Innovation in Motion

TSUBAKI

TSUBAKI
TIMING BELTS & PULLEYS
PX / ULTRA PX-HC / TRAPEZOIDAL

All for the customer's delight

Since TSUBAKI's "Timing Belt Drive" was introduced to the market in 1975, the timing belts and pulleys have ceaselessly been improved and new models developed to meet diversified needs of our valued customers.

Complying with JIS and ISO Standards:
"Trapezoidal Belt & Pulley"

High strength, high precision and low noise achieved by the adoption of an optimum arc tooth profile:
"PX Belt & Pulley"

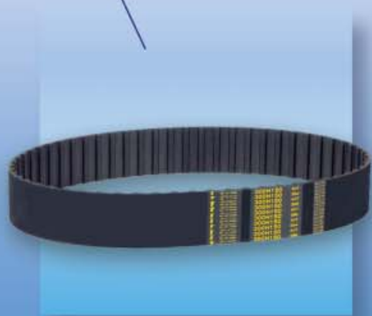
High performance belt having a transmission capacity more than two times that of the PX belt:
"ULTRA PX Belt HC Type"

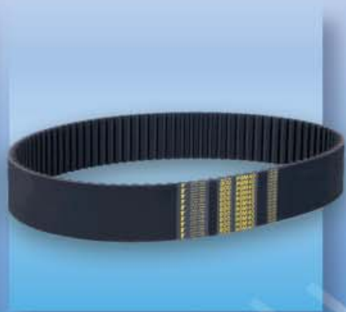
Meeting the needs of clean drive:
"SHINAYAKA 530 Belt"

Capable of multi-axial drive:
"Multi-Timing Belt"

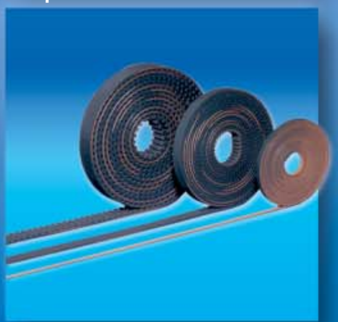
Most suitable for use in wet environment:
"PX Belt Water Proof Type"

As an integrated manufacturer of power transmission products, TSUBAKI makes full use of its know-how and high engineering capability to continue to offer products that meet customers' satisfaction.
We believe you will find in this brochure "Timing Belts and Pulleys" that meet your needs.


Trapezoidal Belt


PX Belt

ULTRA PX Belt HC Type


Open-Ended Belt


Multi-Timing Belt


PX Belt Water Proof Type


SHINAYAKA 530 Belt

Contents

How to Use the Catalog

This catalog shows the headings at the top of each page. The headings are classified according to the following contents. Please refer to these headings to find the information you need.

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How they have been constructed?
What types of belts are available?

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Overview

I want to know belt dimensions.
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Belt Types and Dimensions

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How to adjust the tension of belts?

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Selection and Design

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I want to know the dimensions and materials of stock pulleys.
I want to design pulleys. What dimensions to use?
I want reference data to design pulleys.

