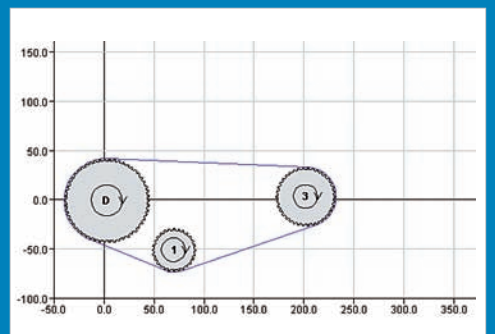
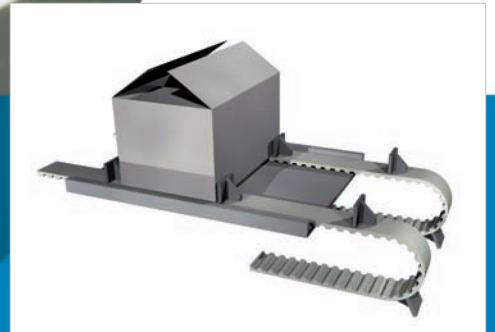
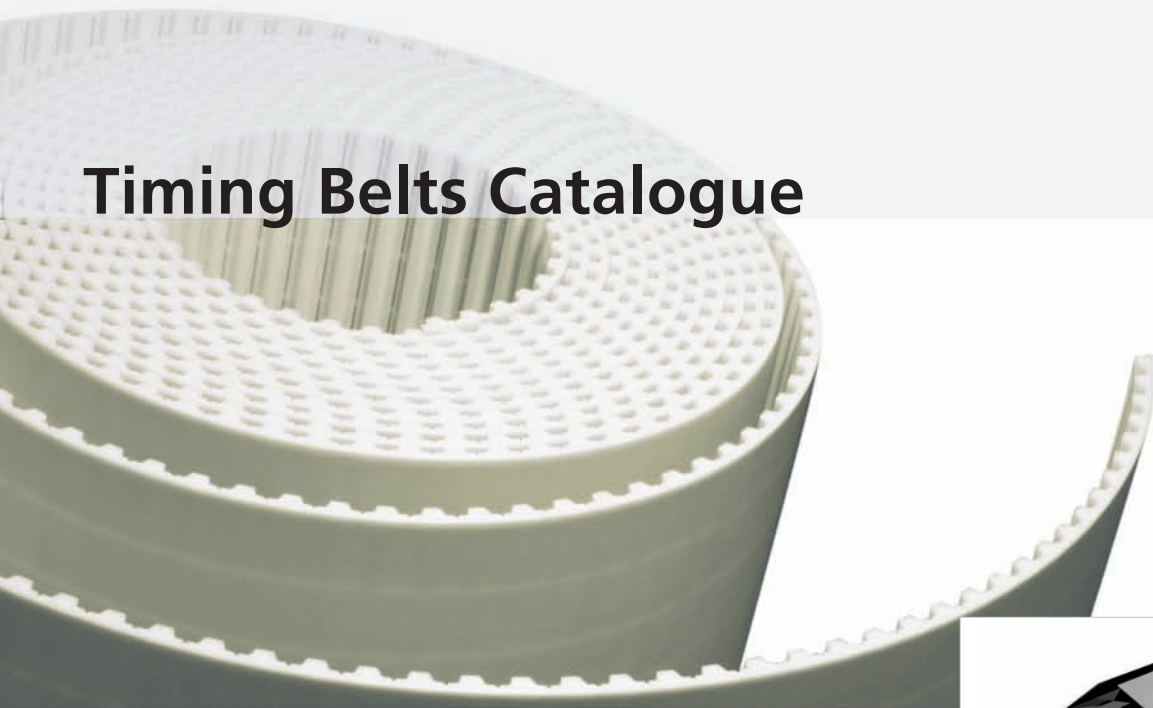


Timing Belts Catalogue



» Precise solution for synchronised conveying, positioning and power transmission

Welcome to Ammeraal Beltech



Facts and figures

Ammeraal Beltech is a leading manufacturer of process and conveyor belts for a diverse range of applications in almost every industry.

We have 7 production plants and operating companies in 25 countries, each with its own local customer service structure. More than 1,600 highly qualified employees in over 85 service centres provide standard and tailor-made solutions, often combined with 24-hour service. Thanks to our extensive network of trading partners, our products and services are available in more than 150 countries.

Ammeraal Beltech is part of the Dutch Gamma Holding organization. This stocklisted company has 7 different business units, all connected by the fact that they use technical textiles as their base product.



Products

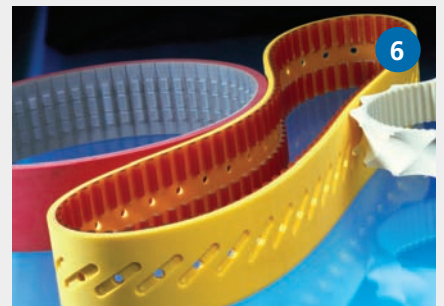
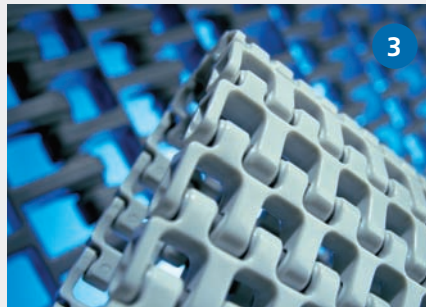
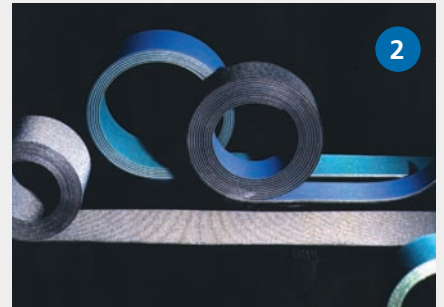
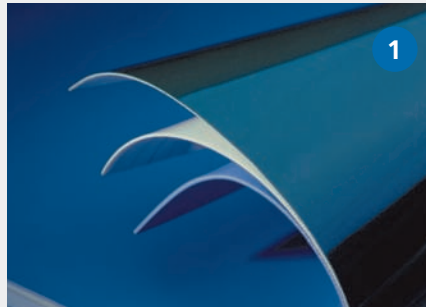
The largest product range worldwide

Whether you need antimicrobial conveyor belts for the food industry or a flameretardant product for use at airports, Ammeraal Beltech has the product to meet your requirements.

Our comprehensive range is built around six product groups:

1. Process & conveyor belts
2. High performance flat belts
3. Modular belts
4. Endless woven belts
5. Timing belts
6. Engineered belts

And for assembly and work on site, a range of suitable tools is available for all our product groups.



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List of formula signs

List of formula signs		
symbol	name	unit
β	Wrapping angle	[°]
Δl	Elongation	[mm]
η	Efficiency	[-]
μ	Coefficient of friction	[-]
1	Index for small pulley	[-]
2	Index for large pulley	[-]
a	Acceleration	[m/s ²]
a	bore distance	[mm]
b	Width of Vee-guide groove	[mm]
B	Width of Vee-guide	[mm]
c	Safety factor	[-]
C	Width of clamping plate	[mm]
CC	Shaft centre distance	[mm]
C_h	Duty factor of operation	[-]
C_l	Factor load	[-]
C_s	Service factor	[-]
C_{spec}	Spec. spring ratio	[N]
d	Borehole diameter	[mm]
d_1	Minimum pulley diameter	[mm]
d_2	Minimum tension pulley diameter	[mm]
d_e	Outer diameter	[mm]
d_{max}	Max. borehole diameter	[mm]
d_b	Effective diameter	[mm]
e	Index "engaged"	[-]
e	Distance to end	[mm]
f	Frequency	[1/s]
F	Force	[N]
F_{ac}	Acceleration force	[N]
F_{al}	Allowed span force	[N]
F_b	Bearing load	[N]
F_{br}	Breaking load	[N]
F_c	Circumferential force	[N]
F_{fric}	Friction force	[N]
F_{incl}	Climbing resistance	[N]
F_m	Shaft load	[N]
F_p	Pre-tensioning force	[N]
f_R	Rolling friction	[-]

List of formula signs		
symbol	name	unit
F_{rem}	Motion resistance	[N]
F_{spec}	Specific tooth force	[N]
g	Acceleration of gravity	[m/s ²]
h	Depth of Vee-guide groove	[mm]
H	Height of Vee-guide	[mm]
H	Total height	[mm]
h_1	Depth of slider bed groove	[mm]
h_n	Height of flange	[mm]
i	Transmission ratio	[-]
L	Total length	[mm]
l_s	Span length	[mm]
l_{tb}	Timing belt length	[mm]
$l_{tb,a}$	Approx. belt length	[mm]
$l_{tb,c}$	Correct belt length	[mm]
$l_{tb,ten}$	Belt elongation	[mm]
l_{ten}	Tensioning distance	[mm]
$l_{ten,fl}$	Tensioning distance due to flanges	[mm]
m	Weight	[kg]
m_{ach}	Index "drive"	[-]
m_{ot}	Index "driven"	[-]
n	Speed	[1/s]
n_1	Speed, rpm	[1/min]
p	Pitch	[mm]
P_{mech}	Mech. power	[W]
P_{mot}	Motor power	[W]
P_{spec}	Specific power	[W]
t	Number of teeth	[-]
t	Height of teeth	[mm]
T	Torque	[Nm]
T_{mot}	Motor torque	[Nm]
T_{spec}	Specific torque	[Nm]
t_{tb}	Number of belt teeth	[-]
v	Velocity	[m/s]
w	Width of groove base	[mm]
W	Width of groove top	[mm]
w_f	Width over flanges	[mm]
w_{tb}	Belt width	[mm]

Timing Belt Applications

Logistics and material handling increasingly rely on the advantages that *Ammeraal Beltech* timing belts offer.

From transferring power to lifting your product, timing belts are your guarantee, that everything is where it needs to be, when it needs to be there.

Pollutants from the working environment can greatly effect traditional rubber timing belts; fats, acids, ozone and other chemicals can cause lost production and costly maintenance time.

Ammeraal Beltech PU timing belts are highly resistant to these damaging influences.



Food and tobacco applications have for a long time benefited from the unparalleled advantages of *Ammeraal Beltech* PU timing belts. Their durability offer a flexible solution to demanding production situations.

Noise pollution is an increasing danger in all production environments. Noisy chains and gearing add to this problem. Timing belts reduce these noise levels, contributing to a safer and more comfortable working environment.

Many industrial applications require the exact positioning of products in relation to other operations in the production process. Specially profiled welded flights can accommodate awkwardly shaped products.

Many types of customized profiles and cleats are available, locating and holding your product as required. Your local *Ammeraal Beltech* distribution point can make the necessary recommendations for these products.



Efficient transfer of power from source to destination, has always been a technical challenge.

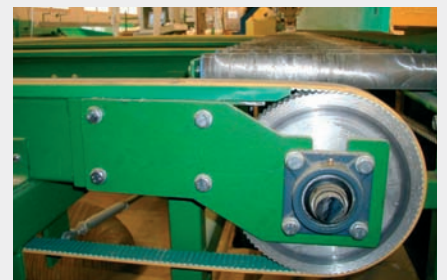
Ammeraal Beltech timing belts offer all the advantages that are needed to achieve this.

Our belts offer positive drive, high torque, dynamic flexibility and a superb resistance to adverse environmental conditions.



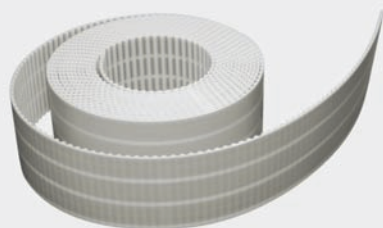
Ammeraal Beltech timing belts for a wide range of industrial applications and environments:

- Airport baggage handling systems
- Logistics industry
- Food industry
- Print & Paper industry
- Packaging industry
- Wood industry
- Ceramic industry
- Automotive industry
- Tobacco industry
- Chemical industry
- Electronics assembly lines
- Power transmission



A comprehensive range for many industries

PU Linear



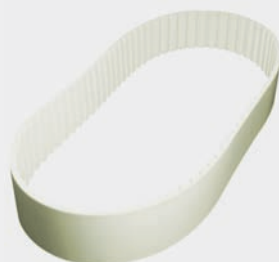
- Open end rolls or endless jointed
- Standard roll length 100 m
- Min. jointed length 500 mm
- Material: thermoplastic PU with steel or aramid cords
- Accessories: Vee-guides, cleats, covers

A versatile belt for automation and material handling equipment, mainly for linear and conveying purposes.

Typical applications

- Open length belts:
 - › Automation and material handling equipment, horizontal and vertical doors, printing applications, automatic assembly operations, automatic storage and retrieval systems, fabric cutting machines, woodworking machines, glass cutting, scanner movement, robotics.
- Endless jointed belts:
 - › Sheet metal and sheet glass transport systems, food conveying, print and paper applications, conveying applications for wood and related industry; in general for synchronised conveying and positioning, assembly, packaging, inserting and other automation equipment applications.

PU Torque



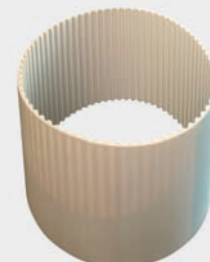
- truly endless, no joint
- Length: 1.5 m – 24.0 m
all length available according to tooth pitch
- Material: thermoplastic PU with steel cords (spirally wound)
- Accessories: Vee-guides, cleats, covers

A belt for high tension conveying, positioning and power transmission applications

Typical applications

- High tension conveying and positioning applications giving longer life compared to spliced or welded belts.
- General industry drive belts for use in wood, printing, paper converting and textile industries.

PU Moulded



- truly endless, no joint
- Standard length
(min. 112 mm, max. 2250 mm)
- Material: thermoset PU with steel cords (spirally wound)
- Accessories: wide range of covers

A belt which can be used in many sectors of industry, from very light operations to high-performance applications as a drive, conveying and positioning belt.

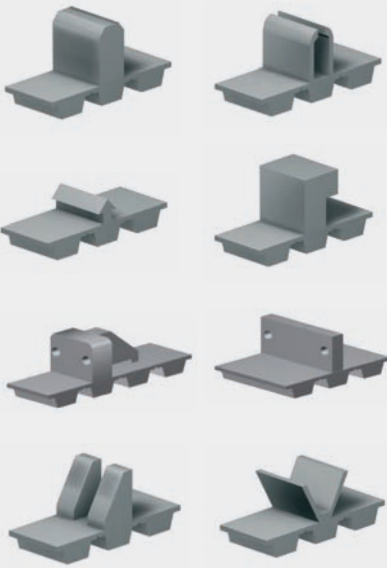
Typical applications

- Moulded timing belts can be used in many sectors of industry, from very light miniature drives to high-performance applications.
- They are ideal for high speed and high torque drive belts. They are also suitable for short conveying and positioning applications.

Fabrication & Specials

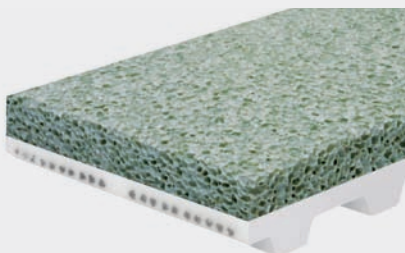
Cleats

- Timing belts can be customised with welded-on profiles/cleats made from the same urethane as the body of the belt
- A comprehensive range of simple rectangular and custom made complex cleats are available
- Welding
 - › High frequency (HF) welding
 - › Friction welding
 - › Contact heated tool welding



Covers

- Different types of cover materials:
 - › Soft – hard ; foam – solid
 - › Low grip – high grip
 - › Thin – thick
- Truly endless covers or with seam
- Special methods to bond covers on to timing belts
- Special machined slots or holes



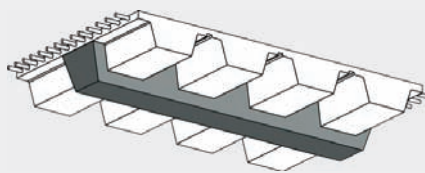
Jointing

- Welded joint
 - › Only with open-end PU Linear types
 - › Finger joint, tapered fingers
 - › No glues or adhesives
 - › Strength: 50 % of the max. allowable belt strength
- Fasteners
 - › Only for special and urgent purposes
 - › Special plastic belt fastener
 - › quick installation on site
- Jointing tools
 - › Special finger punching machine
 - › Welding moulds per type
 - › Heating press
 - › Control unit
 - › Water cooling unit
 - › Jointing on site also possible



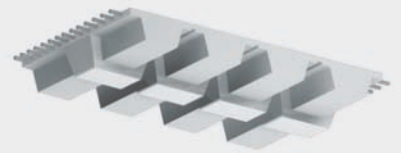
Vee-guides

- Fabricated Vee-guides
 - › For PU Linear and PU Torque
 - › Can be welded to any belt type in any width, length combination
 - › In addition can be added on to the back side of the belt
 - › Special dimensions, hardnesses and colours available
 - › Special notched types available for extra flexibility



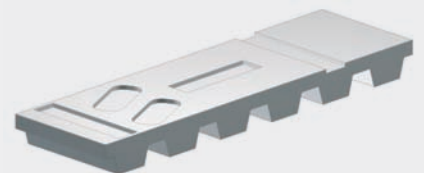
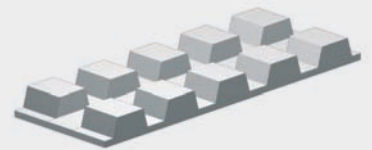
Integral Vee-guides

- › Integral, notched Vee-guides are integrally moulded to specific belt types
- › Only for PU Linear
- › PU compound, hardness and colour are the same as the body of the belt
- › Standard belt widths



Tooling

- Grooves for Vee-guides and vacuum
- Holes: by water jet cutting, punching or drilling
- Grinding and slitting
- Cross slots and slits
- Machinery according to drawings



Precise solution for synchronised conveying, positioning and power transmission

Ammeraal Beltech timing belts offer standard solutions for all types of conveying and power transmission requirements.

Different pitches, tooth shapes, dimensions, cord and coating materials to suit different applications. Special treatments for the belt surface such as grinding, milling or the attachment of cleats are all available options. Outstanding mechanical and chemical properties lead to high-performance operation and precision.



The following features are available:

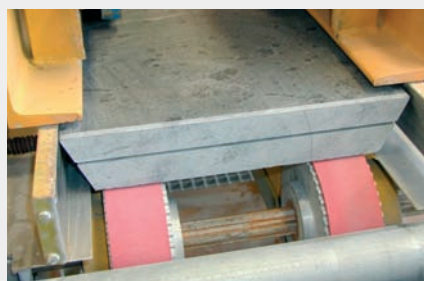
- 3 product segments of timing belts
 - › Linear
 - › Torque
 - › Moulded
- Several pitches
 - › Metric pitch: T, DT, AT, ATL, HTD, STD, TK, ATK, Eagle, flat belts F1, F2 and F4
 - › Inch pitch: MXL, XL, L, H, XH
- Different cords
 - › steel
 - › high performance steel
 - › high flexibility steel
 - › stainless steel
 - › aramid
- special surface finishings
 - › nylon fabric on tooth side
 - › nylon fabric on back side
 - › antistatic surface
- More than 60 coverings
- Customized specials
 - › Cleats
 - › Vee-guides
 - › Perforations
 - › Vacuum grooves

Ammeraal Beltech timing belts provide total solutions:

- Extensive standard range
- Local technical support
- Worldwide manufacturing facilities
- Innovative solutions
- Low maintenance
- Customization possible
- Commercial security

Ammeraal Beltech PU (polyurethane) timing belts provide excellent properties:

- Oil, fat and chemical resistance
- Flexible and stable at high speeds and torques
- Food-quality standard
- Antistatic
- Abrasion and ozone resistance
- Low noise
- Optional surface finishes
- Low maintenance



Nomenclature Timing Belts

» Introduction

The nomenclature explains the structure of Timing Belts based on manufacturing and/or fabrication processes.

All accessories and other special fabrications have to be mentioned separately.

» Detailed overview

1. Product segment

PU Linear:	open end roll material or endless welded
PU Torque:	truly endless, no joint, min. length 1500 mm, max. length 24000 mm
PU Moulded:	truly endless, standard lengths

2. Belt width

Metric pitch belt:	belt width mm
Inch pitch belt:	belt width code; e.g. 037 = 0,37" => 9,53 mm

3. Belt type

Metric pitch belts:	T, DT, AT, ATL, HTD, STD, TK, ATK, Eagle, flat belts F1, F2, and F4
Inch pitch belts:	MXL, XL, L, H, XH

4. Belt length

Metric pitch belts:	belt length mm
Inch pitch belts:	belt length code; e.g. 3937 = 393,7" => 9999,98 mm

5. Cord material

PU Linear:	steel and aramid (Kevlar) are standard. special cords on request.
PU Torque:	steel is standard. Aramid, stainless steel and other special cords on request.
PU Moulded:	steel is standard, aramid on request.

6. Standard surface covers

PU Linear:	NT	= Nylon fabric on tooth side
	NB	= Nylon fabric on back side
	NTB	= Nylon fabric on tooth and back side
	NTB AS	= antistatic Nylon fabric on tooth and back side
PU Torque:	NT	= Nylon fabric on tooth side
PU Moulded:		no standard surface covers

7. Open end or endless

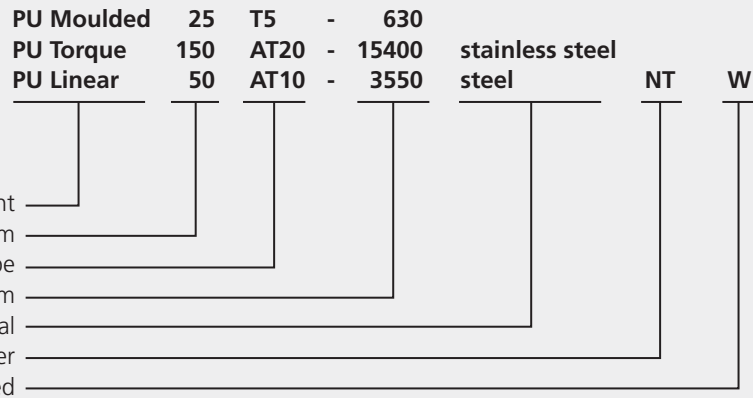
PU Linear:	M = open end roll material	W = endless welded
PU Torque and PU Moulded	are always truly endless, no indication.	

Nomenclature Timing Belts

» Structure of the Nomenclature

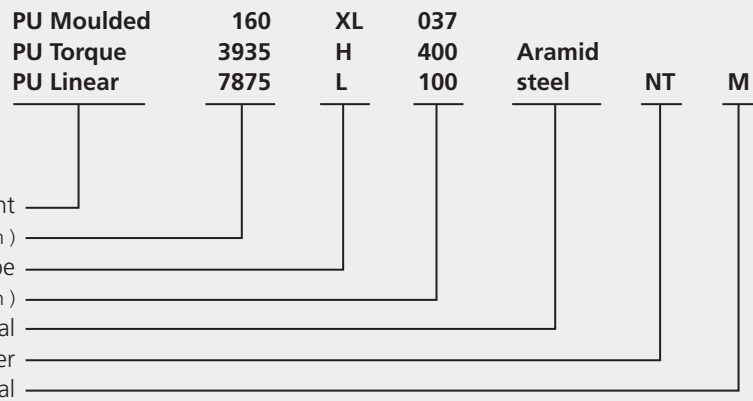
Metric pitch belt

Example



Inch pitch belt

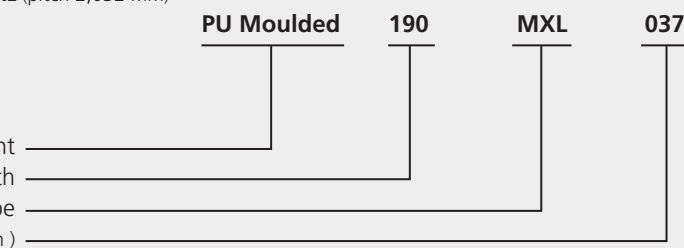
Example



Exception

Inch pitch belt, PU Moulded, type MXL (pitch 2,032 mm)

Example

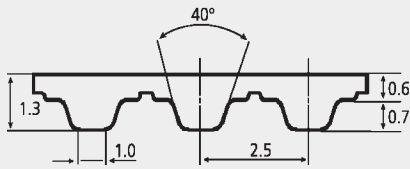


» Order examples

- 1. PU Linear:** endless welded PU Linear 50 T10 – 6780 aramid NT W
 endless welded PU Linear 4560 L 200 steel NTB W
 open end roll material PU Linear 50 AT10 – 25000 steel M
 open end roll material PU Linear 100m H400 steel NT M

- 2. PU Torque and PU Moulded:** PU Moulded 25 DT10 – 1880
 PU Moulded 510 L 150
 PU Moulded 72 MXL 037
 PU Torque 150 HTD5M – 7900 aramid NT

PU Linear T2,5 steel cord

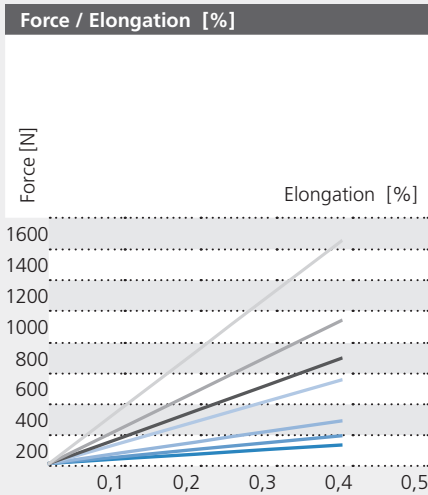


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

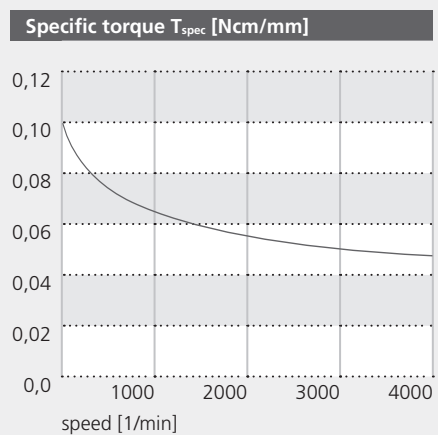
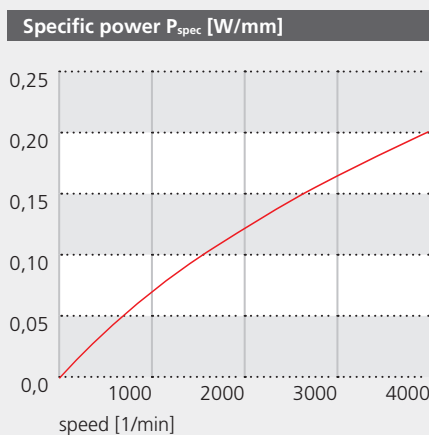
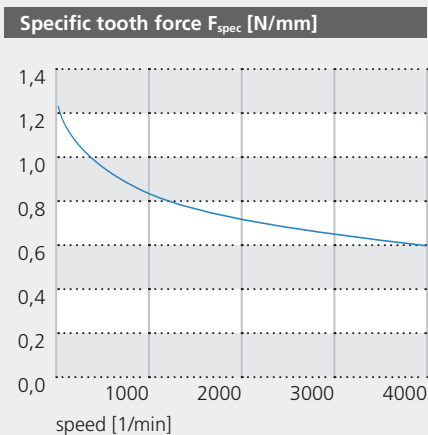
- › pitch 2.5 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 50 mm
- › min. length for jointed belt (W) 500 mm
- › max. speed 10.000 rpm



Technical data		allowable tensile load Typ $L F_{all}$ [N]	allowable tensile load Typ $W F_{all}$ [N]	breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	belt weight per metre m [kg/m]
standard-belt width w_{tb} [mm]	graph					
4		120	60	350	30000	0,004
6		180	90	570	45000	0,007
10		240	120	1000	69000	0,011
20		540	270	2250	135000	0,020
25		720	360	2900	170000	0,025
32		860	430	4000	231000	0,363
50		1440	720	6000	360000	0,050

Specific tooth force/power/torque*																			
speed [1/min]		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F_{spec} [N/mm]		1,235	1,180	1,137	1,138	1,114	1,069	1,045	0,995	0,955	0,923	0,860	0,816	0,779	0,750	0,724	0,702	0,633	0,583
Specific power P_{spec} [W/mm]		0,000	0,002	0,005	0,007	0,009	0,013	0,017	0,025	0,032	0,038	0,054	0,068	0,081	0,094	0,106	0,117	0,158	0,194
Specific torque T_{spec} [Ncm/mm]		0,098	0,094	0,090	0,091	0,089	0,085	0,083	0,079	0,076	0,073	0,068	0,065	0,062	0,060	0,058	0,056	0,050	0,046

* max. force/power/torque per tooth in mesh and per mm belt width

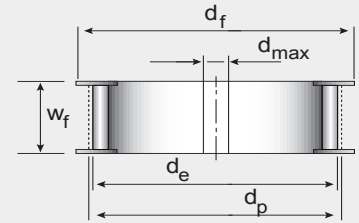


T2.5 Steel

Pulleys PU Linear T2,5 steel cord

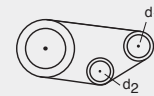
Table of belt widths

timing belt width [mm] w_b	4	6	10	20	25	32	50
pulley width [mm] w_f	8	10	14	25	30	38	55

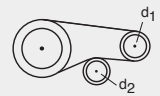


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	10	15
minimum pulley diameter [mm]	d_1	7,46	11,44
diameter of idler roller [mm]	d_2	15,00	15,00



belt drive without counter flexion



belt drive with counter flexion

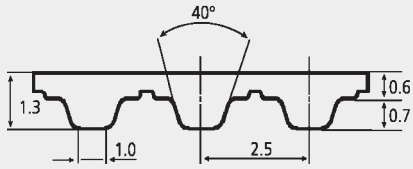
Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
10	7,46	7,96	11	3	
11	8,25	8,75	12	3	
12	9,05	9,55	13	3	
13	9,85	10,35	13	4	
14	10,64	11,14	14	4	
15	11,44	11,94	15	5	
16	12,23	12,73	16	6	
17	13,03	13,53	17	7	
18	13,82	14,32	17	8	
19	14,62	15,12	18	8	
20	15,42	15,92	19	9	
21	16,21	16,71	20	10	
22	17,01	17,51	21	11	
23	17,80	18,30	21	12	
24	18,60	19,10	22	12	
25	19,39	19,89	23	13	
26	20,19	20,69	24	13	
27	20,99	21,49	24	13	
28	21,78	22,28	25	14	
29	22,58	23,08	26	15	
30	23,37	23,87	27	16	
31	24,17	24,67	28	17	
32	24,96	25,46	28	18	
33	25,76	26,26	29	19	
34	26,56	27,06	30	19	
35	27,35	27,85	31	20	
36	28,15	28,65	32	21	
37	28,94	29,44	32	21	
38	29,74	30,24	33	22	
39	30,54	31,04	34	22	
40	31,33	31,83	35	23	
41	32,13	32,63	36	24	
42	32,92	33,42	36	25	
43	33,72	34,22	37	26	
44	34,51	35,01	38	26	
45	35,31	35,81	39	27	
46	36,11	36,61	40	28	

standard

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
47	36,90	37,40	40	29	
48	37,70	38,20	41	30	
49	38,49	38,99	42	30	
50	39,29	39,79	43	30	
51	40,08	40,58	44	31	
52	40,88	41,38	44	32	
53	41,68	42,18	45	33	
54	42,47	42,97	46	33	
55	43,27	43,77	47	34	
56	44,06	44,56	48	35	
57	44,86	45,36	48	36	
58	45,65	46,15	49	37	
59	46,45	46,95	50	37	
60	47,25	47,75	51	38	
61	48,04	48,54	52	39	
62	48,84	49,34	52	40	
63	49,63	50,13	53	41	
64	50,43	50,93	54	41	
65	51,23	51,73	55	42	
66	51,65	52,52	56	43	
67	52,45	53,32	56	44	
68	53,24	54,11	57	45	
69	54,04	54,91	58	45	
70	54,83	55,70	59	45	
71	55,63	56,50	60	46	
72	56,43	57,30	60	47	
73	57,22	58,09	61	48	
74	58,02	58,89	62	48	
75	58,81	59,68	63	49	
76	59,61	60,48	64	50	
77	60,40	61,27	64	51	
78	61,20	62,07	65	52	
79	62,00	62,87	66	52	
80	62,79	63,66	67	53	
81	63,59	64,46	68	54	
82	64,38	65,25	68	55	
83	65,18	66,05	69	55	

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
84	65,98	66,85	70	56	
85	66,77	67,64	71	57	
86	67,57	68,44	71	58	
87	68,36	69,23	72	59	
88	69,16	70,03	73	60	
89	69,95	70,82	74	61	
90	70,75	71,62	75	62	
91	71,55	72,42	75	62	
92	72,34	73,21	76	63	
93	73,14	74,01	77	63	
94	73,93	74,80	78	64	
95	74,73	75,60	79	65	
96	75,52	76,39	79	65	
97	76,32	77,19	80	66	
98	77,12	77,99	81	66	
99	77,91	78,78	82	67	
100	78,71	79,58	83	68	
101	79,50	80,37	83	69	
102	80,30	81,17	84	70	
103	81,09	81,96	85	70	
104	81,89	82,76	86	71	
105	82,69	83,56	87	72	
106	83,48	84,35	87	73	
107	84,28	85,15	88	73	
108	85,07	85,94	89	74	
109	85,87	86,74	90	75	
110	86,67	87,54	91	75	
111	87,46	88,33	91	76	
112	88,26	89,13	92	76	
113	89,05	89,92	93	77	
114	89,85	90,72	94	77	
115	90,64	91,51	95	77	
116	91,44	92,31	95	77	
117	92,24	93,11	96	77	
118	93,03	93,90	97	78	
119	93,83	94,70	98	78	
120	94,62	95,49	100	78	

PU Moulded T2,5 steel cord



» **General properties**

- › Type: T2,5
- › Pitch: 2,5 mm
- › Material: thermoset polyurethane, 87° ShA
- › Color: light grey
- › Cord: steel (special cords on request)

» **Standard tolerances**

- › width: ± 0,3 mm
- › length: ± 0,14 - 0,52 mm/m
- › height: ± 0,15 mm

» **standard widths [mm]:**

- › 4, 6, 8, 10, 12, 16, 20, 25, 32, 50

Available dimensions

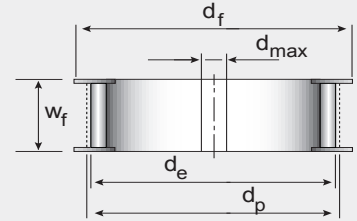
length [mm]	number of teeth	max. width [mm]
120	48	240
145	58	240
160	64	300
177,5	71	300
180	72	300
182,5	73	300
200	80	300
230	92	300
245	98	300
265	106	300
285	114	300
290	116	300
305	122	300
317,5	127	300
330	132	300
380	152	300
420	168	300
480	192	300
500	200	300
540	216	300
600	240	300
620	248	300
650	260	300
680	272	300
700	280	300
780	312	300
880	352	300
915	366	300
950	380	300
1185	474	300

T2,5 Moulded

Pulleys PU Moulded T2,5 steel cord

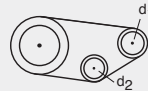
Table of belt widths

timing belt width [mm] w_b	4	6	10	20	25	32	50
pulley width [mm] w_f	8	10	14	25	30	38	55

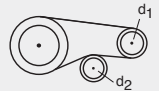


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	10	15
minimum pulley diameter [mm]	d_1	7,46	11,44
diameter of idler roller [mm]	d_2	15,00	15,00



belt drive without counter flexion



belt drive with counter flexion

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
10	7,46	7,96	11	3	
11	8,25	8,75	12	3	
12	9,05	9,55	13	3	
13	9,85	10,35	13	4	
14	10,64	11,14	14	4	
15	11,44	11,94	15	5	
16	12,23	12,73	16	6	
17	13,03	13,53	17	7	
18	13,82	14,32	17	8	
19	14,62	15,12	18	8	
20	15,42	15,92	19	9	
21	16,21	16,71	20	10	
22	17,01	17,51	21	11	
23	17,80	18,30	21	12	
24	18,60	19,10	22	12	
25	19,39	19,89	23	13	
26	20,19	20,69	24	13	
27	20,99	21,49	24	13	
28	21,78	22,28	25	14	
29	22,58	23,08	26	15	
30	23,37	23,87	27	16	
31	24,17	24,67	28	17	
32	24,96	25,46	28	18	
33	25,76	26,26	29	19	
34	26,56	27,06	30	19	
35	27,35	27,85	31	20	
36	28,15	28,65	32	21	
37	28,94	29,44	32	21	
38	29,74	30,24	33	22	
39	30,54	31,04	34	22	
40	31,33	31,83	35	23	
41	32,13	32,63	36	24	
42	32,92	33,42	36	25	
43	33,72	34,22	37	26	
44	34,51	35,01	38	26	
45	35,31	35,81	39	27	
46	36,11	36,61	40	28	

standard

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
47	36,90	37,40	40	29	
48	37,70	38,20	41	30	
49	38,49	38,99	42	30	
50	39,29	39,79	43	30	
51	40,08	40,58	44	31	
52	40,88	41,38	44	32	
53	41,68	42,18	45	33	
54	42,47	42,97	46	33	
55	43,27	43,77	47	34	
56	44,06	44,56	48	35	
57	44,86	45,36	48	36	
58	45,65	46,15	49	37	
59	46,45	46,95	50	37	
60	47,25	47,75	51	38	
61	48,04	48,54	52	39	
62	48,84	49,34	52	40	
63	49,63	50,13	53	41	
64	50,43	50,93	54	41	
65	51,23	51,73	55	42	
66	51,65	52,52	56	43	
67	52,45	53,32	56	44	
68	53,24	54,11	57	45	
69	54,04	54,91	58	45	
70	54,83	55,70	59	45	
71	55,63	56,50	60	46	
72	56,43	57,30	60	47	
73	57,22	58,09	61	48	
74	58,02	58,89	62	48	
75	58,81	59,68	63	49	
76	59,61	60,48	64	50	
77	60,40	61,27	64	51	
78	61,20	62,07	65	52	
79	62,00	62,87	66	52	
80	62,79	63,66	67	53	
81	63,59	64,46	68	54	
82	64,38	65,25	68	55	
83	65,18	66,05	69	55	

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
84	65,98	66,85	70	56	
85	66,77	67,64	71	57	
86	67,57	68,44	71	58	
87	68,36	69,23	72	59	
88	69,16	70,03	73	60	
89	69,95	70,82	74	61	
90	70,75	71,62	75	62	
91	71,55	72,42	75	62	
92	72,34	73,21	76	63	
93	73,14	74,01	77	63	
94	73,93	74,80	78	64	
95	74,73	75,60	79	65	
96	75,52	76,39	79	65	
97	76,32	77,19	80	66	
98	77,12	77,99	81	66	
99	77,91	78,78	82	67	
100	78,71	79,58	83	68	
101	79,50	80,37	83	69	
102	80,30	81,17	84	70	
103	81,09	81,96	85	70	
104	81,89	82,76	86	71	
105	82,69	83,56	87	72	
106	83,48	84,35	87	73	
107	84,28	85,15	88	73	
108	85,07	85,94	89	74	
109	85,87	86,74	90	75	
110	86,67	87,54	91	75	
111	87,46	88,33	91	76	
112	88,26	89,13	92	76	
113	89,05	89,92	93	77	
114	89,85	90,72	94	77	
115	90,64	91,51	95	77	
116	91,44	92,31	95	77	
117	92,24	93,11	96	77	
118	93,03	93,90	97	78	
119	93,83	94,70	98	78	
120	94,62	95,49	100	78	

Power Rating Table

PU Moulded T2,5 steel cord

Technical data – Power in watt per tooth in mesh and per mm belt width – Max. teeth in mesh = 15										
n1 \ z1	10	11	12	13	14	15	16	17	18	19
600	0,195	0,215	0,234	0,254	0,273	0,293	0,312	0,332	0,351	0,371
800	0,245	0,27	0,294	0,319	0,343	0,368	0,392	0,417	0,441	0,466
1000	0,292	0,321	0,351	0,38	0,409	0,438	0,467	0,497	0,526	0,555
1200	0,336	0,37	0,404	0,437	0,471	0,505	0,538	0,572	0,606	0,639
1400	0,379	0,416	0,454	0,492	0,53	0,568	0,606	0,644	0,681	0,719
1600	0,419	0,461	0,503	0,545	0,586	0,628	0,67	0,712	0,754	0,796
1800	0,458	0,503	0,549	0,595	0,641	0,686	0,732	0,778	0,824	0,869
2000	0,495	0,544	0,594	0,643	0,693	0,742	0,792	0,841	0,891	0,94
2200	0,531	0,584	0,637	0,69	0,743	0,796	0,849	0,902	0,956	1,009
2400	0,566	0,622	0,679	0,735	0,792	0,848	0,905	0,962	1,018	1,075
2600	0,599	0,659	0,719	0,779	0,839	0,899	0,959	1,019	1,079	1,139
2800	0,632	0,695	0,759	0,822	0,885	0,948	1,011	1,075	1,138	1,201
3000	0,664	0,73	0,797	0,863	0,93	0,996	1,062	1,129	1,195	1,262
3200	0,695	0,764	0,834	0,903	0,973	1,042	1,112	1,181	1,251	1,32
3400	0,725	0,798	0,87	0,943	1,015	1,088	1,16	1,233	1,305	1,378
3600	0,754	0,83	0,905	0,981	1,056	1,132	1,207	1,283	1,358	1,433
3800	0,783	0,861	0,94	1,018	1,096	1,175	1,253	1,331	1,41	1,488
4000	0,811	0,892	0,973	1,054	1,136	1,217	1,298	1,379	1,46	1,541
4200	0,839	0,922	1,006	1,09	1,174	1,258	1,342	1,425	1,509	1,593
4400	0,865	0,952	1,038	1,125	1,211	1,298	1,384	1,471	1,557	1,644
4600	0,891	0,981	1,07	1,159	1,248	1,337	1,426	1,515	1,605	1,694
4800	0,917	1,009	1,1	1,192	1,284	1,375	1,467	1,559	1,651	1,742
5000	0,942	1,036	1,13	1,225	1,319	1,413	1,507	1,602	1,696	1,79
5200	0,967	1,063	1,16	1,257	1,353	1,45	1,547	1,643	1,74	1,837
5400	0,991	1,09	1,189	1,288	1,387	1,486	1,585	1,684	1,783	1,882
5600	1,014	1,116	1,217	1,318	1,42	1,521	1,623	1,724	1,826	1,927
5800	1,037	1,141	1,245	1,349	1,452	1,556	1,66	1,763	1,867	1,971
6000	1,06	1,166	1,272	1,378	1,484	1,59	1,696	1,802	1,908	2,014
6200	1,082	1,19	1,299	1,407	1,515	1,623	1,732	1,84	1,948	2,056
6400	1,104	1,214	1,325	1,435	1,546	1,656	1,766	1,877	1,987	2,098
6600	1,125	1,238	1,351	1,463	1,576	1,688	1,801	1,913	2,026	2,138
6800	1,147	1,261	1,376	1,49	1,605	1,72	1,834	1,949	2,064	2,178
7000	1,167	1,284	1,401	1,517	1,634	1,751	1,867	1,984	2,101	2,218
7500	1,217	1,339	1,461	1,582	1,704	1,826	1,948	2,069	2,191	2,313
8000	1,265	1,392	1,518	1,645	1,771	1,898	2,024	2,151	2,277	2,404
8500	1,311	1,442	1,573	1,704	1,835	1,966	2,098	2,229	2,36	2,491
9000	1,355	1,49	1,626	1,761	1,897	2,032	2,168	2,303	2,439	2,574
9500	1,397	1,537	1,677	1,816	1,956	2,096	2,235	2,375	2,515	2,654
10000	1,438	1,581	1,725	1,869	2,013	2,156	2,3	2,444	2,588	2,731
11000	1,514	1,665	1,817	1,968	2,119	2,271	2,422	2,573	2,725	2,876
12000	1,584	1,743	1,901	2,059	2,218	2,376	2,535	2,693	2,851	3,01
13000	1,649	1,814	1,979	2,144	2,309	2,474	2,639	2,804	2,968	3,133
14000	1,709	1,88	2,051	2,222	2,393	2,564	2,735	2,906	3,077	3,247
15000	1,765	1,941	2,118	2,294	2,47	2,647	2,823	3	3,176	3,353

 Reduction in belt life is expected  Critical pulley speed - Balanced pulley required

n1: r.p.m. of pulley z1: number of teeth on pulley Interpolation formulars are shown in the chapter calculations (page 140)

T2,5 Power Rating Table


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Power Rating Table

PU Moulded T2,5 steel cord

Technical data – Power in watt per tooth in mesh and per mm belt width – Max. teeth in mesh = 15											
n1 \ t1	20	22	24	26	28	30	32	34	36	38	40
600	0,39	0,429	0,468	0,507	0,546	0,585	0,624	0,663	0,702	0,741	0,78
800	0,49	0,539	0,588	0,637	0,686	0,736	0,785	0,834	0,883	0,932	0,981
1000	0,584	0,643	0,701	0,759	0,818	0,876	0,935	0,993	1,052	1,11	1,168
1200	0,673	0,74	0,807	0,875	0,942	1,009	1,077	1,144	1,211	1,278	1,346
1400	0,757	0,833	0,909	0,984	1,06	1,136	1,211	1,287	1,363	1,439	1,514
1600	0,838	0,922	1,005	1,089	1,173	1,257	1,34	1,424	1,508	1,592	1,676
1800	0,915	1,007	1,098	1,19	1,281	1,373	1,464	1,556	1,647	1,739	1,83
2000	0,99	1,089	1,188	1,287	1,386	1,485	1,584	1,683	1,782	1,881	1,98
2200	1,062	1,168	1,274	1,38	1,486	1,593	1,699	1,805	1,911	2,017	2,123
2400	1,131	1,244	1,358	1,471	1,584	1,697	1,81	1,923	2,036	2,15	2,263
2600	1,199	1,319	1,439	1,558	1,678	1,798	1,918	2,038	2,158	2,278	2,398
2800	1,264	1,391	1,517	1,644	1,77	1,896	2,023	2,149	2,276	2,402	2,529
3000	1,328	1,461	1,594	1,726	1,859	1,992	2,125	2,257	2,39	2,523	2,656
3200	1,39	1,529	1,668	1,807	1,946	2,085	2,224	2,363	2,502	2,641	2,78
3400	1,45	1,595	1,74	1,885	2,03	2,175	2,32	2,465	2,61	2,755	2,9
3600	1,509	1,66	1,811	1,962	2,113	2,263	2,414	2,565	2,716	2,867	3,018
3800	1,566	1,723	1,88	2,036	2,193	2,349	2,506	2,663	2,819	2,976	3,133
4000	1,622	1,785	1,947	2,109	2,271	2,433	2,596	2,758	2,92	3,082	3,245
4200	1,677	1,845	2,012	2,18	2,348	2,516	2,683	2,851	3,019	3,186	3,354
4400	1,73	1,904	2,077	2,25	2,423	2,596	2,769	2,942	3,115	3,288	3,461
4600	1,783	1,961	2,139	2,318	2,496	2,674	2,852	3,031	3,209	3,387	3,566
4800	1,834	2,017	2,201	2,384	2,568	2,751	2,934	3,118	3,301	3,485	3,668
5000	1,884	2,073	2,261	2,449	2,638	2,826	3,015	3,203	3,391	3,58	3,768
5200	1,933	2,127	2,32	2,513	2,706	2,9	3,093	3,286	3,48	3,673	3,866
5400	1,981	2,179	2,378	2,576	2,774	2,972	3,17	3,368	3,566	3,764	3,963
5600	2,028	2,231	2,434	2,637	2,84	3,043	3,246	3,448	3,651	3,854	4,057
5800	2,075	2,282	2,49	2,697	2,905	3,112	3,319	3,527	3,734	3,942	4,149
6000	2,12	2,332	2,544	2,756	2,968	3,18	3,392	3,604	3,816	4,028	4,24
6200	2,164	2,381	2,597	2,814	3,03	3,247	3,463	3,68	3,896	4,113	4,329
6400	2,208	2,429	2,65	2,871	3,091	3,312	3,533	3,754	3,975	4,195	4,416
6600	2,251	2,476	2,701	2,926	3,151	3,376	3,602	3,827	4,052	4,277	4,502
6800	2,293	2,522	2,752	2,981	3,21	3,44	3,669	3,898	4,127	4,357	4,586
7000	2,334	2,568	2,801	3,035	3,268	3,501	3,735	3,968	4,202	4,435	4,669
7500	2,434	2,678	2,921	3,165	3,408	3,652	3,895	4,138	4,382	4,625	4,869
8000	2,53	2,783	3,036	3,289	3,542	3,795	4,048	4,301	4,554	4,807	5,06
8500	2,622	2,884	3,146	3,408	3,671	3,933	4,195	4,457	4,719	4,982	5,244
9000	2,71	2,981	3,252	3,523	3,794	4,065	4,336	4,607	4,878	5,149	5,42
9500	2,794	3,074	3,353	3,632	3,912	4,191	4,471	4,75	5,03	5,309	5,588
10000	2,875	3,163	3,45	3,738	4,025	4,313	4,6	4,888	5,175	5,463	5,75
11000	3,028	3,33	3,633	3,936	4,239	4,541	4,844	5,147	5,45	5,752	6,055
12000	3,168	3,485	3,802	4,119	4,436	4,752	5,069	5,386	5,703	6,02	6,337
13000	3,298	3,628	3,958	4,288	4,618	4,947	5,277	5,607	5,937	6,267	6,597
14000	3,418	3,76	4,102	4,444	4,786	5,128	5,469	5,811	6,153	6,495	6,837
15000	3,529	3,882	4,235	4,588	4,941	5,294	5,647	6	6,353	6,705	7,058

 Reduction in belt life is expected

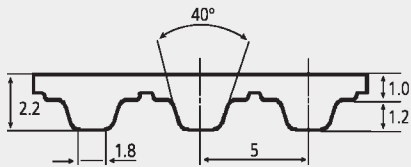
 Critical pulley speed - Balanced pulley required

n1: r.p.m. of pulley

z1: number of teeth on pulley

Interpolation formulars are shown in the chapter calculations (page 140)

PU Linear/Torque T5 steel cord

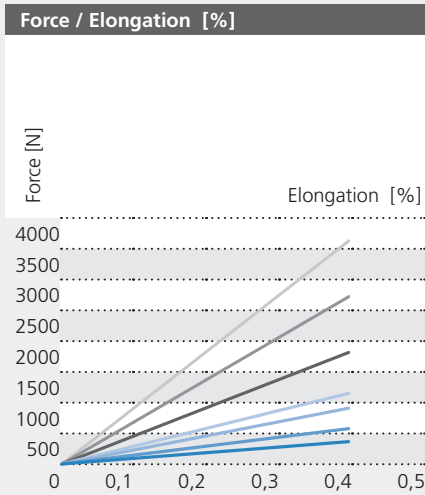


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

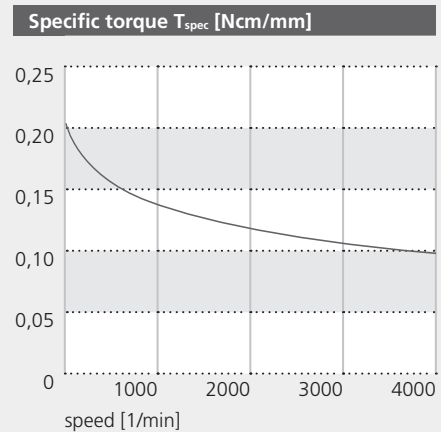
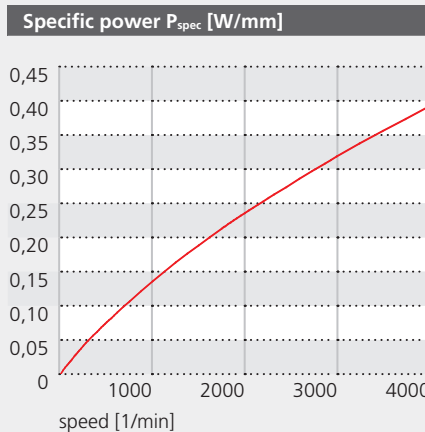
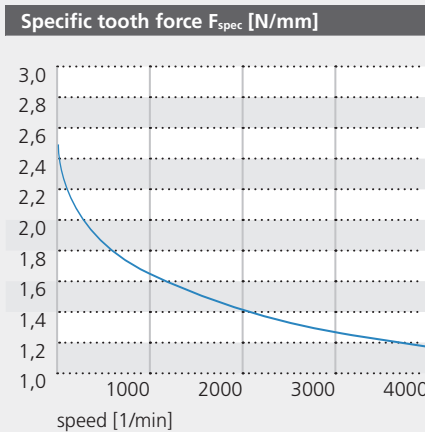
- › pitch 5 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 100 mm (PU Linear)
- › max. width up to 150 mm (PU Torque)
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 24,000 mm (PU Torque)
- › max. speed 10.000 rpm



Technical data		allowable tensile load	allowable tensile load	breaking load	spec. spring ratio	belt weight per metre
standard-belt width w_{tb} [mm]	graph	Typ $L F_{ai}$ [N]	Typ $T F_{ai}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
10	■	390	195	1520	90000	0,021
16	■	550	275	2430	142500	0,034
25	■	910	455	3800	225000	0,053
32	■	1100	550	4850	285000	0,068
50	■	1690	845	7650	450000	0,106
75	■	2400	1200	11475	675000	0,160
100	■	3200	1600	15300	900000	0,210

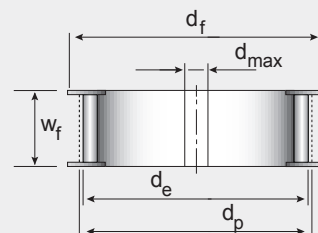
Specific tooth force/power/torque*		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
speed [1/min]																				
Specific tooth force F_{spec} [N/mm]	■	2,452	2,36	2,274	2,23	2,175	2,105	2,05	1,955	1,867	1,815	1,697	1,626	1,56	1,5	1,448	1,403	1,265	1,166	
Specific power P_{spec} [W/mm]	■	0	0,005	0,009	0,014	0,018	0,026	0,034	0,049	0,062	0,076	0,106	0,136	0,163	0,188	0,211	0,234	0,316	0,389	
Specific torque T_{spec} [Ncm/mm]	■	0,195	0,187	0,181	0,177	0,173	0,167	0,163	0,155	0,148	0,144	0,135	0,129	0,124	0,119	0,115	0,111	0,100	0,092	

* max. force/power/torque per tooth in mesh and per mm belt width

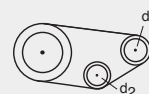


Pulleys PU Linear/Torque T5 steel cord

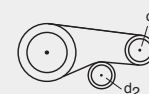
timing belt width [mm] w_b	10	16	25	32	50	75	100
pulley width [mm] w_f	15	21	30	38	57	83	110



		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t	10	15
minimum pulley diameter [mm]	d_1	15,05	23,05
diameter of idler roller [mm]	d_2	30,00	30,00



belt drive without counter flexion



belt drive with counter flexion

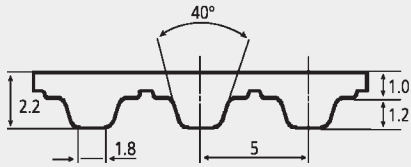
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
10	15,05	15,92	20	6
11	16,64	17,51	22	6
12	18,23	19,01	23	6
13	19,82	20,69	25	8
14	21,41	22,28	26	8
15	23,05	23,87	28	10
16	24,59	25,46	30	12
17	26,19	27,06	31	14
18	27,78	28,65	33	16
19	29,37	30,24	34	16
20	30,96	31,83	36	18
21	32,55	33,42	37	20
22	34,14	35,01	39	22
23	35,74	36,61	41	24
24	37,33	38,20	42	24
25	38,92	39,79	44	25
26	40,51	41,38	45	25
27	42,10	42,97	47	27
28	43,69	44,56	49	29
29	45,29	46,16	50	31
30	46,88	47,75	52	33
31	48,47	49,34	53	35
32	50,06	50,93	55	37
33	51,65	52,52	57	39
34	53,24	54,11	58	39
35	54,83	55,70	60	40
36	56,43	57,30	61	42
37	58,02	58,89	63	43
38	59,61	60,48	65	45
39	61,20	62,07	66	45
40	62,79	63,66	68	47
41	64,38	65,25	69	48
42	65,98	66,85	71	50
43	67,57	68,44	72	52
44	69,16	70,03	74	52
45	70,75	71,62	76	54
46	72,34	73,21	77	56

standard

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
47	73,93	74,80	79	58
48	75,52	76,39	80	60
49	77,12	77,99	82	60
50	78,71	79,58	84	60
51	80,30	81,17	85	62
52	81,89	82,76	87	64
53	83,48	84,35	88	66
54	85,07	85,94	90	66
55	86,67	87,54	92	68
56	88,26	89,13	93	70
57	89,85	90,72	95	72
58	91,44	92,31	96	74
59	93,03	93,90	98	74
60	94,62	95,49	100	76
61	96,21	97,08	101	79
62	97,81	98,68	103	80
63	99,40	100,27	104	82
64	100,99	101,86	106	82
65	102,58	103,45	108	84
66	104,17	105,04	109	86
67	105,76	106,63	111	88
68	107,36	108,23	112	90
69	108,95	109,82	114	90
70	110,54	111,41	115	90
71	112,13	113,00	117	92
72	113,72	114,59	119	94
73	115,31	116,18	120	96
74	116,90	117,77	122	96
75	118,50	119,37	123	98
76	120,09	120,96	125	100
77	121,68	122,55	127	102
78	123,27	124,14	128	104
79	124,86	125,73	130	104
80	126,45	127,32	131	106
81	128,05	128,92	133	108
82	129,64	130,51	135	110
83	131,23	132,11	136	110

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
84	132,82	133,69	138	112
85	134,41	135,28	139	114
86	136,00	136,87	141	116
87	137,59	138,46	143	119
88	139,19	140,06	144	120
89	140,78	141,65	146	120
90	142,37	143,24	147	122
91	143,96	144,83	149	124
92	145,55	146,42	150	126
93	147,14	148,01	152	126
94	148,74	149,61	154	129
95	150,33	151,20	155	130
96	151,92	152,79	157	130
97	153,51	154,38	158	132
98	155,10	155,97	160	132
99	156,69	157,56	162	134
100	158,29	159,16	163	136
101	159,88	160,75	165	139
102	161,47	162,34	166	140
103	163,06	163,93	168	140
104	164,65	165,52	170	140
105	166,24	167,11	171	142
106	167,83	168,70	173	146
107	169,43	170,30	174	146
108	171,02	171,89	176	148
109	172,61	173,48	178	150
110	174,20	175,07	179	150
111	175,79	176,66	181	152
112	177,38	178,25	182	152
113	178,98	179,85	184	152
114	180,57	181,44	185	154
115	182,16	183,03	187	154
116	183,75	184,62	189	154
117	185,34	186,21	190	154
118	186,93	187,80	192	156
119	188,52	189,39	193	156
120	190,12	190,99	195	156

PU Linear/Torque T5 Aramid cord

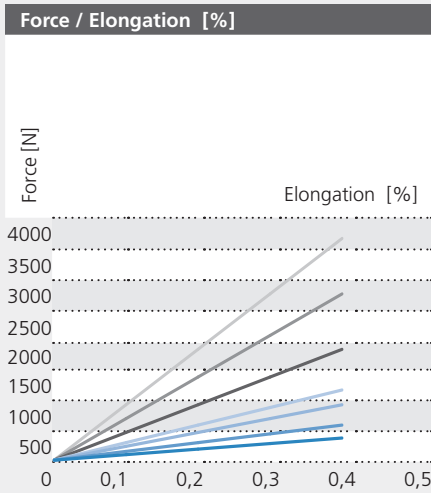


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

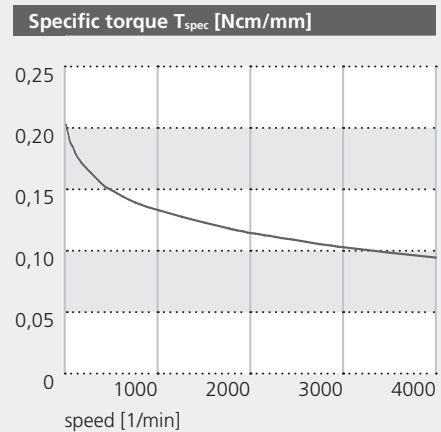
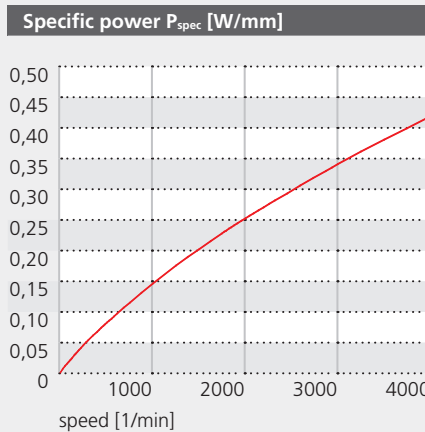
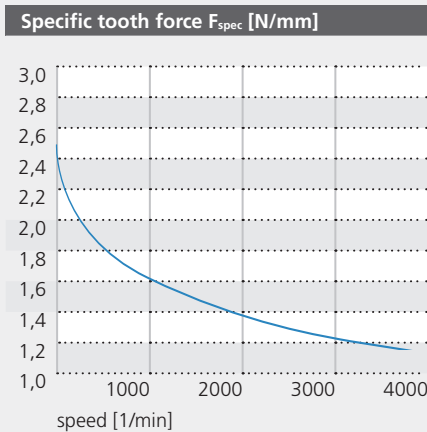
- › pitch 5 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 100 mm (PU Linear)
- › max. width up to 150 mm (PU Torque)
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 22,770 mm (PU Torque)
- › max. speed 10.000 rpm



Technical data		allowable tensile load	allowable tensile load	breaking load	spec. spring ratio	belt weight per metre
standard-belt width w_{tb} [mm]	graph	Typ $L F_{ai}$ [N]	Typ $T F_{ai}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
10	■	430	215	1500	75000	0,020
16	■	610	305	2400	135000	0,032
25	■	980	490	3750	210000	0,050
32	■	1140	570	4575	260000	0,064
50	■	1800	900	7500	409000	0,100
75	■	2700	1350	11250	590000	0,160
100	■	3600	1800	15000	780000	0,200

Specific tooth force/power/torque*																			
speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]	■	2,452	2,360	2,274	2,230	2,175	2,105	2,050	1,955	1,867	1,815	1,697	1,626	1,560	1,500	1,448	1,403	1,265	1,166
Specific power P_{spec} [W/mm]	■	0,000	0,005	0,009	0,014	0,018	0,026	0,034	0,049	0,062	0,076	0,106	0,136	0,163	0,188	0,211	0,234	0,316	0,389
Specific torque T_{spec} [Ncm/mm]	■	0,195	0,188	0,181	0,177	0,173	0,168	0,163	0,156	0,149	0,144	0,135	0,129	0,124	0,119	0,115	0,112	0,101	0,093

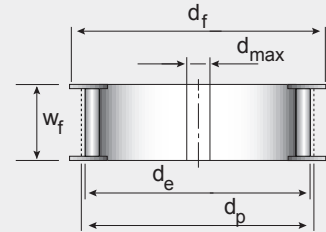
* max. force/power/torque per tooth in mesh and per mm belt width



Pulleys PU Linear/Torque T5 Aramid cord

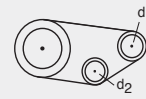
Table of belt widths

timing belt width [mm] w_b	10	16	25	32	50	75	100
pulley width [mm] w_f	15	21	30	38	57	83	110

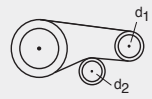


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	10	15
minimum pulley diameter [mm]	d_1	15,05	23,05
diameter of idler roller [mm]	d_2	25,00	25,00



belt drive without counter flexion



belt drive with counter flexion

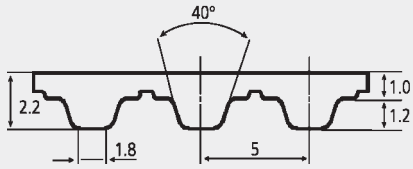
Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
10	15,05	15,92	20	6	
11	16,64	17,51	22	6	
12	18,23	19,01	23	6	
13	19,82	20,69	25	8	
14	21,41	22,28	26	8	
15	23,05	23,87	28	10	
16	24,59	25,46	30	12	
17	26,19	27,06	31	14	
18	27,78	28,65	33	16	
19	29,37	30,24	34	16	
20	30,96	31,83	36	18	
21	32,55	33,42	37	20	
22	34,14	35,01	39	22	
23	35,74	36,61	41	24	
24	37,33	38,20	42	24	
25	38,92	39,79	44	25	
26	40,51	41,38	45	25	
27	42,10	42,97	47	27	
28	43,69	44,56	49	29	
29	45,29	46,16	50	31	
30	46,88	47,75	52	33	
31	48,47	49,34	53	35	
32	50,06	50,93	55	37	
33	51,65	52,52	57	39	
34	53,24	54,11	58	39	
35	54,83	55,70	60	40	
36	56,43	57,30	61	42	
37	58,02	58,89	63	43	
38	59,61	60,48	65	45	
39	61,20	62,07	66	45	
40	62,79	63,66	68	47	
41	64,38	65,25	69	48	
42	65,98	66,85	71	50	
43	67,57	68,44	72	52	
44	69,16	70,03	74	52	
45	70,75	71,62	76	54	
46	72,34	73,21	77	56	

standard

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
47	73,93	74,80	79	58	
48	75,52	76,39	80	60	
49	77,12	77,99	82	60	
50	78,71	79,58	84	60	
51	80,30	81,17	85	62	
52	81,89	82,76	87	64	
53	83,48	84,35	88	66	
54	85,07	85,94	90	66	
55	86,67	87,54	92	68	
56	88,26	89,13	93	70	
57	89,85	90,72	95	72	
58	91,44	92,31	96	74	
59	93,03	93,90	98	74	
60	94,62	95,49	100	76	
61	96,21	97,08	101	79	
62	97,81	98,68	103	80	
63	99,40	100,27	104	82	
64	100,99	101,86	106	82	
65	102,58	103,45	108	84	
66	104,17	105,04	109	86	
67	105,76	106,63	111	88	
68	107,36	108,23	112	90	
69	108,95	109,82	114	90	
70	110,54	111,41	115	90	
71	112,13	113,00	117	92	
72	113,72	114,59	119	94	
73	115,31	116,18	120	96	
74	116,90	117,77	122	96	
75	118,50	119,37	123	98	
76	120,09	120,96	125	100	
77	121,68	122,55	127	102	
78	123,27	124,14	128	104	
79	124,86	125,73	130	104	
80	126,45	127,32	131	106	
81	128,05	128,92	133	108	
82	129,64	130,51	135	110	
83	131,23	132,10	136	110	

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
84	132,82	133,69	138	112	
85	134,41	135,28	139	114	
86	136,00	136,87	141	116	
87	137,59	138,46	143	119	
88	139,19	140,06	144	120	
89	140,78	141,65	146	120	
90	142,37	143,24	147	122	
91	143,96	144,83	149	124	
92	145,55	146,42	150	126	
93	147,14	148,01	152	126	
94	148,74	149,61	154	129	
95	150,33	151,20	155	130	
96	151,92	152,79	157	130	
97	153,51	154,38	158	132	
98	155,10	155,97	160	132	
99	156,69	157,56	162	134	
100	158,29	159,16	163	136	
101	159,88	160,75	165	139	
102	161,47	162,34	166	140	
103	163,06	163,93	168	140	
104	164,65	165,52	170	140	
105	166,24	167,11	171	142	
106	167,83	168,70	173	146	
107	169,43	170,30	174	146	
108	171,02	171,89	176	148	
109	172,61	173,48	178	150	
110	174,20	175,07	179	150	
111	175,79	176,66	181	152	
112	177,38	178,25	182	152	
113	178,98	179,85	184	152	
114	180,57	181,44	185	154	
115	182,16	183,03	187	154	
116	183,75	184,62	189	154	
117	185,34	186,21	190	154	
118	186,93	187,80	192	156	
119	188,52	189,39	193	156	
120	190,12	190,99	195	156	

