be combined one with another.

Depending on the design you select, the performance data listed on pages 30 to 38 may vary considerably; please contact us for details.

PowerGrip – Twin Power HTD

The structure, the materials and the dimensions of the standard designs have been retained here. Seen in cross-section, the Twin Power HTD belts are entirely symmetrical around the center of the tensile member. The thickness of the belt at the root corresponds exactly to twice the distance from the root to the center of the tensile member.

Overall thickness, the symmetry of teeth which are opposite one of the other and the pitch are monitored continuously during manufacturing.

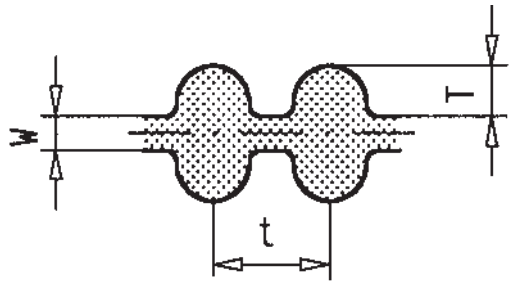
The faces of both the inside and outside teeth are finished with a wear-resistant nylon fabric and thus can handle equally high loads. Using the Twin Power HTD belts makes it possible to transfer the same and opposed directions of rotation at high accuracy.
The load may be distributed as desired where two or more driven shafts are used; their total may, however, not exceed the design load for the drive.

Drive power ≥ Total of the driven loads

The drive design uses the same calculation processes as for the normal HTD synchronous belts.

Please note that in multiple-sprocket drives the loading can have a decisive impact on belt service life. We thus urge you to use the project data sheet on page 54 when determining the power design and to consult with our applications engineers.

Belt dimensions



t	W	T
5M	1.14 +/– 0.13	2.10 +/– 0.12
8M	1.37 +/– 0.13	3.45 +/– 0.15
14M	2.79 + 0.25 – 0.18	6.00 +/– 0.30

Other tolerances correspond to those for the normal HTD toothed belts.

The **order number** is prefaced with the TP (Twin Power) abbreviation.

Example **TP 720-8M-30**

Effective length mm	Pitch mm	Width mm
720	8M	30

Available belt length:

* Special design; prices and delivery periods upon inquiry.

3M pitch
on inquiry.

5M pitch
Standard widths: 9, 15, 25 mm

Belt length	Number of teeth
TP 425	85
TP 450	90
TP 460	92
TP 480 *	96
TP 495 *	99
TP 500	100
TP 520	104
TP 535	107
TP 555	111
TP 560	112
TP 565 *	113
TP 575	115
TP 580 *	116
TP 585 *	117
TP 590 *	118
TP 600	120
TP 610	122
TP 615	123
TP 635	127
TP 640	128
TP 655	131
TP 665 *	133
TP 670	134
TP 680 *	136
TP 685 *	137
TP 695	139
TP 700	140
TP 710	142
TP 720	144
TP 740	148
TP 745 *	149
TP 755	151
TP 765 *	153
TP 775	155
TP 790 *	158
TP 800	160
TP 830 *	166
TP 835	167
TP 850 *	170
TP 870 *	174
TP 890	178
TP 925 *	185
TP 935	187
TP 950	190
TP 975 *	195
TP 985 *	197
TP 1000 *	200
TP 1035	207
TP 1050	210
TP 1100	220
TP 1125 *	225
TP 1195 *	239
TP 1200	240
TP 1225	245
TP 1250 *	250
TP 1270 *	254
TP 1295 *	259
TP 1375 *	275
TP 1420 *	284
TP 1575 *	315
TP 1595 *	319
TP 1635 *	327
TP 1690 *	338
TP 1790 *	358
TP 1800 *	360
TP 1870 *	374
TP 1895 *	379
TP 1945 *	389
TP 2000 *	400
TP 2100 *	420
TP 2110 *	422
TP 2250 *	450
TP 2350 *	470
TP 2525 *	505

8M pitch
Standard widths: 20, 30, 50, 85 mm

Belt length	Number of teeth
TP 480	60
TP 512	64
TP 560 *	70
TP 592 *	74
TP 600	75
TP 640	80
TP 656	82
TP 672 *	84
TP 680 *	85
TP 720	90
TP 776	97
TP 800	100
TP 840 *	105
TP 880	110
TP 912	114
TP 920	115
TP 936 *	117
TP 960	120
TP 968	121
TP 1000	125
TP 1040	130
TP 1120	140
TP 1128	141
TP 1152 *	144
TP 1160	145
TP 1176 *	147
TP 1200	150
TP 1216	152
TP 1224	153
TP 1256	157
TP 1264	158
TP 1280	160
TP 1304	163
TP 1360	170
TP 1424	178
TP 1432	179
TP 1440	178
TP 1552 *	194
TP 1600	200
TP 1696 *	212
TP 1760	220
TP 1800	225
TP 2000	250
TP 2080	260
TP 2104 *	263
TP 2240	280
TP 2272	284
TP 2288 *	286
TP 2400	300
TP 2600	325
TP 2800	350
TP 3048 *	381
TP 3280 *	410
TP 3600 *	450
TP 4400 *	550
TP 4960 *	620

14M pitch
Standard widths: 40, 55, 85, 115, 170 mm

Belt length	Number of teeth
TP 1610	115
TP 1778	127
TP 1890	135
TP 1904	136
TP 2100	150
TP 2310	165
TP 2450	175
TP 2590	185
TP 2800	200
TP 3150	225
TP 3360	240
TP 3500	250
TP 3850	275
TP 4326	309
TP 4578	327
TP 4956	354
TP 5320	380
TP 5530	395
TP 5740	410
TP 6160	440
TP 6860	490

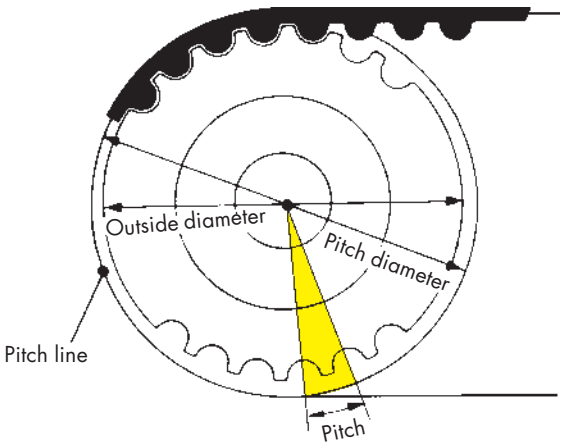
SPROCKETS

PowerGrip HTD sprockets are produced with special hobs and are pitch accurate. Original milling hobs are used exclusively. Only these tools can ensure the dependability and long service life.

The main characteristics of the sprocket are:

Number of teeth, pitch, width, make

The sprocket pitch is the distance between the centers of two adjacent grooves, measured at the pitch diameter. The pitch diameter, or effective diameter, always lies beyond the outside diameter of the sprocket and coincides with the pitch line in the synchronous belt.



Standard sprockets

To satisfy your needs we can draw upon an extensive program of standard sprockets, both with and without TaperLock mounting bushings, and as shown in the information on pages 40 to 53.

Standard sprockets are available for the following belt widths:

Pitch designation	3M	5M	8M	14M
Nominal belt width in mm	9 15	9 15 25	20 30 50 85	40 55 85 115 170

The order numbers for PowerGrip HTD toothed sprockets are composed as follows:

P28 – 8M – 20 6F

Number of teeth	Pitch	Sprocket width (mm)	Version
28	8M	20	6F

Sprockets in standard and special designs

Standard-design sprockets will fully satisfy requirements in terms of function and space utilization in a large number of drives. They are available at short notice.

When outfitting heavy-duty, precision drives requiring high positioning accuracy, we recommend using sprockets in special designs which we make up according to your drawings. Numerous special tooth designs, *e.g.* allmost zero backlash or low-noise drives, are available.

Custom sprockets can be manufactured in a large number of materials in addition to the standard cast iron, aluminum and steel versions; their surfaces may also be specially finished. Kindly consult with our applications engineers.

We stock a comprehensive line of self-centering mounting bushings used to fix the hub to the shaft. A survey of the styles available is shown in page 16.

Special-design sprockets

Even though the pitch graduations and sprocket designs selected when setting up the line of HTD standard sprockets are intended to provide the most universal utilization possible, a number of applications will require special designs, *i.e.* engineering modifications.

We have laid out our manufacturing facilities to deal with such situations.

We can supply any desired sprocket design, as per your drawings; special processing such as polishing, balancing, surface finishing etc. can quoted.

MANUFACTURING GUIDELINES

Materials

Materials providing high wear resistance are used to withstand high belt power transmission levels and speeds in many cases.

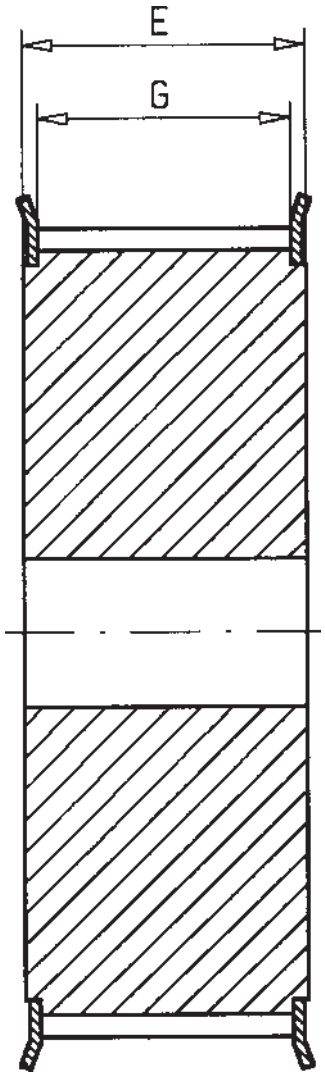
To meet this need we offer a large selection of steel, sintered metal and plastic sprockets along with high-strength aluminum alloys.

We recommend surface treatment in the form of hard coatings or nickel plating where using aluminum with strength values of less than 280 N/mm^2.

Recommended sprocket widths

Tooth code designation	Sprocket width designation*	Narrowest tooth width G mm	Narrowest sprocket width, including flanges, E mm
3M	6	7	11
	9	10	14
	15	16.5	20.5
5M	9	10	14
	15	16.5	22.5
	25	26.5	32.5
8M	20	22	26
	30	33	37
	50	53	58
	85	89	94
14M	40	44	50
	55	60	66
	85	92	98
	115	123	129
	170	178	185
20M	115	125	133
	170	180	191
	230	242	253
	290	305	315
	340	355	365

* corresponds to the nominal belt width.



The sprocket widths specified here take into consideration additional material to roll the flanges and should, if at all possible, never be narrower.

Position and shape tolerances

The surface quality and the accuracy of tooth dimensions and pitch, along with the positioning and shape tolerances in the sprockets, will have a decisive influence on how quietly the drive operates.

Since the outside diameter of the sprockets will be milled down in the rolling proass the rough workpieces must have an oversize when compared with the final dimensions.

There are close tolerances necessary for the outside diameter.

– Tolerances for standard sprockets

Outside diameter (mm) from		to	Permissible deviation (mm)
0		30	+ 0.05
31		50	+ 0.08
51		100	+ 0.1
101		180	+ 0.13
181		310	+ 0.15
311		510	+ 0.18
511	–	800	+ 0.2

– Tolerances for special-design sprockets

All dimensions in mm

Outside diameter from	to	Permissible tolerance	Permissible radial run-out	Rough turning dimension
0	25	+ 0.05	0.03	0.2 to 0.3
26	50	+ 0.05	0.04	
51	100	+ 0.08	0.05	
101	150	+ 0.10	0.07	0.3 to 0.4
151	200	+ 0.12	0.1	
201	300	+ 0.15	0.12 +	0.4 to 0.5
301	500	+ 0.18	0.03 per	0.5 to 0.7
501	. . .	+ 0.20	100 mm	0.7 to 0.9

– Axial run-out tolerance

Outside diameter range mm		Permissible deviations mm
up to	101.60	0.10
from 101.60 to	254.00	0.001 mm per mm of outside diameter
above	254.00	0.25 mm + 0.0005 mm per mm of outside diameter beyond 254.00 mm

– Permissible surface roughness at the toothing

Toothing/pitch	Permisssible roughness R_z
up to 5 mm	$R_z \leq 10$
5 mm – 10 mm	$R_z \leq 16$
above 10 mm	$R_z \leq 25$

– Thermal coefficient of expansion α in the sprocket materials

Drive heating can cause an increase in sprocket diameter due to thermal expansion and, consequently, a change in belt tension. It is for this reason that you should take the following coefficients of thermal expansion into account where extreme temperature variations are to be expected.

Steel	$12 \cdot 10^{-6}$ 1/K
Aluminum	$23.5 \cdot 10^{-6}$ 1/K

Plastic (thermoplastics):

PA 6	$70 \cdot 10^{-6}$ 1/K
PA 66 6F	$50 \cdot 10^{-6}$ 1/K
PC	$60 \cdot 10^{-6}$ 1/K
POM	$110 \cdot 10^{-6}$ 1/K

Plastic (thermoset plastics):

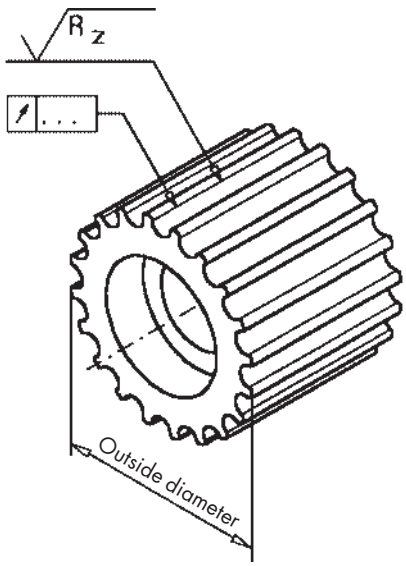
PF 74	$35 \cdot 10^{-6}$ 1/K

– Balancing

Sprockets machined on all their surfaces and symmetrical around the axis need not be balanced when used in standard drives.

High-speed sprockets for precision drives will be balanced in accordance with DIN/ISO 1940 (previous VDZ 2060).

Please contact our applications technicians if the quality index is lower than 6.3.



Flanges

Using flanges to guide the belt

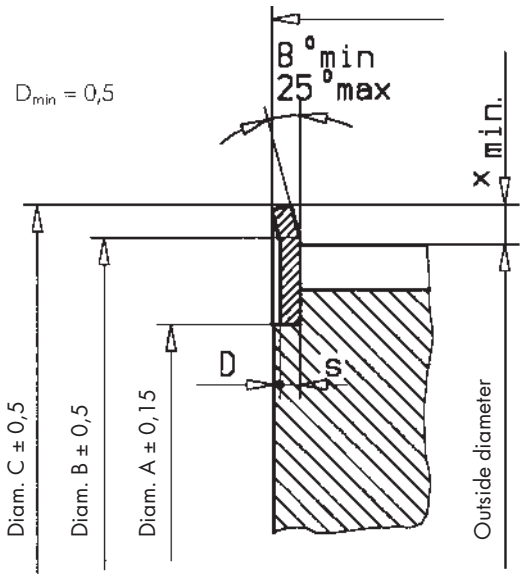
The PowerGrip HTD synchronous belt drive systems incorporate a sprocket which is fitted with flanges on both sides to guide the belt. In many cases the smaller sprocket will be selected for this purpose, in the interest of cost savings.

It should be noted, however, that the driven sprocket should in fact always be fitted with flanges on both faces, since it is easier to guide the slack section where it runs onto the sprocket. Both sprockets, or the larger of the two, should be fitted with flanges on both sides where the distance between centers is very large (8 · d), for transmission ratios upward of 1:3, and where the shafts are vertical.

We carry a broad standard range of galvanized steel flanges. Please note the flange dimensions specified in the following tables during your engineering work.

The flanges are flared to guide the belt better as it runs onto the sprocket. A disadvantage of flat flanges is that where shafts are not aligned exactly, for example, the synchronous belt will rub on the inside edge of the flange and suffer premature wear. Consequently we do not recommend using flat flanges.

D: Minimum material overhang for proper flange fitting



Important! Depending on the angle, the outside edge of the flange may not be conform with the face of the sprocket.

HTD 3M

Number of teeth	Code	A (mm)	B (mm)	C (mm)	s (mm)
9 – 10	–	5	–	11	0.5
11 – 13	6 XL	7	10.5	16	1
14 – 16	9 XL	10	14	20	1
17 – 18	10 XL	12.5	16.5	23	1
19 – 21	12 XL	15	19	25	1
22 – 24	14 XL	16.8	23.8	28	1
25 – 28	16 XL	20	25.4	32	1
29 – 31	18 XL	23	29	35	1
32 – 34	20 XL	26.5	32.5	38	1
35 – 37	22 XL	30	35	41	1
38 – 40	24 XL	33	38	44	1
41 – 42	–	32	–	46	1
43 – 44	14 L	37	42	48	1.5
45 – 48	15 L	39.5	45	51	1.5
49 – 51	16 L	43	48	54	1.5
52 – 54	17 L	46	51	57	1.5
55 – 57	18 L	48	54	60	1.5
58 – 60	14 H	47	57	63	1.5
61 – 64	15 H	51	60.5	66.5	1.5
65 – 68	16 H	53	64	71	1.5
69 – 72	17 H	57	68	75	1.5
73 – 76	18 H	60	72	79	1.5
77 – 80	19 H	64	76	83	1.5

xmin = 2.5 mm

HTD 5M

Number of teeth	Code	A (mm)	B (mm)	C (mm)	s (mm)
13	12 XL	15	19	25	1
14 – 15	14 XL	16.8	23.8	28	1
16 – 17	16 XL	20	25.4	32	1
18 – 19	18 XL	23	29	35	1
20 – 21	20 XL	26.5	32.5	38	1
22 – 23	22 XL	30	35	41	1
24 – 25	24 XL	33	38	44	1
26 – 27	26 XL	37	42	48	1
28 – 29	28 XL	39.5	45	51	1
30 – 31	30 XL	43	48	54	1
32 – 33	17 L	46	51	57	1.5
34 – 35	18 L	48	54	60	1.5
36	14 H	47	57	63	1.5
37 – 39	15 H	51	60.5	66.5	1.5
40 – 41	16 H	53	64	71	1.5
42 – 43	17 H	57	68	75	1.5
44 – 46	18 H	60	72	79	1.5
47 – 49	19 H	64	76	83	1.5
50 – 51	20 H	68	79	87	1.5
52 – 54	21 H	73	84	91	1.5
55 – 56	22 H	76	88	93	1.5
57 – 58	23 H	79	91	97	1.5
59 – 61	24 H	82.5	96	103	1.5
62 – 64	25 H	87	100	106	1.5
65 – 67	26 H	91	105	111	1.5
68 – 69	27 H	95	109	115	1.5
70 – 73	28 H	99	114	119	1.5
74 – 77	30 H	107	121	127	1.5
78 – 82	32 H	116	129	135	1.5
83 – 85	33 H	120	134	140	1.5
86 – 88	34 H	126	139	146	1.5
89 – 92	36 H	132	145	152	1.5
93 – 97	38 H	140	154	160	1.5
98 – 100	40 H	148	161	168	1.5

xmin = 2.0 mm

HTD 8M

Number of teeth	Code	A (mm)	B (mm)	C (mm)	s (mm)
18 – 19	–	39.5	–	60	1.5
20	16 L	43	48	54	1.5
21	17 L	46	51	57	1.5
22	18 L	48	54	60	1.5
23	14 H	47	57	63	1.5
24	15 H	51	60.5	66.5	1.5
25	16 H	53	64	71	1.5
26 – 27	17 H	57	68	75	1.5
28 – 29	18 H	60	72	79	1.5
30	19 H	64	76	83	1.5
31 – 32	20 H	68	79	87	1.5
33	21 H	73	84	91	1.5
34 – 35	22 H	76	88	93	1.5
36	23 H	79	91	97	1.5
37 – 38	24 H	82.5	96	103	1.5
39 – 40	25 H	87	100	106	1.5
41 – 42	26 H	91	105	111	1.5
43	27 H	95	109	115	1.5
44 – 45	28 H	99	114	119	1.5
46 – 48	30 H	107	121	127	1.5
49 – 51	32 H	116	129	135	1.5
52 – 53	33 H	120	134	140	1.5
54 – 55	34 H	126	139	146	1.5
56 – 57	36 H	132	145	152	1.5
58 – 61	38 H	140	154	160	1.5
62 – 64	40 H	148	161	168	1.5
65 – 67	42 H	156	170	176	1.5
68 – 70	44 H	164	177	184	1.5
71 – 73	46 H	172	186	192	1.5
74 – 77	48 H	180	195	200	1.5
78 – 83	L 216	190	–	216	2
84 – 92	L 238	200	–	238	2
93	L 260	210	–	260	2.5
94 – 99	L 260 S	230	–	260	2
100 – 107	L 280	230	–	280	2.5

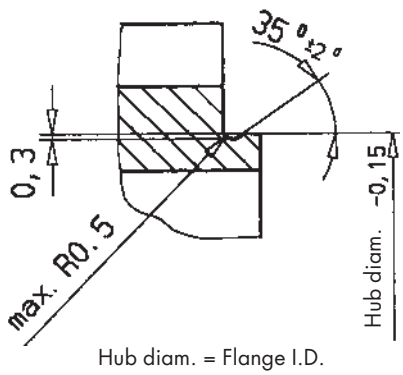
xmin = 3.0 mm

HTD 14M

Number of teeth	Code	A (mm)	B (mm)	C (mm)	s (mm)
28	L 138	105	0	138	2.5
29 – 30	L 142	90	0	142	2.5
31 – 32	L 156	105	0	156	2.5
33 – 34	L 172	115	0	172	2.5
35 – 38	L 186	130	0	186	2.5
39 – 43	L 200	144	0	200	2.5
44 – 46	L 215	160	0	215	2.5
47 – 49	L 230	190	0	230	2.5
50 – 52	L 242	185	0	242	2.5
53 – 55	L 260	210	0	260	2.5
56 – 59	L 280	230	0	280	2.5
60 – 64	L 300	250	0	300	2.5
65 – 68	L 320	260	0	320	2.5
69 – 73	L 340	280	0	340	2.5
74 – 79	L 372	300	0	372	2.5
80 – 84	L 385	330	0	385	2.5
85 – 92	L 420	360	0	420	2.5
> 92 No standard flanges available. Special make.					

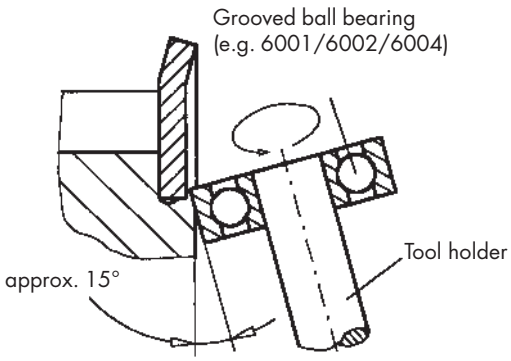
xmin = 6.0 mm

Hub design for flange fitting:

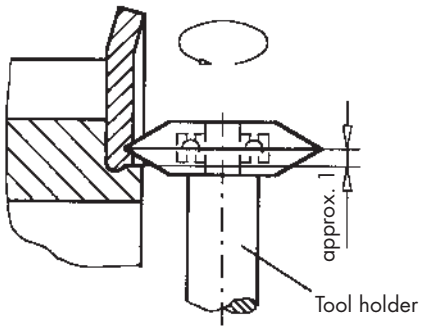


Hub diam. = Flange I.D.

Options for rolling the flanges in place – for standard sprockets:



– for thin-walled sprockets:



Speeds for rolling: 400 to 1000 r.p.m., depending on sprocket diameter.

Higher speeds for smaller sprockets, lower speeds for larger sprockets.

There are additional press tools available to form the seat in groove for the flange.

Mounting and maintenance

Mounting:

The concept used for mounting the PowerGrip HTD synchronous belt drive must be compatible with the belt design. The more carefully the manufacturer's recommendations are followed the more favorable the operating properties, utility and service life will be.

Mounting should be taken into consideration right from the early stages of planning; this applies in particular to the belt length tolerance range.

Due to the relatively low stretch properties of the tensile member, the synchronous belts may never be forced onto the pulleys and under no circumstances should they be forced to roll over the flanges.

We differentiate between mounting procedures for sprockets with an
a) adjustable center distance
b) fixed center distance.

Adjustable center distance

The ability to adjust the distance between the centers is for very convenient mounting. This adjustment can be made, for example, by shifting the centers using an eccentric cam or a wedge or by shifting the motor mount.