See
Pulleys

Detailed Contents

Features

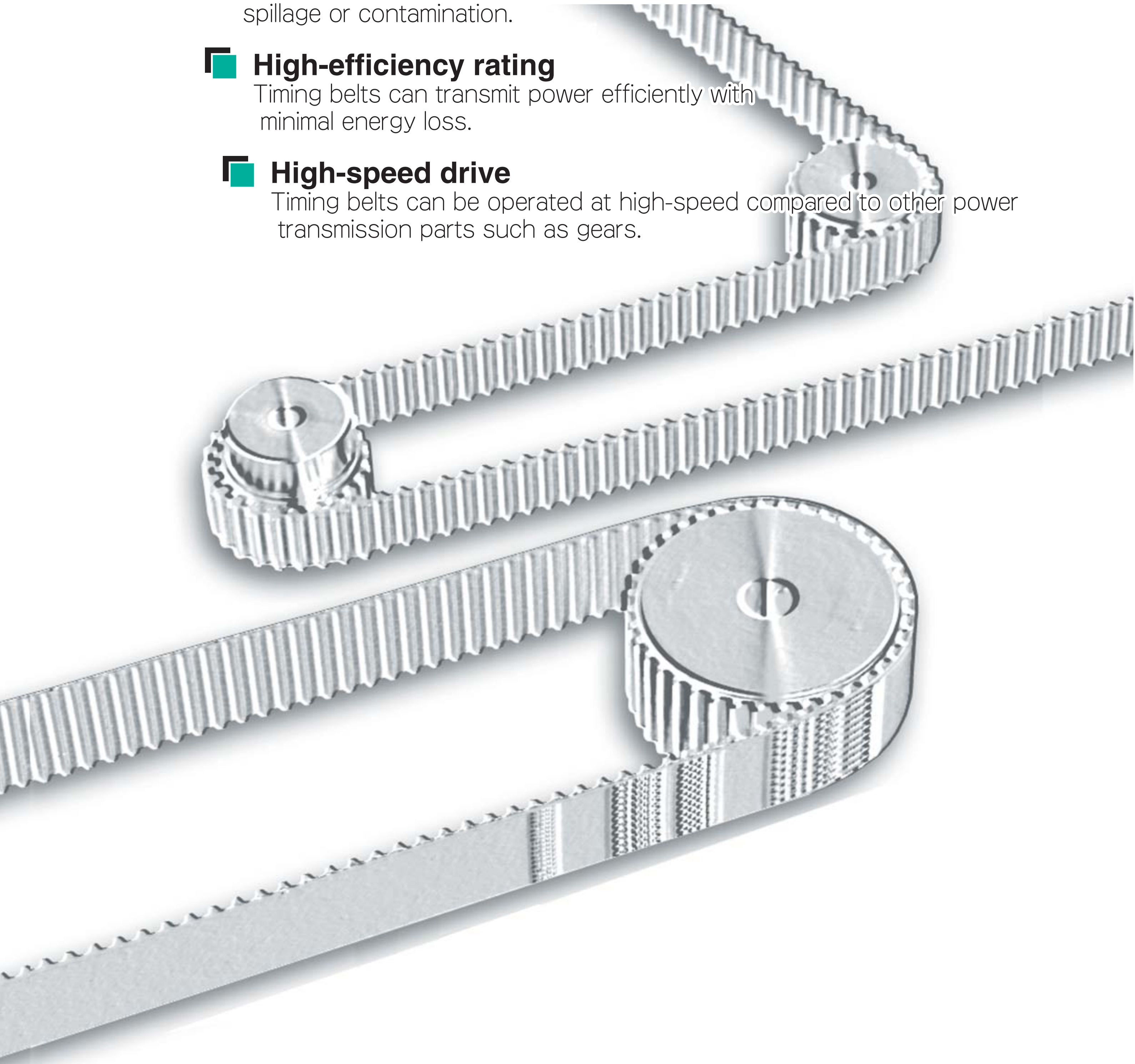
Precision drive
As a mechanism of engaged-drive, timing belts realize precision drive with only little belt elongation.

Low noise drive
Compared to other power transmission elements such as gears, timing belts offer low-noise and smooth drive.

Lube-free
Timing belts are lube-free allowing a clean drive without spillage or contamination.