PU Moulded T5 steel cord



» **Standard tolerances**

- › width: ± 0,5 mm
- › length: ± 0,14 - 0,52 mm
- › height: ± 0,15 mm

» **General properties**

- › Type: T5
- › Pitch: 5 mm
- › Material: thermoset polyurethane, 87° ShA
- › Color: light grey
- › Cord: steel (special cords on request)

» **Standard widths [mm]:**

- › 6, 8, 10, 12, 16, 20, 25, 32, 50

Available dimensions		
length [mm]	number of teeth	max. width [mm]
120	24	120
150	30	240
165	33	240
180	36	300
185	37	300
200	40	300
210	42	300
215	43	300
220	44	300
225	45	300
245	49	300
250	50	300
255	51	300
260	52	300
270	54	300
275	55	300
280	56	300
295	59	300
305	61	300
330	66	300
340	68	300
350	70	300
355	71	300
365	73	300
390	78	300
400	80	300
410	82	300

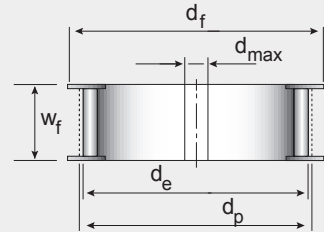
Available dimensions		
length [mm]	number of teeth	max. width [mm]
420	84	300
425	85	300
440	88	300
445	89	300
450	90	300
455	91	300
460	92	300
475	95	300
480	96	300
500	100	300
510	102	300
525	105	300
545	109	300
550	110	300
560	112	300
575	115	300
590	118	300
610	122	300
620	124	300
630	126	300
640	128	300
650	130	300
660	132	300
675	135	300
690	138	300
700	140	300
720	144	300

Available dimensions		
length [mm]	number of teeth	max. width [mm]
725	145	300
750	150	300
765	153	300
780	156	300
800	160	300
815	163	300
830	166	300
840	168	300
860	172	300
885	177	300
900	180	300
940	188	300
990	198	300
1075	215	300
1100	220	300
1160	232	300
1200	240	300
1215	243	300
1275	255	300
1280	256	300
1315	263	300
1355	271	300
1380	276	300
1500	300	300
1580	316	300
1955	391	300

Pulleys PU Moulded T5 steel cord

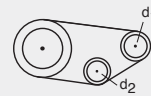
Table of belt widths

timing belt width [mm] w_b	10	16	25	32	50	75	100
pulley width [mm] w_f	15	21	30	38	57	83	110

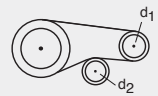


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t	10	15
minimum pulley diameter [mm]	d	15,05	23,05
diameter of idler roller [mm]	d_i	30,00	30,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
10	15,05	15,92	20	6
11	16,64	17,51	22	6
12	18,23	19,01	23	6
13	19,82	20,69	25	8
14	21,41	22,28	26	8
15	23,05	23,87	28	10
16	24,59	25,46	30	12
17	26,19	27,06	31	14
18	27,78	28,65	33	16
19	29,37	30,24	34	16
20	30,96	31,83	36	18
21	32,55	33,42	37	20
22	34,14	35,01	39	22
23	35,74	36,61	41	24
24	37,33	38,20	42	24
25	38,92	39,79	44	25
26	40,51	41,38	45	25
27	42,10	42,97	47	27
28	43,69	44,56	49	29
29	45,29	46,16	50	31
30	46,88	47,75	52	33
31	48,47	49,34	53	35
32	50,06	50,93	55	37
33	51,65	52,52	57	39
34	53,24	54,11	58	39
35	54,83	55,70	60	40
36	56,43	57,30	61	42
37	58,02	58,89	63	43
38	59,61	60,48	65	45
39	61,20	62,07	66	45
40	62,79	63,66	68	47
41	64,38	65,25	69	48
42	65,98	66,85	71	50
43	67,57	68,44	72	52
44	69,16	70,03	74	52
45	70,75	71,62	76	54
46	72,34	73,21	77	56

Standard

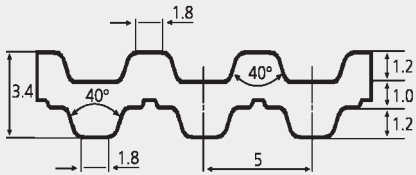
Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
47	73,93	74,80	79	58
48	75,52	76,39	80	60
49	77,12	77,99	82	60
50	78,71	79,58	84	60
51	80,30	81,17	85	62
52	81,89	82,76	87	64
53	83,48	84,35	88	66
54	85,07	85,94	90	66
55	86,67	87,54	92	68
56	88,26	89,13	93	70
57	89,85	90,72	95	72
58	91,44	92,31	96	74
59	93,03	93,90	98	74
60	94,62	95,49	100	76
61	96,21	97,08	101	79
62	97,81	98,68	103	80
63	99,40	100,27	104	82
64	100,99	101,86	106	82
65	102,58	103,45	108	84
66	104,17	105,04	109	86
67	105,76	106,63	111	88
68	107,36	108,23	112	90
69	108,95	109,82	114	90
70	110,54	111,41	115	90
71	112,13	113,00	117	92
72	113,72	114,59	119	94
73	115,31	116,18	120	96
74	116,90	117,77	122	96
75	118,50	119,37	123	98
76	120,09	120,96	125	100
77	121,68	122,55	127	102
78	123,27	124,14	128	104
79	124,86	125,73	130	104
80	126,45	127,32	131	106
81	128,05	128,92	133	108
82	129,64	130,51	135	110
83	131,23	132,11	136	110

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
84	132,82	133,69	138	112
85	134,41	135,28	139	114
86	136,00	136,87	141	116
87	137,59	138,46	143	119
88	139,19	140,06	144	120
89	140,78	141,65	146	120
90	142,37	143,24	147	122
91	143,96	144,83	149	124
92	145,55	146,42	150	126
93	147,14	148,01	152	126
94	148,74	149,61	154	129
95	150,33	151,20	155	130
96	151,92	152,79	157	130
97	153,51	154,38	158	132
98	155,10	155,97	160	132
99	156,69	157,56	162	134
100	158,29	159,16	163	136
101	159,88	160,75	165	139
102	161,47	162,34	166	140
103	163,06	163,93	168	140
104	164,65	165,52	170	140
105	166,24	167,11	171	142
106	167,83	168,70	173	146
107	169,43	170,30	174	146
108	171,02	171,89	176	148
109	172,61	173,48	178	150
110	174,20	175,07	179	150
111	175,79	176,66	181	152
112	177,38	178,25	182	152
113	178,98	179,85	184	152
114	180,57	181,44	185	154
115	182,16	183,03	187	154
116	183,75	184,62	189	154
117	185,34	186,21	190	154
118	186,93	187,80	192	156
119	188,52	189,39	193	156
120	190,12	190,99	195	156

PU Moulded DT5 steel cord



» Standard tolerances

- › width: $\pm 0,5$ mm
- › length: $\pm 0,14 - 0,52$ mm
- › height: $\pm 0,15$ mm

» General properties

- › Type: DT5
- › Pitch: 5 mm
- › Material: thermoset polyurethane, 87° ShA
- › Color: light grey
- › Cord: steel (special cords on request)

» Standard widths [mm]:

- › 6, 8, 10, 12, 16, 20, 25, 32, 50

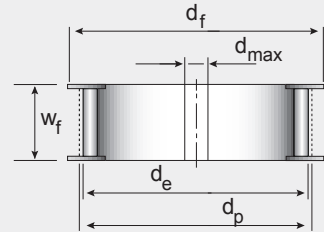
Available dimensions

length [mm]	number of teeth	max. width [mm]
410	82	300
460	92	300
590	118	300
620	124	300
750	150	300
815	163	300
860	172	300
940	188	300
1100	220	300

Pulleys PU Moulded DT5 steel cord

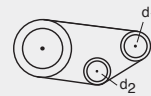
Table of belt widths

timing belt width [mm] w_b	10	16	25	32	50	75	100
pulley width [mm] w_f	15	21	30	38	57	83	110

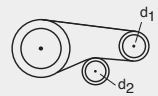


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t	10	15
minimum pulley diameter [mm]	d_e	15,05	23,05
diameter of idler roller [mm]	d_i	30,00	30,00



belt drive without counter flexion



belt drive with counter flexion

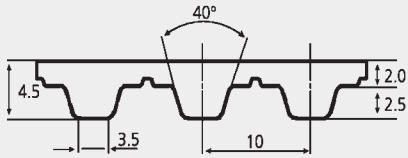
Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
10	15,05	15,92	20	6	
11	16,64	17,51	22	6	
12	18,23	19,01	23	6	
13	19,82	20,69	25	8	
14	21,41	22,28	26	8	
15	23,05	23,87	28	10	
16	24,59	25,46	30	12	
17	26,19	27,06	31	14	
18	27,78	28,65	33	16	
19	29,37	30,24	34	16	
20	30,96	31,83	36	18	
21	32,55	33,42	37	20	
22	34,14	35,01	39	22	
23	35,74	36,61	41	24	
24	37,33	38,20	42	24	
25	38,92	39,79	44	25	
26	40,51	41,38	45	25	
27	42,10	42,97	47	27	
28	43,69	44,56	49	29	
29	45,29	46,16	50	31	
30	46,88	47,75	52	33	
31	48,47	49,34	53	35	
32	50,06	50,93	55	37	
33	51,65	52,52	57	39	
34	53,24	54,11	58	39	
35	54,83	55,70	60	40	
36	56,43	57,30	61	42	
37	58,02	58,89	63	43	
38	59,61	60,48	65	45	
39	61,20	62,07	66	45	
40	62,79	63,66	68	47	
41	64,38	65,25	69	48	
42	65,98	66,85	71	50	
43	67,57	68,44	72	52	
44	69,16	70,03	74	52	
45	70,75	71,62	76	54	
46	72,34	73,21	77	56	

Standard

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
47	73,93	74,80	79	58	
48	75,52	76,39	80	60	
49	77,12	77,99	82	60	
50	78,71	79,58	84	60	
51	80,30	81,17	85	62	
52	81,89	82,76	87	64	
53	83,48	84,35	88	66	
54	85,07	85,94	90	66	
55	86,67	87,54	92	68	
56	88,26	89,13	93	70	
57	89,85	90,72	95	72	
58	91,44	92,31	96	74	
59	93,03	93,90	98	74	
60	94,62	95,49	100	76	
61	96,21	97,08	101	79	
62	97,81	98,68	103	80	
63	99,40	100,27	104	82	
64	100,99	101,86	106	82	
65	102,58	103,45	108	84	
66	104,17	105,04	109	86	
67	105,76	106,63	111	88	
68	107,36	108,23	112	90	
69	108,95	109,82	114	90	
70	110,54	111,41	115	90	
71	112,13	113,00	117	92	
72	113,72	114,59	119	94	
73	115,31	116,18	120	96	
74	116,90	117,77	122	96	
75	118,50	119,37	123	98	
76	120,09	120,96	125	100	
77	121,68	122,55	127	102	
78	123,27	124,14	128	104	
79	124,86	125,73	130	104	
80	126,45	127,32	131	106	
81	128,05	128,92	133	108	
82	129,64	130,51	135	110	
83	131,23	132,10	136	110	

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
84	132,82	133,69	138	112	
85	134,41	135,28	139	114	
86	136,00	136,87	141	116	
87	137,59	138,46	143	119	
88	139,19	140,06	144	120	
89	140,78	141,65	146	120	
90	142,37	143,24	147	122	
91	143,96	144,83	149	124	
92	145,55	146,42	150	126	
93	147,14	148,01	152	126	
94	148,74	149,61	154	129	
95	150,33	151,20	155	130	
96	151,92	152,79	157	130	
97	153,51	154,38	158	132	
98	155,10	155,97	160	132	
99	156,69	157,56	162	134	
100	158,29	159,16	163	136	
101	159,88	160,75	165	139	
102	161,47	162,34	166	140	
103	163,06	163,93	168	140	
104	164,65	165,52	170	140	
105	166,24	167,11	171	142	
106	167,83	168,70	173	146	
107	169,43	170,30	174	146	
108	171,02	171,89	176	148	
109	172,61	173,48	178	150	
110	174,20	175,07	179	150	
111	175,79	176,66	181	152	
112	177,38	178,25	182	152	
113	178,98	179,85	184	152	
114	180,57	181,44	185	154	
115	182,16	183,03	187	154	
116	183,75	184,62	189	154	
117	185,34	186,21	190	154	
118	186,93	187,80	192	156	
119	188,52	189,39	193	156	
120	190,12	190,99	195	156	

PU Linear/Torque T10 steel cord

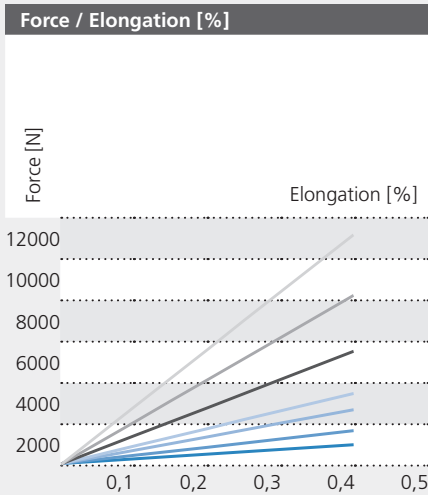


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

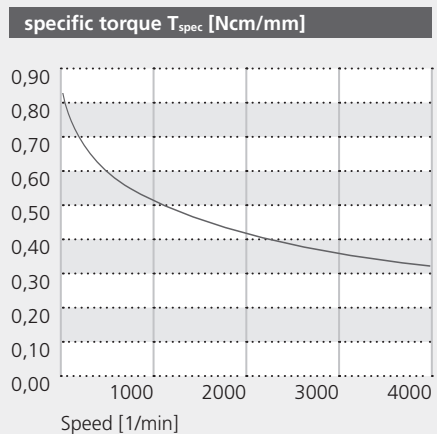
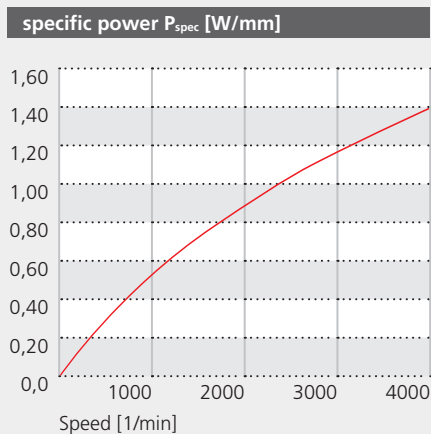
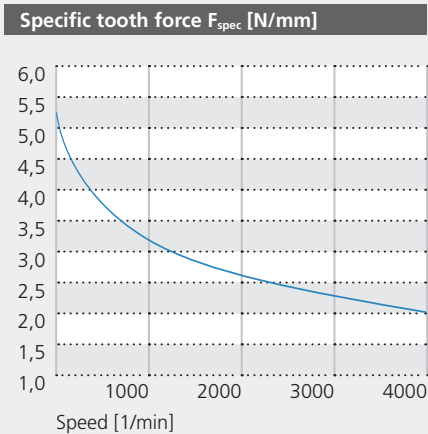
- › pitch 10 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 150 mm
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 24,000 mm (PU Torque)
- › max. speed 10.000 rpm



Technical data		allowable tensile load	allowable tensile load	Breaking load	spec. spring ratio	Belt weight per metre
Standard-belt width w_{tb} [mm]	Graph	Typ $L F_{ai}$ [N]	Typ $T F_{ai}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
10	■	840	420	3210	220000	0,05
16	■	1000	500	5150	385000	0,07
25	■	2200	1100	8050	632500	0,11
32	■	2620	1310	10300	825000	0,15
50	■	4200	2100	16050	1320000	0,23
75	■	5100	2550	24100	1980000	0,34
100	■	7100	3550	32130	2695000	0,45

Specific tooth force/power/torque*		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Speed [1/min]																				
Specific tooth force F_{spec} [N/mm]	■	5,180	5,000	4,855	4,700	4,611	4,443	4,275	4,028	3,836	3,68	3,430	3,163	2,992	2,844	2,724	2,612	2,278	2,039	
Specific power P_{spec} [W/mm]	■	0,000	0,021	0,040	0,059	0,077	0,111	0,143	0,201	0,256	0,307	0,429	0,527	0,623	0,711	0,795	0,871	1,139	1,359	
Specific torque T_{spec} [Ncm/mm]	■	0,824	0,796	0,773	0,748	0,734	0,707	0,680	0,641	0,611	0,586	0,546	0,503	0,476	0,453	0,434	0,416	0,363	0,325	

* max. force/power/torque per tooth in mesh and per mm belt width



T10 Steel

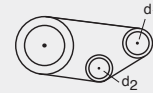
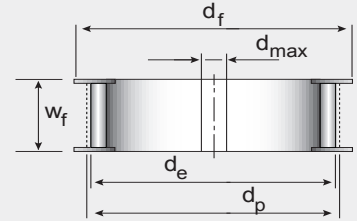
Pulleys PU Linear/Torque T10 steel cord

Table of belt widths

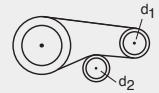
timing belt width [mm] w_b	10	16	25	32	50	75	100	150
pulley width [mm] w_f	15	21	30	38	57	83	110	162

Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t	12	20
minimum pulley diameter [mm]	d_e	36,35	61,81
diameter of idler roller [mm]	d_i	60,00	60,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
12	36,35	38,20	42	24
13	39,53	41,38	45	26
14	42,71	44,56	49	30
15	45,90	47,75	52	34
16	49,08	50,93	55	36
17	52,26	54,11	58	40
18	55,45	57,30	61	44
19	58,63	60,48	65	46
20	61,81	63,66	68	50
21	65,00	66,85	71	52
22	68,18	70,03	74	56
23	71,36	73,21	77	60
24	74,54	76,39	80	62
25	77,73	79,58	84	66
26	80,91	82,76	87	68
27	84,09	85,94	90	72
28	87,28	89,13	93	76
29	90,46	92,31	96	78
30	93,64	95,49	100	82
31	96,83	98,68	103	84
32	100,01	101,86	106	88
33	103,19	105,04	109	88
34	106,38	108,23	112	92
35	109,56	111,41	115	96
36	112,74	114,59	119	98
37	115,92	117,77	122	101
38	119,11	120,96	125	104
39	122,29	124,14	128	106
40	125,47	127,32	131	110
41	128,66	130,51	135	110
42	131,84	133,69	138	112
43	135,02	136,87	141	114
44	138,21	140,06	144	118
45	141,39	143,24	147	120
46	144,57	146,42	150	122
47	147,76	149,61	154	122
48	150,94	152,79	157	124

Standard

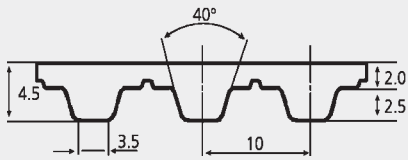
Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
49	154,12	155,97	160	126
50	157,31	159,16	163	130
51	160,49	162,34	166	134
52	163,67	165,52	170	136
53	166,85	168,70	173	140
54	170,04	171,89	176	144
55	173,22	175,07	179	146
56	176,40	178,25	182	150
57	179,59	181,44	185	152
58	182,77	184,62	189	156
59	185,95	187,80	192	160
60	189,14	190,99	195	162
61	192,32	194,17	198	164
62	195,50	197,35	201	166
63	198,69	200,54	205	170
64	201,87	203,72	208	171
65	205,05	206,90	211	174
66	208,23	210,08	214	175
67	211,42	213,27	217	177
68	214,60	216,45	221	181
69	217,78	219,63	224	185
70	220,97	222,82	227	187
71	224,15	226,00	230	191
72	227,33	229,18	233	193
73	230,52	232,37	236	197
74	233,70	235,55	240	201
75	236,88	238,73	243	203
76	240,07	241,92	246	207
77	243,25	245,01	249	209
78	246,43	248,28	252	213
79	249,61	251,46	256	215
80	252,80	254,65	259	219
81	255,98	257,83	262	223
82	259,16	261,01	265	225
83	262,35	264,20	268	229
84	265,53	267,38	271	231

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
85	268,71	270,56	275	235
86	271,90	273,75	278	239
87	275,08	276,93	281	241
88	278,26	280,11	284	245
89	281,45	283,30	287	247
90	284,63	286,48	291	251
91	287,81	289,66	294	255
92	291,00	292,85	297	257
93	294,18	296,03	300	261
94	297,36	299,21	303	263
95	300,54	302,39	306	267
96	303,73	305,58	310	269
97	306,91	308,76	313	273
98	310,09	311,94	316	279
99	313,28	315,13	319	283
100	316,46	318,31	322	285
101	319,64	321,49	326	289
102	322,83	324,68	329	293
103	326,01	327,86	332	295
104	329,19	331,04	335	299
105	332,38	334,23	338	301
106	335,56	337,41	341	305
107	338,74	340,59	345	309
108	341,92	343,77	348	311
109	345,11	346,96	351	315
110	348,29	350,14	354	317
111	351,47	353,32	357	321
112	354,66	356,51	361	323
113	357,84	359,69	364	327
114	361,02	362,87	367	330
115	364,21	366,06	370	333
116	367,39	369,24	373	336
117	370,57	372,42	376	340
118	373,76	375,61	380	344
119	376,94	378,79	383	348
120	380,12	381,97	386	354

PU Linear/Torque T10 Aramid cord

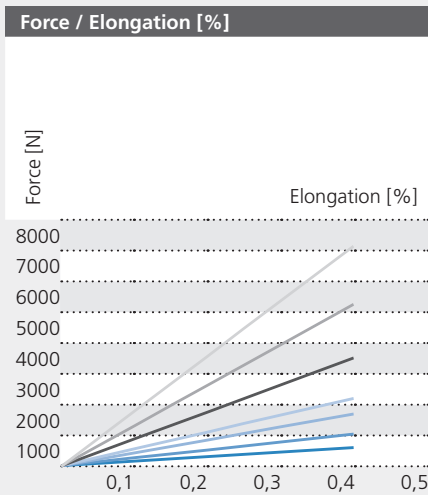


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

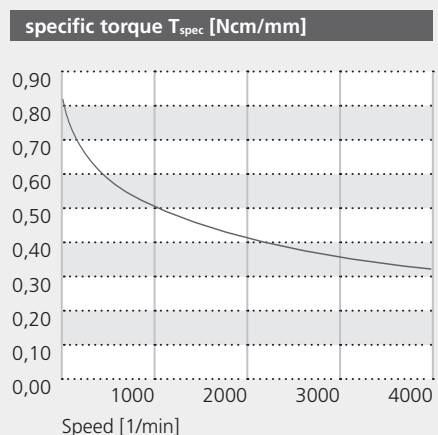
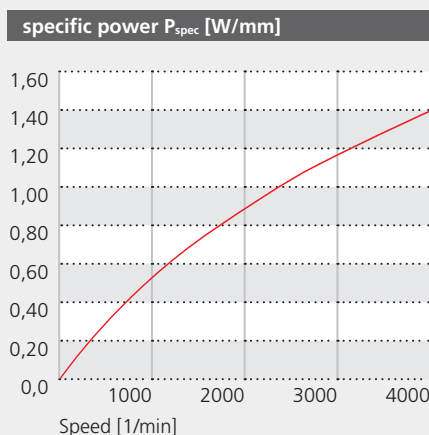
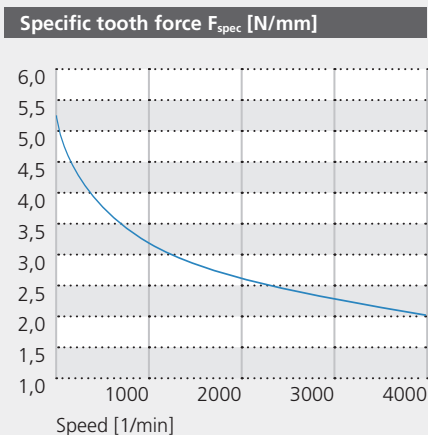
- › pitch 10 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 150 mm
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 22,770 mm (PU Torque)
- › max. Speed 10.000 rpm



Technical data		allowable tensile load Typ $L F_{ai}$ [N]	allowable tensile load Typ $W F_{ai}$ [N]	Breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	Belt weight per metre m [kg/m]
Standard-belt width w_{tb} [mm]	Graph	Typ $L F_{ai}$ [N]	Typ $W F_{ai}$ [N]			
10		700	350	2590	145000	0,040
16		1000	500	4800	235000	0,064
25		1750	875	7500	392000	0,100
32		2350	1175	9600	507000	0,128
50		3970	1985	15200	861000	0,200
75		4900	2450	22400	1332000	0,300
100		6700	3350	31500	1776000	0,400

Specific tooth force/power/torque*		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Speed [1/min]																				
Specific tooth force F_{spec} [N/mm]		5,180	5,000	4,855	4,700	4,611	4,443	4,275	4,028	3,836	3,68	3,430	3,163	2,992	2,844	2,724	2,612	2,278	2,039	
Specific power P_{spec} [W/mm]		0,000	0,021	0,040	0,059	0,077	0,111	0,143	0,201	0,256	0,307	0,429	0,527	0,623	0,711	0,795	0,871	1,139	1,359	
Specific torque T_{spec} [Ncm/mm]		0,824	0,796	0,773	0,748	0,734	0,707	0,680	0,641	0,611	0,586	0,546	0,503	0,476	0,453	0,434	0,416	0,363	0,325	

* max. force/power/torque per tooth in mesh and per mm belt width



T10 Aramid

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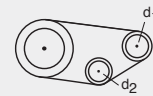
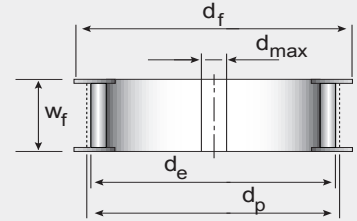
Pulleys PU Linear/Torque T10 Aramid cord

Table of belt widths

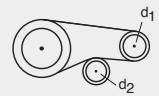
timing belt width [mm] w_b	10	16	25	32	50	75	100	150
pulley width [mm] w_f	15	21	30	38	57	83	110	162

Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t	12	20
minimum pulley diameter [mm]	d_e	36,35	61,81
diameter of idler roller [mm]	d_i	50,00	50,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
12	36,35	38,20	42	24
13	39,53	41,38	45	26
14	42,71	44,56	49	30
15	45,90	47,75	52	34
16	49,08	50,93	55	36
17	52,26	54,11	58	40
18	55,45	57,30	61	44
19	58,63	60,48	65	46
20	61,81	63,66	68	50
21	65,00	66,85	71	52
22	68,18	70,03	74	56
23	71,36	73,21	77	60
24	74,54	76,39	80	62
25	77,73	79,58	84	66
26	80,91	82,76	87	68
27	84,09	85,94	90	72
28	87,28	89,13	93	76
29	90,46	92,31	96	78
30	93,64	95,49	100	82
31	96,83	98,68	103	84
32	100,01	101,86	106	88
33	103,19	105,04	109	88
34	106,38	108,23	112	92
35	109,56	111,41	115	96
36	112,74	114,59	119	98
37	115,92	117,77	122	101
38	119,11	120,96	125	104
39	122,29	124,14	128	106
40	125,47	127,32	131	110
41	128,66	130,51	135	110
42	131,84	133,69	138	112
43	135,02	136,87	141	114
44	138,21	140,06	144	118
45	141,39	143,24	147	120
46	144,57	146,42	150	122
47	147,76	149,61	154	122
48	150,94	152,79	157	124

Standard

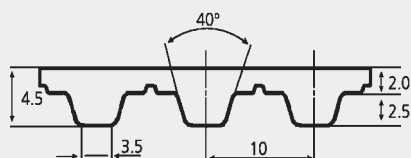
Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
49	154,12	155,97	160	126
50	157,31	159,16	163	130
51	160,49	162,34	166	134
52	163,67	165,52	170	136
53	166,85	168,70	173	140
54	170,04	171,89	176	144
55	173,22	175,07	179	146
56	176,40	178,25	182	150
57	179,59	181,44	185	152
58	182,77	184,62	189	156
59	185,95	187,80	192	160
60	189,14	190,99	195	162
61	192,32	194,17	198	164
62	195,50	197,35	201	166
63	198,69	200,54	205	170
64	201,87	203,72	208	171
65	205,05	206,90	211	174
66	208,23	210,08	214	175
67	211,42	213,27	217	177
68	214,60	216,45	221	181
69	217,78	219,63	224	185
70	220,97	222,82	227	187
71	224,15	226,00	230	191
72	227,33	229,18	233	193
73	230,52	232,37	236	197
74	233,70	235,55	240	201
75	236,88	238,73	243	203
76	240,07	241,92	246	207
77	243,25	245,01	249	209
78	246,43	248,28	252	213
79	249,61	251,46	256	215
80	252,80	254,65	259	219
81	255,98	257,83	262	223
82	259,16	261,01	265	225
83	262,35	264,20	268	229
84	265,53	267,38	271	231

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
85	268,71	270,56	275	235
86	271,90	273,75	278	239
87	275,08	276,93	281	241
88	278,26	280,11	284	245
89	281,45	283,30	287	247
90	284,63	286,48	291	251
91	287,81	289,66	294	255
92	291,00	292,85	297	257
93	294,18	296,03	300	261
94	297,36	299,21	303	263
95	300,54	302,39	306	267
96	303,73	305,58	310	269
97	306,91	308,76	313	273
98	310,09	311,94	316	279
99	313,28	315,13	319	283
100	316,46	318,31	322	285
101	319,64	321,49	326	289
102	322,83	324,68	329	293
103	326,01	327,86	332	295
104	329,19	331,04	335	299
105	332,38	334,23	338	301
106	335,56	337,41	341	305
107	338,74	340,59	345	309
108	341,92	343,77	348	311
109	345,11	346,96	351	315
110	348,29	350,14	354	317
111	351,47	353,32	357	321
112	354,66	356,51	361	323
113	357,84	359,69	364	327
114	361,02	362,87	367	330
115	364,21	366,06	370	333
116	367,39	369,24	373	336
117	370,57	372,42	376	340
118	373,76	375,61	380	344
119	376,94	378,79	383	348
120	380,12	381,97	386	354

PU Moulded T10 steel cord



» Standard tolerances

- › width: $\pm 0,5$ mm
- › length: $\pm 0,14 - 0,52$ mm
- › height: $\pm 0,30$ mm

» General properties

- › Type: T10
- › Pitch: 10 mm
- › Material: thermoset polyurethane, 87° ShA
- › Color: light grey
- › Cord: steel (special cords on request)

» Standard widths [mm]:

- › 10, 12, 16, 20, 25, 32, 50

Available dimensions		
length [mm]	number of teeth	max. width [mm]
260	26	300
340	34	300
370	37	300
390	39	300
400	40	300
410	41	300
440	44	300
450	45	300
480	48	300
500	50	300
530	53	300
550	55	300
560	56	300
600	60	300
610	61	300
630	63	300
650	65	300
660	66	300
680	68	300
690	69	300
700	70	300
720	72	300
730	73	300
750	75	300
780	78	300
810	81	300
840	84	300
850	85	300
880	88	300
890	89	300
900	90	300

Available dimensions		
length [mm]	number of teeth	max. width [mm]
910	91	300
920	92	300
950	95	300
960	96	300
970	97	300
980	98	300
1010	101	300
1080	108	300
1110	111	300
1140	114	300
1150	115	300
1210	121	300
1240	124	300
1250	125	300
1300	130	300
1320	132	300
1350	135	300
1390	139	300
1400	140	300
1420	142	300
1450	145	300
1460	146	300
1500	150	300
1560	156	300
1610	161	300
1750	175	300
1780	178	300
1880	188	300
1960	196	300
2250	225	300

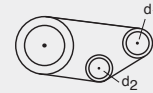
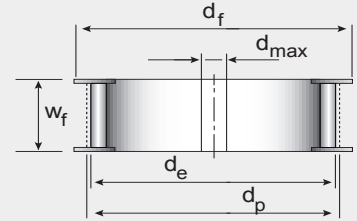
Pulleys PU Moulded T10 steel cord

Table of belt widths

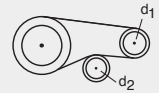
timing belt width [mm] w_b	10	16	25	32	50	75	100	150
pulley width [mm] w_f	15	21	30	38	57	83	110	162

Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t	12	20
minimum pulley diameter [mm]	d	36,35	61,81
diameter of idler roller [mm]	d_i	60,00	60,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
12	36,35	38,20	42	24
13	39,53	41,38	45	26
14	42,71	44,56	49	30
15	45,90	47,75	52	34
16	49,08	50,93	55	36
17	52,26	54,11	58	40
18	55,45	57,30	61	44
19	58,63	60,48	65	46
20	61,81	63,66	68	50
21	65,00	66,85	71	52
22	68,18	70,03	74	56
23	71,36	73,21	77	60
24	74,54	76,39	80	62
25	77,73	79,58	84	66
26	80,91	82,76	87	68
27	84,09	85,94	90	72
28	87,28	89,13	93	76
29	90,46	92,31	96	78
30	93,64	95,49	100	82
31	96,83	98,68	103	84
32	100,01	101,86	106	88
33	103,19	105,04	109	88
34	106,38	108,23	112	92
35	109,56	111,41	115	96
36	112,74	114,59	119	98
37	115,92	117,77	122	101
38	119,11	120,96	125	104
39	122,29	124,14	128	106
40	125,47	127,32	131	110
41	128,66	130,51	135	110
42	131,84	133,69	138	112
43	135,02	136,87	141	114
44	138,21	140,06	144	118
45	141,39	143,24	147	120
46	144,57	146,42	150	122
47	147,76	149,61	154	122
48	150,94	152,79	157	124

Standard

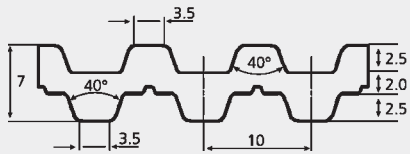
Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
49	154,12	155,97	160	126
50	157,31	159,16	163	130
51	160,49	162,34	166	134
52	163,67	165,52	170	136
53	166,85	168,70	173	140
54	170,04	171,89	176	144
55	173,22	175,07	179	146
56	176,40	178,25	182	150
57	179,59	181,44	185	152
58	182,77	184,62	189	156
59	185,95	187,80	192	160
60	189,14	190,99	195	162
61	192,32	194,17	198	164
62	195,50	197,35	201	166
63	198,69	200,54	205	170
64	201,87	203,72	208	171
65	205,05	206,90	211	174
66	208,23	210,08	214	175
67	211,42	213,27	217	177
68	214,60	216,45	221	181
69	217,78	219,63	224	185
70	220,97	222,82	227	187
71	224,15	226,00	230	191
72	227,33	229,18	233	193
73	230,52	232,37	236	197
74	233,70	235,55	240	201
75	236,88	238,73	243	203
76	240,07	241,92	246	207
77	243,25	245,01	249	209
78	246,43	248,28	252	213
79	249,61	251,46	256	215
80	252,80	254,65	259	219
81	255,98	257,83	262	223
82	259,16	261,01	265	225
83	262,35	264,20	268	229
84	265,53	267,38	271	231

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
85	268,71	270,56	275	235
86	271,90	273,75	278	239
87	275,08	276,93	281	241
88	278,26	280,11	284	245
89	281,45	283,30	287	247
90	284,63	286,48	291	251
91	287,81	289,66	294	255
92	291,00	292,85	297	257
93	294,18	296,03	300	261
94	297,36	299,21	303	263
95	300,54	302,39	306	267
96	303,73	305,58	310	269
97	306,91	308,76	313	273
98	310,09	311,94	316	279
99	313,28	315,13	319	283
100	316,46	318,31	322	285
101	319,64	321,49	326	289
102	322,83	324,68	329	293
103	326,01	327,86	332	295
104	329,19	331,04	335	299
105	332,38	334,23	338	301
106	335,56	337,41	341	305
107	338,74	340,59	345	309
108	341,92	343,77	348	311
109	345,11	346,96	351	315
110	348,29	350,14	354	317
111	351,47	353,32	357	321
112	354,66	356,51	361	323
113	357,84	359,69	364	327
114	361,02	362,87	367	330
115	364,21	366,06	370	333
116	367,39	369,24	373	336
117	370,57	372,42	376	340
118	373,76	375,61	380	344
119	376,94	378,79	383	348
120	380,12	381,97	386	354

PU Moulded DT10 steel cord



» Standard tolerances

- › width: $\pm 0,5$ mm
- › length: $\pm 0,14 - 0,52$ mm
- › height: $\pm 0,30$ mm

» General properties

- › Type: DT10
- › Pitch: 10 mm
- › Material: thermoset polyurethane, 87° ShA
- › Color: light grey
- › Cord: steel (special cords on request)

» Standard widths [mm]:

- › 10, 12, 16, 20, 25, 32, 50

Available dimensions

length [mm]	number of teeth	max. width [mm]
260	26	300
530	53	300
630	63	300
660	66	300
720	72	300
840	84	300
920	92	300
980	98	300
1210	121	300
1240	124	300
1250	125	300
1320	132	300
1350	135	300
1420	142	300
1610	161	300
1880	188	300

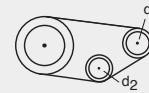
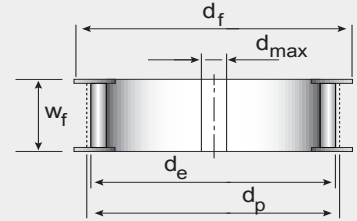
Pulleys PU Moulded DT10 steel cord

Table of belt widths

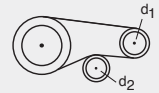
timing belt width [mm] w_b	10	16	25	32	50	75	100	150
pulley width [mm] w_f	15	21	30	38	57	83	110	162

Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t	12	20
minimum pulley diameter [mm]	d	36,35	61,81
diameter of idler roller [mm]	d_i	60,00	60,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
12	36,35	38,20	42	24
13	39,53	41,38	45	26
14	42,71	44,56	49	30
15	45,90	47,75	52	34
16	49,08	50,93	55	36
17	52,26	54,11	58	40
18	55,45	57,30	61	44
19	58,63	60,48	65	46
20	61,81	63,66	68	50
21	65,00	66,85	71	52
22	68,18	70,03	74	56
23	71,36	73,21	77	60
24	74,54	76,39	80	62
25	77,73	79,58	84	66
26	80,91	82,76	87	68
27	84,09	85,94	90	72
28	87,28	89,13	93	76
29	90,46	92,31	96	78
30	93,64	95,49	100	82
31	96,83	98,68	103	84
32	100,01	101,86	106	88
33	103,19	105,04	109	88
34	106,38	108,23	112	92
35	109,56	111,41	115	96
36	112,74	114,59	119	98
37	115,92	117,77	122	101
38	119,11	120,96	125	104
39	122,29	124,14	128	106
40	125,47	127,32	131	110
41	128,66	130,51	135	110
42	131,84	133,69	138	112
43	135,02	136,87	141	114
44	138,21	140,06	144	118
45	141,39	143,24	147	120
46	144,57	146,42	150	122
47	147,76	149,61	154	122
48	150,94	152,79	157	124

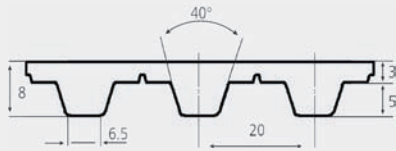
Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
49	154,12	155,97	160	126
50	157,31	159,16	163	130
51	160,49	162,34	166	134
52	163,67	165,52	170	136
53	166,85	168,70	173	140
54	170,04	171,89	176	144
55	173,22	175,07	179	146
56	176,40	178,25	182	150
57	179,59	181,44	185	152
58	182,77	184,62	189	156
59	185,95	187,80	192	160
60	189,14	190,99	195	162
61	192,32	194,17	198	164
62	195,50	197,35	201	166
63	198,69	200,54	205	170
64	201,87	203,72	208	171
65	205,05	206,90	211	174
66	208,23	210,08	214	175
67	211,42	213,27	217	177
68	214,60	216,45	221	181
69	217,78	219,63	224	185
70	220,97	222,82	227	187
71	224,15	226,00	230	191
72	227,33	229,18	233	193
73	230,52	232,37	236	197
74	233,70	235,55	240	201
75	236,88	238,73	243	203
76	240,07	241,92	246	207
77	243,25	245,01	249	209
78	246,43	248,28	252	213
79	249,61	251,46	256	215
80	252,80	254,65	259	219
81	255,98	257,83	262	223
82	259,16	261,01	265	225
83	262,35	264,20	268	229
84	265,53	267,38	271	231

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
85	268,71	270,56	275	235
86	271,90	273,75	278	239
87	275,08	276,93	281	241
88	278,26	280,11	284	245
89	281,45	283,30	287	247
90	284,63	286,48	291	251
91	287,81	289,66	294	255
92	291,00	292,85	297	257
93	294,18	296,03	300	261
94	297,36	299,21	303	263
95	300,54	302,39	306	267
96	303,73	305,58	310	269
97	306,91	308,76	313	273
98	310,09	311,94	316	279
99	313,28	315,13	319	283
100	316,46	318,31	322	285
101	319,64	321,49	326	289
102	322,83	324,68	329	293
103	326,01	327,86	332	295
104	329,19	331,04	335	299
105	332,38	334,23	338	301
106	335,56	337,41	341	305
107	338,74	340,59	345	309
108	341,92	343,77	348	311
109	345,11	346,96	351	315
110	348,29	350,14	354	317
111	351,47	353,32	357	321
112	354,66	356,51	361	323
113	357,84	359,69	364	327
114	361,02	362,87	367	330
115	364,21	366,06	370	333
116	367,39	369,24	373	336
117	370,57	372,42	376	340
118	373,76	375,61	380	344
119	376,94	378,79	383	348
120	380,12	381,97	386	354

PU Linear/Torque T20 steel cord

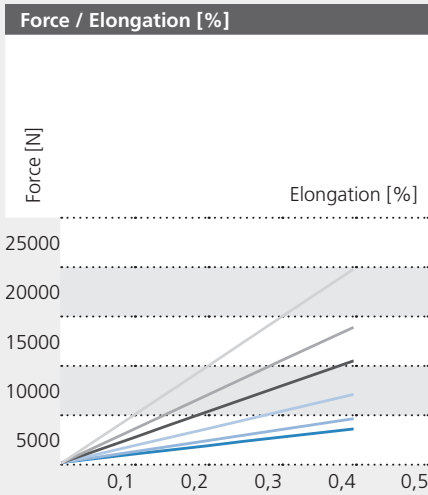


» Standard tolerances

- › width: ± 1,0 mm
- › height: ± 0,4 mm
- › length: ± 0,5 mm/m

» General properties

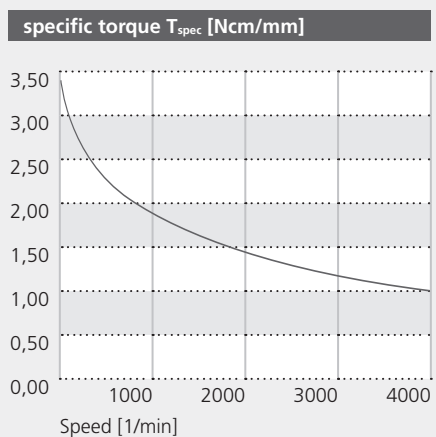
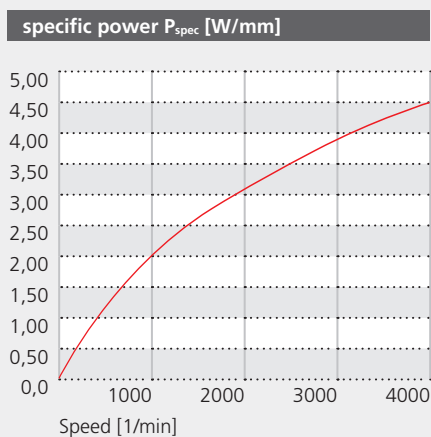
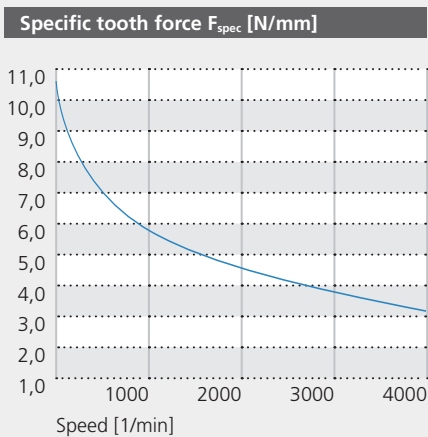
- › pitch 20 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 150 mm
- › min. length for jointed belt (W) 840 mm
- › length between 1,500 to 24,000 mm (PUTorque)
- › max. speed 6.500 rpm



Technical data		allowable tensile load	allowable tensile load	Breaking load	spec. spring ratio	Belt weight per metre
Standard-belt width w_{tb} [mm]	Graph	Typ $L F_{ai}$ [N]	Typ $T F_{ai}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
25	■	3200	1600	13500	870000	0,19
32	■	4100	2050	16500	1130000	0,24
50	■	6500	3250	26500	1760000	0,38
75	■	9800	4900	34000	2630000	0,58
100	■	13500	6750	48000	3500000	0,77
150	■	20000	10000	74000	5000000	0,88

Specific tooth force/power/torque*																			
Speed [1/min]		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F_{spec} [N/mm]	■	10,45	10,00	9,69	9,35	9,14	8,74	8,350	7,78	7,340	6,95	6,33	5,83	5,39	5,11	4,84	4,59	3,84	3,31
Specific power P_{spec} [W/mm]	■	0,000	0,083	0,161	0,234	0,305	0,437	0,557	0,778	0,979	1,158	1,583	1,943	2,246	2,555	2,823	3,060	3,840	4,413
Specific torque T_{spec} [Ncm/mm]	■	3,326	3,183	3,083	2,976	2,909	2,782	2,658	2,476	2,336	2,212	2,015	1,856	1,716	1,627	1,541	1,461	1,222	1,054

* max. force/power/torque per tooth in mesh and per mm belt width.

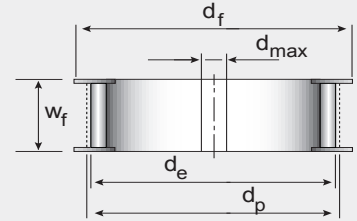


T20 Steel

Pulleys PU Linear/Torque T20 steel cord

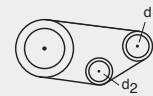
Table of belt widths

timing belt width [mm] w_b	25	32	50	75	100	150
pulley width [mm] w_f	32	39	58	75	110	162

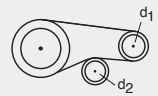


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_i	15	25
minimum pulley diameter [mm]	d_i	92,64	156,32
diameter of idler roller [mm]	d_i	120,00	120,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
15	92,64	95,49	103	67
16	99,02	101,86	109	74
17	105,39	108,23	115	80
18	111,75	114,59	122	86
19	118,12	120,96	128	93
20	124,48	127,32	134	100
21	130,85	133,69	141	105
22	137,22	140,06	147	112
23	143,58	146,42	153	118
24	149,95	152,79	160	125
25	156,32	159,16	166	131
26	162,68	165,52	173	137
27	169,05	171,89	179	144
28	175,41	178,25	185	150
29	181,78	184,62	192	156
30	188,15	190,99	198	163
31	194,51	197,35	204	169
32	200,88	203,72	211	175
33	207,24	210,08	217	182
34	213,61	216,45	224	188
35	219,98	222,82	230	195
36	226,34	229,18	236	201
37	232,71	235,55	243	207
38	239,08	241,92	249	214
39	245,44	248,28	255	220
40	251,81	254,65	262	226
41	258,17	261,01	268	233
42	264,54	267,38	274	239
43	270,91	273,75	281	245
44	277,27	280,11	287	252
45	283,64	286,48	294	258
46	290,01	292,85	300	265
47	296,37	299,21	306	271
48	302,74	305,58	313	278
49	309,10	311,94	319	284
50	315,47	318,31	325	290

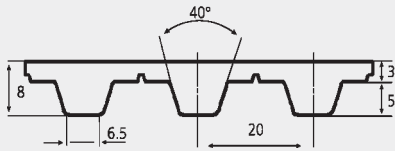
Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
51	321,84	324,68	332	296
52	328,20	331,04	338	303
53	334,57	337,41	344	310
54	340,93	343,77	351	315
55	347,30	350,14	357	322
56	353,67	356,51	364	328
57	360,03	362,87	370	335
58	366,40	369,24	376	341
59	372,77	375,61	383	347
60	379,13	381,97	389	354
61	385,50	388,34	395	360
62	391,86	394,70	402	366
63	398,23	401,07	408	373
64	404,60	407,44	414	379
65	410,96	413,80	421	385
66	417,33	420,17	427	392
67	423,70	426,54	434	398
68	430,05	432,90	440	405
69	436,42	439,27	446	406
70	442,78	445,63	453	412
71	449,15	452,00	459	419
72	455,52	458,37	465	425
73	461,88	464,73	472	431
74	468,25	471,01	478	438
75	474,61	477,46	485	444
76	480,98	483,83	491	450
77	487,35	490,20	497	457
78	493,71	496,56	504	463
79	500,08	502,93	510	470
80	506,45	509,30	516	476
81	512,81	515,66	523	482
82	519,18	522,03	529	489
83	525,54	528,39	535	495
84	531,91	534,76	542	501
85	538,28	541,13	548	503
86	544,64	547,49	555	509

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
87	551,01	553,86	561	516
88	557,38	560,23	567	522
89	563,74	566,59	574	528
90	570,11	572,96	580	535
91	576,47	579,32	586	541
92	582,84	585,69	593	548
93	589,21	592,06	599	554
94	595,57	598,42	605	580
95	601,94	604,79	612	566
96	608,31	611,16	618	573
97	614,67	617,52	625	579
98	621,04	623,89	631	586
99	627,40	630,25	637	592
100	633,77	636,62	644	598
101	640,14	642,99	650	605
102	646,50	649,35	656	611
103	652,87	655,72	663	617
104	659,23	662,08	669	624
105	665,60	668,45	676	630
106	671,97	674,82	682	636
107	678,33	681,18	688	643
108	684,70	687,55	695	649
109	691,07	693,92	701	656
110	697,43	700,28	707	662
111	703,80	706,65	714	663
112	710,16	713,01	720	670
113	716,53	719,38	726	676
114	722,90	725,75	733	682
115	729,26	732,11	739	688
116	735,63	738,48	746	694
117	742,00	744,85	752	700
118	748,36	751,21	758	707
119	754,73	757,58	765	714
120	761,09	763,94	771	720

PU Linear/Torque T20 Aramid cord

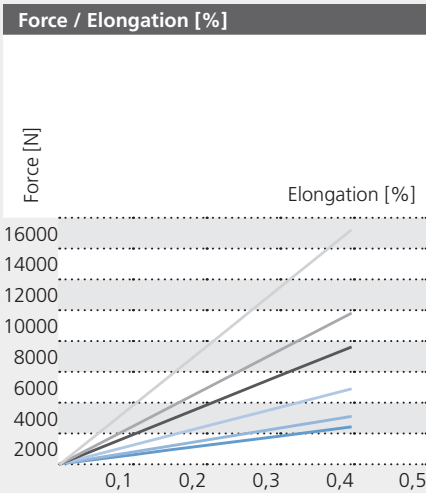


» General properties

- › pitch 20 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 150 mm
- › min. length for jointed belt (W) 840 mm
- › length between 1,500 to 22,760 mm (PU Torque)
- › max. speed 6,500 rpm

» Standard tolerances

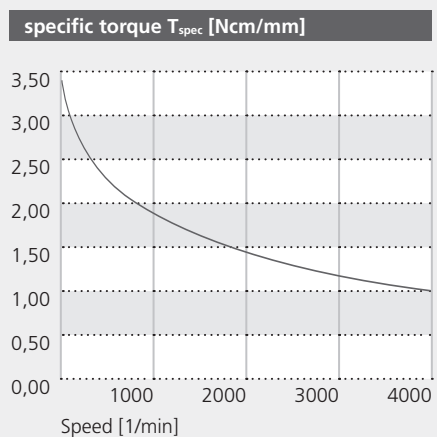
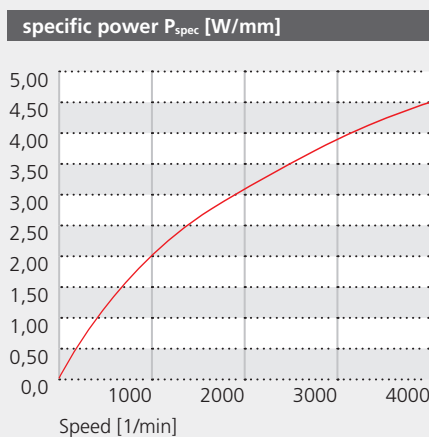
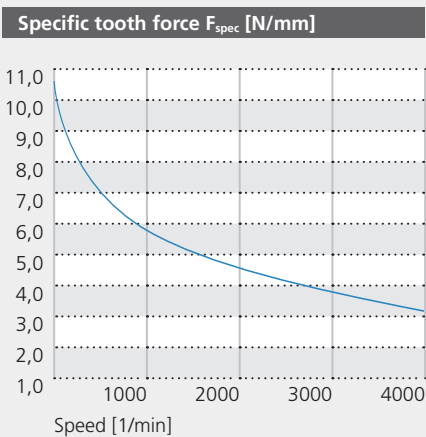
- › width: ± 1,0 mm
- › height: ± 0,4 mm
- › length: ± 0,5 mm/m



Technical data		allowable tensile load Typ $L F_{ai}$ [N]	allowable tensile load Typ $W F_{ai}$ [N]	Breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	Belt weight per metre m [kg/m]
Standard-belt width w_{tb} [mm]	Graph	Typ $L F_{ai}$ [N]	Typ $W F_{ai}$ [N]			
25		2900	1450	12250	600000	0,16
32		3750	1875	15680	770000	0,21
50		5700	2850	24000	1220000	0,32
75		8400	4200	31000	1900000	0,48
100		11000	5500	43000	2450000	0,64
150		15000	7500	65000	3800000	0,96

Specific tooth force/power/torque*																			
Speed [1/min]		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F_{spec} [N/mm]		10,45	10,00	9,69	9,35	9,14	8,74	8,350	7,78	7,340	6,95	6,33	5,83	5,39	5,11	4,84	4,59	3,84	3,31
specific power P_{spec} [W/mm]		0,000	0,083	0,161	0,234	0,305	0,437	0,557	0,778	0,979	1,158	1,583	1,943	2,246	2,555	2,823	3,060	3,840	4,413
specific torque T_{spec} [Ncm/mm]		3,326	3,183	3,083	2,976	2,909	2,782	2,658	2,476	2,336	2,212	2,015	1,856	1,716	1,627	1,541	1,461	1,222	1,054

* max. force/power/torque per tooth in mesh and per mm belt width



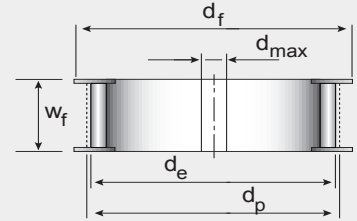
T20 Aramid

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Pulleys PU Linear/Torque T20 Aramid cord

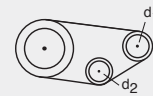
Table of belt widths

timing belt width [mm] w_b	25	32	50	75	100	150
pulley width [mm] w_f	32	39	58	75	110	162

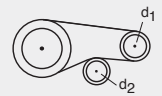


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t	15	25
minimum pulley diameter [mm]	d_e	92,64	156,32
diameter of idler roller [mm]	d_i	100,00	100,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
15	92,64	95,49	103	67
16	99,02	101,86	109	74
17	105,39	108,23	115	80
18	111,75	114,59	122	86
19	118,12	120,96	128	93
20	124,48	127,32	134	100
21	130,85	133,69	141	105
22	137,22	140,06	147	112
23	143,58	146,42	153	118
24	149,95	152,79	160	125
25	156,32	159,16	166	131
26	162,68	165,52	173	137
27	169,05	171,89	179	144
28	175,41	178,25	185	150
29	181,78	184,62	192	156
30	188,15	190,99	198	163
31	194,51	197,35	204	169
32	200,88	203,72	211	175
33	207,24	210,08	217	182
34	213,61	216,45	224	188
35	219,98	222,82	230	195
36	226,34	229,18	236	201
37	232,71	235,55	243	207
38	239,08	241,92	249	214
39	245,44	248,28	255	220
40	251,81	254,65	262	226
41	258,17	261,01	268	233
42	264,54	267,38	274	239
43	270,91	273,75	281	245
44	277,27	280,11	287	252
45	283,64	286,48	294	258
46	290,01	292,85	300	265
47	296,37	299,21	306	271
48	302,74	305,58	313	278
49	309,10	311,94	319	284
50	315,47	318,31	325	290

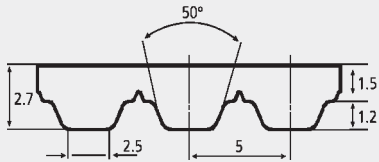
Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
51	321,84	324,68	332	296
52	328,20	331,04	338	303
53	334,57	337,41	344	310
54	340,93	343,77	351	315
55	347,30	350,14	357	322
56	353,67	356,51	364	328
57	360,03	362,87	370	335
58	366,40	369,24	376	341
59	372,77	375,61	383	347
60	379,13	381,97	389	354
61	385,50	388,34	395	360
62	391,86	394,70	402	366
63	398,23	401,07	408	373
64	404,60	407,44	414	379
65	410,96	413,80	421	385
66	417,33	420,17	427	392
67	423,70	426,54	434	398
68	430,05	432,90	440	405
69	436,42	439,27	446	406
70	442,78	445,63	453	412
71	449,15	452,00	459	419
72	455,52	458,37	465	425
73	461,88	464,73	472	431
74	468,25	471,01	478	438
75	474,61	477,46	485	444
76	480,98	483,83	491	450
77	487,35	490,20	497	457
78	493,71	496,56	504	463
79	500,08	502,93	510	470
80	506,45	509,30	516	476
81	512,81	515,66	523	482
82	519,18	522,03	529	489
83	525,54	528,39	535	495
84	531,91	534,76	542	501
85	538,28	541,13	548	503
86	544,64	547,49	555	509

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
87	551,01	553,86	561	516
88	557,38	560,23	567	522
89	563,74	566,59	574	528
90	570,11	572,96	580	535
91	576,47	579,32	586	541
92	582,84	585,69	593	548
93	589,21	592,06	599	554
94	595,57	598,42	605	580
95	601,94	604,79	612	566
96	608,31	611,16	618	573
97	614,67	617,52	625	579
98	621,04	623,89	631	586
99	627,40	630,25	637	592
100	633,77	636,62	644	598
101	640,14	642,99	650	605
102	646,50	649,35	656	611
103	652,87	655,72	663	617
104	659,23	662,08	669	624
105	665,60	668,45	676	630
106	671,97	674,82	682	636
107	678,33	681,18	688	643
108	684,70	687,55	695	649
109	691,07	693,92	701	656
110	697,43	700,28	707	662
111	703,80	706,65	714	663
112	710,16	713,01	720	670
113	716,53	719,38	726	676
114	722,90	725,75	733	682
115	729,26	732,11	739	688
116	735,63	738,48	746	694
117	742,00	744,85	752	700
118	748,36	751,21	758	707
119	754,73	757,58	765	714
120	761,09	763,94	771	720

PU Linear/Torque AT5 steel cord

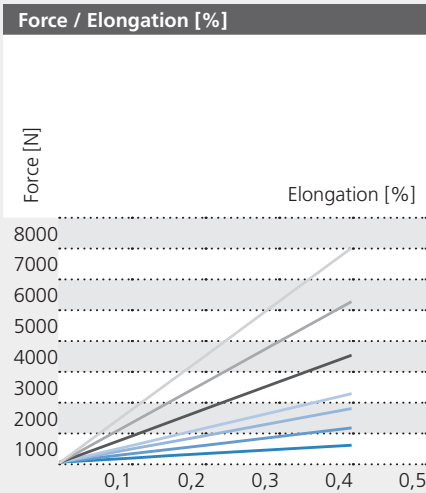


Standard tolerances

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

General properties

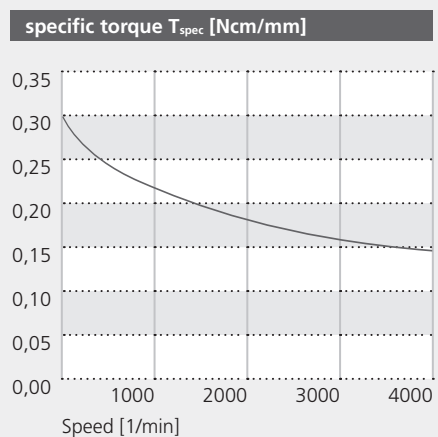
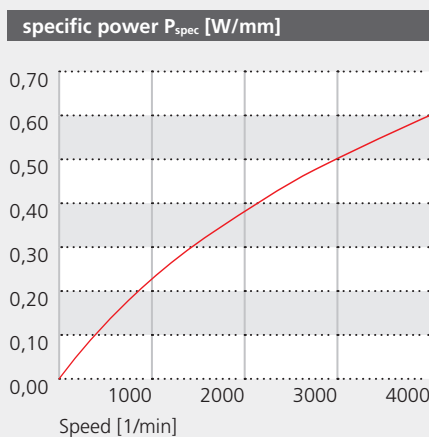
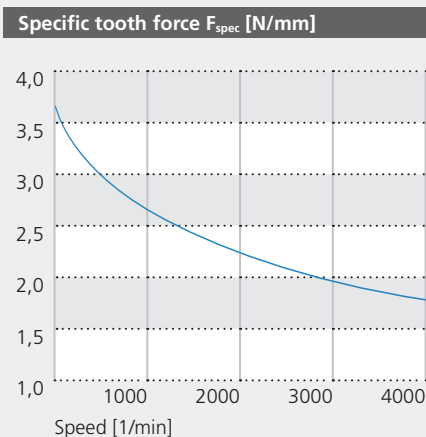
- › pitch 5 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 100 mm (PU Linear)
- › PU Torque (T) max. width bis 150 mm
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 24,000 mm (PU Torque)
- › max. speed 10,000 rpm



Technical data		allowable tensile load	allowable tensile load	Breaking load	spec. spring ratio	Belt weight per metre
Standard-belt width w_{tb} [mm]	Graph	Typ $L F_{ai}$ [N]	Typ $T F_{ai}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
10	■	560	280	2000	140000	0,03
16	■	1100	550	4000	280000	0,05
25	■	1700	850	6250	437500	0,09
32	■	2220	1110	8000	560000	0,11
50	■	3500	1750	12800	875000	0,17
75	■	5250	2625	18750	1312500	0,26
100	■	7000	3500	25000	1750000	0,34

Specific tooth force/power/torque*																			
Speed [1/min]		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F_{spec} [N/mm]	■	3,640	3,572	3,501	3,468	3,424	3,34	3,292	3,192	3,089	2,995	2,807	2,649	2,522	2,416	2,326	2,242	1,985	1,796
Specific power P_{spec} [W/mm]	■	0,000	0,007	0,015	0,022	0,029	0,042	0,055	0,080	0,103	0,125	0,175	0,221	0,263	0,302	0,339	0,374	0,496	0,599
Specific torque T_{spec} [Ncm/mm]	■	0,290	0,284	0,279	0,276	0,272	0,266	0,262	0,254	0,246	0,238	0,223	0,211	0,201	0,192	0,185	0,178	0,158	0,143

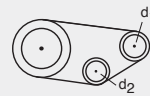
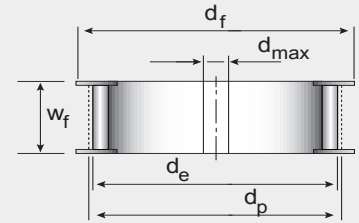
* max. force/power/torque per tooth in mesh and per mm belt width



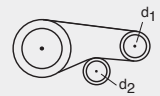
Pulleys PU Linear/Torque AT5 steel cord

Table of belt widths

timing belt width [mm] w_b	10	16	25	32	50	75	100
pulley width [mm] w_f	15	20	30	38	57	83	110



belt drive without counter flexion



belt drive with counter flexion

Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t	15	25
minimum pulley diameter [mm]	d	22,64	38,56
diameter of idler roller [mm]	d_i	30,00	60,00

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
15	22,64	23,87	28	10
16	24,23	25,46	31	12
17	25,83	27,06	32	14
18	27,42	28,65	34	16
19	29,00	30,24	35	16
20	30,60	31,83	37	18
21	32,19	33,42	38	20
22	33,78	35,01	40	22
23	35,38	36,61	42	24
24	36,97	38,20	43	24
25	38,56	39,79	45	25
26	40,15	41,38	46	25
27	41,74	42,97	48	27
28	43,33	44,56	50	29
29	44,93	46,16	51	31
30	46,52	47,75	53	33
31	48,11	49,34	54	35
32	49,70	50,93	56	37
33	51,29	52,52	58	39
34	52,88	54,11	59	39
35	54,47	55,70	61	40
36	56,07	57,30	62	42
37	57,66	58,89	64	43
38	59,25	60,48	66	45
39	60,84	62,07	67	45
40	62,43	63,66	69	47
41	64,02	65,25	70	48
42	65,62	66,85	72	50
43	67,21	68,44	73	52
44	68,80	70,03	75	52
45	70,39	71,62	77	54
46	71,98	73,21	78	56
47	73,57	74,80	80	58
48	75,16	76,39	81	60
49	76,76	77,99	83	60
50	78,35	79,58	85	60

Technical data

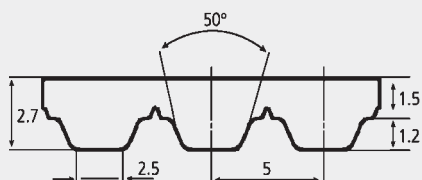
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
51	79,94	81,17	86	62
52	81,53	82,76	88	64
53	83,12	84,35	89	66
54	84,71	85,94	91	66
55	86,31	87,54	93	68
56	87,90	89,13	94	70
57	89,49	90,72	96	72
58	91,08	92,31	97	74
59	92,67	93,90	99	74
60	94,26	95,49	101	76
61	95,85	97,08	102	79
62	97,45	98,68	104	80
63	99,04	100,27	105	82
64	100,63	101,86	107	82
65	102,22	103,45	109	84
66	103,81	105,04	110	86
67	105,40	106,63	112	88
68	107,00	108,23	113	90
69	108,59	109,82	115	90
70	110,18	111,41	116	90
71	111,77	113,00	118	92
72	113,36	114,59	120	94
73	114,95	116,18	121	96
74	116,54	117,77	123	96
75	118,14	119,37	124	98
76	119,73	120,96	126	100
77	121,32	122,55	128	102
78	122,91	124,14	129	104
79	124,50	125,73	131	104
80	126,09	127,32	132	106
81	127,69	128,92	134	108
82	129,28	130,51	136	110
83	130,87	132,10	137	110
84	132,46	133,69	139	112
85	134,05	135,28	140	114
86	135,64	136,87	142	116

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
87	137,23	138,46	144	119
88	138,83	140,06	145	120
89	140,42	141,65	147	120
90	142,00	143,24	148	122
91	143,60	144,83	150	124
92	145,19	146,42	151	126
93	146,78	148,01	153	126
94	148,38	149,61	155	129
95	149,97	151,20	156	130
96	151,56	152,79	158	130
97	153,15	154,38	159	132
98	154,74	155,97	161	132
99	156,33	157,56	163	134
100	157,93	159,16	164	136
101	159,52	160,75	166	139
102	161,11	162,34	167	140
103	162,70	163,93	169	140
104	164,29	165,52	171	140
105	165,88	167,11	172	142
106	167,47	168,70	174	146
107	169,07	170,30	175	146
108	170,66	171,89	177	148
109	172,25	173,48	179	150
110	173,84	175,07	180	150
111	175,43	176,66	182	152
112	177,02	178,25	183	152
113	178,62	179,85	185	152
114	180,21	181,44	186	154
115	181,80	183,03	188	154
116	183,39	184,62	190	154
117	184,98	186,21	191	154
118	186,57	187,80	193	156
119	188,16	189,39	194	156
120	189,76	190,99	196	156