This adjustment dimension should, at a minimum, be selected so that the belt can easily be passed over one of the flanged pulleys. The minimum values required here are given in the tables.

PowerGrip HTD adjustment tolerances, without flanges

Center distance (mm)	Shifting distance required to mount the synchronous belt (mm)
up to 1000	1.8
from 1000 to 1780	2.8
from 1780 to 2540	3.3
from 2540 to 3300	4.1
over 3300	5.3

Adjustment tolerances for sprockets with flanges

Pitch	Flange on one pulley (mm)	Flange on both pulleys (mm)
3	8	14
5	14	19
8	22	33
14	36	58
20	47	78

Once the belt has been mounted, the following limit values for adjusting the center distance are to be observed; this is to compensate for tolerances in manufacturing the synchronous belts.

Limit values for the center distance adjustment

Belt length (mm)	Adjustment range for center distance (mm)
up to – 508	± 0.25
509 – 762	± 0.30
762 – 1016	± 0.33
1017 – 1270	± 0.38
1271 – 1524	± 0.41
1525 – 1778	± 0.43
over – 1778	0.03 mm to be added for each 254 mm of additional length

It is important that the center distance, once it has been set, be securely fixed and locked.

Fixed center distance

We differentiate between
– drives using two or more pulleys, entirely without adjustment capabilities
– driving and driven pulley fixed, but the use of an idler or idlers is possible.

In the first case all the tolerances for pulleys, belts and center distances will have to be kept very narrow in order to achieve correct belt tension.

Please contact our application technicians in such cases.

Idlers

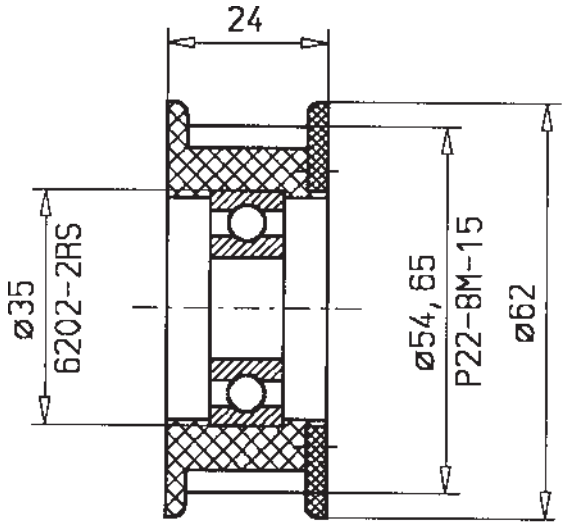
Where idlers can be used, you may use either a toothed idler on the inside or a cylindrical flat pulley on the outside of the belt, on the slack section.

Toothed pulleys of up to 40 teeth are required for use as the **inside idlers**.
Flat idler pulleys may be individualy used on larger diameters. Idler pulleys should not be smaller in diameter than the smallest pulley in the system.

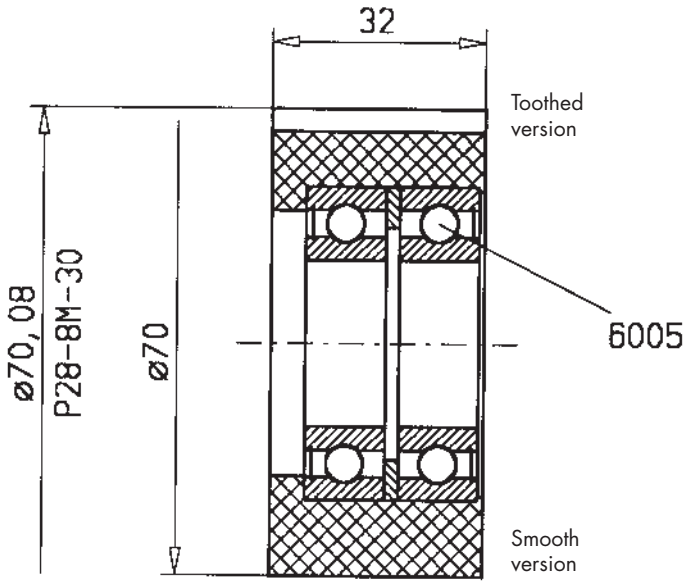
Outside idlers running on the belt backing may not be toothed. The diameter may be not less than the smallest operating pulley in the system. The arc of contact should be kept to a minimum in order to keep the bending of the synchronous belt as small as possible.

Outside idlers may induce unfavorable bending of the synchronous belt. Synchronous belts with polished backing should be specified when engineering particulary high-speed drives for quiet running. The **use of spring-loaded idlers** with synchronous belt drives is not recommended.

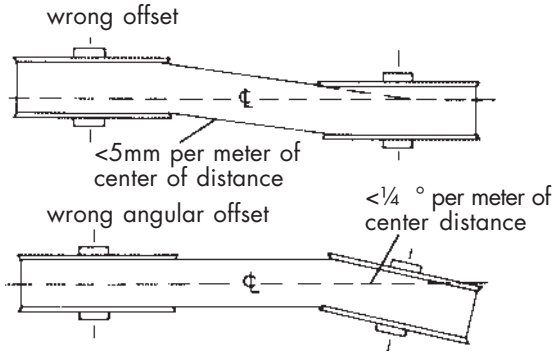
The spring force can induce additional and excessive belt tension which would considerably shorten belt life.
We also offer a selection of idlers running on bearings (also in plastic), as shown in the illustrations. Please make use of our consulting services.



Flanges on both sides



Plastic idlers with bearings



Shaft alignment

Essential for straight and smooth belt running is careful, parallel alignment of the shafts and the pulleys. Unacceptable deviations from the parallel will cause variations in the tensions at the belt edges; as a consequence the belt will tend to drift toward the edge with the greater tension and will rub against one of the flanges. In the latter case and at high speed this may induce excessive running noise and severe belt wear.

At greater center distances it is more difficult to align the shafts exactly; the belt's inclination to drift to the side increases. It is necessary to ensure that the synchronous belt does not tend to run off the outside faces of the pulleys. It may be necessary to shift the driven pulley slightly out of alignment.

We recommend that shaft deviation from the parallel does not exceed ±0.25°.

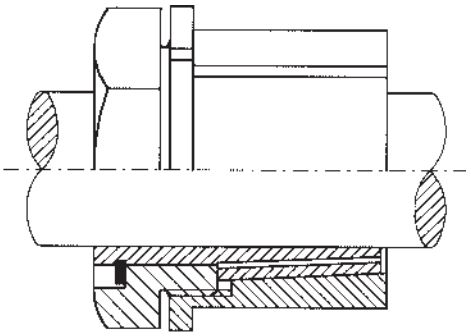
Mounting elements

In the interest of securely attaching the sprocket to the shaft there are – aside from the conventional groove and key connectors – various frictional, detachable tightening elements available to fit all the standard bore diameters.

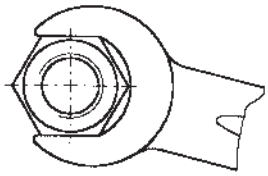
In addition to the TL (TaperLock®) bushings which are generally used with the standard sprockets, we offer an extensive line of cylindrical inner and outer mounting sets. They satisfy all requirements in an ideal fashion.

We recommend giving preference to styles 3000/5006 and 5007, shown on pages 19 and 20.

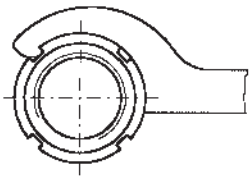
Moreover, there is a line of tightening elements available in graduated sizes and using hex or ring nuts for the fastest possible assembly and disassembly. This innovative installation concept is shown in the sketches. Kindly contact our application engineers in regard to dimensions and the torques which can be transmitted.



Inner mounting element with hex nut



Mounting with open-end wrench



Mounting with a hooked wrench

Friction-fit, cylindrical mounting bushings

– **Simple installation and removal**
The unit is assembled or disassembled by tightening or loosening the screws with conventional tools. Using a torque wrench makes it possible to achieve exact tightening torque.

Oil the screws sparingly before installing them. Do not use oil containing molybdenum sulfide; never use grease.

– **Connection free backlash**
These mounting sets give a zero-play connection for positive power transmission; the connection can be disassembled again at any time.

– **Wide machining tolerances**
The following fits are recommended:
Tolerances at the shaft diameter: h 7 / h 9
Tolerances in the bore through the hub: H 7 / H 9
Surface roughness $R_z \leq 16$

The eccentricity error is between 0.02 and 0.04 mm, depending upon the design; all the mounting devices listed here are self-centering.

– **Long lasting strength**
The shaft and the bore in the hub cannot be weakened by the key working inside the grooves.

– **Simple adjustment**
Because it is not necessary to align the grooves, the components can be attached at an exact angle in any desired position.

– **Overload protection**
If the torque being transmitted exceeds the acceptable limit, slippage within the mounting unit will prevent damage to parts which are joined one with another. Repeated slippage should be avoided.

– **Economical fastening**
Economical join between the shaft and the hub since machining the smooth, cylindrical mating surfaces on the shaft and inside the bore is simple.

Explanation of physical magnitudes

M_S	Nm	Tightening torque for the set screws
M_t	Nm	Maximum transmittable torque
P_{ax}	kN	Axial force which can be transmitted
P_W	N/mm²	Permissible surface pressure on the shaft
P_N	N/mm²	Permissible surface pressure on the hub
P_O	kN	Axial force required to achieve the frictional connection
P_{tot}	kN	Total axial force

Minimum outside diameter of the hub

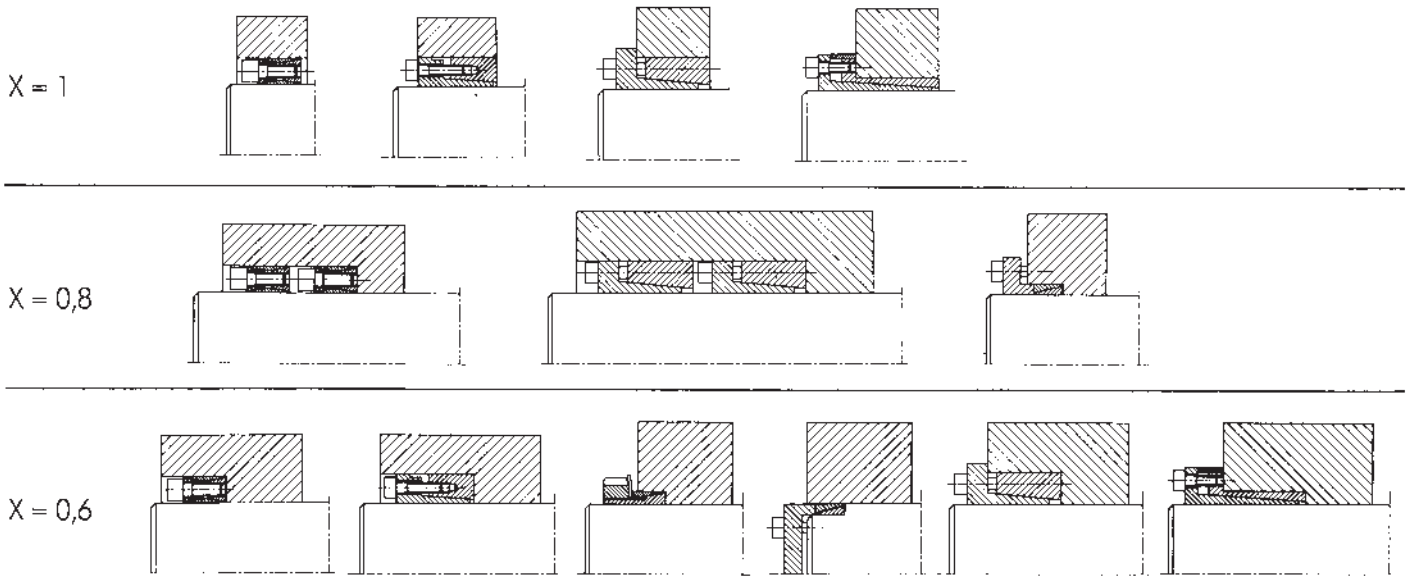
The minimum outside diameter for the hub is obtained by multiplying the outside diameter of the bushings by the factors shown in the table. These factors are dependent upon the elongation (permanent deformation) limit of the hub material and upon the surface pressure P_N on the hub. In addition, factor "x" (refer to the table; dependent on the length of the hub) to be observed.

Examples

1. Hub material: C 35
   Permanent deformation limit: 270 N/mm²
   ML bushings, style 5006, 45 x 75
   Factor x = 1, P_N = 155 N/mm²
   Hub outside diameter = 75 x 1.93 = approx. 145 mm

2. Hub material GG 25
   Permanent deformation limit: 180 N/mm²
   ML bushings: style 3000, 55 ´ 71
   Factor x = 0.6, P_N = 80 N/mm²
   Hub outside diameter = 71 x 1.32 = approx. 94 mm

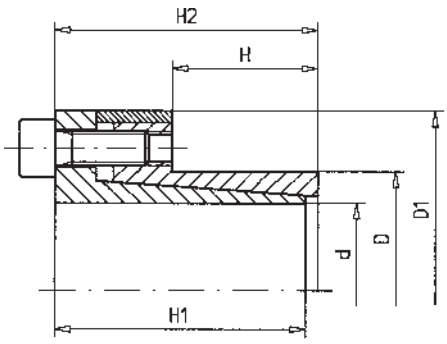
Hub factor



Surface pressure (pressure on the hub) P_N N/mm²	Hub factor X	Permanent deformation limit for the hub material, N/mm²										
		150	180	200	220	250	270	300	350	400	450	600
		Hub material										
		GG 20	GG 25 GS 38	GG 30 GTS 35	GS 45 ST 37-2	GGG 40 GS 52	ST 50-2 C 35	GGG 50 GS 60 ST 60-2	GGG 60 GS 62 ST 70-2	GGG 70 GS 70 C 60	Quenched and tempered steel	
60	0.6	1.29	1.26	1.21	1.19	1.16	1.15	1.13	1.11	1.10	1.09	1.07
	0.8	1.40	1.31	1.25	1.24	1.23	1.21	1.19	1.16	1.13	1.12	1.09
	1	1.53	1.43	1.37	1.33	1.29	1.26	1.23	1.19	1.17	1.15	1.11
65	0.6	1.31	1.26	1.23	1.21	1.19	1.16	1.14	1.12	1.11	1.10	1.08
	0.8	1.45	1.36	1.31	1.29	1.25	1.23	1.21	1.17	1.15	1.13	1.10
	1	1.61	1.46	1.41	1.36	1.31	1.29	1.25	1.21	1.19	1.17	1.13
70	0.6	1.35	1.27	1.25	1.23	1.19	1.17	1.16	1.13	1.12	1.11	1.08
	0.8	1.49	1.39	1.35	1.31	1.26	1.24	1.21	1.19	1.16	1.14	1.11
	1	1.66	1.51	1.46	1.41	1.35	1.31	1.26	1.23	1.21	1.18	1.14
75	0.6	1.31	1.29	1.26	1.24	1.21	1.19	1.16	1.15	1.13	1.12	1.09
	0.8	1.53	1.43	1.37	1.33	1.29	1.26	1.23	1.19	1.17	1.15	1.12
	1	1.75	1.56	1.49	1.43	1.37	1.34	1.31	1.26	1.21	1.19	1.14
80	0.6	1.40	1.32	1.29	1.26	1.22	1.21	1.19	1.16	1.14	1.12	1.09
	0.8	1.59	1.46	1.40	1.36	1.31	1.28	1.25	1.21	1.19	1.16	1.12
	1	1.82	1.62	1.54	1.47	1.40	1.37	1.32	1.27	1.23	1.21	1.15
85	0.6	1.43	1.35	1.31	1.28	1.24	1.22	1.20	1.17	1.15	1.13	1.10
	0.8	1.64	1.50	1.43	1.39	1.33	1.30	1.27	1.23	1.20	1.17	1.13
	1	1.91	1.68	1.58	1.51	1.43	1.40	1.35	1.29	1.25	1.22	1.16
90	0.6	1.47	1.37	1.33	1.29	1.26	1.23	1.21	1.18	1.16	1.14	1.10
	0.8	1.70	1.54	1.47	1.41	1.35	1.32	1.29	1.24	1.21	1.19	1.14
	1	2.01	1.74	1.63	1.55	1.47	1.42	1.37	1.31	1.27	1.23	1.17
95	0.6	1.50	1.40	1.35	1.31	1.27	1.25	1.22	1.19	1.16	1.15	1.11
	0.8	1.76	1.58	1.50	1.44	1.38	1.35	1.31	1.26	1.22	1.20	1.15
	1	2.12	1.81	1.69	1.60	1.50	1.45	1.40	1.33	1.28	1.25	1.18
100	0.6	1.54	1.42	1.37	1.33	1.29	1.26	1.23	1.20	1.17	1.15	1.12
	0.8	1.82	1.62	1.54	1.47	1.40	1.37	1.32	1.27	1.23	1.21	1.15
	1	2.25	1.88	1.74	1.64	1.54	1.49	1.42	1.35	1.30	1.26	1.19
105	0.6	1.57	1.45	1.40	1.35	1.30	1.28	1.25	1.21	1.18	1.16	1.12
	0.8	1.89	1.67	1.57	1.51	1.43	1.39	1.34	1.29	1.25	1.22	1.16
	1	2.39	1.96	1.80	1.69	1.57	1.52	1.45	1.37	1.32	1.28	1.20
110	0.6	1.61	1.48	1.42	1.37	1.32	1.29	1.26	1.22	1.19	1.17	1.13
	0.8	1.97	1.72	1.61	1.54	1.45	1.41	1.36	1.30	1.26	1.23	1.17
	1	2.56	2.05	1.87	1.74	1.61	1.55	1.48	1.39	1.34	1.29	1.21
115	0.6	1.65	1.51	1.44	1.37	1.34	1.31	1.27	1.23	1.20	1.18	1.13
	0.8	2.05	1.77	1.65	1.57	1.48	1.44	1.38	1.32	1.27	1.24	1.18
	1	2.76	2.14	1.94	1.80	1.65	1.59	1.51	1.42	1.35	1.31	1.22
120	0.6	1.70	1.54	1.47	1.40	1.35	1.32	1.29	1.24	1.21	1.19	1.14
	0.8	2.14	1.82	1.70	1.61	1.51	1.46	1.40	1.34	1.29	1.25	1.19
	1	3.01	2.25	2.01	1.85	1.70	1.62	1.54	1.44	1.37	1.32	1.23
125	0.6	1.74	1.57	1.49	1.44	1.37	1.34	1.30	1.25	1.22	1.19	1.14
	0.8	2.25	1.88	1.74	1.64	1.54	1.49	1.42	1.35	1.30	1.26	1.19
	1	3.33	2.36	2.09	1.92	1.74	1.66	1.57	1.46	1.39	1.34	1.25
130	0.6	1.79	1.60	1.52	1.46	1.39	1.36	1.31	1.26	1.23	1.20	1.15
	0.8	2.36	1.94	1.79	1.68	1.57	1.51	1.45	1.37	1.31	´1.28	1.20
	1	3.75	2.50	2.18	1.98	1.79	1.70	1.60	1.49	1.41	1.36	1.26
135	0.6	1.84	1.62	1.55	1.48	1.41	1.37	1.33	1.28	1.24	1.21	1.16
	0.8	2.49	2.01	1.84	1.72	1.60	1.54	1.47	1.39	1.33	1.20	1.21
	1	4.37	2.66	2.28	2.05	1.84	1.74	1.63	1.51	1.43	1.37	1.27
140	0.6	1.89	1.67	1.57	1.51	1.43	1.39	1.34	1.29	1.25	1.22	1.16
	0.8	2.64	2.08	1.89	1.76	1.63	1.55	1.49	1.40	1.34	1.30	1.22
	1	5.40	2.84	2.39	2.13	1.89	1.79	1.67	1.54	1.45	1.39	1.28
145	0.6	1.95	1.70	1.60	1.53	1.45	1.41	1.36	1.30	1.26	1.23	1.17
	0.8	2.81	2.16	1.95	1.81	1.66	1.59	1.51	1.42	1.36	1.31	1.23
	1	7.67	3.06	2.51	2.22	1.95	1.83	1.70	1.56	1.47	1.41	1.29
150	0.6	2.01	1.74	1.63	1.55	1.47	1.42	1.37	1.31	1.27	1.24	1.17
	0.8	3.01	2.25	2.01	1.85	1.70	1.62	´1.54	1.44	1.37	1.32	1.24
	1	–	3.33	2.66	2.31	2.01	1.88	1.74	1.59	1.49	1.42	1.30
155	0.6	2.07	1.78	1.66	1.58	1.49	1.44	1.39	1.32	1.28	1.25	1.18
	0.8	3.26	2.34	2.07	1.90	1.73	1.66	1.56	1.46	1.39	1.34	1.24
	1	–	3.67	2.81	2.41	2.07	1.93	1.78	1.62	1.52	1.44	1.31
160	0.6	2.14	1.82	1.70	1.61	1.51	1.46	1.40	1.34	1.29	1.25	1.19
	0.8	3.56	2.44	2.14	1.95	1.77	1.68	1.59	1.48	1.40	1.35	1.25
	1	–	4.13	3.01	2.53	2.14	1.99	1.82	1.65	1.54	1.48	1.32
165	0.6	2.22	1.87	1.73	1.63	1.53	1.48	1.42	1.35	1.30	1.26	1.19
	0.8	3.97	2.56	2.22	2.01	1.81	1.72	1.61	1.50	1.42	1.36	1.26
	1	–	4.81	3.24	2.66	2.22	2.05	1.87	1.68	1.56	1.48	1.34

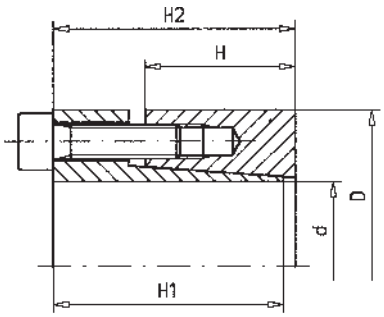
Type 3000

This mounting type is self aligning with a very good concentricity. The small outside diameter is space saving and suitable for small sprocket diameter.
By the spacer between flange and hub the correct assembling is guaranteed in axial direction. There is an exact positioning, also without axial collar. For dismatting the counter thread in the outer flange must be used.



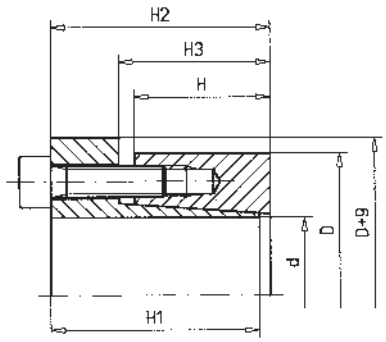
d x D mm	H mm	H_1 mm	H_2 mm	D_1 mm	Number Z	Screws DIN 912-12.9	M_s Nm	M_t Nm	F_{AX} kN	p_N N/mm²
6 x 14	10	19.5	21.5	25	4	M 3	2.3	14	4.6	87
8 x 15	12	22	25	27	3	M 4	4.9	28	6.9	101
9 x 16	14	22	26	29	4	M 4	4.9	41	9.2	108
10 x 16	14	22	26	29	4	M 4	4.9	46	9.2	108
11 x 18	14	23	26	32	4	M 4	4.9	50	9.2	96
12 x 18	14	23	26	32	4	M 4	4.9	55	9.2	96
14 x 23	14	23	26	38	4	M 4	4.9	64	9.2	75
15 x 24	16	33	36	44	4	M 6	17	135	18.0	124
16 x 24	16	33	36	44	4	M 6	17	144	18.0	124
18 x 26	18	33	38	47	4	M 6	17	194	21.5	122
19 x 27	18	33	38	48	4	M 6	17	205	21.5	118
20 x 28	18	33	38	49	4	M 6	17	216	21.5	113
22 x 32	25	40	45	54	4	M 6	17	237	21.5	71
24 x 34	25	40	45	56	4	M 6	17	259	21.5	67
25 x 34	25	40	45	56	4	M 6	17	270	21.5	67
28 x 39	25	40	45	61	6	M 6	17	453	32.3	88
30 x 41	25	40	45	62	6	M 6	17	485	32.3	84
32 x 43	30	45	50	65	8	M 6	17	690	43.1	89
35 x 47	30	45	50	69	8	M 6	17	755	43.1	81
38 x 50	30	45	50	72	8	M 6	17	820	43.1	76
40 x 53	30	45	50	75	8	M 6	17	863	43.1	72
42 x 55	40	59	65	78	8	M 8	41	1.676	79.7	96
45 x 59	40	59	65	85	8	M 8	41	1.795	79.7	90
48 x 62	45	64	70	87	8	M 8	41	1.915	79.7	76
50 x 65	45	64	62	92	10	M 8	41	2.494	99.6	90
55 x 71	50	69	67	98	10	M 8	41	2.743	99.6	74
60 x 77	50	69	67	104	10	M 8	41	2.992	99.6	69
65 x 84	50	69	67	111	10	M 8	41	3.242	99.6	63
70 x 90	60	69	80	119	10	M 10	83	5.758	164.2	81
75 x 95	60	84	80	126	10	M 10	83	6.169	164.2	76
80 x100	65	89	86	131	12	M 10	83	7.896	197.1	80
85 x106	65	89	86	137	12	M 10	83	8.390	197.1	76
90 x112	65	89	86	143	15	M 10	83	11.104	246.4	90
95 x120	65	89	86	153	15	M 10	83	11.721	246.4	84
100 x125	65	94	86	162	12	M 12	145	14.586	291.3	95

Type 5006 and 5007



This mounting type is the most priceworthy and preferred one.
It is smaller in width and suitable for narrow hub lengths. Diameters are same.
Type 5007 has a bigger flange diameter for a better positioning in axial direction due to the shoulder.
The friction between outer ring and hub reduces the transmittable torque comparing with the values for type 5006.
Both types are self concentrical and dragging. Due to extensive demand those types are always ex stock.