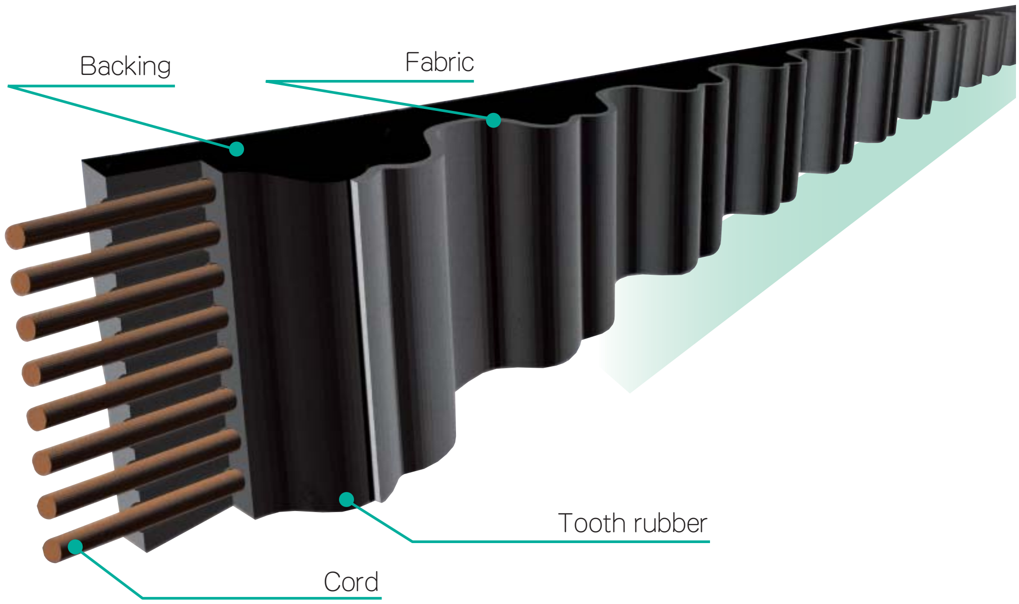
High-efficiency rating
Timing belts can transmit power efficiently with minimal energy loss.

High-speed drive
Timing belts can be operated at high-speed compared to other power transmission parts such as gears.



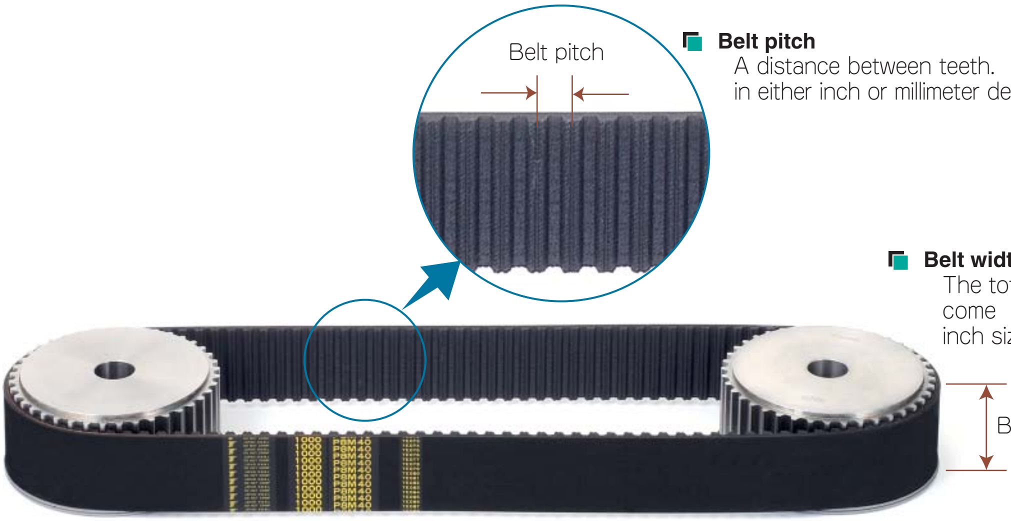
Structure & Materials

- **Backing** : Durable and wear-resistant rubber
- **Cord** : Fiberglass with very minimal growth
- **Tooth rubber** : Same material as the backing to realize high-power drive
- **Fabric** : Nylon with superior wear-resistance



Nomenclature

Belt



Belt pitch
A distance between teeth. The pitch is expressed in either inch or millimeter depending on belt types.

Belt width
The total width of the belt.Thebelts come in either millimeter size or inch size depending on types.

Belt length
The total length of the belt. The belt length is expressed either in millimeter or by a nominal length depending on types. "Belt pitch" x "number of teeth of belt" = "belt length" (mm)

Belt tooth profile
There are several profiles; ISO standardized type (trapezoidal teeth) and TSUBAKI original high performance tooth profile (PX tooth profile).