Standard

PU Moulded AT5 steel cord



» Standard tolerances

- › width: $\pm 0,5$ mm
- › length: $\pm 0,14 - 0,52$ mm
- › thickness: $\pm 0,15$ mm

» General properties

- › Type: AT5
- › Pitch: 5 mm
- › Material: thermoset polyurethane, 87° ShA
- › Color: light grey
- › Cord: steel (special cords on request)

» Standard widths [mm]:

- › 6, 8, 10, 12, 16, 20, 25, 32, 50

Available dimensions

length [mm]	number of teeth	max. width [mm]
225	45	300
255	51	300
275	55	300
280	56	300
300	60	300
330	66	300
340	68	300
375	75	300
390	78	300
420	84	300
450	90	300
455	91	300
480	96	300
500	100	300
525	105	300
545	109	300
600	120	300
610	122	300
630	126	300
660	132	300
670	134	300
710	142	300
720	144	300
750	150	300
780	156	300
825	165	300
860	172	300
975	195	300
1050	210	300
1125	225	300
1500	300	300
2000	400	300

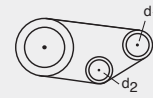
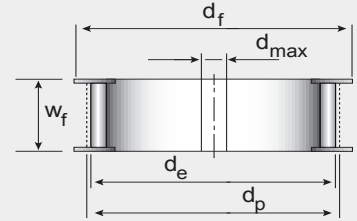
Pulleys PU Moulded AT5 steel cord

Table of belt widths

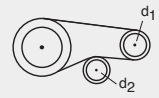
timing belt width [mm] w_b	10	16	25	32	50	75	100
pulley width [mm] w_f	15	20	30	38	57	83	110

Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t	15	25
minimum pulley diameter [mm]	d_1	22,64	38,56
diameter of idler roller [mm]	d_2	30,00	60,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_r [mm]	max. bore d_{max} [mm]
15	22,64	23,87	28	10
16	24,23	25,46	31	12
17	25,83	27,06	32	14
18	27,42	28,65	34	16
19	29,00	30,24	35	16
20	30,60	31,83	37	18
21	32,19	33,42	38	20
22	33,78	35,01	40	22
23	35,38	36,61	42	24
24	36,97	38,20	43	24
25	38,56	39,79	45	25
26	40,15	41,38	46	25
27	41,74	42,97	48	27
28	43,33	44,56	50	29
29	44,93	46,16	51	31
30	46,52	47,75	53	33
31	48,11	49,34	54	35
32	49,70	50,93	56	37
33	51,29	52,52	58	39
34	52,88	54,11	59	39
35	54,47	55,70	61	40
36	56,07	57,30	62	42
37	57,66	58,89	64	43
38	59,25	60,48	66	45
39	60,84	62,07	67	45
40	62,43	63,66	69	47
41	64,02	65,25	70	48
42	65,62	66,85	72	50
43	67,21	68,44	73	52
44	68,80	70,03	75	52
45	70,39	71,62	77	54
46	71,98	73,21	78	56
47	73,57	74,80	80	58
48	75,16	76,39	81	60
49	76,76	77,99	83	60
50	78,35	79,58	85	60

Standard

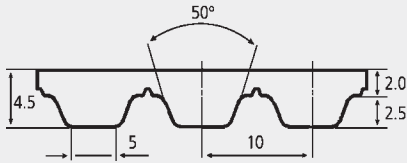
Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_r [mm]	max. bore d_{max} [mm]
51	79,94	81,17	86	62
52	81,53	82,76	88	64
53	83,12	84,35	89	66
54	84,71	85,94	91	66
55	86,31	87,54	93	68
56	87,90	89,13	94	70
57	89,49	90,72	96	72
58	91,08	92,31	97	74
59	92,67	93,90	99	74
60	94,26	95,49	101	76
61	95,85	97,08	102	79
62	97,45	98,68	104	80
63	99,04	100,27	105	82
64	100,63	101,86	107	82
65	102,22	103,45	109	84
66	103,81	105,04	110	86
67	105,40	106,63	112	88
68	107,00	108,23	113	90
69	108,59	109,82	115	90
70	110,18	111,41	116	90
71	111,77	113,00	118	92
72	113,36	114,59	120	94
73	114,95	116,18	121	96
74	116,54	117,77	123	96
75	118,14	119,37	124	98
76	119,73	120,96	126	100
77	121,32	122,55	128	102
78	122,91	124,14	129	104
79	124,50	125,73	131	104
80	126,09	127,32	132	106
81	127,69	128,92	134	108
82	129,28	130,51	136	110
83	130,87	132,10	137	110
84	132,46	133,69	139	112
85	134,05	135,28	140	114
86	135,64	136,87	142	116

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_r [mm]	max. bore d_{max} [mm]
87	137,23	138,46	144	119
88	138,83	140,06	145	120
89	140,42	141,65	147	120
90	142,00	143,24	148	122
91	143,60	144,83	150	124
92	145,19	146,42	151	126
93	146,78	148,01	153	126
94	148,38	149,61	155	129
95	149,97	151,20	156	130
96	151,56	152,79	158	130
97	153,15	154,38	159	132
98	154,74	155,97	161	132
99	156,33	157,56	163	134
100	157,93	159,16	164	136
101	159,52	160,75	166	139
102	161,11	162,34	167	140
103	162,70	163,93	169	140
104	164,29	165,52	171	140
105	165,88	167,11	172	142
106	167,47	168,70	174	146
107	169,07	170,30	175	146
108	170,66	171,89	177	148
109	172,25	173,48	179	150
110	173,84	175,07	180	150
111	175,43	176,66	182	152
112	177,02	178,25	183	152
113	178,62	179,85	185	152
114	180,21	181,44	186	154
115	181,80	183,03	188	154
116	183,39	184,62	190	154
117	184,98	186,21	191	154
118	186,57	187,80	193	156
119	188,16	189,39	194	156
120	189,76	190,99	196	156

PU Linear/Torque AT10 steel cord

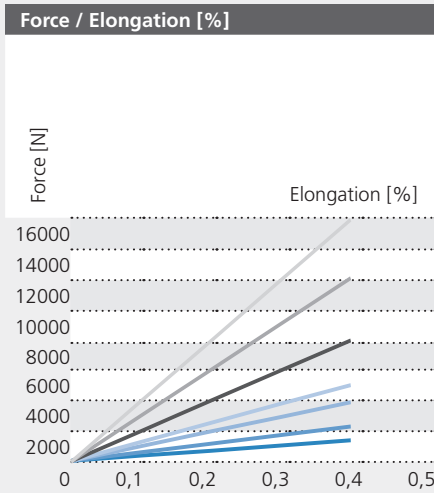


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,3 mm
- › length: ± 0,5 mm/m

» **General properties**

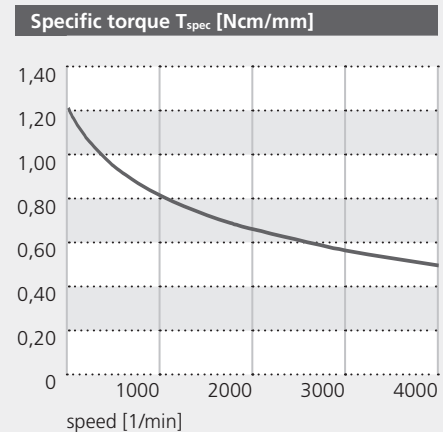
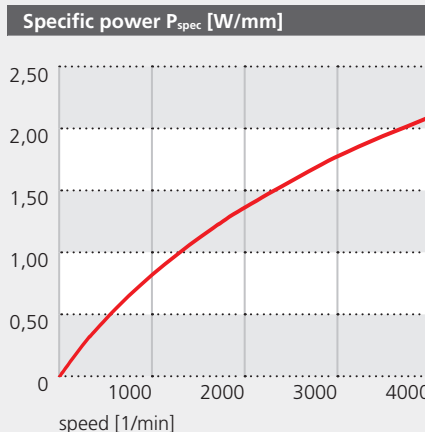
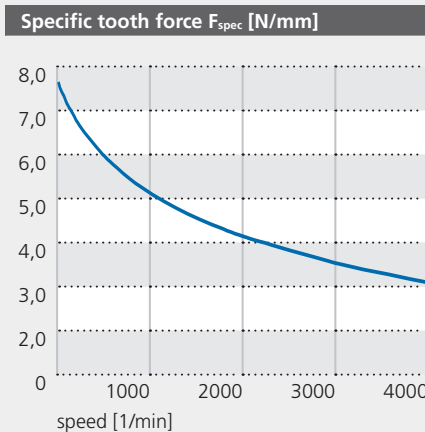
- › pitch 10 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 150 mm
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 24,000 mm (PU Torque)
- › max. speed 10,000 rpm



Technical data		allowable tensile load Typ $L F_{st}$ [N]	allowable tensile load Typ $W F_{st}$ [N]	breaking load F_{Br} [N]	pec. spring ratio C_{spec} [N]	belt weight per metre m [kg/m]
standard-belt width w_{tb} [mm]	graph	Typ $L F_{st}$ [N]	Typ $W F_{st}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
10		1125	562,5	6000	330000	0,06
16		1850	925	9600	560000	0,10
25		3750	1875	15000	952000	0,16
32		5000	2500	19200	1232000	0,20
50		7500	3750	30000	1960000	0,32
75		12000	6000	45000	2968000	0,48
100		16000	8000	60000	3920000	0,64

Specific tooth force/power/torque*																			
speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]		7,570	7,423	7,306	7,180	7,078	6,895	6,713	6,418	6,153	5,921	5,452	5,085	4,789	4,536	4,320	4,128	3,530	3,094
Specific power P_{spec} [W/mm]		0,000	0,031	0,061	0,090	0,118	0,172	0,224	0,321	0,410	0,493	0,682	0,848	0,998	1,134	1,260	1,376	1,765	2,063
Specific torque T_{spec} [Ncm/mm]		1,205	1,181	1,163	1,143	1,127	1,097	1,068	1,021	0,979	0,942	0,868	0,809	0,762	0,722	0,688	0,657	0,562	0,492

* max. force/power/torque per tooth in mesh and per mm belt width



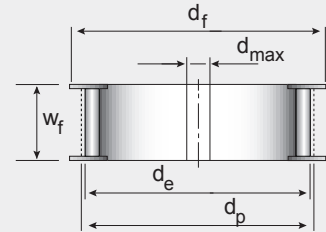
AT10 Steel

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Pulleys PU Linear/Torque AT10 steel cord

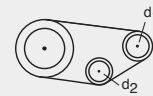
Table of belt widths

timing belt width [mm] w_{tb}	10	16	25	32	50	75	100	150
pulley width [mm] w_f	15	20	30	38	57	83	110	162

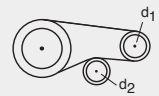


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	15	25
minimum pulley diameter [mm]	d_1	45,90	77,73
diameter of idler roller [mm]	d_2	50,00	120,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
15	45,90	47,75	52	34
16	49,08	50,93	55	36
17	52,26	54,11	58	40
18	55,45	57,30	61	44
19	58,63	60,48	65	46
20	61,81	63,66	68	50
21	65,00	66,85	71	52
22	68,18	70,03	74	56
23	71,36	73,21	77	60
24	74,54	76,39	80	62
25	77,73	79,58	84	66
26	80,91	82,76	87	68
27	84,09	85,94	90	72
28	87,28	89,13	93	76
29	90,46	92,31	96	78
30	93,64	95,49	100	82
31	96,83	98,68	103	84
32	100,01	101,86	106	88
33	103,19	105,04	109	88
34	106,38	108,23	112	92
35	109,56	111,41	115	96
36	112,74	114,59	119	98
37	115,92	117,77	122	101
38	119,11	120,96	125	104
39	122,29	124,14	128	106
40	125,47	127,32	131	110
41	128,66	130,51	135	110
42	131,84	133,69	138	112
43	135,02	136,87	141	114
44	138,21	140,06	144	118
45	141,39	143,24	147	120
46	144,57	146,42	150	122
47	147,76	149,61	154	122
48	150,94	152,79	157	124
49	154,12	155,97	160	126
50	157,31	159,16	163	130

Standard

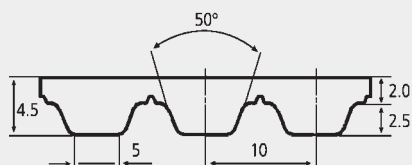
Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
51	160,49	162,34	166	134
52	163,67	165,52	170	136
53	166,85	168,70	173	140
54	170,04	171,89	176	144
55	173,22	175,07	179	146
56	176,40	178,25	182	150
57	179,59	181,44	185	152
58	182,77	184,62	189	156
59	185,95	187,80	192	160
60	189,14	190,99	195	162
61	192,32	194,17	198	164
62	195,50	197,35	201	166
63	198,69	200,54	205	170
64	201,87	203,72	208	171
65	205,05	206,90	211	174
66	208,23	210,08	214	175
67	211,42	213,27	217	177
68	214,60	216,45	221	181
69	217,78	219,63	224	185
70	220,97	222,82	227	187
71	224,15	226,00	230	191
72	227,33	229,18	233	193
73	230,52	232,37	236	197
74	233,70	235,55	240	201
75	236,88	238,73	243	203
76	240,07	241,92	246	207
77	243,25	245,01	249	209
78	246,43	248,28	252	213
79	249,61	251,46	256	215
80	252,80	254,65	259	219
81	255,98	257,83	262	223
82	259,16	261,01	265	225
83	262,35	264,20	268	229
84	265,53	267,38	271	231
85	268,71	270,56	275	235

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
86	271,90	273,75	278	239
87	275,08	276,93	281	241
88	278,26	280,11	284	245
89	281,45	283,30	287	247
90	284,63	286,48	291	251
91	287,81	289,66	294	255
92	291,00	292,85	297	257
93	294,18	296,03	300	261
94	297,36	299,21	303	263
95	300,54	302,39	306	267
96	303,73	305,58	310	269
97	306,91	308,76	313	273
98	310,09	311,94	316	279
99	313,28	315,13	319	283
100	316,46	318,31	322	285
101	319,64	321,49	326	289
102	322,83	324,68	329	293
103	326,01	327,86	332	295
104	329,19	331,04	335	299
105	332,38	334,23	338	301
106	335,56	337,41	341	305
107	338,74	340,59	345	309
108	341,92	343,77	348	311
109	345,11	346,96	351	315
110	348,29	350,14	354	317
111	351,47	353,32	357	321
112	354,66	356,51	361	323
113	357,84	359,69	364	327
114	361,02	362,87	367	330
115	364,21	366,06	370	333
116	367,39	369,24	373	336
117	370,57	372,42	376	340
118	373,76	375,61	380	344
119	376,94	378,79	383	348
120	380,12	381,97	386	354

PU Moulded AT10 steel cord



» Standard tolerances

- › width: $\pm 0,5$ mm
- › length: $\pm 0,14 - 0,52$ mm
- › thickness: $\pm 0,30$ mm

» General properties

- › Type: AT10
- › Pitch: 10 mm
- › Material: thermoset polyurethane, 87° ShA
- › Color: light grey
- › Cord: steel (special cords on request)

» Standard widths [mm]:

- › 10, 12, 16, 20, 25, 32, 50

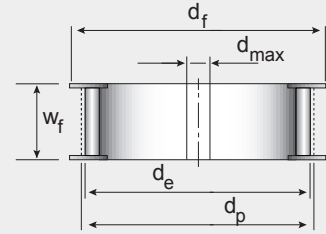
Available dimensions		
length [mm]	number of teeth	max. width [mm]
370	37	300
500	50	300
560	56	300
580	58	300
600	60	300
610	61	300
660	66	300
700	70	300
730	73	300
780	78	300
800	80	300
810	81	300
840	84	300
880	88	300
890	89	300
920	92	300
960	96	300
980	98	300
1000	100	300
1010	101	300
1050	105	300
1080	108	300
1100	110	300

Available dimensions		
length [mm]	number of teeth	max. width [mm]
1150	115	300
1200	120	300
1210	121	300
1220	122	300
1230	123	300
1240	124	300
1250	125	300
1280	128	300
1300	130	300
1320	132	300
1350	135	300
1360	136	300
1400	140	300
1420	142	300
1480	148	300
1500	150	300
1600	160	300
1700	170	300
1720	172	300
1800	180	300
1860	186	300
1940	194	300

Pulleys PU Moulded AT10 steel cord

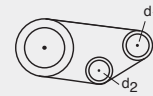
Table of belt widths

timing belt width [mm] w_b	10	16	25	32	50	75	100	150
pulley width [mm] w_f	15	20	30	38	57	83	110	162

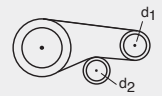


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	15	25
minimum pulley diameter [mm]	d_1	45,90	77,73
diameter of idler roller [mm]	d_2	50,00	120,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
15	45,90	47,75	52	34
16	49,08	50,93	55	36
17	52,26	54,11	58	40
18	55,45	57,30	61	44
19	58,63	60,48	65	46
20	61,81	63,66	68	50
21	65,00	66,85	71	52
22	68,18	70,03	74	56
23	71,36	73,21	77	60
24	74,54	76,39	80	62
25	77,73	79,58	84	66
26	80,91	82,76	87	68
27	84,09	85,94	90	72
28	87,28	89,13	93	76
29	90,46	92,31	96	78
30	93,64	95,49	100	82
31	96,83	98,68	103	84
32	100,01	101,86	106	88
33	103,19	105,04	109	88
34	106,38	108,23	112	92
35	109,56	111,41	115	96
36	112,74	114,59	119	98
37	115,92	117,77	122	101
38	119,11	120,96	125	104
39	122,29	124,14	128	106
40	125,47	127,32	131	110
41	128,66	130,51	135	110
42	131,84	133,69	138	112
43	135,02	136,87	141	114
44	138,21	140,06	144	118
45	141,39	143,24	147	120
46	144,57	146,42	150	122
47	147,76	149,61	154	122
48	150,94	152,79	157	124
49	154,12	155,97	160	126
50	157,31	159,16	163	130

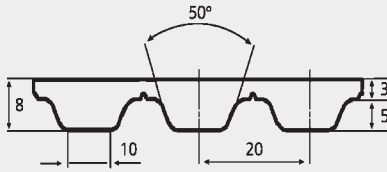
Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
51	160,49	162,34	166	134
52	163,67	165,52	170	136
53	166,85	168,70	173	140
54	170,04	171,89	176	144
55	173,22	175,07	179	146
56	176,40	178,25	182	150
57	179,59	181,44	185	152
58	182,77	184,62	189	156
59	185,95	187,80	192	160
60	189,14	190,99	195	162
61	192,32	194,17	198	164
62	195,50	197,35	201	166
63	198,69	200,54	205	170
64	201,87	203,72	208	171
65	205,05	206,90	211	174
66	208,23	210,08	214	175
67	211,42	213,27	217	177
68	214,60	216,45	221	181
69	217,78	219,63	224	185
70	220,97	222,82	227	187
71	224,15	226,00	230	191
72	227,33	229,18	233	193
73	230,52	232,37	236	197
74	233,70	235,55	240	201
75	236,88	238,73	243	203
76	240,07	241,92	246	207
77	243,25	245,01	249	209
78	246,43	248,28	252	213
79	249,61	251,46	256	215
80	252,80	254,65	259	219
81	255,98	257,83	262	223
82	259,16	261,01	265	225
83	262,35	264,20	268	229
84	265,53	267,38	271	231
85	268,71	270,56	275	235

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
86	271,90	273,75	278	239
87	275,08	276,93	281	241
88	278,26	280,11	284	245
89	281,45	283,30	287	247
90	284,63	286,48	291	251
91	287,81	289,66	294	255
92	291,00	292,85	297	257
93	294,18	296,03	300	261
94	297,36	299,21	303	263
95	300,54	302,39	306	267
96	303,73	305,58	310	269
97	306,91	308,76	313	273
98	310,09	311,94	316	279
99	313,28	315,13	319	283
100	316,46	318,31	322	285
101	319,64	321,49	326	289
102	322,83	324,68	329	293
103	326,01	327,86	332	295
104	329,19	331,04	335	299
105	332,38	334,23	338	301
106	335,56	337,41	341	305
107	338,74	340,59	345	309
108	341,92	343,77	348	311
109	345,11	346,96	351	315
110	348,29	350,14	354	317
111	351,47	353,32	357	321
112	354,66	356,51	361	323
113	357,84	359,69	364	327
114	361,02	362,87	367	330
115	364,21	366,06	370	333
116	367,39	369,24	373	336
117	370,57	372,42	376	340
118	373,76	375,61	380	344
119	376,94	378,79	383	348
120	380,12	381,97	386	354

PU Linear/Torque AT20 steel cord

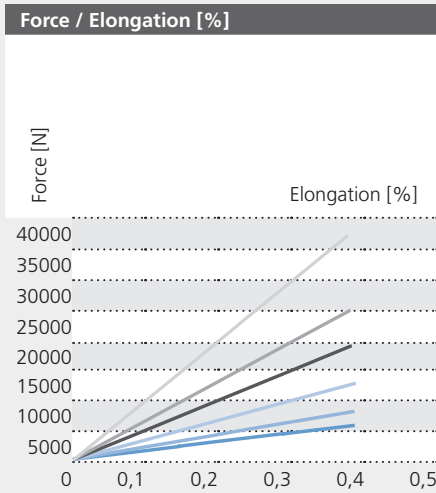


» **Standard tolerances**

- › width: ± 1,0 mm
- › height: ± 0,4 mm
- › length: ± 0,5 mm/m

» **General properties**

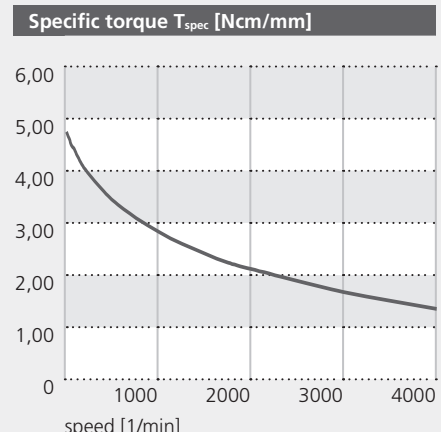
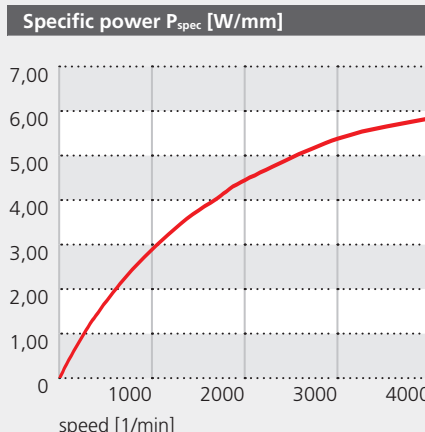
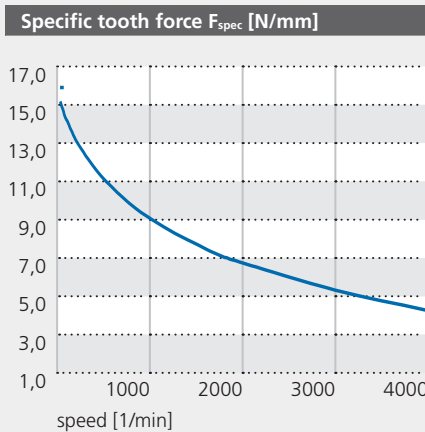
- › pitch 20 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 150 mm
- › min. length for jointed belt (W) 840 mm
- › length between 1,500 to 24,000 mm (PU Torque)
- › max. speed 6,500 rpm



Technical data		allowable tensile load	allowable tensile load	breaking load	pec. spring ratio	belt weight per metre
standard-belt width w_{tb} [mm]	graph	Typ $L F_{ai}$ [N]	Typ $W F_{ai}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
25	■	5600	2800	15500	1375000	0,24
32	■	7200	3600	20800	1875000	0,31
50	■	11700	5850	32500	3000000	0,48
75	■	18000	9000	48500	4625000	0,73
100	■	25200	12600	65000	6125000	0,97
150	■	37000	18500	98000	9250000	1,43

Specific tooth force/power/torque*																			
speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]	■	15,14	14,81	14,41	14,20	13,87	13,36	12,940	12,23	11,590	11,04	9,94	9,08	8,37	7,78	7,21	6,82	5,42	4,39
Specific power P_{spec} [W/mm]	■	0,000	0,123	0,240	0,355	0,462	0,668	0,863	1,223	1,545	1,840	2,485	3,027	3,488	3,890	4,206	4,547	5,420	5,853
Specific torque T_{spec} [Ncm/mm]	■	4,819	4,714	4,587	4,520	4,415	4,253	4,119	3,893	3,689	3,514	3,164	2,890	2,664	2,476	2,295	2,171	1,725	1,397

* max. force/power/torque per tooth in mesh and per mm belt width



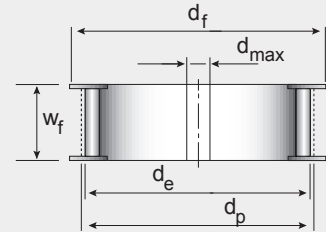
AT20 Steel

Copyright Ammeraal Beltech 2006

Pulleys PU Linear/Torque AT20 steel cord

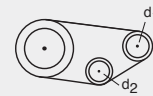
Table of belt widths

timing belt width [mm] w_b	25	32	50	75	100	150
pulley width [mm] w_f	32	39	59	75	110	162

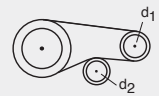


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	18	25
minimum pulley diameter [mm]	d_1	111,75	156,32
diameter of idler roller [mm]	d_2	120,00	180,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_o [mm]	effective \varnothing d_e [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
18	111,75	114,59	122	86
19	118,12	120,96	128	93
20	124,48	127,32	134	100
21	130,85	133,69	141	105
22	137,22	140,06	147	112
23	143,58	146,42	153	118
24	149,95	152,79	160	125
25	156,32	159,16	166	131
26	162,68	165,52	173	137
27	169,05	171,89	179	144
28	175,41	178,25	185	150
29	181,78	184,62	192	156
30	188,15	190,99	198	163
31	194,51	197,35	204	169
32	200,88	203,72	211	175
33	207,24	210,08	217	182
34	213,61	216,45	224	188
35	219,98	222,82	230	195
36	226,34	229,18	236	201
37	232,71	235,55	243	207
38	239,08	241,92	249	214
39	245,44	248,28	255	220
40	251,81	254,65	262	226
41	258,17	261,01	268	233
42	264,54	267,38	274	239
43	270,91	273,75	281	245
44	277,27	280,11	287	252
45	283,64	286,48	294	258
46	290,01	292,85	300	265
47	296,37	299,21	306	271
48	302,74	305,58	313	278
49	309,10	311,94	319	284
50	315,47	318,31	325	290
51	321,84	324,68	332	296
52	328,20	331,04	338	303

Technical data

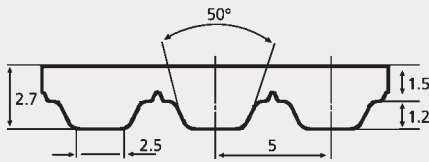
number of teeth t [-]	outer \varnothing d_o [mm]	effective \varnothing d_e [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
53	334,57	337,41	344	310
54	340,93	343,77	351	315
55	347,30	350,14	357	322
56	353,67	356,51	364	328
57	360,03	362,87	370	335
58	366,40	369,24	376	341
59	372,77	375,61	383	347
60	379,13	381,97	389	354
61	385,50	388,34	395	360
62	391,86	394,70	402	366
63	398,23	401,07	408	373
64	404,60	407,44	414	379
65	410,96	413,80	421	385
66	417,33	420,17	427	392
67	423,70	426,54	434	398
68	430,05	432,90	440	405
69	436,42	439,27	446	406
70	442,78	445,63	453	412
71	449,15	452,00	459	419
72	455,52	458,37	465	425
73	461,88	464,73	472	431
74	468,25	471,10	478	438
75	474,61	477,46	485	444
76	480,98	483,83	491	450
77	487,35	490,20	497	457
78	493,71	496,56	504	463
79	500,08	502,93	510	470
80	506,45	509,30	516	476
81	512,81	515,66	523	482
82	519,18	522,03	529	489
83	525,54	528,39	535	495
84	531,91	534,76	542	501
85	538,28	541,13	548	503
86	544,64	547,49	555	509

Technical data

number of teeth t [-]	outer \varnothing d_o [mm]	effective \varnothing d_e [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
87	551,01	553,86	561	516
88	557,38	560,23	567	522
89	563,74	566,59	574	528
90	570,11	572,96	580	535
91	576,47	579,32	586	541
92	582,84	585,69	593	548
93	589,21	592,06	599	554
94	595,57	598,42	605	580
95	601,94	604,79	612	566
96	608,31	611,16	618	573
97	614,67	617,52	625	579
98	621,04	623,89	631	586
99	627,40	630,25	637	592
100	633,77	636,62	644	598
101	640,14	642,99	650	605
102	646,50	649,35	656	611
103	652,87	655,72	663	617
104	659,23	662,08	669	624
105	665,60	668,45	676	630
106	671,97	674,82	682	636
107	678,33	681,18	688	643
108	684,70	687,55	695	649
109	691,07	693,92	701	656
110	697,43	700,28	707	662
111	703,80	706,65	714	663
112	710,16	713,01	720	670
113	716,53	719,38	726	676
114	722,90	725,75	733	682
115	729,26	732,11	739	688
116	735,63	738,48	746	694
117	742,00	744,85	752	700
118	748,36	751,21	758	707
119	754,73	757,58	765	714
120	761,09	763,94	771	720

Standard

PU Linear/Torque ATL5 steel cord

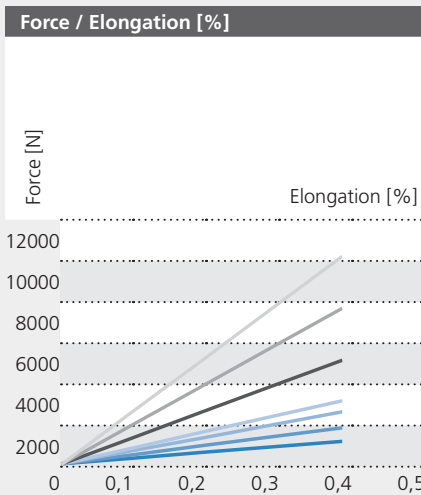


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

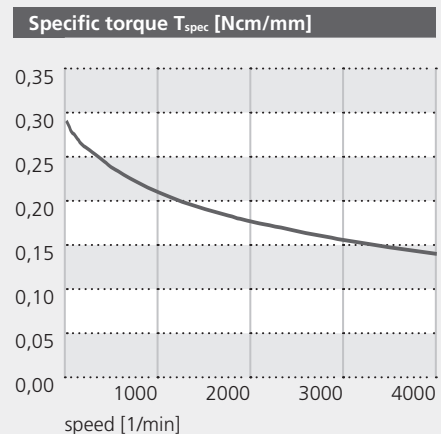
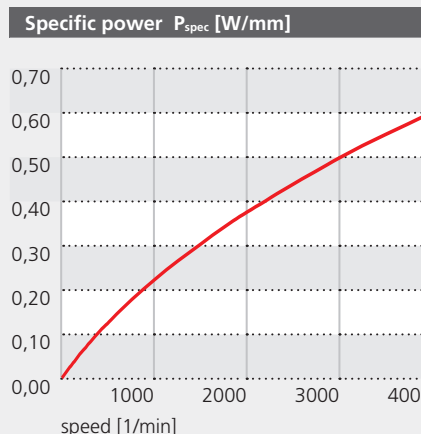
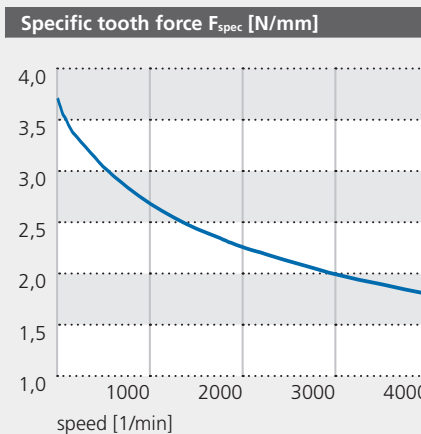
- › pitch 5 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 100 mm (PU Linear)
- › max. width up to 150 mm (PU Torque)
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 22,770 mm (PU Torque)
- › high performance steel cords
- › max. speed 10,000 rpm



Technical data		allowable tensile load Typ $L F_{st}$ [N]	allowable tensile load Typ $W F_{st}$ [N]	breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	belt weight per metre m [kg/m]
Standard-belt width w_{tb} [mm]	graph					
10	■	1100	280	4000	275000	0,04
16	■	1760	630	6400	440000	0,06
25	■	2530	840	9200	632500	0,10
32	■	3080	1120	11200	770000	0,12
50	■	5060	1750	18400	1265000	0,19
75	■	7590	2590	27600	1897500	0,29
100	■	10120	3500	36800	2530000	0,38

Specific tooth force/power/torque*																			
speed [1/min]		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F_{spec} [N/mm]	■	3,640	3,572	3,501	3,468	3,424	3,34	3,292	3,192	3,089	2,995	2,807	2,649	2,522	2,416	2,326	2,242	1,985	1,796
Specific power P_{spec} [W/mm]	■	0,000	0,007	0,015	0,022	0,029	0,042	0,055	0,080	0,103	0,125	0,175	0,221	0,263	0,302	0,339	0,374	0,496	0,599
Specific torque T_{spec} [Ncm/mm]	■	0,290	0,284	0,279	0,276	0,272	0,266	0,262	0,254	0,246	0,238	0,223	0,211	0,201	0,192	0,185	0,178	0,158	0,143

* max. force/power/torque per tooth in mesh and per mm belt width

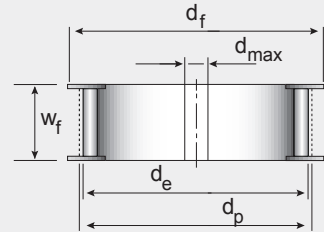


ATL5 Steel

Pulleys PU Linear/Torque ATL5 steel cord

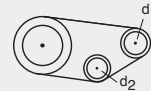
Table of belt widths

timing belt width [mm] w_b	10	16	25	32	50	75	100	150
pulley width [mm] w_f	15	20	30	38	57	83	110	162

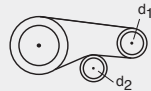


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	25	25
minimum pulley diameter [mm]	d_1	38,56	38,56
diameter of idler roller [mm]	d_2	40,00	60,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
15	22,64	23,87	28	10
16	24,23	25,46	31	12
17	25,83	27,06	32	14
18	27,42	28,65	34	16
19	29,00	30,24	35	16
20	30,60	31,83	37	18
21	32,19	33,42	38	20
22	33,78	35,01	40	22
23	35,38	36,61	42	24
24	36,97	38,20	43	24
25	38,56	39,79	45	25
26	40,15	41,38	46	25
27	41,74	42,97	48	27
28	43,33	44,56	50	29
29	44,93	46,16	51	31
30	46,52	47,75	53	33
31	48,11	49,34	54	35
32	49,70	50,93	56	37
33	51,29	52,52	58	39
34	52,88	54,11	59	39
35	54,47	55,70	61	40
36	56,07	57,30	62	42
37	57,66	58,89	64	43
38	59,25	60,48	66	45
39	60,84	62,07	67	45
40	62,43	63,66	69	47
41	64,02	65,25	70	48
42	65,62	66,85	72	50
43	67,21	68,44	73	52
44	68,80	70,03	75	52
45	70,39	71,62	77	54
46	71,98	73,21	78	56
47	73,57	74,80	80	58
48	75,16	76,39	81	60
49	76,76	77,99	83	60
50	78,35	79,58	85	60

Standard

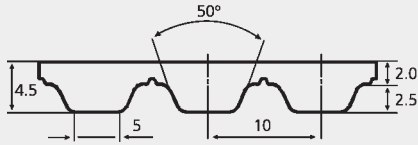
Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
51	79,94	81,17	86	62
52	81,53	82,76	88	64
53	83,12	84,35	89	66
54	84,71	85,94	91	66
55	86,31	87,54	93	68
56	87,90	89,13	94	70
57	89,49	90,72	96	72
58	91,08	92,31	97	74
59	92,67	93,90	99	74
60	94,26	95,49	101	76
61	95,85	97,08	102	79
62	97,45	98,68	104	80
63	99,04	100,27	105	82
64	100,63	101,86	107	82
65	102,22	103,45	109	84
66	103,81	105,04	110	86
67	105,40	106,63	112	88
68	107,00	108,23	113	90
69	108,59	109,82	115	90
70	110,18	111,41	116	90
71	111,77	113,00	118	92
72	113,36	114,59	120	94
73	114,95	116,18	121	96
74	116,54	117,77	123	96
75	118,14	119,37	124	98
76	119,73	120,96	126	100
77	121,32	122,55	128	102
78	122,91	124,14	129	104
79	124,50	125,73	131	104
80	126,09	127,32	132	106
81	127,69	128,92	134	108
82	129,28	130,51	136	110
83	130,87	132,10	137	110
84	132,46	133,69	139	112
85	134,05	135,28	140	114

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
86	135,64	136,87	142	116
87	137,23	138,46	144	119
88	138,83	140,06	145	120
89	140,42	141,65	147	120
90	142,00	143,24	148	122
91	143,60	144,83	150	124
92	145,19	146,42	151	126
93	146,78	148,01	153	126
94	148,38	149,61	155	129
95	149,97	151,20	156	130
96	151,56	152,79	158	130
97	153,15	154,38	159	132
98	154,74	155,97	161	132
99	156,33	157,56	163	134
100	157,93	159,16	164	136
101	159,52	160,75	166	139
102	161,11	162,34	167	140
103	162,70	163,93	169	140
104	164,29	165,52	171	140
105	165,88	167,11	172	142
106	167,47	168,70	174	146
107	169,07	170,30	175	146
108	170,66	171,89	177	148
109	172,25	173,48	179	150
110	173,84	175,07	180	150
111	175,43	176,66	182	152
112	177,02	178,25	183	152
113	178,62	179,85	185	152
114	180,21	181,44	186	154
115	181,80	183,03	188	154
116	183,39	184,62	190	154
117	184,98	186,21	191	154
118	186,57	187,80	193	156
119	188,16	189,39	194	156
120	189,76	190,99	196	156

PU Linear/Torque ATL10 steel cord

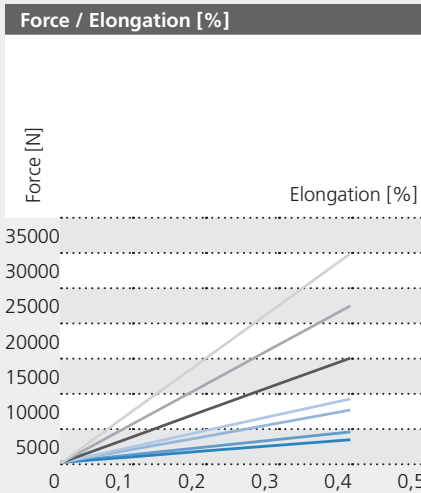


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,3 mm
- › length: ± 0,5 mm/m

» **General properties**

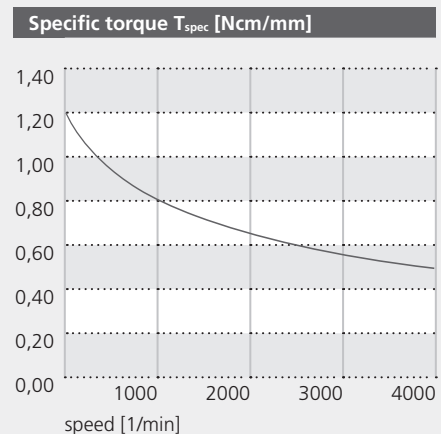
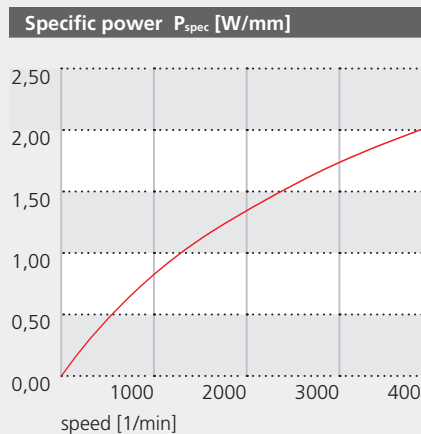
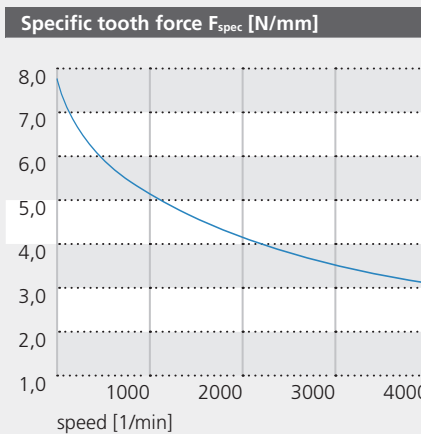
- › pitch 10 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 150 mm
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 24,000 mm (PU Torque)
- › high performance steel cords
- › max. speed 10,000 rpm



Technical data		allowable tensile load Typ $L F_{ai}$ [N]	allowable tensile load Typ $W F_{ai}$ [N]	breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	belt weight per metre m [kg/m]
Standard-belt width w_{tb} [mm]	graph					
10		2500	580	8600	625000	0,07
16		4000	925	13800	1000000	0,11
25		7000	1875	24200	1750000	0,17
32		9000	2500	31100	2250000	0,22
50		14500	3750	50100	3625000	0,35
75		22000	6000	76000	5500000	0,52
100		29500	8000	102000	7375000	0,69

Specific tooth force/power/torque*		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
speed [1/min]																				
Specific tooth force F_{spec} [N/mm]		7,570	7,423	7,306	7,180	7,078	6,895	6,713	6,418	6,153	5,921	5,452	5,085	4,789	4,536	4,320	4,128	3,530	3,094	
Specific power P_{spec} [W/mm]		0,000	0,031	0,061	0,090	0,118	0,172	0,224	0,321	0,410	0,493	0,682	0,848	0,998	1,134	1,260	1,376	1,765	2,063	
Specific torque T_{spec} [Ncm/mm]		1,205	1,181	1,163	1,143	1,127	1,097	1,068	1,021	0,979	0,942	0,868	0,809	0,762	0,722	0,688	0,657	0,562	0,492	

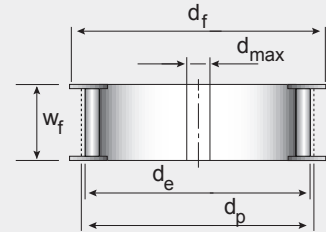
* max. force/power/torque per tooth in mesh and per mm belt width



Pulleys PU Linear/Torque ATL10 steel cord

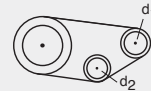
Table of belt widths

timing belt width [mm] w_b	10	16	25	32	50	75	100	150
pulley width [mm] w_f	15	20	30	38	57	83	110	162

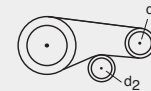


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	25	25
minimum pulley diameter [mm]	d_1	77,73	77,73
diameter of idler roller [mm]	d_2	80,00	150,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
15	45,90	47,75	52	34
16	49,08	50,93	55	36
17	52,26	54,11	58	40
18	55,45	57,30	61	44
19	58,63	60,48	65	46
20	61,81	63,66	68	50
21	65,00	66,85	71	52
22	68,18	70,03	74	56
23	71,36	73,21	77	60
24	74,54	76,39	80	62
25	77,73	79,58	84	66
26	80,91	82,76	87	68
27	84,09	85,94	90	72
28	87,28	89,13	93	76
29	90,46	92,31	96	78
30	93,64	95,49	100	82
31	96,83	98,68	103	84
32	100,01	101,86	106	88
33	103,19	105,04	109	88
34	106,38	108,23	112	92
35	109,56	111,41	115	96
36	112,74	114,59	119	98
37	115,92	117,77	122	101
38	119,11	120,96	125	104
39	122,29	124,14	128	106
40	125,47	127,32	131	110
41	128,66	130,51	135	110
42	131,84	133,69	138	112
43	135,02	136,87	141	114
44	138,21	140,06	144	118
45	141,39	143,24	147	120
46	144,57	146,42	150	122
47	147,76	149,61	154	122
48	150,94	152,79	157	124
49	154,12	155,97	160	126
50	157,31	159,16	163	130

Standard

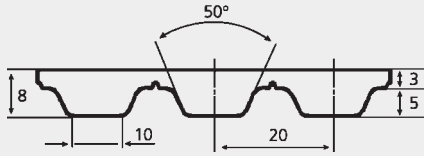
Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
51	160,49	162,34	166	134
52	163,67	165,52	170	136
53	166,85	168,70	173	140
54	170,04	171,89	176	144
55	173,22	175,07	179	146
56	176,40	178,25	182	150
57	179,59	181,44	185	152
58	182,77	184,62	189	156
59	185,95	187,80	192	160
60	189,14	190,99	195	162
61	192,32	194,17	198	164
62	195,50	197,35	201	166
63	198,69	200,54	205	170
64	201,87	203,72	208	171
65	205,05	206,90	211	174
66	208,23	210,08	214	175
67	211,42	213,27	217	177
68	214,60	216,45	221	181
69	217,78	219,63	224	185
70	220,97	222,82	227	187
71	224,15	226,00	230	191
72	227,33	229,18	233	193
73	230,52	232,37	236	197
74	233,70	235,55	240	201
75	236,88	238,73	243	203
76	240,07	241,92	246	207
77	243,25	245,01	249	209
78	246,43	248,28	252	213
79	249,61	251,46	256	215
80	252,80	254,65	259	219
81	255,98	257,83	262	223
82	259,16	261,01	265	225
83	262,35	264,20	268	229
84	265,53	267,38	271	231
85	268,71	270,56	275	235

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
86	271,90	273,75	278	239
87	275,08	276,93	281	241
88	278,26	280,11	284	245
89	281,45	283,30	287	247
90	284,63	286,48	291	251
91	287,81	289,66	294	255
92	291,00	292,85	297	257
93	294,18	296,03	300	261
94	297,36	299,21	303	263
95	300,54	302,39	306	267
96	303,73	305,58	310	269
97	306,91	308,76	313	273
98	310,09	311,94	316	279
99	313,28	315,13	319	283
100	316,46	318,31	322	285
101	319,64	321,49	326	289
102	322,83	324,68	329	293
103	326,01	327,86	332	295
104	329,19	331,04	335	299
105	332,38	334,23	338	301
106	335,56	337,41	341	305
107	338,74	340,59	345	309
108	341,92	343,77	348	311
109	345,11	346,96	351	315
110	348,29	350,14	354	317
111	351,47	353,32	357	321
112	354,66	356,51	361	323
113	357,84	359,69	364	327
114	361,02	362,87	367	330
115	364,21	366,06	370	333
116	367,39	369,24	373	336
117	370,57	372,42	376	340
118	373,76	375,61	380	344
119	376,94	378,79	383	348
120	380,12	381,97	386	354

PU Linear/Torque ATL20 steel cord

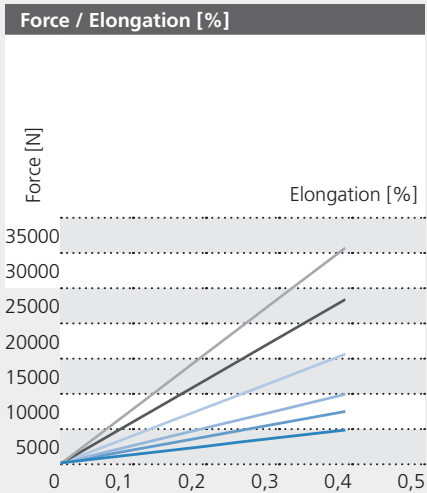


» **Standard tolerances**

- › width: ± 1,0 mm
- › height: ± 0,4 mm
- › length: ± 0,5 mm/m

» **General properties**

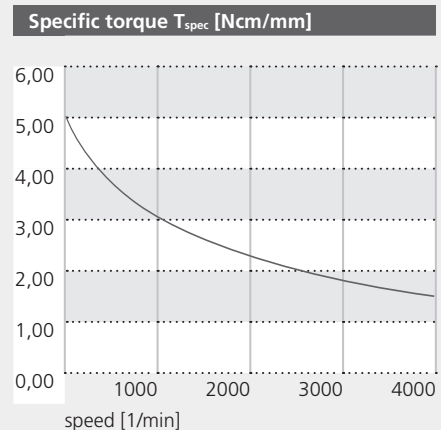
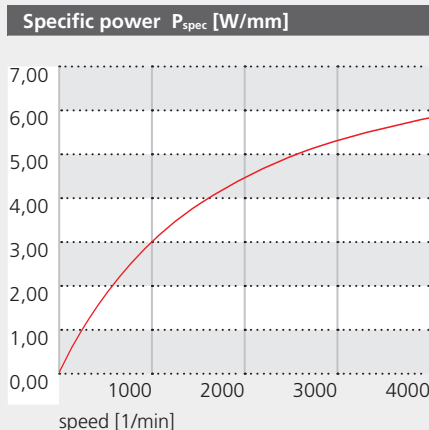
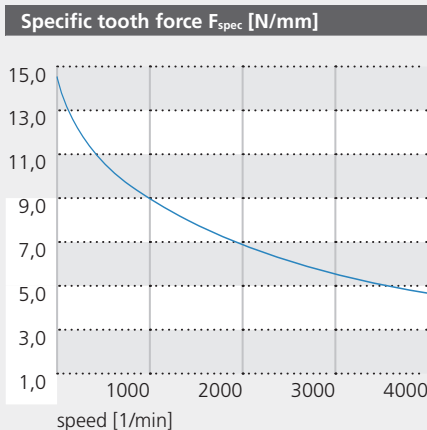
- › pitch 20 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 150 mm
- › min. length for jointed belt (W) 840 mm
- › length between 1,500 to 22,700 mm (PU Torque)
- › high performance steel cords
- › max. speed 6,500 rpm



Technical data		allowable tensile load Typ L F _{ai} [N]	allowable tensile load Typ W F _{ai} [N]	breaking load F _{Br} [N]	spec. spring ratio C _{spec} [N]	belt weight per metre m [kg/m]
Standard-belt width w _{tb} [mm]	graph					
25	■	7600	2800	29700	1890000	0,28
32	■	10100	3600	39600	2520000	0,36
50	■	16000	5850	62700	3990000	0,56
75	■	24400	9000	95700	6000000	0,84
100	■	31900	12600	125400	7900000	1,12
150	■	48700	18500	191400	1200000	1,68

Specific tooth force/power/torque*																			
speed [1/min]		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F _{spec} [N/mm]	■	15,14	14,81	14,41	14,20	13,87	13,36	12,940	12,23	11,590	11,04	9,94	9,08	8,37	7,78	7,21	6,82	5,42	4,39
Specific power P _{spec} [W/mm]	■	0,000	0,123	0,240	0,355	0,462	0,668	0,863	1,223	1,545	1,840	2,485	3,027	3,488	3,890	4,206	4,547	5,420	5,853
Specific torque T _{spec} [Ncm/mm]	■	4,819	4,714	4,587	4,520	4,415	4,253	4,119	3,893	3,689	3,514	3,164	2,890	2,664	2,476	2,295	2,171	1,725	1,397

* max. force/power/torque per tooth in mesh and per mm belt width



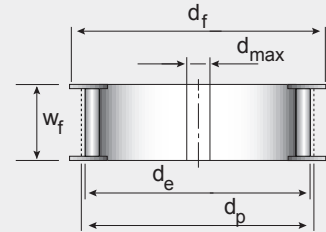
ATL20 Steel

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Pulleys PU Linear/Torque ATL20 steel cord

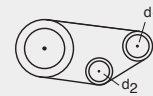
Table of belt widths

timing belt width [mm] w_b	25	32	50	75	100	150
pulley width [mm] w_f	32	39	58	75	110	162

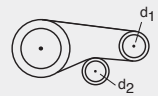


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	25	25
minimum pulley diameter [mm]	d_1	156,32	156,32
diameter of idler roller [mm]	d_2	160,00	250,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
25	156,32	159,16	166	131
26	162,68	165,52	173	137
27	169,05	171,89	179	144
28	175,41	178,25	185	150
29	181,78	184,62	192	156
30	188,15	190,99	198	163
31	194,51	197,35	204	169
32	200,88	203,72	211	175
33	207,24	210,08	217	182
34	213,61	216,45	224	188
35	219,98	222,82	230	195
36	226,34	229,18	236	201
37	232,71	235,55	243	207
38	239,08	241,92	249	214
39	245,44	248,28	255	220
40	251,81	254,65	262	226
41	258,17	261,01	268	233
42	264,54	267,38	274	239
43	270,91	273,75	281	245
44	277,27	280,11	287	252
45	283,64	286,48	294	258
46	290,01	292,85	300	265
47	296,37	299,21	306	271
48	302,74	305,58	313	278
49	309,10	311,94	319	284
50	315,47	318,31	325	290
51	321,84	324,68	332	296
52	328,20	331,04	338	303
53	334,57	337,41	344	310
54	340,93	343,77	351	315
55	347,30	350,14	357	322
56	353,67	356,51	364	328

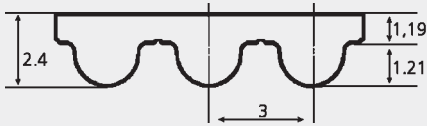
Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
57	360,03	362,87	370	335
58	366,40	369,24	376	341
59	372,77	375,61	383	347
60	379,13	381,97	389	354
61	385,50	388,34	395	360
62	391,86	394,70	402	366
63	398,23	401,07	408	373
64	404,60	407,44	414	379
65	410,96	413,80	421	385
66	417,33	420,17	427	392
67	423,70	426,54	434	398
68	430,05	432,90	440	405
69	436,42	439,27	446	406
70	442,78	445,63	453	412
71	449,15	452,00	459	419
72	455,52	458,37	465	425
73	461,88	464,73	472	431
74	468,25	471,01	478	438
75	474,61	477,46	485	444
76	480,98	483,83	491	450
77	487,35	490,20	497	457
78	493,71	496,56	504	463
79	500,08	502,93	510	470
80	506,45	509,30	516	476
81	512,81	515,66	523	482
82	519,18	522,03	529	489
83	525,54	528,39	535	495
84	531,91	534,76	542	501
85	538,28	541,13	548	503
86	544,64	547,49	555	509
87	551,01	553,86	561	516
88	557,38	560,23	567	522

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
89	563,74	566,59	574	528
90	570,11	572,96	580	535
91	576,47	579,32	586	541
92	582,84	585,69	593	548
93	589,21	592,06	599	554
94	595,57	598,42	605	560
95	601,94	604,79	612	566
96	608,31	611,16	618	573
97	614,67	617,52	625	579
98	621,04	623,89	631	586
99	627,40	630,25	637	592
100	633,77	636,62	644	598
101	640,14	642,99	650	605
102	646,50	649,35	656	611
103	652,87	655,72	663	617
104	659,23	662,08	669	624
105	665,60	668,45	676	630
106	671,97	674,82	682	636
107	678,33	681,18	688	643
108	684,70	687,55	695	649
109	691,07	693,92	701	656
110	697,43	700,28	707	662
111	703,80	706,65	714	663
112	710,16	713,01	720	670
113	716,53	719,38	726	676
114	722,90	725,75	733	682
115	729,26	732,11	739	688
116	735,63	738,48	746	694
117	742,00	744,85	752	700
118	748,36	751,21	758	707
119	754,73	757,58	765	714
120	761,09	763,94	771	720

PU Linear HTD3M steel cord

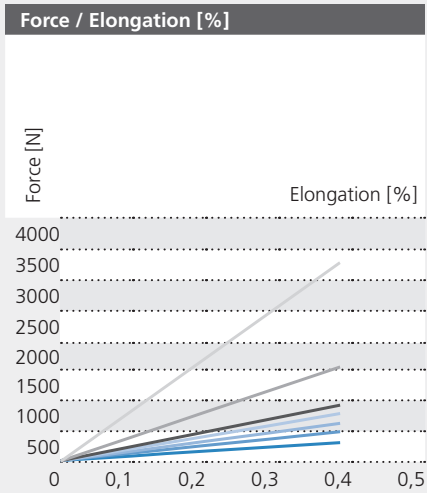


» General properties

- › pitch 3 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 100 mm
- › min. length for jointed belt (W) 501 mm
- › max. speed 10,000 rpm

» Standard tolerances

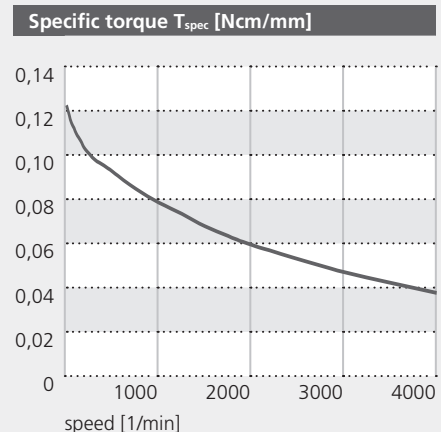
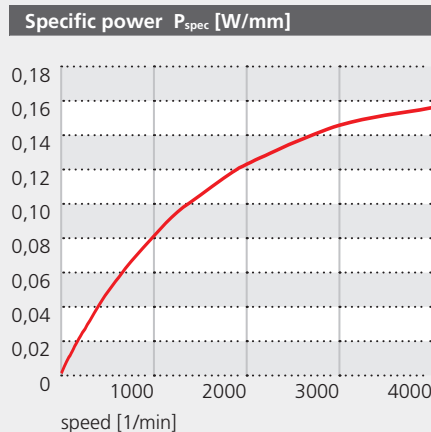
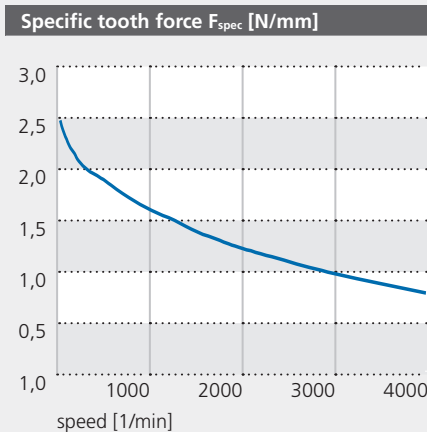
- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m



Technical data		allowable tensile load Typ $L F_{all}$ [N]	allowable tensile load Typ $W F_{all}$ [N]	breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	belt weight per metre m [kg/m]
Standard-belt width w_{tb} [mm]	graph					
10		300	150	1250	75000	0,02
15		480	240	2000	120000	0,03
20		615	307,5	2530	154000	0,04
25		780	390	3250	195000	0,05
30		950	475	3900	230000	0,06
50		1560	780	6500	390000	0,10
100		3300	1650	13750	825000	0,20

Specific tooth force/power/torque*																			
speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]		2,520	2,440	2,370	2,320	2,272	2,2	2,122	2,031	1,975	1,914	1,755	1,624	1,520	1,406	1,317	1,236	0,979	0,786
Specific power P_{spec} [W/mm]		0,000	0,003	0,006	0,009	0,011	0,017	0,021	0,030	0,040	0,048	0,066	0,081	0,095	0,105	0,115	0,124	0,147	0,157
Specific torque T_{spec} [Ncm/mm]		0,120	0,117	0,113	0,111	0,108	0,105	0,101	0,097	0,094	0,091	0,084	0,078	0,073	0,067	0,063	0,059	0,047	0,038

* max. force/power/torque per tooth in mesh and per mm belt width



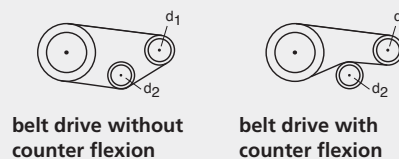
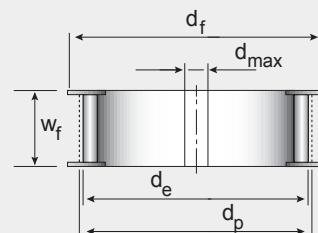
HTD3M Steel

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Pulleys PU Linear HTD3M steel cord

Table of belt widths							
timing belt width [mm] w_b	10	15	20	25	30	50	100
pulley width [mm] w_f	15	20	26	31	37	58	110

Requirements at pulleys			
		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	16	20
minimum pulley diameter [mm]	d_1	14,52	18,34
diameter of idler roller [mm]	d_2	40,00	50,00



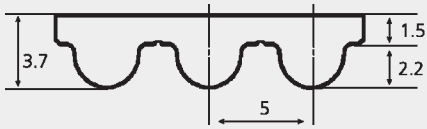
Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
16	14,52	15,28	19	6	
17	15,47	16,23	20	6	
18	16,43	17,19	21	7	
19	17,38	18,14	22	8	
20	18,34	19,01	23	9	
21	19,29	20,05	24	10	
22	20,25	21,01	25	11	
23	21,20	21,96	26	13	
24	22,16	22,92	27	13	
25	23,11	23,87	28	13	
26	24,07	24,83	29	13	
27	25,02	25,78	30	14	
28	25,98	26,74	31	15	
29	26,93	27,69	32	16	
30	27,89	28,65	33	17	
31	28,84	29,60	34	18	
32	29,80	30,56	35	19	
33	30,75	31,51	36	20	
34	31,71	32,47	37	20	
35	32,66	33,42	37	21	
36	33,62	34,38	38	22	
37	34,57	35,33	39	22	
38	35,53	36,29	40	23	
39	36,48	37,24	41	23	
40	37,44	38,20	42	24	
41	38,39	39,15	43	25	
42	39,35	40,11	44	25	
43	40,30	41,06	45	26	
44	41,26	42,02	46	27	
45	42,21	42,97	47	28	
46	43,17	43,93	48	29	
47	44,12	44,88	49	30	
48	45,08	45,84	50	31	
49	46,03	46,79	51	31	
50	46,99	47,75	52	32	

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
51	47,94	48,70	53	32	
52	48,90	49,66	54	33	
53	49,85	50,61	55	34	
54	50,81	51,57	56	34	
55	51,76	52,52	57	35	
56	52,72	53,48	58	36	
57	53,67	54,43	58	37	
58	54,63	55,39	59	37	
59	55,58	56,34	60	39	
60	56,54	57,30	61	40	
61	57,49	58,25	62	41	
62	58,45	59,21	63	42	
63	59,40	60,16	64	43	
64	60,36	61,12	65	43	
65	61,31	62,07	66	44	
66	62,27	63,03	67	45	
67	63,22	63,98	68	46	
68	64,18	64,94	69	47	
69	65,13	65,89	70	47	
70	66,09	66,85	71	47	
71	67,04	67,80	72	48	
72	68,00	68,76	73	49	
73	68,95	69,71	74	49	
74	69,90	70,66	75	50	
75	70,86	71,62	76	50	
76	71,81	72,57	77	51	
77	72,77	73,53	78	52	
78	73,72	74,48	79	53	
79	74,68	75,44	79	54	
80	75,63	76,39	80	55	
81	76,59	77,35	81	56	
82	77,54	78,30	82	57	
83	78,50	79,26	83	57	
84	79,45	80,21	84	58	
85	80,41	81,17	85	59	

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
86	81,36	82,12	86	60	
87	82,32	83,08	87	61	
88	83,27	84,03	88	62	
89	84,23	84,99	89	62	
90	85,18	85,94	90	62	
91	86,14	86,90	91	63	
92	87,09	87,85	92	65	
93	88,05	88,81	93	65	
94	89,00	89,76	94	66	
95	89,96	90,72	95	66	
96	90,91	91,67	96	67	
97	91,87	92,63	97	68	
98	92,82	93,58	98	68	
99	93,78	94,54	99	69	
100	94,73	95,49	100	69	
101	95,69	96,45	100	70	
102	96,64	97,40	101	70	
103	97,60	98,36	102	71	
104	98,55	99,31	103	72	
105	99,51	100,27	104	73	
106	100,46	101,22	105	74	
107	101,42	102,18	106	75	
108	102,37	103,13	107	76	
109	103,33	104,09	108	77	
110	104,28	105,04	109	78	
111	105,24	106,00	110	78	
112	106,19	106,95	111	79	
113	107,15	107,91	112	79	
114	108,10	108,86	113	79	
115	109,06	109,82	114	80	
116	110,01	110,77	115	80	
117	110,97	111,73	116	80	
118	111,92	112,68	117	81	
119	112,88	113,64	118	81	
120	113,83	114,59	119	81	

Standard

PU Linear/Torque HTD5M steel cord

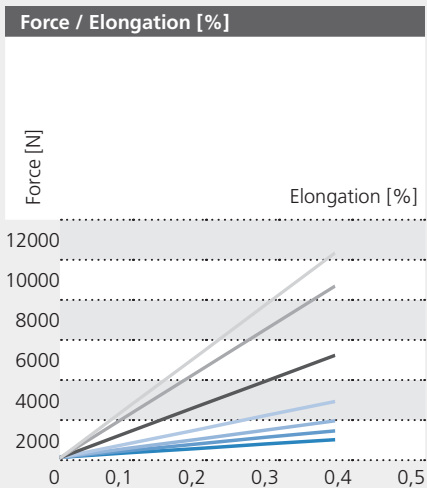


» Standard tolerances

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» General properties

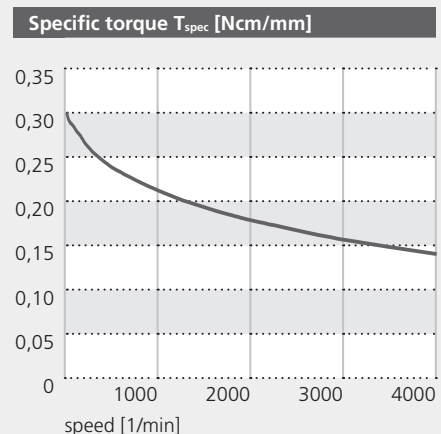
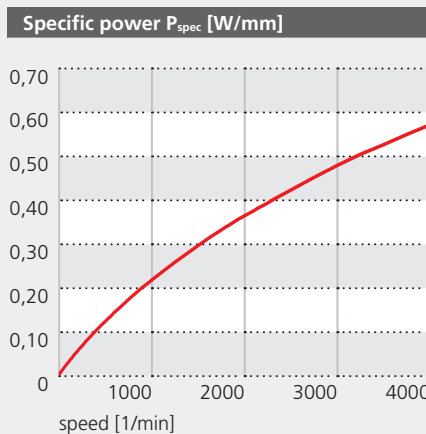
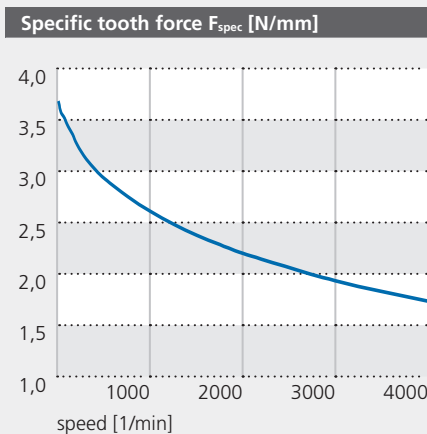
- › pitch 5 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 100 mm (PU Linear)
- › max. width up to 150 mm (PU Torque)
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 24,000 mm (PU Torque)
- › max. speed 10,000 rpm