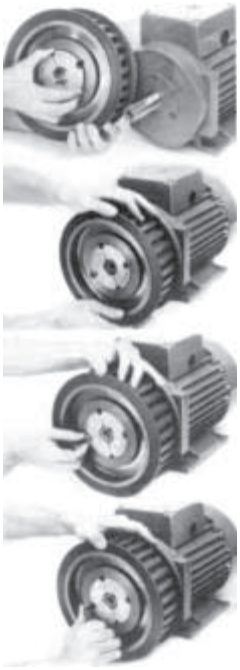
d x D mm	H mm	H_1 mm	H_2 mm	Number Z	Screws DIN 912-12.9	M_s Nm	M_t Nm	F_{AX} kN	p_N N/mm²
20 x 47	17	25	28	6	M 6	14	343	34.3	114
22 x 47	17	25	28	6	M 6	14	377	34.3	114
24 x 50	17	25	28	6	M 6	14	411	34.3	107
25 x 50	17	25	28	6	M 6	14	428	34.3	107
28 x 55	17	25	28	6	M 6	14	480	34.3	97
30 x 55	17	25	28	6	M 6	14	514	34.3	97
32 x 60	17	25	28	8	M 6	14	731	45.7	119
35 x 60	17	25	28	8	M 6	14	799	45.7	119
38 x 65	17	25	28	8	M 6	14	868	45.7	110
40 x 65	17	25	28	8	M 6	14	914	45.7	110
42 x 75	20	30	33	8	M 8	35	1.840	87.6	155
45 x 75	20	30	33	8	M 8	35	1.971	87.6	155
48 x 80	20	30	33	8	M 8	35	2.102	87.6	145
50 x 80	20	30	33	8	M 8	35	2.190	87.6	145
55 x 85	20	30	33	8	M 8	35	2.409	87.6	137
60 x 90	20	30	33	8	M 8	35	2.628	87.6	129
65 x 95	20	30	33	8	M 8	35	2.847	87.6	122
70 x110	24	36	40	8	M 10	70	4.996	142.7	143
75 x115	24	36	40	8	M 10	70	5.353	142.7	137
80 x120	24	36	40	8	M 10	70	5.709	142.7	131
85 x125	24	36	40	10	M 10	70	7.583	178.4	158
90 x130	24	36	40	10	M 10	70	8.029	178.4	152
100 x145	26	40	44	8	M 12	125	10.780	215.6	152
110 x155	26	40	44	8	M 12	125	11.858	215.6	142
120 x165	26	40	44	10	M 12	125	16.171	269.5	167
130 x180	34	48	52	12	M 12	125	21.022	323.4	140
140 x190	34	50	54	10	M 14	190	24.262	346.6	142
150 x200	34	50	54	10	M 14	190	25.995	346.6	135
160 x210	34	50	54	12	M 14	190	33.273	415.9	155
170 x225	44	60	64	12	M 14	190	35.353	415.9	111
180 x235	44	60	64	12	M 14	190	37.432	415.9	107
190 x250	44	60	64	15	M 14	190	49.390	519.9	125
200 x260	44	60	64	15	M 14	190	51.989	519.9	121



d x D mm	H mm	H_1 mm	H_2 mm	H_3 mm	Number Z	Screws DIN 912-12.9	M_s Nm	M_t Nm	F_{AX} kN	p_N N/mm²
20 x 47	17	25	28	22	6	M 6	17	323	32.3	107
22 x 47	17	25	28	22	6	M 6	17	355	32.3	107
24 x 50	17	25	28	22	6	M 6	17	388	32.3	101
25 x 50	17	25	28	22	6	M 6	17	404	32.3	101
28 x 55	17	25	28	22	6	M 6	17	452	32.3	92
30 x 55	17	25	28	22	6	M 6	17	485	32.3	92
32 x 60	17	25	28	22	8	M 6	17	689	43.1	112
35 x 60	17	25	28	22	8	M 6	17	754	43.1	112
38 x 65	17	25	28	22	8	M 6	17	818	43.1	103
40 x 65	17	25	28	22	8	M 6	17	861	43.1	103
42 x 75	20	30	33	25	8	M 8	41	1.673	79.7	141
45 x 75	20	30	33	25	8	M 8	41	1.792	79.7	141
48 x 80	20	30	33	25	8	M 8	41	1.912	79.7	132
50 x 80	20	30	33	25	8	M 8	41	1.992	79.7	132
55 x 85	20	30	33	25	8	M 8	41	2.191	79.7	124
60 x 90	20	30	33	25	8	M 8	41	2.390	79.7	117
65 x 95	20	30	33	25	8	M 8	41	2.589	79.7	111
70 x110	24	36	40	30	8	M 10	83	4.599	131.4	132
75 x115	24	36	40	30	8	M 10	83	4.927	131.4	126
80 x120	24	36	40	30	8	M 10	83	5.256	131.4	121
85 x125	24	36	40	30	10	M 10	83	6.980	164.2	145
90 x130	24	36	40	30	10	M 10	83	7.391	164.2	140
100 x145	26	40	44	32	8	M 12	145	9.708	194.2	137
110 x155	26	40	44	32	8	M 12	145	10.679	194.2	128
120 x165	26	40	44	32	10	M 12	145	14.563	242.7	150
130 x180	34	48	52	40	12	M 12	145	18.931	291.3	126
140 x190	34	50	54	40	10	M 14	230	22.801	325.7	134
150 x200	34	50	54	40	10	M 14	230	24.429	325.7	127
160 x210	34	50	54	40	12	M 14	230	31.270	390.9	145
170 x225	44	60	64	50	12	M 14	230	33.224	390.9	105
180 x235	44	60	64	50	12	M 14	230	35.178	390.9	100
190 x250	44	60	64	50	15	M 14	230	46.416	488.6	118
200 x260	44	60	64	50	15	M 14	230	48.859	488.6	113

Taper Lock® mounting bushings

In addition to the cylindrical mounting bushings mentioned above, there is also a great line of conical TaperLock® mounting bushings available. Details are shown on pages 20 and 21.



Installation
Clean and degrease all bright surfaces. Insert the bushing in the sprocket, align the holes and turn down the screws loosely. ◎

Slide the sprocket and the bushing onto the shaft; align and then tighten down the screws alternately and uniformly, applying the tightening torque specified in the table.

Fill the empty holes with grease in order to keep dirt out.

Removal
Remove the screws and use one of them as a puller screw; insert this screw in the hole at the bushing which is threaded on one side only and turn down the screw to separate the bushing components. ●

This will loosen the TaperLock® bushing. The sprocket unit, now loose on the shaft, can be removed by hand – **without force or impact and without damaging the machine.**

1008 to 3030

3525 to 5050

◎ Mounting holes
● Removal holes

Where it is necessary to transfer high torques and no key is used, the TaperLock® bushings can be driven further into the conical bore, using a suitable sleeve or wooden block and tapping gently with a mallet or hammer. It will then be possible to turn the screws down a little further. This procedure may be repeated.

1008	1108	1210	1610	1615	2012	2517	3020	3030	Taper Lock® bushing	3525	3535	4030	4040	4535	4545	5040	5050
5,6	5,6	20	20	20	30	50	90	90	Tightening torque for the srews (Nm)	115	115	170	170	190	190	270	270
2	2	2	2	2	2	2	2	2	Number of screws	3	3	3	3	3	3	3	3
1/4"	1/4"	3/8"	3/8"	3/8"	7/16"	1/2"	5/8"	5/8"	Screw size (inch)	1/2"	1/2"	5/8"	5/8"	3/4"	3/4"	7/8"	7/8"
3	3	5	5	5	6	6	8	8	hex. key width	10	10	12	12	14	14	14	14

Taper Lock® mounting bushing	Bushing bore (mm)	Slip torque* (Nm)	Clamping force (N)
1008	12 19 24	29 51 66	3990 4940 5490
1108	12 19 24 28	28 49 64 79	– 4630 5220 5720
1210	16 19 24 32	82 105 142 210	8840 9800 10900 12300
1610 + 1615	19 24 38 42	98 135 240 265	– 9570 11900 12700
2012	24 38 42 48 50	165 310 340 400 420	11500 14400 15700 – 16700
2517	24 38 42 48 55 60	220 380 430 510 600 670	– 17000 18500 – 21000 22300

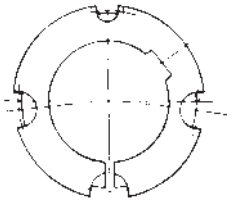
Taper Lock® mounting bushing	Bushing bore (mm)	Slip torque* (Nm)	Clamping force (N)
3020 + 3030	38 48 55 60 75	520 730 890 970 1300	23900 26100 29900 31500 34500
3525 + 3535	42 60 75 90	1000 1580 2150 2600	41000 49800 54800 59000
4030 + 4040	48 60 75 100	1700 2300 3150 4400	– 70200 77200 89400
4535 + 4545	55 75 100 110	2500 3900 5500 6300	79600 93000 107700 –
5040 + 5050	75 100 125	3950 5650 7370	91800 106600 119500

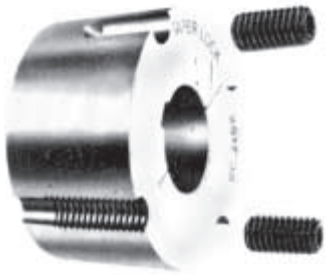
* The slip torques indicated were determined at test beds, with the screws torqued down to the specified values.

TaperLock® is a registered trademark of J. H. Fenner and Co. Ltd.

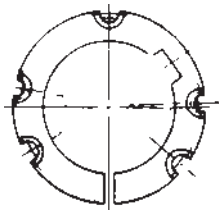
Taper Lock® mounting bushings

4-hole





5-hole



Bushing No.	Bushing bore (mm)	Groove for key (mm)		Bushing length (mm)	Weight, approx. (kg)	Largest diameter (mm)
		Width	Depth			
1008	10 11 12 14 16 18 19 20 22 24 25	3 4 5 6 8	1.4 1.8 2.3 2.8 1.3*	22.3	0.15 to 0.08	35
1108	10 11 12 14 16 18 19 20 22 24 25 28	3 4 5 6 8 8	1.4 1.8 2.3 2.8 3.3 1.3*	22.3	0.18 to 0.10	38
1210	11 12 14 16 18 19 20 22 24 25 28 30 32	4 5 6 8 10	1.8 2.3 2.8 3.3 3.3	25.4	0.17 to 0.30	47.5
1310	14 16 18 19 20 22 24 25 28 30 32 35	5 6 8 10 10	2.3 2.8 3.3 3.3 1.3*	25.4	0.19 to 0.33	51
1610	14 15 16 18 19 20 22 24 25 28 30 32 35 38 40 42	5 6 8 10 12	2.3 2.8 3.3 3.3 3.3	25.4	0.42 to 0.20	57
1615	14 16 18 19 20 22 24 25 28 30 32 35 38 40 42	5 6 8 10 12	2.3 2.8 3.3 3.3 1.3*	38.1	0.60 to 0.25	57
2012	14 16 18 19 20 22 24 25 28 30 32 35 38 40 42 45 48 50	5 6 8 10 12 14	2.3 2.8 3.3 3.3 3.3 3.8	31.8	0.80 to 0.38	70
2517	16 18 19 20 22 24 25 28 30 32 35 38 40 42 45 48 50 55 60	5 6 8 10 12 14 16 18	2.3 2.8 3.3 3.3 3.3 3.8 4.3 4.4	44.5	1.7 to 0.80	85.5
3020	25 28 30 32 35 38 40 42 45 48 50 55 60 65 70 75	8 10 12 14 16 18 20	3.3 3.3 3.3 3.8 4.3 4.3 4.9	50.8	2.8 to 1.5	108
3030	35 38 40 42 45 48 50 55 60 65 70 75	10 12 14 16 18 20	3.3 3.3 3.8 4.3 4.4 4.9	76.2	4.0 to 2.1	108

Bushing No.	Bushing bore (mm)	Groove for key (mm)		Bushing length (mm)	Weight, approx. (kg)	Largest diameter (mm)
		Width	Depth			
3525	35 38 40 42 45 48 50 55 60 65 70 75 80 85 90 95 100	10 12 14 16 18 20 22 25 28	3.3 3.3 3.8 4.3 4.4 4.9 5.4 5.4 4.4*	64	5.5 to 1.8	127
3535	35 38 40 42 45 48 50 55 60 65 70 75 80 85 90	10 12 14 16 18 20 22 25	3.3 3.3 3.8 4.3 4.4 4.9 5.4 5.4	88.9	6.6 to 3.2	127
4030	40 42 45 48 50 55 60 65 70 75 80 85 90 95 100 105 110 115	12 14 16 18 20 22 25 28 32	3.3 3.8 4.3 4.4 4.9 5.4 5.4 6.4 5.4*	76	7.4 to 4.2	146
4040	40 42 45 48 50 55 60 65 70 75 80 85 90 95 100	12 14 16 18 20 22 25 28	3.3 3.8 4.3 4.4 4.9 5.4 5.4 6.4	101.6	10.1 to 5.2	146
4535	55 60 65 70 75 80 85 90 95 100 105 110 115 120 125	16 18 20 22 25 28 32	4.3 4.4 4.9 5.4 5.4 6.4 7.4	89	10.7 to 4.2	162
4545	55 60 65 70 75 80 85 90 95 100 105 110	16 18 20 22 25 28	4.3 4.4 4.9 5.4 5.4 6.4	114.3	13.2 to 7.4	162
5040	70 75 80 85 90 95 100 105 110 115 120 125	20 22 25 28 32	4.9 5.4 5.4 6.4 7.4	102	12.2 to 6.2	178
5050	70 75 80 85 90 95 100 105 110 115 120 125	20 22 25 28 32	4.9 5.4 5.4 6.4 7.4	127	15.2 to 9.2	178

* Bore with flat groove

Maintenance and storage

PowerGrip HTD synchronous belts incorporate a tensile member which is stable in the longitudinal dimension and will permit no permanent elongation during operation. It is for this reason that there is no need to correct belt tensioning; no special maintenance is required.

There is, however, a danger if the synchronous belts, which should be laid very loose during storage, could be crimped or folded. This can cause damage to the cords and a loss of power transmission capacity. Do never crimp sharply.

We recommend leaving the synchronous belts in the factory packaging until they are installed and, during storage, to protect them against wide temperature fluctuations, high humidity and ultraviolet radiation.

Belt tension

The PowerGrip HTD synchronous belts must be under a certain amount of tension to ensure that positive tooth engagement is maintained even in case of shock loading or brief overloads.

Excessive pre-load will reduce the drive's service life while increasing the loads on the bearings, tooth wear and running noise.

Insufficient tension can result in the teeth not engaging correctly in the grooves at the sprockets' circumferences; this could cause tooth jump in case of overload.

At proper belt tension the radial load on the bearings used in the HTD synchronous belt drive is very low; experience has shown that it will attain only 1.2 times the value of the circumferential force being transmitted.

Checking the belt tension

We distinguish between two different methods for checking belt tension.

1. Test load method

The HTD synchronous belt should be mounted with sufficient tension if test load Fp is applied at the center of the span (s/2) it will be deflected from a straight line by d = $s/_{50}$.

The required value for the test load is between the maximum and minimum values which can be calculated using the formula given below.

As a general rule, the lower value is to be used for standard drives and where loading is moderate, whereas drives with extreme loading peaks and/or frequent starts should be pre-loaded to a higher value.

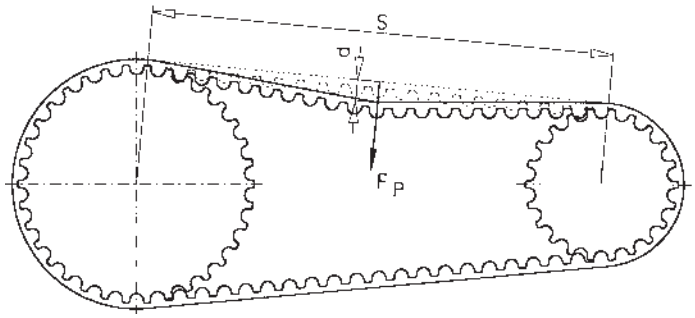
The test loads for all belt pitches, depending on drive power P measured in kW and belt velocity v in m/s, are in accordance with the following formulae:

$$Fp_{max.} = \frac{P \cdot 50}{v} \quad (N)$$

$$Fp_{min.} = \frac{P \cdot 25}{v} \quad (N)$$

Deflection

at Fp = Test load (N)
at d = Deflection
at s = Span length (center distance)



2. Frequency measurement

An exact method for setting proper belt tension is to measure the frequency using the WF Tension Meter. Using a test sensor which is held against the installed belt, the frequency of the pre-tightened belt can be determined, thus achieving ideal belt tension values. Kindly apply to our applications technology department for detailed descriptions of this test instrument and calculation documentation.

WF - Tension Meter

Troubleshooting

Failure	Cause of Failure	Corrective action
Excessive drive noise	Sprockets misaligned Excessive belt tension Drive system overloaded Sprocket wear Incorrect sprocket groove profile Flange with too large surface contact Air displacement in the gaps between teeth	Align sprockets Reduce belt pre-load Increase belt width Replace the sprocket Install sprocket with correct groove profile Use standardized flanges Special profile
Apparent belt stretch	Center distance shortened due to loosening of the shaft or sprocket mounts Sprocket wear (outside diameter) Drive system overload Drive heating and subsequent cooling Excessive change in synchronous belt material (melting, softening)	Readjust center distance and reinforce the mounts Replace sprocket Re-engineer the drive system Check the coefficient of thermal expansion and, if indicated, use different materials Reduce temperatures within the permissible temperature ranges
Lateral belt run-off	Belt running off the side of the sprocket Excessive belt edge wear	Correct the drive alignment Correct the drive alignment
Detachment of flanges	Non-alignment of the sprockets resulting in excessive axial forces	Align sprockets
Excessive belt edge wear	Center lines not absolutely parallel or change in center distance due to insufficient strength of bearings and shafts Flanges defective or without angle Damage due to improper handling Synchronous belts too wide	Examine to ensure that center lines are parallel and/or reinforce shafts and bearings Align or replace the flanges Follow mounting instructions Install sprockets of correct width
Premature tooth wear	Belt pre-load too high or too low Belt runs off over the flange Belt profile does not match the sprocket grooves Sprocket is wear Sprocket surface is too rough Overloading Excessive damage by foreign-object	Correct the belt pre-load. Align flanges and correct the belt pre-load. Use PowerGrip HTD belts on PowerGrip HTD sprockets. Replace sprocket. Replace sprocket. Re-engineer the system Install belt cover
Belt teeth shear off	Too few teeth in mesh Drive system overloaded Sprocket is worn Belt profile does not match the sprocket Insufficient belt pre-load Extreme shock loading	Increase the number of teeth at the sprockets or use a smaller pitch Use wider belt Replace sprocket Use the correct tooth profile Adjust for correct belt pre-load Re-engineer the system
Belt break	Sprocket diameter is too small Drive system overload Foreign objects Incorrect handling of the synchronous belt during installation; previous damage due to bending	Use larger-diameter sprocket or stronger belt Use wider synchronous belt Install a cover for the drive system Follow installation instructions
Abnormal wear at the sprocket (outside diameter or loads on tooth flanks)	Excessive belt pre-load or drive system overload Sprocket diameter(s) too small Incorrect profile Foreign objects	Reduce belt pre-load or increase belt width; re-engineer system if necessary Use correctly dimensioned sprocket(s) Use correct drive system Install a cover for the drive system
Formation of crucks on belt backing	Operating temperature too low Operating temperature too high Strong chemicals	Avoid low temperatures Avoid high temperatures Install drive cover
Excessive temperature	Belt pre-load too high or too low Incorrect toothed belt profile or sprocket groove profile Outside diameter too large	Adjust for correct belt pre-load Install correctly designed drive system Correct the outside diameter
Vibrations	Belt pre-load too high or too low Sprocket is loose Vibrations in the slack span	Correct belt tension Re-tighten sprockets and mount according to instructions Install tangential idler

Calculations

General

Used as the basis for determining belt dimensioning is a calculation technique which takes into account the following influencing parameters: power, speed, operating characteristics of the driving and driven equipment, duty cycle, number of teeth in mesh, transmission ratio and center distance.

All datas on the torque, transmission the speed and the length of the PowerGrip HTD synchronous belt are referenced so-called belt pitch line, which is assumed to be at the center of the tensile member. The effective force line (pitch line) is dimensioned as precisely as possible and coincides with the sprocket effective diameter (pitch diameter). Half of the difference between the pitch diameter and the outside diameter is equal to the dimension from the root of the belt grooves to the center of the tensile member.

Right from the calculation and later while dimensioning the drive, it should be kept in mind that ideal exploitation of power transfer capabilities, long service life and high efficiency can be achieved only if all the operating conditions are known during the engineering phase so that critical conditions can be taken into account early in project development work. The project sheet on page 54 is provided for your assistance.

An approximate, preliminary selection of suitable belt pitch can be made using the chart provided on page 4.

Taking account the synchronous belt's own intrinsic loading, it is advantageous to select always a belt width which is narrower than the diameter of the smaller sprocket. The wider the synchronous belt, the more easily divergent tension levels may be induced at the edges if installation is not precise; this can have an unfavorable effect on proper belt running. In borderline cases it is often better to select a larger pitch so that a narrower belt may be used.

Please select the largest possible sprocket diameters. In doing so you employ the most favorable performance range at high circumferential speed. The flexural load and the width of the belt both decline with rising diameter.

Abbreviations

α	Coefficient of thermal expansion	1/K
a	Acceleration	m/sec^2
A	Center distance	mm
b	Deceleration	m/sec^2
b_R	Belt width	mm
B	Sprocket width	mm
B_w	Flexural cycle	1/sec
C_{spez}	Specific spring constant	N
d_B	Bore diameter	mm
d_a	Outside diameter	mm
d_w	Pitch diameter	mm
d_{wk}	Pitch diameter, small sprocket	mm
d_{wg}	Pitch diameter, large sprocket	mm
ε	Elongation	%
F_a	Acceleration force	N
F_b	Braking force	N
F_B	Calculated drive power	N
F_H	Lift force	N
F_P	Belt tension test load	N
F_R	Friction force	N
F_t	Span force	N
F_U	Circumferential force	N
F_V	Pre-load force	N
F_{zul}	Permissible circumferential force	N
g	Acceleration due to gravity	m/sec^2
h_s	Belt thickness	mm
h_t	Tooth height	mm
i	Transmission ratio	
l_w	Effective length	mm
l_t	Length of taut span	mm
M	Torque	Nm
m	Mass	kg
m_L	Mass of the load	kg
m_R	Mass of the belt	kg
m_{ges}	Total weight	kg
m_Z	Mass of the sprocket	kg
$m_{Z, red}$	Reduced sprocket mass	kg
n	Revolution perminats (RPM)	l/min
n_{MOT}	Revolution per minute of motor (RPM)	l/min
P	Load	kW
P_B	Calculated power	kW
P_N	Nominal power	kW
S_{fail}	Failure safety	
S_G	Overall service factor	
S_1	Load factor	
S_2	Ratio factor	
S_3	Ratio factor	
S_4	Flexure factor	
S_5	Special service factor	
S_6	Belt length factor	
S_7	Belt width factor	
t	Pitch	
v	Velocity	m/sec
z	Number of sprockets	
z_e	Number of teeth in mesh	
z_g	Number of teeth, large sprocket	
z_k	Number of teeth, small sprocket	

(As the formulas are uniform for all corresponding catalogues, it may be that not all formulas appear in this catalogue.)