PRODUCT Line-Up

TRAPEZOIDAL BELT

Since the TSUBAKI trapezoidal belt complies with ISO standards, it can be used for general-purpose. Moreover, since it is manufactured fully taking advantage of TSUBAKI engagement drive technology, the features of timing belt drives such as precision, low-noise, and lube-free have now been realized on a higher level.

Features

- **Precision drive**
  The mechanism of engagement drive make precision possible.
- **Lube-free**
  Enables a clean drive and reduces maintenance costs.
- **Complies with ISO standards**

MXL	(Belt pitch 2.032 mm)	**H**	(Belt pitch 12.700 mm)
XL	(Belt pitch 5.080 mm)	**XH**	(Belt pitch 22.225 mm)
L	(Belt pitch 9.525 mm)	**XXH**	(Belt pitch 31.750 mm)

PX BELT

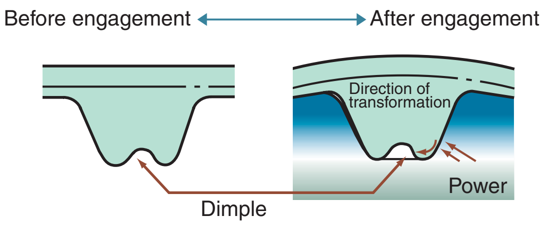
Compared to the trapezoidal belt, the performance of TSUBAKI PX belt is improved sharply through the adoption of a unique tooth contour. Moreover, there is an abundance of sizes available in the line-up to suit a variety of applications.

Features

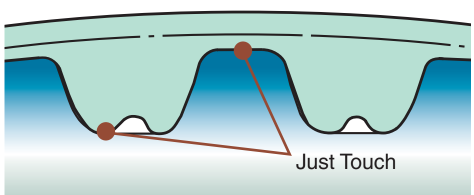
- **Ideal tooth engagement**
  The unique contour of the teeth enables high torque drive.Transmission capacity is about 1.6 times that of the trapezoidal belt.
- **High jumping torque**
  Large belt teeth provide high jumping torque capabilities.
- **Low noise**
  Low-noise drive is made possible by the adoption of a unique dimple on the tooth ends.
- **High precision**
  Since the mechanism of "teeth-in-mesh" is a "just touch" system, both the top and bottom of the belt contact the pulley enabling high precision drive.

P2M	(Belt pitch 2 mm)	**P8M**	(Belt pitch 8 mm)
P3M	(Belt pitch 3 mm)	**P14M**	(Belt pitch 14 mm)
P5M	(Belt pitch 5 mm)		