Technical data		allowable tensile load Typ $L F_{st}$ [N]	allowable tensile load Typ $W F_{st}$ [N]	breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	belt weight per metre m [kg/m]
Standard-belt width w_{tb} [mm]	graph	Typ $L F_{st}$ [N]	Typ $W F_{st}$ [N]			
10	■	880	440	3200	220000	0,05
15	■	1320	660	4800	330000	0,07
20	■	1750	875	6300	450000	0,10
30	■	2600	1300	9500	690000	0,15
50	■	5060	2530	18400	1265000	0,24
85	■	8600	4300	31200	2120000	0,41
100	■	10120	5060	36800	2530000	0,48

Specific tooth force/power/torque*																			
speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]	■	3,680	3,588	3,545	3,500	3,452	3,37	3,270	3,125	3,017	2,931	2,753	2,605	2,479	2,371	2,278	2,191	1,923	1,723
Specific power P_{spec} [W/mm]	■	0,000	0,007	0,015	0,022	0,029	0,042	0,055	0,078	0,101	0,122	0,172	0,217	0,258	0,296	0,332	0,365	0,481	0,574
Specific torque T_{spec} [Ncm/mm]	■	0,293	0,286	0,282	0,279	0,275	0,268	0,260	0,249	0,240	0,233	0,219	0,207	0,197	0,189	0,181	0,174	0,153	0,137

* max. force/power/torque per tooth in mesh and per mm belt width



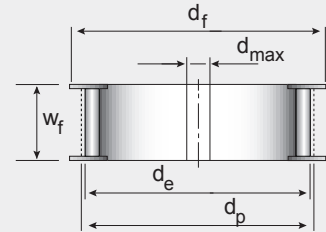
HTD5M Steel

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Pulleys PU Linear/Torque HTD5M steel cord

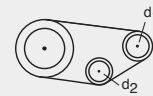
Table of belt widths

timing belt width [mm] w_b	10	15	20	25	30	50	85	100
pulley width [mm] w_f	15	20	26	31	37	58	94	110

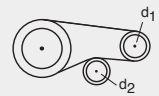


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	16	20
minimum pulley diameter [mm]	d_1	24,32	30,69
diameter of idler roller [mm]	d_2	50,00	50,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
15	22,73	23,87	27	8
16	24,32	25,46	30	10
17	25,92	27,06	31	12
18	27,51	28,65	33	14
19	29,10	30,24	34	16
20	30,69	31,83	36	18
21	32,28	33,42	37	20
22	33,87	35,01	39	22
23	35,47	36,61	41	24
24	37,06	38,20	42	24
25	38,65	39,79	44	25
26	40,24	41,38	45	25
27	41,83	42,97	47	27
28	43,42	44,56	49	29
29	45,02	46,16	50	31
30	46,61	47,75	52	33
31	48,20	49,34	53	35
32	49,79	50,93	55	37
33	51,38	52,52	57	39
34	52,97	54,11	58	39
35	54,56	55,70	60	40
36	56,16	57,30	61	42
37	57,75	58,89	63	43
38	59,34	60,48	65	45
39	60,93	62,07	66	45
40	62,52	63,66	68	47
41	64,11	65,25	69	48
42	65,71	66,85	71	48
43	67,30	68,44	72	50
44	68,89	70,03	74	52
45	70,48	71,62	76	54
46	72,07	73,21	77	56
47	73,66	74,80	79	58
48	75,25	76,39	80	60
49	76,85	77,99	82	60
50	78,44	79,58	84	62

Standard

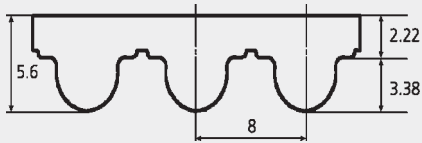
Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
51	80,03	81,17	85	62
52	81,62	82,76	87	64
53	83,21	84,35	88	66
54	84,80	85,94	90	66
55	86,40	87,54	92	68
56	87,99	89,13	93	70
57	89,58	90,72	95	72
58	91,17	92,31	96	72
59	92,76	93,90	98	74
60	94,35	95,49	100	76
61	95,94	97,08	101	78
62	97,54	98,68	103	80
63	99,13	100,27	104	82
64	100,72	101,86	106	82
65	102,31	103,45	108	84
66	103,90	105,04	109	86
67	105,49	106,63	111	88
68	107,09	108,23	112	90
69	108,68	109,82	114	90
70	110,27	111,41	115	90
71	111,86	113,00	117	92
72	113,45	114,59	119	94
73	115,04	116,18	120	94
74	116,63	117,77	122	96
75	118,23	119,37	123	96
76	119,82	120,96	125	98
77	121,41	122,55	127	100
78	123,00	124,14	128	102
79	124,59	125,73	130	104
80	126,18	127,32	131	106
81	127,78	128,92	133	108
82	129,37	130,51	135	110
83	130,96	132,11	136	110
84	132,55	133,70	138	112
85	134,14	135,29	139	114

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
86	135,73	136,87	141	116
87	137,32	138,46	143	118
88	138,92	140,06	144	119
89	140,51	141,65	146	120
90	142,10	143,24	147	120
91	143,69	144,83	149	122
92	145,28	146,42	150	124
93	146,87	148,01	152	124
94	148,47	149,61	154	126
95	150,06	151,20	155	127
96	151,65	152,79	157	129
97	153,24	154,38	158	130
98	154,83	155,97	160	130
99	156,42	157,56	162	132
100	158,02	159,16	163	132
101	159,61	160,75	165	134
102	161,20	162,34	166	134
103	162,79	163,93	168	136
104	164,38	165,52	170	138
105	165,97	167,11	171	140
106	167,56	168,70	173	142
107	169,16	170,30	174	144
108	170,75	171,89	176	146
109	172,34	173,48	178	148
110	173,93	175,07	179	150
111	175,52	176,66	181	150
112	177,11	178,25	182	152
113	178,71	179,85	184	152
114	180,30	181,44	185	152
115	181,89	183,03	187	154
116	183,48	184,62	189	154
117	185,07	186,21	190	154
118	186,66	187,80	192	156
119	188,25	189,39	193	156
120	189,85	190,99	195	156

PU Linear/Torque HTD8M steel cord

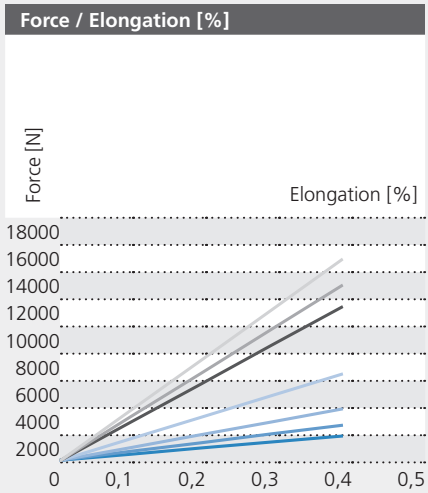


» Standard tolerances

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» General properties

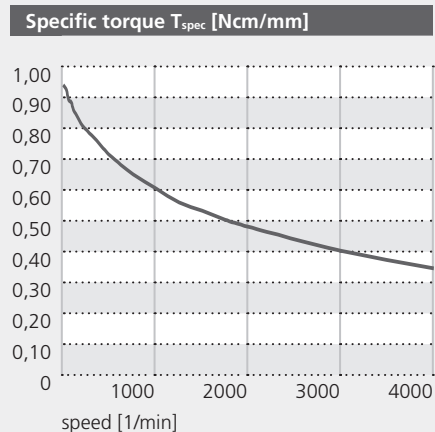
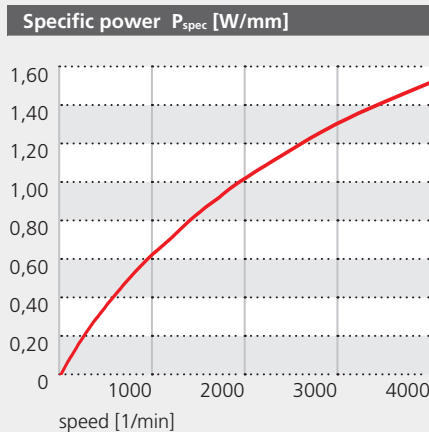
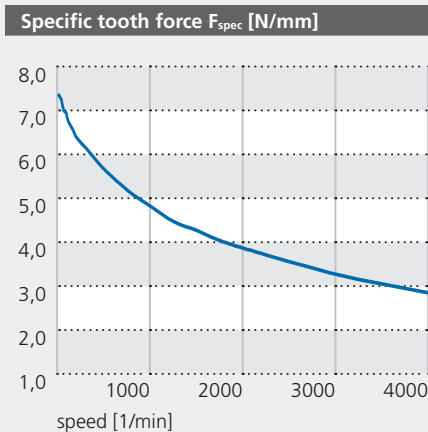
- › pitch 8 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 100 mm (PU Linear)
- › max. width up to 150 mm (PU Torque)
- › min. length for jointed belt (W) 960 mm
- › length between 1,504 to 24,000 mm (PU Torque)
- › max. speed 6,000 rpm



Technical data		allowable tensile load	allowable tensile load	breaking load	spec. spring ratio	belt weight per metre
Standard-belt width w_{tb} [mm]	graph	Typ $L F_{ai}$ [N]	Typ $T F_{ai}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
15	■	2000	1000	8550	504000	0,10
20	■	2900	1450	12350	728000	0,14
30	■	4250	2125	18050	1064000	0,21
50	■	7170	3585	30400	1792000	0,35
85	■	12750	6375	54150	3192000	0,59
100	■	14550	7275	61750	3640000	0,69
115	■	16670	8335	71000	4180000	0,79

Specific tooth force/power/torque*																		
speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F_{spec} [N/mm]	7,400	7,310	7,060	7,000	6,810	6,608	6,409	6,168	5,903	5,671	5,198	4,835	4,487	4,286	4,048	3,878	3,280	2,844
Specific power P_{spec} [W/mm]	0,000	0,024	0,047	0,070	0,091	0,132	0,171	0,247	0,315	0,378	0,520	0,645	0,748	0,857	0,945	1,034	1,312	1,517
Specific torque T_{spec} [Ncm/mm]	0,942	0,931	0,899	0,891	0,867	0,841	0,816	0,785	0,752	0,722	0,662	0,616	0,571	0,546	0,515	0,494	0,418	0,362

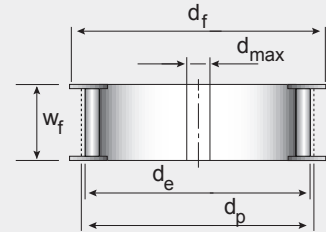
* max. force/power/torque per tooth in mesh and per mm belt width



Pulleys PU Linear/Torque HTD8M steel cord

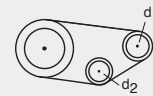
Table of belt widths

timing belt width [mm] w_b	15	20	25	30	50	85	100	115
pulley width [mm] w_f	20	26	32	37	58	94	110	125

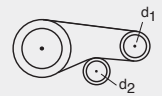


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	18	18
minimum pulley diameter [mm]	d_1	44,46	44,46
diameter of idler roller [mm]	d_2	50,00	120,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
18	44,46	45,84	50	32
19	47,00	48,38	52	34
20	49,55	50,93	55	36
21	52,01	53,48	58	38
22	54,64	56,02	60	42
23	57,19	58,57	63	44
24	59,74	61,12	65	46
25	62,28	63,66	68	50
26	64,83	66,21	70	52
27	67,38	68,76	73	56
28	69,92	71,30	75	58
29	72,47	73,85	78	60
30	75,01	76,39	80	62
31	77,56	78,94	83	64
32	80,11	81,49	86	66
33	82,65	84,03	88	68
34	85,20	86,58	91	72
35	87,75	89,13	93	76
36	90,29	91,67	96	78
37	92,84	94,22	98	80
38	95,39	96,77	101	82
39	97,93	99,31	103	84
40	100,48	101,86	106	86
41	103,03	104,41	108	88
42	105,57	106,95	111	90
43	108,12	109,50	114	94
44	110,67	112,05	116	96
45	113,21	114,59	119	98
46	115,76	117,14	121	100
47	118,30	119,68	124	102
48	120,85	122,23	126	104
49	123,40	124,78	129	106
50	125,94	127,32	131	108
51	128,49	129,87	134	110
52	131,04	132,42	136	112

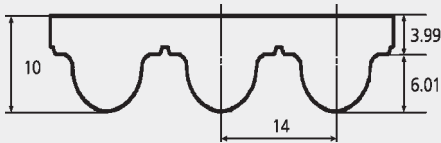
Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
53	133,58	134,96	139	114
54	136,13	137,51	142	116
55	138,68	140,06	144	118
56	141,22	142,60	147	120
57	143,77	145,15	149	122
58	146,32	147,70	152	122
59	148,86	150,24	154	124
60	151,41	152,79	157	124
61	153,96	155,34	159	126
62	156,50	157,88	162	130
63	159,05	160,43	164	134
64	161,59	162,97	167	136
65	164,14	165,52	170	136
66	166,69	168,07	172	140
67	169,23	170,61	175	144
68	171,78	173,16	177	146
69	174,33	175,71	180	146
70	176,87	178,25	182	150
71	179,42	180,80	185	152
72	181,97	183,35	187	156
73	184,51	185,89	190	158
74	187,06	188,44	192	160
75	189,61	190,99	195	162
76	192,15	193,53	198	162
77	194,70	196,08	200	164
78	197,25	198,63	203	166
79	199,79	201,17	205	170
80	202,34	203,72	208	172
81	204,88	206,26	210	174
82	207,43	208,81	213	176
83	209,98	211,36	215	178
84	212,52	213,90	218	180
85	215,07	216,45	221	183
86	217,62	219,00	223	185

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
87	220,16	221,54	226	187
88	222,71	224,09	228	189
89	225,26	226,64	231	191
90	227,80	229,18	233	193
91	230,35	231,73	236	195
92	232,90	234,28	238	197
93	235,44	236,82	241	201
94	237,99	239,37	243	203
95	240,54	241,92	246	207
96	243,08	244,46	249	209
97	245,63	247,01	251	213
98	248,18	249,56	254	215
99	250,72	252,10	256	217
100	253,27	254,65	259	219
101	255,81	257,19	261	221
102	258,36	259,74	264	224
103	260,91	262,29	266	226
104	263,45	264,83	269	228
105	266,00	267,38	271	231
106	268,55	269,93	274	233
107	271,09	272,47	277	236
108	273,64	275,02	279	239
109	276,19	277,57	282	242
110	278,73	280,11	284	245
111	281,28	282,66	287	247
112	283,83	285,21	289	251
113	286,37	287,75	292	253
114	288,92	290,30	294	255
115	291,47	292,85	297	257
116	294,01	295,39	299	259
117	296,56	297,94	302	262
118	299,10	300,48	305	265
119	301,65	303,03	307	267
120	304,20	305,58	310	269

PU Linear/Torque HTD14M steel cord

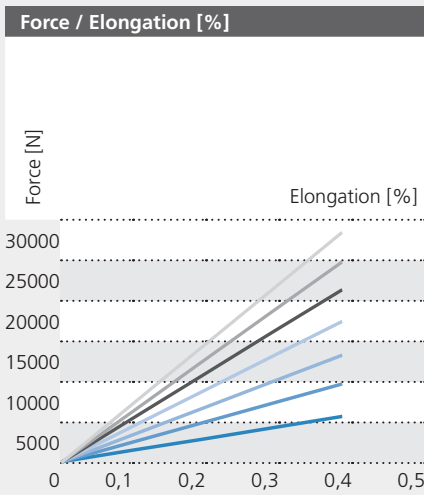


» Standard tolerances

- › width: ± 1,0 mm
- › height: ± 0,4 mm
- › length: ± 0,5 mm/m

» General properties

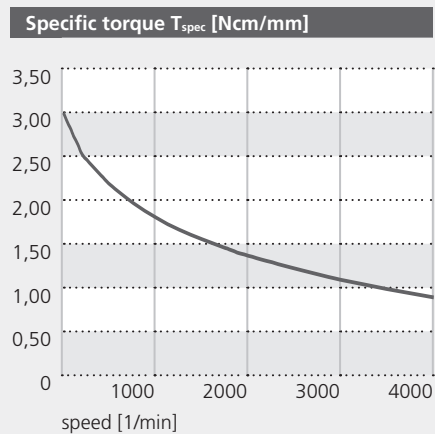
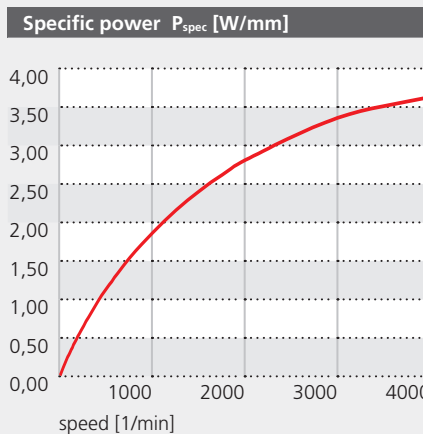
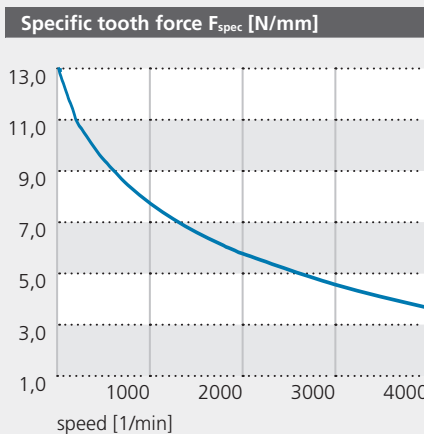
- › pitch 14 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 115 mm (PU Linear)
- › max. width up to 100 mm (PU Torque)
- › min. length for welded belt (W) 966 mm
- › length between 1,512 to 23,996 mm (PU Torque)
- › max. speed 4,000 rpm



Technical data		allowable tensile load	allowable tensile load	breaking load	spec. spring ratio	belt weight per metre
Standard-belt width w_{tb} [mm]	graph	Typ $L F_{st}$ [N]	Typ $T F_{st}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
25	■	5500	2750	19000	1375000	0,28
40	■	9500	4750	32800	2375000	0,44
55	■	13000	6500	44980	3250000	0,61
70	■	17100	8550	58800	4280000	0,79
85	■	21000	10500	72600	5250000	0,94
100	■	24700	12350	84100	6100000	1,13
115	■	28000	14000	96700	7000000	1,30

Specific tooth force/power/torque*																			
speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]	■	13,00	12,71	12,46	12,20	11,91	11,46	10,970	10,43	9,920	9,46	8,54	7,81	7,22	6,72	6,28	5,90	4,71	3,82
Specific power P_{spec} [W/mm]	■	0,000	0,074	0,145	0,214	0,278	0,401	0,512	0,730	0,926	1,104	1,495	1,822	2,106	2,352	2,564	2,753	3,297	3,565
Specific torque T_{spec} [Ncm/mm]	■	2,897	2,832	2,776	2,718	2,654	2,553	2,444	2,324	2,210	2,108	1,903	1,740	1,609	1,497	1,399	1,315	1,049	0,851

* max. force/power/torque per tooth in mesh and per mm belt width



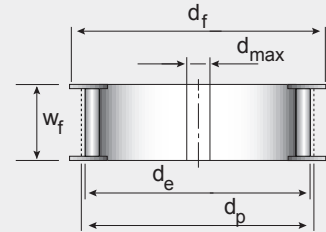
HTD14M Steel

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Pulleys PU Linear/Torque HTD14M steel cord

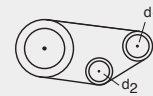
Table of belt widths

timing belt width [mm] w_b	25	40	55	75	85	100	115
pulley width [mm] w_f	32	47	63	83	94	110	125

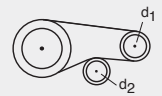


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	28	28
minimum pulley diameter [mm]	d_1	122,13	122,13
diameter of idler roller [mm]	d_2	120,00	180,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
25	108,76	111,41	117	90
26	113,21	115,86	122	94
27	117,67	120,32	126	98
28	122,13	124,78	131	102
29	126,58	129,23	135	104
30	131,04	133,69	140	106
31	135,50	138,15	144	108
32	139,95	142,60	149	110
33	144,41	147,06	153	114
34	148,87	151,52	158	118
35	153,32	155,97	162	124
36	157,78	160,43	166	130
37	162,13	164,88	171	136
38	166,69	169,34	175	142
39	171,15	173,80	180	144
40	175,60	178,25	184	148
41	180,06	182,71	189	152
42	184,52	187,17	193	156
43	188,97	191,62	198	162
44	193,43	196,08	202	164
45	197,89	200,54	207	168
46	202,34	204,99	211	174
47	206,80	209,45	215	180
48	211,25	213,90	220	186
49	215,71	218,36	224	192
50	220,17	222,82	229	196
51	224,62	227,27	233	200
52	229,08	231,73	238	204
53	233,54	236,19	242	208
54	237,99	240,64	247	212
55	242,45	245,01	251	216
56	246,91	249,56	256	220

Technical data

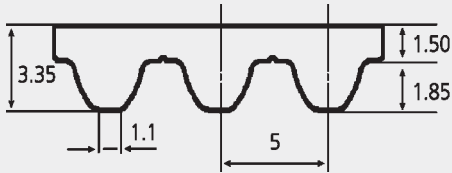
number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
57	251,36	254,01	260	224
58	255,82	258,47	265	228
59	260,27	262,92	269	232
60	264,73	267,38	273	238
61	269,19	271,84	278	242
62	273,64	276,29	282	248
63	278,01	280,75	287	252
64	282,56	285,21	291	256
65	287,01	289,66	296	260
66	291,47	294,12	300	264
67	295,92	298,57	305	268
68	300,38	303,03	309	274
69	304,84	307,49	314	278
70	309,29	311,94	318	284
71	313,75	316,40	322	288
72	318,21	320,86	327	292
73	322,66	325,31	331	296
74	327,12	329,77	336	300
75	331,58	334,23	340	306
76	336,03	338,68	345	310
77	340,49	343,14	349	314
78	344,94	347,59	354	318
79	349,40	352,05	358	322
80	353,86	356,51	363	328
81	358,31	360,96	367	332
82	362,77	365,42	371	336
83	367,23	369,88	376	340
84	371,68	374,33	380	345
85	376,14	378,79	385	350
86	380,60	383,25	389	356
87	385,05	387,70	394	360
88	389,51	392,16	398	364

Technical data

number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]
89	393,96	396,61	403	368
90	398,42	401,07	407	372
91	402,88	405,53	412	376
92	407,33	409,98	416	380
93	411,79	414,44	420	384
94	416,25	418,90	425	388
95	420,70	423,35	429	392
96	425,16	427,81	434	396
97	429,61	432,26	438	400
98	434,07	436,72	443	405
99	438,53	441,18	447	410
100	442,98	445,63	452	414
101	447,44	450,09	456	418
102	451,90	454,55	461	422
103	456,35	459,00	465	426
104	460,81	463,46	470	430
105	465,27	467,92	474	434
106	469,72	472,37	478	438
107	474,18	476,83	483	444
108	478,63	481,28	487	448
109	483,09	485,74	492	452
110	487,55	490,20	496	456
111	492,00	494,65	501	460
112	496,46	499,11	505	464
113	500,92	503,57	510	468
114	505,37	508,02	514	474
115	509,83	512,48	519	478
116	514,29	516,94	523	484
117	518,74	521,39	527	488
118	523,20	525,85	532	492
119	527,65	530,30	536	496
120	532,11	534,76	541	500

Standard

PU Linear/Torque STD5M steel cord

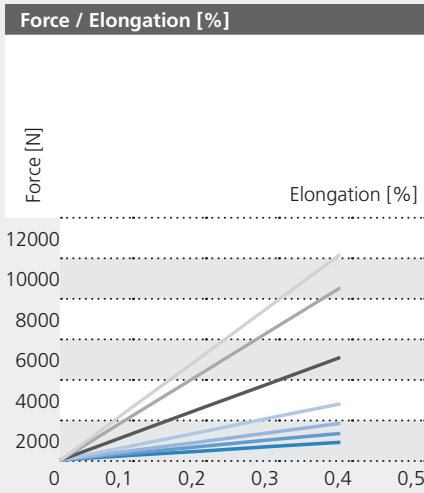


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

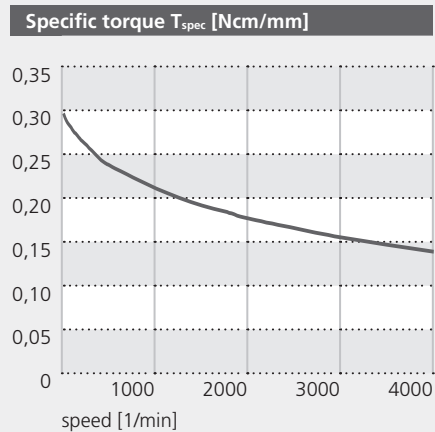
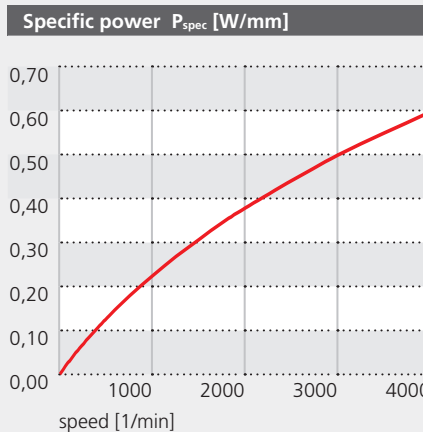
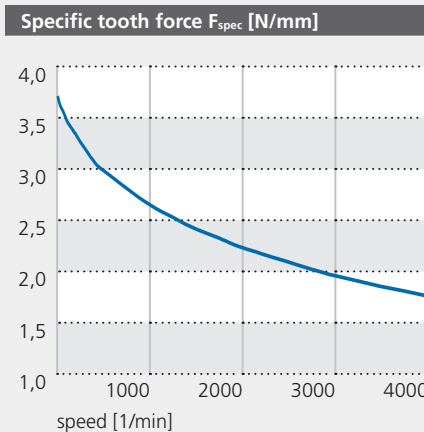
- › pitch 5 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 100 mm (PU Linear)
- › max. width up to 150 mm (PU Torque)
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 20,400 mm (PU Torque)
- › max. speed 10,000 rpm



Technical data		allowable tensile load	allowable tensile load	breaking load	spec. spring ratio	belt weight per metre
Standard-belt width w_{tb} [mm]	graph	Typ $L F_{ai}$ [N]	Typ $T F_{ai}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
10	■	880	440	3200	220000	0,05
15	■	1320	660	4800	330000	0,07
20	■	1750	875	6300	450000	0,09
30	■	2700	1350	9500	690000	0,14
50	■	5060	2530	18400	1265000	0,23
85	■	8600	4300	31200	2120000	0,41
100	■	10120	5060	36800	2530000	0,46

Specific tooth force/power/torque*																			
speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]	■	3,690	3,611	3,563	3,512	3,462	3,39	3,323	3,19	3,060	2,981	2,810	2,655	2,531	2,421	2,333	2,241	1,973	1,773
Specific power P_{spec} [W/mm]	■	0,000	0,008	0,015	0,022	0,029	0,042	0,055	0,080	0,102	0,124	0,176	0,221	0,264	0,303	0,340	0,374	0,493	0,591
Specific torque T_{spec} [Ncm/mm]	■	0,294	0,287	0,284	0,279	0,276	0,270	0,264	0,254	0,244	0,237	0,224	0,211	0,201	0,193	0,186	0,178	0,157	0,141

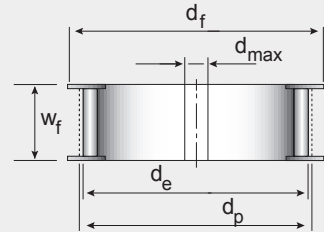
* max. force/power/torque per tooth in mesh and per mm belt width



Pulleys PU Linear/Torque STD5M steel cord

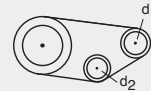
Table of belt widths

timing belt width [mm] w_b	10	15	20	25	30	50	85	100
pulley width [mm] w_f	15	20	26	31	37	58	94	110

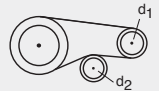


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	16	20
minimum pulley diameter [mm]	d_1	24,50	30,87
diameter of idler roller [mm]	d_2	50,00	50,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
16	24,50	25,46	30	10
17	26,01	27,06	31	12
18	27,69	28,65	33	14
19	29,28	30,24	34	16
20	30,87	31,83	36	18
21	32,46	33,42	37	20
22	34,05	35,01	39	22
23	35,65	36,61	41	24
24	37,24	38,20	42	24
25	38,83	39,79	44	25
26	40,42	41,38	45	25
27	42,01	42,97	47	27
28	43,60	44,56	49	29
29	45,20	46,16	50	31
30	46,79	47,75	52	33
31	48,38	49,34	53	35
32	49,97	50,93	55	37
33	51,56	52,52	57	39
34	53,15	54,11	58	39
35	54,74	55,70	60	40
36	56,34	57,30	61	42
37	57,93	58,89	63	43
38	59,52	60,48	65	45
39	61,11	62,07	66	45
40	62,70	63,66	68	47
41	64,29	65,25	69	48
42	65,89	66,85	71	48
43	67,48	68,44	72	50
44	69,07	70,03	74	52
45	70,66	71,62	76	54
46	72,25	73,21	77	56
47	73,84	74,80	79	58
48	75,43	76,39	80	60
49	77,03	77,99	82	60
50	78,62	79,58	84	62

Technical data

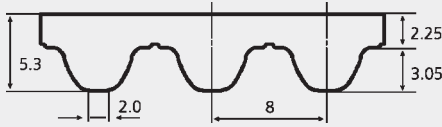
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
51	80,21	81,17	85	62
52	81,80	82,76	87	64
53	83,39	84,35	88	66
54	84,98	85,94	90	66
55	86,58	87,54	92	68
56	88,17	89,13	93	70
57	89,76	90,72	95	72
58	91,35	92,31	96	72
59	92,94	93,90	98	74
60	94,53	95,49	100	76
61	96,12	97,08	101	78
62	97,72	98,68	103	80
63	99,31	100,27	104	82
64	100,90	101,86	106	82
65	102,49	103,45	108	84
66	104,08	105,04	109	86
67	105,67	106,63	111	88
68	107,27	108,23	112	90
69	108,86	109,82	114	90
70	110,45	111,41	115	90
71	112,04	113,00	117	92
72	113,63	114,59	119	94
73	115,22	116,18	120	94
74	116,81	117,77	122	96
75	118,41	119,37	123	96
76	120,00	120,96	125	98
77	121,59	122,55	127	100
78	123,18	124,14	128	102
79	124,77	125,73	130	104
80	126,36	127,32	131	106
81	127,96	128,92	133	108
82	129,55	130,51	135	110
83	131,14	132,11	136	110
84	132,73	133,70	138	112
85	134,32	135,29	139	114

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
86	135,91	136,87	141	116
87	137,50	138,46	143	118
88	139,09	140,06	144	119
89	140,69	141,65	146	120
90	142,28	143,24	147	120
91	143,87	144,83	149	122
92	145,46	146,42	150	124
93	147,05	148,01	152	124
94	148,65	149,61	154	126
95	150,24	151,20	155	127
96	151,83	152,79	157	129
97	153,42	154,38	158	130
98	155,01	155,97	160	130
99	156,60	157,56	162	132
100	158,20	159,16	163	132
101	159,79	160,75	165	134
102	161,38	162,34	166	134
103	162,97	163,93	168	136
104	164,56	165,52	170	138
105	166,15	167,11	171	140
106	167,74	168,70	173	142
107	169,34	170,30	174	144
108	170,93	171,89	176	146
109	172,52	173,48	178	148
110	174,11	175,07	179	150
111	175,70	176,66	181	150
112	177,29	178,25	182	152
113	178,89	179,85	184	152
114	180,48	181,44	185	152
115	182,07	183,03	187	154
116	183,66	184,62	189	154
117	185,25	186,21	190	154
118	186,84	187,80	192	156
119	188,43	189,39	193	156
120	190,03	190,99	195	156

Standard

PU Linear/Torque STD8M steel cord



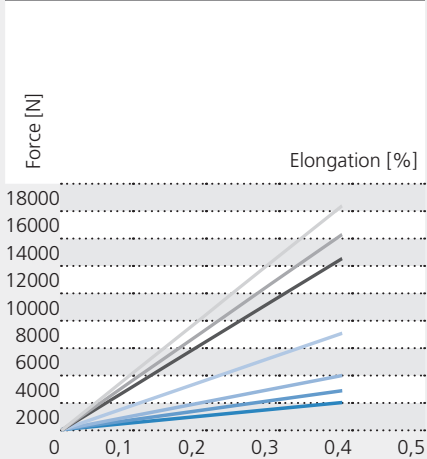
» Standard tolerances

- › width: $\pm 0,5$ mm
- › height: $\pm 0,2$ mm
- › length: $\pm 0,5$ mm/m

» General properties

- › pitch 8 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 100 mm (PU Linear)
- › max. width up to 150 mm (PU Torque)
- › min. length for jointed belt (W) 960 mm
- › length between 1,504 to 20,400 mm (PU Torque)
- › max. speed 6,000 rpm

Force / Elongation [%]



Technical data

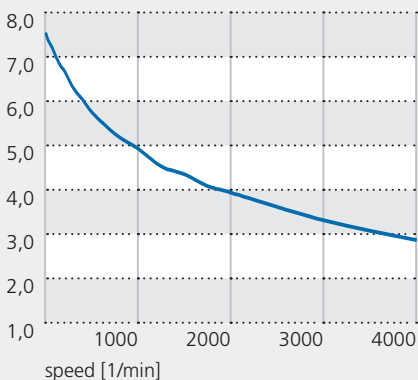
Standard-belt width w_{tb} [mm]	graph	allowable tensile load Typ $L F_{ai}$ [N]	allowable tensile load Typ $W F_{ai}$ [N]	breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	belt weight per metre m [kg/m]
15	■	1980	990	8550	495000	0,10
20	■	2860	1430	12350	715000	0,13
30	■	3960	1980	17100	990000	0,20
50	■	7170	3585	30400	1760000	0,33
85	■	12540	6270	54150	3135000	0,56
100	■	14300	7150	61750	3575000	0,66
115	■	16500	8250	71000	4100000	0,76

Specific tooth force/power/torque*

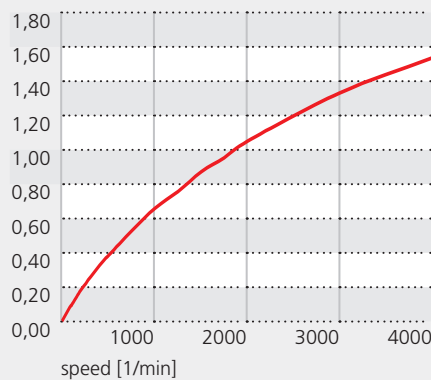
speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F_{spec} [N/mm]	7,410	7,270	7,170	7,070	6,943	6,73	6,598	6,211	5,943	5,671	5,198	4,866	4,487	4,313	4,048	3,902	3,300	2,861
Specific power P_{spec} [W/mm]	0,000	0,024	0,048	0,071	0,093	0,135	0,176	0,248	0,317	0,378	0,520	0,649	0,748	0,863	0,945	1,041	1,320	1,526
Specific torque T_{spec} [Ncm/mm]	0,943	0,926	0,913	0,900	0,884	0,857	0,840	0,791	0,757	0,722	0,662	0,620	0,571	0,549	0,515	0,497	0,420	0,364

* max. force/power/torque per tooth in mesh and per mm belt width

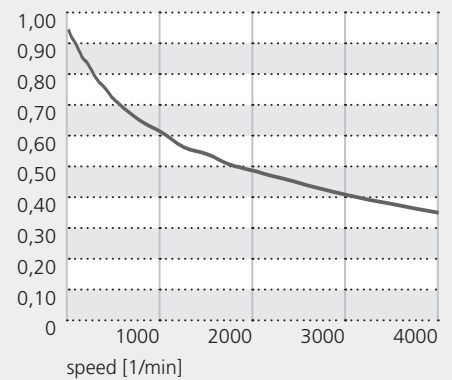
Specific tooth force F_{spec} [N/mm]



Specific power P_{spec} [W/mm]



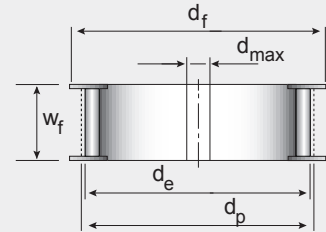
Specific torque T_{spec} [Ncm/mm]



Pulleys PU Linear/Torque STD8M steel cord

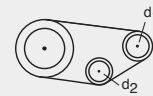
Table of belt widths

timing belt width [mm] w_b	15	20	25	30	50	85	100	115
pulley width [mm] w_f	20	26	32	37	58	94	110	125

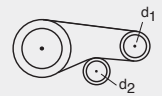


Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	18	18
minimum pulley diameter [mm]	d_1	44,46	44,46
diameter of idler roller [mm]	d_2	50,00	120,00



belt drive without counter flexion



belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
18	44,46	45,84	50	32
19	47,00	48,38	52	34
20	49,55	50,93	55	36
21	52,01	53,48	58	38
22	54,64	56,02	60	42
23	57,19	58,57	63	44
24	59,74	61,12	65	46
25	62,28	63,66	68	50
26	64,83	66,21	70	52
27	67,38	68,76	73	56
28	69,92	71,30	75	58
29	72,47	73,85	78	60
30	75,01	76,39	80	62
31	77,56	78,94	83	64
32	80,11	81,49	86	66
33	82,65	84,03	88	68
34	85,20	86,58	91	72
35	87,75	89,13	93	76
36	90,29	91,67	96	78
37	92,84	94,22	98	80
38	95,39	96,77	101	82
39	97,93	99,31	103	84
40	100,48	101,86	106	86
41	103,03	104,41	108	88
42	105,57	106,95	111	90
43	108,12	109,50	114	94
44	110,67	112,05	116	96
45	113,21	114,59	119	98
46	115,76	117,14	121	100
47	118,30	119,68	124	102
48	120,85	122,23	126	104
49	123,40	124,78	129	106
50	125,94	127,32	131	108
51	128,49	129,87	134	110
52	131,04	132,42	136	112

Technical data

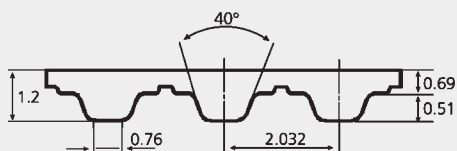
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
53	133,58	134,96	139	114
54	136,13	137,51	142	116
55	138,68	140,06	144	118
56	141,22	142,60	147	120
57	143,77	145,15	149	122
58	146,32	147,70	152	122
59	148,86	150,24	154	124
60	151,41	152,79	157	124
61	153,96	155,34	159	126
62	156,50	157,88	162	130
63	159,05	160,43	164	134
64	161,59	162,97	167	136
65	164,14	165,52	170	136
66	166,69	168,07	172	140
67	169,23	170,61	175	144
68	171,78	173,16	177	146
69	174,33	175,71	180	146
70	176,87	178,25	182	150
71	179,42	180,80	185	152
72	181,97	183,35	187	156
73	184,51	185,89	190	158
74	187,06	188,44	192	160
75	189,61	190,99	195	162
76	192,15	193,53	198	162
77	194,70	196,08	200	164
78	197,25	198,63	203	166
79	199,79	201,17	205	170
80	202,34	203,72	208	172
81	204,88	206,26	210	174
82	207,43	208,81	213	176
83	209,98	211,36	215	178
84	212,52	213,90	218	180
85	215,07	216,45	221	183
86	217,62	219,00	223	185

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
87	220,16	221,54	226	187
88	222,71	224,09	228	189
89	225,26	226,64	231	191
90	227,80	229,18	233	193
91	230,35	231,73	236	195
92	232,90	234,28	238	197
93	235,44	236,82	241	201
94	237,99	239,37	243	203
95	240,54	241,92	246	207
96	243,08	244,46	249	209
97	245,63	247,01	251	213
98	248,18	249,56	254	215
99	250,72	252,10	256	217
100	253,27	254,65	259	219
101	255,81	257,19	261	221
102	258,36	259,74	264	224
103	260,91	262,29	266	226
104	263,45	264,83	269	228
105	266,00	267,38	271	231
106	268,55	269,93	274	233
107	271,09	272,47	277	236
108	273,64	275,02	279	239
109	276,19	277,57	282	242
110	278,73	280,11	284	245
111	281,28	282,66	287	247
112	283,83	285,21	289	251
113	286,37	287,75	292	253
114	288,92	290,30	294	255
115	291,47	292,85	297	257
116	294,01	295,39	299	259
117	296,56	297,94	302	262
118	299,10	300,48	305	265
119	301,65	303,03	307	267
120	304,20	305,58	310	269

Standard

PU Moulded MXL steel cord



» Standard tolerances

- › width: + 0,5 / -0,8 mm
- › length: ± 0,14 - 0,52 mm
- › thickness: ± 0,20 mm

» General properties

- › Type: MXL
- › Pitch: 2,032 mm
- › Material: thermoset polyurethane, 87° ShA
- › Color: light grey
- › Cord: steel (special cords on request)

Width

Standard width [mm]	3,2	4,8	6,4	7,9	9,6	12,7
Width code	012	019	025	031	037	050

Available dimensions

Length code	Length [mm]	Teeth number	max. Width [mm]
55	111,76	55	100
57	115,82	57	100
60	121,92	60	120
70	142,24	70	100
72	146,30	72	270
75	152,40	75	120
76	154,43	76	100
79	160,53	79	100
80	162,56	80	300
82	166,62	82	100
88	178,82	88	240
91	184,91	91	240
92	186,94	92	100
96	195,07	96	300
101	205,23	101	100
102	207,26	102	300
103	209,30	103	300
105	213,36	105	300
110	223,52	110	300
114	231,65	114	100
118	239,78	118	300
120	243,84	120	300
130	264,16	130	100

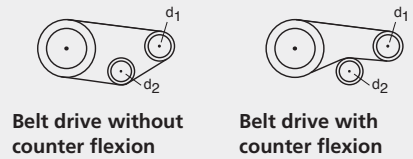
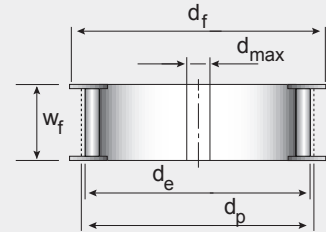
Available dimensions

Length code	Length [mm]	Teeth number	max. Width [mm]
132	268,22	132	100
135	274,32	135	300
140	284,48	140	300
145	294,64	145	300
150	304,80	150	300
155	314,96	155	300
175	355,60	175	100
190	386,08	190	300
200	406,40	200	300
221	449,07	221	300
256	520,19	256	300
280	568,96	280	300
285	579,12	285	300
308	625,86	308	300
332	674,62	332	100
352	715,26	352	270
360	731,52	360	270
395	802,64	395	300
405	822,96	405	270
412	837,18	412	270
432	877,82	432	300
454	922,53	454	300
485	985,52	485	300

Pulleys PU Moulded MXL steel cord

Table of belt widths						
Timing belt width Code	012	019	025	031	037	050
Timing belt width [mm] w_{fb}	3,2	4,8	6,35	7,94	9,53	12,7
Pulley width [mm] w_f	6	9	10	12	14	17

Requirements at pulleys			
		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_1	15	18
minimum pulley diameter [mm]	d_1	9,19	11,13
diameter of idler roller [mm]	d_2	15,00	15,00



Technical data					
number of teeth t_1	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_1 [mm]	max. bore d_{max} [mm]	
15	9,19	9,70	13	3,5	
16	9,84	10,35	13	3,5	
17	10,49	11,00	14	4,0	
18	11,13	11,64	15	4,0	
19	11,78	12,29	15	5,0	
20	12,43	12,94	16	5,0	
21	13,07	13,58	17	6,0	
22	13,72	14,23	17	6,0	
23	14,37	14,88	18	8,0	
24	15,01	15,52	19	8,0	
25	15,66	16,17	19	9,0	
26	16,31	16,82	20	9,0	
27	16,95	17,46	21	10,0	
28	17,60	18,11	21	10,0	
29	18,25	18,76	22	12,0	
30	18,89	19,40	22	12,0	
31	19,54	20,05	23	12,0	
32	20,19	20,70	24	13,0	
33	20,83	21,34	24	13,0	
34	21,48	21,99	25	13,0	
35	22,13	22,64	26	14,0	
36	22,78	23,29	26	14,0	
37	23,42	23,93	27	14,0	
38	24,07	24,58	28	16,0	
39	24,72	25,23	28	16,0	
40	25,36	25,87	29	16,0	
41	26,01	26,52	30	18,0	
42	26,66	27,17	30	18,0	
43	27,30	27,81	31	18,0	
44	27,95	28,46	32	18,0	
45	28,60	29,11	32	20,0	
46	29,24	29,75	33	20,0	
47	29,89	30,40	33	21,0	
48	30,54	31,05	34	21,0	
49	31,18	31,69	35	21,0	
50	31,83	32,34	35	22,0	

Technical data					
number of teeth t_1	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_1 [mm]	max. bore d_{max} [mm]	
51	32,48	32,99	36	22,0	
52	33,12	33,63	37	23,0	
53	33,77	34,28	37	23,0	
54	34,42	34,93	38	24,0	
55	35,06	35,57	39	24,0	
56	35,71	36,22	39	24,0	
57	36,36	36,87	40	25,0	
58	37,01	37,51	41	25,0	
59	37,65	38,16	41	26,0	
60	38,30	38,81	42	26,0	
61	38,95	39,46	43	28,0	
62	39,59	40,10	43	28,0	
63	40,24	40,75	44	28,0	
64	40,89	41,40	44	28,0	
65	41,53	42,04	45	30,0	
66	42,18	42,69	46	32	
67	42,83	43,34	46	32	
68	43,47	43,98	47	34	
69	44,12	44,63	48	34	
70	44,77	45,28	48	36	
71	45,41	45,92	49	36	
72	46,06	46,57	50	36	
73	46,71	47,22	50	38	
74	47,35	47,86	51	38	
75	48,00	48,51	52	38	
76	48,65	49,16	52	38	
77	49,29	49,80	53	40	
78	49,94	50,45	54	40	
79	50,59	51,01	54	40	
80	51,23	51,74	55	41	
81	51,88	52,39	55	41	
82	52,53	53,04	56	41	
83	53,17	53,68	57	42	
84	53,82	54,33	57	42	
85	54,47	54,98	58	44	


Technical data					
number of teeth t_1	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_1 [mm]	max. bore d_{max} [mm]	
86	55,12	55,63	59	44	
87	55,76	56,27	59	46	
88	56,41	56,92	60	46	
89	57,06	57,57	61	46	
90	57,70	58,21	61	48	
91	58,35	58,86	62	48	
92	59,00	59,51	63	48	
93	59,64	60,15	63	50	
94	60,29	60,80	64	50	
95	60,94	61,45	64	50	
96	61,58	62,09	65	52	
97	62,23	62,74	66	52	
98	62,88	63,39	66	52	
99	63,52	64,03	67	54	
100	64,17	64,68	68	54	
101	64,82	65,33	68	54	
102	65,46	65,97	69	56	
103	66,11	66,62	70	56	
104	66,76	67,27	70	56	
105	67,40	67,91	71	58	
106	68,05	68,56	72	58	
107	68,70	69,21	72	58	
108	69,35	69,86	73	60	
109	69,99	70,50	74	60	
110	70,64	71,15	74	60	
111	71,29	71,80	75	62	
112	71,93	72,44	75	62	
113	72,58	73,09	76	62	
114	73,23	73,74	77	64	
115	73,87	74,38	77	64	
116	74,52	75,03	78	64	
117	75,17	75,68	79	66	
118	75,81	76,32	79	66	
119	76,46	76,97	80	66	
120	77,11	77,62	81	66	


Power Rating Table

PU Moulded MXL steel cord

Technical data – Power in watt per tooth in mesh and per mm belt width – Max. teeth in mesh = 15

n1 \ t1	10	11	12	13	14	15	16	17	18	19
600	0,137	0,15	0,164	0,177	0,191	0,205	0,218	0,232	0,246	0,259
800	0,172	0,189	0,206	0,223	0,24	0,257	0,275	0,292	0,309	0,326
1000	0,204	0,225	0,245	0,266	0,286	0,307	0,327	0,348	0,368	0,388
1200	0,235	0,259	0,283	0,306	0,33	0,353	0,377	0,4	0,424	0,447
1400	0,265	0,292	0,318	0,345	0,371	0,398	0,424	0,451	0,477	0,504
1600	0,293	0,323	0,352	0,381	0,411	0,44	0,469	0,498	0,528	0,557
1800	0,32	0,352	0,384	0,416	0,448	0,48	0,513	0,545	0,577	0,609
2000	0,346	0,381	0,416	0,45	0,485	0,52	0,554	0,589	0,624	0,658
2200	0,372	0,409	0,446	0,483	0,52	0,557	0,595	0,632	0,669	0,706
2400	0,396	0,436	0,475	0,515	0,554	0,594	0,634	0,673	0,713	0,752
2600	0,42	0,462	0,503	0,545	0,587	0,629	0,671	0,713	0,755	0,797
2800	0,442	0,487	0,531	0,575	0,619	0,664	0,708	0,752	0,796	0,841
3000	0,465	0,511	0,558	0,604	0,651	0,697	0,744	0,79	0,837	0,883
3200	0,486	0,535	0,584	0,632	0,681	0,73	0,778	0,827	0,876	0,924
3400	0,508	0,558	0,609	0,66	0,711	0,761	0,812	0,863	0,914	0,964
3600	0,528	0,581	0,634	0,687	0,739	0,792	0,845	0,898	0,951	1,003
3800	0,548	0,603	0,658	0,713	0,767	0,822	0,877	0,932	0,987	1,042
4000	0,568	0,625	0,681	0,738	0,795	0,852	0,908	0,965	1,022	1,079
4200	0,587	0,646	0,704	0,763	0,822	0,88	0,939	0,998	1,057	1,115
4400	0,606	0,666	0,727	0,787	0,848	0,909	0,969	1,03	1,09	1,151
4600	0,624	0,686	0,749	0,811	0,874	0,936	0,998	1,061	1,123	1,186
4800	0,642	0,706	0,77	0,834	0,899	0,963	1,027	1,091	1,155	1,22
5000	0,659	0,725	0,791	0,857	0,923	0,989	1,055	1,121	1,187	1,253
5200	0,677	0,744	0,812	0,88	0,947	1,015	1,083	1,15	1,218	1,286
5400	0,693	0,763	0,832	0,901	0,971	1,04	1,11	1,179	1,248	1,318
5600	0,71	0,781	0,852	0,923	0,994	1,065	1,136	1,207	1,278	1,349
5800	0,726	0,799	0,871	0,944	1,017	1,089	1,162	1,234	1,307	1,38
6000	0,742	0,816	0,89	0,965	1,039	1,113	1,187	1,261	1,336	1,41
6200	0,758	0,833	0,909	0,985	1,061	1,136	1,212	1,288	1,364	1,439
6400	0,773	0,85	0,927	1,005	1,082	1,159	1,237	1,314	1,391	1,468
6600	0,788	0,867	0,945	1,024	1,103	1,182	1,261	1,339	1,418	1,497
6800	0,803	0,883	0,963	1,043	1,124	1,204	1,284	1,364	1,445	1,525
7000	0,817	0,899	0,98	1,062	1,144	1,226	1,307	1,389	1,471	1,552
7500	0,852	0,937	1,022	1,108	1,193	1,278	1,363	1,448	1,534	1,619
8000	0,886	0,974	1,063	1,151	1,24	1,328	1,417	1,505	1,594	1,683
8500	0,918	1,009	1,101	1,193	1,285	1,376	1,468	1,56	1,652	1,744
9000	0,948	1,043	1,138	1,233	1,328	1,423	1,518	1,612	1,707	1,802
9500	0,978	1,076	1,174	1,271	1,369	1,467	1,565	1,663	1,76	1,858
10000	1,006	1,107	1,208	1,308	1,409	1,509	1,61	1,711	1,811	1,912
11000	1,06	1,166	1,272	1,378	1,484	1,59	1,695	1,801	1,907	2,013
12000	1,109	1,22	1,331	1,442	1,552	1,663	1,774	1,885	1,996	2,107
13000	1,154	1,27	1,385	1,501	1,616	1,732	1,847	1,962	2,078	2,193
14000	1,196	1,316	1,436	1,555	1,675	1,795	1,914	2,034	2,154	2,273
15000	1,235	1,359	1,482	1,606	1,729	1,853	1,976	2,1	2,223	2,347

 Reduction in belt life is expected

 Critical pulley speed - Balanced pulley required

n1: r.p.m. of pulley

z1: number of teeth on pulley

Interpolation formulars are shown in the chapter calculations (page 140)

Power Rating Table

PU Moulded MXL steel cord

Technical data – Power in watt per tooth in mesh and per mm belt width – Max. teeth in mesh = 15

n1 \ t1	20	22	24	26	28	30	32	34	36	38	40
600	0,273	0,3	0,328	0,355	0,382	0,41	0,437	0,464	0,491	0,519	0,546
800	0,343	0,378	0,412	0,446	0,481	0,515	0,549	0,584	0,618	0,652	0,686
1000	0,409	0,45	0,491	0,532	0,573	0,613	0,654	0,695	0,736	0,777	0,818
1200	0,471	0,518	0,565	0,612	0,659	0,706	0,754	0,801	0,848	0,895	0,942
1400	0,53	0,583	0,636	0,689	0,742	0,795	0,848	0,901	0,954	1,007	1,06
1600	0,586	0,645	0,704	0,762	0,821	0,88	0,938	0,997	1,056	1,114	1,173
1800	0,641	0,705	0,769	0,833	0,897	0,961	1,025	1,089	1,153	1,217	1,281
2000	0,693	0,762	0,831	0,901	0,97	1,039	1,109	1,178	1,247	1,316	1,386
2200	0,743	0,818	0,892	0,966	1,04	1,115	1,189	1,263	1,338	1,412	1,486
2400	0,792	0,871	0,95	1,03	1,109	1,188	1,267	1,346	1,425	1,505	1,584
2600	0,839	0,923	1,007	1,091	1,175	1,259	1,343	1,427	1,51	1,594	1,678
2800	0,885	0,973	1,062	1,15	1,239	1,327	1,416	1,504	1,593	1,681	1,77
3000	0,93	1,022	1,115	1,208	1,301	1,394	1,487	1,58	1,673	1,766	1,859
3200	0,973	1,07	1,167	1,265	1,362	1,459	1,557	1,654	1,751	1,848	1,946
3400	1,015	1,117	1,218	1,32	1,421	1,523	1,624	1,726	1,827	1,929	2,03
3600	1,056	1,162	1,268	1,373	1,479	1,584	1,69	1,796	1,901	2,007	2,113
3800	1,096	1,206	1,316	1,425	1,535	1,645	1,754	1,864	1,974	2,083	2,193
4000	1,136	1,249	1,363	1,476	1,59	1,703	1,817	1,931	2,044	2,158	2,271
4200	1,174	1,291	1,409	1,526	1,643	1,761	1,878	1,996	2,113	2,23	2,348
4400	1,211	1,332	1,454	1,575	1,696	1,817	1,938	2,059	2,18	2,302	2,423
4600	1,248	1,373	1,498	1,622	1,747	1,872	1,997	2,122	2,246	2,371	2,496
4800	1,284	1,412	1,541	1,669	1,797	1,926	2,054	2,182	2,311	2,439	2,568
5000	1,319	1,451	1,583	1,715	1,846	1,978	2,11	2,242	2,374	2,506	2,638
5200	1,353	1,489	1,624	1,759	1,895	2,03	2,165	2,301	2,436	2,571	2,706
5400	1,387	1,526	1,664	1,803	1,942	2,08	2,219	2,358	2,496	2,635	2,774
5600	1,42	1,562	1,704	1,846	1,988	2,13	2,272	2,414	2,556	2,698	2,84
5800	1,452	1,597	1,743	1,888	2,033	2,178	2,324	2,469	2,614	2,759	2,905
6000	1,484	1,632	1,781	1,929	2,078	2,226	2,374	2,523	2,671	2,82	2,968
6200	1,515	1,667	1,818	1,97	2,121	2,273	2,424	2,576	2,727	2,879	3,03
6400	1,546	1,7	1,855	2,009	2,164	2,319	2,473	2,628	2,782	2,937	3,091
6600	1,576	1,733	1,891	2,048	2,206	2,364	2,521	2,679	2,836	2,994	3,151
6800	1,605	1,766	1,926	2,087	2,247	2,408	2,568	2,729	2,889	3,05	3,21
7000	1,634	1,797	1,961	2,124	2,288	2,451	2,614	2,778	2,941	3,105	3,268
7500	1,704	1,874	2,045	2,215	2,386	2,556	2,727	2,897	3,067	3,238	3,408
8000	1,771	1,948	2,125	2,302	2,48	2,657	2,834	3,011	3,188	3,365	3,542
8500	1,835	2,019	2,202	2,386	2,569	2,753	2,937	3,12	3,304	3,487	3,671
9000	1,897	2,087	2,276	2,466	2,656	2,845	3,035	3,225	3,414	3,604	3,794
9500	1,956	2,152	2,347	2,543	2,738	2,934	3,13	3,325	3,521	3,716	3,912
10000	2,013	2,214	2,415	2,616	2,818	3,019	3,22	3,421	3,623	3,824	4,025
11000	2,119	2,331	2,543	2,755	2,967	3,179	3,391	3,603	3,815	4,027	4,239
12000	2,218	2,44	2,661	2,883	3,105	3,327	3,549	3,77	3,992	4,214	4,436
13000	2,309	2,54	2,771	3,001	3,232	3,463	3,694	3,925	4,156	4,387	4,618
14000	2,393	2,632	2,871	3,111	3,35	3,589	3,829	4,068	4,307	4,546	4,786
15000	2,47	2,717	2,965	3,212	3,459	3,706	3,953	4,2	4,447	4,694	4,941

Reduction in belt life is expected

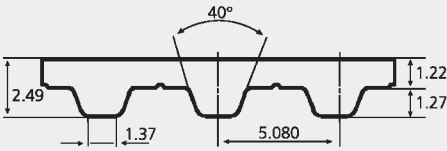
Critical pulley speed - Balanced pulley required

n1: r.p.m. of pulley

z1: number of teeth on pulley

Interpolation formulars are shown in the chapter calculations (page 140)

PU Linear/Torque XL steel cord

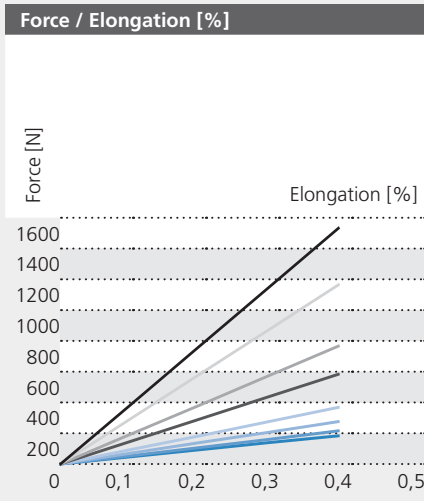


» Standard tolerances

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» General properties

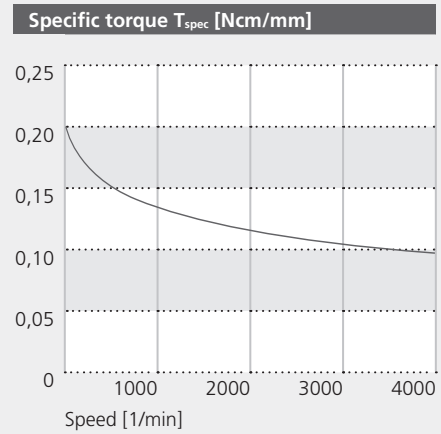
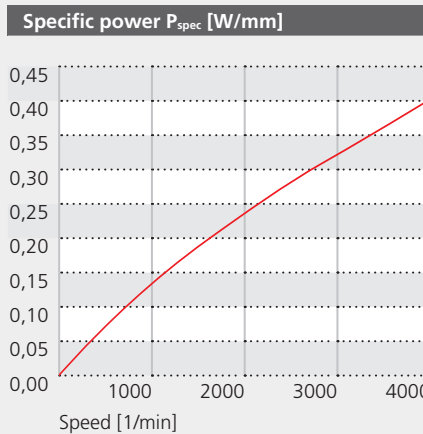
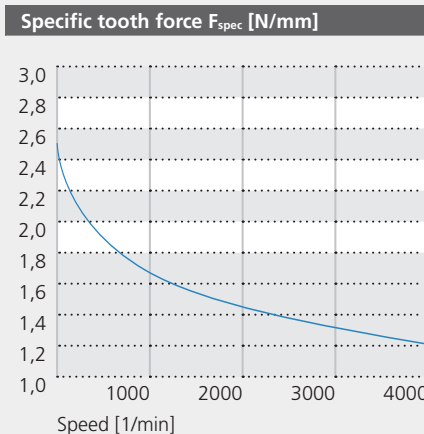
- › inch pitch 1/5" = 5,08 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 101.6 mm (PU Linear)
- › max. width up to 152.4 mm (PU Torque)
- › min. length for jointed belt (W) 498 mm
- › length between 1,503 to 22,768 mm (PU Torque)
- › max. speed 10.000 rpm



Technical data		allowable tensile load	allowable tensile load	Breaking load	spec. spring ratio	Belt weight per metre
Standard-belt width w_{tb} [mm]	Graph	Typ $L F_{ai}$ [N]	Typ $T F_{ai}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
025 / 6,35	■	180	90	750	45000	0,015
031 / 7,94	■	210	105	875	52500	0,019
037 / 9,53	■	270	135	1125	67500	0,023
050 / 12,7	■	360	180	1500	90000	0,031
075 / 19,1	■	570	285	2375	142500	0,046
100 / 25,4	■	750	375	3125	187500	0,061
150 / 38,1	■	1140	570	4750	285000	0,092
200 / 50,8	■	1500	750	6250	375000	0,122

Specific tooth force/power/torque*																			
Speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]	■	2,510	2,420	2,366	2,321	2,263	2,193	2,124	2,022	1,942	1,877	1,753	1,66	1,587	1,526	1,474	1,428	1,288	1,187
Specific power P_{spec} [W/mm]	■	0,000	0,005	0,010	0,015	0,019	0,028	0,036	0,051	0,066	0,079	0,111	0,141	0,168	0,194	0,218	0,242	0,327	0,402
Specific torque T_{spec} [Ncm/mm]	■	0,203	0,196	0,191	0,188	0,183	0,177	0,172	0,163	0,157	0,152	0,142	0,134	0,128	0,123	0,119	0,115	0,104	0,096

* max. force/power/torque per tooth in mesh and per mm belt width



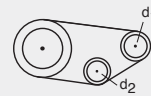
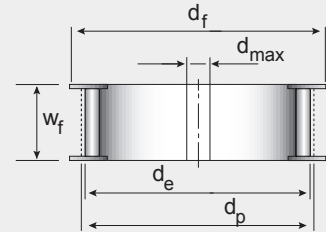
Pulleys PU Linear/Torque XL steel cord

Table of belt widths

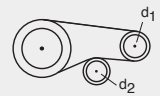
Timing belt width Code	025	031	037	050	075	100	150	200
Timing belt width [mm] w_b	6,35	7,94	9,53	12,7	19,1	25,4	38,1	50,8
Pulley width [mm] w_i	10	12	14	17	24	31	43	57

Requirements at pulleys

		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_1	10	15
minimum pulley diameter [mm]	d_1	15,66	23,75
diameter of idler roller [mm]	d_2	30,00	30,00



Belt drive without counter flexion



Belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
10	15,66	16,17	20	7
11	17,28	17,79	22	8
12	18,89	19,40	23	11
13	20,51	21,02	25	13
14	22,13	22,64	27	14
15	23,75	24,26	28	14
16	25,36	25,87	30	18
17	26,98	27,49	32	18
18	28,60	29,11	33	21
19	30,21	30,72	35	22
20	31,83	32,34	36	23
21	33,45	33,96	38	25
22	35,06	35,57	40	26
23	36,68	37,19	41	26
24	38,30	38,81	43	27
25	39,92	40,43	44	29
26	41,53	42,04	46	31
27	43,15	43,66	48	32
28	44,77	45,28	49	34
29	46,38	46,89	51	36
30	48,00	48,51	53	37
31	49,62	50,13	54	39
32	51,23	51,74	56	40
33	52,85	53,36	57	42
34	54,47	54,98	59	44
35	56,09	56,60	61	46
36	57,70	58,21	62	46
37	59,32	59,83	64	48
38	60,94	61,45	65	48
39	62,55	63,06	67	50
40	64,17	64,68	69	54
41	65,79	66,30	70	54
42	67,40	67,91	72	54
43	69,02	69,53	74	56
44	70,64	71,15	75	57
45	72,26	72,77	77	60
46	73,87	74,38	78	62

Standard

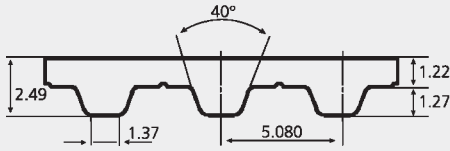
Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
47	75,49	76,00	80	62
48	77,11	77,62	82	64
49	78,72	79,23	83	66
50	80,34	80,85	85	68
51	81,96	82,47	87	70
52	83,57	84,08	88	72
53	85,19	85,70	90	72
54	86,81	87,32	91	73
55	88,43	88,94	93	75
56	90,04	90,55	95	78
57	91,66	92,17	96	79
58	93,28	93,79	98	79
59	94,89	95,40	99	80
60	96,51	97,02	101	82
61	98,13	98,64	103	84
62	99,74	100,25	104	86
63	101,36	101,87	106	86
64	102,98	103,49	108	89
65	104,60	105,11	109	89
66	106,21	106,72	111	92
67	107,83	108,34	112	95
68	109,45	109,96	114	95
69	111,06	111,57	116	97
70	112,68	113,19	117	98
71	114,30	114,81	119	98
72	115,92	116,43	120	101
73	117,53	118,04	122	103
74	119,15	119,66	124	105
75	120,77	121,28	125	108
76	122,38	122,89	127	108
77	124,00	124,51	129	109
78	125,62	126,13	130	109
79	127,23	127,74	132	110
80	128,85	129,36	133	111
81	130,47	130,98	135	113
82	132,09	132,60	137	113
83	133,70	134,21	138	116

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
84	135,32	135,83	140	116
85	136,94	137,45	141	120
86	138,55	139,06	143	120
87	140,17	140,68	145	123
88	141,79	142,30	146	123
89	143,40	143,91	148	126
90	145,02	145,53	150	126
91	146,64	147,15	151	129
92	148,26	148,77	153	129
93	149,87	150,38	154	132
94	151,49	152,00	156	134
95	153,11	153,62	158	134
96	154,72	155,23	159	136
97	156,34	156,85	161	139
98	157,96	158,47	163	142
99	159,57	160,08	164	142
100	161,19	161,70	166	145
101	162,81	163,32	167	145
102	164,43	164,94	169	147
103	166,04	166,55	171	147
104	167,66	168,17	172	150
105	169,28	169,79	174	150
106	170,89	171,40	175	152
107	172,51	173,02	177	155
108	174,13	174,64	179	155
109	175,74	176,25	180	158
110	177,36	177,87	182	158
111	178,98	179,49	184	161
112	180,60	181,11	185	164
113	182,21	182,72	187	164
114	183,83	184,34	188	167
115	185,45	185,96	190	167
116	187,06	187,57	192	170
117	188,68	189,19	193	170
118	190,30	190,81	195	173
119	191,91	192,42	196	173
120	193,53	194,04	198	175