Calculation formulae

Torque

$$M = \frac{P \cdot 9.55 \cdot 10^3}{n} = \frac{F_U \cdot d_w}{2 \cdot 10^3} \text{ [Nm]}$$

Power

$$P = \frac{M \cdot n}{9.55 \cdot 10^3} = \frac{F_U \cdot v}{10^3} \text{ [kW]}$$

Circumferential force

$$F_U = \frac{P \cdot 10^3}{v} = \frac{M \cdot 2 \cdot 10^3}{d_w} \text{ [N]}$$

Revolution

$$n = \frac{19.1 \cdot 10^3 \cdot v}{d_w} \text{ [min}^{-1}\text{]}$$

Circumferential speed

$$v = \frac{d_w \cdot n}{19.1 \cdot 10^3} \left[\frac{m}{sec}\right]$$

Acceleration force

$F_a = m \cdot a$ [N]

Braking force

$F_b = m \cdot b$ [N]

Lifting force

$F_H = m \cdot g$ [N]

Frictional force

$F_R = m \cdot g \cdot \mu$ [N]

Mass

$m = m_L + m_R + m_{Zred}$ [kg]
mit $m_R = l_W \cdot m_G$

Reduced sprocket mass

$$m_{Zred} = \frac{m_Z}{2} \cdot \left(1 + \frac{d_B^2}{d_a^2}\right) \text{ [kg]}$$

Sprocket mass

$$m_Z = \frac{(d_a^2 - d_B^2) \cdot \pi \cdot B \cdot \varsigma}{4 \cdot 10^6} \text{ [kg]}$$

ς = Density

Elongation

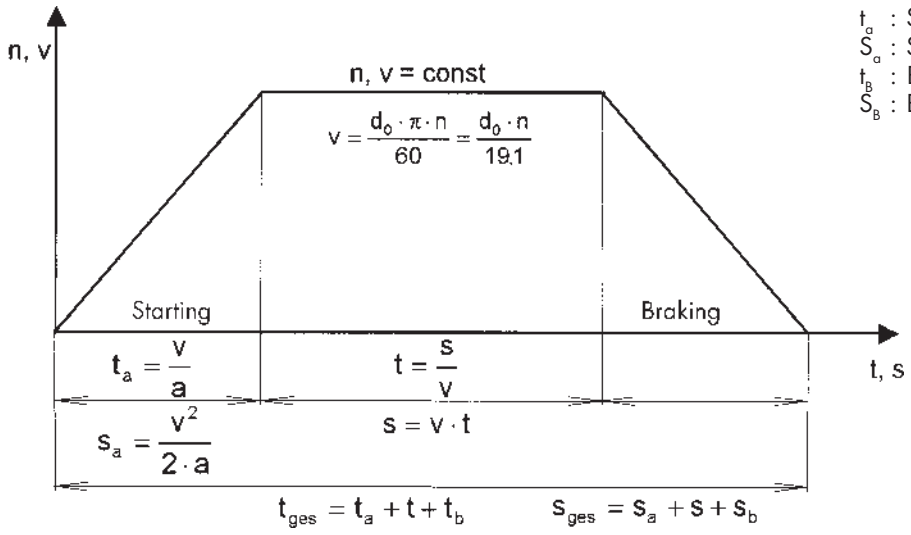
$$\varepsilon = \frac{\Delta l \cdot 100}{l_t} \text{ [\%]}$$

Specific spring constant

$$C_{spec} = \frac{F_{admissible} \cdot 100}{\varepsilon} \text{ [N]}$$

Flexure cycles

$$B_w = \frac{v \cdot z \cdot 10^3}{l_w} \text{ [1/sec]}$$



t_a : Starting period
S_a : Starting distance
t_B : Braking period
S_B : Braking distance

Motion equations for acceleration and braking processes

Factors used in calculation

An overall service factor S_G is required for drive system calculations:

$S_G = S_2 \cdot (S_1 + S_3 + S_4 - S_5)$

The following factors are determinant in calculating the overall service factor:

1. Loading factor S_1
2. Teeth-in-mesh factor S_2
3. Transmission ratio supplement S_3
4. Flexure factor S_4
5. Special service factor S_5
6. Belt length factor S_6
7. Width factor S_7

Loading factor S_1

The loading factors S_1 specified on page 28 represent guideline values which cannot take into account all the influences exerted by specific loading criteria. When dealing with reversing operations with fixed final positions, such when driving the traversing table or bed for machine tools, there will be constant, recurring tooth engagement areas if the table advancing distances remain constant. During the start-up phase the same belt teeth will always be subjected to especially heavy loading.

It is for this reason that in critical situations the loading factors may not provide information which is particularly relevant; please contact our application technology department in such cases.

Teeth-in-mesh factor S_2

Depending upon the magnitude of the acceleration and deceleration moments and upon the frequency with which the direction is reversed, the largest possible sprocket diameter should be selected, with a minimum of 12 teeth in mesh. Where fewer than 6 teeth are engaged, compensation will have to be made by applying correction factor S_2 when calculating the drive system.

Number of teeth in mesh	5	4	3	2
S_2	1.25	1.66	2.5	5.0

Number of teeth in mesh z_e at the smaller sprocket:

$$z_e = \frac{z_k}{6} \left[3 - \frac{d_{wg} - d_{wk}}{A} \right]$$

Transmission ratio supplement S_3

For step-up ratios	S_3
Transmission ratio of 1.00 to 1.24	–
Transmission ratio of 1.25 to 1.74	0.10
Transmission ratio of 1.75 to 2.49	0.20
Transmission ratio of 2.50 to 3.49	0.30
Transmission ratio of 3.50 and greater	0.40

Flexure factor S_4

A correction of the S_4 values is necessary when idlers are used: Additional flexure factor $S_4 = 0.2$.

Special service factor S_5

A special service factor of $S_5 = 0.2$ is to be taken into account where operations are frequently interrupted or where use is only occasional.

Factors S_6, S_7

The values for the belt length and width factors, S_6 and S_7, are taken from the performance tables for the particular pitch values.

Special attention will have to be paid to unfavorable outside influences resulting, for example, from extreme temperatures, gases, vapors, liquids, radiation, load oscillations and reversals and multiple deflections across the length of the belt. In such cases we urge that you consult with our application engineers.

Loading factor S_1

The loading factor S_1 is found at the intersection of the driven equipment, previously categorized (horizontal row) and the class of driving unit which may be considered, taking into account the duty cycle (vertical column).

Driven equipment		**Drive**					
The driven machines listed below are only a representative sample. Select a drive which corresponds closely with your requirements in regard to the performance characteristics.		AC and three-phase motors: Normal torque, squirrel-cage motors, synchronous motors, single-phase motors; DC motors: shunt-wound motors Multi-cylinder internal combustion engines			AC and three-phase motors: High torque, single-phase, series-wound, slip-ring motors, braking motors DC motors: series-wound, compound-wound Single-cylinder internal combustion engines		
		Intermittent duty	Normal duty	Continuous duty	Intermittent duty	Normal duty	Continuous duty
		3 to 8 h per day	8 to 16 h per day	16 to 24 h per day	3 to 8 h per day	8 to 16 h per day	16 to 24 h per day
1	Filling plants Measurement instruments Medical equipment Floor cleaning appliances Sewing machines Office machines	1.0	1.2	1.4	1.2	1.4	1.6
2	Conveyor systems for smaller goods Band saws	1.1	1.3	1.5	1.3	1.5	1.7
3	Mixers for liquids Dough kneading machines Drills, lathes, screwdrivers, peelers, circular saws, power planers, laundry machinery Paper-making machinery (except kneading machines) Printing presses	1.2	1.4	1.6	1.6	1.8	2.0
4	Mixers for semi-liquid masses Conveyor systems for ore, coal, sand Machine tools: grinders, milling machines Drill presses, rollers Pumps: centrifugal, gear Sieve systems: vibratory Textiles: warping, coiling units Centrifugal compressors	1.3	1.5	1.7	1.6	1.8	2.0
5	Brick making and clay forming machines (excepting edge mills) Conveyor systems: plate, bucket Lifts, unloaders, washing machines Fans, blowers: centrifugal Generators and exciters, winches and lifts, rubber calenders, mills, injection molding machines, extruders, sawmill machinery Textile machinery: looms, spinning frames, yarn twisters	1.4	1.6	1.8	1.8	2.0	2.2
6	Centrifuges Conveyor systems: plate belt, screw conveyors Hammer mills Paper kneading machines	1.5	1.7	1.9	1.9	2.1	2.3
7	Brick making and clay edge mills Fans, blowers, helical fans Enclosed fans	1.6	1.8	2.0	2.0	2.2	2.4
8	Piston compressors Mills: ball, rock Piston pumps	1.7	1.9	2.1	2.1	2.3	2.5

The indicated safety factors can be considered as approximate values for many applications but do not replace a detailed technical layout of the individual drive.

Calculation methods

1. Refer to Chart 1 on page 4, showing data on power and rotation speeds, to select the belt pitch.
2. Select the sprockets / calculate belt length.
3. Determine the number of teeth in mesh.
4. Ascertain the overall service factor $S_G = S_2 \cdot (S_1 + S_3 + S_4 - S_5)$
5. Determine the design power $P_B = P \cdot S_G$
6. Read the nominal power from the performance table.
7. Determine the width factor and thus the final belt width

$$S_7 = \frac{P_B}{S_6 \cdot P_N}$$

Requirement: Width factor selected > S_7

Sample calculation

Drive motor:	Three-phase braking motor P= 15 kW, n_1= 2000 r.p.m.
Driven equipment:	Printing press n_2 = 1330 r.p.m. Duty cycle 16 hours daily
Ratio:	1 : 1.5 (step-down)
Center distance:	approx. 275 mm
Special considerations:	The driven sprocket shall be at least 170 mm in diameter.

1. Selecting the belt pitch

The intersection of the vertical power line at 15 kW and the horizontal rotation speed line at 2000 r.p.m. lies within the 8M pitch range (chart on page 4).

2. Selecting the sprocket and the belt length

Number of teeth at the larger sprocket is 72 since the specification is "minimum diameter 170 mm."

Number of teeth at the smaller sprocket = 48;
specification i = 1:1.5.

Using the center distance factors (given in a separate catalog) and the specified center distance of about 275 mm, a synchronous belt 1040 mm in length is selected, resulting in a center distance of 278.3 mm.

3. Number of teeth in mesh

$$\text{Teeth in mesh} = \frac{48}{6} \cdot \left[3 - \frac{183.35 - 122.23}{278.3}\right] = 22.2$$ *i.e.* teeth-in-mesh factor $S_2 = 1$

4. Overall service factor

$S_G = S_2 \cdot (S_1 + S_3 + S_4 - S_5)$
$S_G = 1 \cdot (1{,}8 + 0 + 0 - 0) = 1.8$

Loading factor:	$S_1 = 1.8$
Teeth-in-mesh factor:	$S_2 = 1$
Ratio supplement:	$S_3 = 0$
Flexure factor:	$S_4 = 0$
Special service factor:	$S_5 = 0$
Belt length factor:	$S_6 = 1.0$

5. Design power

$P_B = P \cdot S_G$
calculated power = load overall service factors = 15 kW · 1.8 = 27 kW

6. Rated (nominal) power (P_N)

P_N = 12.89 kW as per the performance table, page 34, at the intersection of Z = 48 and n = 2000 r.p.m.
Z = no. of teeth of small sprocket

7. Width factor

$$S_7 = \frac{P_B}{S_6 \cdot P_N} = \frac{27}{1 \cdot 12.89} =$$ 2.09, i.e. belt width is 50 mm at $S_7 = 2.10$

PB = calculated power
PN = nominal power

Results:

HTD belt:	1040 – 8M – 50
HTD sprockets:	P72 – 8M – 50
	P48 – 8M – 50

Synchronous belts – 3M pitch

Power values in kW per 25 mm of belt width

Rotation speed for the smaller sprocket (r.p.m.)	Number of teeth at the smaller sprocket																
	10	12	14	16	18	20	24	28	32	36	40	44	48	56	64	72	80
Pitch diameter	9.55	11.46	13.37	15.28	17.19	19.10	22.92	26.74	30.56	34.38	38.20	42.02	45.84	53.48	61.12	68.75	76.39
20	0.005	0.006	0.008	0.009	0.010	0.012	0.015	0.017	0.020	0.022	0.025	0.028	0.030	0.035	0.040	0.045	0.050
40	0.009	0.012	0.014	0.017	0.020	0.022	0.027	0.032	0.037	0.042	0.047	0.052	0.056	0.066	0.075	0.084	0.093
60	0.013	0.017	0.021	0.024	0.028	0.032	0.039	0.046	0.054	0.061	0.068	0.075	0.082	0.095	0.109	0.122	0.135
100	0.020	0.026	0.032	0.038	0.044	0.050	0.062	0.074	0.085	0.096	0.107	0.118	0.129	0.151	0.172	0.193	0.214
200	0.036	0.048	0.059	0.071	0.082	0.093	0.115	0.137	0.158	0.179	0.200	0.220	0.240	0.280	0.320	0.358	0.397
300	0.051	0.068	0.085	0.101	0.117	0.133	0.165	0.196	0.226	0.256	0.286	0.315	0.344	0.402	0.458	0.513	0.568
400	0.065	0.087	0.108	0.130	0.151	0.171	0.212	0.252	0.291	0.330	0.369	0.406	0.444	0.517	0.590	0.660	0.730
500	0.078	0.105	0.131	0.157	0.183	0.208	0.258	0.306	0.354	0.402	0.448	0.494	0.540	0.629	0.716	0.802	0.886
600	0.091	0.122	0.153	0.184	0.214	0.244	0.302	0.359	0.415	0.471	0.525	0.579	0.632	0.736	0.838	0.937	1.035
700	0.103	0.139	0.175	0.210	0.244	0.278	0.345	0.411	0.475	0.538	0.600	0.662	0.722	0.841	0.956	1.068	1.178
800	0.115	0.155	0.195	0.235	0.274	0.312	0.387	0.461	0.533	0.604	0.674	0.742	0.810	0.942	1.070	1.194	1.315
900	0.126	0.171	0.216	0.260	0.303	0.345	0.428	0.510	0.590	0.668	0.745	0.821	0.895	1.040	1.180	1.315	1.446
950	0.13	0.18	0.22	0.27	0.32	0.36	0.45	0.53	0.62	0.70	0.78	0.86	0.94	1.08	1.23	1.37	1.51
1000	0.13	0.19	0.23	0.28	0.33	0.38	0.47	0.56	0.64	0.73	0.81	0.89	0.98	1.13	1.29	1.43	1.57
1200	0.16	0.22	0.27	0.33	0.38	0.44	0.55	0.65	0.75	0.85	0.95	1.04	1.13	1.32	1.49	1.65	1.80
1400	0.18	0.24	0.31	0.37	0.44	0.50	0.62	0.74	0.86	0.97	1.08	1.18	1.29	1.49	1.67	1.85	2.01
1450	0.18	0.25	0.32	0.39	0.45	0.51	0.64	0.76	0.88	0.99	1.11	1.22	1.32	1.53	1.72	1.89	2.06
1600	0.20	0.27	0.35	0.42	0.49	0.56	0.69	0.83	0.96	1.08	1.20	1.32	1.43	1.64	1.84	2.02	2.19
1800	0.22	0.30	0.38	0.46	0.54	0.62	0.77	0.91	1.05	1.19	1.32	1.44	1.56	1.79	1.99	2.18	2.33
2000	0.23	0.33	0.42	0.50	0.59	0.67	0.84	0.99	1.14	1.29	1.43	1.56	1.69	1.92	2.13	2.31	2.45
2400	0.32	0.41	0.50	0.59	0.68	0.76	0.92	1.08	1.22	1.36	1.51	1.64	1.77	2.02	2.26	2.49	2.71
2850	0.35	0.46	0.57	0.67	0.76	0.86	1.04	1.22	1.39	1.55	1.71	1.86	2.00	2.29	2.55	2.81	3.06
3200	0.38	0.50	0.62	0.73	0.83	0.94	1.14	1.32	1.51	1.68	1.85	2.02	2.17	2.48	2.77	3.04	3.31
3600	0.41	0.54	0.67	0.79	0.90	1.02	1.23	1.44	1.64	1.83	2.01	2.19	2.36	2.69	3.00	3.29	3.58
4000	0.44	0.58	0.72	0.85	0.97	1.09	1.33	1.55	1.76	1.97	2.16	2.35	2.54	2.89	3.22	3.53	3.83
5000	0.51	0.67	0.83	0.98	1.13	1.27	1.55	1.81	2.05	2.29	2.52	2.73	2.95	3.35	3.72	4.07	4.41
6000	0.56	0.75	0.93	1.11	1.27	1.44	1.75	2.04	2.32	2.58	2.84	3.08	3.31	3.76	4.17	4.56	4.93
7000	0.68	0.89	1.09	1.28	1.46	1.68	1.97	2.25	2.56	2.85	3.13	3.39	3.54	3.92	4.27	4.69	5.38
8000	0.80	1.03	1.25	1.46	1.65	1.84	2.19	2.52	2.82	3.09	3.34	3.57	3.77	4.12	4.39	4.57	4.66
10000	0.89	1.16	1.41	1.65	1.87	2.09	2.48	2.83	3.15	3.43	3.68	3.89	4.07	4.34	4.47	4.47	4.33
12000	0.97	1.27	1.55	1.81	2.06	2.29	2.71	3.07	3.39	3.66	3.88	4.06	4.19	4.30	4.21		
14000	1.03	1.36	1.66	1.94	2.20	2.45	2.88	3.24	3.50	3.78	3.96	4.07	4.11	3.99			

The permissible power values for any desired belt widths are determined by multiplying the values shown in the table above times the appropriate width factors.

Length factor S_6

Length (mm)	to 190	191–260	261–400	401–599	>600
Factor	0.8	0.9	1.0	1.1	1.2

Width factor S_7

Belt width	3	5	**6**	8	**9**	12	**15**	19	22	25
Width factor	0.09	0.14	**0.18**	0.25	**0.29**	0.42	**0.54**	0.72	0.86	1.0

Standard synchronous belts (Item Group 705)

Styles and dimensions
Standard widths: 6, 9 and 15 mm

Style	Number of teeth	Style	Number of teeth	Style	Number of teeth
120-3M	40	267-3M	89	570-3M	190
129-3M	43	288-3M	96	645-3M	215
144-3M	48	300-3M	100	711-3M	237
150-3M	50	318-3M	106	804-3M	268
159-3M	53	330-3M	110	1071-3M	357
168-3M	56	345-3M	115	1245-3M	415
180-3M	60	384-3M	128	1500-3M	500
195-3M	65	420-3M	140	1530-3M	510
210-3M	70	447-3M	149	1863-3M	621
225-3M	75	480-3M	160		
243-3M	81	513-3M	171		
255-3M	85	537-3M	179		

Synchronous belts in special lengths*)

(Item Group 705)

Pitch line	Number of teeth	Shape No.	Pitch line	Number of teeth	Shape No.
105	35	53035	462	154	53154
111	37	53037	465	155	53155
123	41	53041	471	157	53157
126	42	53042	474	158	53158
141	47	53047	477	159	53159
147	49	53049	486	162	53162
156	52	53052	489	163	53163
165	55	53055	501	167	53167
174	58	53058	510	170	53170
177	59	53059	522	174	53174
183	61	53061	525	175	53175
186	62	53062	531	177	53177
189	63	53063	558	186	53186
192	64	53064	564	188	53188
201	67	53067	576	192	53192
204	68	53068	582	194	53194
207	69	53069	585	195	53195
213	71	53071	591	197	53197
219	73	53073	594	198	53198
234	78	53078	597	199	53199
237	79	53079	600	200	53200
240	80	53080	612	204	53204
249	83	53083	627	209	53209
252	84	53084	633	211	53211
261	87	53087	648	216	53216
270	90	53090	663	221	53221
276	92	53092	669	223	53223
282	94	53094	672	224	53224
285	95	53095	684	228	53228
291	97	53097	696	232	53232
294	98	53098	735	245	53245
297	99	53099	738	246	53246
306	102	53102	753	251	53251
312	104	53104	795	265	53265
315	105	53105	843	281	53281
324	108	53108	873	291	53291
333	111	53111	882	294	53294
336	112	53112	900	300	53300
339	113	53113	915	305	53305
357	119	53119	945	315	53315
360	120	53120	981	327	53327
369	123	53123	1002	334	53334
381	127	53127	1062	354	53354
390	130	53130	1125	375	53375
396	132	53132	1155	385	53385
399	133	53133	1191	397	53397
405	135	53135	1263	421	53421
411	137	53137	1512	504	53504
426	142	53142	1587	529	53529
432	144	53144	1956	652	53652
435	145	53145			

*) May be used only after examining availability!