Dimple



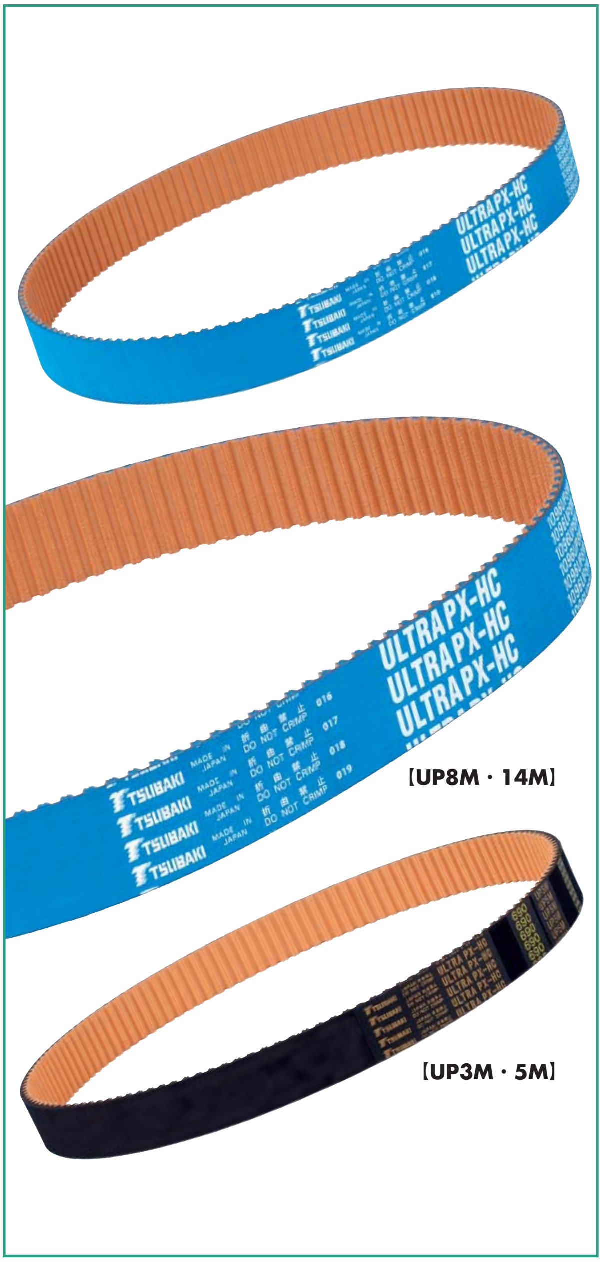
Just Touch System



PRODUCT Line-Up

ULTRA PX BELT HC TYPE PAT. P.

"HC" type is the high perfomance version of ULTRA PX belt. HC type offers the following features in addition to those of ULTRA PX belt.

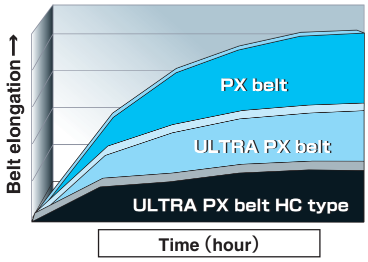


UP3M-HC (Belt pitch 3 mm)
UP5M-HC (Belt pitch 5 mm)
UP8M-HC (Belt pitch 8 mm)
UP14M-HC (Belt pitch 14 mm)

Features

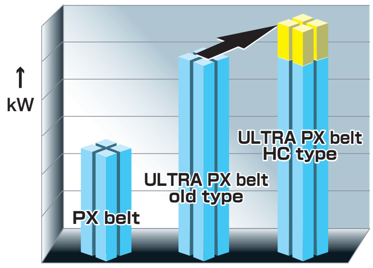
High Precision

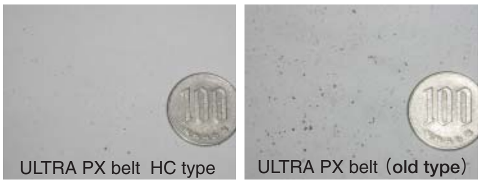
There is almost no elongation eradicating the need for re- tensioning.



High Power

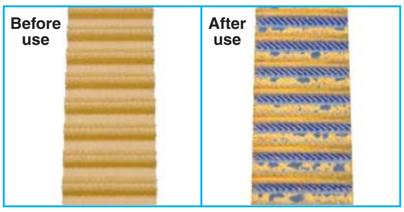
Transmission capacity is about 2 times that of PX belt.





Clean Drive

Very minimal wear dust is generated allowing a clean drive.



Color

Adoption of blue color enables the wear condition to be determined at a glance.

OPEN-ENDED BELT

Features

- Suitable for reciprocating movement, such as a cart drive or the opening/closing of a door.
- Long-span drive is available.
- ULTRA PX belt has also been added to the line-up, so high-torque drive is now possible.

P2M	(Belt pitch 2 mm)	**MXL**	(Belt pitch 2.032 mm)
P3M、UP3M-HC	(Belt pitch 3 mm)	**XL**	(Belt pitch 5.080 mm)
P5M、UP5M-HC	(Belt pitch 5 mm)	**L**	(Belt pitch 9.525 mm)
P8M、UP8M-HC	(Belt pitch 8 mm)	**H**	(Belt pitch 12.700 mm)

MULTI TIMING BELT

Features

- Multi-axial drive is possible.
- Available in both trapeziodal and PX belts.