PU Linear XL Aramid cord

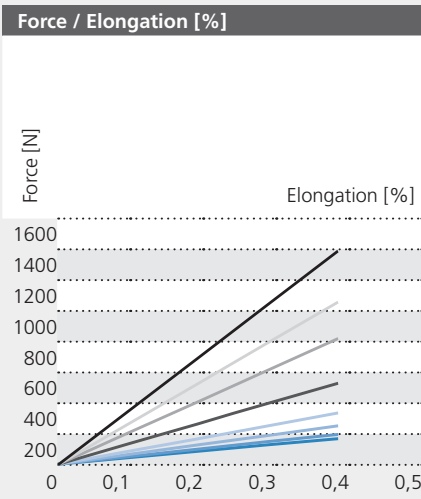


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

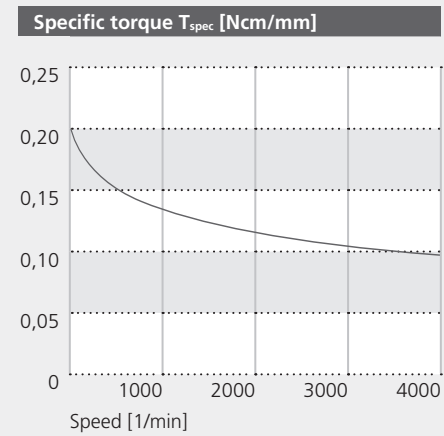
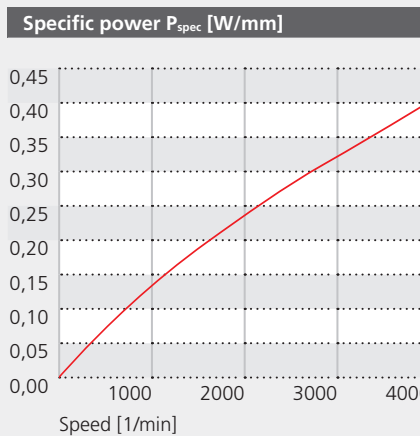
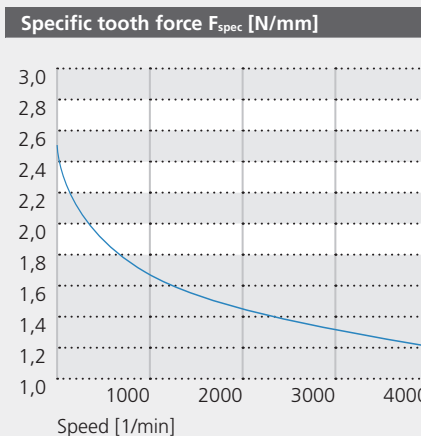
- › inch pitch 1/5" = 5,08 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 101.6 mm
- › min. length for jointed belt (W) 498 mm
- › max. speed 10.000 rpm



Technical data		allowable tensile load Typ $L F_{all}$ [N]	allowable tensile load Typ $W F_{all}$ [N]	Breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	Belt weight per metre m [kg/m]
Standard-belt width w_{tb} [mm]	Graph					
025 / 6,35	■	250	125	1250	40500	0,011
031 / 7,94	■	320	160	1590	47250	0,014
037 / 9,53	■	410	205	1900	60750	0,017
050 / 12,7	■	500	250	2500	81000	0,023
075 / 19,1	■	780	390	3700	128250	0,034
100 / 25,4	■	1000	500	5000	198750	0,046
150 / 38,1	■	1500	750	7500	256500	0,068
200 / 50,8	■	2000	1000	10000	337500	0,091

Specific tooth force/power/torque*																			
Speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]	■	2,510	2,420	2,366	2,321	2,263	2,193	2,124	2,022	1,942	1,877	1,753	1,66	1,587	1,526	1,474	1,428	1,288	1,187
Specific power P_{spec} [W/mm]	■	0,000	0,005	0,010	0,015	0,019	0,028	0,036	0,051	0,066	0,079	0,111	0,141	0,168	0,194	0,218	0,242	0,327	0,402
Specific torque T_{spec} [Ncm/mm]	■	0,203	0,196	0,191	0,188	0,183	0,177	0,172	0,163	0,157	0,152	0,142	0,134	0,128	0,123	0,119	0,115	0,104	0,096

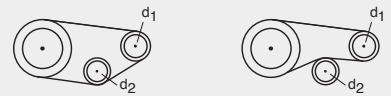
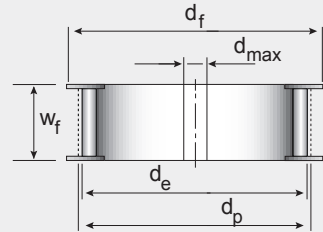
* max. force/power/torque per tooth in mesh and per mm belt width



XL Aramid

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Pulleys PU Linear XL Aramid cord



Belt drive without counter flexion

Belt drive with counter flexion

Table of belt widths								
Timing belt width Code	025	031	037	050	075	100	150	200
Timing belt width [mm] w_b	6,35	7,94	9,53	12,7	19,1	25,4	38,1	50,8
Pulley width [mm] w_i	10	12	14	17	24	31	43	57

Requirements at pulleys			
		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_i	10	15
minimum pulley diameter [mm]	d_i	15,66	23,75
diameter of idler roller [mm]	d_i	25,00	25,00

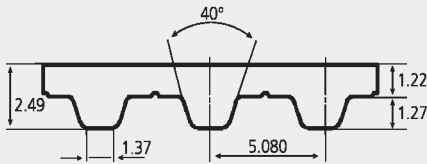
Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
10	15,66	16,17	20	7	
11	17,28	17,79	22	8	
12	18,89	19,40	23	11	
13	20,51	21,02	25	13	
14	22,13	22,64	27	14	
15	23,75	24,26	28	14	
16	25,36	25,87	30	18	
17	26,98	27,49	32	18	
18	28,60	29,11	33	21	
19	30,21	30,72	35	22	
20	31,83	32,34	36	23	
21	33,45	33,96	38	25	
22	35,06	35,57	40	26	
23	36,68	37,19	41	26	
24	38,30	38,81	43	27	
25	39,92	40,43	44	29	
26	41,53	42,04	46	31	
27	43,15	43,66	48	32	
28	44,77	45,28	49	34	
29	46,38	46,89	51	36	
30	48,00	48,51	53	37	
31	49,62	50,13	54	39	
32	51,23	51,74	56	40	
33	52,85	53,36	57	42	
34	54,47	54,98	59	44	
35	56,09	56,60	61	46	
36	57,70	58,21	62	46	
37	59,32	59,83	64	48	
38	60,94	61,45	65	48	
39	62,55	63,06	67	50	
40	64,17	64,68	69	54	
41	65,79	66,30	70	54	
42	67,40	67,91	72	54	
43	69,02	69,53	74	56	
44	70,64	71,15	75	57	
45	72,26	72,77	77	60	
46	73,87	74,38	78	62	

Standard

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
47	75,49	76,00	80	62	
48	77,11	77,62	82	64	
49	78,72	79,23	83	66	
50	80,34	80,85	85	68	
51	81,96	82,47	87	70	
52	83,57	84,08	88	72	
53	85,19	85,70	90	72	
54	86,81	87,32	91	73	
55	88,43	88,94	93	75	
56	90,04	90,55	95	78	
57	91,66	92,17	96	79	
58	93,28	93,79	98	79	
59	94,89	95,40	99	80	
60	96,51	97,02	101	82	
61	98,13	98,64	103	84	
62	99,74	100,25	104	86	
63	101,36	101,87	106	86	
64	102,98	103,49	108	89	
65	104,60	105,11	109	89	
66	106,21	106,72	111	92	
67	107,83	108,34	112	95	
68	109,45	109,96	114	95	
69	111,06	111,57	116	97	
70	112,68	113,19	117	98	
71	114,30	114,81	119	98	
72	115,92	116,43	120	101	
73	117,53	118,04	122	103	
74	119,15	119,66	124	105	
75	120,77	121,28	125	108	
76	122,38	122,89	127	108	
77	124,00	124,51	129	109	
78	125,62	126,13	130	109	
79	127,23	127,74	132	110	
80	128,85	129,36	133	111	
81	130,47	130,98	135	113	
82	132,09	132,60	137	113	
83	133,70	134,21	138	116	

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
84	135,32	135,83	140	116	
85	136,94	137,45	141	120	
86	138,55	139,06	143	120	
87	140,17	140,68	145	123	
88	141,79	142,30	146	123	
89	143,40	143,91	148	126	
90	145,02	145,53	150	126	
91	146,64	147,15	151	129	
92	148,26	148,77	153	129	
93	149,87	150,38	154	132	
94	151,49	152,00	156	134	
95	153,11	153,62	158	134	
96	154,72	155,23	159	136	
97	156,34	156,85	161	139	
98	157,96	158,47	163	142	
99	159,57	160,08	164	142	
100	161,19	161,70	166	145	
101	162,81	163,32	167	145	
102	164,43	164,94	169	147	
103	166,04	166,55	171	147	
104	167,66	168,17	172	150	
105	169,28	169,79	174	150	
106	170,89	171,40	175	152	
107	172,51	173,02	177	155	
108	174,13	174,64	179	155	
109	175,74	176,25	180	158	
110	177,36	177,87	182	158	
111	178,98	179,49	184	161	
112	180,60	181,11	185	164	
113	182,21	182,72	187	164	
114	183,83	184,34	188	167	
115	185,45	185,96	190	167	
116	187,06	187,57	192	170	
117	188,68	189,19	193	170	
118	190,30	190,81	195	173	
119	191,91	192,42	196	173	
120	193,53	194,04	198	175	

PU Moulded XL steel cord



» Standard tolerances

- › width: + 0,5 / -0,8 mm
- › length: ± 0,14 - 0,52 mm
- › thickness: ± 0,25 mm

» General properties

- › Type: XL
- › Pitch: inch pitch 1/5" = 5.08 mm
- › Material: thermoset polyurethane, 87° ShA
- › Color: light grey
- › Cord: steel (special cords on request)

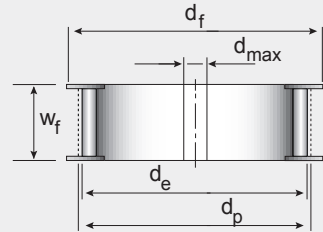
Width

Standard width [mm]	6,4	7,9	9,5	12,7	19,1	25,4	38,1	50,8
Width code	025	031	037	050	075	100	150	200

Available dimensions

Length code	Length [mm]	Teeth number	max. Width [mm]
60	152,40	30	300
70	177,80	35	300
76	193,04	38	300
80	203,20	40	300
90	228,60	45	300
100	254,00	50	300
110	279,40	55	300
120	304,80	60	300
130	330,20	65	300
134	340,36	67	300
140	355,60	70	300
150	381,00	75	300
160	406,40	80	300
170	431,80	85	300
180	457,20	90	300
190	482,60	95	300
194	492,76	97	300
200	508,00	100	300
210	533,40	105	300
220	558,80	110	300
230	584,20	115	300
240	609,60	120	300
250	635,00	125	300
260	660,40	130	300
270	685,80	135	300
288	731,52	144	300
290	736,60	145	300
300	762,00	150	300
356	904,24	178	300
414	1051,56	207	300
450	1143,00	225	300
566	1437,64	283	300

Pulleys PU Moulded XL steel cord



Belt drive without counter flexion

Belt drive with counter flexion

Table of belt widths								
Timing belt width Code	025	031	037	050	075	100	150	200
Timing belt width [mm] w_f	6,35	7,94	9,53	12,7	19,1	25,4	38,1	50,8
Pulley width [mm] w_f	10	12	14	17	24	31	43	57

Requirements at pulleys			
		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_1	10	15
minimum pulley diameter [mm]	d_1	15,66	23,75
diameter of idler roller [mm]	d_2	30,00	30,00

Technical data				
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_1 [mm]	max. bore d_{max} [mm]
10	15,66	16,17	20	7
11	17,28	17,79	22	8
12	18,89	19,40	23	11
13	20,51	21,02	25	13
14	22,13	22,64	27	14
15	23,75	24,26	28	14
16	25,36	25,87	30	18
17	26,98	27,49	32	18
18	28,60	29,11	33	21
19	30,21	30,72	35	22
20	31,83	32,34	36	23
21	33,45	33,96	38	25
22	35,06	35,57	40	26
23	36,68	37,19	41	26
24	38,30	38,81	43	27
25	39,92	40,43	44	29
26	41,53	42,04	46	31
27	43,15	43,66	48	32
28	44,77	45,28	49	34
29	46,38	46,89	51	36
30	48,00	48,51	53	37
31	49,62	50,13	54	39
32	51,23	51,74	56	40
33	52,85	53,36	57	42
34	54,47	54,98	59	44
35	56,09	56,60	61	46
36	57,70	58,21	62	46
37	59,32	59,83	64	48
38	60,94	61,45	65	48
39	62,55	63,06	67	50
40	64,17	64,68	69	54
41	65,79	66,30	70	54
42	67,40	67,91	72	54
43	69,02	69,53	74	56
44	70,64	71,15	75	57
45	72,26	72,77	77	60
46	73,87	74,38	78	62

Technical data				
Zahnezahl t [-]	Außen- \varnothing d_e [mm]	Wirk- \varnothing d_p [mm]	\varnothing mit Bordscheibe d_1 [mm]	max. mögl. Bohr. d_{max} [mm]
47	75,49	76,00	80	62
48	77,11	77,62	82	64
49	78,72	79,23	83	66
50	80,34	80,85	85	68
51	81,96	82,47	87	70
52	83,57	84,08	88	72
53	85,19	85,70	90	72
54	86,81	87,32	91	73
55	88,43	88,94	93	75
56	90,04	90,55	95	78
57	91,66	92,17	96	79
58	93,28	93,79	98	79
59	94,89	95,40	99	80
60	96,51	97,02	101	82
61	98,13	98,64	103	84
62	99,74	100,25	104	86
63	101,36	101,87	106	86
64	102,98	103,49	108	89
65	104,60	105,11	109	89
66	106,21	106,72	111	92
67	107,83	108,34	112	95
68	109,45	109,96	114	95
69	111,06	111,57	116	97
70	112,68	113,19	117	98
71	114,30	114,81	119	98
72	115,92	116,43	120	101
73	117,53	118,04	122	103
74	119,15	119,66	124	105
75	120,77	121,28	125	108
76	122,38	122,89	127	108
77	124,00	124,51	129	109
78	125,62	126,13	130	109
79	127,23	127,74	132	110
80	128,85	129,36	133	111
81	130,47	130,98	135	113
82	132,09	132,60	137	113
83	133,70	134,21	138	116

Technical data				
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_1 [mm]	max. bore d_{max} [mm]
84	135,32	135,83	140	116
85	136,94	137,45	141	120
86	138,55	139,06	143	120
87	140,17	140,68	145	123
88	141,79	142,30	146	123
89	143,40	143,91	148	126
90	145,02	145,53	150	126
91	146,64	147,15	151	129
92	148,26	148,77	153	129
93	149,87	150,38	154	132
94	151,49	152,00	156	134
95	153,11	153,62	158	134
96	154,72	155,23	159	136
97	156,34	156,85	161	139
98	157,96	158,47	163	142
99	159,57	160,08	164	142
100	161,19	161,70	166	145
101	162,81	163,32	167	145
102	164,43	164,94	169	147
103	166,04	166,55	171	147
104	167,66	168,17	172	150
105	169,28	169,79	174	150
106	170,89	171,40	175	152
107	172,51	173,02	177	155
108	174,13	174,64	179	155
109	175,74	176,25	180	158
110	177,36	177,87	182	158
111	178,98	179,49	184	161
112	180,60	181,11	185	164
113	182,21	182,72	187	164
114	183,83	184,34	188	167
115	185,45	185,96	190	167
116	187,06	187,57	192	170
117	188,68	189,19	193	170
118	190,30	190,81	195	173
119	191,91	192,42	196	173
120	193,53	194,04	198	175


Standard


Power Rating Table

PU Moulded XL steel cord

Technical data – Power in watt per tooth in mesh and per mm belt width – Max. teeth in mesh = 15

n1 \ t1	10	11	12	13	14	15	16	17	18	19	20	21	22
100	0,16	0,18	0,19	0,21	0,22	0,24	0,26	0,27	0,29	0,3	0,32	0,34	0,35
200	0,29	0,32	0,35	0,38	0,41	0,44	0,47	0,5	0,53	0,56	0,59	0,62	0,64
300	0,42	0,46	0,5	0,54	0,58	0,62	0,67	0,71	0,75	0,79	0,83	0,87	0,92
400	0,53	0,59	0,64	0,69	0,75	0,8	0,85	0,91	0,96	1,01	1,07	1,12	1,17
500	0,65	0,71	0,78	0,84	0,9	0,97	1,03	1,1	1,16	1,23	1,29	1,36	1,42
600	0,75	0,83	0,91	0,98	1,06	1,13	1,21	1,28	1,36	1,43	1,51	1,58	1,66
700	0,86	0,95	1,03	1,12	1,2	1,29	1,38	1,46	1,55	1,63	1,72	1,81	1,89
800	3,96	1,06	1,15	1,25	1,35	1,44	1,54	1,64	1,73	1,83	1,92	2,02	2,12
900	1,06	1,17	1,27	1,38	1,49	1,59	1,7	1,81	1,91	2,02	2,12	2,23	2,34
1000	1,16	1,28	1,39	1,51	1,62	1,74	1,86	1,97	2,09	2,2	2,32	2,44	2,55
1100	1,26	1,38	1,51	1,63	1,76	1,88	2,01	2,14	2,26	2,39	2,51	2,64	2,76
1200	1,35	1,49	1,62	1,76	1,89	2,03	2,16	2,3	2,43	2,57	2,7	2,84	2,97
1300	1,44	1,59	1,73	1,88	2,02	2,17	2,31	2,45	2,6	2,74	2,89	3,03	3,18
1400	1,53	1,69	1,84	2	2,15	2,3	2,46	2,61	2,76	2,92	3,07	3,22	3,38
1500	1,62	1,79	1,95	2,11	2,27	2,44	2,6	2,76	2,92	3,09	3,25	3,41	3,57
1600	1,71	1,88	2,06	2,23	2,4	2,57	2,74	2,91	3,08	3,26	3,43	3,6	3,77
1700	1,8	1,98	2,16	2,34	2,52	2,7	2,88	3,06	3,24	3,42	3,6	3,78	3,96
1800	1,89	2,08	2,27	2,45	2,64	2,83	3,02	3,21	3,4	3,59	3,78	3,96	4,15
1900	1,97	2,17	2,37	2,56	2,76	2,96	3,16	3,35	3,55	3,75	3,95	4,14	4,34
2000	2,06	2,26	2,47	2,67	2,88	3,09	3,29	3,5	3,7	3,91	4,11	4,32	4,53
2200	2,22	2,45	2,67	2,89	3,11	3,33	3,56	3,78	4	4,22	4,45	4,67	4,89
2400	23,9	2,62	2,86	3,1	3,34	3,58	3,82	4,06	4,29	4,53	4,77	5,01	5,25
2600	2,55	2,8	3,05	3,31	3,56	3,82	4,07	4,33	4,58	4,84	5,09	5,34	5,6
2800	2,7	2,97	3,24	3,51	3,78	4,05	4,32	4,59	4,86	5,13	5,4	5,67	5,94
3000	2,86	3,14	3,43	3,71	4	4,28	4,57	4,85	5,14	5,42	5,71	6	6,28
3200	3,01	3,31	3,61	3,91	4,21	4,51	4,81	5,11	5,41	5,71	6,01	6,31	6,61
3400	3,16	3,47	3,79	4,1	4,42	4,73	5,05	5,36	5,68	5,99	6,31	6,63	6,94
3600	3,3	3,63	3,96	4,29	4,62	4,95	5,28	5,61	5,94	6,27	6,6	6,93	7,26
3800	3,45	3,79	4,14	4,48	4,82	5,17	5,51	5,86	6,2	6,55	6,89	7,24	7,58
4000	3,59	3,95	4,31	4,67	5,02	5,38	5,74	6,1	6,46	6,82	7,18	7,54	7,89
4200	3,73	4,1	4,47	4,85	5,22	5,59	5,97	6,34	6,71	7,09	7,46	7,83	8,2
4400	3,87	4,25	4,64	5,03	5,41	5,8	6,19	6,58	6,96	7,35	7,74	8,12	8,51
4600	4	4,41	4,81	5,21	5,61	6,01	6,41	6,81	7,21	7,61	8,01	8,41	8,81
4800	4,14	4,55	4,97	5,38	5,8	6,21	6,62	7,04	7,45	7,87	8,28	8,69	9,11
5000	4,27	4,7	5,13	5,56	5,98	6,41	6,84	7,27	7,69	8,12	8,55	8,98	9,4
5500	4,6	5,06	5,52	5,98	6,44	6,9	7,36	7,82	8,28	8,74	9,2	9,66	10,12
6000	4,92	5,41	5,91	6,4	6,89	7,38	7,87	8,37	8,86	9,35	9,84	10,33	10,83
6500	5,23	5,76	6,28	6,8	7,33	7,85	8,37	8,89	9,42	9,84	10,46	10,99	11,51
7000	5,54	6,09	6,64	7,2	7,75	8,3	8,86	9,41	9,97	10,52	11,07	11,63	12,18
7500	5,83	6,42	7	7,58	8,17	8,75	9,33	9,92	10,5	11,08	11,67	12,25	12,83
8000	6,12	6,74	7,35	7,96	8,57	9,19	9,8	10,41	11,02	11,64	12,25	12,86	13,47
8500	6,41	7,05	7,69	8,33	8,97	9,61	10,26	10,9	11,54	12,18	12,82	13,46	14,1
9000	6,69	7,36	8,03	8,7	9,36	10,03	10,7	11,37	12,04	12,71	13,38	14,05	14,72
9500	6,96	7,66	8,36	9,05	9,75	10,44	11,14	11,84	12,53	13,23	13,93	14,62	15,32
10000	7,23	7,96	8,68	9,4	10,13	10,85	11,57	12,29	13,02	13,74	14,46	15,19	15,91

 Reduction in belt life is expected

 Critical pulley speed - Balanced pulley required

n1: r.p.m. of pulley

z1: number of teeth on pulley

Interpolation formulars are shown in the chapter calculations (page 140)

Power Rating Table

PU Moulded XL steel cord

Technical data – Power in watt per tooth in mesh and per mm belt width – Max. teeth in mesh = 15

n1 \ t1	23	24	25	26	27	28	30	32	36	40	48	60	72
100	0,37	0,38	0,4	0,42	0,43	0,45	0,48	0,51	0,57	0,64	0,77	0,96	1,15
200	0,67	0,7	0,73	0,76	0,79	0,82	0,88	0,94	1,06	1,17	1,41	1,76	2,11
300	0,96	1	1,04	1,08	1,12	1,17	1,25	1,33	1,5	1,67	2	2,5	3
400	1,23	1,28	1,33	1,39	1,44	1,49	1,6	1,71	1,92	2,13	2,56	3,2	3,84
500	1,49	1,55	1,61	1,68	1,74	1,81	1,94	2,07	2,33	2,58	3,1	3,88	4,65
600	1,73	1,81	1,89	1,96	2,04	2,11	2,26	2,41	2,72	3,02	3,62	4,53	5,43
700	1,98	2,06	2,15	2,23	2,32	2,41	2,58	2,75	3,09	3,44	4,13	5,16	6,19
800	2,21	2,31	2,41	2,5	2,6	2,69	2,89	3,08	3,46	3,85	4,62	5,77	6,93
900	2,44	2,55	2,66	2,76	2,87	2,97	3,19	3,4	3,82	4,25	5,1	6,37	7,65
1000	2,67	2,78	2,9	3,02	3,13	3,25	3,48	3,71	4,18	4,64	5,57	6,96	8,35
1100	2,89	3,02	3,14	3,27	3,39	3,52	3,77	4,02	4,52	5,03	6,03	7,54	9,05
1200	3,11	3,24	3,38	3,51	3,65	3,78	4,05	4,32	4,86	5,4	6,48	8,1	9,73
1300	3,32	3,46	3,61	3,75	3,9	4,04	4,33	4,62	5,2	5,77	6,93	8,66	10,39
1400	3,53	3,68	3,84	3,99	4,14	4,3	4,6	4,91	5,53	6,14	7,37	9,21	11,05
1500	3,74	3,9	4,06	4,22	4,39	4,55	4,87	5,2	5,85	6,5	7,8	9,75	11,7
1600	3,94	4,11	4,28	4,46	4,63	4,8	5,14	5,48	6,17	6,85	8,23	10,28	12,34
1700	4,14	4,32	4,5	4,68	4,86	5,04	5,4	5,76	6,48	7,2	8,65	10,81	12,97
1800	4,34	4,53	4,72	4,91	5,1	5,29	5,66	6,04	6,8	7,55	9,06	11,33	13,59
1900	4,54	4,74	4,93	5,13	5,33	5,52	5,92	6,31	7,1	7,89	9,47	11,84	14,21
2000	4,73	4,94	5,14	5,35	5,55	5,76	6,17	6,58	7,41	8,23	9,88	12,34	14,81
2200	5,11	5,34	5,56	5,78	6	6,23	6,67	7,11	8	8,89	10,67	13,34	16,01
2400	5,49	5,73	5,96	6,2	6,44	6,68	7,16	7,63	8,59	9,54	11,45	14,31	17,18
2600	5,85	6,11	6,36	6,62	6,87	7,13	7,64	8,14	9,16	10,18	12,22	15,27	18,32
2800	6,21	6,48	6,75	7,02	7,29	7,56	8,1	8,64	9,73	10,81	12,97	16,21	19,45
3000	6,57	6,85	7,14	7,42	7,71	7,99	8,57	9,14	10,28	11,42	13,7	17,13	20,56
3200	6,91	7,22	7,52	7,82	8,12	8,42	9,02	9,62	10,82	12,03	14,43	18,04	21,65
3400	7,26	7,57	7,89	8,2	8,52	8,83	9,47	10,1	11,36	12,62	15,14	18,93	22,72
3600	7,59	7,92	8,25	8,58	8,91	9,24	9,9	10,57	11,89	13,21	15,85	19,81	23,77
3800	7,93	8,27	8,62	8,96	9,3	9,65	10,34	11,03	12,41	13,78	16,54	20,68	24,81
4000	8,25	8,61	8,97	9,33	9,69	10,05	10,77	11,48	12,92	14,35	17,22	21,53	25,84
4200	8,58	8,95	9,32	9,7	10,07	10,44	11,19	11,93	13,42	14,92	17,9	22,37	26,85
4400	8,9	9,28	9,67	10,06	10,44	10,83	11,6	12,38	13,92	15,47	18,57	23,21	27,85
4600	9,21	9,61	10,01	10,41	10,81	11,21	12,01	12,82	14,42	16,02	19,22	24,03	28,83
4800	9,52	9,94	10,35	10,76	11,18	11,59	12,42	13,25	14,9	16,56	19,87	24,84	29,81
5000	9,83	10,26	10,68	11,11	11,54	11,97	12,82	13,68	15,39	17,1	20,51	25,64	30,77
5500	10,58	11,04	11,5	11,96	12,42	12,88	13,81	14,73	16,57	18,41	22,09	27,61	33,13
6000	11,32	11,81	12,3	12,79	13,29	13,78	14,76	15,75	17,72	19,68	23,62	29,53	35,43
6500	12,03	12,56	13,08	13,6	14,13	14,65	15,7	16,74	18,84	20,93	25,12	31,39	37,67
7000	12,73	13,29	13,84	14,39	14,95	15,5	16,61	17,72	19,93	22,15	26,57	33,22	39,86
7500	13,42	14	14,58	15,17	15,75	16,33	17,5	18,67	21	23,33	28	35	42
8000	14,09	14,7	15,31	15,92	16,54	17,15	18,37	19,6	22,05	24,5	29,4	36,75	44,1
8500	14,74	15,38	16,02	16,66	17,31	17,95	19,23	20,51	23,07	25,64	30,77	38,46	46,15
9000	15,38	16,05	16,72	17,39	18,06	18,73	20,07	21,4	24,08	26,76	32,11	40,13	48,16
9500	16,02	16,71	17,41	18,1	18,8	19,5	20,89	22,28	25,07	27,85	33,42	41,78	50,13
10000	16,63	17,36	18,08	18,8	19,53	20,25	21,7	23,14	26,04	28,93	34,71	43,39	52,07

Reduction in belt life is expected

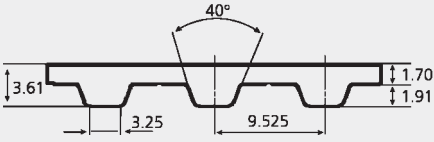
Critical pulley speed - Balanced pulley required

n1: r.p.m. of pulley

z1: number of teeth on pulley

Interpolation formulars are shown in the chapter calculations (page 140)

PU Linear/Torque L steel cord

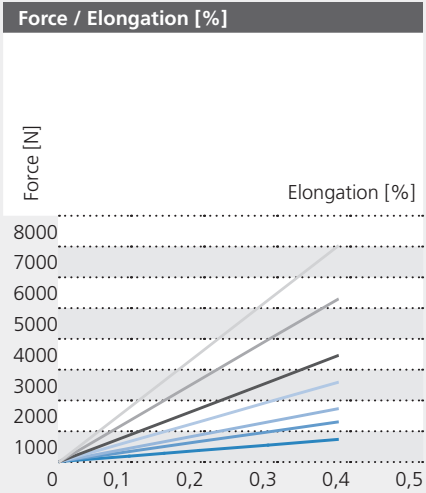


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

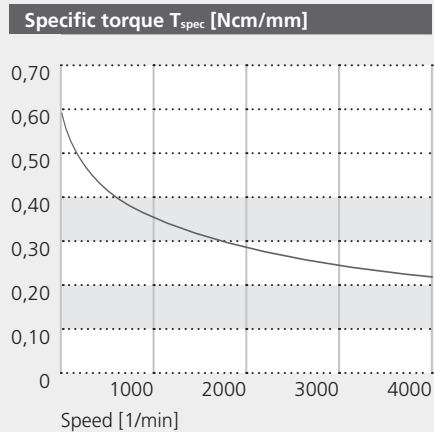
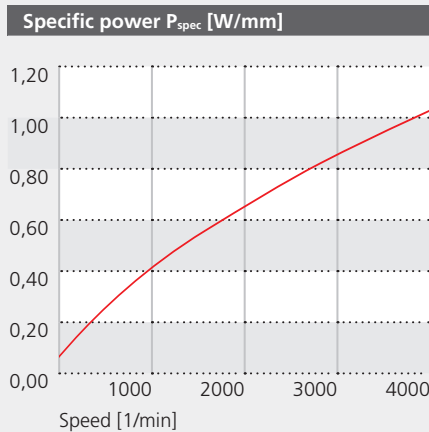
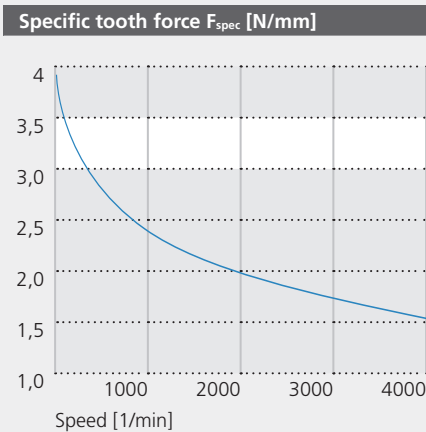
- › inch pitch 3/8" = 9.525 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 101.6 mm (PU Linear)
- › max. width up to 152.4 mm (PU Torque)
- › min. length for jointed belt (W) 505 mm
- › length between 1,505 to 22,688 mm (PU Torque)
- › max. speed 10.000 rpm



Technical data		allowable tensile load	allowable tensile load	Breaking load	spec. spring ratio	Belt weight per metre
Standard-belt width w_{tb} [mm]	Graph	Typ $L F_{al}$ [N]	Typ $T F_{al}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
050 / 12,7	■	890	445	3730	175000	0,049
075 / 19,1	■	1340	670	5610	315000	0,073
100 / 25,4	■	1780	890	7460	420000	0,098
150 / 38,1	■	2670	1335	11200	630000	0,146
200 / 50,8	■	3560	1780	14930	840000	0,195
300 / 76,2	■	5340	2670	22400	1290000	0,293
400 / 101,6	■	7120	3560	29860	1710000	0,39

Specific tooth force/power/torque*																			
Speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]	■	3,860	3,655	3,57	3,492	3,407	3,283	3,159	2,979	2,839	2,725	2,507	2,344	2,214	2,107	2,015	1,935	1,688	1,509
Specific power P_{spec} [W/mm]	■	0,000	0,015	0,028	0,042	0,054	0,078	0,100	0,142	0,180	0,216	0,298	0,372	0,439	0,502	0,560	0,614	0,804	0,958
Specific torque T_{spec} [Ncm/mm]	■	0,585	0,554	0,541	0,529	0,516	0,498	0,479	0,452	0,430	0,413	0,380	0,355	0,336	0,319	0,305	0,293	0,256	0,229

* max. force/power/torque per tooth in mesh and per mm belt width



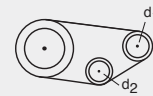
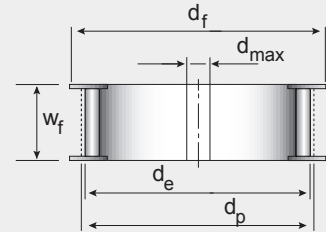
Pulleys PU Linear/Torque L steel cord

Table of belt widths

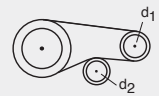
Timing belt width Code	050	075	100	150	200	300	400
Timing belt width [mm] w_{th}	12,7	19,1	25,4	38,1	50,8	76,2	101,6
Pulley width [mm] w_i	17	24	30	46	58	84	110

Requirements at pulleys

		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_i	15	20
minimum pulley diameter [mm]	d_i	44,72	59,88
diameter of idler roller [mm]	d_i	60,00	60,00



Belt drive without counter flexion



Belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
15	44,72	45,48	51	34
16	47,75	48,51	54	36
17	50,78	51,54	57	38
18	53,81	54,57	60	41
19	56,85	57,61	63	44
20	59,88	60,64	66	47
21	62,91	63,67	69	50
22	65,94	66,70	72	52
23	68,97	69,73	75	54
24	72,01	72,77	78	58
25	75,04	75,80	81	62
26	78,07	78,83	84	62
27	81,10	81,86	87	66
28	84,13	84,89	90	70
29	87,17	87,93	93	73
30	90,20	90,96	96	77
31	93,23	93,99	99	79
32	96,26	97,02	102	81
33	99,29	100,05	105	86
34	102,32	103,08	108	88
35	105,36	106,12	111	90
36	108,39	109,15	114	95
37	111,42	112,18	117	98
38	114,45	115,21	120	100
39	117,48	118,24	123	102
40	120,52	121,28	126	104
41	123,55	124,31	129	107
42	126,58	127,34	132	109
43	129,61	130,37	135	111
44	132,64	133,40	138	115
45	135,68	136,44	141	118
46	138,71	139,47	145	123
47	141,74	142,50	148	126
48	144,77	145,53	151	131
49	147,80	148,56	154	131
50	150,84	151,60	157	134

Standard

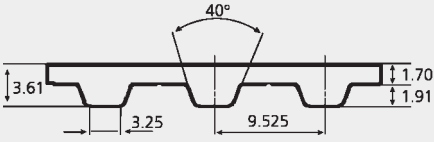
Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
51	153,87	154,63	160	139
52	156,90	157,66	163	142
53	159,93	160,69	166	144
54	162,96	163,72	169	147
55	165,99	166,75	172	149
56	169,03	169,79	175	152
57	172,06	172,82	178	157
58	175,09	175,85	181	160
59	178,12	178,88	184	163
60	181,15	181,91	187	166
61	184,19	184,95	190	167
62	187,22	187,98	193	167
63	190,25	191,00	196	173
64	193,28	194,04	199	176
65	196,31	197,07	202	180
66	199,35	200,11	205	180
67	202,38	203,14	208	186
68	205,41	206,17	211	186
69	208,44	209,20	214	190
70	211,47	212,23	217	190
71	214,51	215,27	220	196
72	217,54	218,30	223	199
73	220,57	221,33	226	202
74	223,60	224,36	229	206
75	226,63	227,39	232	208
76	229,66	230,42	235	212
77	232,70	233,46	239	215
78	235,73	236,49	242	218
79	238,76	239,52	245	221
80	241,79	242,55	248	221
81	244,82	245,58	251	223
82	247,86	248,62	254	225
83	250,89	251,65	257	227
84	253,92	254,68	260	231
85	256,95	257,71	263	235

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
86	259,98	260,74	266	239
87	263,02	263,78	269	241
88	266,05	266,81	272	244
89	269,08	269,84	275	247
90	272,11	272,87	278	250
91	275,14	275,90	281	255
92	278,18	278,94	284	257
93	281,21	281,97	287	262
94	284,24	285,00	290	265
95	287,27	288,03	293	254
96	290,30	291,06	296	257
97	293,33	294,09	299	261
98	296,37	297,13	302	264
99	299,40	300,16	305	267
100	302,43	303,19	308	270
101	305,46	306,22	311	273
102	308,49	309,25	314	277
103	311,53	312,29	317	280
104	314,56	315,32	320	283
105	317,59	318,35	323	286
106	320,62	321,38	326	288
107	323,65	324,41	329	290
108	326,69	327,45	332	293
109	329,72	330,48	336	296
110	332,75	333,51	339	299
111	335,78	336,54	342	302
112	338,81	339,57	345	305
113	341,84	342,60	348	308
114	344,88	345,64	351	312
115	347,91	348,67	354	315
116	350,94	351,70	357	318
117	353,97	354,73	360	320
118	357,00	357,76	363	323
119	360,04	360,80	366	326
120	363,07	363,83	369	330

PU Linear L Aramid cord

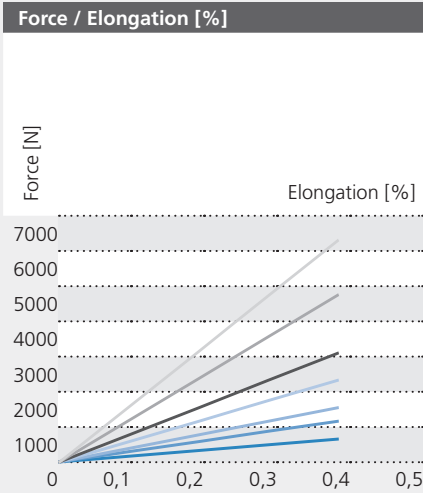


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

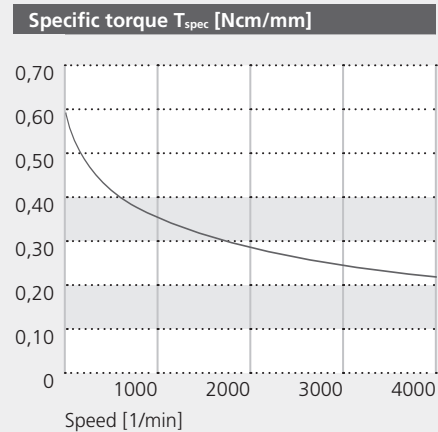
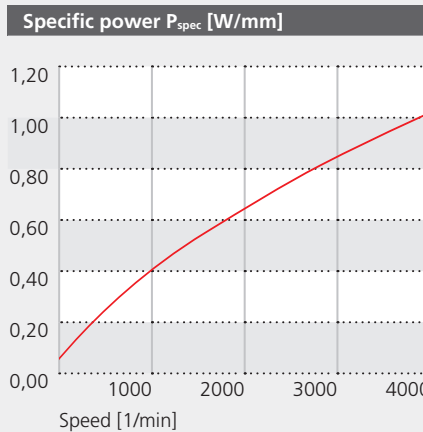
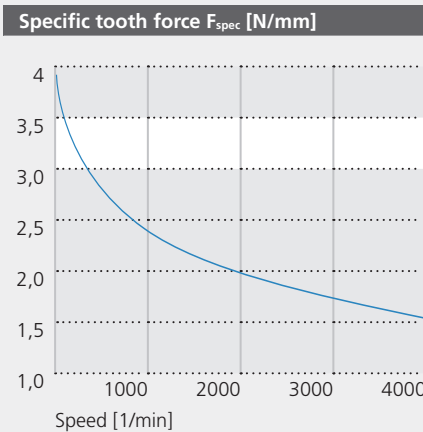
- › inch pitch 3/8" = 9.525 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 101.6 mm
- › min. length for jointed belt (W) 505 mm
- › max. speed 10.000 rpm



Technical data		allowable tensile load Typ $L F_{al}$ [N]	allowable tensile load Typ $W F_{al}$ [N]	Breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	Belt weight per metre m [kg/m]
Standard-belt width w_{tb} [mm]	Graph					
050 / 12,7	■	830	415	3550	157500	0,044
075 / 19,1	■	1250	625	5340	283500	0,067
100 / 25,4	■	1660	830	7100	378000	0,089
150 / 38,1	■	2480	1240	10650	567000	0,133
200 / 50,8	■	3320	1660	14220	756000	0,177
300 / 76,2	■	4960	2480	21300	1161000	0,267
400 / 101,6	■	6640	3320	28440	1539000	0,356

Specific tooth force/power/torque*																			
Speed [1/min]		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F_{spec} [N/mm]	■	3,860	3,655	3,57	3,492	3,407	3,283	3,159	2,979	2,839	2,725	2,507	2,344	2,214	2,107	2,015	1,935	1,688	1,509
Specific power P_{spec} [W/mm]	■	0,000	0,015	0,028	0,042	0,054	0,078	0,100	0,142	0,180	0,216	0,298	0,372	0,439	0,502	0,560	0,614	0,804	0,958
Specific torque T_{spec} [Ncm/mm]	■	0,585	0,554	0,541	0,529	0,516	0,498	0,479	0,452	0,430	0,413	0,380	0,355	0,336	0,319	0,305	0,293	0,256	0,229

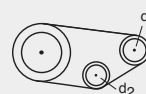
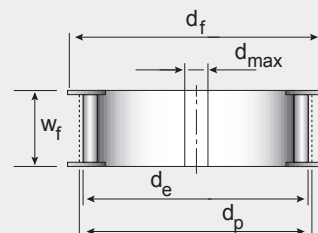
* max. force/power/torque per tooth in mesh and per mm belt width



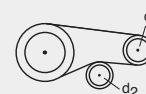
Pulleys PU Linear L Aramid cord

Table of belt widths							
Timing belt width Code	050	075	100	150	200	300	400
Timing belt width [mm] w_{th}	12,7	19,1	25,4	38,1	50,8	76,2	101,6
Pulley width [mm] w_r	17	24	30	46	58	84	110

Requirements at pulleys			
		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_1	15	20
minimum pulley diameter [mm]	d_1	44,72	59,88
diameter of idler roller [mm]	d_2	50,00	50,00



Belt drive without counter flexion



Belt drive with counter flexion

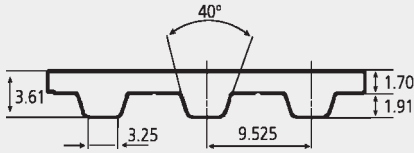
Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
15	44,72	45,48	51	34	
16	47,75	48,51	54	36	
17	50,78	51,54	57	38	
18	53,81	54,57	60	41	
19	56,85	57,61	63	44	
20	59,88	60,64	66	47	
21	62,91	63,67	69	50	
22	65,94	66,70	72	52	
23	68,97	69,73	75	54	
24	72,01	72,77	78	58	
25	75,04	75,80	81	62	
26	78,07	78,83	84	62	
27	81,10	81,86	87	66	
28	84,13	84,89	90	70	
29	87,17	87,93	93	73	
30	90,20	90,96	96	77	
31	93,23	93,99	99	79	
32	96,26	97,02	102	81	
33	99,29	100,05	105	86	
34	102,32	103,08	108	88	
35	105,36	106,12	111	90	
36	108,39	109,15	114	95	
37	111,42	112,18	117	98	
38	114,45	115,21	120	100	
39	117,48	118,24	123	102	
40	120,52	121,28	126	104	
41	123,55	124,31	129	107	
42	126,58	127,34	132	109	
43	129,61	130,37	135	111	
44	132,64	133,40	138	115	
45	135,68	136,44	141	118	
46	138,71	139,47	145	123	
47	141,74	142,50	148	126	
48	144,77	145,53	151	131	
49	147,80	148,56	154	131	
50	150,84	151,60	157	134	

Standard

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
51	153,87	154,63	160	139	
52	156,90	157,66	163	142	
53	159,93	160,69	166	144	
54	162,96	163,72	169	147	
55	165,99	166,75	172	149	
56	169,03	169,79	175	152	
57	172,06	172,82	178	157	
58	175,09	175,85	181	160	
59	178,12	178,88	184	163	
60	181,15	181,91	187	166	
61	184,19	184,95	190	167	
62	187,22	187,98	193	167	
63	190,25	191,00	196	173	
64	193,28	194,04	199	176	
65	196,31	197,07	202	180	
66	199,35	200,11	205	180	
67	202,38	203,14	208	186	
68	205,41	206,17	211	186	
69	208,44	209,20	214	190	
70	211,47	212,23	217	190	
71	214,51	215,27	220	196	
72	217,54	218,30	223	199	
73	220,57	221,33	226	202	
74	223,60	224,36	229	206	
75	226,63	227,39	232	208	
76	229,66	230,42	235	212	
77	232,70	233,46	239	215	
78	235,73	236,49	242	218	
79	238,76	239,52	245	221	
80	241,79	242,55	248	221	
81	244,82	245,58	251	223	
82	247,86	248,62	254	225	
83	250,89	251,65	257	227	
84	253,92	254,68	260	231	
85	256,95	257,71	263	235	

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
86	259,98	260,74	266	239	
87	263,02	263,78	269	241	
88	266,05	266,81	272	244	
89	269,08	269,84	275	247	
90	272,11	272,87	278	250	
91	275,14	275,90	281	255	
92	278,18	278,94	284	257	
93	281,21	281,97	287	262	
94	284,24	285,00	290	265	
95	287,27	288,03	293	254	
96	290,30	291,06	296	257	
97	293,33	294,09	299	261	
98	296,37	297,13	302	264	
99	299,40	300,16	305	267	
100	302,43	303,19	308	270	
101	305,46	306,22	311	273	
102	308,49	309,25	314	277	
103	311,53	312,29	317	280	
104	314,56	315,32	320	283	
105	317,59	318,35	323	286	
106	320,62	321,38	326	288	
107	323,65	324,41	329	290	
108	326,69	327,45	332	293	
109	329,72	330,48	336	296	
110	332,75	333,51	339	299	
111	335,78	336,54	342	302	
112	338,81	339,57	345	305	
113	341,84	342,60	348	308	
114	344,88	345,64	351	312	
115	347,91	348,67	354	315	
116	350,94	351,70	357	318	
117	353,97	354,73	360	320	
118	357,00	357,76	363	323	
119	360,04	360,80	366	326	
120	363,07	363,83	369	330	

PU Moulded L steel cord



» Standard tolerances

- › width: + 0,5 / -0,8 mm
- › length: ± 0,14 - 0,52 mm
- › thickness: ± 0,30 mm

» General properties

- › Type: L
- › Pitch: inch pitch 3/8" = 9.525 mm
- › Material: thermoset polyurethane, 87° ShA
- › Color: light grey
- › Cord: steel (special cords on request)

Width

Standard width [mm]	12,7	19,1	25,4	38,1	50,7
Width code	050	075	100	150	200

Available dimensions

Length code	Length [mm]	Teeth number	max. Width [mm]
86	219,08	23	300
124	314,33	33	300
150	381,00	40	300
173	438,15	46	300
187	476,25	50	300
202	514,35	54	300
210	533,40	56	300
225	571,50	60	300
240	609,60	64	300
255	647,70	68	300
270	685,80	72	300
285	723,90	76	300
300	762,00	80	300
322	819,15	86	300
345	876,30	92	300
367	933,45	98	300
390	990,60	104	300
420	1066,80	112	300
450	1143,00	120	300
480	1219,20	126	300
510	1295,40	136	300
540	1371,60	144	300
570	1447,80	152	300
600	1524,00	160	300

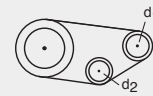
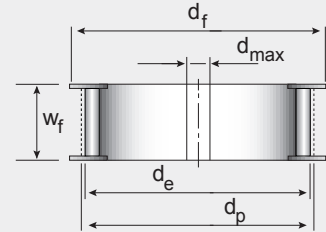
Pulleys PU Moulded L steel cord

Table of belt widths

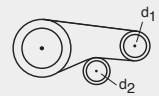
Timing belt width Code	050	075	100	150	200	300	400
Timing belt width [mm] w_b	12,7	19,1	25,4	38,1	50,8	76,2	101,6
Pulley width [mm] w_f	17	24	30	46	58	84	110

Requirements at pulleys

		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_1	15	20
minimum pulley diameter [mm]	d_1	44,72	59,88
diameter of idler roller [mm]	d_2	60,00	60,00



Belt drive without counter flexion



Belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
15	44,72	45,48	51	34
16	47,75	48,51	54	36
17	50,78	51,54	57	38
18	53,81	54,57	60	41
19	56,85	57,61	63	44
20	59,88	60,64	66	47
21	62,91	63,67	69	50
22	65,94	66,70	72	52
23	68,97	69,73	75	54
24	72,01	72,77	78	58
25	75,04	75,80	81	62
26	78,07	78,83	84	62
27	81,10	81,86	87	66
28	84,13	84,89	90	70
29	87,17	87,93	93	73
30	90,20	90,96	96	77
31	93,23	93,99	99	79
32	96,26	97,02	102	81
33	99,29	100,05	105	86
34	102,32	103,08	108	88
35	105,36	106,12	111	90
36	108,39	109,15	114	95
37	111,42	112,18	117	98
38	114,45	115,21	120	100
39	117,48	118,24	123	102
40	120,52	121,28	126	104
41	123,55	124,31	129	107
42	126,58	127,34	132	109
43	129,61	130,37	135	111
44	132,64	133,40	138	115
45	135,68	136,44	141	118
46	138,71	139,47	145	123
47	141,74	142,50	148	126
48	144,77	145,53	151	131
49	147,80	148,56	154	131
50	150,84	151,60	157	134

Standard

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
51	153,87	154,63	160	139
52	156,90	157,66	163	142
53	159,93	160,69	166	144
54	162,96	163,72	169	147
55	165,99	166,75	172	149
56	169,03	169,79	175	152
57	172,06	172,82	178	157
58	175,09	175,85	181	160
59	178,12	178,88	184	163
60	181,15	181,91	187	166
61	184,19	184,95	190	167
62	187,22	187,98	193	167
63	190,25	191,00	196	173
64	193,28	194,04	199	176
65	196,31	197,07	202	180
66	199,35	200,11	205	180
67	202,38	203,14	208	186
68	205,41	206,17	211	186
69	208,44	209,20	214	190
70	211,47	212,23	217	190
71	214,51	215,27	220	196
72	217,54	218,30	223	199
73	220,57	221,33	226	202
74	223,60	224,36	229	206
75	226,63	227,39	232	208
76	229,66	230,42	235	212
77	232,70	233,46	239	215
78	235,73	236,49	242	218
79	238,76	239,52	245	221
80	241,79	242,55	248	221
81	244,82	245,58	251	223
82	247,86	248,62	254	225
83	250,89	251,65	257	227
84	253,92	254,68	260	231
85	256,95	257,71	263	235

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
86	259,98	260,74	266	239
87	263,02	263,78	269	241
88	266,05	266,81	272	244
89	269,08	269,84	275	247
90	272,11	272,87	278	250
91	275,14	275,90	281	255
92	278,18	278,94	284	257
93	281,21	281,97	287	262
94	284,24	285,00	290	265
95	287,27	288,03	293	254
96	290,30	291,06	296	257
97	293,33	294,09	299	261
98	296,37	297,13	302	264
99	299,40	300,16	305	267
100	302,43	303,19	308	270
101	305,46	306,22	311	273
102	308,49	309,25	314	277
103	311,53	312,29	317	280
104	314,56	315,32	320	283
105	317,59	318,35	323	286
106	320,62	321,38	326	288
107	323,65	324,41	329	290
108	326,69	327,45	332	293
109	329,72	330,48	336	296
110	332,75	333,51	339	299
111	335,78	336,54	342	302
112	338,81	339,57	345	305
113	341,84	342,60	348	308
114	344,88	345,64	351	312
115	347,91	348,67	354	315
116	350,94	351,70	357	318
117	353,97	354,73	360	320
118	357,00	357,76	363	323
119	360,04	360,80	366	326
120	363,07	363,83	369	330

Power Rating Table

PU Moulded L steel cord

Technical data – Power in watt per tooth in mesh and per mm belt width – Max. teeth in mesh = 15

n1 \ t1	10	11	12	13	14	15	16	17	18	19	20	21
100	0,5	0,55	0,6	0,65	0,7	0,75	0,79	0,84	0,89	0,94	0,99	1,04
200	0,89	0,98	1,07	1,16	1,25	1,34	1,43	1,52	1,61	1,69	1,78	1,87
300	1,25	1,37	1,5	1,62	1,75	1,87	2	2,12	2,25	2,37	2,5	2,62
400	1,58	1,74	1,9	2,05	2,21	2,37	2,53	2,69	2,84	3	3,16	3,32
500	1,89	2,08	2,27	2,46	2,65	2,84	3,03	3,22	3,41	3,6	3,79	3,97
600	2,19	2,41	2,63	2,85	3,07	3,29	3,51	3,72	3,94	4,16	4,38	4,6
700	2,48	2,72	2,97	3,22	3,47	3,72	3,96	4,21	4,46	4,71	4,95	5,2
800	2,75	3,03	3,3	3,58	3,85	4,13	4,4	4,68	4,95	5,23	5,5	5,78
900	3,02	3,32	3,62	3,92	4,23	4,53	4,83	5,13	5,43	5,73	6,04	6,34
1000	3,28	3,6	3,93	4,26	4,59	4,91	5,24	5,57	5,9	6,23	6,55	6,88
1100	3,53	3,88	4,23	4,59	4,94	5,29	5,64	6	6,35	6,7	7,05	7,41
1200	3,77	4,15	4,53	4,9	5,28	5,66	6,03	6,41	6,79	7,16	7,54	7,92
1300	4,01	4,41	4,81	5,21	5,61	6,01	6,41	6,81	7,22	7,62	8,02	8,42
1400	4,24	4,66	5,09	5,51	5,94	6,36	6,79	7,21	7,63	8,06	8,48	8,91
1500	4,47	4,91	5,36	5,81	6,25	6,7	7,15	7,6	8,04	8,49	8,94	9,38
1600	4,69	5,16	5,63	6,1	6,57	7,03	7,5	7,97	8,44	8,91	9,38	9,85
1700	4,91	5,4	5,89	6,38	6,87	7,36	7,85	8,34	8,83	9,32	9,81	10,3
1800	5,12	5,63	6,14	6,66	7,17	7,68	8,19	8,7	9,22	9,73	10,24	10,75
1900	5,33	5,86	6,39	6,93	7,46	7,99	8,53	9,06	9,59	10,13	10,66	11,19
2000	5,53	6,09	6,64	7,19	7,75	8,3	8,85	9,41	9,96	10,52	11,07	11,62
2200	5,93	6,53	7,12	7,71	8,31	8,9	9,49	10,09	10,68	11,27	11,87	12,46
2400	6,32	6,95	7,58	8,22	8,85	9,48	10,11	10,74	11,38	12,01	12,64	13,27
2600	6,69	7,36	8,03	8,7	9,37	10,04	10,71	11,38	12,05	12,72	13,39	14,06
2800	7,06	7,76	8,47	9,17	9,88	10,58	11,29	11,99	12,7	13,41	14,11	14,82
3000	7,41	8,15	8,89	9,63	10,37	11,11	11,85	12,59	13,33	14,07	14,82	15,56
3200	7,75	8,52	9,3	10,07	10,85	11,62	12,4	13,17	13,95	14,72	15,5	16,27
3400	8,08	8,89	9,7	10,51	11,32	12,12	12,93	13,74	14,55	15,36	16,17	16,97
3600	8,41	9,25	10,09	10,93	11,77	12,61	13,45	14,29	15,13	15,97	16,81	17,65
3800	8,72	9,6	10,47	11,34	12,21	13,08	13,96	14,83	15,7	16,57	17,45	18,32
4000	9,03	9,93	10,84	11,74	12,64	13,55	14,45	15,35	16,26	17,16	18,06	18,97
4200	9,33	10,27	11,2	12,13	13,07	14	14,93	15,87	16,8	17,73	18,67	19,6
4400	9,63	10,59	11,55	12,51	13,48	14,44	15,4	16,37	17,33	18,29	19,25	20,22
4600	9,91	10,91	11,9	12,89	13,88	14,87	15,86	16,85	17,85	18,84	19,83	20,82
4800	10,19	11,21	12,23	13,25	14,27	15,29	16,31	17,33	18,35	19,37	20,39	21,41
5000	10,47	11,52	12,56	13,61	14,66	15,7	16,75	17,8	18,85	19,89	20,94	21,99
5500	11,13	12,24	13,36	14,47	15,58	16,7	17,81	18,92	20,04	21,15	22,26	23,38
6000	11,76	12,94	14,11	15,29	16,46	17,64	18,82	19,99	21,17	22,34	23,52	24,7
6500	12,36	13,59	14,83	16,07	17,3	18,54	19,77	21,01	22,24	23,48	24,72	25,95
7000	12,93	14,22	15,51	16,81	18,1	19,39	20,68	21,98	23,27	24,56	25,85	27,15
7500	13,47	14,82	16,16	17,51	18,86	20,21	21,55	22,9	24,25	25,59	26,94	28,29
8000	13,99	15,39	16,79	18,19	19,58	20,98	22,38	23,78	25,18	26,58	27,98	29,38
8500	14,48	15,93	17,38	18,83	20,28	21,73	23,18	24,62	26,07	27,52	28,97	30,42
9000	14,96	16,45	17,95	19,45	20,94	22,44	23,93	25,43	26,93	28,42	29,92	31,41
9500	15,41	16,95	18,5	20,04	21,58	23,12	24,66	26,2	27,74	29,28	30,83	32,37
10000	15,85	17,43	19,02	20,6	22,19	23,77	25,36	26,94	28,52	30,11	31,69	33,28

Reduction in belt life is expected Critical pulley speed - Balanced pulley required

n1: r.p.m. of pulley z1: number of teeth on pulley Interpolation formulars are shown in the chapter calculations (page 140)

L Power Rating Table

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Power Rating Table

PU Moulded L steel cord

Technical data – Power in watt per tooth in mesh and per mm belt width – Max. teeth in mesh = 15													
n1 \ t1	22	23	24	25	26	27	28	30	32	34	36	38	40
100	1,09	1,14	1,19	1,24	1,29	1,34	1,39	1,49	1,59	1,69	1,79	1,89	1,99
200	1,96	2,05	2,14	2,23	2,32	2,41	2,5	2,68	2,85	3,03	3,21	3,39	3,57
300	2,75	2,87	3	3,12	3,25	3,37	3,5	3,74	3,99	4,24	4,49	4,74	4,99
400	3,48	3,63	3,79	3,95	4,11	4,27	4,42	4,74	5,06	5,37	5,69	6	6,32
500	4,16	4,35	4,54	4,73	4,92	5,11	5,3	5,68	6,06	6,44	6,81	7,19	7,57
600	4,82	5,04	5,26	5,48	5,7	5,92	6,13	6,57	7,01	7,45	7,89	8,33	8,76
700	5,45	5,7	5,94	6,19	6,44	6,69	6,94	7,43	7,93	8,42	8,92	9,41	9,91
800	6,05	6,33	6,61	6,88	7,16	7,43	7,71	8,26	8,81	9,36	9,91	10,46	11,01
900	6,64	6,94	7,24	7,55	7,85	8,15	8,45	9,06	9,66	10,26	10,87	11,47	12,07
1000	7,21	7,54	7,86	8,19	8,52	8,85	9,17	9,83	10,48	11,14	11,79	12,45	13,11
1100	7,76	8,11	8,46	8,82	9,17	9,52	9,88	10,58	11,29	11,99	12,7	13,4	14,11
1200	8,3	8,67	9,05	9,43	9,8	10,18	10,56	11,31	12,07	12,82	13,58	14,33	15,08
1300	8,82	9,22	9,62	10,02	10,42	10,82	11,22	12,03	12,83	13,63	14,43	15,23	16,03
1400	9,33	9,75	10,18	10,6	11,03	11,45	11,87	12,72	13,57	14,42	15,27	16,12	16,96
1500	9,83	10,28	10,72	11,17	11,62	12,06	12,51	13,4	14,3	15,19	16,08	16,98	17,87
1600	10,32	10,79	11,26	11,72	12,19	12,66	13,13	14,07	15,01	15,95	16,88	17,82	18,76
1700	10,8	11,29	11,78	12,27	12,76	13,25	13,74	14,72	15,7	16,68	17,67	18,65	19,63
1800	11,26	11,78	12,29	12,8	13,31	13,82	14,34	15,36	16,38	17,41	18,43	19,46	20,48
1900	11,72	12,26	12,79	13,32	13,86	14,39	14,92	15,99	17,05	18,12	19,18	20,25	21,32
2000	12,18	12,73	13,28	13,84	14,39	14,94	15,5	16,6	17,71	18,82	19,92	21,03	22,14
2200	13,05	13,65	14,24	14,83	15,43	16,02	16,61	17,8	18,99	20,17	21,36	22,55	23,73
2400	13,9	14,54	15,17	15,8	16,43	17,06	17,69	18,96	20,22	21,49	22,75	24,01	25,28
2600	14,73	15,39	16,06	16,73	17,4	18,07	18,74	20,08	21,42	22,76	24,1	25,43	26,77
2800	15,52	16,23	16,93	17,64	18,35	19,05	19,76	21,17	22,58	23,99	25,4	26,81	28,22
3000	16,3	17,04	17,78	18,52	19,26	20	20,74	22,22	23,7	25,19	26,67	28,15	29,63
3200	17,05	17,82	18,6	19,37	20,15	20,92	21,7	23,25	24,8	26,35	27,9	29,45	31
3400	17,78	18,59	19,4	20,21	21,02	21,82	22,63	24,25	25,86	27,48	29,1	30,71	32,33
3600	18,5	19,34	20,18	21,02	21,86	22,7	23,54	25,22	26,9	28,58	30,27	31,95	33,63
3800	19,19	20,06	20,94	21,81	22,68	23,55	24,42	26,17	27,91	29,66	31,4	33,15	34,89
4000	19,87	20,77	21,68	22,58	23,48	24,39	25,29	27,09	28,9	30,71	32,51	34,32	36,13
4200	20,53	21,46	22,4	23,33	24,26	25,2	26,13	28	29,86	31,73	33,6	35,46	37,33
4400	21,18	22,14	23,1	24,07	25,03	25,99	26,95	28,88	30,81	32,73	34,66	36,58	38,51
4600	21,81	22,8	23,79	24,78	25,78	26,77	27,76	29,74	31,72	33,71	35,69	37,67	39,66
4800	22,43	23,45	24,47	25,49	26,51	27,53	28,55	30,58	32,62	34,66	36,7	38,74	40,78
5000	23,03	24,08	25,13	26,17	27,22	28,27	29,32	31,41	33,5	35,6	37,69	39,79	41,88
5500	24,49	25,6	26,72	27,83	28,94	30,06	31,17	33,39	35,62	37,85	40,07	42,3	44,53
6000	25,87	27,05	28,22	29,4	30,58	31,75	32,93	35,28	37,63	39,98	42,34	44,69	47,04
6500	27,19	28,42	29,66	30,89	32,13	33,37	34,6	37,07	39,54	42,02	44,49	46,96	49,43
7000	28,44	29,73	31,03	32,32	33,61	34,9	36,2	38,78	41,37	43,95	46,54	49,12	51,71
7500	29,63	30,98	32,33	33,68	35,02	36,37	37,72	40,41	43,11	45,8	48,49	51,19	53,88
8000	30,78	32,18	33,57	34,97	36,37	37,77	39,17	41,97	44,77	47,56	50,36	53,16	55,96
8500	31,87	33,32	34,76	36,21	37,66	39,11	40,56	43,45	46,35	49,25	52,15	55,04	57,94
9000	32,91	34,41	35,9	37,4	38,89	40,39	41,89	44,88	47,87	50,86	53,85	56,84	59,84
9500	33,91	35,45	36,99	38,53	40,07	41,61	43,16	46,24	49,32	52,4	55,49	58,57	61,65
10000	34,86	36,45	38,03	39,62	41,2	42,79	44,37	47,54	50,71	53,88	57,05	60,22	63,39

Reduction in belt life is expected

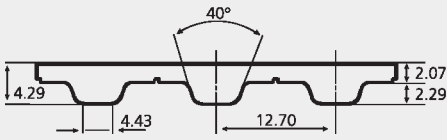
Critical pulley speed - Balanced pulley required

n1: r.p.m. of pulley

z1: number of teeth on pulley

Interpolation formulas are shown in the chapter calculations (page 140)

PU Linear/Torque H steel cord

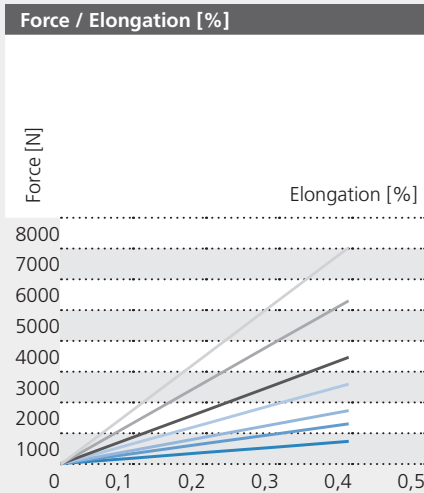


» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

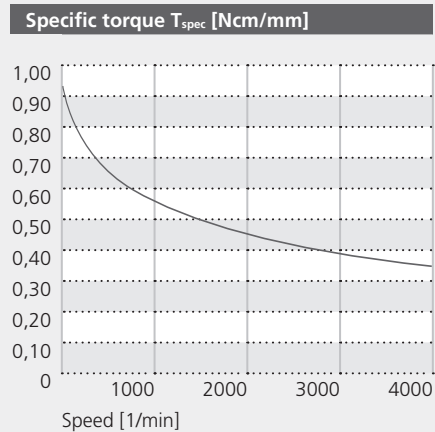
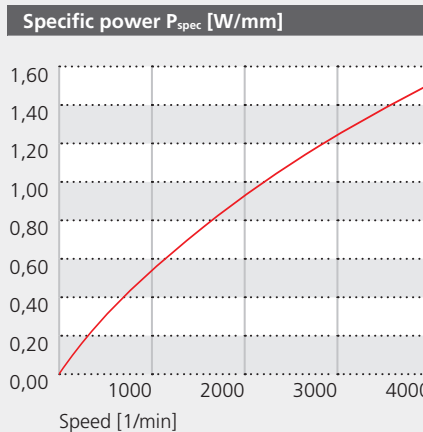
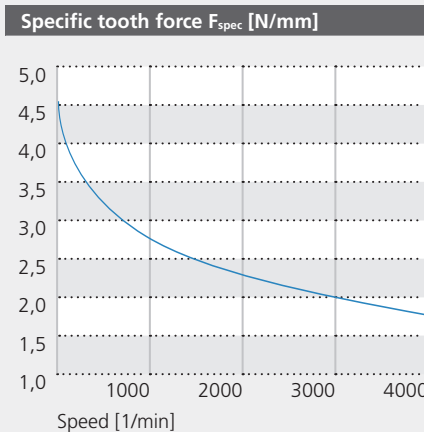
- › inch pitch 1/2" = 12.70 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 101.6 mm (PU Linear)
- › max. width up to 152.4 mm (PU Torque)
- › min. length for jointed belt (W) 508 mm
- › length between 1,511 to 22,770 mm (PU Torque)
- › max. speed 10.000 rpm