Sprocket pitch diameter and outside diameter

Number of teeth	Pitch diam. (mm)	O.D. (mm)	Number of teeth	Pitch diam. (mm)	O.D. (mm)
9	8.59	7.83	85	81.17	80.41
10	9.55	8.79	86	82.12	81.36
11	10.50	9.74	87	83.08	82.32
12	11.46	10.70	88	84.03	83.27
13	12.41	11.65	89	84.99	84.23
14	13.37	12.61	90	85.94	85.18
15	14.32	13.56	91	86.90	86.14
16	15.28	14.52	92	87.85	87.09
17	16.23	15.47	93	88.81	88.05
18	17.19	16.43	94	89.76	89.00
19	18.14	17.38	95	90.72	89.96
20	19.10	18.34	96	91.67	90.91
21	20.05	19.29	97	99.63	91.87
22	21.01	20.25	98	93.58	92.82
23	21.96	21.20	99	94.54	93.78
24	22.92	22.16	100	95.49	94.73
25	23.87	23.11	101	96.45	95.69
26	24.83	24.07	102	97.40	96.64
27	25.78	25.02	103	98.36	97.60
28	26.74	25.98	104	99.31	98.55
29	27.69	26.93	105	100.27	99.51
30	28.65	27.89	106	101.22	100.46
31	29.60	28.84	107	102.18	101.42
32	30.56	29.80	108	103.13	102.37
33	31.51	30.75	109	104.09	103.33
34	32.47	31.71	110	105.04	104.28
35	33.42	32.66	111	106.00	105.24
36	34.38	33.62	112	106.95	106.19
37	35.33	34.57	113	107.91	107.15
38	36.29	35.53	114	108.86	108.10
39	37.24	36.48	115	109.82	109.06
40	38.20	37.44	116	110.77	110.01
41	39.15	38.39	117	111.73	110.97
42	40.11	39.35	118	112.68	111.92
43	41.06	40.30	119	113.64	112.88
44	42.02	41.26	120	114.59	113.83
45	42.97	42.21	121	115.55	114.79
46	43.93	43.17	122	116.50	115.74
47	44.88	44.12	123	117.46	116.70
48	45.84	45.08	124	118.41	117.65
49	46.79	46.03	125	119.37	118.61
50	47.75	46.99	126	120.32	119.56
51	48.70	47.94	127	121.28	120.52
52	49.66	48.89	128	122.23	121.47
53	50.61	49.85	129	123.19	122.43
54	51.57	50.81	130	124.14	123.38
55	52.52	51.76	131	125.10	124.34
56	53.48	52.72	132	126.05	125.29
57	54.43	53.67	133	127.01	126.25
58	55.39	54.63	134	127.96	127.20
59	56.34	55.58	135	128.92	128.16
60	57.30	56.54	136	129.87	129.11
61	58.25	57.49	137	130.83	130.07
62	59.21	58.45	138	131.78	131.02
63	60.16	59.40	139	132.74	131.98
64	61.12	60.36	140	133.69	132.93
65	62.07	61.31	141	134.65	133.89
66	63.03	62.27	142	135.60	134.84
67	63.98	63.22	143	136.55	135.79
68	64.94	64.18	144	137.51	136.75
69	65.89	65.13	145	138.46	137.70
70	66.85	66.09	146	139.42	138.66
71	67.80	67.04	147	140.37	139.61
72	68.75	67.99	148	141.33	140.57
73	69.71	68.95	149	142.28	141.52
74	70.66	69.90	150	143.24	142.48
75	71.62	70.86	151	144.19	143.43
76	72.57	71.81	152	145.15	144.39
77	73.53	72.77	153	146.10	145.34
78	74.48	73.72	154	147.06	146.30
79	75.44	74.68	155	148.01	147.25
80	76.39	75.63	156	148.97	148.21
81	77.35	76.59	157	149.92	149.16
82	78.30	77.54	158	150.88	150.12
83	79.26	78.50	159	151.83	151.07
84	80.21	79.45	160	152.79	152.03

Synchronous belts – 5M pitch

Power values in kW per 25 mm of belt width

Rotation speed for the smaller sprocket (r.p.m.)	Number of teeth at the smaller sprocket																
	14	16	18	20	22	24	26	28	32	36	40	44	48	56	64	72	80
Pitch diameter	22.28	25.46	28.65	31.83	35.01	38.20	41.38	44.56	50.93	57.30	63.66	70.03	76.39	89.13	101.86	114.59	127.32
20	0.016	0.020	0.024	0.028	0.032	0.036	0.040	0.044	0.051	0.059	0.066	0.074	0.081	0.095	0.110	0.124	0.138
40	0.031	0.038	0.046	0.053	0.060	0.068	0.075	0.082	0.097	0.111	0.125	0.139	0.153	0.180	0.207	0.234	0.261
60	0.044	0.055	0.065	0.076	0.087	0.098	0.108	0.119	0.140	0.160	0.181	0.201	0.221	0.261	0.300	0.339	0.377
100	0.068	0.085	0.103	0.120	0.137	0.154	0.171	0.188	0.221	0.254	0.286	0.319	0.351	0.414	0.476	0.538	0.599
200	0.122	0.155	0.188	0.220	0.253	0.285	0.316	0.348	0.410	0.472	0.533	0.593	0.652	0.770	0.886	1.000	1.112
300	0.171	0.219	0.266	0.313	0.360	0.406	0.451	0.497	0.587	0.675	0.762	0.848	0.934	1.101	1.266	1.426	1.584
400	0.216	0.278	0.340	0.401	0.461	0.521	0.580	0.638	0.754	0.868	0.980	1.091	1.200	1.413	1.621	1.823	2.020
500	0.258	0.335	0.410	0.484	0.558	0.630	0.702	0.773	0.914	1.052	1.188	1.321	1.452	1.707	1.954	2.191	2.419
600	0.299	0.388	0.477	0.564	0.650	0.736	0.820	0.903	1.068	1.229	1.386	1.540	1.691	1.984	2.263	2.528	2.779
700	0.337	0.440	0.542	0.641	0.740	0.838	0.934	1.029	1.215	1.398	1.575	1.749	1.918	2.242	2.547	2.832	3.096
800	0.374	0.490	0.604	0.716	0.827	0.936	1.043	1.149	1.357	1.559	1.756	1.946	2.131	2.481	2.805	3.101	3.366
900	0.410	0.538	0.664	0.788	0.910	1.031	1.149	1.265	1.493	1.714	1.927	2.133	2.330	2.700	3.035	3.331	3.585
950	0.43	0.56	0.69	0.82	0.95	1.08	1.20	1.32	1.56	1.79	2.01	2.22	2.42	2.80	3.14	3.43	3.67
1000	0.44	0.58	0.72	0.86	0.99	1.12	1.25	1.38	1.62	1.86	2.09	2.31	2.51	2.90	3.23	3.52	3.75
1200	0.61	0.74	0.87	1.00	1.13	1.26	1.38	1.50	1.75	1.98	2.21	2.44	2.66	3.10	3.52	3.93	4.33
1400	0.68	0.84	0.98	1.14	1.28	1.43	1.57	1.71	1.98	2.25	2.51	2.77	3.02	3.51	3.99	4.44	4.89
1450	0.70	0.86	1.02	1.17	1.32	1.47	1.61	1.76	2.01	2.31	2.58	2.85	3.11	3.61	4.10	4.57	5.02
1600	0.76	0.90	1.10	1.26	1.43	1.59	1.75	1.90	2.21	2.51	2.80	3.08	3.36	3.91	4.43	4.93	5.41
1800	0.83	1.02	1.20	1.39	1.57	1.74	1.92	2.09	2.43	2.75	3.07	3.39	3.69	4.29	4.85	5.39	5.91
2000	0.89	1.10	1.31	1.51	1.70	1.90	2.09	2.27	2.64	2.99	3.34	3.68	4.01	4.65	5.25	5.83	6.37
2400	1.03	1.27	1.50	1.74	1.96	2.19	2.41	2.62	3.04	3.45	3.85	4.24	4.61	5.33	6.00	6.63	7.21
2850	1.16	1.44	1.71	1.98	2.24	2.50	2.75	2.99	3.47	3.94	4.38	4.82	5.23	6.02	6.74	7.40	7.99
3200	1.26	1.57	1.87	2.16	2.45	2.73	3.00	3.27	3.79	4.29	4.77	5.24	5.68	6.51	7.25	7.91	8.48
3600	1.37	1.70	2.04	2.36	2.67	2.98	3.28	3.57	4.13	4.67	5.19	5.68	6.15	7.01	7.75	8.39	8.90
4000	1.48	1.84	2.20	2.54	2.88	3.21	3.54	3.85	4.46	5.03	5.58	6.09	6.57	7.44	8.17	8.74	9.17
5000	1.71	2.14	2.57	2.98	3.37	3.76	4.13	4.49	5.18	5.81	6.40	6.94	7.42	8.22	8.77	9.05	9.04
6000	1.97	2.42	2.89	3.36	3.80	4.23	4.64	5.04	5.77	6.44	7.02	7.53	7.95	8.52	8.69	8.42	8.26
7000	2.33	2.65	3.19	3.69	4.18	4.64	5.08	5.49	6.24	6.89	7.42	7.83	8.12	8.27	7.82		
8000	2.63	3.14	3.53	4.00	4.52	4.92	5.29	5.62	6.38	6.65	6.96	7.12	7.12	7.02			
10000	2.92	3.49	4.03	4.51	4.95	5.33	5.67	5.95	6.36	6.53	6.46	6.12	6.00				
12000	3.32	3.73	4.27	4.74	5.13	5.46	5.70	5.86	5.93	5.62							
14000	3.62	3.93	4.35	4.76	5.07	5.27	5.35	5.30	4.83								

The permissible power values for any desired belt widths are determined by multiplying the values shown in the table above times the appropriate width factors.

Length factor S_6

Length (mm)	to 440	441–555	551–800	801–1100	>1100
Factor	0.8	0.9	1.0	1.1	1.2

Width factor S_7

Belt width	6	8	**9**	12	**15**	19	22	**25**	32	40	50
Width factor	0.18	0.25	**0.29**	0.42	**0.54**	0.72	0.86	**1.0**	1.32	1.69	2.14

Standard synchronous belts (Item Group 706)

Styles and dimensions
Standard widths: 9, 15 and 25 mm

Style	Number of teeth
180-5M	36
225-5M	45
255-5M	51
280-5M	56
305-5M	61
325-5M	65
350-5M	70
375-5M	75
400-5M	80
425-5M	85
450-5M	90
475-5M	95
500-5M	100
525-5M	105
550-5M	110
575-5M	115
600-5M	120

Style	Number of teeth
635-5M	127
670-5M	134
700-5M	140
750-5M	150
800-5M	160
860-5M	172
900-5M	180
935-5M	187
980-5M	196
1050-5M	210
1100-5M	220
1135-5M	227
1200-5M	240
1350-5M	270
1870-5M	374
2350-5M	470

Synchronous belts in special lengths*)

(Item Group 706)

Pitch line	Number of teeth	Shape No.
120	24	55024
200	40	55040
265	53	55053
270	54	55054
295	59	55059
330	66	55066
335	67	55067
340	68	55068
345	69	55069
360	72	55072
365	73	55073
370	74	35074
385	77	33077
405	81	33081
460	92	55092
480	96	55096
495	99	55099
520	104	55104
535	107	55107
560	112	55112
565	113	55113
580	116	55116
585	117	55117
590	118	55118
610	122	55122
615	123	55123
640	128	55128
655	131	55131
665	133	55133
710	142	55142

Pitch line	Number of teeth	Shape No.
740	148	55148
755	151	55151
775	155	55155
790	158	55158
825	165	55165
830	166	55166
835	167	55167
850	170	55170
870	174	55174
890	178	55178
925	185	55185
940	188	55188
950	190	55190
1000	200	55200
1125	225	55225
1195	239	55239
1270	254	55254
1420	284	55284
1575	315	55315
1595	319	55319
1690	338	55338
1790	358	55358
1800	360	55360
1895	379	55379
1945	389	55389
2000	400	55400
2110	422	55422
2250	450	55450
2525	505	55505

*) May be used only after examining availability!

Sprocket pitch diameter and outside diameter

Number of teeth	Pitch diam. (mm)	O.D. (mm)
13	20.69	19.55
14	22.28	21.14
15	23.87	22.73
16	25.46	24.32
17	27.06	25.92
18	28.65	27.51
19	30.24	29.10
20	31.83	30.69
21	33.42	32.28
22	35.01	33.87
23	36.61	35.47
24	38.20	37.06
25	39.79	38.65
26	41.38	40.24
27	42.97	41.83
28	44.56	43.42
29	46.15	45.01
30	47.75	46.61
31	49.34	48.20
32	50.93	49.79
33	52.52	51.38
34	54.11	52.97
35	55.70	54.56
36	57.30	56.16
37	58.89	57.75
38	60.48	59.34
39	62.07	60.93
40	63.66	62.52
41	65.25	64.11
42	66.85	65.71
43	68.44	67.30
44	70.03	68.89
45	71.62	70.48
46	73.21	72.07
47	74.80	73.66
48	76.39	75.25
49	77.99	76.85
50	79.58	78.43
51	81.17	80.03
52	82.76	81.62
53	84.35	83.21
54	85.94	84.80
55	87.54	86.40
56	89.13	87.99
57	90.72	89.58
58	92.31	91.17
59	93.90	92.76
60	95.49	94.35
61	97.08	95.94
62	98.68	97.54
63	100.27	99.13
64	101.86	100.72
65	103.45	102.31
66	105.04	103.90
67	106.63	105.49
68	108.23	107.09
69	109.82	108.68
70	111.41	110.27
71	113.00	111.86
72	114.59	113.45
73	116.18	115.04
74	117.77	116.63
75	119.37	118.23
76	120.96	119.82
77	122.55	121.41
78	124.14	123.00
79	125.73	124.59
80	127.32	126.18
81	128.92	127.78
82	130.51	129.37
83	132.10	130.96
84	133.69	132.55
85	135.28	134.14
86	136.87	135.73
87	138.46	137.32
88	140.06	138.92

Number of teeth	Pitch diam. (mm)	O.D. (mm)
89	141.65	140.51
90	143.24	142.10
91	144.83	143.69
92	146.42	145.28
93	148.01	146.87
94	149.61	148.47
95	151.20	150.06
96	152.79	151.65
97	154.38	153.24
98	155.97	154.83
99	157.56	156.42
100	159.15	158.01
101	160.75	159.61
102	162.34	161.20
103	163.93	162.79
104	165.52	164.38
105	167.11	165.97
106	168.70	167.56
107	170.30	169.16
108	171.89	170.75
109	173.48	172.34
110	175.07	173.93
111	176.66	175.52
112	178.25	177.11
113	179.85	178.71
114	181.44	180.30
115	183.03	181.89
116	184.62	183.48
117	186.21	185.07
118	187.80	186.66
119	189.39	188.25
120	190.99	189.85
121	192.58	191.44
122	194.17	193.03
123	195.76	194.62
124	197.35	196.21
125	198.94	197.80
126	200.54	199.40
127	202.13	200.99
128	203.72	202.58
129	205.31	204.17
130	206.90	205.76
131	208.49	207.35
132	210.08	208.94
133	211.68	210.54
134	213.27	212.13
135	214.86	213.72
136	216.45	215.31
137	218.04	216.90
138	219.63	218.49
139	221.23	220.09
140	222.82	221.68
141	224.41	223.27
142	226.00	224.86
143	227.59	226.45
144	229.18	228.04
145	230.77	229.63
146	232.37	231.23
147	233.96	232.82
148	235.55	234.41
149	237.14	236.00
150	238.73	237.59
151	240.32	239.18
152	241.92	240.78
153	243.51	242.37
154	245.10	243.96
155	246.69	245.55
156	248.28	247.14
157	249.87	248.73
158	251.46	250.32
159	253.06	251.92
160	254.65	253.51

Synchronous belts – 8M pitch

Power values in kW per 25 mm of belt width

Rotation speed for the smaller sprocket (r.p.m.)	Number of teeth at the smaller sprocket																
	20	22	24	26	28	30	32	34	36	38	40	44	48	56	64	72	80
Pitch diameter	50.93	56.02	61.12	66.21	71.30	76.39	81.49	86.58	91.67	96.77	101.86	112.05	122.23	142.60	162.97	183.35	203.72
10	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.05	0.06	0.07	0.08	0.09	0.11	0.13	0.14
20	0.04	0.05	0.05	0.06	0.07	0.08	0.09	0.10	0.10	0.11	0.12	0.14	0.15	0.19	0.22	0.25	0.28
50	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.26	0.28	0.30	0.34	0.38	0.46	0.54	0.62	0.70
100	0.19	0.23	0.27	0.31	0.35	0.39	0.43	0.47	0.51	0.55	0.59	0.67	0.75	0.91	1.07	1.22	1.38
200	0.38	0.46	0.54	0.62	0.70	0.77	0.85	0.93	1.01	1.09	1.17	1.32	1.48	1.79	2.10	2.41	2.72
300	0.56	0.68	0.80	0.91	1.03	1.15	1.26	1.38	1.50	1.61	1.73	1.96	2.19	2.66	3.11	3.57	4.03
400	0.74	0.89	1.05	1.21	1.36	1.52	1.67	1.83	1.98	2.13	2.29	2.59	2.90	3.51	4.11	4.72	5.32
500	0.91	1.11	1.30	1.49	1.69	1.88	2.07	2.26	2.46	2.65	2.84	3.22	3.60	4.35	5.10	5.85	6.59
600	1.09	1.32	1.55	1.78	2.01	2.24	2.47	2.70	2.93	3.16	3.38	3.84	4.29	5.18	6.07	6.97	7.84
700	1.26	1.53	1.80	2.06	2.33	2.60	2.86	3.13	3.39	3.66	3.92	4.45	4.97	6.00	7.03	8.07	9.07
800	1.43	1.74	2.04	2.35	2.65	2.95	3.26	3.56	3.86	4.16	4.46	5.05	5.64	6.81	7.97	9.14	10.28
950	1.68	2.04	2.40	2.76	3.12	3.48	3.84	4.19	4.54	4.90	5.25	5.94	6.63	8.00	9.34	10.72	12.03
1000	1.76	2.14	2.52	2.90	3.28	3.65	4.03	4.40	4.77	5.14	5.51	6.24	6.96	8.39	9.79	11.24	12.60
1200	2.09	2.55	3.00	3.45	3.89	4.34	4.78	5.22	5.66	6.10	6.53	7.39	8.24	9.91	11.53	13.24	14.80
1450	2.50	3.04	3.58	4.12	4.65	5.18	5.71	6.23	6.75	7.27	7.78	8.79	9.79	11.72	13.58	15.59	17.35
1600	2.74	3.33	3.92	4.51	5.09	5.67	6.25	6.82	7.38	7.95	8.50	9.60	10.67	12.75	14.72	16.90	18.74
1800	3.05	3.71	4.37	5.03	5.68	6.32	6.96	7.59	8.21	8.83	9.44	10.64	11.81	14.05	16.14	18.54	20.45
2000	3.36	4.09	4.82	5.53	6.24	6.95	7.64	8.33	9.01	9.68	10.34	11.64	12.89	15.26	17.43	20.02	21.94
2200	3.66	4.46	5.25	6.03	6.80	7.56	8.31	9.05	9.78	10.50	11.21	12.59	13.91	16.38	18.57	21.33	23.20
2500	4.10	4.99	5.88	6.74	7.60	8.44	9.27	10.09	10.88	11.67	12.43	13.91	15.30	17.84	19.98	22.94	24.62
2850	4.60	5.59	6.58	7.54	8.49	9.41	10.32	11.21	12.07	12.91	13.72	15.27	16.70	19.19	21.10	24.23	25.45
3000	4.80	5.94	6.87	7.87	8.85	9.81	10.75	11.66	12.54	13.40	14.23	15.79	17.22	19.64	21.39	24.56	25.52
3500	5.88	7.16	8.03	8.90	9.76	10.62	11.47	12.31	13.14	13.97	14.78	16.39	17.94	20.91	23.66	26.15	26.35
4000	7.07	8.16	9.15	10.13	11.10	12.06	13.01	13.95	14.88	15.79	16.69	18.45	20.14	23.29	26.11	27.55	
4500	8.04	9.15	10.25	11.34	12.41	13.47	14.51	15.54	16.55	17.54	18.51	20.39	22.17	25.42	27.18		
5000	8.91	10.12	11.33	12.52	13.68	14.83	15.96	17.06	18.14	19.20	20.22	22.18	24.02	27.05			
5500	9.76	11.08	12.38	13.66	14.92	16.15	17.35	18.52	19.65	20.75	21.82	23.83	25.66				
6000	10.60	12.02	13.41	14.78	16.11	17.41	18.67	19.89	21.07	22.20	23.28	25.30	27.08				

The permissible power values for any desired belt widths are determined by multiplying the values shown in the table above times the appropriate width factors.

Length factor S_6

Length (mm)	440–600	640–880	960–1200	1280–1760	1800–2800
Factor	0.8	0.9	1.0	1.1	1.2

Width factor S_7

Belt width	10	15	**20**	25	**30**	42,5	**50**	65	**85**	100	115
Width factor	0.35	0.56	**0.77**	1.0	**1.21**	1.76	**2.10**	2.76	**3.66**	4.32	4.98

Standard synchronous belts (Item Group 700)

Styles and dimensions
Standard widths: 20, 30, 50 and 85 mm

Style	Number of teeth
480-8M	60
560-8M	70
600-8M	75
640-8M	80
720-8M	90
800-8M	100
880-8M	110
960-8M	120
1040-8M	130
1120-8M	140

Style	Number of teeth
1200-8M	150
1280-8M	160
1440-8M	180
1600-8M	200
1760-8M	220
1800-8M	225
2000-8M	250
2400-8M	300
2800-8M	350

Synchronous belts in special lengths*)

(Item Group 702)

Pitch line	Number of teeth	Shape No.
264	33	37033
320	40	37040
376	47	37047
384	48	37048
424	53	37053
512	64	37064
520	65	37065
576	72	37072
592	74	37074
608	76	37076
624	78	37078
656	82	37082
672	84	37084
760	95	37095
776	97	37097
840	105	37105
856	107	37107
912	114	37114
920	115	37115
936	117	37117
976	122	37122
1000	125	37125
1064	133	37133
1080	135	37135

Pitch line	Number of teeth	Shape No.
1128	141	37141
1152	144	37144
1160	145	37145
1176	147	37147
1216	152	37152
1224	153	37153
1256	157	37157
1264	158	37158
1360	170	37170
1392	174	37174
1432	179	37179
1520	190	37190
1552	194	37194
1696	212	37212
1896	237	37237
1904	238	37238
2080	260	37260
2272	284	37284
2600	325	37325
3048	381	37381
3280	410	37410
3600	450	37450
4400	550	37550
4960	620	37620

*) May be used only after examining availability!

Sprocket pitch diameter and outside diameter

Number of teeth	Pitch diam. (mm)	O.D. (mm)
18	45.84	44.46
19	48.38	47.01
20	50.93	49.56
21	53.48	52.10
22	56.02	54.65
23	58.57	57.20
24	61.12	59.74
25	63.66	62.29
26	66.21	64.84
27	68.75	67.38
28	71.30	70.08
29	73.85	72.62
30	76.39	75.13
31	78.94	77.65
32	81.49	80.16
33	84.03	82.68

Number of teeth	Pitch diam. (mm)	O.D. (mm)
34	86.58	85.22
35	89.13	87.76
36	91.67	90.30
37	94.22	92.85
38	96.77	95.39
39	99.31	97.94
40	101.86	100.49
41	104.41	103.03
42	106.95	105.58
43	109.50	108.13
44	112.05	110.67
45	114.59	113.22
46	117.14	115.77
47	119.68	118.31
48	122.23	120.86
49	124.78	123.41

Sprocket pitch diameter and outside diameter

Number of teeth	Pitch diam. (mm)	O.D. (mm)
50	127.32	125.95
51	129.87	128.50
52	132.42	131.05
53	134.96	133.59
54	137.51	136.14
55	140.06	138.68
56	142.60	141.23
57	145.15	143.78
58	147.70	146.32
59	150.24	148.87
60	152.79	151.42
61	155.33	153.96
62	157.88	156.51
63	160.43	159.06
64	162.97	161.60
65	165.52	164.15
66	168.07	166.70
67	170.61	169.24
68	173.16	171.79
69	175.71	174.34
70	178.25	176.88
71	180.80	179.43
72	183.35	181.97
73	185.89	184.52
74	188.44	187.07
75	190.99	189.61
76	193.53	192.16
77	196.08	194.71
78	198.62	197.25
79	201.17	199.81
80	203.72	202.35
81	206.26	204.89
82	208.81	207.44
83	211.36	209.99
84	213.90	212.53
85	216.45	215.08
86	219.00	217.63
87	221.54	220.17
88	224.09	222.72
89	226.64	225.27
90	229.18	227.81
91	231.73	230.36
92	234.28	232.90
93	236.82	235.45
94	239.37	238.00
95	241.92	240.54
96	244.46	243.09
97	247.01	245.64
98	249.55	248.18
99	252.10	250.73
100	254.65	253.28
101	257.19	255.82
102	259.74	258.37
103	262.29	260.92
104	264.83	263.46
105	267.38	266.01
106	269.93	268.56
107	272.47	271.10
108	275.02	273.65
109	277.57	276.19
110	280.11	278.74
111	282.66	281.29
112	285.20	283.83
113	287.75	286.38
114	290.30	288.93
115	292.84	291.47
116	295.39	294.02
117	297.94	296.57
118	300.48	299.11
119	303.03	301.66
120	305.58	304.21
121	308.12	306.75

Number of teeth	Pitch diam. (mm)	O.D. (mm)
122	310.67	309.30
123	313.22	311.85
124	315.76	314.39
125	318.31	316.94
126	320.86	319.48
127	323.40	322.03
128	325.95	324.58
129	328.50	327.12
130	331.04	329.67
131	333.59	332.22
132	336.13	334.76
133	338.68	337.31
134	341.23	339.86
135	343.77	342.40
136	346.32	344.95
137	348.87	347.50
138	351.41	350.04
139	353.96	352.59
140	356.51	355.14
141	359.05	357.68
142	361.60	360.23
143	364.15	362.77
144	366.69	365.32
145	369.24	367.87
146	371.79	370.41
147	374.33	372.96
148	376.88	375.51
149	379.42	378.05
150	381.97	380.60
151	384.52	383.15
152	387.06	385.70
153	389.61	388.24
154	392.16	390.79
155	394.70	393.33
156	397.25	395.88
157	399.80	398.43
158	402.34	400.97
159	404.89	403.52
160	407.44	406.07
161	409.98	408.61
162	412.53	411.16
163	415.08	413.70
164	417.62	416.25
165	420.17	418.80
166	422.71	421.34
167	425.26	423.89
168	427.81	426.44
169	430.35	428.98
170	432.90	431.53
171	435.45	434.08
172	437.99	436.62
173	440.54	439.17
174	443.09	441.72
175	445.63	444.26
176	448.18	446.81
177	450.73	449.36
178	453.27	451.90
179	455.82	454.45
180	458.37	456.99
181	460.91	459.54
182	463.46	462.09
183	466.00	464.63
184	468.55	467.18
185	471.10	469.73
186	473.64	472.27
187	476.19	474.82
188	478.74	477.37
189	481.28	479.91
190	483.83	482.46
191	486.38	485.01
192	488.92	487.55

Synchronous belts – 14M pitch

Power values in kW per 25 mm of belt width

Rotation speed for the smaller sprocket (r.p.m.)	Number of teeth at the smaller sprocket														
	28	29	30	32	34	36	38	40	44	48	52	56	64	72	80
Pitch diameter	124.78	129.23	133.69	142.60	151.51	160.43	169.34	178.25	196.08	213.90	231.73	249.55	285.21	320.86	356.51
10	0.12	0.13	0.14	0.16	0.18	0.20	0.22	0.24	0.27	0.32	0.34	0.36	0.41	0.46	0.50
20	0.24	0.25	0.27	0.32	0.36	0.41	0.46	0.50	0.55	0.59	0.68	0.73	0.82	0.91	1.00
40	0.50	0.55	0.59	0.64	0.73	0.82	0.91	0.96	1.10	1.19	1.32	1.42	1.64	1.83	2.05
60	0.73	0.78	0.87	1.00	1.10	1.23	1.37	1.46	1.64	1.83	2.01	2.15	2.47	2.74	3.06
100	1.23	1.32	1.42	1.64	1.87	2.15	2.28	2.42	2.74	3.01	3.29	3.56	4.11	4.61	5.11
200	2.47	2.65	2.88	3.29	3.74	4.25	4.61	4.89	5.43	6.03	6.62	7.17	8.17	9.18	10.23
300	3.33	3.61	3.93	4.52	5.11	5.80	6.26	6.62	7.40	8.17	8.90	9.68	11.23	12.83	14.52
400	4.15	4.52	4.84	5.57	6.35	7.17	7.72	8.17	9.09	10.05	10.96	11.83	13.70	15.62	17.58
500	4.89	5.30	5.71	6.57	7.44	8.40	9.09	9.60	10.64	11.69	12.74	13.74	15.89	17.99	20.18
600	5.57	6.03	6.53	7.49	8.49	9.54	10.27	10.87	12.01	13.20	14.34	15.48	17.81	20.09	22.47
700	6.21	6.72	7.23	8.29	9.41	10.57	11.35	12.01	13.23	14.52	15.75	16.96	19.40	21.75	24.29
800	6.85	7.35	7.94	9.09	10.32	11.60	12.47	13.15	14.47	15.84	17.17	18.45	21.00	23.56	26.12
950	7.60	8.23	8.85	10.17	11.55	12.93	13.87	14.59	16.02	17.50	18.94	20.28	22.92	25.57	28.17
1000	7.94	8.54	9.18	10.55	11.92	13.38	14.34	15.07	16.57	18.04	19.45	20.82	23.52	26.12	28.68
1200	8.90	9.59	10.32	11.78	13.29	14.89	15.94	16.76	18.31	19.86	21.32	22.69	25.39	27.90	30.27
1450	9.99	10.70	11.47	13.11	14.79	16.50	17.66	18.49	20.00	21.69	23.10	24.41	26.86	29.09	30.86
1600	10.55	11.32	12.15	13.84	15.57	17.35	18.54	19.36	20.96	22.51	23.88	25.11	27.40	29.18	30.55
1800	11.23	12.01	12.90	14.70	16.48	18.34	19.54	20.36	21.92	23.36	24.61	25.70	27.49	28.73	29.27
2000	11.83	12.69	13.56	15.39	17.21	19.13	20.32	21.10	22.56	23.88	24.98	25.80	27.03	27.40	26.94
2200	12.74	13.24	14.11	15.98	17.85	19.82	20.96	21.64	22.97	24.11	24.93	25.53	25.94	25.34	
2400	13.74	14.16	14.61	16.44	18.36	20.27	21.37	22.00	23.15	24.00	24.57	24.75	24.25		
2600	14.75	15.16	15.57	16.80	18.68	20.59	21.51	22.15	23.06	23.61	23.79	23.52	22.28		
2850	15.82	16.37	16.76	17.62	18.85	20.73	21.54	22.09	22.56	22.45	22.42	22.42			
3000	16.65	17.12	17.54	18.40	19.02	20.82	21.60	21.83	22.10	22.33	22.46	22.19			
3500	18.54	19.00	19.41	20.18	20.87	21.42	21.87	22.24	22.22	22.19					
4000	20.18	20.59	20.91	21.60	22.05	22.33	22.47	22.42	22.19						

The permissible power values for any desired belt widths are determined by multiplying the values shown in the table above times the appropriate width factors.

Length factor S_6

Length (mm)	966–1190	1400–1610	1778–1890	2100–2450	2590–3150	3500–4578
Factor	0.8	0.9	0.95	1.0	1.05	1.1

Width factor S_7

Belt width	25	30	**40**	**55**	**85**	**115**	130	**170**	200	250
Width factor	1.0	1.14	**1.46**	**2.19**	**3.66**	**5.12**	5.85	**7.78**	9.30	11.30

Standard synchronous belts (Item Group 701)

Styles and dimensions
Standard widths: 40, 55, 85, 115 and 170 mm

Style	Number of teeth	Style	Number of teeth
966-14M	69	2450-14M	175
1190-14M	85	2590-14M	185
1400-14M	100	2800-14M	200
1610-14M	115	3150-14M	225
1778-14M	127	3500-14M	250
1890-14M	135	3850-14M	275
2100-14M	150	4326-14M	309
2310-14M	165	4578-14M	327

Synchronous belts in special lengths*)

(Item Group 703)

Pitch line	Number of teeth	Shape No.	Pitch line	Number of teeth	Shape No.
784	56	38056	3360	240	38240
798	57	38057	4004	286	38286
826	59	38059	4956	354	38354
924	66	38066	5320	380	38380
1092	78	38078	5740	410	38410
1358	97	38097	6160	440	38440
1470	105	38105	6860	490	38490
1904	136	38136			

*) May be used only after examining availability!

Sprocket pitch diameter and outside diameter

Number of teeth	Pitch diam. (mm)	O.D. (mm)	Number of teeth	Pitch diam. (mm)	O.D. (mm)
28	124.78	122.12	44	196.08	193.28
29	129.23	126.57	45	200.53	197.74
30	133.69	130.99	46	204.99	202.20
31	138.15	135.46	47	209.45	206.65
32	142.60	139.88	48	213.90	211.11
33	147.06	144.35	49	218.36	215.57
34	151.52	148.79	50	222.82	220.02
35	155.97	153.24	51	227.27	224.48
36	160.43	157.68	52	231.73	228.94
37	164.88	162.13	53	236.19	233.39
38	169.34	166.60	54	240.64	237.85
39	173.80	174.02	55	245.10	242.30
40	178.25	175.49	56	249.55	246.76
41	182.71	179.92	57	254.01	251.22
42	187.17	184.37	58	258.47	255.67
43	191.62	188.83	59	262.92	260.13

Sprocket pitch diameter and outside diameter

Number of teeth	Pitch diam. (mm)	O.D. (mm)	Number of teeth	Pitch diam. (mm)	O.D. (mm)
60	267.38	264.59	128	570.41	567.62
61	271.84	269.04	129	574.87	572.07
62	276.29	273.50	130	579.32	576.53
63	280.75	277.95	131	583.78	580.99
64	285.20	282.41	132	588.24	585.44
65	289.66	286.87	133	592.69	589.90
66	294.12	291.32	134	597.15	594.35
67	298.57	295.78	135	601.60	598.81
68	303.03	300.24	136	606.06	603.27
69	307.49	304.69	137	610.52	607.72
70	311.94	309.15	138	614.97	612.18
71	316.40	313.61	139	619.43	616.64
72	320.86	318.06	140	623.89	621.09
73	325.31	322.52	141	628.34	625.55
74	329.77	326.97	142	632.80	630.01
75	334.22	331.43	143	637.25	634.46
76	338.68	335.89	144	641.71	638.92
77	343.14	340.34	145	646.17	643.37
78	347.59	344.80	146	650.62	647.83
79	352.05	349.26	147	655.08	652.29
80	356.51	353.71	148	659.54	656.74
81	360.96	358.17	149	663.99	661.20
82	365.42	362.63	150	668.45	665.66
83	369.88	367.08	151	672.91	670.11
84	374.33	371.54	152	677.36	674.57
85	378.79	375.99	153	681.82	679.03
86	383.24	380.45	154	686.27	683.48
87	387.70	384.91	155	690.73	687.94
88	392.16	389.36	156	695.19	692.39
89	396.61	393.82	157	699.64	696.85
90	401.07	398.28	158	704.10	701.31
91	405.53	402.73	159	708.56	705.76
92	409.98	407.19	160	713.01	710.22
93	414.44	411.64	161	717.47	714.68
94	418.89	416.10	162	721.93	719.13
95	423.35	420.56	163	726.38	723.59
96	427.81	425.01	164	730.84	728.05
97	432.26	429.47	165	735.29	782.50
98	436.72	433.93	166	739.75	736.96
99	441.18	438.38	167	744.21	741.41
100	445.63	442.84	168	748.66	745.87
101	450.09	447.30	169	753.12	750.33
102	454.55	451.75	170	757.58	754.78
103	459.00	456.21	171	762.03	759.24
104	463.46	460.66	172	766.49	763.70
105	467.91	465.12	173	770.94	768.15
106	472.37	469.58	174	775.40	772.61
107	476.83	474.03	175	779.86	777.06
108	481.28	478.49	176	784.31	781.52
109	485.74	482.95	177	788.77	785.98
110	490.20	487.40	178	793.23	790.43
111	494.65	491.86	179	797.68	794.89
112	499.11	496.32	180	802.14	799.35
113	503.57	500.77	181	806.60	803.80
114	508.02	505.23	182	811.05	808.26
115	512.48	509.68	183	815.51	812.72
116	516.93	514.14	184	819.96	817.17
117	521.39	518.60	185	824.42	821.63
118	525.85	523.05	186	828.88	826.08
119	530.30	527.51	187	833.33	830.54
120	534.76	531.97	188	837.79	835.00
121	539.22	536.42	189	842.25	839.45
122	543.67	540.88	190	846.70	843.91
123	548.13	545.34	191	851.16	848.37
124	552.58	549.79	192	855.61	852.82
125	557.04	554.25			
126	561.50	558.70			
127	565.95	563.16			

Synchronous belts – 20M pitch

Power values in kW per 25 mm of belt width

Rotation speed for the smaller sprocket (r.p.m.)	Number of teeth at the smaller sprocket													
	34	36	38	40	44	48	52	56	60	64	68	72	80	90
Pitch diameter	216.45	229.18	241.92	254.65	280.11	305.58	331.04	356.51	381.97	407.44	432.90	458.37	509.30	572.96
10	0.41	0.44	0.46	0.49	0.53	0.58	0.63	0.68	0.73	0.78	0.83	0.87	0.97	1.09
20	0.80	0.85	0.89	0.94	1.04	1.13	1.23	1.32	1.41	1.51	1.60	1.69	1.88	2.11
40	1.54	1.64	1.73	1.82	2.01	2.19	2.37	2.55	2.73	2.91	3.09	3.27	3.63	4.07
60	2.27	2.41	2.54	2.68	2.95	3.21	3.48	3.75	4.01	4.27	4.54	4.80	5.32	5.97
80	2.98	3.16	3.34	3.51	3.87	4.22	4.57	4.92	5.26	5.61	5.95	6.30	6.98	7.82
100	3.68	3.90	4.12	4.34	4.77	5.21	5.64	6.07	6.50	6.92	7.35	7.77	8.61	9.65
150	5.39	5.72	6.04	6.36	6.99	7.63	8.26	8.88	9.51	10.13	10.74	11.36	12.57	14.07
200	7.07	7.49	7.91	8.33	9.16	9.99	10.81	11.62	12.43	13.24	14.03	14.83	16.40	18.33
300	10.33	10.94	11.55	12.15	13.36	14.55	15.73	16.90	18.05	19.20	20.33	21.45	23.64	26.31
400	13.48	14.27	15.06	15.84	17.39	18.92	20.42	21.91	23.36	24.80	26.21	27.59	30.27	33.47
500	16.54	17.50	18.45	19.40	21.26	23.09	24.87	26.62	28.33	30.00	31.62	33.19	36.19	39.64
600	19.49	20.61	21.72	22.81	24.95	27.03	29.06	31.02	32.91	34.74	36.49	38.16	41.27	44.65
700	22.35	23.61	24.85	26.07	28.45	30.74	32.94	35.05	37.06	38.96	40.74	42.41	45.37	48.30
800	25.09	26.48	27.83	29.16	31.73	34.18	36.50	38.68	40.71	42.59	44.30	45.84	48.37	50.40
950	28.99	30.53	32.02	33.47	36.22	38.78	41.04	43.06	45.05	46.48	47.75	48.83	49.78	
1000	30.23	31.80	33.33	34.80	37.59	40.16	42.48	44.54	46.32	47.81	48.99	49.84	50.48	
1200	33.28	34.61	35.88	37.11	40.05	42.64	47.77	46.64	48.48	50.22	51.87	53.45	54.40	
1450	36.70	38.10	39.45	40.75	43.21	45.51	47.95	49.67	51.57	53.38	52.10			
1600	38.49	39.94	41.32	42.66	45.17	47.51	49.70	51.75	53.70					
1800	40.64	42.13	43.55	44.92	47.49	49.89	52.13	54.24						
2000	42.54	44.06	45.52	46.92	49.54	51.99								

The permissible power values for any desired belt widths are determined by multiplying the values shown in the table above times the appropriate width factors.

Length factor S_6

Length (mm)	2000	3400	4200	5000–5400	5800–6200	6400-6600
Factor	0.90	0.95	1.0	1.05	1.10	1.15

Width factor S_7

Belt width	25	85	**115**	130	**170**	**230**	290	**340**
Width factor	1.00	3.50	**5.03**	5.80	**7.82**	**10.87**	13.93	**16.48**

Standard synchronous belts (Item Group 704)

Styles and dimensions
Standard widths: 115, 170, 230, 290 and 340 mm

Style	Number of teeth
2000-20M	100
2500-20M	125
3400-20M	170
4200-20M	210
4600-20M	230
5000-20M	250
5200-20M	260
5400-20M	270
5600-20M	280
5800-20M	290
6000-20M	300
6200-20M	310
6400-20M	320
6600-20M	330

Sprocket pitch diameter and outside diameter

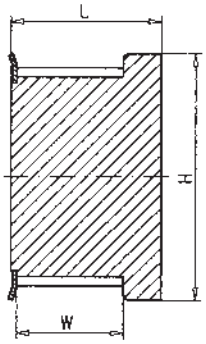
Number of teeth	Pitch diam. (mm)	O.D. (mm)
34	216.45	212.13
35	222.82	218.50
36	229.18	224.86
37	235.55	231.23
38	241.92	237.60
39	248.28	243.96
40	254.65	250.33
41	261.01	256.70
42	267.38	263.06
43	273.75	269.43
44	280.11	275.79
45	286.48	282.16
46	292.84	288.53
47	299.21	294.89
48	305.58	301.26
49	311.94	307.63
50	318.31	313.99
51	324.68	320.36
52	331.04	326.72
53	337.41	333.09
54	343.77	339.46
55	350.14	345.82
56	356.51	352.19
57	362.87	358.55
58	369.24	364.92
59	375.61	371.29
60	381.97	377.65
61	388.34	384.02
62	394.70	390.39
63	401.07	396.75
64	407.44	403.12
65	413.80	409.48
66	420.17	415.85
67	426.53	422.22
68	432.90	428.58
69	439.27	434.95
70	445.63	441.32
71	452.00	447.68
72	458.37	454.05
73	464.73	460.41
74	471.10	466.78
75	477.46	473.15
76	483.83	479.51
77	490.20	485.88
78	496.56	492.24
79	502.93	498.61
80	509.30	504.98
81	515.66	511.34

Sprocket pitch diameter and outside diameter

Number of teeth	Pitch diam. (mm)	O.D. (mm)
82	522.03	517.71
83	528.39	524.08
84	534.76	530.44
85	541.13	536.81
86	547.49	543.17
87	553.86	549.54
88	560.22	555.91
89	566.59	562.27
90	572.96	568.64
91	579.32	575.01
92	585.69	581.37
93	592.06	587.74
94	598.42	594.10
95	604.79	600.47
96	611.15	606.84
97	617.52	613.20
98	623.89	619.57
99	630.25	625.94
100	636.62	632.30
101	642.99	638.67
102	649.35	645.03
103	655.72	651.40
104	662.08	657.77
105	668.45	664.13
106	674.82	670.50
107	681.18	676.86
108	687.55	683.23
109	693.92	689.60
110	700.28	695.96
111	706.65	702.33
112	713.01	708.70
113	719.38	745.06
114	725.75	721.43
115	732.11	727.79
116	738.48	734.16
117	744.84	740.53
118	751.21	746.89
119	757.58	753.26
120	763.94	759.63
121	770.31	765.99
122	776.68	772.36
123	783.04	778.72
124	789.41	785.09
125	795.77	791.46
126	802.14	797.82
127	808.51	804.19
128	814.87	810.55
129	821.24	816.92
130	827.61	823.29
131	833.97	829.65
132	840.34	836.02
133	846.70	842.39
134	853.07	848.75
135	859.44	855.12
136	865.80	861.48
137	872.17	867.85
138	878.53	874.22
139	884.90	880.58
140	891.27	886.95
141	897.63	893.31
142	904.00	899.68
143	910.37	906.05
144	916.73	912.41
145	923.10	918.78
146	929.46	925.15
147	935.83	931.51
148	942.20	937.88
149	948.56	944.24
150	954.93	950.61
151	961.30	956.98
152	967.66	963.34
153	974.03	969.71
154	980.39	976.08
155	986.76	982.44
156	993.13	988.81
157	999.49	995.17
158	1005.86	1001.54
159	1012.22	1007.91
160	1018.59	1014.27
161	1024.96	1020.64
162	1031.32	1027.01
163	1037.69	1033.37
164	1044.06	1039.74
165	1050.42	1046.10
166	1056.79	1052.47
167	1063.15	1058.84
168	1069.52	1065.20
169	1075.89	1071.57
170	1082.25	1077.94
177	1088.62	1084.30
172	1094.99	1090.67
173	1101.35	1097.03
174	1107.72	1103.40
175	1114.08	1109.77
176	1120.45	1116.13
177	1126.82	1122.50
178	1133.18	1128.86
179	1139.55	1135.23
180	1145.92	1141.60
181	1152.28	1147.96
182	1158.65	1154.33
183	1165.01	1160.70
184	1171.38	1167.06
185	1177.75	1173.43
186	1184.11	1179.79
187	1190.48	1186.16
188	1196.84	1192.53
189	1203.21	1198.89
190	1209.58	1205.26
191	1215.94	1211.63
192	1222.31	1217.99

Standard sprocket range

Typ 1F



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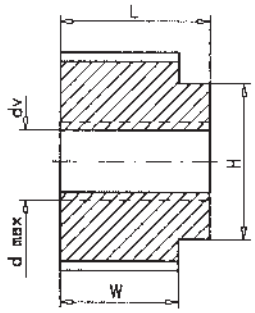
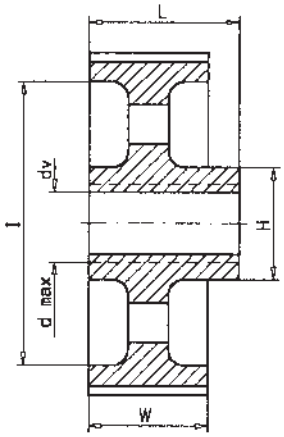


Typ 6A



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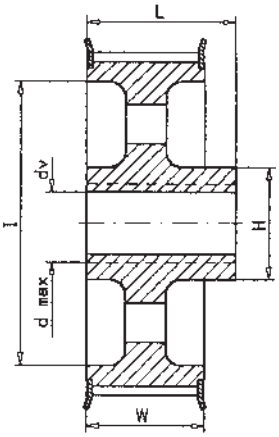

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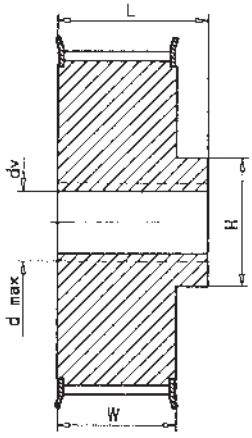

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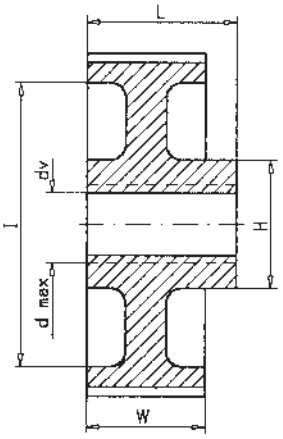

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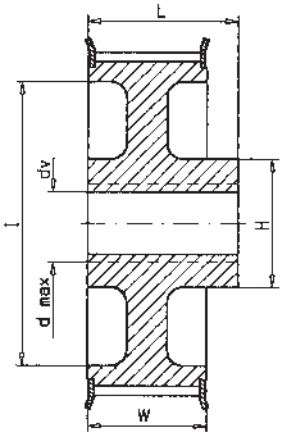

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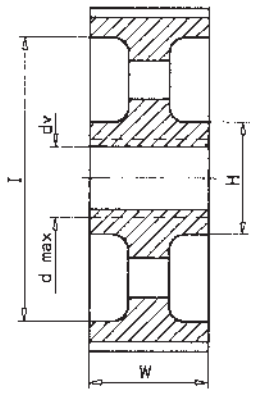

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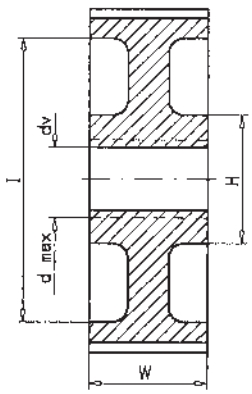

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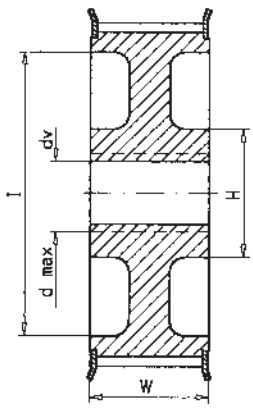


Standard sprocket range

3 mm pitch (Item Group *775*)

HTD 3M-09

Material: Aluminium

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	W	L	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P10-3M-09	8.79	13.0	1F	13.0	10.2	17.5	—	3.5	0.004
P12-3M-09	10.70	15.0	1F	15.0	10.2	17.5	—	5.0	0.006
P14-3M-09	12.61	16.0	1F	16.0	10.2	17.5	—	6.0	0.007
P15-3M-09	13.56	17.5	1F	17.5	10.2	17.5	—	7.0	0.008
P16-3M-09	14.52	18.0	6F	10.0	12.8	20.6	4.0	5.5	0.007
P18-3M-09	16.43	19.5	6F	11.0	12.8	20.6	6.0	6.5	0.008
P20-3M-09	18.34	23.0	6F	13.0	12.8	20.6	6.0	8.0	0.010
P21-3M-09	19.29	25.0	6F	14.0	12.8	20.6	6.0	9.0	0.013
P22-3M-09	20.25	25.0	6F	14.0	12.8	20.6	6.0	9.0	0.014
P24-3M-09	22.16	25.0	6F	14.0	12.8	20.6	6.0	9.0	0.016
P26-3M-09	24.07	28.0	6F	16.0	12.8	20.6	6.0	10.0	0.018
P28-3M-09	25.98	32.0	6F	18.0	12.8	20.6	6.0	11.0	0.024
P30-3M-09	27.89	32.0	6F	20.0	12.8	20.6	6.0	12.5	0.028
P32-3M-09	29.80	36.0	6F	22.0	12.8	20.6	6.0	13.5	0.032
P36-3M-09	33.62	38.0	6F	26.0	13.4	22.2	6.0	15.0	0.045
P40-3M-09	37.44	42.0	6F	28.0	13.4	22.2	6.0	16.5	0.055
P44-3M-09	41.26	48.0	6F	33.0	13.4	22.2	6.0	20.0	0.074
P48-3M-09	45.08	—	6	33.0	13.4	22.2	8.0	20.0	0.074
P60-3M-09	56.54	—	6	33.0	13.4	22.2	8.0	20.0	0.106
P72-3M-09	67.99	—	6	33.0	13.4	22.2	8.0	20.0	0.145