Technical data		allowable tensile load Typ L F _{all} [N]	allowable tensile load Typ W F _{all} [N]	Breaking load F _{Br} [N]	spec. spring ratio C _{spec} [N]	Belt weight per metre m [kg/m]
Standard-belt width w _{tb} [mm]	Graph	Typ T F _{all} [N]				
050 / 12,7	■	890	445	3730	175000	0,05
075 / 19,1	■	1340	670	5610	315000	0,08
100 / 25,4	■	1780	890	7460	420000	0,11
150 / 38,1	■	2670	1335	11200	630000	0,16
200 / 50,8	■	3560	1780	14930	840000	0,22
300 / 76,2	■	5340	2670	22400	1290000	0,32
400 / 101,6	■	7120	3560	29860	1710000	0,43

Specific tooth force/power/torque*																			
Speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F _{spec} [N/mm]	■	4,530	4,352	4,23	4,104	4,011	3,84	3,722	3,507	3,341	3,205	2,952	2,755	2,603	2,477	2,369	2,274	1,984	1,775
Specific power P _{spec} [W/mm]	■	0,000	0,023	0,045	0,065	0,085	0,122	0,158	0,223	0,283	0,339	0,469	0,583	0,689	0,786	0,878	0,963	1,260	1,503
Specific torque T _{spec} [Ncm/mm]	■	0,916	0,880	0,855	0,830	0,811	0,776	0,752	0,709	0,675	0,648	0,597	0,557	0,526	0,501	0,479	0,460	0,401	0,359

* max. force/power/torque per tooth in mesh and per mm belt width



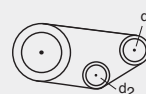
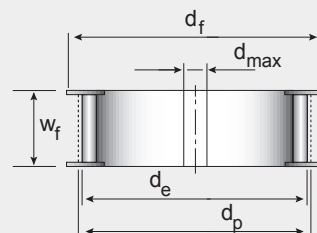
H Steel

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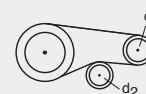
Pulleys PU Linear/Torque H steel cord

Table of belt widths							
Timing belt width Code	050	075	100	150	200	300	400
Timing belt width [mm] w_{th}	12,7	19,1	25,4	38,1	50,8	76,2	101,6
Pulley width [mm] w_i	17	24	30	46	58	84	110

Requirements at pulleys			
		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_i	14	20
minimum pulley diameter [mm]	d_i	55,23	79,48
diameter of idler roller [mm]	d_i	60,00	80,00



Belt drive without counter flexion



Belt drive with counter flexion

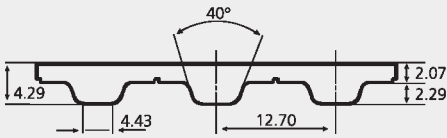
Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
14	55,23	56,60	62	42	
15	59,27	60,64	66	46	
16	63,31	64,68	70	51	
17	67,35	68,72	74	54	
18	71,40	72,77	78	58	
19	75,44	76,81	82	62	
20	79,48	80,85	86	66	
21	83,52	84,89	90	70	
22	87,57	88,94	94	74	
23	91,61	92,98	98	78	
24	95,65	97,02	102	82	
25	99,69	101,06	106	86	
26	103,74	105,11	110	90	
27	107,78	109,15	114	92	
28	111,82	113,19	118	95	
29	115,86	117,23	122	98	
30	119,91	121,28	126	101	
31	123,95	125,32	130	105	
32	127,99	129,36	134	110	
33	132,03	133,40	138	113	
34	136,08	137,45	142	118	
35	140,12	141,49	147	121	
36	144,16	145,53	151	126	
37	148,20	149,57	155	130	
38	152,25	153,62	159	134	
39	156,29	157,66	163	138	
40	160,33	161,70	167	142	
41	164,37	165,74	171	146	
42	168,42	169,79	175	150	
43	172,46	173,83	179	156	
44	176,50	177,87	183	158	
45	180,54	181,91	187	162	
46	184,59	185,96	191	166	
47	188,63	190,00	195	170	
48	192,67	194,04	199	174	
49	196,71	198,08	203	178	

Standard

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
50	200,76	202,13	207	182	
51	204,80	206,17	211	186	
52	208,84	210,21	215	190	
53	212,88	214,25	219	195	
54	216,93	218,30	223	199	
55	220,97	222,34	227	202	
56	225,01	226,38	231	206	
57	229,05	230,42	235	210	
58	233,01	234,47	240	214	
59	237,14	238,51	244	218	
60	241,18	242,55	248	222	
61	245,22	246,59	252	226	
62	249,27	250,64	256	230	
63	253,31	254,68	260	234	
64	257,35	258,72	264	238	
65	261,39	262,76	268	242	
66	265,44	266,81	272	246	
67	269,48	270,85	276	248	
68	273,52	274,89	280	250	
69	277,57	278,94	284	254	
70	281,61	282,98	288	258	
71	285,65	287,02	292	260	
72	289,69	291,06	296	262	
73	293,74	295,11	300	266	
74	297,78	299,15	304	269	
75	301,82	303,19	308	272	
76	305,86	307,23	312	276	
77	309,91	311,28	316	279	
78	313,95	315,32	320	282	
79	317,99	319,36	324	286	
80	322,03	323,40	328	290	
81	326,08	327,45	332	294	
82	330,12	331,49	337	300	
83	334,16	335,53	341	304	
84	338,20	339,57	345	307	
85	342,25	343,62	349	310	

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
86	346,29	347,66	353	314	
87	350,33	351,70	357	318	
88	354,37	355,74	361	322	
89	358,42	359,79	365	326	
90	362,46	363,83	369	330	
91	366,50	367,87	373	334	
92	370,54	371,91	377	336	
93	374,59	375,96	381	340	
94	378,63	380,00	385	344	
95	382,67	384,04	389	348	
96	386,71	388,08	393	352	
97	390,76	392,13	397	356	
98	394,80	396,17	401	360	
99	398,84	400,21	405	364	
100	402,88	404,25	409	368	
101	406,93	408,30	413	372	
102	410,97	412,34	417	376	
103	415,01	416,38	421	380	
104	419,05	420,42	425	385	
105	423,01	424,47	430	389	
106	427,14	428,51	434	392	
107	431,18	432,55	438	395	
108	435,22	436,59	442	398	
109	439,27	440,64	446	401	
110	443,31	444,68	450	404	
111	447,35	448,72	454	407	
112	451,39	452,76	458	410	
113	455,44	456,81	462	413	
114	459,48	460,85	466	416	
115	463,52	464,89	470	420	
116	467,56	468,93	474	423	
117	471,61	472,98	478	426	
118	475,65	477,02	482	430	
119	479,69	481,06	486	433	
120	483,73	485,10	490	435	

PU Linear H Aramid cord

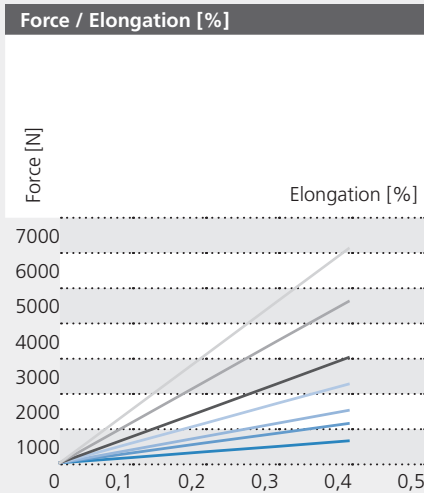


» General properties

- › inch pitch 1/2" = 12.70 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 101.6 mm
- › min. length for jointed belt (W) 508 mm
- › max. speed 10.000 rpm

» Standard tolerances

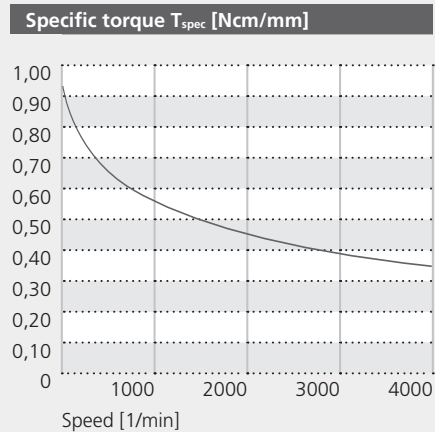
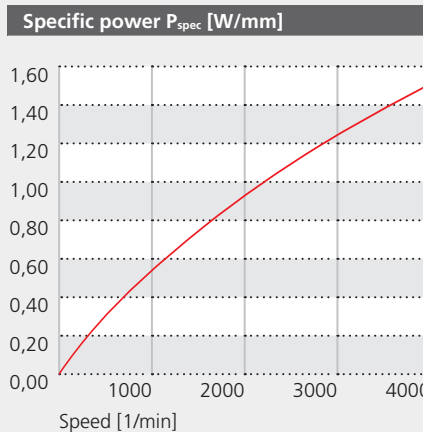
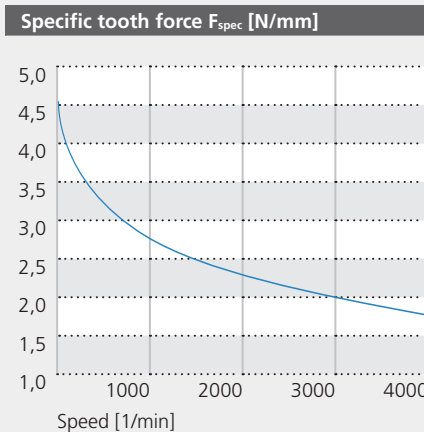
- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m



Technical data		allowable tensile load Typ $L F_{al}$ [N]	allowable tensile load Typ $W F_{al}$ [N]	Breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	Belt weight per metre m [kg/m]
Standard-belt width w_{tb} [mm]	Graph					
050 / 12,7		830	415	3550	175000	0,044
075 / 19,1		1250	625	5340	280000	0,067
100 / 25,4		1650	825	7100	385000	0,089
150 / 38,1		2480	1240	10650	580000	0,133
200 / 50,8		3300	1650	14220	768000	0,178
300 / 76,2		4900	2450	22780	1180000	0,267
400 / 101,6		6300	3150	30350	1570000	0,356

Specific tooth force/power/torque*																			
Speed [1/min]		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F_{spec} [N/mm]		4,530	4,352	4,23	4,104	4,011	3,84	3,722	3,507	3,341	3,205	2,952	2,755	2,603	2,477	2,369	2,274	1,984	1,775
Specific power P_{spec} [W/mm]		0,000	0,023	0,045	0,065	0,085	0,122	0,158	0,223	0,283	0,339	0,469	0,583	0,689	0,786	0,878	0,963	1,260	1,503
Specific torque T_{spec} [Ncm/mm]		0,916	0,880	0,855	0,830	0,811	0,776	0,752	0,709	0,675	0,648	0,597	0,557	0,526	0,501	0,479	0,460	0,401	0,359

* max. force/power/torque per tooth in mesh and per mm belt width

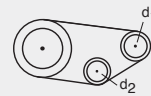
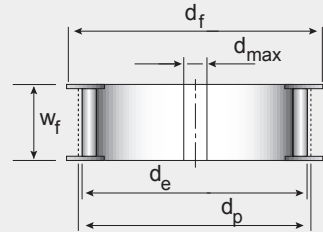


H Aramid

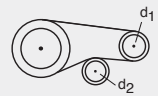
Pulleys PU Linear H Aramid cord

Table of belt widths							
Timing belt width Code	050	075	100	150	200	300	400
Timing belt width [mm] w_{th}	12,7	19,1	25,4	38,1	50,8	76,2	101,6
Pulley width [mm] w_r	17	24	30	46	58	84	110

Requirements at pulleys			
		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_1	14	20
minimum pulley diameter [mm]	d_1	55,23	79,48
diameter of idler roller [mm]	d_2	50,00	65,00



Belt drive without counter flexion



Belt drive with counter flexion

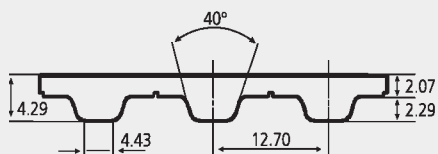
Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
14	55,23	56,60	62	42	
15	59,27	60,64	66	46	
16	63,31	64,68	70	51	
17	67,35	68,72	74	54	
18	71,40	72,77	78	58	
19	75,44	76,81	82	62	
20	79,48	80,85	86	66	
21	83,52	84,89	90	70	
22	87,57	88,94	94	74	
23	91,61	92,98	98	78	
24	95,65	97,02	102	82	
25	99,69	101,06	106	86	
26	103,74	105,11	110	90	
27	107,78	109,15	114	92	
28	111,82	113,19	118	95	
29	115,86	117,23	122	98	
30	119,91	121,28	126	101	
31	123,95	125,32	130	105	
32	127,99	129,36	134	110	
33	132,03	133,40	138	113	
34	136,08	137,45	142	118	
35	140,12	141,49	147	121	
36	144,16	145,53	151	126	
37	148,20	149,57	155	130	
38	152,25	153,62	159	134	
39	156,29	157,66	163	138	
40	160,33	161,70	167	142	
41	164,37	165,74	171	146	
42	168,42	169,79	175	150	
43	172,46	173,83	179	156	
44	176,50	177,87	183	158	
45	180,54	181,91	187	162	
46	184,59	185,96	191	166	
47	188,63	190,00	195	170	
48	192,67	194,04	199	174	
49	196,71	198,08	203	178	

Standard

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
50	200,76	202,13	207	182	
51	204,80	206,17	211	186	
52	208,84	210,21	215	190	
53	212,88	214,25	219	195	
54	216,93	218,30	223	199	
55	220,97	222,34	227	202	
56	225,01	226,38	231	206	
57	229,05	230,42	235	210	
58	233,01	234,47	240	214	
59	237,14	238,51	244	218	
60	241,18	242,55	248	222	
61	245,22	246,59	252	226	
62	249,27	250,64	256	230	
63	253,31	254,68	260	234	
64	257,35	258,72	264	238	
65	261,39	262,76	268	242	
66	265,44	266,81	272	246	
67	269,48	270,85	276	248	
68	273,52	274,89	280	250	
69	277,57	278,94	284	254	
70	281,61	282,98	288	258	
71	285,65	287,02	292	260	
72	289,69	291,06	296	262	
73	293,74	295,11	300	266	
74	297,78	299,15	304	269	
75	301,82	303,19	308	272	
76	305,86	307,23	312	276	
77	309,91	311,28	316	279	
78	313,95	315,32	320	282	
79	317,99	319,36	324	286	
80	322,03	323,40	328	290	
81	326,08	327,45	332	294	
82	330,12	331,49	337	300	
83	334,16	335,53	341	304	
84	338,20	339,57	345	307	
85	342,25	343,62	349	310	

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]	
86	346,29	347,66	353	314	
87	350,33	351,70	357	318	
88	354,37	355,74	361	322	
89	358,42	359,79	365	326	
90	362,46	363,83	369	330	
91	366,50	367,87	373	334	
92	370,54	371,91	377	336	
93	374,59	375,96	381	340	
94	378,63	380,00	385	344	
95	382,67	384,04	389	348	
96	386,71	388,08	393	352	
97	390,76	392,13	397	356	
98	394,80	396,17	401	360	
99	398,84	400,21	405	364	
100	402,88	404,25	409	368	
101	406,93	408,30	413	372	
102	410,97	412,34	417	376	
103	415,01	416,38	421	380	
104	419,05	420,42	425	385	
105	423,01	424,47	430	389	
106	427,14	428,51	434	392	
107	431,18	432,55	438	395	
108	435,22	436,59	442	398	
109	439,27	440,64	446	401	
110	443,31	444,68	450	404	
111	447,35	448,72	454	407	
112	451,39	452,76	458	410	
113	455,44	456,81	462	413	
114	459,48	460,85	466	416	
115	463,52	464,89	470	420	
116	467,56	468,93	474	423	
117	471,61	472,98	478	426	
118	475,65	477,02	482	430	
119	479,69	481,06	486	433	
120	483,73	485,10	490	435	

PU Moulded H steel cord



» standard tolerances

- › width: + 0,5 / -0,8 mm
- › length: ± 0,14 - 0,52 mm
- › thickness: ± 0,30 mm

» General properties

- › Type: H
- › Pitch: inch pitch 1/2" = 12.70 mm
- › Material: thermoset polyurethane, 87° ShA
- › Color: light grey
- › Cord: steel (special cords on request)

Width

Standard width [mm]	12,7	19,1	25,4	38,1	50,8
Width code	050	075	100	150	200

Available dimensions

Length code	Length [mm]	Teeth number	max. Width [mm]
230	584,20	46	300
240	609,60	48	300
270	685,80	54	300
300	762,00	60	300
330	838,20	66	300
360	914,40	72	300
390	990,60	78	300
420	1066,80	84	300
450	1143,00	90	300
480	1219,20	96	300
510	1295,40	102	300

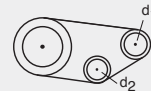
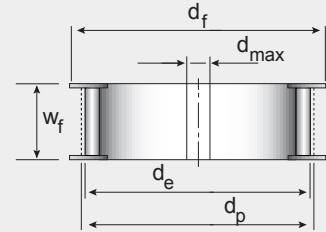
Pulleys PU Moulded H steel cord

Table of belt widths

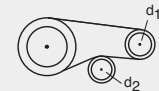
Timing belt width Code	050	075	100	150	200	300	400
Timing belt width [mm] w_{fb}	12,7	19,1	25,4	38,1	50,8	76,2	101,6
Pulley width [mm] w_f	17	24	30	46	58	84	110

Requirements at pulleys

		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_1	14	20
minimum pulley diameter [mm]	d_1	55,23	79,48
diameter of idler roller [mm]	d_2	60,00	80,00



Belt drive without counter flexion



Belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_r [mm]	max. bore d_{max} [mm]
14	55,23	56,60	62	42
15	59,27	60,64	66	46
16	63,31	64,68	70	51
17	67,35	68,72	74	54
18	71,40	72,77	78	58
19	75,44	76,81	82	62
20	79,48	80,85	86	66
21	83,52	84,89	90	70
22	87,57	88,94	94	74
23	91,61	92,98	98	78
24	95,65	97,02	102	82
25	99,69	101,06	106	86
26	103,74	105,11	110	90
27	107,78	109,15	114	92
28	111,82	113,19	118	95
29	115,86	117,23	122	98
30	119,91	121,28	126	101
31	123,95	125,32	130	105
32	127,99	129,36	134	110
33	132,03	133,40	138	113
34	136,08	137,45	142	118
35	140,12	141,49	147	121
36	144,16	145,53	151	126
37	148,20	149,57	155	130
38	152,25	153,62	159	134
39	156,29	157,66	163	138
40	160,33	161,70	167	142
41	164,37	165,74	171	146
42	168,42	169,79	175	150
43	172,46	173,83	179	156
44	176,50	177,87	183	158
45	180,54	181,91	187	162
46	184,59	185,96	191	166
47	188,63	190,00	195	170
48	192,67	194,04	199	174
49	196,71	198,08	203	178

Standard

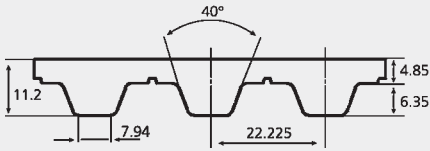
Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_r [mm]	max. bore d_{max} [mm]
50	200,76	202,13	207	182
51	204,80	206,17	211	186
52	208,84	210,21	215	190
53	212,88	214,25	219	195
54	216,93	218,30	223	199
55	220,97	222,34	227	202
56	225,01	226,38	231	206
57	229,05	230,42	235	210
58	233,01	234,47	240	214
59	237,14	238,51	244	218
60	241,18	242,55	248	222
61	245,22	246,59	252	226
62	249,27	250,64	256	230
63	253,31	254,68	260	234
64	257,35	258,72	264	238
65	261,39	262,76	268	242
66	265,44	266,81	272	246
67	269,48	270,85	276	248
68	273,52	274,89	280	250
69	277,57	278,94	284	254
70	281,61	282,98	288	258
71	285,65	287,02	292	260
72	289,69	291,06	296	262
73	293,74	295,11	300	266
74	297,78	299,15	304	269
75	301,82	303,19	308	272
76	305,86	307,23	312	276
77	309,91	311,28	316	279
78	313,95	315,32	320	282
79	317,99	319,36	324	286
80	322,03	323,40	328	290
81	326,08	327,45	332	294
82	330,12	331,49	337	300
83	334,16	335,53	341	304
84	338,20	339,57	345	307
85	342,25	343,62	349	310

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_r [mm]	max. bore d_{max} [mm]
86	346,29	347,66	353	314
87	350,33	351,70	357	318
88	354,37	355,74	361	322
89	358,42	359,79	365	326
90	362,46	363,83	369	330
91	366,50	367,87	373	334
92	370,54	371,91	377	336
93	374,59	375,96	381	340
94	378,63	380,00	385	344
95	382,67	384,04	389	348
96	386,71	388,08	393	352
97	390,76	392,13	397	356
98	394,80	396,17	401	360
99	398,84	400,21	405	364
100	402,88	404,25	409	368
101	406,93	408,30	413	372
102	410,97	412,34	417	376
103	415,01	416,38	421	380
104	419,05	420,42	425	385
105	423,01	424,47	430	389
106	427,14	428,51	434	392
107	431,18	432,55	438	395
108	435,22	436,59	442	398
109	439,27	440,64	446	401
110	443,31	444,68	450	404
111	447,35	448,72	454	407
112	451,39	452,76	458	410
113	455,44	456,81	462	413
114	459,48	460,85	466	416
115	463,52	464,89	470	420
116	467,56	468,93	474	423
117	471,61	472,98	478	426
118	475,65	477,02	482	430
119	479,69	481,06	486	433
120	483,73	485,10	490	435

PU Linear/Torque XH steel cord

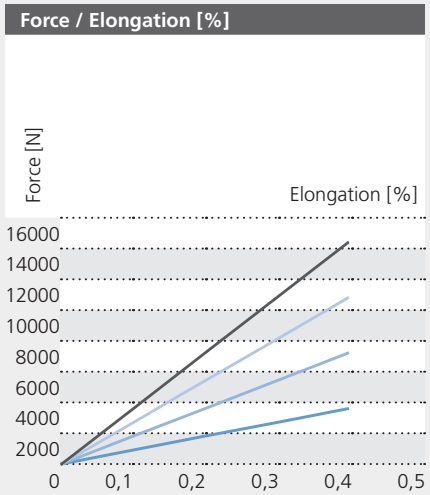


» **Standard tolerances**

- › width: ± 1,0 mm
- › height: ± 0,4 mm
- › length: ± 0,5 mm/m

» **General properties**

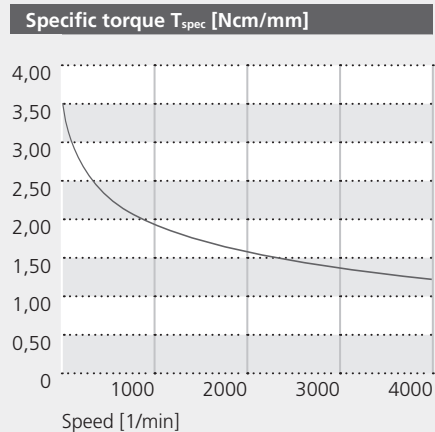
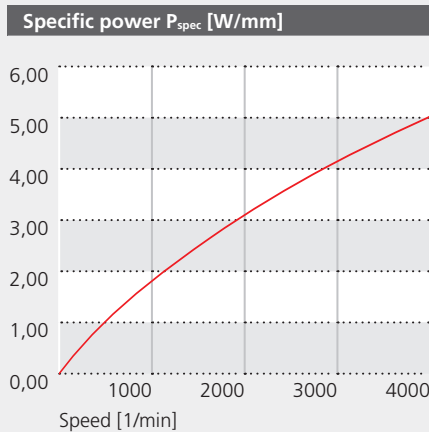
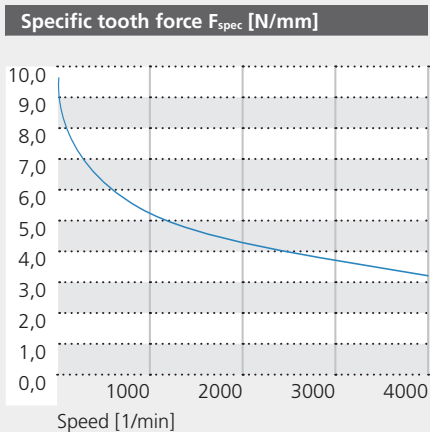
- › inch pitch 7/8" = 22.225 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 152.4 mm
- › min. length for jointed belt (W) 845 mm
- › length between 1,511 to 22,770 mm (PU Torque)
- › max. speed 4.500 rpm



Technical data		allowable tensile load Typ $L F_{el}$ [N]	allowable tensile load Typ $W F_{el}$ [N]	Breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	Belt weight per metre m [kg/m]
Standard-belt width w_{tb} [mm]	Graph	Typ $L F_{el}$ [N]	Typ $W F_{el}$ [N]			
100 / 25,4	■	3200	1600	13500	880000	0,26
200 / 50,8	■	6500	3250	26500	1760000	0,54
300 / 76,2	■	9800	4900	34000	2640000	0,8
400 / 101,6	■	13500	6750	48000	3520000	1,06

Specific tooth force/power/torque*																			
Speed [1/min]		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F_{spec} [N/mm]	■	9,600	9,266	8,953	8,670	8,383	7,926	7,480	6,942	6,553	6,248	5,691	5,288	4,977	4,719	4,502	4,314	3,740	3,331
Specific power P_{spec} [W/mm]	■	0,000	0,086	0,166	0,241	0,311	0,440	0,554	0,771	0,971	1,157	1,581	1,959	2,304	2,622	2,918	3,196	4,156	4,935
Specific torque T_{spec} [Ncm/mm]	■	3,396	3,278	3,167	3,067	2,965	2,804	2,646	2,456	2,318	2,210	2,013	1,870	1,760	1,669	1,592	1,526	1,323	1,178

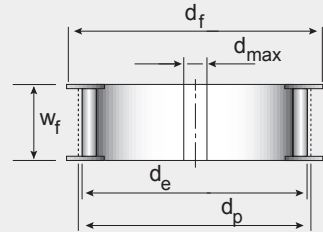
* max. force/power/torque per tooth in mesh and per mm belt width



Pulleys PU Linear/Torque XH steel cord

Table of belt widths					
Timing belt width Code	100	150	200	300	400
Timing belt width [mm] w_{fb}	25,4	38,1	50,8	76,2	101,6
Pulley width [mm] w_i	31	44	58	84	111

Requirements at pulleys		
	Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_1	18
minimum pulley diameter [mm]	d_1	124,54
diameter of idler roller [mm]	d_2	150,00



Belt drive without counter flexion

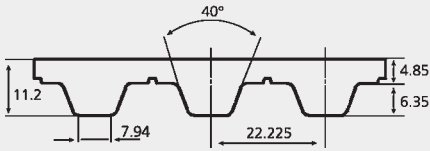
Belt drive with counter flexion

Technical data					
number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]	
18	124,54	127,34	134	95	
19	131,61	134,41	141	102	
20	138,69	141,49	149	109	
21	145,76	148,56	156	116	
22	152,84	155,64	163	123	
23	159,91	162,71	170	130	
24	166,99	169,79	177	137	
25	174,06	176,86	184	144	
26	181,14	183,94	191	151	
27	188,21	191,00	198	158	
28	195,28	198,08	205	166	
29	202,36	205,16	212	172	
30	209,43	212,23	219	179	
31	216,51	219,31	226	187	
32	223,58	226,38	233	194	
33	230,66	233,46	241	201	
34	237,73	240,53	248	208	
35	244,81	247,61	255	215	
36	251,88	254,68	262	222	
37	258,95	261,75	269	229	
38	266,03	268,83	276	236	
39	273,10	275,90	283	243	
40	280,18	282,98	290	250	
41	287,25	290,05	297	257	
42	294,33	297,13	304	264	
43	301,40	304,20	311	271	
44	308,48	311,28	318	278	
45	315,55	318,35	325	286	
46	322,62	325,42	332	293	
47	329,70	332,50	340	300	
48	336,77	339,57	347	307	
49	343,85	346,65	354	314	
50	350,92	353,72	361	321	
51	358,00	360,80	368	328	
52	365,07	367,87	375	335	

Technical data					
number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]	
53	372,15	374,95	382	342	
54	379,22	382,02	389	349	
55	386,29	389,09	396	356	
56	393,37	396,17	403	363	
57	400,44	403,24	410	370	
58	407,52	410,32	417	378	
59	414,59	417,39	424	385	
60	421,67	424,47	432	392	
61	428,74	431,54	439	399	
62	435,82	438,62	446	406	
63	442,89	445,69	453	413	
64	449,96	452,76	460	420	
65	457,04	459,84	467	427	
66	464,11	466,91	474	434	
67	471,19	473,99	481	441	
68	478,26	481,06	488	448	
69	485,34	488,14	495	455	
70	492,41	495,21	502	462	
71	499,49	502,29	509	469	
72	506,56	509,36	516	477	
73	513,63	516,43	523	484	
74	520,71	523,51	531	491	
75	527,78	530,58	538	498	
76	534,86	537,66	545	505	
77	541,93	544,73	552	512	
78	549,01	551,81	559	519	
79	556,08	558,88	566	526	
80	563,16	565,96	573	533	
81	570,23	573,03	580	540	
82	577,30	580,10	587	547	
83	584,38	587,18	594	554	
84	591,45	594,25	601	561	
85	598,53	601,33	608	569	
86	605,60	608,40	615	576	

Technical data					
number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]	
87	612,68	615,48	623	583	
88	619,75	622,55	630	590	
89	626,83	629,63	637	597	
90	633,90	636,70	644	604	
91	640,97	643,77	651	611	
92	648,05	650,85	658	618	
93	655,12	657,92	665	625	
94	662,20	665,00	672	632	
95	669,27	672,07	679	639	
96	676,35	679,15	686	646	
97	683,42	686,22	693	653	
98	690,49	693,29	700	660	
99	697,57	700,37	707	668	
100	704,64	707,44	714	675	
101	711,72	714,52	722	682	
102	718,79	721,59	729	689	
103	725,87	728,67	736	696	
104	732,94	735,74	743	703	
105	740,02	742,82	750	710	
106	747,09	749,89	757	717	
107	754,16	756,96	764	724	
108	761,24	764,04	771	731	
109	768,31	771,11	778	738	
110	775,39	778,19	785	745	
111	782,46	785,26	792	752	
112	789,54	792,34	799	760	
113	796,61	799,41	806	767	
114	803,69	806,49	814	774	
115	810,76	813,56	821	781	
116	817,83	820,63	828	788	
117	824,91	827,71	835	795	
118	831,98	834,78	842	802	
119	839,06	841,86	849	810	
120	846,13	848,93	856	817	

PU Linear XH Aramid cord

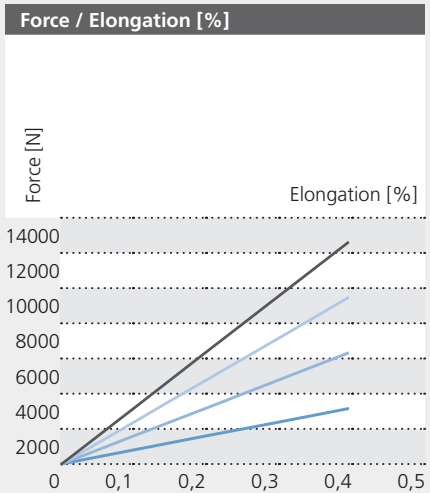


» **Standard tolerances**

- › width: ± 1,0 mm
- › height: ± 0,4 mm
- › length: ± 0,5 mm/m

» **General properties**

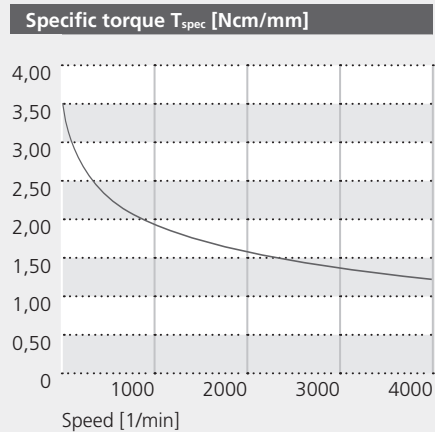
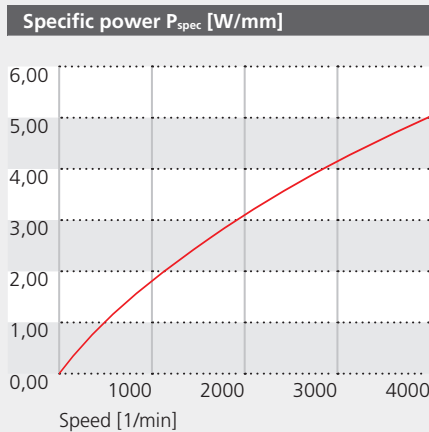
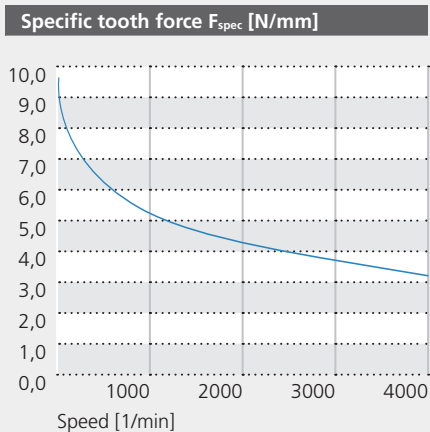
- › inch pitch 7/8" = 22.225 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 152.4 mm
- › min. length for jointed belt (W) 845 mm
- › max. speed 4.500 rpm



Technical data		allowable tensile load Typ $L_{F_{al}}$ [N]	allowable tensile load Typ $W_{F_{al}}$ [N]	Breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	Belt weight per metre m [kg/m]
Standard-belt width w_{tb} [mm]	Graph					
100 / 25,4	■	2800	1400	12000	792000	0,246
200 / 50,8	■	5600	2800	23500	1584000	0,493
300 / 76,2	■	8400	4200	30000	2376000	0,739
400 / 101,6	■	11200	5600	41000	3168000	0,985

Specific tooth force/power/torque*																			
Speed [1/min]		0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000
Specific tooth force F_{spec} [N/mm]	■	9,600	9,266	8,953	8,670	8,383	7,926	7,480	6,942	6,553	6,248	5,691	5,288	4,977	4,719	4,502	4,314	3,740	3,331
Specific power P_{spec} [W/mm]	■	0,000	0,086	0,166	0,241	0,311	0,440	0,554	0,771	0,971	1,157	1,581	1,959	2,304	2,622	2,918	3,196	4,156	4,935
Specific torque T_{spec} [Ncm/mm]	■	3,396	3,278	3,167	3,067	2,965	2,804	2,646	2,456	2,318	2,210	2,013	1,870	1,760	1,669	1,592	1,526	1,323	1,178

* max. force/power/torque per tooth in mesh and per mm belt width



XH Aramid

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Pulleys PU Linear XH Aramid cord

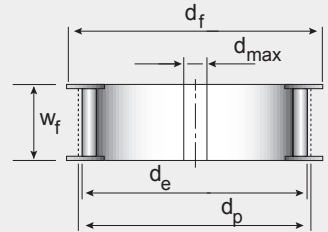
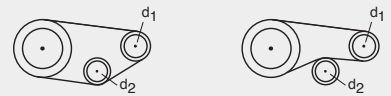


Table of belt widths					
Timing belt width Code	100	150	200	300	400
Timing belt width [mm] w_{fb}	25,4	38,1	50,8	76,2	101,6
Pulley width [mm] w_i	31	44	58	84	111

Requirements at pulleys			
		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_i	18	20
minimum pulley diameter [mm]	d_i	124,54	138,69
diameter of idler roller [mm]	d_i	120,00	150,00



Belt drive without counter flexion

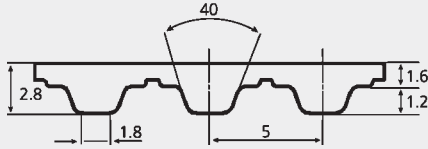
Belt drive with counter flexion

Technical data					
number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]	
18	124,54	127,34	134	95	
19	131,61	134,41	141	102	
20	138,69	141,49	149	109	
21	145,76	148,56	156	116	
22	152,84	155,64	163	123	
23	159,91	162,71	170	130	
24	166,99	169,79	177	137	
25	174,06	176,86	184	144	
26	181,14	183,94	191	151	
27	188,21	191,00	198	158	
28	195,28	198,08	205	166	
29	202,36	205,16	212	172	
30	209,43	212,23	219	179	
31	216,51	219,31	226	187	
32	223,58	226,38	233	194	
33	230,66	233,46	241	201	
34	237,73	240,53	248	208	
35	244,81	247,61	255	215	
36	251,88	254,68	262	222	
37	258,95	261,75	269	229	
38	266,03	268,83	276	236	
39	273,10	275,90	283	243	
40	280,18	282,98	290	250	
41	287,25	290,05	297	257	
42	294,33	297,13	304	264	
43	301,40	304,20	311	271	
44	308,48	311,28	318	278	
45	315,55	318,35	325	286	
46	322,62	325,42	332	293	
47	329,70	332,50	340	300	
48	336,77	339,57	347	307	
49	343,85	346,65	354	314	
50	350,92	353,72	361	321	
51	358,00	360,80	368	328	
52	365,07	367,87	375	335	

Technical data					
number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]	
53	372,15	374,95	382	342	
54	379,22	382,02	389	349	
55	386,29	389,09	396	356	
56	393,37	396,17	403	363	
57	400,44	403,24	410	370	
58	407,52	410,32	417	378	
59	414,59	417,39	424	385	
60	421,67	424,47	432	392	
61	428,74	431,54	439	399	
62	435,82	438,62	446	406	
63	442,89	445,69	453	413	
64	449,96	452,76	460	420	
65	457,04	459,84	467	427	
66	464,11	466,91	474	434	
67	471,19	473,99	481	441	
68	478,26	481,06	488	448	
69	485,34	488,14	495	455	
70	492,41	495,21	502	462	
71	499,49	502,29	509	469	
72	506,56	509,36	516	477	
73	513,63	516,43	523	484	
74	520,71	523,51	531	491	
75	527,78	530,58	538	498	
76	534,86	537,66	545	505	
77	541,93	544,73	552	512	
78	549,01	551,81	559	519	
79	556,08	558,88	566	526	
80	563,16	565,96	573	533	
81	570,23	573,03	580	540	
82	577,30	580,10	587	547	
83	584,38	587,18	594	554	
84	591,45	594,25	601	561	
85	598,53	601,33	608	569	
86	605,60	608,40	615	576	

Technical data					
number of teeth t [-]	outer Ø d_e [mm]	effective Ø d_p [mm]	Ø with flanges d_f [mm]	max. bore d_{max} [mm]	
87	612,68	615,48	623	583	
88	619,75	622,55	630	590	
89	626,83	629,63	637	597	
90	633,90	636,70	644	604	
91	640,97	643,77	651	611	
92	648,05	650,85	658	618	
93	655,12	657,92	665	625	
94	662,20	665,00	672	632	
95	669,27	672,07	679	639	
96	676,35	679,15	686	646	
97	683,42	686,22	693	653	
98	690,49	693,29	700	660	
99	697,57	700,37	707	668	
100	704,64	707,44	714	675	
101	711,72	714,52	722	682	
102	718,79	721,59	729	689	
103	725,87	728,67	736	696	
104	732,94	735,74	743	703	
105	740,02	742,82	750	710	
106	747,09	749,89	757	717	
107	754,16	756,96	764	724	
108	761,24	764,04	771	731	
109	768,31	771,11	778	738	
110	775,39	778,19	785	745	
111	782,46	785,26	792	752	
112	789,54	792,34	799	760	
113	796,61	799,41	806	767	
114	803,69	806,49	814	774	
115	810,76	813,56	821	781	
116	817,83	820,63	828	788	
117	824,91	827,71	835	795	
118	831,98	834,78	842	802	
119	839,06	841,86	849	810	
120	846,13	848,93	856	817	

PU Linear/Torque TT5 steel cord

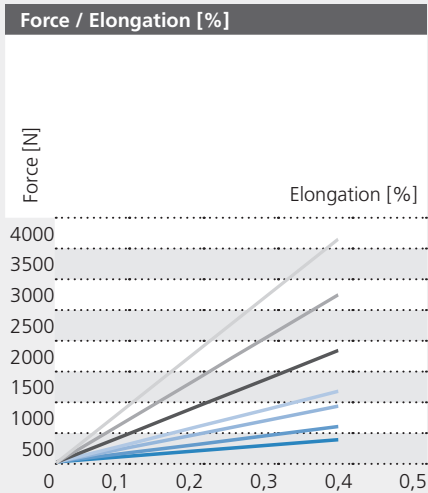


» Standard tolerances

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» General properties

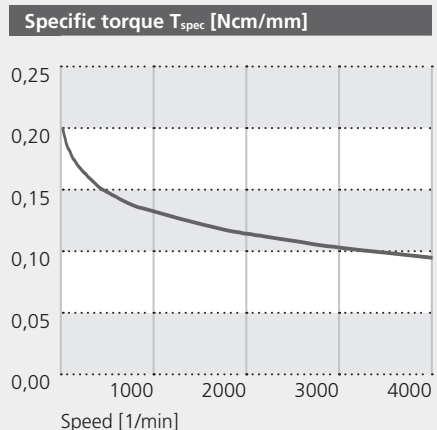
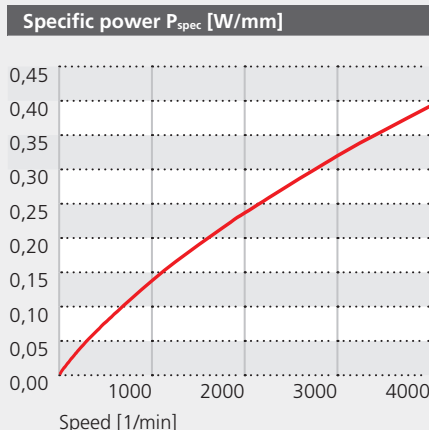
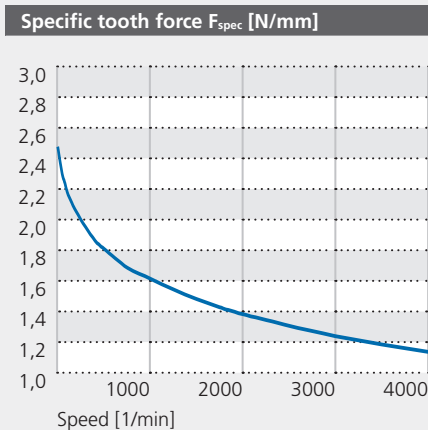
- › pitch 5 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 100 mm (PU Linear)
- › max. width up to 150 mm (PU Torque)
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 20,400 mm (PU Torque)
- › max. speed 10,000 rpm



Technical data		allowable tensile load	allowable tensile load	Breaking load	spec. spring ratio	Belt weight per metre
Standard-belt width w_{tb} [mm]	Graph	Typ $L F_{ai}$ [N]	Typ $T F_{ai}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
10	■	430	215	1500	75000	0,027
16	■	610	305	2400	135000	0,043
25	■	980	490	3750	210000	0,068
32	■	1140	570	4575	260000	0,086
50	■	1800	900	7500	409000	0,135
75	■	2700	1350	11250	590000	0,203
100	■	3600	1800	15000	780000	0,270

Specific tooth force/power/torque*																			
Speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]	■	2,452	2,360	2,274	2,230	2,175	2,105	2,050	1,955	1,867	1,815	1,697	1,626	1,560	1,500	1,448	1,403	1,265	1,166
Specific power P_{spec} [W/mm]	■	0,000	0,005	0,009	0,014	0,018	0,026	0,034	0,049	0,062	0,076	0,106	0,136	0,163	0,188	0,211	0,234	0,316	0,389
Specific torque T_{spec} [Ncm/mm]	■	0,195	0,188	0,181	0,177	0,173	0,168	0,163	0,156	0,149	0,144	0,135	0,129	0,124	0,119	0,115	0,112	0,101	0,093

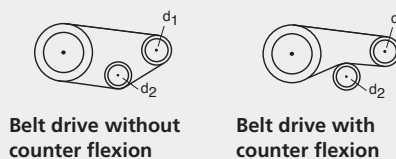
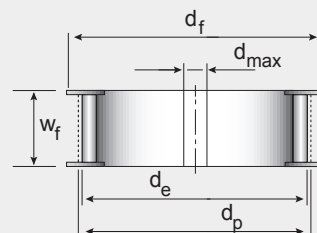
* max. Kraft/Leistung/Drehmoment, pro im Eingriff befindlichem Zahn und Millimeter Breite übertragen lässt



Pulleys PU Linear/Torque TT5 steel cord

Table of belt widths							
Timing belt width [mm] w_{fb}	10	16	25	32	50	75	100
Pulley width [mm] w_f	15	21	30	38	57	83	110

Requirements at pulleys			
		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_1	15	25
minimum pulley diameter [mm]	d_1	23,00	38,92
diameter of idler roller [mm]	d_2	30,00	40,00



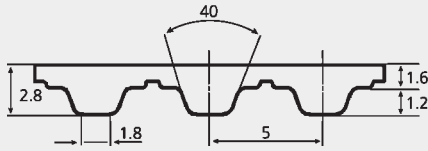
Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore [mm]	d_{max} [mm]
15	23,00	23,87	28		10
16	24,59	25,46	30		12
17	26,19	27,06	31		14
18	27,78	28,65	33		16
19	29,37	30,24	34		16
20	30,96	31,83	36		18
21	32,55	33,42	37		20
22	34,14	35,01	39		22
23	35,74	36,61	41		24
24	37,33	38,20	42		24
25	38,92	39,79	44		25
26	40,51	41,38	45		25
27	42,10	42,97	47		27
28	43,69	44,56	49		29
29	45,29	46,16	50		31
30	46,88	47,75	52		33
31	48,47	49,34	53		35
32	50,06	50,93	55		37
33	51,65	52,52	57		39
34	53,24	54,11	58		39
35	54,83	55,70	60		40
36	56,43	57,30	61		42
37	58,02	58,89	63		43
38	59,61	60,48	65		45
39	61,20	62,07	66		45
40	62,79	63,66	68		47
41	64,38	65,25	69		48
42	65,98	66,85	71		50
43	67,57	68,44	72		52
44	69,16	70,03	74		52
45	70,75	71,62	76		54
46	72,34	73,21	77		56
47	73,93	74,80	79		58
48	75,52	76,39	80		60
49	77,12	77,99	82		60
50	78,71	79,58	84		60

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore [mm]	d_{max} [mm]
51	80,30	81,17	85		62
52	81,89	82,76	87		64
53	83,48	84,35	88		66
54	85,07	85,94	90		66
55	86,67	87,54	92		68
56	88,26	89,13	93		70
57	89,85	90,72	95		72
58	91,44	92,31	96		74
59	93,03	93,90	98		74
60	94,62	95,49	100		76
61	96,21	97,08	101		79
62	97,81	98,68	103		80
63	99,40	100,27	104		82
64	100,99	101,86	106		82
65	102,58	103,45	108		84
66	104,17	105,04	109		86
67	105,76	106,63	111		88
68	107,36	108,23	112		90
69	108,95	109,82	114		90
70	110,54	111,41	115		90
71	112,13	113,00	117		92
72	113,72	114,59	119		94
73	115,31	116,18	120		96
74	116,90	117,77	122		96
75	118,50	119,37	123		98
76	120,09	120,96	125		100
77	121,68	122,55	127		102
78	123,27	124,14	128		104
79	124,86	125,73	130		104
80	126,45	127,32	131		106
81	128,05	128,92	133		108
82	129,64	130,51	135		110
83	131,23	132,10	136		110
84	132,82	133,69	138		112
85	134,41	135,28	139		114

Technical data					
number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore [mm]	d_{max} [mm]
86	136,00	136,87	141		116
87	137,59	138,46	143		119
88	139,19	140,06	144		120
89	140,78	141,65	146		120
90	142,37	143,24	147		122
91	143,96	144,83	149		124
92	145,55	146,42	150		126
93	147,14	148,01	152		126
94	148,74	149,61	154		129
95	150,33	151,20	155		130
96	151,92	152,79	157		130
97	153,51	154,38	158		132
98	155,10	155,97	160		132
99	156,69	157,56	162		134
100	158,29	159,16	163		136
101	159,88	160,75	165		139
102	161,47	162,34	166		140
103	163,06	163,93	168		140
104	164,65	165,52	170		140
105	166,24	167,11	171		142
106	167,83	168,70	173		146
107	169,43	170,30	174		146
108	171,02	171,89	176		148
109	172,61	173,48	178		150
110	174,20	175,07	179		150
111	175,79	176,66	181		152
112	177,38	178,25	182		152
113	178,98	179,85	184		152
114	180,57	181,44	185		154
115	182,16	183,03	187		154
116	183,75	184,62	189		154
117	185,34	186,21	190		154
118	186,93	187,80	192		156
119	188,52	189,39	193		156
120	190,12	190,99	195		156

Standard

PU Linear/Torque TT5 Aramid cord

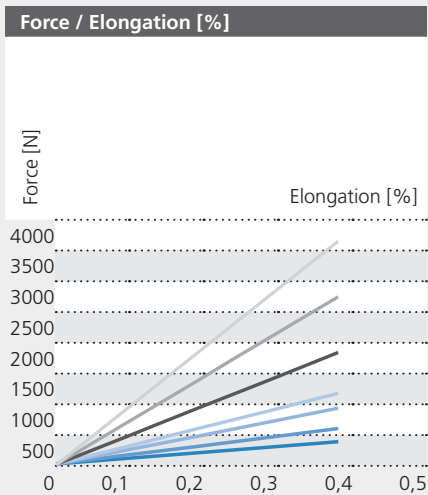


» Standard tolerances

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» General properties

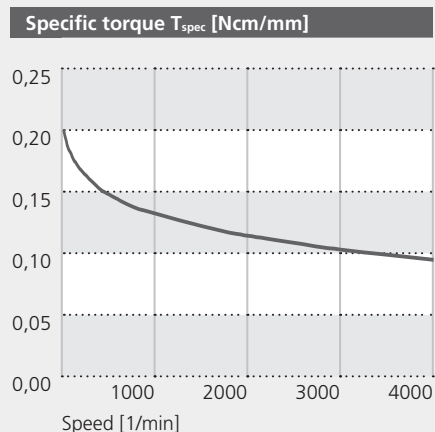
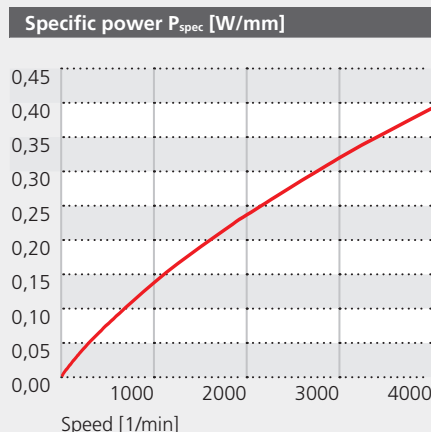
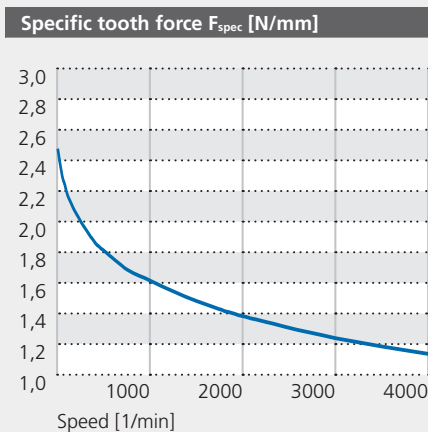
- › pitch 5 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › max. width up to 100 mm (PU Linear)
- › max. width up to 150 mm (PU Torque)
- › min. length for jointed belt (W) 500 mm
- › length between 1,500 to 20,400 mm (PU Torque)
- › max. speed 10,000 rpm



Technical data		allowable tensile load	allowable tensile load	Breaking load	spec. spring ratio	Belt weight per metre
Standard-belt width w_{tb} [mm]	Graph	Typ $L F_{ai}$ [N]	Typ $T F_{ai}$ [N]	F_{Br} [N]	C_{spec} [N]	m [kg/m]
10	■	430	215	1500	75000	0,026
16	■	610	305	2400	135000	0,046
25	■	980	490	3750	210000	0,065
32	■	1140	570	4575	260000	0,083
50	■	1800	900	7500	409000	0,130
75	■	2700	1350	11250	590000	0,195
100	■	3600	1800	15000	780000	0,260

Specific tooth force/power/torque*																			
Speed [1/min]	0	25	50	75	100	150	200	300	400	500	750	1000	1250	1500	1750	2000	3000	4000	
Specific tooth force F_{spec} [N/mm]	■	2,452	2,360	2,274	2,230	2,175	2,105	2,050	1,955	1,867	1,815	1,697	1,626	1,560	1,500	1,448	1,403	1,265	1,166
Specific power P_{spec} [W/mm]	■	0,000	0,005	0,009	0,014	0,018	0,026	0,034	0,049	0,062	0,076	0,106	0,136	0,163	0,188	0,211	0,234	0,316	0,389
Specific torque T_{spec} [Ncm/mm]	■	0,195	0,188	0,181	0,177	0,173	0,168	0,163	0,156	0,149	0,144	0,135	0,129	0,124	0,119	0,115	0,112	0,101	0,093

* max. force/power/torque per tooth in mesh and per mm belt width



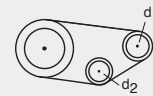
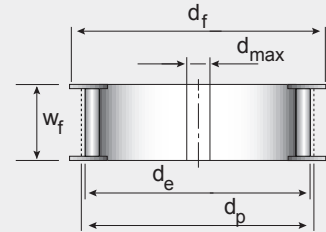
Pulleys PU Linear/Torque TT5 Aramid cord

Table of belt widths

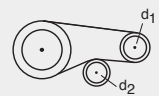
Timing belt width [mm] w_{fb}	10	16	25	32	50	75	100
Pulley width [mm] w_f	15	21	30	38	57	83	110

Requirements at pulleys

		Belt drive without counter flexion	Belt drive with counter flexion
minimum number of teeth [-]	t_1	15	25
minimum pulley diameter [mm]	d_1	23,00	38,92
diameter of idler roller [mm]	d_2	30,00	40,00



Belt drive without counter flexion



Belt drive with counter flexion

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
15	23,00	23,87	28	10
16	24,59	25,46	30	12
17	26,19	27,06	31	14
18	27,78	28,65	33	16
19	29,37	30,24	34	16
20	30,96	31,83	36	18
21	32,55	33,42	37	20
22	34,14	35,01	39	22
23	35,74	36,61	41	24
24	37,33	38,20	42	24
25	38,92	39,79	44	25
26	40,51	41,38	45	25
27	42,10	42,97	47	27
28	43,69	44,56	49	29
29	45,29	46,16	50	31
30	46,88	47,75	52	33
31	48,47	49,34	53	35
32	50,06	50,93	55	37
33	51,65	52,52	57	39
34	53,24	54,11	58	39
35	54,83	55,70	60	40
36	56,43	57,30	61	42
37	58,02	58,89	63	43
38	59,61	60,48	65	45
39	61,20	62,07	66	45
40	62,79	63,66	68	47
41	64,38	65,25	69	48
42	65,98	66,85	71	50
43	67,57	68,44	72	52
44	69,16	70,03	74	52
45	70,75	71,62	76	54
46	72,34	73,21	77	56
47	73,93	74,80	79	58
48	75,52	76,39	80	60
49	77,12	77,99	82	60
50	78,71	79,58	84	60

Standard

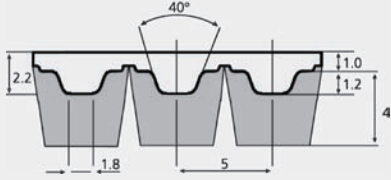
Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
51	80,30	81,17	85	62
52	81,89	82,76	87	64
53	83,48	84,35	88	66
54	85,07	85,94	90	66
55	86,67	87,54	92	68
56	88,26	89,13	93	70
57	89,85	90,72	95	72
58	91,44	92,31	96	74
59	93,03	93,90	98	74
60	94,62	95,49	100	76
61	96,21	97,08	101	79
62	97,81	98,68	103	80
63	99,40	100,27	104	82
64	100,99	101,86	106	82
65	102,58	103,45	108	84
66	104,17	105,04	109	86
67	105,76	106,63	111	88
68	107,36	108,23	112	90
69	108,95	109,82	114	90
70	110,54	111,41	115	90
71	112,13	113,00	117	92
72	113,72	114,59	119	94
73	115,31	116,18	120	96
74	116,90	117,77	122	96
75	118,50	119,37	123	98
76	120,09	120,96	125	100
77	121,68	122,55	127	102
78	123,27	124,14	128	104
79	124,86	125,73	130	104
80	126,45	127,32	131	106
81	128,05	128,92	133	108
82	129,64	130,51	135	110
83	131,23	132,10	136	110
84	132,82	133,69	138	112
85	134,41	135,28	139	114

Technical data

number of teeth t [-]	outer \varnothing d_e [mm]	effective \varnothing d_p [mm]	\varnothing with flanges d_f [mm]	max. bore d_{max} [mm]
86	136,00	136,87	141	116
87	137,59	138,46	143	119
88	139,19	140,06	144	120
89	140,78	141,65	146	120
90	142,37	143,24	147	122
91	143,96	144,83	149	124
92	145,55	146,42	150	126
93	147,14	148,01	152	126
94	148,74	149,61	154	129
95	150,33	151,20	155	130
96	151,92	152,79	157	130
97	153,51	154,38	158	132
98	155,10	155,97	160	132
99	156,69	157,56	162	134
100	158,29	159,16	163	136
101	159,88	160,75	165	139
102	161,47	162,34	166	140
103	163,06	163,93	168	140
104	164,65	165,52	170	140
105	166,24	167,11	171	142
106	167,83	168,70	173	146
107	169,43	170,30	174	146
108	171,02	171,89	176	148
109	172,61	173,48	178	150
110	174,20	175,07	179	150
111	175,79	176,66	181	152
112	177,38	178,25	182	152
113	178,98	179,85	184	152
114	180,57	181,44	185	154
115	182,16	183,03	187	154
116	183,75	184,62	189	154
117	185,34	186,21	190	154
118	186,93	187,80	192	156
119	188,52	189,39	193	156
120	190,12	190,99	195	156

PU Linear TK5 steel cord



» **Standard tolerances**

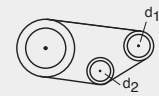
- › width: $\pm 0,5$ mm
- › height: $\pm 0,2$ mm
- › length: $\pm 0,5$ mm/m

» **General properties**

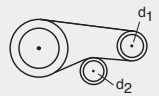
- › pitch 5 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › PU Linear (L) width up to 100 mm
- › min. length for jointed belt (W) 500 mm
- › self-guiding belt, no flanges required

Technical data					
belt width [mm]	25	32	50	75	100
allowable tensile load, Typ W [N]	455	550	845	1200	1600
belt weight per metre [kg/m]	0,07	0,08	0,13	0,20	0,26

Requirements at pulleys			
		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	25	25
minimum pulley diameter [mm]	d_1	38,92	38,92
diameter of idler roller [mm]	d_2	60,00	80,00



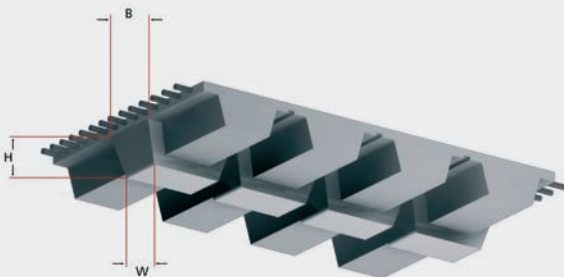
belt drive without counter flexion



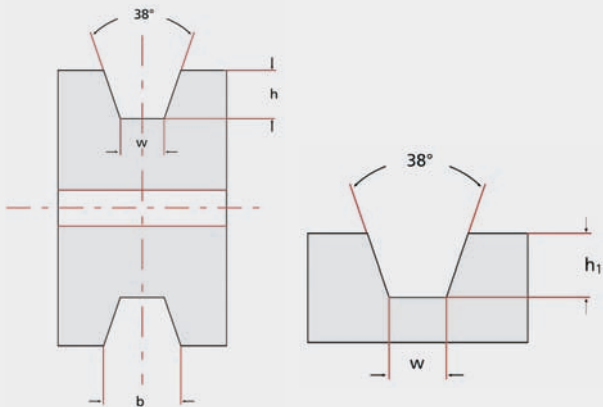
belt drive with counter flexion

Note: take width of the v-guide (6 mm) into account while calculating the belt width.

$$\text{necessary belt width} = \text{calculated belt width} + 6 \text{ mm}$$

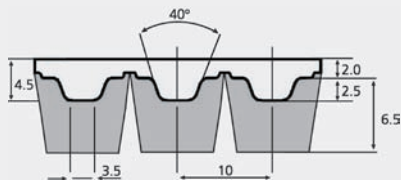


V-guide dimension [mm]		
B	H	W
6,0	4,0	3,3



Pulley groove [mm]			Slider groove [mm]	
b	h	w	h_1	w
7,5	5,0	4,1	3,8	4,1

PU Linear TK10 steel cord



» **Standard tolerances**

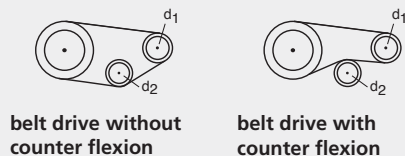
- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

- › pitch 10 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › PU Linear (M) width up to 100 mm
- › min. length for jointed belt (W) 500 mm
- › self-guiding belt, no flanges required

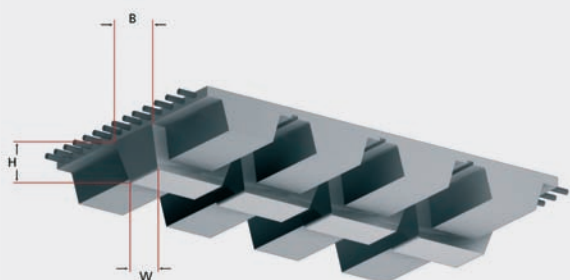
Technical data					
belt width [mm]	25	32	50	75	100
allowable tensile load, Typ W [N]	1100	1310	2100	2550	3550
belt weight per metre [kg/m]	0,17	0,22	0,30	0,41	0,53

	Requirements at pulleys	
	belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	25
minimum pulley diameter [mm]	d_1	77,73
diameter of idler roller [mm]	d_2	80,00

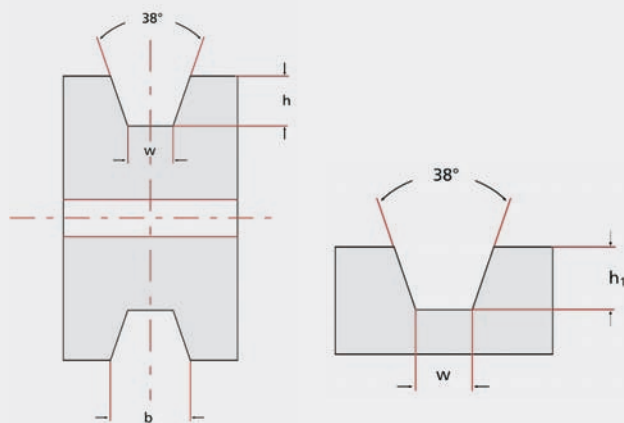


Note: take width of the v-guide (6 mm) into account while calculating the belt width.

$$\text{necessary belt width} = \text{calculated belt width} + 6 \text{ mm}$$

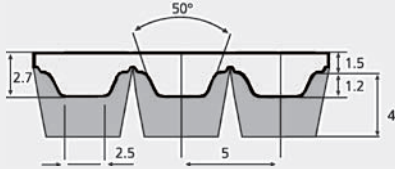


V-guide dimension [mm]		
B	H	W
13	6,5	8,5



Pulley groove [mm]			Slider groove [mm]	
b	h	w	h_1	w
14,5	7,5	9,3	5,0	9,3

PU Linear ATK5 steel cord



» **Standard tolerances**

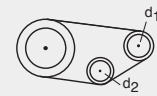
- › width: $\pm 0,5$ mm
- › height: $\pm 0,2$ mm
- › length: $\pm 0,5$ mm/m

» **General properties**

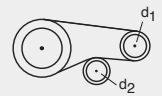
- › pitch 5 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › PU Linear (L) max. width up to 100 mm
- › min. length for jointed belt (W) 500 mm
- › self-guiding belt, no flanges required

Technical data					
belt width [mm]	25	32	50	75	100
allowable tensile load, Typ W [N]	850	1110	1750	2625	3500
belt weight per metre [kg/m]	0,09	0,11	0,19	0,29	0,38

Requirements at pulleys			
		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	25	25
minimum pulley diameter [mm]	d_1	38,56	38,56
diameter of idler roller [mm]	d_2	60,00	80,00



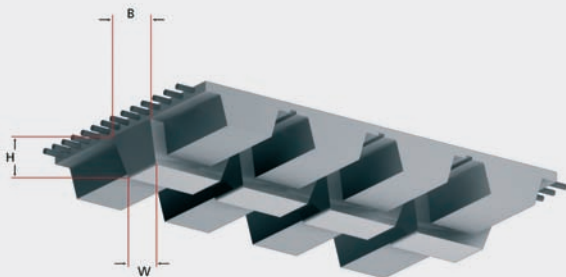
belt drive without counter flexion



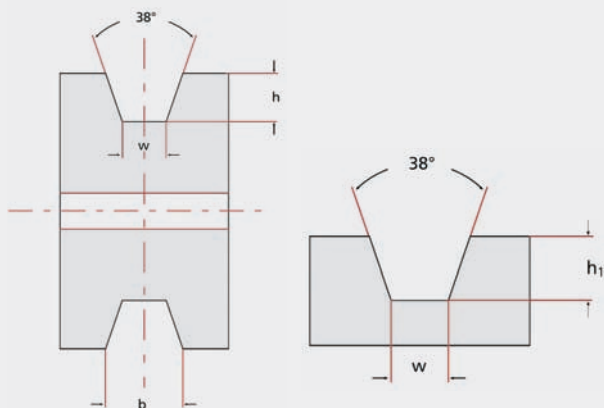
belt drive with counter flexion

Note: take width of the v-guide (6 mm) into account while calculating the belt width.

$$\text{necessary belt width} = \text{calculated belt width} + 6 \text{ mm}$$

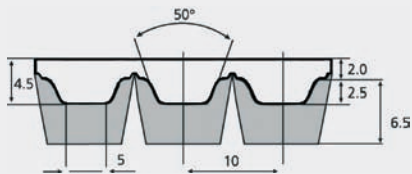


V-guide dimension [mm]		
B	H	W
6,0	4,0	3,3



Pulley groove [mm]			Slider groove [mm]	
b	h	w	h_1	w
7,5	5,0	4,1	3,8	4,1

PU Linear ATK10 steel cord



» **Standard tolerances**

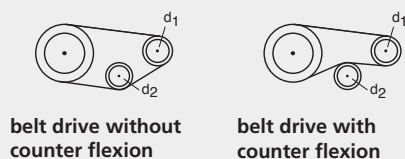
- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

» **General properties**

- › pitch 10 mm
- › thermoplastic polyurethane
- › hardness 92° Shore A
- › PU Linear (M) max. width up to 100 mm
- › min. length for jointed belt (W) 500 mm
- › self-guiding belt, no flanges required

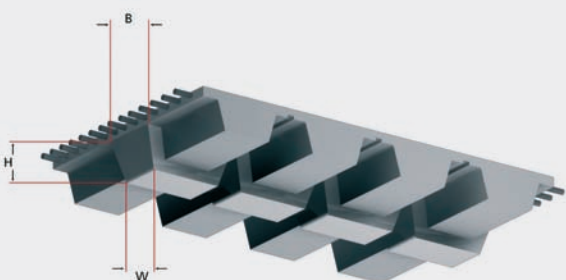
Technical data					
belt width [mm]	25	32	50	75	100
allowable tensile load, Typ W [N]	1875	2500	3750	6000	8000
belt weight per metre [kg/m]	0,22	0,27	0,36	0,50	0,72