HTD 3M-15

Material: Aluminium

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	W	L	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P10-3M-15	8.79	13.0	1F	13.0	17.0	26.0	—	3.5	0.006
P12-3M-15	10.70	15.0	1F	15.0	17.0	26.0	—	5.0	0.008
P14-3M-15	12.61	16.0	1F	16.0	17.0	26.0	—	6.0	0.010
P15-3M-15	13.56	17.5	1F	17.5	17.0	26.0	—	7.0	0.012
P16-3M-15	14.52	18.0	6F	10.0	19.5	26.0	4.0	5.5	0.010
P18-3M-15	16.43	19.5	6F	11.0	19.5	26.0	6.0	6.5	0.012
P20-3M-15	18.34	23.0	6F	13.0	19.5	26.0	6.0	8.0	0.014
P21-3M-15	19.29	25.0	6F	14.0	19.5	26.0	6.0	9.0	0.016
P22-3M-15	20.25	25.0	6F	14.0	19.5	26.0	6.0	9.0	0.018
P24-3M-15	22.16	25.0	6F	14.0	19.5	26.0	6.0	9.0	0.020
P26-3M-15	24.07	28.0	6F	16.0	19.5	26.0	6.0	10.0	0.027
P28-3M-15	25.98	32.0	6F	18.0	19.5	26.0	6.0	11.0	0.030
P30-3M-15	27.89	32.0	6F	20.0	19.5	26.0	6.0	12.5	0.035
P32-3M-15	29.80	36.0	6F	22.0	19.5	26.0	6.0	13.5	0.042
P36-3M-15	33.62	38.0	6F	26.0	20.0	30.0	6.0	15.0	0.060
P40-3M-15	37.44	42.0	6F	28.0	20.0	30.0	6.0	16.5	0.075
P44-3M-15	41.26	48.0	6F	33.0	20.0	30.0	6.0	20.0	0.095
P48-3M-15	45.08	—	6	33.0	20.0	30.0	8.0	20.0	0.103
P60-3M-15	56.54	—	6	33.0	20.0	30.0	8.0	20.0	0.150
P72-3M-15	67.99	—	6	33.0	20.0	30.0	8.0	20.0	0.212

Standard sprocket range

5 mm pitch (Item Group 776)

HTD 5M-09 Gear ring width "W = 14.5 mm — Material: Steel up to P40-5M, aluminium as of P44-5M

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	L	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P12-5M-09	17.96	23.0	6F	13.0	—	20.0	4.0	8.0	0.028
P14-5M-09	21.14	25.0	6F	14.0	—	20.0	6.0	9.0	0.034
P15-5M-09	22.73	28.0	6F	16.0	—	20.0	6.0	10.0	0.042
P16-5M-09	24.32	28.0	6F	16.5	—	20.0	6.0	10.5	0.050
P18-5M-09	27.51	32.0	6F	20.0	—	20.0	6.0	12.5	0.070
P20-5M-09	30.69	36.0	6F	23.0	—	22.5	6.0	13.5	0.094
P21-5M-09	32.28	38.0	6F	24.0	—	22.5	6.0	14.0	0.110
P22-5M-09	33.87	38.0	6F	25.5	—	22.5	6.0	15.0	0.118
P24-5M-09	37.06	42.0	6F	27.0	—	22.5	6.0	16.0	0.145
P26-5M-09	40.24	44.0	6F	30.0	—	22.5	6.0	18.0	0.170
P28-5M-09	43.42	48.0	6F	30.5	—	22.5	6.0	18.0	0.200
P30-5M-09	46.60	51.0	6F	35.0	—	22.5	6.0	21.0	0.236
P32-5M-09	49.79	54.0	6F	38.0	—	22.5	8.0	23.0	0.270
P36-5M-09	56.16	60.0	6F	38.0	—	22.5	8.0	23.0	0.324
P40-5M-09	62.52	71.0	6F	38.0	—	22.5	8.0	23.0	0.400
P44-5M-09	68.89	—	6W	38.0	—	25.5	8.0	23.0	0.170
P48-5M-09	75.25	—	6W	45.0	61	25.5	8.0	28.0	0.182
P60-5M-09	94.35	—	6W	45.0	80	25.5	8.0	28.0	0.230
P72-5M-09	113.45	—	6W	45.0	100	25.5	8.0	28.0	0.270

HTD 5M-15 Gear ring width "W" = 20.5 mm — Material: Steel up to P40-5M, aluminium as of P44-5M

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	L	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P12-5M-15	17.96	23.0	6F	13.0	—	26.0	4.0	8.0	0.034
P14-5M-15	21.14	25.0	6F	14.0	—	26.0	6.0	9.0	0.046
P15-5M-15	22.73	28.0	6F	16.0	—	26.0	6.0	10.0	0.056
P16-5M-15	24.32	28.0	6F	16.5	—	26.0	6.0	10.5	0.064
P18-5M-15	27.51	32.0	6F	20.0	—	26.0	6.0	12.5	0.086
P20-5M-15	30.69	36.0	6F	23.0	—	26.0	6.0	13.5	0.112
P21-5M-15	32.28	38.0	6F	24.0	—	26.0	6.0	14.0	0.130
P22-5M-15	33.87	38.0	6F	25.5	—	26.0	6.0	15.0	0.140
P24-5M-15	37.06	42.0	6F	27.0	—	28.0	6.0	16.0	0.180
P26-5M-15	40.24	44.0	6F	30.0	—	28.0	6.0	18.0	0.220
P28-5M-15	43.42	48.0	6F	30.5	—	28.0	6.0	18.0	0.250
P30-5M-15	46.60	51.0	6F	35.0	—	28.0	6.0	21.0	0.300
P32-5M-15	49.79	54.0	6F	38.0	—	28.0	8.0	23.0	0.350
P36-5M-15	56.16	60.0	6F	38.0	—	28.0	8.0	23.0	0.426
P40-5M-15	62.52	71.0	6F	38.0	—	28.0	8.0	23.0	0.520
P44-5M-15	68.89	—	6W	38.0	—	30.0	8.0	23.0	0.225
P48-5M-15	75.25	—	6W	38.0	61	30.0	8.0	23.0	0.187
P60-5M-15	94.35	—	6W	50.0	80	30.0	8.0	30.0	0.305
P72-5M-15	113.45	—	6W	50.0	100	30.0	8.0	30.0	0.375

Standard sprocket range

HTD 5M-25 Gear ring width "W" = 30.0 mm — Material: Steel up to P40-5M, aluminium as of P44-5M

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	L	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P12-5M-25	17.96	23.0	6F	13.0	—	36.0	4.0	8.0	0.050
P14-5M-25	21.14	25.0	6F	14.0	—	36.0	6.0	9.0	0.070
P15-5M-25	22.73	28.0	6F	16.0	—	36.0	6.0	10.0	0.080
P16-5M-25	24.32	28.0	6F	16.5	—	36.0	6.0	10.5	0.100
P18-5M-25	27.51	32.0	6F	20.0	—	36.0	6.0	12.5	0.120
P20-5M-25	30.69	36.0	6F	23.0	—	36.0	6.0	13.5	0.160
P21-5M-25	32.28	38.0	6F	24.0	—	38.0	6.0	14.0	0.190
P22-5M-25	33.87	38.0	6F	25.5	—	38.0	6.0	15.0	0.210
P24-5M-25	37.06	42.0	6F	27.0	—	38.0	6.0	16.0	0.250
P26-5M-25	40.24	44.0	6F	30.0	—	38.0	6.0	18.0	0.300
P28-5M-25	-43.42	48.0	6F	30.5	—	38.0	6.0	18.0	0.350
P30-5M-25	46.60	51.0	6F	35.0	—	38.0	6.0	21.0	0.420
P32-5M-25	49.79	54.0	6F	38.0	—	38.0	8.0	23.0	0.480
P36-5M-25	56.16	60.0	6F	38.0	—	38.0	8.0	23.0	0.590
P40-5M-25	62.52	71.0	6F	38.0	—	38.0	8.0	23.0	0.740
P44-5M-25	68.89	—	6	38.0	—	40.0	8.0	23.0	0.320
P48-5M-25	75.25	—	6W	38.0	61	40.0	8.0	23.0	0.275
P60-5M-25	94.35	—	6W	50.0	80	40.0	8.0	30.0	0.435
P72-5M-25	113.45	—	6W	50.0	100	40.0	8.0	30.0	0.525

8 mm pitch (Item Group 770)

HTD 8M-20 Gear ring width "W" = 28 mm, overall width "L" = 38 mm — Material: Steel up to P38-8M, GG 15 gray casting as of P40-8M

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P22-8M-20	54.65	60	6F	43	—	12	25	0.54
P24-8M-20	59.75	66	6F	45	—	12	28	0.65
P26-8M-20	64.84	71	6F	50	—	12	30	0.80
P28-8M-20	70.08	75	6F	50	—	15	30	0.87
P30-8M-20	75.13	83	6F	55	—	15	32	1.02
P32-8M-20	80.16	87	6F	60	—	15	35	1.20
P34-8M-20	85.22	91	6F	70	—	15	42	1.40
P36-8M-20	90.30	98.5	6F	70	—	15	42	1.55
P38-8M-20	95.39	103	6F	75	—	15	45	1.65
P40-8M-20	100.49	106	6F	75	—	15	45	1.74
P44-8M-20	110.67	119	6F	75	—	15	45	2.10
P48-8M-20	120.86	127	6F	75	—	15	45	2.44
P56-8M-20	141.23	148	6WF	80	117	15	45	2.60
P64-8M-20	161.60	168	6WF	80	137	15	45	2.90
P72-8M-20	181.97	192	6WF	80	158	15	45	3.10
P80-8M-20	202.35	—	6A	90	180	15	50	3.80
P90-8M-20	227.81	—	6A	90	204	15	50	4.20
P112-8M-20	283.83	—	6A	90	260	18	50	5.20
P144-8M-20	365.32	—	6A	90	341	20	50	7.50
P168-8M-20	426.44	—	6A	100	402	20	60	10.00
P192-8M-20	487.55	—	6A	100	463	20	60	14.40

Standard sprocket range

HTD 8M-30 Gear ring width "W" = 38 mm, overall width "L" = 48 mm

Material: Steel up to P38-8M, GG 15 gray casting as of P40-8M

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P22-8M-30	54.65	60	6F	43	—	12	25	0.69
P24-8M-30	59.75	66	6F	45	—	12	28	0.84
P26-8M-30	64.84	71	6F	50	—	12	30	1.00
P28-8M-30	70.08	75	6F	50	—	15	30	1.12
P30-8M-30	75.13	83	6F	55	—	15	32	1.32
P32-8M-30	80.16	87	6F	60	—	15	35	1.53
P34-8M-30	85.22	91	6F	70	—	15	42	1.80
P36-8M-30	90.30	98.5	6F	70	—	15	42	1.99
P38-8M-30	95.39	103	6F	75	—	15	45	2.27
P40-8M-30	100.49	106	6F	75	—	15	45	2.40
P44-8M-30	110.67	119	6F	75	—	15	45	2.80
P48-8M-30	120.86	127	6F	75	—	15	45	3.20
P56-8M-30	141.23	148	6WF	90	117	15	50	3.60
P64-8M-30	161.60	168	6WF	90	137	15	50	4.30
P72-8M-30	181.97	192	6WF	95	158	15	55	4.80
P80-8M-30	202.35	—	6A	100	180	15	60	5.10
P90-8M-30	227.81	—	6A	100	204	15	60	5.70
P112-8M-30	283.83	—	6A	100	260	18	60	6.80
P144-8M-30	365.32	—	6A	100	341	20	60	9.30
P168-8M-30	426.44	—	6A	100	402	20	60	11.40
P192-8M-30	487.55	—	6A	100	463	20	60	16.00

HTD 8M-50 Gear ring width "W" = 60 mm

Material: Steel up to P38-8M, GG 15 gray casting as of P40-8M

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	L	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P22-8M-50	54.65	60	6F	43	—	70	12	28	1.00
P24-8M-50	59.75	66	6F	45	—	70	12	28	1.23
P26-8M-50	64.84	71	6F	50	—	70	12	30	1.50
P28-8M-50	70.08	75	6F	50	—	70	15	30	1.67
P30-8M-50	75.13	83	6F	55	—	70	15	32	1.97
P32-8M-50	80.16	87	6F	60	—	70	15	35	2.27
P34-8M-50	85.22	91	6F	70	—	70	15	42	2.69
P36-8M-50	90.30	98.5	6F	70	—	70	15	42	2.97
P38-8M-50	95.39	103	6F	75	—	70	15	45	3.23
P40-8M-50	100.49	106	6F	75	—	70	18	45	3.50
P44-8M-50	110.67	119	6F	75	—	70	18	45	3.90
P48-8M-50	120.86	127	6F	80	—	70	18	45	4.30
P56-8M-50	141.23	148	10WF	90	117	60	18	50	5.00
P64-8M-50	161.60	168	10WF	100	137	60	18	60	5.60
P72-8M-50	181.97	192	10WF	100	158	60	18	60	6.80
P80-8M-50	202.35	—	10A	110	180	60	18	65	6.90
P90-8M-50	227.81	—	10A	110	204	60	18	65	8.60
P112-8M-50	283.83	—	10A	110	260	60	18	65	9.60
P144-8M-50	365.32	—	10A	110	341	60	20	65	13.80
P168-8M-50	426.44	—	10A	120	402	60	20	70	16.00
P192-8M-50	487.55	—	10A	130	463	60	20	70	22.40

Standard sprocket range

HTD 8M-85 Gear ring width "W" = 95 mm

Material: Steel up to P38-8M, GG 15 gray casting as of P40-8M

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	L	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P22-8M-85	54.65	60	6F	43	—	105	12	28	1.55
P24-8M-85	59.75	66	6F	45	—	105	12	30	1.90
P26-8M-85	64.84	71	6F	50	—	105	12	32	2.25
P28-8M-85	70.08	75	6F	50	—	105	15	32	2.55
P30-8M-85	75.13	83	6F	55	—	105	15	32	3.00
P32-8M-85	80.16	87	6F	60	—	105	15	35	3.57
P34-8M-85	85.22	91	6F	70	—	105	15	42	4.00
P36-8M-85	90.30	98.5	6F	70	—	105	15	42	4.50
P38-8M-85	95.39	103	6F	75	—	105	15	45	4.90
P40-8M-85	100.49	106	6F	75	—	105	18	45	5.20
P44-8M-85	110.67	119	6F	75	—	105	18	45	6.60
P48-8M-85	120.86	127	6F	80	—	105	18	45	7.60
P56-8M-85	141.23	148	6F	80	—	105	20	45	9.80
P64-8M-85	161.60	168	10WF	100	137	95	20	60	10.40
P72-8M-85	181.97	192	10WF	110	158	95	20	65	11.40
P80-8M-85	202.35	—	10A	110	180	95	20	65	11.10
P90-8M-85	227.81	—	10A	110	204	95	20	65	13.20
P112-8M-85	283.83	—	10A	110	260	95	24	65	16.30
P144-8M-85	365.32	—	10A	120	341	95	24	70	21.50
P168-8M-85	426.44	—	10A	120	402	95	24	70	26.10
P192-8M-85	487.55	—	10A	130	463	95	24	70	30.60

14 mm pitch (Item Group 771)

HTD 14M-40 Gear ring width "W" = 54 mm, overall width "L" = 69 mm

Material: GG 15 gray casting

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P28-14M-40	122.12	127	6F	100	—	24	60	4.73
P29-14M-40	126.57	138	6F	100	—	24	60	5.09
P30-14M-40	130.99	138	6F	100	—	24	60	5.45
P32-14M-40	139.88	154	6F	100	—	24	60	6.17
P34-14M-40	148.79	160	6F	100	—	24	60	6.88
P36-14M-40	157.68	168	6F	100	—	24	60	7.60
P38-14M-40	166.60	183	6F	120	—	24	70	8.28
P40-14M-40	175.49	188	6F	120	—	24	70	9.26
P44-14M-40	193.28	211	6F	120	—	24	70	10.32
P48-14M-40	211.11	226	6WF	135	172	24	75	11.50
P56-14M-40	246.76	256	6WF	135	207	28	75	13.05
P64-14M-40	282.41	296	6WF	135	242	28	75	14.40
P72-14M-40	318.06	—	6A	135	278	28	75	16.90
P80-14M-40	353.71	—	6A	135	314	28	75	18.50
P90-14M-40	398.28	—	6A	135	358	28	75	20.00
P112-14M-40	496.32	—	6A	135	456	28	75	26.70
P144-14M-40	638.92	—	6A	135	600	28	75	35.00
P168-14M-40	745.87	—	6A	135	706	28	75	44.20
P192-14M-40	852.82	—	6A	135	813	28	75	52.20
P216-14M-40	959.76	—	6A	150	920	28	85	60.00

Standard sprocket range

HTD 14M-55 Gear ring width "W" = 70 mm — Material: GG 15 gray casting

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	L	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P28-14M-55	122.12	127	6F	100	—	85	24	60	5.60
P29-14M-55	126.57	138	6F	100	—	85	24	60	6.10
P30-14M-55	130.99	138	6F	100	—	85	24	60	6.60
P32-14M-55	139.88	154	6F	100	—	85	24	60	7.60
P34-14M-55	148.79	160	6F	100	—	85	24	60	8.60
P36-14M-55	157.68	168	6F	100	—	85	24	60	9.60
P38-14M-55	166.60	183	6F	120	—	85	24	70	10.80
P40-14M-55	175.49	188	6F	120	—	85	24	70	11.20
P44-14M-55	193.28	211	6F	120	—	85	24	70	12.50
P48-14M-55	211.11	226	10WF	135	172	70	24	75	13.70
P56-14M-55	246.76	256	10WF	135	207	70	28	75	14.50
P64-14M-55	282.41	296	10WF	135	242	70	28	75	15.60
P72-14M-55	318.06	—	10A	135	278	70	28	75	18.50
P80-14M-55	353.71	—	10A	135	314	70	28	75	20.00
P90-14M-55	398.28	—	10A	135	358	70	28	75	22.60
P112-14M-55	496.32	—	10A	135	456	70	28	75	29.50
P144-14M-55	638.92	—	10A	135	600	70	28	75	39.00
P168-14M-55	745.87	—	10A	135	706	70	28	75	48.50
P192-14M-55	852.82	—	10A	135	813	70	28	75	57.80
P216-14M-55	959.76	—	10A	150	920	70	28	85	67.00

HTD 14M-85 Gear ring width "W" = 102 mm — Material: GG 15 gray casting

Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	L	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P28-14M-85	122.12	127	6F	100	—	117	24	60	7.70
P29-14M-85	126.57	138	6F	100	—	117	24	60	8.40
P30-14M-85	130.99	138	6F	100	—	117	24	60	9.10
P32-14M-85	139.88	154	6F	100	—	117	24	60	10.50
P34-14M-85	148.79	160	6F	100	—	117	24	60	11.90
P36-14M-85	157.68	168	6F	100	—	117	32	60	13.20
P38-14M-85	166.60	183	6F	120	—	117	32	70	15.15
P40-14M-85	175.49	188	6F	135	—	117	32	75	17.10
P44-14M-85	193.28	211	6F	135	—	117	32	75	23.30
P48-14M-85	211.11	226	6F	150	—	117	32	85	25.00
P56-14M-85	246.76	256	10WF	150	207	102	32	85	25.00
P64-14M-85	282.41	296	10WF	150	242	102	32	85	30.50
P72-14M-85	318.06	—	10A	150	278	102	32	85	28.80
P80-14M-85	353.71	—	10A	150	314	102	32	85	30.10
P90-14M-85	398.28	—	10A	150	358	102	32	85	33.00
P112-14M-85	496.32	—	10A	150	456	102	32	85	41.80
P144-14M-85	638.92	—	10A	150	600	102	32	85	52.40
P168-14M-85	745.87	—	10A	150	706	102	32	85	60.30
P192-14M-85	852.82	—	10A	165	813	102	32	95	70.20
P216-14M-85	959.76	—	10A	165	920	102	32	95	81.00

Standard sprocket range

HTD 14M-115 Gear ring width "W" = 133 mm — Material: GG 15 gray casting

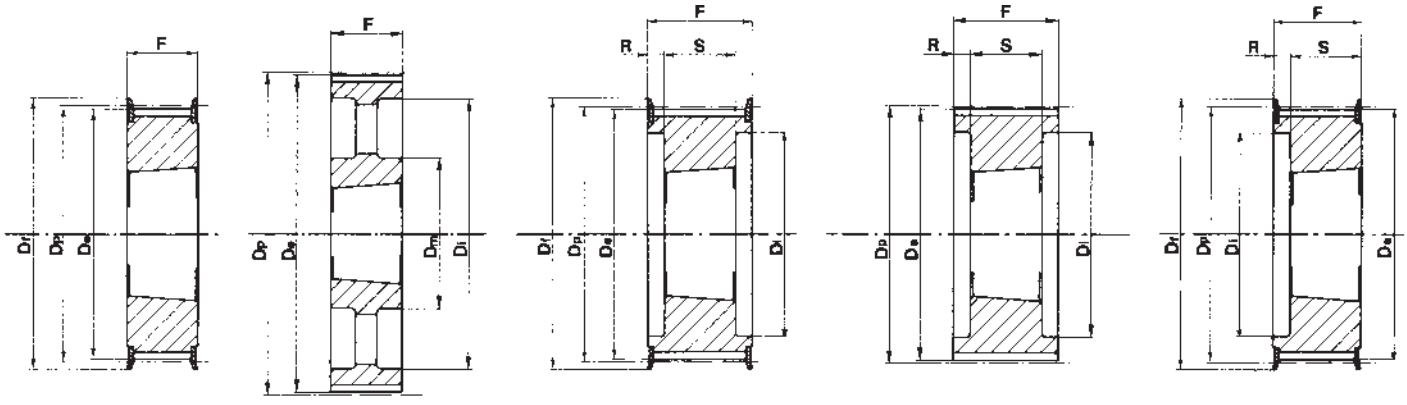
Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	L	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P28-14M-115	122.12	127	6F	100	—	148	32	60	9.20
P29-14M-115	126.57	138	6F	100	—	148	32	60	10.20
P30-14M-115	130.99	138	6F	100	—	148	32	60	11.20
P32-14M-115	139.88	154	6F	100	—	148	32	60	13.20
P34-14M-115	148.79	160	6F	100	—	148	32	60	14.80
P36-14M-115	157.68	168	6F	120	—	148	32	70	16.60
P38-14M-115	166.60	183	6F	120	—	148	32	70	19.20
P40-14M-115	175.49	188	6F	135	—	148	32	75	20.56
P44-14M-115	193.28	211	6F	140	—	148	32	80	21.93
P48-14M-115	211.11	226	6F	150	—	148	32	80	25.00
P56-14M-115	246.76	256	6F	150	—	148	32	85	27.50
P64-14M-115	282.41	296	10WF	150	242	133	32	85	30.10
P72-14M-115	318.06	—	10A	150	278	133	32	85	32.83
P80-14M-115	353.71	—	10A	150	314	133	32	85	35.55
P90-14M-115	398.28	—	10A	150	358	133	32	85	41.00
P112-14M-115	496.32	—	10A	150	456	133	32	85	54.40
P144-14M-115	638.92	—	10A	165	600	133	32	95	67.80
P168-14M-115	745.87	—	10A	165	706	133	32	95	75.80
P192-14M-115	852.82	—	10A	165	813	133	32	95	88.30
P216-14M-115	959.76	—	10A	165	920	133	32	95	98.00

HTD 14M-170 Gear ring width "W" = 187 mm — Material: GG 15 gray casting

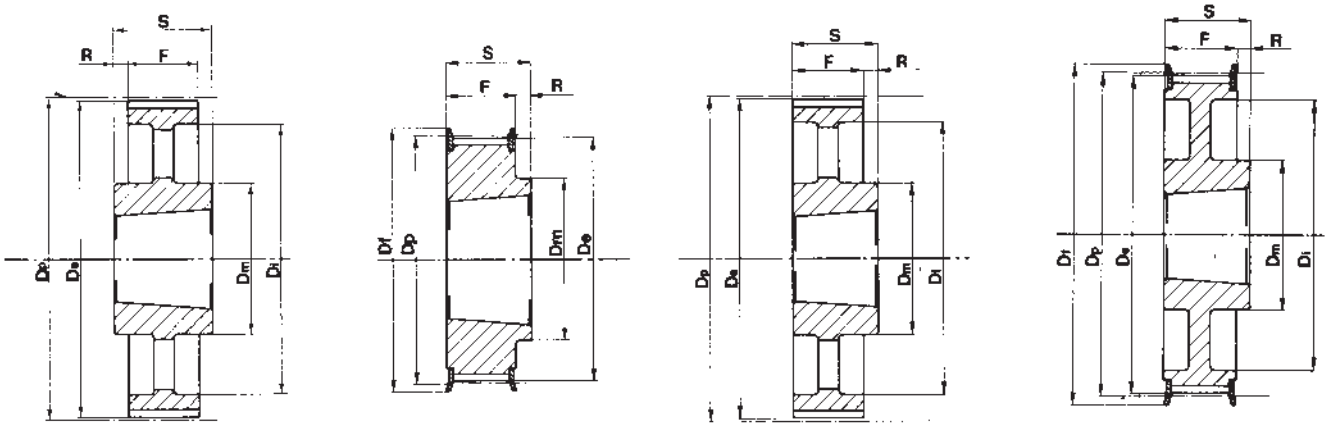
Number of teeth Designation code	Outside diameter Sprocket	Flange	Version	H	I	L	Preliminary bore (dv)	Max. finished bore (d max)	Weight kg
P28-14M-170	122.12	127	6F	100	—	202	32	60	13.80
P29-14M-170	126.57	138	6F	100	—	202	32	60	14.20
P30-14M-170	130.99	138	6F	100	—	202	32	60	15.60
P32-14M-170	139.88	154	6F	100	—	202	32	60	18.10
P34-14M-170	148.79	160	6F	100	—	202	32	60	20.40
P36-14M-170	157.68	168	6F	120	—	202	32	70	23.50
P38-14M-170	166.60	183	6F	135	—	202	32	75	26.50
P40-14M-170	175.49	188	6F	140	—	202	32	80	30.10
P44-14M-170	193.28	211	6F	160	—	202	32	90	37.80
P48-14M-170	211.11	226	6F	160	—	202	32	90	44.50
P56-14M-170	246.76	256	6F	160	—	202	32	90	61.00
P64-14M-170	282.41	296	6F	180	—	202	32	100	81.00
P72-14M-170	318.06	—	10W	180	278	187	32	100	61.40
P80-14M-170	353.71	—	10W	180	314	187	32	100	65.00
P90-14M-170	398.28	—	10A	180	358	187	38	100	68.00
P112-14M-170	496.32	—	10A	200	456	187	38	110	87.50
P144-14M-170	638.92	—	10A	220	600	187	38	120	114.00
P168-14M-170	745.87	—	10A	220	706	187	38	120	125.00
P192-14M-170	852.82	—	10A	220	813	187	38	120	136.40
P216-14M-170	959.76	—	10A	220	920	187	38	120	147.00