Requirements at pulleys			
		belt drive without counter flexion	belt drive with counter flexion
minimum number of teeth [-]	t_1	25	25
minimum pulley diameter [mm]	d_1	77,73	77,73
diameter of idler roller [mm]	d_2	80,00	120,00

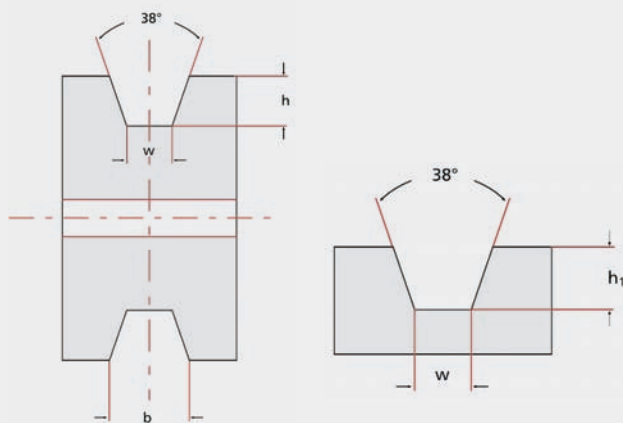


Note: take width of the v-guide (6 mm) into account while calculating the belt width.

$$\text{necessary belt width} = \text{calculated belt width} + 6 \text{ mm}$$



V-guide dimension [mm]		
B	H	W
13	6,5	8,5



Pulley groove [mm]			Slider groove [mm]	
b	h	w	h_1	w
14,5	7,5	9,3	5,0	9,3

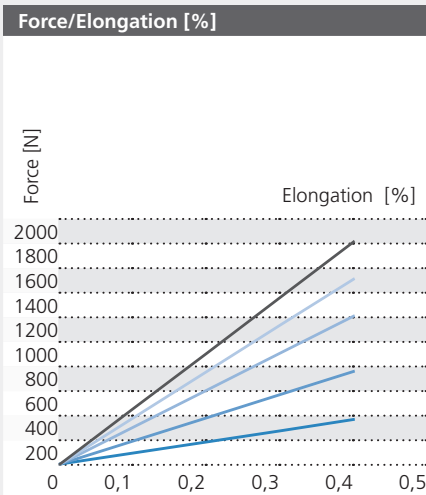
PU Linear F1 steel cord



- » **General properties**
- › thermoplastic polyurethane
 - › hardness 92° Shore A
 - › max. width up to 50 mm

» **Standard tolerances**

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

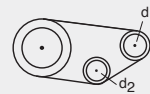


Technical data							
standard belt width w_b [mm]	graph	allowable tensile load Typ $L F_{st}$ [N]	allowable tensile load Typ $W F_{st}$ [N]	breaking load F_{br} [N]	spec. spring ratio C_{spec} [N]	belt weight per metre m [kg/m]	
10	■	360	180	1500	90000	0,02	
20	■	750	375	3125	187500	0,04	
30	■	1200	600	5000	300000	0,05	
40	■	1500	750	6250	375000	0,08	
50	■	1800	900	7500	450000	0,09	

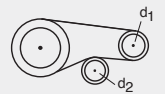
Pulleys

Table of belt widths					
belt width [mm]	10	20	30	40	50
pulley width [mm] W_f	15	25	35	46	57

Requirements at pulleys		
	belt drive without counter flexion	belt drive with counter flexion
minimum pulley diameter [mm] d_1	16	30
diameter of idler roller [mm] d_2	16	30



belt drive without counter flexion



belt drive with counter flexion

PU Linear/Torque F2 steel cord

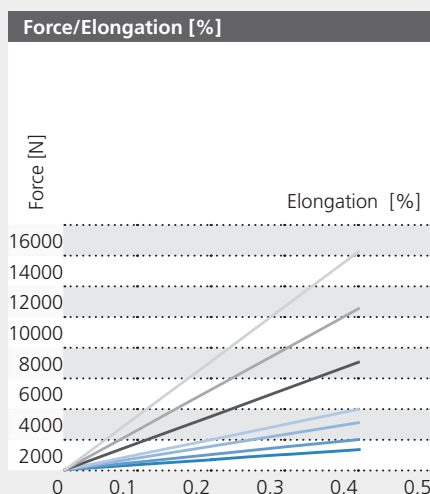


» Standard tolerances

- › width: $\pm 0,5$ mm
- › height: $\pm 0,2$ mm
- › length: $\pm 0,5$ mm/m

» General properties

- › thermoplastic polyurethane
- › hardness 92° Shore A
- › PU Linear (L) max. width up to 100 mm
- › PU Torque (T) max. width up to 150 mm
- › length between Typ Torque (T) 1.500 bis 22.770 mm



Technical data

standard belt width w_{fb} [mm]	graph	allowable tensile load Typ $L F_{st}$ [N]	allowable tensile load Typ $W F_{st}$ [N]	breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	belt weight per metre m [kg/m]
10	■	1320	660	5700	330000	0,02
15	■	1980	990	8550	495000	0,04
25	■	3080	1540	13300	770000	0,05
30	■	3960	1980	17100	990000	0,08
50	■	7040	3520	30400	1760000	0,09
75	■	10560	5280	45600	2640000	0,09
100	■	14300	7150	61750	3575000	0,09

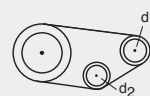
Pulleys

Table of belt widths

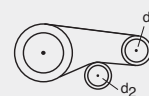
belt width [mm]	10	15	25	30	50	75	100
pulley width [mm] W_f	15	20	30	36	57	83	110

Requirements at pulleys

		belt drive without counter flexion	belt drive with counter flexion
minimum pulley diameter [mm]	d_1	50	100
diameter of idler roller [mm]	d_2	50	100

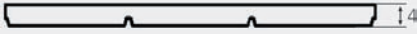


belt drive without counter flexion



belt drive with counter flexion

PU Linear F4 steel cord

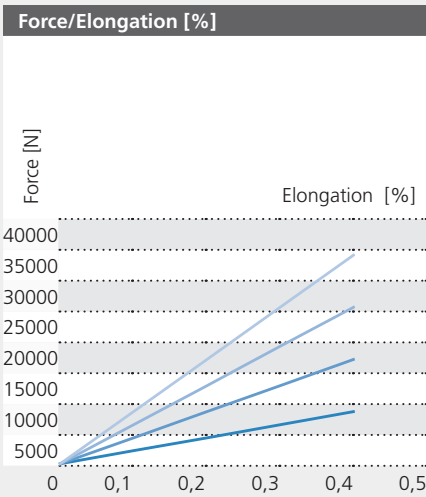


» General properties

- › thermoplastic polyurethane
- › hardness 92° Shore A
- › PU Linear (L) max. width up to 100 mm

» Standard tolerances

- › width: ± 0,5 mm
- › height: ± 0,2 mm
- › length: ± 0,5 mm/m

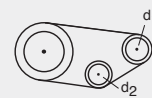


Technical data							
standard belt width w_b [mm]	graph	allowable tensile load Typ $L F_{st}$ [N]	allowable tensile load Typ $W F_{st}$ [N]	breaking load F_{Br} [N]	spec. spring ratio C_{spec} [N]	belt weight per metre m [kg/m]	
25		8400	4200	33000	2100000	0,20	
50		16800	8400	66000	4200000	0,40	
75		25200	12600	99000	6300000	0,60	
100		33600	16800	132000	8400000	0,80	

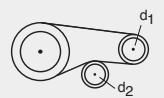
Pulleys

Table of belt widths				
belt width [mm]	25	50	75	100
pulley width [mm] W_f	30	57	83	110

Requirements at pulleys		
	belt drive without counter flexion	belt drive with counter flexion
minimum pulley diameter [mm] d_1	120	150
diameter of idler roller [mm] d_2	120	150

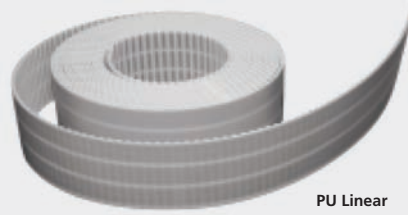


belt drive without counter flexion



belt drive with counter flexion

Feasibility Tables



PU Linear

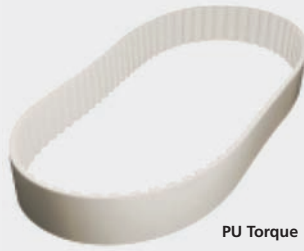
PU Linear

Feasibility Table														
	T				AT			TT	HTD				STD	
	2,5	5	10	20	5	10	20	5	3M	5M	8M	14M	5M	8M
Steel cord	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aramid cord	x	●	●	■	□	□	■	●	x	■	□	■	x	□
Stainless steel cord	x	x	□	□	□	□	□	x	□	□	□	□	□	□
High flexibility (HF, E) cord	x	x	□	□	□	□	■	x	x	□	□	x	□	□
High performance (HP, L) cord	x	■	■	■	○	●	○	x	x	x	□	□	x	□
Polyester cord	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Fiberglass cord	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Nylon fabric on tooth side, NT	○	●	●	●	●	●	●	x	□	●	●	●	●	●
Nylon fabric on back side, NB	○	●	●	●	●	●	●	x	□	○	○	○	□	□
Nylon fabric on both sides, NTB	○	○	○	○	○	○	○	x	□	○	□	□	□	□
Antistatic NTB	□	○	□	□	□	□	□	x	□	□	□	□	□	□
PU compound, FG	□	□	□	□	□	□	□	x	□	□	□	□	□	□
PU compound, cold resistant	□	□	□	□	□	□	□	x	□	□	□	□	□	□
PU compound, antistatic	□	□	□	□	□	□	□	x	□	□	□	□	□	□
Double teeth, steel cord	x	○	○	x	○	○	x	x	x	x	x	x	x	x
Cleats	●	●	●	●	●	●	●	●	●	●	●	●	●	●
V-guides	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Holes	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ATEX	□	□	□	□	□	□	□	□	□	□	□	□	□	□
Without winding groove	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Min. length, welded, mm	500	500	500	840	500	500	840	500	501	500	960	966	500	960
Max. roll length, m	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Max. roll width, mm	50	100	150	150	100	150	150	100	100	100	100	115	100	100

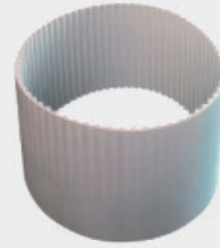
Feasibility Table											
	TK		ATK		Inch				Flat		
	TK5	TK10	ATK5	ATK10	XL	L	H	XH	F1	F2	F4
Steel cord	●	●	●	●	●	●	●	●	●	●	●
Aramid cord	□	□	□	□	●	●	●	■	□	□	□
Stainless steel cord	x	□	□	□	■	□	□	□	□	□	□
High flexibility (HF, E) cord	x	□	□	□	x	□	□	x	x	□	x
High performance (HP, L) cord	x	x	x	x	x	x	x	x	x	○	x
Polyester cord	x	x	x	x	x	x	x	x	x	x	x
Fiberglass cord	x	x	x	x	x	x	x	x	x	x	x
Nylon fabric on tooth side, NT	□	□	□	□	●	●	●	●	□	□	□
Nylon fabric on back side, NB	□	□	□	□	○	○	○	○	x	■	■
Nylon fabric on both sides, NTB	x	x	x	x	○	○	○	○	x	x	x
Antistatic NTB	□	□	□	□	□	□	□	□	x	x	x
PU compound, FG	□	□	□	□	□	□	□	□	□	□	□
PU compound, cold resistant	□	□	□	□	□	□	□	□	□	□	□
PU compound, antistatic	□	□	□	□	□	□	□	□	□	□	□
Double teeth, steel cord	x	x	x	x	x	x	x	x	x	x	x
Cleats	●	●	●	●	●	●	●	●	●	●	●
V-guides	-	-	-	-	●	●	●	●	●	●	●
Holes	●	●	●	●	●	●	●	●	●	●	●
ATEX	□	□	□	□	□	□	□	□	□	□	□
Without winding groove	x	x	x	x	■	■	■	■	■	■	■
Min. length, welded, mm	500	500	500	500	630	505	508	845	500	500	500
Max. roll length, m	100	100	100	100	100	100	100	100	100	100	100
Max. roll width, mm	100	100	100	100	101,6	101,6	101,6	152,4	50	100	100

● = standard □ = on request with min. quantity x = not available ○ = on request without min. quantity ■ = consult Ammeraal Beltech

Feasibility Tables



PU Torque



PU Moulded

PU Torque

Feasibility Table																		
	T			AT			HTD			STD		Inch				Flat		
	5	10	20	5	10	20	5M	8M	14M	5M	8M	XL	L	H	XH	F1	F2	F4
Steel cord	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	x	●	x
Aramid cord	■	□	□	□	□	□	□	□	x	□	□	x	x	x	x	x	x	x
Stainless steel cord	x	□	□	□	□	□	□	□	□	□	□	□	□	□	□	x	□	x
High flexibility cord, (HF, E)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	x	○	x
High performance cord, (HP, L)	□	□	□	□	○	○	x	x	x	x	x	x	x	x	x	x	x	x
Polyester cord	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Fiberglass cord	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Nylon fabric on tooth side, NT	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	x	□	x
Nylon fabric on back side, NB	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Nylon fabric on both sides, NTB	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Antistatic NTB	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	x	□	x
PU compound, FG	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	x	□	x
PU compound, cold resistant	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	x	■	x
PU compound, antistatic	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	x	■	x
Double teeth, steel cord	□	□	□	□	□	□	□	□	x	□	□	□	□	□	□	x	x	x
Cleats	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	x	●	x
V-guides	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	x	●	x
Holes	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	x	●	x
ATEX	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	x	■	x
Without winding groove	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	x	■	x
Min. length, mm	1500	1500	1500	1500	1500	1500	1500	1504	1512	1500	1504	1504	1505	1511	1511	x	1500	x
Min. length with NT, mm	1800	1800	1800	1800	1800	1800	1800	1800	1806	1800	1800	1803	1800	1803	1800	x	1900	x
Max. length with steel cord, mm	24000	24000	24000	24000	24000	24000	24000	24000	24000	20400	20400	22770	22770	22770	22770	x	22770	x
Max. width, mm	150	150	150	150	150	150	150	150	150	150	150	152,4	152,4	152,4	152,4	x	150	x

PU Moulded

Feasibility Table											
	T			AT		DT		Inch			
	2,5	5	10	5	10	5	10	MXL	XL	L	H
Steel cord	●	●	●	●	●	●	●	●	●	●	●
Aramid cord	□	□	□	□	x	□	□	○	○	○	□
Stainless steel cord	x	□	□	□	□	□	□	x	□	□	□
High flexibility cord, (HF, E)	x	□	□	□	□	□	□	x	x	x	x
High performance cord, (HP, L)	□	□	□	□	□	x	x	x	x	x	x
Polyester cord	□	□	□	x	x	x	x	□	□	□	□
Fiberglass cord	x	□	□	x	x	x	x	x	○	□	□
Nylon fabric on tooth side, NT	x	x	x	x	x	x	x	x	x	x	x
Nylon fabric on back side, NB	x	x	x	x	x	x	x	x	x	x	x
Nylon fabric on both sides, NTB	x	x	x	x	x	x	x	x	x	x	x
Antistatic NTB	x	x	x	x	x	x	x	x	x	x	x
PU compound, FG	x	x	x	x	x	x	x	x	x	x	x
PU compound, cold resistant	x	x	x	x	x	x	x	x	x	x	x
PU compound, antistatic	x	x	x	x	x	x	x	x	x	x	x
Double teeth, steel cord	x	x	x	x	x	●	●	x	x	x	x
Cleats	x	x	x	x	x	x	x	x	x	x	x
V-guides	x	x	x	x	x	x	x	x	x	x	x
Holes	●	●	●	●	●	●	●	●	●	●	●
ATEX	x	x	x	x	x	x	x	x	x	x	x
Without winding groove	■	■	■	■	■	■	■	■	■	■	■
Min. length, mm	120	120	260	225	500	410	260	112	152	219	584
Max. length, mm	1185	1955	2250	2000	1940	1100	1880	986	1438	1524	1296
Max. width, mm	300	300	300	300	300	300	300	300	300	300	300

● = standard □ = on request with min. quantity x = not available ○ = on request without min. quantity ■ = consult Ammeraal Beltech

Mechanical Fastener for PU Linear timing belts

Ammeraal Beltech provides a unique way of making timing belts endless by using a mechanical fastener. Downtimes of machinery are reduced to a minimum and installation is quick on site. Timing belts with mechanical fastener can be used also in very compact and inaccessible applications where welding devices can not be used.

The Ammeraal Beltech mechanical fastener can be integrated into following PU Linear timing belt types:

T5, T10, AT5, AT10, H

The minimum belt width is 20 mm. The mechanical fastener can be integrated into timing belts with steel cord or Aramid cords.

The strength of the mechanical fastener is limited. It is about 40% of the strength of a welded belt and depends on the strength of the plastic spiral and not of the timing belt type. The following table shows the strength of the mechanical fastener for different widths:

belt width [mm]	tensile strength [N]
25	250
32	320
50	500
75	750
100	1000

Due to the limited performance mechanical fasteners are commonly used within light conveying applications without impact loading. For power transmission timing belts with mechanical fastener are only used in exceptional cases.



Fabricated V-Guides

Fabricated V-guides

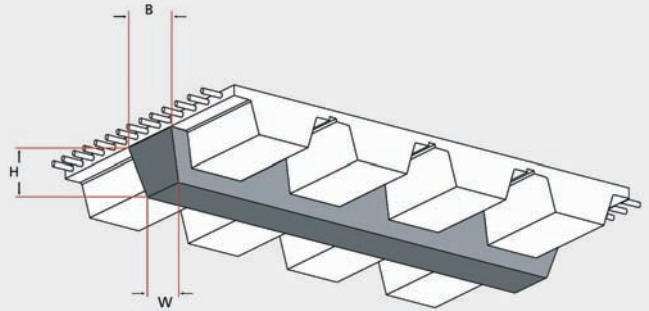
can be added to virtually any of our PU Linear and PU Torque timing belts in any width - length combinations to eliminate lateral movement resulting better tracking.

In addition solving tracking problems V-guides can be added on to the back side of the belt for carrying and conveying purposes.

Specialities on request:

- different dimensions and hardnesses available to serve any application requirement
- notched types available for extra flexibility
- special compounds, materials and colors available

Note: Consider width of V-Guide while calculating timing belt width



Fabricated V-Guides

Type	Size [mm]			Color	Hardness [°ShA]	Weight [g/m]	Min pulley Ø [mm]	
	B	H	W				normal flexing	back flexing
K6-65	6	4	3,25	transparent	65	23	35	55
K6-85	6	4	3,25	white	85	23	40	65
K10-65	10	6	5,9	transparent	65	63	60	80
K10-85	10	6	5,9	white	85	63	70	90
K13-65	13	8	7,5	transparent	65	94	90	120
K13-85	13	8	7,5	white	85	94	100	140
K13-85 low*	13	6,5	8,5	white	85	75	80	100
K17-65	17	11	9,4	transparent	65	184	100	130
K17-85	17	11	9,4	white	85	184	120	150

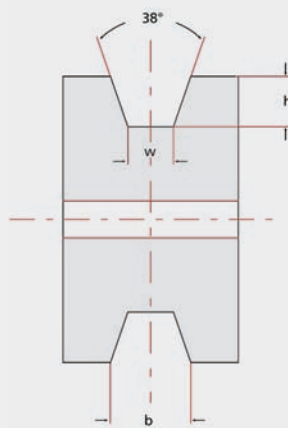
*) notched

the information applies at +20°C (68°F)

Pulley dimensions

Type (V-Guide)	Pulley groove (mm)			
	b	h	w	α
K6-65	7,5	5	4,25	38
K6-85	7,5	5	4,25	38
K10-65	11,5	7	6,9	38
K10-85	11,5	7	6,9	38
K13-65	14,5	9	8,5	38
K13-85	14,5	9	8,5	38
K13-85 low*	14,5	7,5	9,3	38
K17-65	18,5	12	10,4	38
K17-85	18,5	12	10,4	38

*) notched

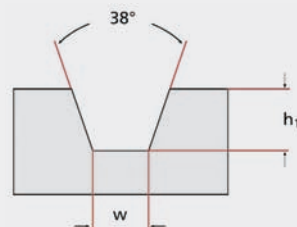


Slider dimensions

Type (V-Guide)	Guide rail groove (mm)		
	h ₁	w	α
K6-65	h - t	4,25	38
K6-85	h - t	4,25	38
K10-65	h - t	6,9	38
K10-85	h - t	6,9	38
K13-65	h - t	8,5	38
K13-85	h - t	8,5	38
K13-85 low*	h - t	9,3	38
K17-65	h - t	10,4	38
K17-85	h - t	10,4	38

*) notched

t = tooth thickness



Tooth thickness table

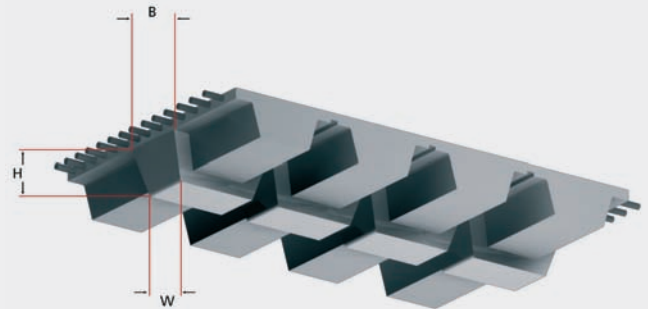
Type	Tooth thickness t [mm]
T5	1,2
T10	2,5
T20	5,0
AT5	1,2
AT10	2,5
AT20	5,0
XL	1,3
L	1,9
H	2,3
XH	6,4
HTD5	2,2
HTD8	3,5
HTD14	6,4
STD5	1,9
STD8	3,1

Integral V-Guides

Integral, notched V-guides are integrally extruded to specific belt types. The PU compound, hardness and color is the same than the body of the belt.

Standard belt widths: 25, 32, 50, 75, 100 mm

Note: Consider width of V-Guide while calculating timing belt width

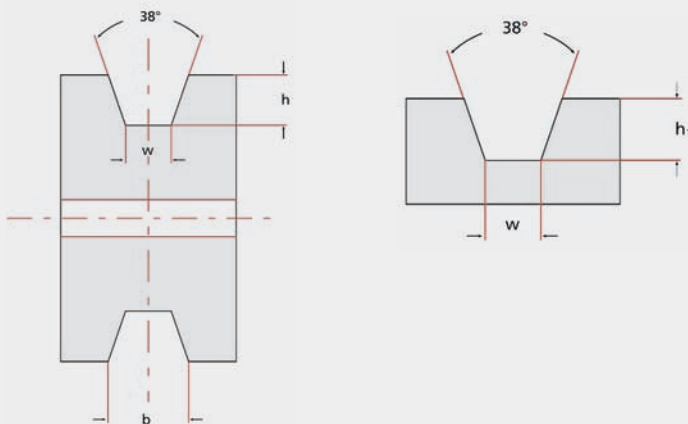


Integral V-Guides							
Type	Size [mm]			Color	Hardness	Min pulley Ø [mm]	
Belt	B	H	W		[°ShA]	normal flexing	back flexing
TK5	6	4	3,3	white	92	39	60
TK10	13	6,5	8,5	white	92	77	80
ATK5	6	4	3,3	white	92	39	60
ATK10	13	6,5	8,5	white	92	77	120

the information applies at +20°C (68°F)

Pulley dimensions				
Type (Belt)	Pulley groove (mm)			
	b	h	w	α
TK5	7,5	5,0	4,1	38
TK10	14,5	7,5	9,3	38
ATK5	7,5	5,0	4,1	38
ATK10	14,5	7,5	9,3	38

Slider dimensions			
Type (Belt)	Guide rail groove (mm)		
	h_1	w	α
TK5	3,8	4,1	38
TK10	5,0	9,3	38
ATK5	3,8	4,1	38
ATK10	5,0	9,3	38



Belt weights [kg/m]				
Std widths [mm]	Belt types			
	TK5	TK10	ATK5	ATK10
25	0,07	0,17	0,09	0,22
32	0,08	0,22	0,11	0,27
50	0,13	0,30	0,19	0,36
75	0,20	0,41	0,29	0,50
100	0,26	0,53	0,38	0,72

Cleats for PU-Linear and PU-Torque Timing Belts

- › Ammeraal Beltech Timing Belts can be customized with welded-on cleats for conveying, indexing and other automation equipment applications.
- › A comprehensive range of Timing Belt cleats consists of standard rectangular cleats and standard complex cleats. However it is possible to have nearly any custom designed cleats to meet specific requirements.
- › All cleats are manufactured from the same PU-compound as the base belts, ensuring an optimum weld strength.
- › Food quality, different hardnesses and colors are available on request.
- › Temperature range: - 10°C - + 80°C
- › The material to be transported and the transport purpose influence the selection of the cleat.

» Design guidelines

Rectangular cleats

- › This simple cleat design is available in a wide range of standard thicknesses with interim sizes available by grinding, milling and cutting from pre-fabricated PU - sheets.
- › Standard thicknesses [mm]: 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 15, 17, 22
- › Maximum height [mm]: 150
- › Minimum height [mm]: 4



Complex cleats

- › Very complex cleats can be moulded or fabricated to specific customer requirements. The most requested types has been listed, please consult Ammeraal Beltech experts.



Cleats for PU-Linear and PU-Torque Timing Belts

The foot of the cleat

- › The flexibility of the belt can be maximized by selecting right size and by positioning the cleat directly over the tooth of the belt.
The minimum pulley diameter must be increased according to the table below.

Minimum number of pulley teeth for cleats over a tooth*												
Belt type	Cleat foot thickness [mm]											
	1,5	3	5	6	8	10	11	12	13	16	20	
XL	10	10	18	25	40	50	60	80	100			
L	12	12	12	18	30	40	50	55	60	100		
H	14	14	14	14	18	25	35	40	45	80	100	
XH	18	18	18	18	18	18	18	19	20	35	50	
T5	12	12	18	25	40	50	60	80	100			
AT5, ATL5	15	15	18	25	40	50	60	80	100			
T10	16	16	16	18	25	35	45	60	80	100		
AT10, ATL10	18	18	18	22	25	35	45	60	80	100		
T20, AT20, ATL20	18	18	18	18	18	18	18	19	20	35	50	
HTD5, STD5	14	14	16	25	40	50	60	80	100			
HTD8, STD8	20	20	20	24	30	40	50	55	60	100		
HTD14	28	28	28	28	28	28	30	30	30	50	72	

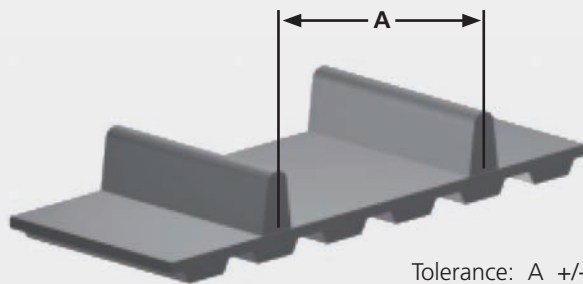
Minimum number of pulley teeth for cleats not over a tooth*												
Belt type	Cleat foot thickness [mm]											
	1,5	3	5	6	8	10	11	12	13	16	20	
XL	12	30	45	50	60	100						
L	12	20	40	45	55	60	70	75	80	100		
H	14	14	25	30	45	50	55	60	65	80	100	
XH	18	18	20	30	40	45	50	52	54	58	60	
T5	12	30	45	50	60	100						
AT5, ATL5	15	30	45	50	60	100						
T10	18	20	30	40	45	50	55	60	65	80	100	
AT10, ATL10	18	20	30	40	45	50	55	60	65	80	100	
T20, AT20, ATL20	18	18	20	30	40	45	50	52	54	58	60	
HTD5, STD5	18	30	45	50	60	100						
HTD8, STD8	20	20	40	45	55	60	70	75	80	100		
HTD14	28	28	30	42	58	64	72	74	78	82	86	

*) Minimum number of pulley teeth must be equal or greater than minimum pulley teeth recommended for base belt.

Cleats for PU-Linear and PU-Torque Timing Belts

Spacing of cleats

- › For the best spacing tolerances it is recommended to weld cleats according to the pitch of the belt teeth. However, if non-pitch spacing is used, the belt length and the minimum pulley diameter must be considered. Consult Ammeraal Beltech experts for further information.

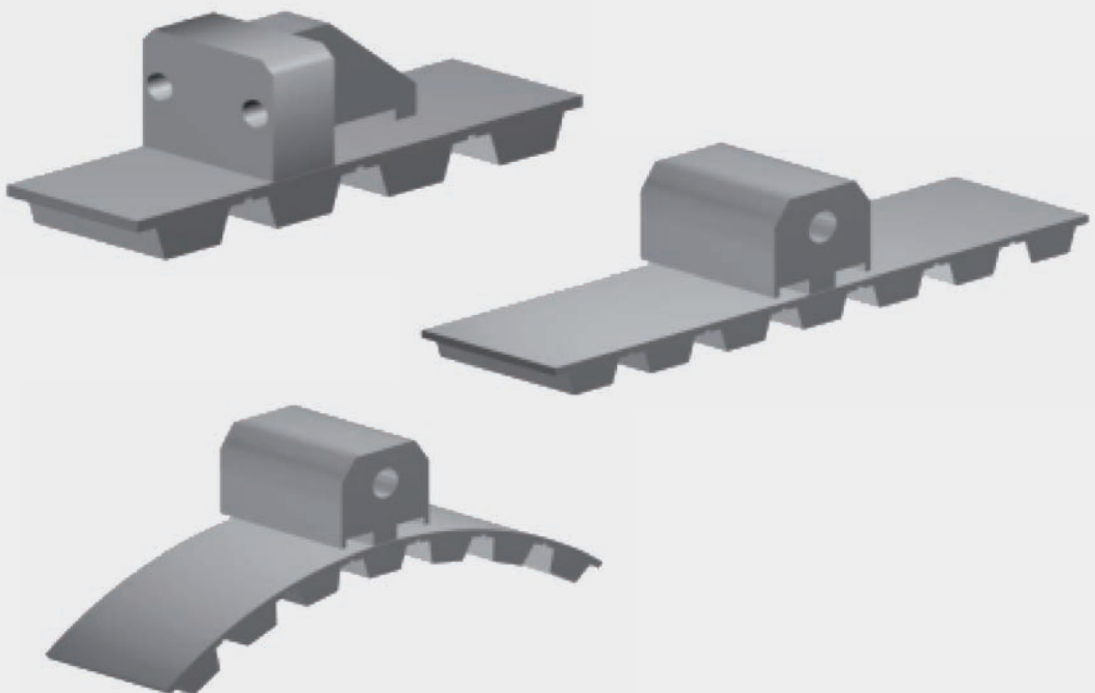


Tolerance: A +/- 0,5 mm

Wide foot cleats and cleats with a rear support leg

- › The strength of the cleat depends primarily on the size of the welded cleat foot. Only one foot should be welded in case of wide base or rear support leg. This allows for flexing around the pulley, yet it remains rigid when loaded.

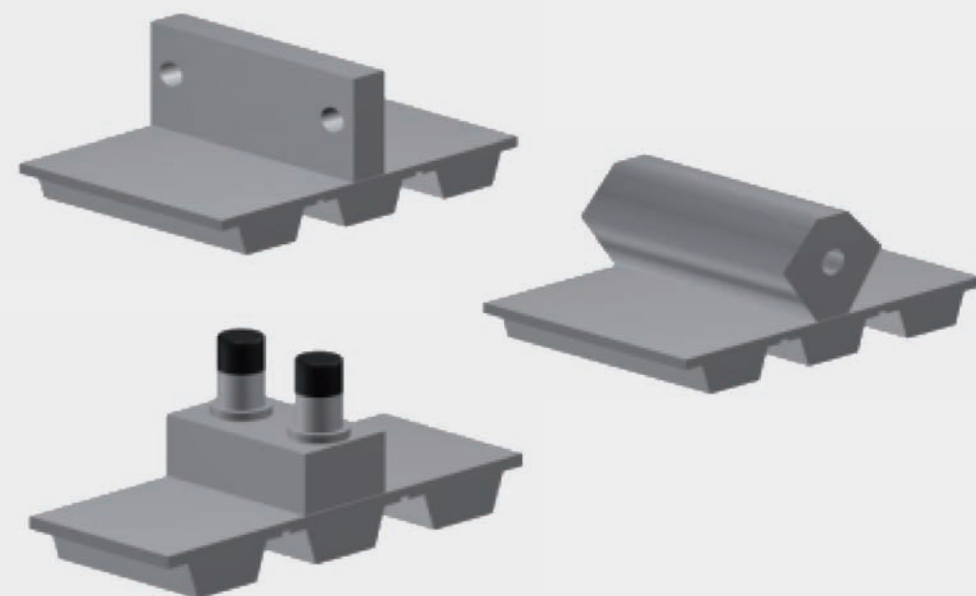
Cleats with rear support leg are commonly specified when a higher pushing force is required. These can be fabricated or moulded from one piece.



Cleats for PU-Linear and PU-Torque Timing Belts

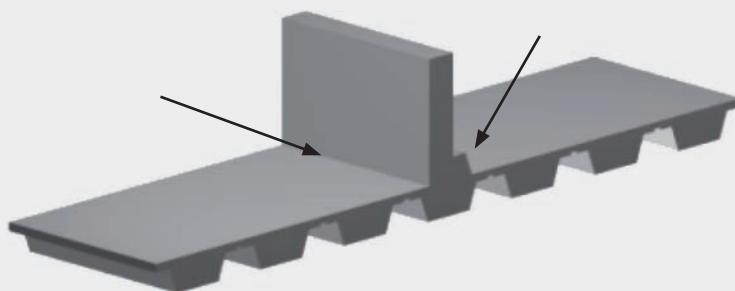
Cleats with holes and inserts

- › Many cleats can be supplied with holes or metallic inserts. Holes are either drilled before bonding or molded. Many types of inserts are available, internal or external. This construction allows attachments to be fitted for a variety of applications. For further information, please consult Ammeraal Beltech experts.



Welding bead

- › A welding bead of polyurethane builds up between cleat and back of the belt during the welding process. The radius of the PU overhang bead can be 0,5 -1 mm. On request a welding bead can be cleaned up.

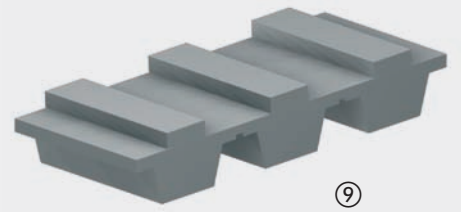
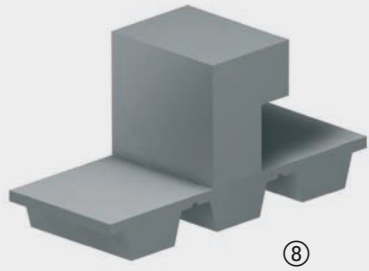
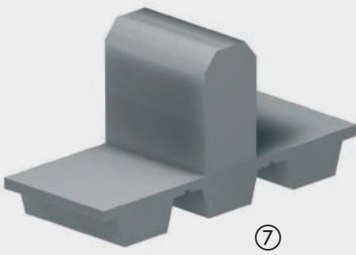
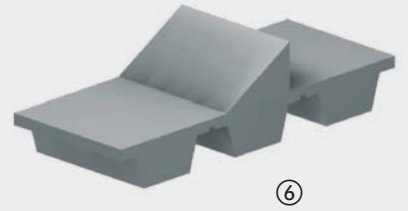
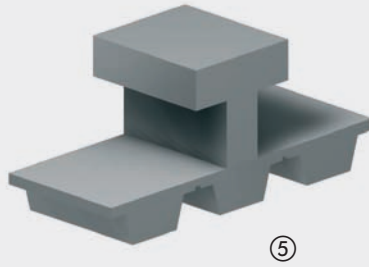
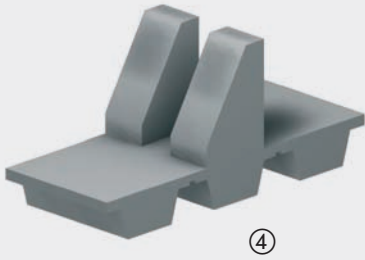
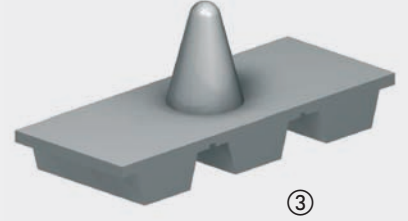
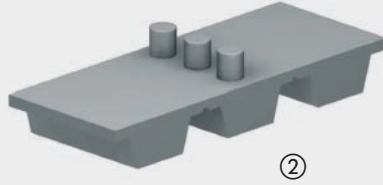
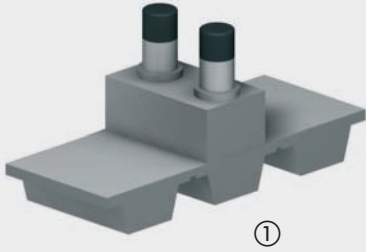


Tolerances:

The cleat in height, width and length: $\pm 0,2$ mm

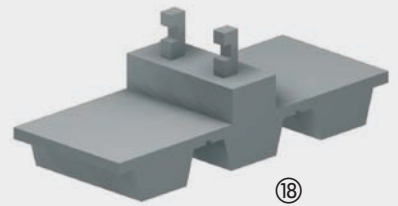
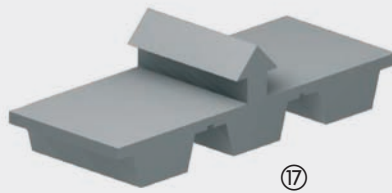
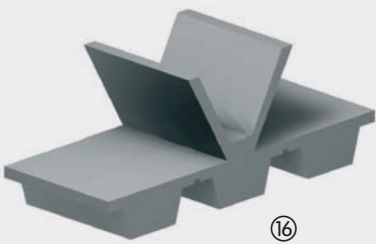
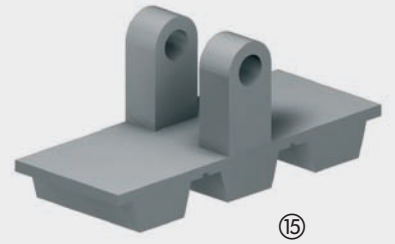
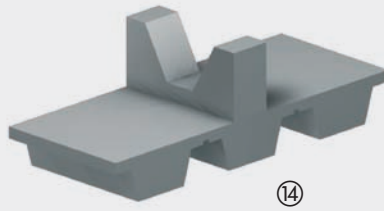
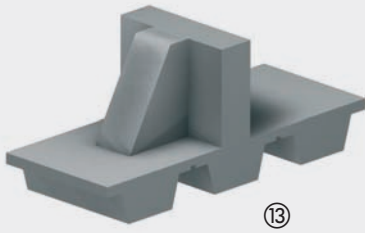
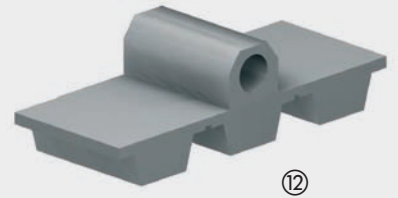
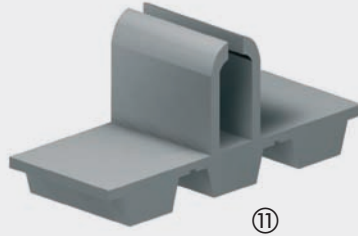
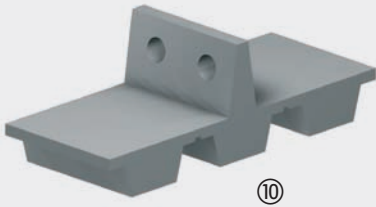
Positional tolerance from nominal position: $\pm 0,5$ mm

Some examples of complex cleats



Please contact Ammeraal Beltech for further information

Some examples of complex cleats



Please contact Ammeraal Beltech for further information

Covering Materials



The range of Ammeraal Beltech covering materials consists of more than 60 different types divided into 4 product segments:

- rubber, PU & PVC, cellular and special covering materials

From the range various materials can be selected:

- Materials from very soft to extremely hard.
- Materials with cellular, fabric, felt or solid compositions.
- Materials with extremely high grip or contrary very low grip
- Materials with antimicrobial and food quality characteristics
- Materials with high oil, fat and chemical resistance
- Materials with excellent abrasion, tear and wear resistance

Outstanding mechanical and chemical properties together with special fabrication techniques lead to high-performance operation and precision, allowing to customise belts for specific applications.

Bonding methods

- Several methods to bond cover materials on to timing belts depending on combinations.
- Methods from simple gluing to special casting treatment.
- Covers can be bonded with seam or without any seam or joint considering material type and construction.
- Please consult Ammeraal Beltech experts for further information.

Custom fabrication

- Surface grinding to get even and exact cover thickness.
- Full range of machining operations like grooves and slots, either longitudinal or crosswise.
- Perforations by water jet cutting, punching or drilling.
- Combinations of covers , e.g. to achieve a soft material topped with wear resistant outer cover.
- Final slitting to get required belt widths with non-freying and precise edges.
- Embossing possible with specific cover materials to get e.g. light pattern surface for better grip.
- All above fabrications precisely according to drawings.

Covering Materials

Pulley diameters

- Minimum pulley diameter can be calculated with „pulley factor“ mentioned in the table
- Material thickness x pulley factor = min. pulley diameter (approx.) for the finished covered belt.
- In generally the smaller the pulley, the thinner the cover needs to be
- More flexibility can be achieved by cross slotting

Note: the pulley diameter for the covered timing belt must be greater than or equal to the minimum pulley diameter for basic timing belt. Please consult Ammeraal Beltech experts for further information.

Temperature range

- Maximum contact temperature : mentioned in the table (short time +10° C)
- Minimum contact temperature : -10°C for all cover materials, however properties of materials vary highly under low temperatures, therefore please consult Ammeraal Beltech experts for further information when temperature below -10° C. (special cold resistant covers available)
- Cover material, base belt and the bonding method all together specify the operation and contact temperature range.

Coefficient of friction

- Static approximate value against steel mentioned in the table.
- By fabrication methods friction values can be increased or decreased.
- For further information please contact Ammeraal Beltech.

Colors

- Subject to change without notice.
- Custom colors available on request

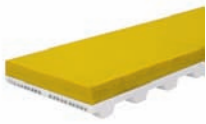
Chemical resistance

- Indication for “oil and fat resistance“ in the table is only normative.
- The concentration and the temperature of the chemical has great influence on material resistance.
- For further information please contact Ammeraal Beltech.

Other guidelines

- Some covering materials have really good non-stick and release properties.
- Very often high cut, tear and abrasion characteristics are required.
- Antistatic properties should be considered particularly in electronic industry applications.
- Hygiene antimicrobial food quality materials are available for various food industry applications.
- Belts for vacuum applications require specific cover materials and fabrication to get holes, slots and possible vacuum lane on tooth side.
- Varying levels of cushioning and durability through material thickness and hardness selection.

Covering Materials: Rubber



NRS 035 yellow
Natural rubber, excellent grip with good abrasion resistance



PBS 060 white FG
Nitrile rubber, oil and fat resistant synthetic rubber, food quality



NRS 040 red
Natural rubber, high grip, good wear and abrasion resistance



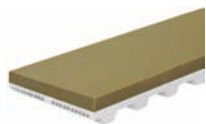
NTS 060 black
Nitrile rubber, very good wear and abrasion resistance under high temperatures, oil and fat resistance



NRS 040 white FG
Natural rubber, high grip, good wear and abrasion resistance, food quality



NTS 070 green
Nitrile rubber, oil and fat resistant, good grip, light fabric texture surface, good wear and abrasion resistance



NRS 040 beige
Synthetic natural rubber, high grip, excellent for profiling and grooving, high tear and abrasion resistance



CXS 065 C37 blue
Nitrile rubber, high wear and abrasion resistant, oil and fat resistance, C37 supergrip pattern



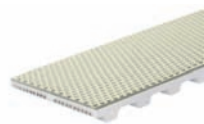
NRS 060 red
Natural rubber, high wear and abrasion resistance, good cut and tear resistance



SRS 040 C37 tan
Synthetic rubber, high wear and abrasion resistance, sensitive grip, C37 supergrip pattern



NRS 070 purple
Natural rubber, excellent wear and abrasion resistance, high cut and tear resistance

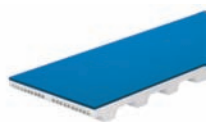


SRS 040 P19 white
Synthetic rubber, good wear and abrasion resistance, good grip, P19 nipple pattern

Rubber

Type	Material	Hardness [° ShA]	Density [kg / m³]	Color	Max. contact temperature [° C]	Oil and fat resistance	Coeff. of friction	Food grade	Pulley factor	Standard thickness [mm]
NRS 035 yellow	natural rubber	35	990	yellow	+65	low	1.2	no	13	3, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30
NRS 040 red	natural rubber	40	980	red	+70	low	1.0	no	15	1.6, 2.4, 3.2, 5, 6, 8, 10, 12, 15
NRS 040 white FG	natural rubber	40	1000	white	+70	limited	1.0	yes	15	2, 3, 5, 6, 8, 10
NRS 040 beige	synthetic rubber	40	1000	beige	+70	low	1.1	no	15	4, 6, 8, 10, 12, 15
NRS 060 red	natural rubber	60	1100	red	+75	low	0.9	no	17	3, 5, 6, 8, 10, 12, 20, 25
NRS 070 purple	natural rubber blend	70	1130	purple	+75	limited	0.6	no	20	3, 4, 5, 6, 8, 10, 12, 15, 20, 25
PBS 060 white FG	nitrile rubber	60	1300	white	+80	good	0.8	yes	18	3, 4, 5, 6, 8, 10
NTS 060 black	nitrile rubber	60	1300	black	+110	good	0.7	no	18	4, 6, 8, 10, 12
NTS 070 green	nitrile rubber	70	1200	green	+100	good	0.7	no	25	1, 2
CXS 065 C37 blue	nitrile rubber	65	750	blue	+120	excellent	0.9	no	20	4.3
SRS 040 C37 tan	synthetic rubber	40	800	tan	+80	limited	1.0	no	15	4.3
NTS 050 C37 red	nitrile rubber	50	1200	red	+120	excellent	0.7	no	20	4.3
SRS 040 N19 white	synthetic rubber	40	1700	white	+80	limited	na	no	20	2

Covering Materials: PU & PVC



PUS 060 blue

Polyurethane, high grip, flexible, very tough, embossing possible



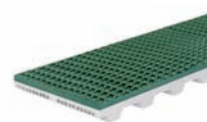
PUS 080/BS white

Polyurethane, excellent cut and wear resistant, good oil and chemical resistance



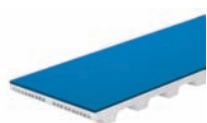
PUS 080 transparent FG

Polyurethane, high grip, high abrasion resistance, cut and tear resistance, embossing possible



PVS 030 P6 green

PVC, good chemical resistance, high grip, P6 supergrip pattern



PUS 085 blue AM FG

Polyurethane, good abrasion resistance, excellent oil and fat resistance, antimicrobial, food quality



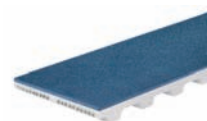
PVS 032 black AS FR

PVC, high grip, antistatic, flame retardent, embossing possible



PUS 085 A16 blue AM FG

Polyurethane, good abrasion resistance, excellent oil and fat resistance, antimicrobial, A16 pattern



PVS 035 blue:

PVC, high grip, limited oil and grease resistance, embossing possible



PUS 085 A5 blue FG

Polyurethane, good abrasion resistance, excellent oil and fat resistance, A5 nipple pattern



PVS 065 P27 white FG

PVC, good oil and grease resistance, good chemical resistance, P27 fish bone pattern



PUS 092 white

Polyurethane, excellent abrasion resistance, good oil and fat resistance



PVS 065 P13 white

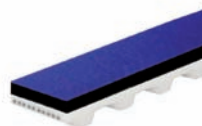
PVC, good oil and grease resistance, good chemical resistance, P13 sawtooth pattern

PU & PVC		Hardness [° ShA]	Density [kg / m³]	Color	Max. contact temperature [° C]	Oil and fat resistance	Coeff. of friction	Food grade	Pulley factor	Standard thickness [mm]
Type	Material									
PUS 060	Polyurethane	60	1150	blue, black	+80	good	0.9	no	25	2.5
PUS 080 transparent FG	Polyurethane	80	1110	transp.	+80	good	0.8	yes	30	1, 2, 3, 4
PUS 085 white FG	TPU Ropanyl	85	1230	white	+90	excellent	0.6	yes	30	2
PUS 085 blue AM FG	TPU Ropanyl	85	1230	blue	+90	excellent	0.6	yes	30	1.5
PUS 085 A16 blue AM FG	TPU Ropanyl	85	860	blue	+90	excellent	na	yes	20	2.5
PUS 085 A5 blue FG	TPU Ropanyl	85	950	blue	+90	excellent	na	yes	20	3.5
PUS 092 white	Polyurethane	92	1300	white	+80	excellent	0.6	no	30	2, 3
PUS 080/BS white	PU Ropan BS	80	1000	white	+80	good	0.4	no	25	2, 3, 4
PVS 030 P6	PVC Flexam	30	780	blue, green	+90	limited	0.9	no	15	4
PVS 032 black AS FR	PVC Flexam	32	1150	black	+90	limited	1.1	no	20	2
PVS 035 blue	PVC Flexam	35	1390	blue	+90	limited	1.1	no	20	1, 2, 3
PVS 065 P27 white FG	PVC Nonex	65	660	white	+90	good	na	yes	18	4
PVS 065 FG	PVC Nonex	65	1330	blue, white	+90	good	0.7	yes	25	2, 3, 4
PVS 065 blue AM FG	PVC Nonex	65	1330	blue	+90	good	0.7	yes	25	1.5
PVS 065 P13 white	PVC Nonex	65	750	white	+90	good	na	yes	18	4

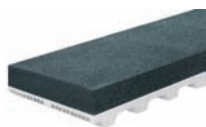
Covering Materials: Cellular



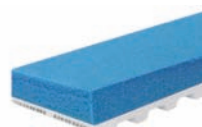
NRS 160 grey
Natural rubber, open cellular construction, high resilience, high elasticity and porosity, compressible



FBS 160 blue
Closed cellular neoprene rubber covered by premium stretch fabric, low friction surface



NRS 200 black
Natural rubber, open cellular construction, high grip, high resilience, high elasticity and porosity, compressible



PUS 220 blue
Polyurethane, low density partially closed cellular construction, good oil and fat resistance



NRS 250 orange
Natural rubber, open cellular construction, non marking, high resilience, high elasticity and porosity



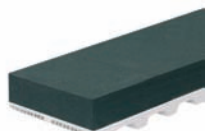
PUS 300 green
Polyurethane, medium density partially closed cellular construction, good abrasion resistance



NRS 270 green
Natural rubber, open cellular construction, high grip, non marking, high resilience



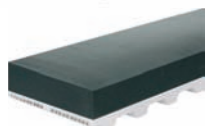
PUS 400 brown:
Polyurethane, high density partially closed cellular construction, good abrasion resistance



NES 330 black
Neoprene rubber, closed cellular construction, very high grip, good oil and chemical resistance



PUS 400 beige
Polyurethane, high density closed cellular construction, excellent wear resistance



NES 675 black
Neoprene rubber, closed cellular construction, very high grip, good aging and compression resistance



PUS 600 yellow
Polyurethane, very high density fully closed cellular construction, good wear and abrasion resistance

Cellular

Type	Material	Hardness [° ShA]	Density [kg / m³]	Color	Max. contact temperature [° C]	Oil and fat resistance	Coeff. of friction	Food grade	Pulley factor	Standard thickness [mm]
NRS 160	natural sponge rubber	-	160	orange, grey, orange, black	+65	low	1.0	no	6	5, 10, 15, 20, 25, 30
NRS 200	natural sponge rubber	-	200	orange, grey, orange, black	+65	low	1.0	no	6	3, 5, 8, 10, 15,
NRS 250 orange	natural sponge rubber	-	250	orange	+65	low	1.0	no	8	5, 10, 15, 20, 25, 30
NRS 270 green	natural sponge rubber	-	270	green	+65	low	1.0	no	8	5, 10, 15
NES 330 black	neoprene sponge rubber	-	330	black	+85	good	1.3	no	10	5.5, 7, 10.5, 13, 30
NES 675 black	neoprene sponge rubber	-	675	black	+100	good	0.9	no	12	5.5, 7, 10.5, 14, 22
FBS 160 blue	fabric covered cellular neoprene	-	160	blue	+70	good	0.3	no	15	3, 6
PUS 220 blue	cellular polyurethane	-	220	blue	+70	good	0.5	no	12	5, 7, 11, 12, 14, 25
PUS 300 green	cellular polyurethane	-	300	green	+70	good	0.5	no	14	4, 5, 7, 10, 11, 12, 14, 25
PUS 400 brown	cellular polyurethane	-	400	brown	+70	good	0.5	no	15	3, 5, 11, 12, 14, 25
PUS 400 beige	cellular polyurethane	-	400	beige	+80	good	0.3	no	16	1, 2, 3, 4, 5, 6
PUS 600 yellow	micro cellular polyurethane	50	600	yellow	+70	excellent	0.4	no	20	2, 3, 4, 5, 6, 8, 10

Covering Materials: Special



PRs 060 blue

Technopolymer, high grip, good abrasion resistance, light embossing possible, silicon-free, good flexibility at low temperatures



CLs 999 grey

Chrome leather, high abrasion resistance, medium grip, good for oily and greasy circumstances



NPs 055 brown

Needle punched polyester fabric, low grip, high abrasion and wear resistance



PAs 778 green

Low friction and low noise nylon fabric, excellent wear resistance, good oil and chemical resistance



PLs 035 red

Pletex poly blend, high grip, limited oil and grease resistance, embossing possible



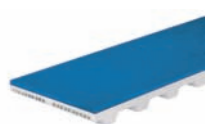
AMs 090 A16 ivory

Polyester, good abrasion resistance, excellent oil and fat resistance, A16 nipple pattern



SLs 060 blue

Silicone rubber, good wear and abrasion resistance, self-releasing surface



SLC 030 blue FG

Silam silicone rubber, excellent tear strength, high grip, self-releasing surface, food quality



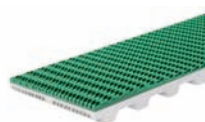
KFs 999 yellow

Aramid felt, heat resistant, good abrasion resistance, good oil and fat resistance



ELs 060 green

Technopolymer, high grip, good oil and fat resistance, excellent abrasion and tear resistance



ELs 060 A34 green

Technopolymer, excellent abrasion and tear resistance, A34 supergrip pattern

Special										
Type	Material	Hardness [° ShA]	Density [kg / m³]	Color	Max. contact temperature [° C]	Oil and fat resistance	Coeff. of friction	Food grade	Pulley factor	Standard thickness [mm]
PRs 060	thermoplastic technopolymer	60	1030	red, blue	+80	good	0.9	no	25	2.3
CLs 999 grey	chrome leather	-	930	grey	+80	excellent	0.8	no	30	3
NPs 055 brown	needle punched polyester fabric	-	560	brown	+80	good	0.4	no	25	2.5
PAs 778 green	nylon fabric	-	220	green	+80	good	0.3	no	-	0.3
PLs 035 red	Pletex poly blend	35	1385	red	+90	limited	0.9	no	20	2, 3, 4
AMs 090 A16 ivory	Amtel polyester	90	450	ivory	+100	excellent	na	yes	30	2.5
SLs 060 blue	silicone rubber	60	1600	blue	+220	good	0.6	no	17	3.2, 4.5, 7.0
SLC 030 blue FG	silicone rubber Silam	30	1120	blue	+250	excellent	1.3	yes	15	1-10
KFs 999 yellow	Aramid felt	-	320	yellow	+250	good	0.3	no	na	10
ELs 060 green	Elastonyl technopolymer	60	1060	green	+80	good	0.9	no	25	2, 3, 4
ELs 060 A34 green	Elastonyl technopolymer	60	1060	green	+80	good	0.7	no	20	4

Timing Belt Pulleys



Pulleys for timing belt applications can be selected from the standard range or they can be manufactured according to specific drawings and requirements. Standard range consists of pulleys for all common timing belts with standard widths, diameters and construction.

Materials: aluminium, steel, cast iron, plastics

Timing bars are available in addition to standard pulleys.

Standard timing pulleys can be modified to include specific borings, keyways and set screws.

Special custom-made fabrication may include grooves for V-guides, special materials and flanges, and zero-backlash pulleys for precise applications.

Timing Belt pulleys can be supplied as follows:

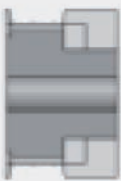


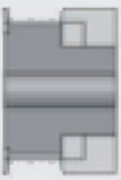

- standard pulleys with pilot bore
- standard pulleys with taper bush
- standard pulleys with customized bore, keyway and set screws
- standard timing bars
- special pulleys according to drawing

Boring tolerances: normally pulleys are bored with H7 tolerances if not otherwise specified.

Pulleys are manufactured according to standards: DIN ISO 5294 and DIN 7721



Timing Belt Pulleys

Belt Types	Pilot Bore Pulleys			
<p>T2,5 / T5 / T10 / T20 AT5 / AT10 / AT20</p>	 <p>1F</p>	 <p>6F</p>	 <p>6</p>	
<p>MXL / XL / L / H / XH HTD3 / HTD5 / HTD8 / HDT14 STD5 / STD8</p>	 <p>1F</p>	 <p>6F</p>	 <p>6</p>	
	 <p>6WF</p>	 <p>6W</p>	 <p>6A</p>	
Belt Types	Taper Bush Pulleys			
<p>HTD / HTD8 / HTD14 STD5 / STD8 L / H / XH</p>	 <p>8F</p>	 <p>3F</p>	 <p>5F</p>	 <p>3W</p>

Timing Belt Pulleys

Other pulley shapes are available, please consult Ammeraal Beltech experts for further information.

Timing Belt clamping plates

Aluminium clamping plates for Timing Belts

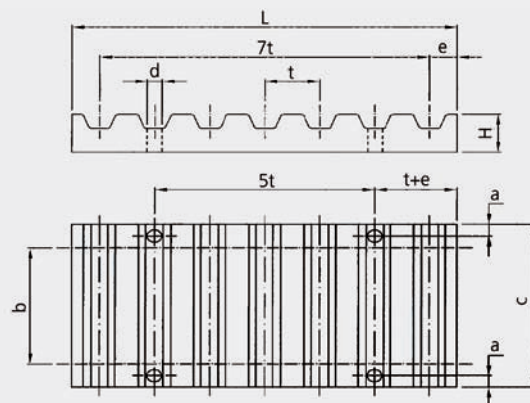
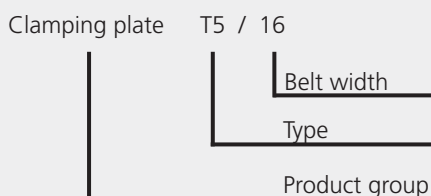
Clamping plates can be used as positive attachment of the belt ends in numerous applications in linear drives. Clamping plates must have the correct belt profile to guarantee a uniform clamping force on all the clamped belt surface and must be rigid. For standard applications a minimum of 7 teeth in clamp is recommended. For heavy applications with high performance L-steel cord, a minimum of 12 teeth in clamp is recommended.

Type	a	d	e	L	H	Belt width b (mm)							
						6	10	16	25	32	50	75	100
T5	6	5,5	3,2	41,8	8	-	29	35	44	-	-	-	-
AT5	6	5,5	3,2	41,8	8	-	29	35	44	-	-	-	-
T10	8	9,0	5,0	80,0	15	-	-	41	50	57	75	100	125
AT10	8	9,0	5,0	80,0	15	-	-	41	50	57	75	100	125
T20	10	11,0	10,0	160,0	20	-	-	-	56	63	81	106	132
AT20	10	11,0	10,0	160,0	20	-	-	-	56	63	81	106	132

Type	a	d	e	L	H	Belt width b (inch code)							
						025	031	037	050	075	100	150	200
XL	6	5,5	3,5	42,5	8	25,5	27	28,5	-	-	-	-	-
L	8	9,0	6,0	76,6	15	-	-	36,0	39	45	51,5	64	77
H	10	11,0	9,0	106,9	22	-	-	-	45	51	57,5	70	83

Type	a	d	e	L	H	Belt width b (mm)								
						15	20	25	30	40	50	55	85	115
5M	6	5,5	3,4	41,8	8	34	-	44	-	-	-	-	-	-
8M	8	9,0	5,0	66,0	15	40	45	-	55	-	75	-	110	-
14M	10	11,0	9,0	116,0	22	-	-	56	-	71	-	86	116	146

Order example:

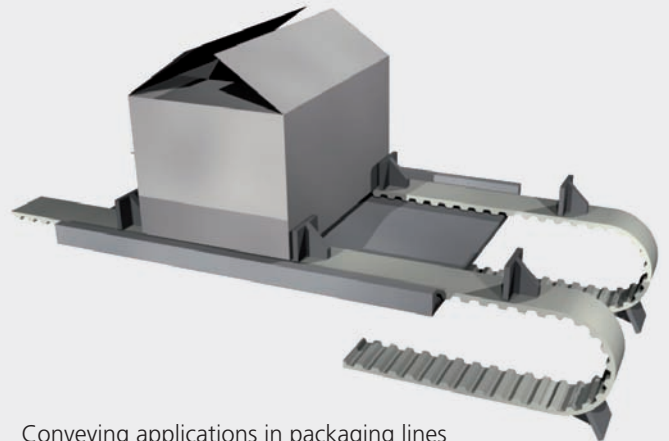


Timing Belt clamping plates

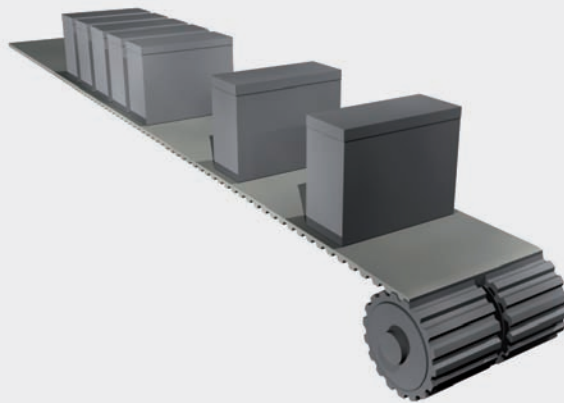
Application examples

Ammeraal Beltech timing belts for a wide range of industrial applications and environments:

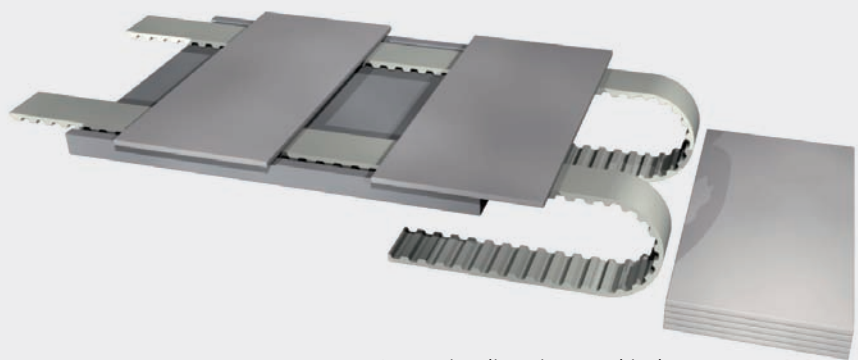
- Airport baggage handling systems
- Logistics industry
- Food industry
- Print & Paper industry
- Packaging industry
- Wood industry
- Ceramic industry
- Automotive industry
- Tobacco industry
- Chemical industry
- Electronics assembly lines
- Glass processing
- Linear positioning
- Power transmission



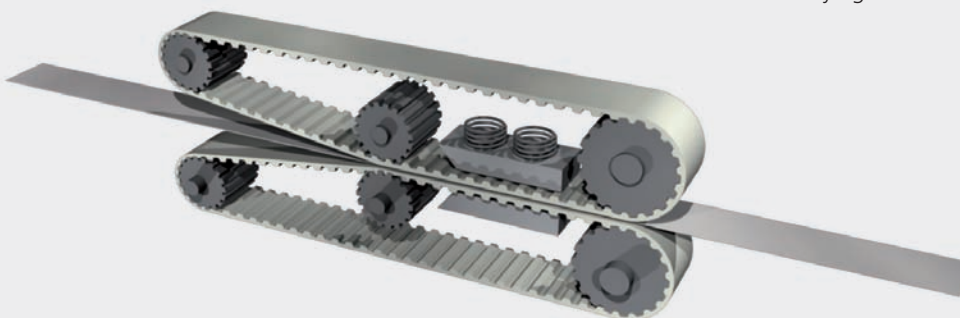
Conveying applications in packaging lines



Conveying applications in packaging lines, accumulation

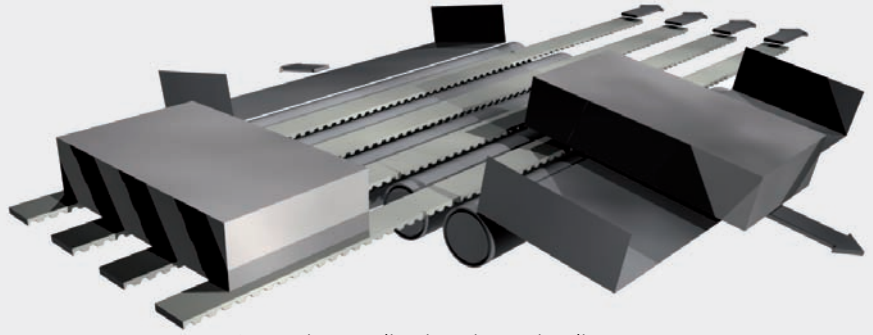


Conveying lines in wood industry

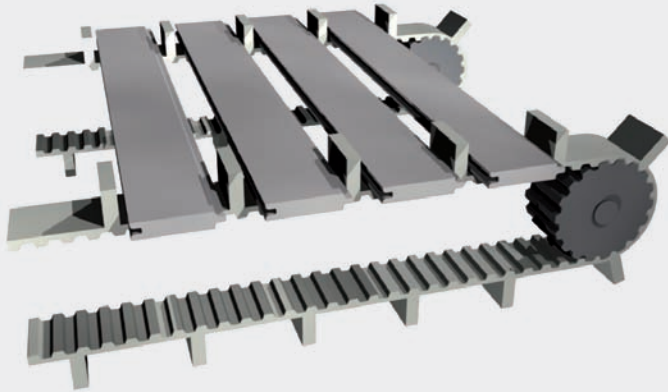


Pressing and haul off applications

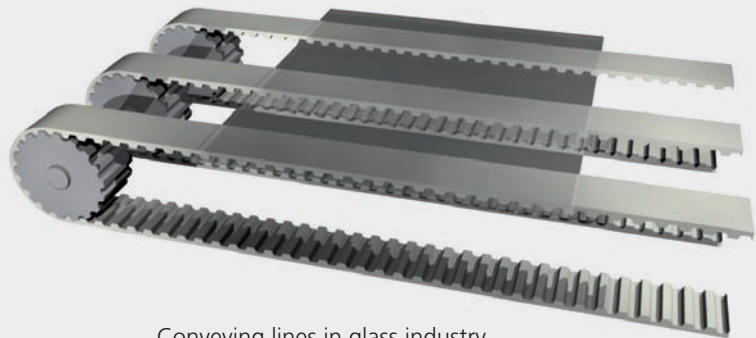
Application examples



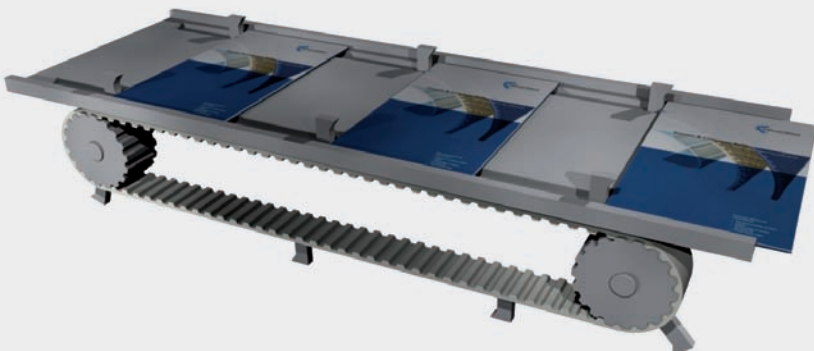
Conveying applications in sorting lines



Synchronised conveying for long products



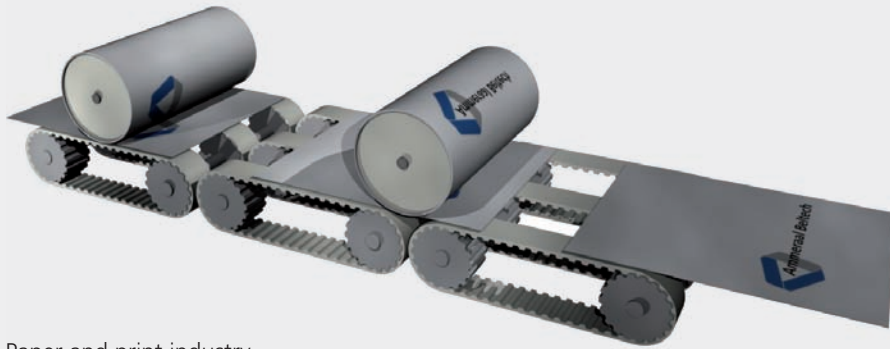
Conveying lines in glass industry



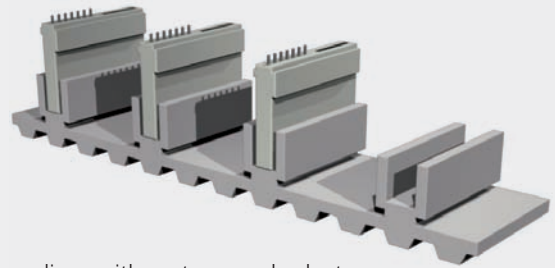
Conveying light products on slider bed

Application examples

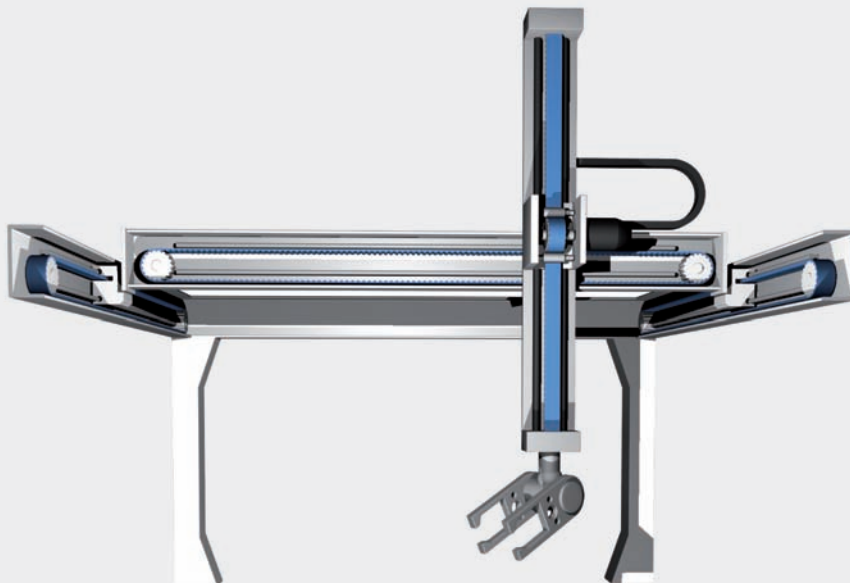
Application examples



Paper and print industry

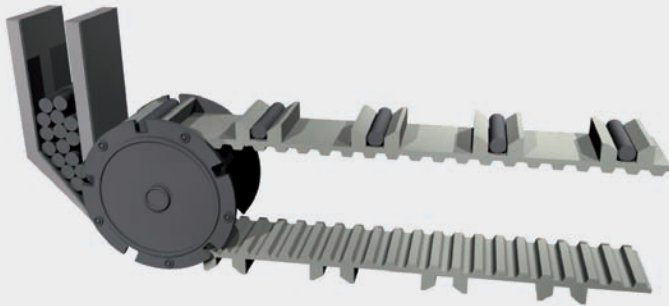


Special conveyor lines with custom-made cleats

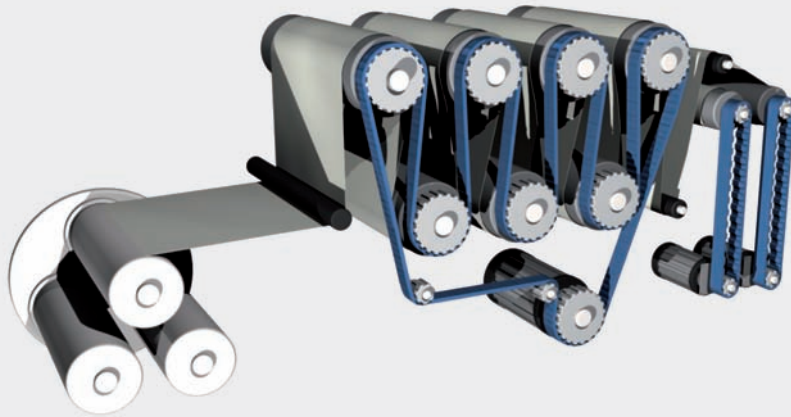


Linear applications in automation equipment

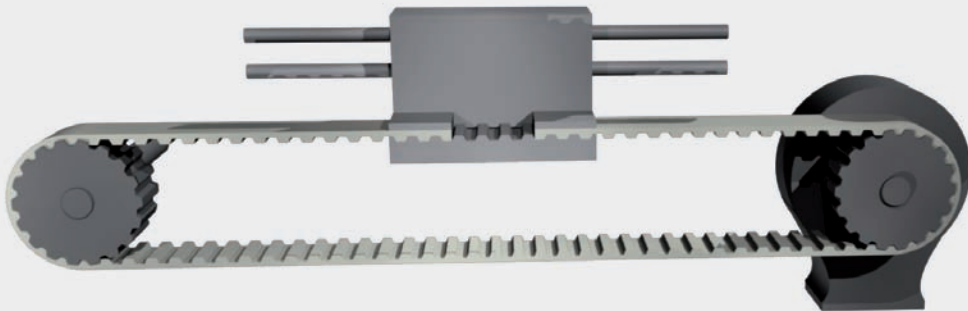
Application examples



Special feeder conveyors with cleats



Power transmission applications



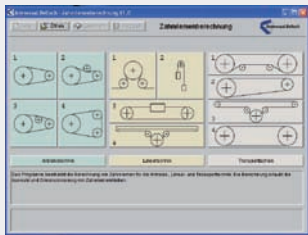
Linear drives

Calculation program for timing belts

With the new Ammeraal Beltech timing belt calculation program you can use our expert knowledge online at any time. Simple, effective and precise. Just ask your Ammeraal Beltech account executive how to use this online tool, or visit our internet homepage. The "highlights" of this program are:

» Home screen

The simple and clearly arranged home screen with a pre-selection of common applications, allows a quick start of the calculation, even for beginners.