*Sprockets for TaperLock mounting bushings * Standard line*

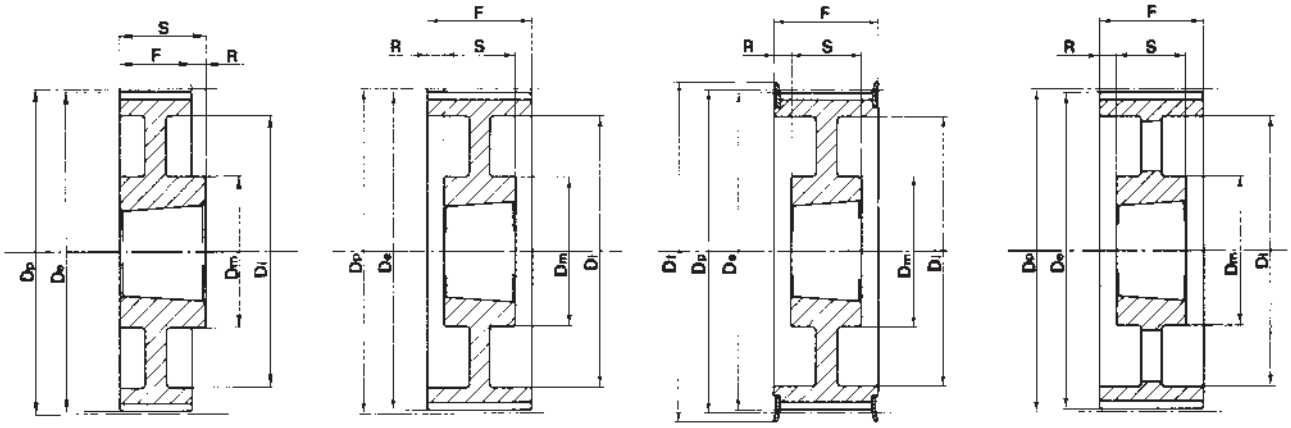
Versions



Typ 3F Typ 3A Typ 4F Typ 4 Typ 5F



Typ 7A Typ 8F Typ 8W Typ 8WF



Typ 8A Typ 9W Typ 9WF Typ 9A

*) Delivery periods on inquiry, since not all styles are stocked as standard.

Sprockets for TaperLock mounting bushings

8M mm pitch (Item Group 780)

HTD 8M-20

Material: Gray casting

Designation	Style	Bushing	Max. Bore	Dp	De	Df	Dm	Di	F	S	R	Weight kg
PL 22-8M-20	5F	1008	25	56.02	54.65	60	—	41	28	22	6	0.24
PL 24-8M-20	5F	1108	28	61.12	59.75	66	—	42	28	22	6	0.30
PL 26-8M-20	5F	1108	28	66.21	64.84	71	—	46	28	22	6	0.36
PL 28-8M-20	5F	1108	28	71.30	70.08	75	—	50	28	22	6	0.44
PL 30-8M-20	5F	1108	28	76.39	75.13	83	—	58	28	22	6	0.53
PL 32-8M-20	5F	1610	42	81.49	80.16	87	—	62	28	25	3	0.42
PL 34-8M-20	5F	1610	42	86.58	85.22	91	—	65	28	25	3	0.55
PL 36-8M-20	5F	1610	42	91.67	90.30	98.5	—	68	28	25	3	0.68
PL 38-8M-20	5F	1610	42	96.77	95.39	103	—	72	28	25	3	0.80
PL 40-8M-20	5F	1610	42	101.86	100.49	106	—	76	28	25	3	1.00
PL 44-8M-20	8F	2012	50	112.05	110.67	119	93	—	28	32	4	1.20
PL 48-8M-20	8F	2012	50	122.23	120.86	127	96	—	28	32	4	1.60
PL 56-8M-20	8F	2012	50	142.60	141.23	148	110	—	28	32	4	2.40
PL 64-8M-20	8WF	2012	50	162.97	161.60	168	110	137	28	32	4	2.70
PL 72-8M-20	8WF	2012	50	183.35	181.97	192	110	158	28	32	4	3.30
PL 80-8M-20	8W	2012	50	203.72	202.35	—	110	180	28	32	4	3.50
PL 90-8M-20	8A	2012	50	229.18	227.81	—	110	204	28	32	4	3.65

HTD 8M-30

Material: Gray casting

Designation	Style	Bushing	Max. Bore	Dp	De	Df	Dm	Di	F	S	R	Weight kg
PL 22-8M-30	5F	1008	25	56.02	54.65	60	—	41	38	22	16	0.29
PL 24-8M-30	5F	1108	25	61.12	59.75	66	—	42	38	22	16	0.38
PL 26-8M-30	5F	1108	25	66.21	64.84	71	—	46	38	22	16	0.45
PL 28-8M-30	5F	1210	32	71.30	70.08	75	—	50	38	25	13	0.50
PL 30-8M-30	3F	1615	42	76.39	75.13	83	—	—	38	38	—	0.55
PL 32-8M-30	3F	1615	42	81.49	80.16	87	—	—	38	38	—	0.59
PL 34-8M-30	3F	1615	42	86.58	85.22	91	—	—	38	38	—	0.77
PL 36-8M-30	3F	1615	42	91.67	90.30	98.5	—	—	38	38	—	0.96
PL 38-8M-30	3F	1615	42	96.77	95.39	103	—	—	38	38	—	1.15
PL 40-8M-30	3F	1615	42	101.86	100.49	106	—	—	38	38	—	1.34
PL 44-8M-30	4F	2012	50	112.05	110.67	119	—	91	38	32	3	1.33
PL 48-8M-30	4F	2012	50	122.23	120.86	127	—	95	38	32	3	1.78
PL 56-8M-30	4F	2012	50	142.60	141.23	148	—	117	38	32	3	3.76
PL 64-8M-30	8F	2517	60	162.97	161.60	168	125	—	38	45	7	4.20
PL 72-8M-30	8WF	2517	60	183.35	181.97	192	125	158	38	45	7	4.30
PL 80-8M-30	8W	2517	60	203.72	202.35	—	125	180	38	45	7	4.60
PL 90-8M-30	8A	2517	60	229.18	227.81	—	125	204	38	45	7	5.00
PL 112-8M-30	8A	2517	60	285.21	283.83	—	125	260	38	45	7	6.20
PL 144-8M-30	8A	2517	60	366.69	365.32	—	125	341	38	45	7	9.00

Sprockets for TaperLock mounting bushings

HTD 8M-50

Material: Gray casting

Designation	Style	Bushing	Max. Bore	Dp	De	Df	Dm	Di	F	S	R	Weight kg
PL 28-8M-50	5F	1210	32	71.30	70.08	75	—	50	60	25	35	0.60
PL 30-8M-50	5F	1615	42	76.39	75.13	83	—	58	60	38	22	0.65
PL 32-8M-50	5F	1615	42	81.49	80.16	87	—	62	60	38	22	0.82
PL 34-8M-50	5F	1615	42	86.58	85.22	91	—	65	60	38	22	1.06
PL 36-8M-50	5F	1615	42	91.67	90.30	98.5	—	68	60	38	22	1.30
PL 38-8M-50	5F	1615	42	96.77	95.39	103	—	72	60	38	22	1.60
PL 40-8M-50	4F	2012	50	101.86	100.49	106	—	82	60	32	14	1.71
PL 44-8M-50	4F	2012	50	112.05	110.67	119	—	91	60	32	14	1.78
PL 48-8M-50	4F	2012	50	122.23	120.86	127	—	95	60	32	14	2.30
PL 56-8M-50	4F	2517	60	142.60	141.23	148	—	116	60	45	7.5	3.40
PL 64-8M-50	4F	2517	60	162.97	161.60	168	—	137	60	45	7.5	5.00
PL 72-8M-50	9WF	2517	60	183.35	181.97	192	125	158	60	45	7.5	6.70
PL 80-8M-50	4	3020	75	203.72	202.35	—	—	180	60	51	4.5	8.80
PL 90-8M-50	9W	3020	75	229.18	227.81	—	170	204	60	51	4.5	10.00
PL112-8M-50	9W	3020	75	285.21	283.83	—	170	260	60	51	4.5	12.00
PL144-8M-50	9A	3020	75	366.69	365.32	—	170	341	60	51	4.5	15.20
PL168-8M-50	7A	3525	90	427.81	426.44	—	190	402	60	65	2.5	16.40
PL192-8M-50	7A	3525	90	488.92	487.55	—	190	460	60	65	2.5	21.80

HTD 8M-85

Material: Gray casting

Designation	Style	Bushing	Max. Bore	Dp	De	Df	Dm	Di	F	S	R	Weight kg
PL 34-8M-85	4F	1615	42	86.58	85.22	91	—	65	95	38	28.5	1.43
PL 36-8M-85	4F	1615	42	91.67	90.30	98.5	—	68	95	38	28.5	1.87
PL 38-8M-85	4F	1615	42	96.77	95.39	103	—	72	95	38	28.5	2.20
PL 40-8M-85	4F	2012	50	101.86	100.49	106	—	82	95	32	31.5	1.80
PL 44-8M-85	4F	2012	50	112.05	110.67	119	—	91	95	32	31.5	2.30
PL 48-8M-85	4F	2517	60	122.23	120.86	127	—	100	95	45	25.0	2.66
PL 56-8M-85	4F	2517	60	142.60	141.23	148	—	117	95	45	25.0	4.45
PL 64-8M-85	4F	2517	60	162.97	161.60	168	—	137	95	45	25.0	6.20
PL 72-8M-85	4F	3020	75	183.35	181.97	192	—	158	95	51	22.0	8.00
PL 80-8M-85	4	3020	75	203.72	202.35	—	—	180	95	51	22.0	10.00
PL 90-8M-85	9W	3020	75	229.18	227.81	—	170	204	95	51	22.0	10.80
PL 112-8M-85	9W	3020	75	285.21	283.83	—	170	260	95	51	22.0	15.00
PL 144-8M-85	9A	3525	90	366.69	365.32	—	190	341	95	65	15.0	20.00
PL 168-8M-85	9A	3525	90	427.81	426.44	—	190	402	95	65	15.0	23.00
PL 192-8M-85	9A	3525	90	488.92	487.55	—	190	460	95	65	15.0	28.50

Sprockets for TaperLock mounting bushings

14M mm pitch (Item Group 781)

HTD 14M-40 Material: Gray casting

Designation	Style	Bushing	Max. Bore	Dp	De	Df	Dm	Di	F	S	R	Weight kg
PL28-14M-40	4F	2012	50	124.78	122.12	127	—	98	54	32	11	2.07
PL29-14M-40	4F	2012	50	129.23	126.57	138	—	100	54	32	11	2.38
PL30-14M-40	4F	2012	50	133.69	130.99	138	—	100	54	32	11	2.65
PL32-14M-40	4F	2012	50	142.60	139.88	154	—	104	54	32	11	3.40
PL34-14M-40	4F	2517	60	151.52	148.79	160	—	110	54	45	4.5	3.87
PL36-14M-40	4F	2517	60	160.43	157.68	168	—	120	54	45	4.5	4.80
PL38-14M-40	4F	2517	60	169.34	166.60	183	—	130	54	45	4.5	5.40
PL40-14M-40	4F	2517	60	178.25	175.49	188	—	138	54	45	4.5	6.00
PL44-14M-40	4F	3020	75	196.08	193.28	211	—	155	54	51	1.5	7.80
PL48-14M-40	4F	3020	75	213.90	211.11	226	—	170	54	51	1.5	9.40
PL56-14M-40	9WF	3020	75	249.55	246.76	256	170	208	54	51	1.5	10.80
PL64-14M-40	9WF	3020	75	285.21	282.41	296	170	242	54	51	1.5	13.40
PL72-14M-40	9W	3020	75	320.86	318.06	—	170	280	54	51	1.5	15.20
PL80-14M-40	9A	3020	75	356.51	353.71	—	170	315	54	51	1.5	16.00
PL90-14M-40	9A	3020	75	401.07	398.28	—	170	360	54	51	1.5	17.80
PL112-14M-40	9A	3020	75	499.11	496.32	—	170	457	54	51	1.5	25.60
PL144-14M-40	9A	3020	75	641.71	638.92	—	170	600	54	51	1.S	32.00
PL168-14M-40	9A	3020	75	748.66	745.87	—	170	706	54	51	1.5	44.00
PL192-14M-40	9A	3020	75	855.62	852.82	—	170	813	54	51	1.5	49.00
PL216-14M-40	9A	3020	75	962.57	959.76	—	170	920	54	51	1.5	55.00

Sprockets for TaperLock mounting bushings

HTD 14M-55

Material: Gray casting

Designation	Style	Bushing	Max. Bore	Dp	De	Df	Dm	Di	F	S	R	Weight kg
PL 28-14M-55	4F	2012	50	124.78	122.12	127	—	98	70	32	19	2.20
PL 29-14M-55	4F	2012	50	129.23	126.57	138	—	100	70	32	19	2.74
PL 30-14M-55	4F	2517	60	133.69	130.99	138	—	100	70	45	12.5	2.70
PL 32-14M-55	4F	2517	60	142.60	139.88	154	—	108	70	45	12.5	3.66
PL 34-14M-55	4F	2517	60	151.52	148.79	160	—	110	70	45	12.5	4.55
PL 36-14M-55	4F	2517	60	160.43	157.68	168	—	120	70	45	12.5	5.20
PL 38-14M-55	4F	2517	60	169.34	166.60	183	—	130	70	45	12.5	6.20
PL 40-14M-55	4F	2517	60	178.25	175.49	188	—	138	70	45	12.5	7.00
PL 44-14M-55	4F	3020	75	196.08	193.28	211	—	155	70	51	9.5	8.60
PL 48-14M-55	4F	3020	75	213.90	211.11	226	—	170	70	51	9.5	10.40
PL 56-14M-55	9WF	3020	75	249.55	246.76	256	170	208	70	51	9.5	12.00
PL 64-14M-55	9WF	3020	75	285.21	282.41	296	170	242	70	51	9.5	14.50
PL 72-14M-55	9W	3020	75	320.86	318.06	—	170	280	70	51	9.5	16.20
PL 80-14M-55	9A	3020	75	356.51	353.71	—	170	315	70	51	9.5	17.50
PL 90-14M-55	9A	3020	75	401.07	398.28	—	170	360	70	51	9.5	20.10
PL112-14M-55	9A	3020	75	499.11	496.32	—	170	457	70	51	9.5	28.40
PL144-14M-55	9A	3020	75	641.71	638.92	—	170	600	70	51	9.5	36.20
PL168-14M-55	9A	3020	75	748.66	745.87	—	170	706	70	51	9.5	49.00
PL192-14M-55	9A	3020	75	855.62	852.82	—	170	813	70	51	9.5	53.00
PL216-14M-55	7A	3535	90	962.57	959.76	—	190	920	70	89	9.5	65.80

HTD 14M-85

Material: Gray casting

Designation	Style	Bushing	Max. Bore	Dp	De	Df	Dm	Di	F	S	R	Weight kg
PL 28-14M-85	4F	2517	60	124.78	122.12	127	—	98	102	45	28.5	2.70
PL 29-14M-85	4F	2517	60	129.23	126.57	138	—	100	102	45	28.5	3.40
PL 30-14M-85	4F	2517	60	133.69	130.99	138	—	100	102	45	28.5	3.75
PL 32-14M-85	4F	2517	60	142.60	139.88	154	—	108	102	45	28.5	4.80
PL 34-14M-85	4F	2517	60	151.52	148.79	160	—	110	102	45	28.5	6.00
PL 36-14M-85	4F	3020	75	160.43	157.68	168	—	125	102	51	25.5	5.80
PL 38-14M-85	4F	3020	75	169.34	166.60	183	—	130	102	51	25.5	6.80
PL 40-14M-85	4F	3020	75	178.25	175.49	188	—	138	102	51	25.5	8.00
PL 44-14M-85	4F	3030	75	196.08	193.28	211	—	155	102	76	13	11.80
PL 48-14M-85	4F	3030	75	213.90	211.11	226	—	170	102	76	13	15.10
PL 56-14M-85	4F	3525	90	249.55	246.76	256	190	210	102	65	18.5	19.00
PL 64-14M-85	9WF	3525	90	285.21	282.41	296	190	242	102	65	18.5	23.00
PL 72-14M-85	9W	3525	90	320.86	318.06	—	190	280	102	65	18.5	25.00
PL 80-14M-85	9A	3525	90	356.51	353.71	—	190	315	102	65	18.5	26.00
PL 90-14M-85	9A	3525	90	401.07	398.28	—	190	360	102	65	18.5	27.80
PL112-14M-85	9A	3525	90	499.11	496.32	—	190	457	102	65	18.5	36.50
PL144-14M-85	9A	3525	90	641.71	638.92	—	190	600	102	65	18.5	48.00
PL168-14M-85	9A	3525	90	748.66	745.87	—	190	706	102	65	18.5	60.00
PL192-14M-85	3A	4040	100	855.62	852.82	—	230	813	102	102	—	86.00
PL216-14M-85	3A	4040	100	962.57	959.76	—	230	920	102	102	—	91.50

Sprockets for TaperLock mounting bushings

HTD 14M-115

Material: Gray casting

Designation	Style	Bushing	Max. Bore	Dp	De	Df	Dm	Di	F	S	R	Weight kg
PL28-14M-115	4F	2517	60	124.78	122.12	127	—	98	133	45	44	3.77
PL29-14M-115	4F	2517	60	129.23	126.57	138	—	100	133	45	44	4.00
PL30-14M-115	4F	2517	60	133.69	130.99	138	—	100	133	45	44	5.00
PL32-14M-115	4F	2517	60	142.60	139.88	154	—	108	133	45	44	6.80
PL34-14M-115	4F	2517	60	151.52	148.79	160	—	110	133	45	44	6.80
PL36-14M-115	4F	3020	75	160.43	157.68	168	—	125	133	51	41	7.00
PL38-14M-115	4F	3020	75	169.34	166.60	183	—	130	133	51	41	8.40
PL40-14M-115	4F	3020	75	178.25	175.49	188	—	140	133	51	41	9.20
PL44-14M-115	4F	3030	75	196.08	193.28	211	—	155	133	76	28.5	14.00
PL48-14M-115	4F	3030	75	213.90	211.11	226	—	170	133	76	28.5	17.10
PL56-14M-115	4F	3535	90	249.55	246.76	256	—	210	133	89	22	24.80
PL64-14M-115	9WF	3535	90	285.21	282.41	296	190	242	133	89	22	27.00
PL72-14M-115	9W	3535	90	320.86	318.06	—	190	280	133	89	22	29.00
PL80-14M-115	9A	3535	90	356.51	353.71	—	190	315	133	89	22	32.00
PL90-14M-115	9A	3535	90	401.07	398.28	—	190	360	133	89	22	36.50
PL112-14M-115	9A	3535	90	499.11	496.32	—	190	457	133	89	22	46.00
PL144-14M-115	9A	4040	100	641.71	638.92	—	230	600	133	102	15.5	68.00
PL168-14M-115	9A	4040	100	748.66	745.87	—	230	706	133	102	15.5	82.60
PL192-14M-115	9A	4040	100	855.62	852.82	—	230	813	133	102	15.5	96.00
PL216-14M-115	9A	4040	100	962.57	959.76	—	230	920	133	102	15.5	107.00

HTD 14M-170

Material: Gray casting

Designation	Style	Bushing	Max. Bore	Dp	De	Df	Dm	Di	F	S	R	Weight kg
PL38-14M-170	4F	3030	75	169.34	166.60	183	—	130	187	76	55.5	11.70
PL40-14M-170	4F	3030	75	178.25	175.49	188	—	140	187	76	55.5	13.00
PL44-14M-170	4F	3535	90	196.08	193.28	211	—	155	187	89	49	15.00
PL48-14M-170	4F	3535	90	213.90	211.11	226	—	175	187	89	49	19.00
PL56-14M-170	4F	3535	90	249.55	246.76	256	—	210	187	89	49	28.50
PL64-14M-170	4F	4040	100	285.21	282.41	296	—	240	187	102	42.5	41.00
PL72-14M-170	9W	4040	100	320.86	318.06	—	230	280	187	102	42.5	46.90
PL80-14M-170	9W	4040	100	356.51	353.71	—	230	315	187	102	42.5	48.00
PL90-14M-170	9A	4040	100	401.07	398.28	—	230	360	187	102	42.5	52.50
PL112-14M-170	9A	5050	125	499.11	496.32	—	265	456	187	127	30	74.50
PL144-14M-170	9A	5050	125	641.71	638.92	—	265	600	187	127	30	91.00
PL168-14M-170	9A	5050	125	748.66	745.87	—	265	706	187	127	30	116.00
PL192-14M-170	9A	5050	125	855.62	852.82	—	265	813	187	127	30	134.00
PL216-14M-170	9A	5050	125	962.57	959.76	—	265	920	187	127	30	146.50

WALTHER FLENDER®

Data sheet for calculation of _____ belt drives

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Fax: +49(0)2 11 / 70 07 - 3 02

Company _____
Name / Department _____
Street address/ P. O. Box _____
Post code /Town _____
Phone _____
Fax _____

Application: _____

◯ Yes ◯ No Requirements: _____ pcs/year

Existing drive to be replaced with _____

Drive data:

	Power source (e.g. electric motor)	Driven equipment (e.g. machine tool)
Type		
Manufacturer	_____	_____
Model	_____	_____
Rotation speed	n_1 _____ r.p.m.	n_2 _____ r.p.m.
Power	P _____ kW	P _____ kW P_{max} _____ kW
Torque	Braking torque _____ Nm	Starting torque _____ Nm

Starting characteristics (e.g. torque development, type of run-up switching)
_____
_____

Type of load
◯ Uniform
◯ Non-uniform
◯ Shock peaks
◯ Reversing

Sprocket diameter	Pitch diameter d_{w1} _____ mm	Pitch diameter d_{w2} _____ mm
	Outside diameter d_{a1} _____ mm	Outside diameter d_{a2} _____ mm
Permissible diameter range	from _____ mm to _____ mm	from _____ mm to _____ mm
Max. permissible sprocket width	_____ mm	_____ mm

Transmission ratio i _____ i_{min} _____ i_{max} _____ ◯ step-down ◯ step-up
Existing center distance a _____ mm Center distance adjustment range _____ mm ◯ fixed
Center distance range (for new engineering) a_{min} _____ mm a_{max} _____ mm

Idler/guide pulleys	◯ Inside pulley	◯ Taut span
	◯ Outside pulley	◯ Slack span
Pulley diameter	d_w _____ mm	d_a _____ mm
Shaft orientation	◯ horizontal	◯ vertical

Operating conditions:

Chemical influences (e.g. oil, dust, etc.) _____
Ambient temperature _____ ° C _____
Daily duty cycle _____ hr/day Number of switch on/off cycles per day
Desired noise level _____ dBA _____

Note: The specifications given in this catalog are not binding.
Subject to technical modification without prior notice; errors and omissions excepted.

WALTHER FLENDER®

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wrwunited cologne

HD 111E