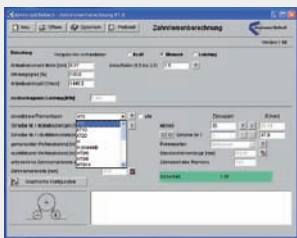


- The three fields of application are:
„Drive engineering“,
„Linear drives“,
„Conveying technology“

- Simple and quick selection by clicking the relevant icons

» Input screen

The user enters the data of his application into the automatically opening input screen. All input boxes are initialised with default values from practice to ease the input process. This helps beginners to quickly come to results.



- Sizing of the timing belt on the basis of mechanical power, torque or force
- On the basis of information entered by the user, the program automatically suggests suitable timing belt types. It does not expect the user to enter this information, as is normal with other programs.
- Default selection boxes with standard values, for a more rapid calculation
- Box with warnings and hints for a safe dimensioning of the timing belt
- Timing belt widths can either be calculated by the program or preset by the user. This is very useful for a construction with limited space

» Input screen

- Simple adjustment of the number of pulley teeth by using the [+] and [-] keys
- Immediate control of safety factors during modification of the input values

» Graphical user interface

The precise positioning of all the pulleys can be achieved with the graphical user interface.



- Simple movement by mouse clicks
- Easy relocation of all pulleys by mouse
- Optimised centre-centre distances by checking standard belt lengths

» Printed report

All input data and all calculated data are collected in a printed report.



- Input of customer details and project information for easy filing
- Printed report with all input information and all information about the calculated timing belt drive
- Print out of all warnings and hints

Cords for timing belts

Timing belts are mainly supplied with cords made of steel or Aramid.

- Steel cords have very low elongation and are less sensitive to flexing than Aramid cords.
- Steel cords can suffer from corrosion.
- Aramid is used where corrosion could be a factor.
- Aramid is not magnetic and is suitable for applications with metal detectors.

Standard cords

These cords represent the optimal compromise of flexibility and strength.

Cords with improved flexibility (HFE)

For special applications steel cords with improved flexibility, so called E-cords, are available. These cords are made of thinner filaments, but have the same overall diameter as standard cords. The tensile force within the cord is spread out over a larger number of filaments. This causes less strain in the cord from flexing. The recommended pulley diameters for standard timing belts can be lowered for 25% when using E-cords.

Standard



HFE



HPL



Cords with higher tensile strength (HPL)

For highly loaded applications, cords with a larger cross section can be used. However, the flexibility of this construction is lower than for standard cord construction!

Cords with higher tensile strength and improved flexibility

To compensate the disadvantage of a lower flexibility, high-strength cords with improved flexibility can be used (particularly for applications with counter-flexing). The cross section of these cords is extended but thinner filaments are used.

Cords made of stainless steel

In wet or corrosive applications, stainless steel cords can be used.

Specific spring ratio

With positioning and indexing applications, it can be critical to calculate the elongation of the timing belt. For this the specific spring ratio c_{spec} is listed in the catalogue of the individual timing belt types. It indicates the relationship between operational load and elongation, indicating how many millimetres the timing belt will stretch under a certain load. The following example explains this:

Timing belt 50 AT 10 , length $l = 5500$ mm

According to the AT10 table the specific spring ratio c_{spec} for a AT 10 timing belt is 1,960,000 N.

Load on the belt: $F = 2200$ N

Calculation of the elongation:

$$\Delta l = \frac{L * F}{c_{spec}} = \frac{5500mm * 2200N}{1960000N} = 6,173mm$$

Result: a 50 AT 10 timing belt with a length of 5500 mm elongates for 6.173 mm at a load of 2200 N.

Storage of timing belts

Under correct storage conditions timing belts can be stored for up to 8 years. This length of time might differ for coated timing belts (please consult Ammeraal Beltech for advice).

The following storage conditions must be adhered to:

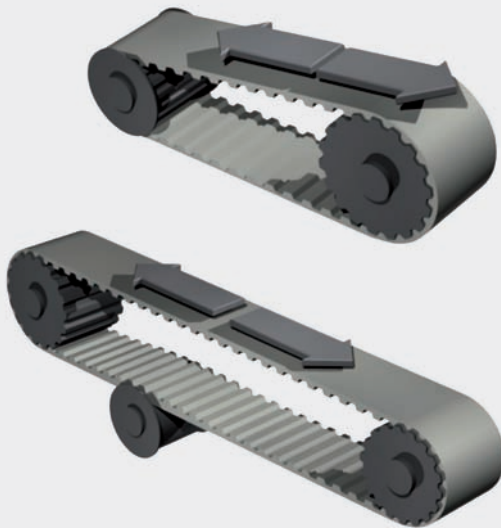
- Lay rolls flat
- Protect from UV (Ultra Violet) light
- Protect from dust and chemical pollution
- Store at room temperature
- If possible in air tight packaging (UV resistant plastic bag or foil)

Timing belt tracking

To ensure smooth operation, the tracking of timing belts is critical. The additional means to track timing belts (below), assumes that pulleys are aligned in accordance with the recommendations in the chapter „installation“.

1) Flanges

Flanges are a common means for tracking timing belts. They are attached to the sides of at least one pulley and prevent the belt from tracking off.



At small centre-to-centre distances it is possible to use only a single flange on each pulley (on opposite sides!).

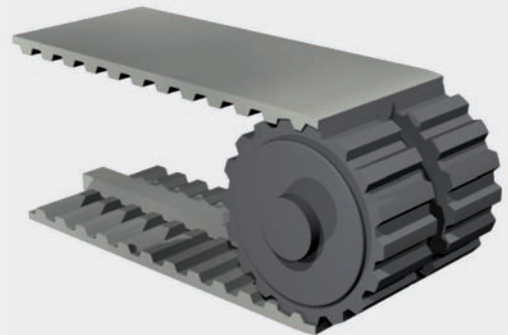
Flanges should be attached to the bigger pulley, but for reasons of cost in most cases the smaller pulley is equipped with flanges. Drives with large centre-to-centre distances should have flanges on all pulleys.

Timing belt tracking with a flanged tension pulley, is also possible.

In some conveying applications, the flanges may interfere with the product. This should be considered and if necessary, an alternative method of tracking should be employed.

2) Vee-guides

Timing belts are often equipped with a Vee-guide on the toothed side. This requires pulleys with a corresponding profile (slider beds also must be profiled accordingly). However, the active tooth width is reduced by the width of the Vee-guide. This must be taken into account at the design stage.

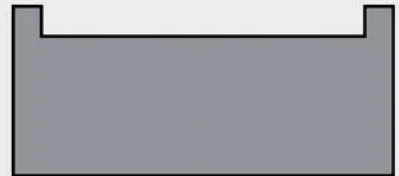


Different kinds of Vee-guides can be found in the corresponding chapter of this catalogue.

Timing belt tracking

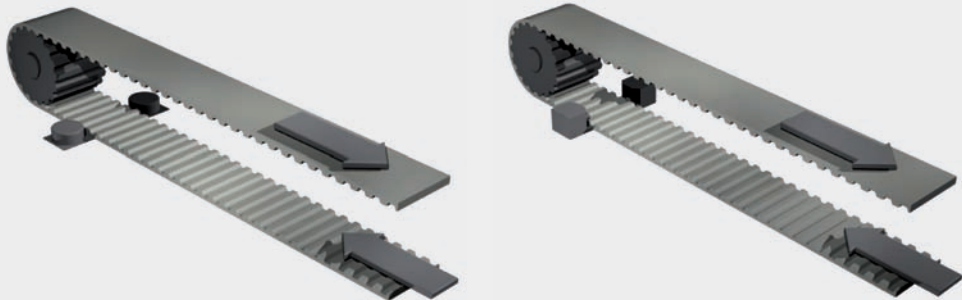
3) Slider bed with lateral guide

Timing belts which are conveying goods on a slider bed can be tracked by the appropriately designed side guides, within the slider bed. These guides must not interfere with the product being conveyed. An additional method of tracking of the timing belt, e.g. an idler pulley with flanges, is recommended.

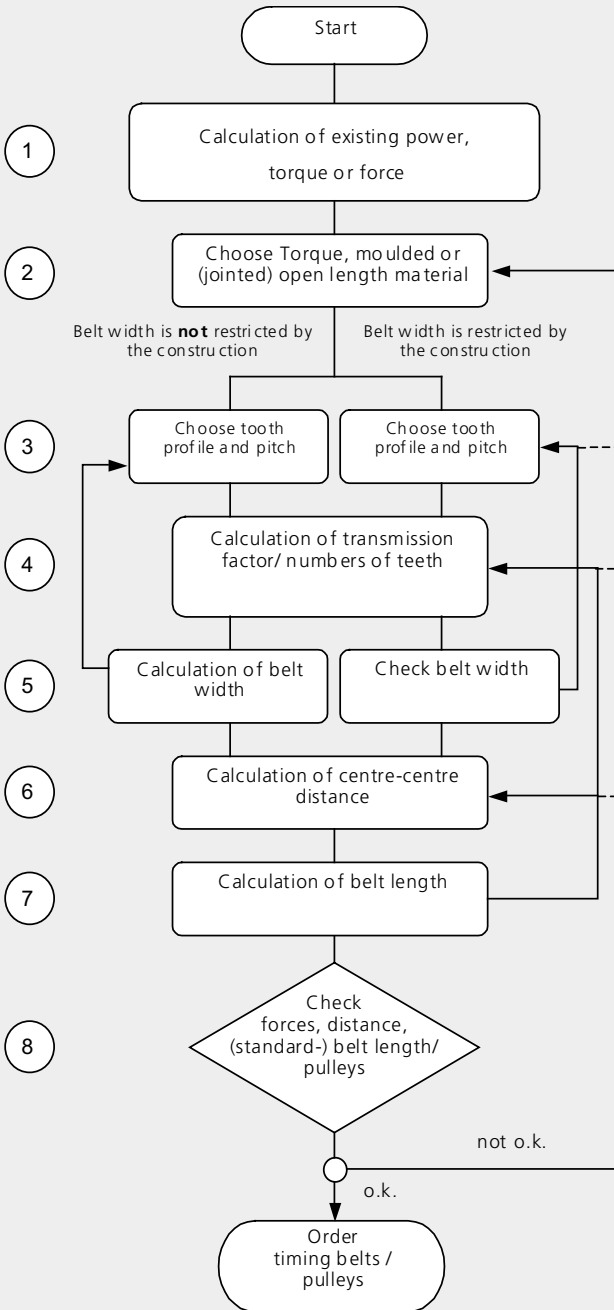


4) Other tracking means

The tracking of timing belts can be achieved by means of rollers or low friction blocks, at the low tension return part of the belt.



Timing belt calculation



$$P_{mech} = F \cdot v \cdot \frac{1}{\eta} = 2 \cdot \pi \cdot n \cdot T \cdot \frac{1}{\eta} = P_{mot} \cdot c \cdot \frac{1}{\eta} \quad [W]$$

$$P_{mech} = P_{mot} \cdot (c_h + c_s + c_l) \cdot \frac{1}{\eta} \quad [W]$$

$$T = T_{mot} \cdot (1,5 \div 2,5) \quad [Nm]$$

$$F = (m \cdot (a + g \cdot \sin \alpha + g \cdot \cos \alpha \cdot (\mu \text{ oder } f_R)) \cdot (1,05 \div 1,15)) [N]$$

$$i = \frac{t_{mot}}{t_{mach}} = \frac{n_{mach}}{n_{mot}} [-] \quad t_{mach} = t_{mot} \cdot \frac{n_{mot}}{n_{mach}} [-]$$

$$w_{tb} = \frac{P_{mech}}{t_1 \cdot t_e \cdot P_{spec}} [mm] \quad w_{tb} = \frac{T}{t_1 \cdot t_e \cdot T_{spec}} [mm]$$

$$w_{tb} = \frac{F}{t_e \cdot F_{spec}} [mm] \quad \text{Wickel: } w_{tb} = \frac{P_{mech}}{t_e \cdot P_{spec}} [mm]$$

$$CC = (0,5 \dots 2) \cdot \frac{P}{\pi} (t_1 + t_2) [mm]$$

$$l_{tb,a} = 2 \cdot CD + \frac{P}{2} (t_1 + t_2) + \frac{P^2}{CD} \left(\frac{t_2 - t_1}{2\pi} \right) [mm]$$

$$l_{tb,c} = 2 \cdot CD \cdot \sin\left(\frac{\beta_1}{2}\right) + \frac{P}{2} \cdot \left[(t_1 + t_2) + \left(1 - \frac{\beta_1}{180^\circ}\right) \cdot (t_2 - t_1) \right] [mm]$$

$$\beta_1 = 2 \cdot \arccos \left[\frac{P \cdot (t_2 - t_1)}{2 \cdot CD \cdot \pi} \right] [^\circ]$$

Timing belt calculation

List of formula signs

List of formula signs		
symbol	name	unit
β	Wrapping angle	[°]
Δl	Elongation	[mm]
η	Efficiency	[-]
μ	Coefficient of friction	[-]
1	Index for small pulley	[-]
2	Index for large pulley	[-]
a	Acceleration	[m/s ²]
a	bore distance	[mm]
b	Width of Vee-guide groove	[mm]
B	Width of Vee-guide	[mm]
c	Safety factor	[-]
C	Width of clamping plate	[mm]
CC	Shaft centre distance	[mm]
C_h	Duty factor of operation	[-]
C_l	Factor load	[-]
C_s	Service factor	[-]
C_{spec}	Spec. spring ratio	[N]
d	Borehole diameter	[mm]
d_1	Minimum pulley diameter	[mm]
d_2	Minimum tension pulley diameter	[mm]
d_e	Outer diameter	[mm]
d_{max}	Max. borehole diameter	[mm]
d_b	Effective diameter	[mm]
e	Index "engaged"	[-]
e	Distance to end	[mm]
f	Frequency	[1/s]
F	Force	[N]
F_{ac}	Acceleration force	[N]
F_{al}	Allowed span force	[N]
F_b	Bearing load	[N]
F_{br}	Breaking load	[N]
F_c	Circumferential force	[N]
F_{fric}	Friction force	[N]
F_{incl}	Climbing resistance	[N]
F_m	Shaft load	[N]
F_p	Pre-tensioning force	[N]
f_R	Rolling friction	[-]

List of formula signs		
symbol	name	unit
F_{rem}	Motion resistance	[N]
F_{spec}	Specific tooth force	[N]
g	Acceleration of gravity	[m/s ²]
h	Depth of Vee-guide groove	[mm]
H	Height of Vee-guide	[mm]
H	Total height	[mm]
h_1	Depth of slider bed groove	[mm]
h_n	Height of flange	[mm]
i	Transmission ratio	[-]
L	Total length	[mm]
l_s	Span length	[mm]
l_{tb}	Timing belt length	[mm]
$l_{tb,a}$	Approx. belt length	[mm]
$l_{tb,c}$	Correct belt length	[mm]
$l_{tb,ten}$	Belt elongation	[mm]
l_{ten}	Tensioning distance	[mm]
$l_{ten,fl}$	Tensioning distance due to flanges	[mm]
m	Weight	[kg]
m_{ach}	Index "drive"	[-]
m_{ot}	Index "driven"	[-]
n	Speed	[1/s]
n_1	Speed, rpm	[1/min]
p	Pitch	[mm]
P_{mech}	Mech. power	[W]
P_{mot}	Motor power	[W]
P_{spec}	Specific power	[W]
t	Number of teeth	[-]
t	Height of teeth	[mm]
T	Torque	[Nm]
T_{mot}	Motor torque	[Nm]
T_{spec}	Specific torque	[Nm]
t_{tb}	Number of belt teeth	[-]
v	Velocity	[m/s]
w	Width of groove base	[mm]
W	Width of groove top	[mm]
w_f	Width over flanges	[mm]
w_{tb}	Belt width	[mm]

Calculation Parameters

Timing belts can be applied to one of the following three fields:

› **Power transmission** › **Linear drives** › **Conveying**

The calculations are based on the:

› **Tooth strength** › **Cord strength** › **Flexibility**

The general method of the timing belt calculation, is shown in the flowchart on the front folding double page of this catalogue. The numbers in the circles on the flow chart refer to the corresponding steps in the following explanatory text.

How to use the power rating tables:

To keep the size of the power rating tables to an acceptable limit, the power ratings are only given for a specific number of teeth and speeds. Interim values can be calculated by linear interpolation, values which exceed the tables can be calculated by linear extrapolation.

1) Calculating intermediate linear values:

The general formula for this is:

$$f(x) = f_0 + \frac{f_1 - f_0}{x_1 - x_0} * (x - x_0)$$

Example: calculate the mechanical power for a T10 moulded timing belt at a speed of 1050 rpm and for 21 teeth

the power value for 1000 rpm (x_0) is 0,0983 W/mm (f_0) (see table of T10 moulded)

the power value for 1100 rpm (x_1) is 0,1508 W/mm (f_1)

the power value for the requested 1050 rpm ($f(x)$) is:

$$L(1050) = 0,0983 + \frac{0,1508 - 0,0983}{1100 - 1000} * (1050 - 1000) = 0,12455 \text{ W / mm}$$

Note: the power values are not linear, so the linear calculation/extrapolation only results in approximate values, which are accurate enough for a safe dimensioning of the timing belt

2) Calculating linear values exceeding the table:

The general formula for this is:

$$f(x) = f_0 + \frac{f_1 - f_0}{x_1 - x_0} * (x - x_0)$$

Example: calculate the mechanical power for a T10 moulded timing belt at a speed of 1000 rpm and for 60 teeth (a maximum of 56 teeth is given in the table)

the power value for 54 teeth (x_0) is 0,2527 W/mm (f_0).

the power value for 56 teeth (x_1) is 0,2621 W/mm (f_1).

the power value for the requested 60 teeth ($f(x)$) is:

$$L(60) = 0,2527 + \frac{0,2621 - 0,2527}{56 - 54} * (60 - 54) = 0,2809 \text{ W / mm}$$

Step ①: Calculation of power/torque/force:

The mechanical power P_{mech} to be transmitted by the timing belt, can be calculated from the forces F , torques T or the motor output P_{mot} :

$$P_{\text{mech}} = F * v * \frac{1}{\eta} = 2 * \pi * n * M * \frac{1}{\eta} = P_{\text{mot}} * c * \frac{1}{\eta} \text{ [W]}$$

with v ... Velocity [m/s]

η ... Efficiency [-], approx. 0,8 ... 0,95

π ... 3,1416 [-]

n ... Speed [1/s]

P_{mot} ... Motor power or required power to drive a machine [W]

c ... Security factor [-], see the following chapter

I. Where the motor output/power demand is known

The known power must be multiplied by security factors from the following tables:

duty of operation (factor c_d):		
mode	description	factor c_d
Easy	No peak loads, small load variations, clean environmental conditions	1,0
Medium	Medium peak loads, medium load variations, clean environmental conditions	1,2
Heavy	High load peaks, large load variations, medium pollution	1,5
Very heavy	High peak loads, extreme load variations, strongly polluted	1,8

service factor c_s :		load factor c_l :	
Operating time [h/day]	factor c_s	Motor type	factor c_l
0 – 2	-0,1	Soft start torque (up to 1.5 times of nominal torque)	0,0
3 – 8	0,0	Medium start torque (1.5 to 2.5 times of nominal torque)	+0,1
8 – 16	+0,1	High start torque (over 2.5 times of nominal torque)	+0,2
16 – 24	+0,2		

The power P_{mech} to be transmitted by the timing belt is calculated as follows:

$$P_{\text{mech}} = P_{\text{mot}} * (c_h + c_s + c_l) * \frac{1}{\eta} \text{ [W]}$$

Calculation Parameters

II. Where the torque is known

The name plate on motor gear boxes often gives information about the torque T . If this torque is given as the nominal torque, the maximum torque while starting the engine is calculated as follows:

$$T_{\text{mech}} = T_{\text{mot}} * (1,5 \div 2,5) \text{ [Nm]}$$

III. Where the mechanical forces are known / can be calculated

Mass inertial forces F_{ac} when accelerating, forces from motion resistance F_{rem} and climbing resistance F_{incl} have to be taken into account. Forces due to a large rotating mass (gear wheels, mandrels, clutches etc.) are considered a factor between 1.05 and 1.15:

$$F = (F_{\text{ac}} + F_{\text{rem}} + F_{\text{incl}}) * (1,05 \div 1,15) \text{ [N]}$$

The individual forces are determined as follows:

Acceleration force:

$$F_{\text{ac}} = m * a \text{ [N]}$$

with m ...Mass to be accelerated, [kg]
 a ...Maximum acceleration [m/s²]

Motion resistance:

$$F_{\text{rem}} = m * a * \mu * \cos \alpha \text{ bzw.}$$

$$F_{\text{rem}} = m * a * f_{\text{R}} * \cos \alpha \text{ [N]}$$

with m ...Moved mass [kg]
 g ...Acceleration of gravity [m/s²],
 9,81 m/s²
 α ... Angle of gradient [°]
 μ ... Coefficient of friction [-],
 approx. 0,1... 0,4
 f_{R} ... Coefficient of rolling friction [-],
 approx. 0,01 ... 0,05

Climbing resistance F_{incl}

$$F_{\text{incl}} = m * g * \sin \alpha \text{ [N]}$$

The total force to be transmitted by the timing belt is:

$$F = (m * (a + g * \sin \alpha + g * \cos \alpha * (\mu \text{ oder } f_{\text{R}}))) * (1,05 \div 1,15) \text{ [N]}$$

Result step 1:

Leistung P_{mech} oder Drehmoment T oder Kraft F

Step ②: Select „Torque“, moulded, jointed or open length material

The following calculation enables the selection of type of timing belt needed. For example, open length material, jointed, moulded or truly endlessly („Torque“) timing belts:

- Open length material is used almost exclusively in linear drives. It can be supplied in every possible length (in general up to 120 metres)
- Moulded belts are inexpensive and have short lead times. The tensional strength is 20% less than open length or Torque type belts. The moulded sizes are only available in certain lengths (see appropriate AB catalogue for moulded timing belts sizes available). They are normally used for power transmission applications, with centre-centre distances of generally less than one metre.
- Jointed timing belts are less expensive than Torque belts. Starting from the minimum, these can be made at any length requested. They are available on short lead times, but due to welded joint the tensile strength is around 50% lower than open length or Torque belts. This weakness can be compensated by using wider widths. This type of belt is mainly used for transportation and conveying purposes.
- Torque timing belts are the most efficient due to the truly endless nature of the product. Torque belts are highest priced and depending on the number of teeth are generally made to order. They are used for high performance drives as well as for heavy load transportation applications.

Result step 2: Open length material, jointed, moulded or Torque belt

Calculation Parameters

Step ③: Select profile form and pitch

Besides the „type“ of the timing belt (result step 2) the form of the teeth (e.g. T, AT, HTD) and the pitch (e.g. 5M, 8M, 20 mm or inch) must be defined. The following principles help to determine this:

small pitch

Good flexing ability
High speeds
Low weight
Lower price
Lower performance

big pitch

Lower flexing ability
Lower speeds
Higher weight
Higher price
Higher performance

T /inch profile

Low price
Low performance

AT profile

Medium price
Medium performance

HTD/STD profile

Higher price
High performance

Medium noise emission

Low noise emission

For simple applications with low to medium loads, timing belts with T and AT profile with small pitches are sufficient. High performance drives request bigger pitches with AT and HTD profiles. To pre-select a suitable timing belt, the following diagrams show the power/force/torque ability, (summarised into groups) as a function of the speed, for a width of 50 mm.

a) Belt width is NOT limited

This is explained with example A:

Timing belt type: Open length material
Calculated accordingly: Power (8.5 kW)
Max. speed: 1400 rpm

- Choose the diagram “power” for “open length material/Torque”
- Find speed (1400 1/min) on the x-axis and given power (8.5 kW) on the y-axis and build the intersection point
- All timing belts whose graphs are directly above this intersection point are suitable (for this example it is the blue line of the T10 toothed belt).
- On the basis of further conditions the choice of suitable belts can be reduced (e.g. flexing ability, no use of inch pitches, low noise emission)

b) Belt width is limited

In this case the result of step 2 (calculated power/force/torque) must be multiplied by a width factor to be able to select a corresponding timing belt in the diagrams:

Belt width	Width factor
5 mm	16,60
10 mm	6,89
15 mm	4,54
20 mm	3,03
25 mm	2,27
30 mm	1,81
35 mm	1,51
40 mm	1,29
45 mm	1,13
50 mm	1,00
55 mm	0,81
60 mm	0,68
70 mm	0,61
80 mm	0,57
95 mm	0,53
100 mm	0,48
110 mm	0,44
120 mm	0,39
130 mm	0,36
140 mm	0,32
150 mm	0,30

Using this width corrected value, it is possible to find a suitable timing belt according to the previous example. Example B is showing how to do this:

Example B: Open length material

Required belt width: 40 mm
Width factor from the above table: 1,29

Power: 0,55 kW
Corrected power:
 $0,55 \text{ kW} * 1,29 = 0,7 \text{ kW}$

Speed: 200 1/min

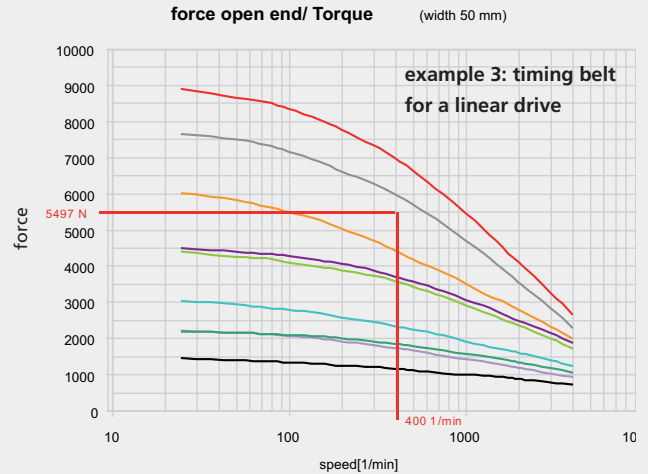
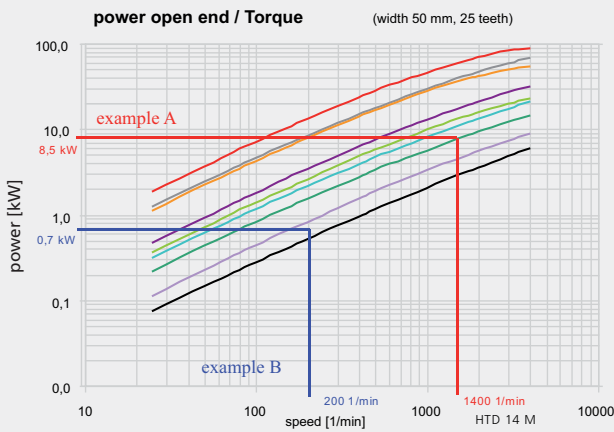
Chosen timing belt type:
STD5 M/HTD5 M/AT5 (purple line)

Calculation Parameters

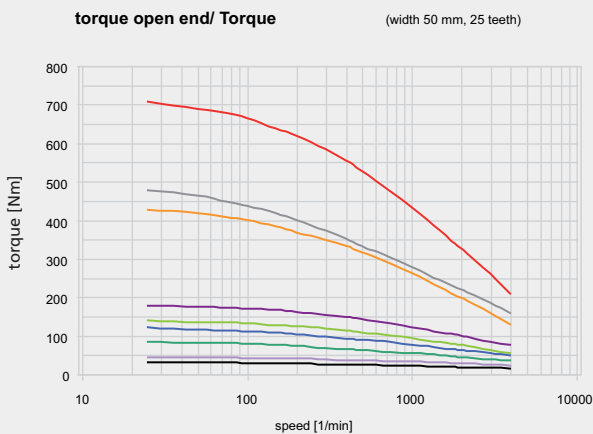
Correction factor of "number of teeth" for calculation according to torque or power

All diagrams refer to timing belt drives with 50 mm width and number of teeth t_1 of the (smaller) pulley of 25 teeth. If the requested number of teeth differs from 25 teeth, the calculated power or torque must be corrected before using the diagrams:

$$P = P_{\text{mech}} * 25 / t_1 \quad \text{bzw.} \quad T = T_{\text{mech}} * 25 / t_1$$

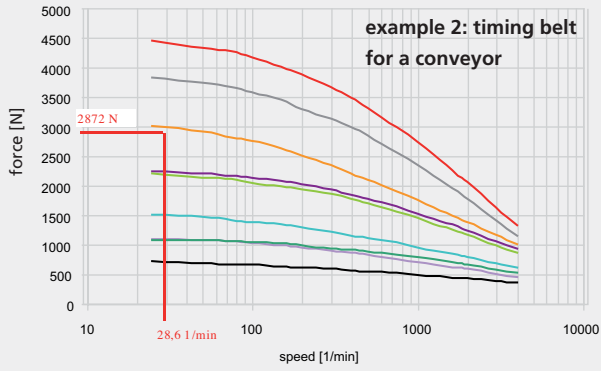


- AT20
- XH, T 20
- HTD 14 M
- AT
- T10
- L
- STD 5 M, HTD 5 I

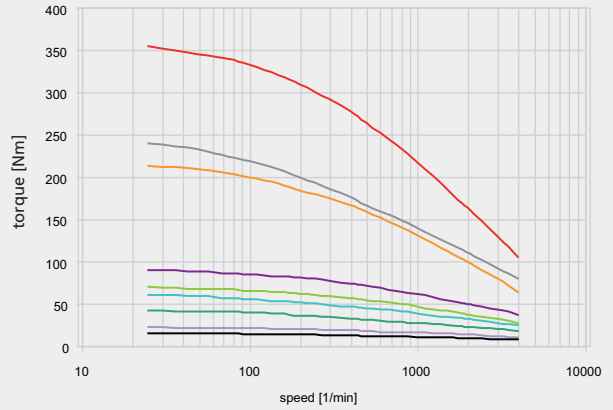


Calculation Parameters

force welded (width 50 mm)

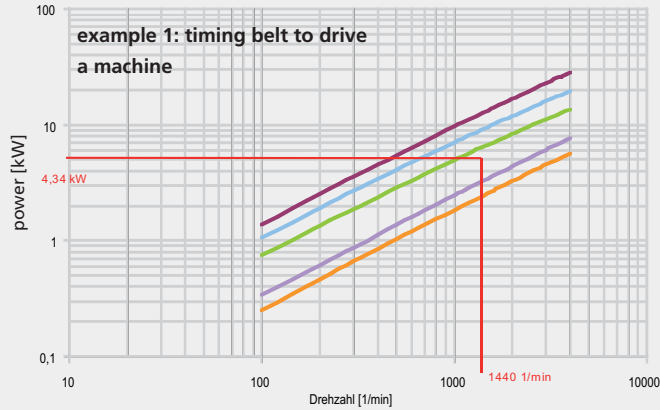


torque welded (width 50 mm, 25 teeth)



- AT20
- XH, T 20
- HTD 14 M
- AT10
- STD 8 M
- T10
- L
- STD 5 M, HTD 5 M, AT5
- XL

power moulded (width 50 mm, 25 teeth)



- AT10
- T 10
- L
- AT 5
- XL, T5

Result step 3: Selected profile form and pitch

Calculation Parameters

Step ④: Calculation of the transmission ratio

The following principles have to be taken into account:

I. Minimum number of teeth

For every timing belt type a minimum number of pulley teeth is recommended to ensure that the flexing ability of the timing belt stays within acceptable limits. The pulley tables in this catalogue show this recommended minimum number of teeth for each type. For special constructions, pulleys with a smaller number of teeth are available on request

II. Number of teeth engaged

The maximum number of teeth to calculate the timing belt is limited to 12 teeth so as not to overload the cords. Due to the joint, jointed belts are less powerful, so the maximum number of teeth for this calculation is limited to 6

III. Pulley size

The bigger the pulley, the more expensive they are with a larger inertial mass. For this reason pulleys should be selected at the smallest practical size.

Calculating the transmission ratio:

A transmission ratio is achieved by a different number of teeth on each pulley. This can be used to adjust the speed of the drive motor to the requirements of the application. This relationship between the number of teeth on each pulley is directly linked to the output speed:

$$i = \frac{t_{mot}}{t_{mach}} = \frac{n_{mach}}{n_{mot}} [-]$$

with t_{mot} ...Tooth number of the drive pulley [-]

t_{mach} ...Tooth number of the tail pulley [-]

n_{mot} ...Motor speed [1/min]

n_{mach} ...Machine speed [1/min]

Neither t_{mot} nor t_{mach} are known so the equation can only be solved by defining one pulley size (normally the drive pulley which is in most cases the smaller one).

Then t_{mach} can be calculated with:

$$t_{mach} = t_{mot} * \frac{n_{mot}}{n_{mach}} [-]$$

Conveyor systems with pulleys of same size

If the timing belt is used as a means to transport goods and a transmission ratio is not required, then all pulleys have the same number of teeth (this is subject to the principles mentioned above).

Result step 4:

Number of teeth for all pulleys,
number of engaged teeth t_e

Calculation Parameters

Step ⑤: Calculation/check of timing belt width w_{tb}

Moulded timing belt:

Moulded belts are normally selected by the power they have to transmit:

$$w_{tb} = \frac{1000 * P_{mech}}{t_e * P_{spec}} [mm]$$

- with P_{mech} ...Mechanical power calculated in step 1 [W]
 t_e ...Engaged number of teeth 3,
 (max. 12 or 6 teeth) [-]
 P_{spec} ...Specific power of moulded belt from step 2
 (see respective catalogue page) [W/mm]

Note: If moulded timing belts are dimensioned according to force or torque, consult the table values of open length material and multiply them with a factor of 0.8, (this considers the fact that moulded belts are approx. 20% weaker than open length belts)

Open length material, Torque belts, jointed belts

Note: If the belt width is limited and the width factor was used in step 2: The following formulas require the calculated power/force/torque of step 1 (and NOT the corrected values)!

I. Calculation with mechanical power P_{mech}

$$w_{tb} = \frac{P_{mech}}{t_1 * t_e * P_{spec}} [mm]$$

- mit P_{mech} ...Calculated power from step 1 [W]
 t_1 ...Number of teeth of the smallest pulley from step 4 [-]
 t_e ...Number of teeth engaged from step 4
 (max. 12 or 6 teeth) [-]
 P_{spec} ...Specific power of selected belt from step 2
 [W/mm]; (see respective catalogue page)

II. Calculation with torque T

$$w_{tb} = \frac{T * 100}{t_1 * t_e * T_{spec}} [mm]$$

- with T ...Calculated torque from step 1 [Nm]
 t_1 ...Number of teeth of smallest pulley from step 4 [-]
 t_e ...Engaged number of teeth step 4
 (max. 12 or 6 teeth [-]
 T_{spec} ...Specific torque of chosen belt from step 2
 [Ncm/mm]; (see respective catalogue page)

III. Calculation with force F

$$w_{tb} = \frac{F}{t_e * F_{spec}} [mm]$$

- mit F ...Calculated force from step 1 [N]
 t_e ...Engaged number of teeth step 3
 (max. 12 or 6 teeth) [-]
 F_{spec} ...Specific tooth strength of
 chosen belt from step 2
 [N/mm]; (see respective
 catalogue page)

If the calculated belt width does not correspond to the standard width of the chosen belt (see respective catalogue page), select the next larger width.

Result step 5:
Timing belt width w_{tb}

Calculation Parameters

Step ⑥: Calculation of preliminary centre-centre distance

If the centre-centre distance CC of the pulleys is not restricted, a preliminary distance can be calculated as follows:

$$CC = (0,5...2) * \frac{p}{\pi} (t_1 + t_2) \text{ [mm]}$$

with p ...Pitch of chosen timing belt from step 2
 t_1 ...Number of teeth of small pulley from step 3
 t_2 ...Number of teeth of big pulley from step 3

In many cases the centre-centre distance of the pulleys is restricted by the construction of the drive system, so this calculation step can be skipped.

Result step 6: Preliminary centre-centre distance

Step ⑦: Calculation of belt length

The **approximate** belt length $l_{tb,a}$ can be calculated with the centre-centre distance of the pulleys (see step 6) and the number of teeth of the pulleys:

$$l_{tb,a} = 2 * CC + \frac{p}{2} (t_1 + t_2) + \frac{p^2}{CC} \left(\frac{t_2 - t_1}{2\pi} \right) \text{ [mm]}$$

If the pulleys equal in size ($t_2 - t_1 = 0$) the formula simplifies to

$$l_{tb,a} = 2 * CC + p * t \text{ [mm]}$$

The **exact** belt length $l_{tb,c}$ is calculated using the wrapping angle β_1 (at the smaller pulley)

$$\beta_1 = 2 * \arccos \left[\frac{p * (t_2 - t_1)}{2 * CC * \pi} \right] \text{ [°]}$$

as follows:

$$l_{tb,c} = 2 * CC * \sin \left(\frac{\beta_1}{2} \right) + \frac{p}{2} * \left[(t_1 + t_2) + \left(1 - \frac{\beta_1}{180^\circ} \right) * (t_2 - t_1) \right] \text{ [mm]}$$

The number of teeth t_{tb} of the timing belt is:

$$t_{tb} = \frac{l_{tb}}{p} \text{ [-]}$$

with l_{tb} ...either the approximate belt length $l_{tb,a}$ or the exact belt length $l_{tb,c}$

Notes: If the timing belt is fitted with flights, then the number of teeth of the timing belt must be adjusted to the pitch of the flights! The length of a moulded or Torque belt (which are only available in specific lengths) influences the centre-centre distance. This is checked by following formula

$$CC \approx \frac{1}{4} * \left[t_{tb} * p - \frac{p}{2} * (t_1 + t_2) \right] +$$

$$\frac{1}{4} \sqrt{\left[t_{tb} * p - \frac{p}{2} (t_1 + t_2) \right]^2 - 2 * \left[\frac{p}{\pi} (t_2 - t_1) \right]^2} \text{ [mm]}$$

Result step 7: Belt length or number of teeth of the timing belt

Calculation Parameters

Step ⑧: Check all calculated data

All data found out with the calculation steps must be checked:

- Is the calculated belt width exceeding the range of available standard widths? In this case the calculation process must be repeated starting from step 3 „Choice of tooth profile and pitch“! Select a more efficient tooth profile form and/or a bigger pitch.
- Is the calculated belt width much smaller than the smallest available standard width? In this case the calculation process should be repeated starting from step 3 „Choice of tooth profile and pitch“ to find a lower cost belt type. Either to select a less efficient profile and/or a smaller pitch.
- Has the maximum number of engaged teeth (normally 12, but 6 for a jointed belt) been taken into account at the calculation of the belt width? If more teeth have been taken into account, the belt might be overloaded!
- Is the calculated belt width suitable for the construction? If the belt is too wide, the calculation process must be repeated starting from step 3“choice of tooth profile and pitch“ selecting a more efficient tooth profile and/or a bigger pitch.
- Is the calculated centre-centre distance suitable for the construction? This must be checked exactly, especially for moulded belts which are only available in specific length. Alternatively jointed belts can be used which are available in every requested length but which are weaker than moulded belts. Perhaps repeating step 4 “calculation of the transmission ratio” with a different number of teeth for the drive pulley results in a more suitable solution.
- Are the calculated pulley sizes available? For exceptional applications special pulleys can be manufactured with a particularly large number of teeth. Too small pulleys can damage the timing belt by exceeding its flexing ability and the life time is reduced considerably.
- Have the permitted tensile strengths been checked (especially of the jointed timing belts)?

Result step 8: Checked results from the previous steps

Ordering timing belts and pulleys

According to the nomenclature shown in the corresponding chapter of this catalogue timing belts and pulleys can be ordered at Ammeraal Beltech, or a sales partner of Ammeraal Beltech.

Calculation Examples

1) Timing belt for a machine drive

Known data

Motor:

Three-phase motor with 1.5 kW

Speed: 1440 1/min

Machine:

Speed: 900 1/min

Operating conditions:

1 shift operation, clean environment
strong load variations, high peak loads

Other:

timing belt width is restricted to max. 30 mm
centre-centre distance between 500 mm
and 600 mm
no inch/imperial pitch

Step ①: Calculation of current power

The timing belt is designed by motor output power with following factors:

- Factor "duty of operation" c_i : 1,5
(strong load variations, high peak loads)
- Service factor c_s : 0,0
(1 shift operation)
- Load factor c_l : 0,1
(a medium starting torque is assumed)

The power to be transmitted by the timing belt is:

$$P_{mech} = P_{mot} * (1,5 + 0,0 + 0,1) = 1,5 kW * 1,6 = 2,4 kW$$

Result step 1: $P_{mech} = 2,4 kW$

Step ②: Select Torque, moulded, jointed or open length material

The timing belt is used as a drive belt, so a moulded belt is selected

Result step 2:
belt type is "moulded"

Step ③: Select profile form and pitch

The maximum belt width is limited to 30 mm, so the belt width factor from the table in chapter 3b) is 1.81:

$$2,4 kW * 1,81 = 4,34 kW$$

Using this value and the given speed of 1400 rpm, select a suitable belt in the diagram "power, moulded belt":
The next line above the intersection point of power and speed (green line), represents "L" timing belts, which are imperial pitch. Due to the requirement not to use imperial belts, the next line (blue) is selected which represents T10 metric timing belts.

In this case using steel or Aramid cords is not important.

Result step 3: timing belt T10 steel

Step ④: Calculation of the transmission ratio

The required transmission ratio is calculated as follows:

$$i = \frac{n_{mach}}{n_{mot}} = \frac{900}{1440} = 0,625 = \frac{t_{mot}}{t_{mach}}$$

As a first step, the driven pulley is assumed to have 24 teeth. The calculated result for the drive pulley is a size of 38.4 teeth. This value must be rounded up or down to the next whole number of teeth. A look at the pulley table of T10 timing belt shows that the standard number of teeth (which are highlighted in blue) is 40 teeth. Since this number of teeth differs from 38.4, the number of teeth on the motor side must be checked:

$$40 * 0,625 = 25$$

Selecting a standard size for the driven pulley of 40 teeth, results in a required number of teeth for the drive pulley of 25 (which is also standard).

Hint: To reduce delivery time it is helpful to assume and calculate different number of teeth trying to come to standard pulleys.

Result step 4:
25 and 40 teeth for drive and driven pulley

Calculation Examples

Step ⑤: Calculation/control of timing belt width

The formula to check the belt width is:

$$w_{tb} = \frac{P_{mech}}{t_e * P_{spec}} = \frac{2,4}{12 * 0,01596} = 12,5mm < 30mm$$

The minimum required belt width is 12.5 mm. A look at the catalogue page for T10 timing belt shows that the next standard width is 16 mm.

Result step 5:
Timing belt width 16 mm

Step ⑥: Calculation of the preliminary centre-centre distance

According to the given data the centre-centre distance should be 500 to 600 mm

Step ⑦: Calculation of the belt length

Due to the fact the centre-centre distance is given as a range (500 to 600 mm, 550 mm is assumed), it is sufficient to determine the belt length only approximately:

$$l_{b,a} = 2 * CC + \frac{p}{2} (t_1 + t_2) + \frac{p^2}{CC} \left(\frac{t_2 - t_1}{2\pi} \right) [mm]$$

$$= 2 * 550 + \frac{10}{2} (25 + 40) + \frac{10^2}{550} \left(\frac{40 - 25}{2\pi} \right) = 1425,4mm$$

In accordance with the catalogue pages of the T10 moulded timing belts, the next standard length is 1420 mm.

Result step 7:
belt length 1420 mm

Final result:
The calculated timing belt is a moulded belt type T10 with 1420 mm length and 16 mm wide.

2) Timing belt for a conveyor

Given data:

Goods to convey:

Weight: 90 kg

Maximum number of pieces on the conveyor: 10

Conveyor:

Goods are supported by two timing belt

Centre-centre distance: 10 metres as exactly as possible

Pulley diameter: approx. . 200 mm

Conveying velocity: 0.3 m/s

All pulleys of same size

Sliding support of timing belt (coefficient of friction $\mu = 0.3$)

Inclined system with angle of 15°

Other:

Acceleration: 1 m/s^2

Mechanical efficiency of the system is high

Delivery time as short as possible

Step ①: Calculation of present forces

The total load on the conveyor is $10 * 90 \text{ kg} = 900 \text{ kg}$.

According to following formula the forces are calculated:

$$F = (F_{ac} + F_{rem} + F_{incl}) * (1,05 + 1,15) [N]$$

Acceleration force:

$$F_{ac} = m * a [N] = 900kg * 1 \frac{m}{s^2} = 900N$$

Motion resistance:

$$F_{rem} = m * g * \mu * \cos \alpha [N] = 900kg * 9,81 \frac{m}{s^2} * 0,3 * \cos 15^\circ = 2559N$$

Climbing resistance:

$$F_{incl} = m * g * \sin \alpha [N] = 900kg * 9,81 \frac{m}{s^2} * \sin 15^\circ = 2285N$$

In total

$$F = (F_{ac} + F_{rem} + F_{incl}) * (1,05 + 1,15) [N] = (900N + 2559N + 2285N) * 1,05 = 5744N$$

The load is supported by two belts, so the total force for a single belt is 2872 N.

Result step 1: $F = 2872 \text{ N}$

Calculation Examples

Step ②: Select Torque, moulded, jointed or open length material

Due to the required centre-centre distance of 10 metres moulded belts are not suitable. Torque and belts made from open length material (jointed) can be produced to the required length. However Torque belts cost more and have a longer lead time. For this reason a jointed belt is selected..

Result step 2:
Selection of jointed belt

Step ③: Select tooth profile and pitch

To select a belt type from the diagrams, the speed needs to be known. This can be calculated by the requested pulley size of 200 mm and the conveying velocity:

$$n = \frac{v}{\pi * D} = \frac{0,3m/s}{\pi * 0,2m} * 60s/min = 28,61/min$$

In the diagram "forces jointed", find the intersection point of speed and force (from step 1). The next line above this point (orange) represents HTD 14 M belts.

Result step 3:
timing belt HTD 14 M

Step ④: Calculation of pulley size

Since the diameter shall be approximately 200 mm, a corresponding pulley can be selected in the pulley table of the HTD 14 m timing belt catalogue pages: a pulley with 45 teeth shows an outside diameter of 200.54 mm, a pulley with 44 teeth shows a diameter of only 196.08 mm. 44 teeth is standard size (highlighted line) which can be delivered from stock.

Result step 4:
pulley with 44 teeth

Step ⑤: Calculation of belt width

The formula to calculate the belt width:

$$w_{th} = \frac{F}{t_e * F_{spec}} = \frac{2872N}{6 * 12,71N/mm} = 37,7mm$$

According to the table of standard width the next size is 40 mm .

Result step 5:
belt width 40 mm

Step ⑥: Calculation of the preliminary centre-centre distance

This step is unnecessary since the centre-centre distance is limited to 10,000 mm (see given data).

Step ⑦: Calculation of belt length

Since the pulleys all have the same diameter, the simplified formula can be used:

$$l_{th,a} = 2 * CC + p * t \quad [mm] = 2 * 10000 + 44 * 14 = 20616mm$$

Checking the pitch: 20616 mm/14 mm/tooth = 1472.5 teeth > select 1472 teeth.

Result step 7:
Selected belt length is 1472 * 14 mm = 20608 mm

Calculation Examples

Step ⑧: Checking all calculated data

The tensile strength of the jointed timing belt can be checked as follows:

$$2872N = F < F_{al} = 4750N$$

Result step 8:

2 timing belts 40 HTD 14 M V 20608 mm

3) Timing belt for a linear drive (rack feeder)

given data:

- Gear motor with nominal torque of 350 Nm
- Relationship nominal torque to starting torque 1 : 1.5
- Gear output speed: 400 1/min
- Velocity: 4 m/s
- Open length timing belt, fixed ends
- Drive pulley/deflection pulleys designed as Omega drive (Ω)

Pre-calculation

Since the speed of the rack feeder is known ($v = 4$ m/s) the necessary pulley diameter is calculated as follows:

$$v = \pi * D * n \Rightarrow D = \frac{v}{\pi * n} = \frac{4 \text{ m/s}}{3,14 * 400 \text{ 1/min}} * 60 \frac{\text{s}}{\text{min}} = 0,191\text{m}$$

The circumference of the pulley ($U = \pi * D$) is 600 mm.

Step ①: Calculation of present torque T and the force F

The maximum torque is $350 \text{ Nm} * 1,5 = 525 \text{ Nm}$.

This torque results in a force which has to be transmitted by the teeth of the timing belt:

$$F = \frac{T}{R} = \frac{2T}{D} = \frac{2 * 525 \text{ Nm}}{0,191\text{m}} = 5497\text{N}$$

Result step 1:

T = 525 Nm, F = 5497 N

Step ②: Select Torque, moulded, jointed or open length material

According to given data an open length belt is suitable.

Result step 2:

Select open length material

Step ③: Select profile form and pitch

Build the intersection point of "speed" and "force" in the diagram, „force open length material/Torque“. The grey line of the XH/T20 timing belts is the next one above this point. A T20 timing belt is selected because inch pitch belts like the XH (imperial), should generally not be used for new designs.

Result step 3:

Selected timing belt T 20 Stahl

Step ④: Calculation of pulley sizes

The circumference of the drive pulley already was calculated with 600 mm. Since the pitch is 20 mm, the number of teeth results in 30. The working diameter is 190.99 mm (see pulley table of T20 timing belt).

Result step 4:

pulley with 30 teeth

Calculation Examples

Step ⑤: Calculation of belt width

The formula to calculate the belt width is:

$$w_{tb} = \frac{F}{t_p * F_{env}} = \frac{5497N}{12 * 9,554N} mm = 47,9mm$$

The minimum required width is 47.9 mm, according to the belt width table of T20 belts the next standard width is 50 mm.

Result step 5:
timing belt width 50 mm

Step ⑥: Calculation of the preliminary centre-centre distance

Since the belt is used as an open length this step can be disregarded.

Step ⑦: Calculation of belt length

The required length of the timing belt is dependent on the desired drive distance, the size of the drive pulley and deflection roller within the Omega drive. Since this information is not available for this example, a calculation is unnecessary.

Step ⑧: Check calculated data

The tensile strength of the timing belt of 50 T20 can be checked with the following formula:

$$5497N = F_{vorh} < F_{zul} = 5700N$$

Result:
timing belt 50 T20

Installation

» Pre-tensioning the belt

While static or at a constant idling speed, the pre-tension is evenly distributed in the whole timing belt. Whilst transmitting power, the tension in the tight side increases, whilst the tension in the slack side correspondingly decreases. The slack side must be prevented from sagging too much, otherwise the teeth will miss mesh and try to climbing up the pulley. Too much tension, needlessly burdens the belt, the shafts and the bearings. Pre-tension should be a good compromise between enough tension of the slack side and not too much tension, so as to prematurely wear out the belt and other machine parts.

The timing belt is correctly tensioned when even under heavy conditions (i.e. starting phase) the slack side does not tend to sag.

Pre-tension force is calculated as follows:

$$F_p \geq \frac{1}{2} F_c$$

with F_p ... Pre-tension force [N]
 F_c ... Circumference force (force to transmit) [N]

A reference value for welded timing belts is 0.1% of pre-tension which means an elongation of 1 mm per meter belt length. For open end belts, moulded and Torque belts a value of 0.2% (2 mm/m) is recommended. The tension can be checked by using marks on the belt in a distance of exactly 1000 millimetres (1 metre).

For linear drives the pre-tension is higher than for drive gears:

$$F_p \geq 1,2 * F_c$$

With means of a special frequency analyser the pre-tension of a timing belt can be applied or checked by using the resonance frequency of a belt span

$$F_p = 4 * m * l_s^3 * f^2$$

with m ... Metermasse des Zahnriemen [kg/m]
 l_s ... Trumlänge, an der die Frequenz gemessen wird [m]
 f ... gemessene Frequenz

» Applying pre-tension

There are alternative methods to apply pre-tension. Generally the tensioning range must correspond to the elongation behaviour of the timing belt (see catalogue pages of belt types). It is not recommended to use springs to apply tension to a timing belt!

One of the pulleys can be adjustable, so the tension can be applied with screwed threads. Additionally a tensioning roller can be located on the slack side of the belt. This idler roller can run on the toothed, or the back side of the belt. Be aware that running this pulley on the back side of the belt, causes back flexing, (see recommendation on pulley diameters!) This can reduce the life time of the belt.

Installation

» Calculating the tensioning range

The necessary tensioning range l_{ten} depends on the position of the idler roller and the belt elongation $l_{tb,ten}$, which is calculated as follows:

$$l_{tb,ten} = \frac{F_p}{C_{spec}} * l_{tb} \text{ [mm]}$$

with l_{tb} ... Belt length [mm]
 F_p ... Pre-tension force [N]
 C_{spec} ... Specific spring ratio

As an alternative, the elongation can be calculated according to the maximum allowed elongation, of 0.1% for jointed belts and 0.2% for open length, moulded and Torque belts:

$$l_{tb,ten} = \frac{(0,1 \div 0,2)}{100} * l_{tb} \text{ [mm]}$$

In a two pulley drive, the tensioning range is calculated thus:

$$l_{ten} = \frac{1}{2} * l_{tb,ten} \text{ [mm]}$$

Note: When mounting the belt on pulleys with flanges, the tensioning range must be extended to incorporate an extra range $l_{ten,fl}$:

$$l_{ten,fl} = h_{fl} * \pi$$

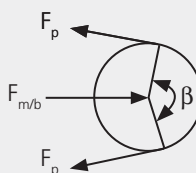
with h_{fl} ... Height of the flanges [mm]
 (see respective catalogue page for pulleys)

» Load on bearings and shafts

The load on bearings F_b and shafts F_m resulting from the tensioning forces is calculated depending on the wrapping angle β :

$$F_m \text{ bzw. } F_b = 2 * F_p * \sin \beta/2$$

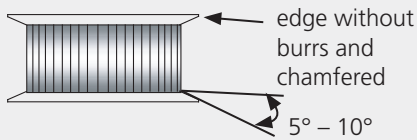
Note: a wrapping angle of 180° means $\sin \beta/2 = 1$



Installation

» Flange design

Flanges must be manufactured with an angle of 5° to 10° to prevent the belt from being damaged by climbing up the flange. The edges of the flanges must be smoothed by removing any burrs or by chamfering



» Alignment of pulleys and idler roller

In general flanges or guiding profiles are only a means to prevent belts from running off the pulleys. They are not meant to compensate forces due to a machine, that is not aligned correctly. For this reason the following guidelines need to be followed:

› Angular misalignment of a pulley

The maximum allowed angular misalignment of a pulley is 1 mm/m (which is $0,06^\circ$)



› Parallel offset of a pulley

The maximum allowed parallel offset of a pulley is 1 mm/m



› Angular misalignment of an idler roller

The maximum allowed angular misalignment of an idler roller is 1 mm/m (which is $0,06^\circ$). Misaligned rollers have a steering effect on the timing belt and increase wear.

The idler roller must be wider than the toothed belt, so that it is completely supported.



Note: It is normal that the timing belt only slightly touches a flange!

Installation

» Handling and assembly

- › Never over fold or crease a belt, this can damage the tension cords of the belt and cause breakages
- › Mount the timing belt by hand. Levering the belt on with tools can damage the belt.
- › Do not run timing belts on damaged pulleys or flanges
- › Store timing belts as a roll under dry conditions and protected from sunlight at room temperature

Failure symptom and failure cause		
Symptom	Possible Cause	Solution
Timing belt teeth are skipping	Too little tension/slack side tends to sag	Apply higher tension
	Joint is damaged	Change timing belt, apply less tension
	Pulley pitch and belt pitch are not corresponding (e.g. XL ↔ T5)	Use timing belt with same pitch as pulleys
	Timing belt does not run true and is riding the flange	Correct alignment of pulleys
Side of timing belt is damaged	Too much misalignment, belt wear caused by flanges	Correct alignment of pulleys
	Timing belt touches machine parts	Change position of pulleys
	Belt was mounted using tools	Mount new timing belt by hand without tools
Back side of belt is damaged	Idler roller is misaligned	Realign idler roller
	Vibrating idler roller	Replace idler roller
	Belt touches machine parts	Apply more tension and/or reposition machine parts
Edges of teeth are damaged	Belt not running straight	Realign pulleys
Single teeth are missing or damaged	Belt is not sufficiently tensioned	Reapply correct tension
	Foreign parts fallen into the belt drive	Protect belt drive from foreign parts
Joint breaking	Too much tension	Reapply correct tension to new belt
	Too much working load	Use a Torque or a wider belt
	Rough running pulley/idler roller	Replace pulley/idler roller
	Belt touches machine parts	Realign pulleys
Lateral tears	Too small pulley diameters	Use bigger pulleys
	Temperature too low	Use special timing belt for low temperatures
	Belt climbs up the flange	Realign pulley

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Innovation & Service in Belting



Innovation

In every industry there are specific production stages where suitable solutions have to be found and provided. Working together with our customers and leading research institutions, we have worked out a large number of different solution concepts.

Within our purpose-built R&D centres we are continuously optimising and improving our products to satisfy constantly changing demands, such as higher operating speeds and temperatures, increased cleanability and durability, and more stringent international standards of hygiene and safety.

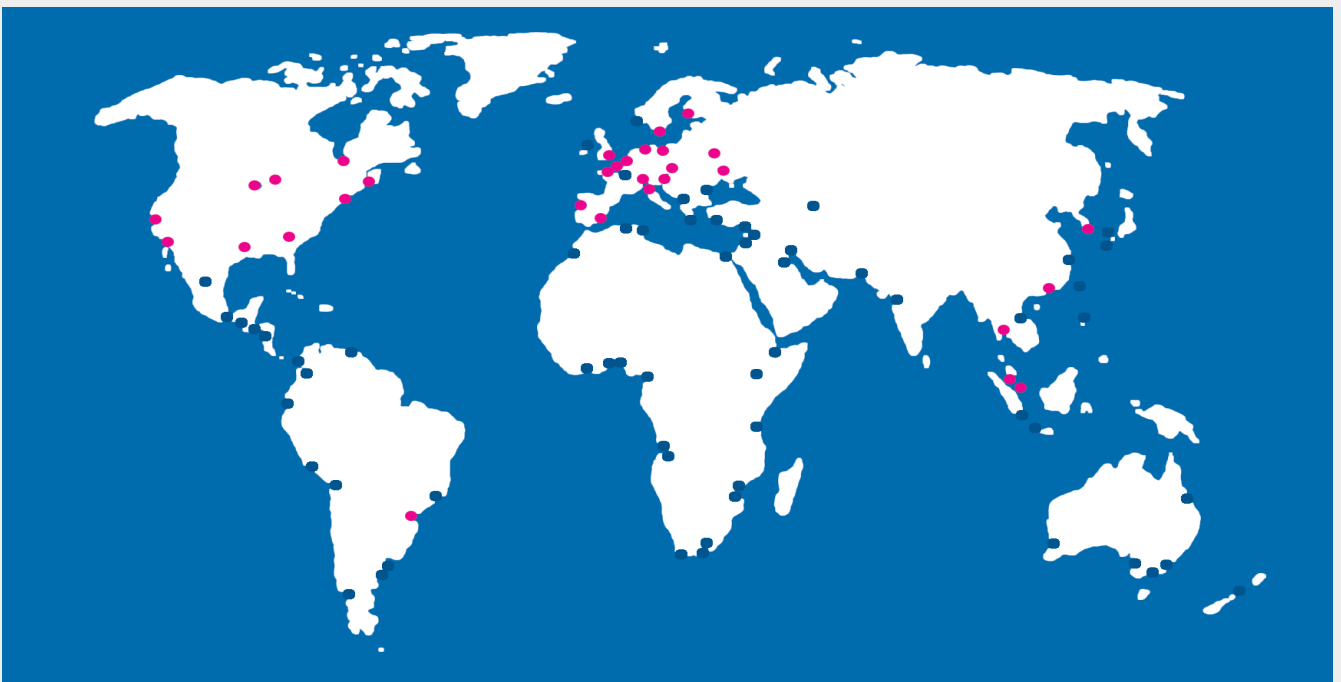
Because *Ammeraal Beltech* manages every aspect of the belting quality – from fabric to final fabrication – we are confident that we are able to develop the belt that meets your future needs.

Service

We understand the importance of keeping your business running and know how costly and disruptive downtime can be. That's why we offer a service network that is often available round the clock at local level. Our experienced and skilled personnel are on call to service, repair and install the entire range of the broad Ammeraal Beltech product portfolio, within your own process environment.

Our range of services also includes the ability to ship most orders directly from the extensive stocks that we maintain. If required, we can even dispatch on the same day and by express service.

Our sales engineers have the technical proficiency to develop a belt for the most challenging operating conditions in practically any industry.



• Operating companies
• Distributors

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