P3M-D	(Belt pitch 3 mm)	**XL-D**	(Belt pitch 5.080 mm)
P5M-D	(Belt pitch 5 mm)	**L-D**	(Belt pitch 9.525 mm)
P8M-D	(Belt pitch 8 mm)	**H-D**	(Belt pitch 12.700 mm)
P14M-D	(Belt pitch 14 mm)		

PX BELT WATER PROOF TYPE PAT. P.

Belt most suitable for use in wet environment.

Features

- **Most suitable for use in wet environment.**
  This belt can be used in wet environment where conventional timing belts cannot be used. It can be used in machines that are washed by water. When this belt is used, the waterproof cover can be simplified.
- **Clean, low noise and high precision.**
  This is a timing belt and thus produces less noise than other drive elements and provides cleaner drive. No lubrication is required.
- **PX standard pulleys can be used.**
  Since the PX tooth profile is employed, this can be used with PX standard pulleys.

P5M-W (Belt pitch 5 mm)
P8M-W (Belt pitch 8 mm)

SHINAYAKA 530 BELT

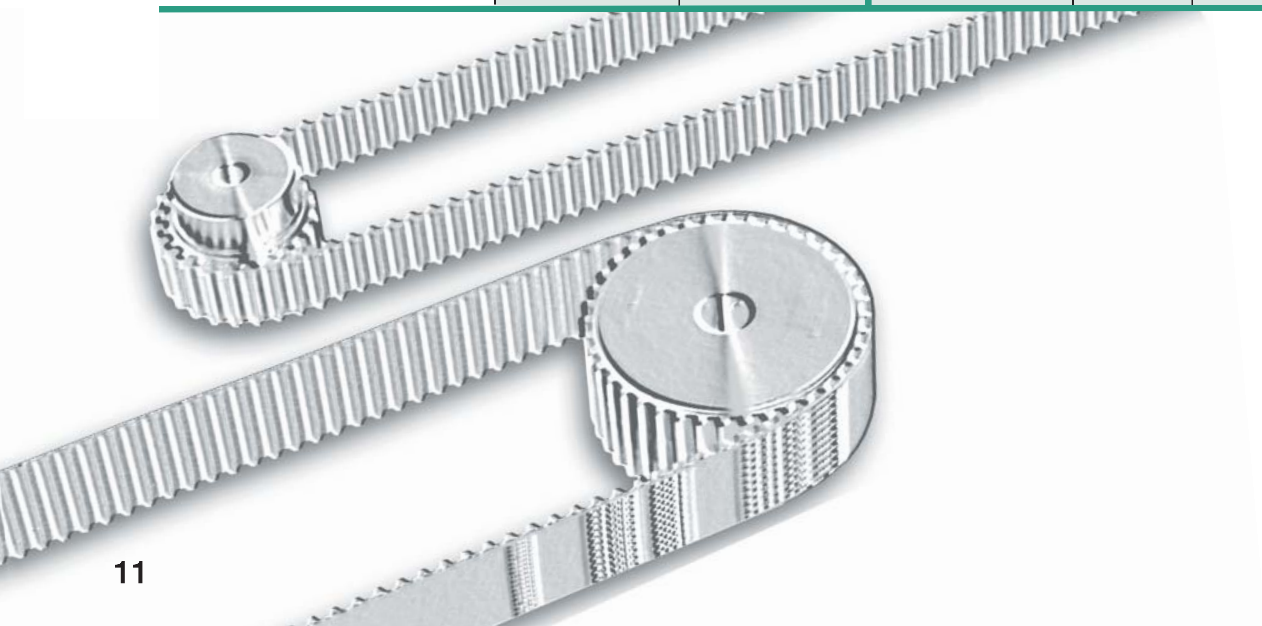
Features

- SHINAYAKA 530 belt is suitable for clean drives, as there is very minimal wear dust generated from the belt.
- SHINAYAKA 530 belt is flexible enough that initial tension can be set at a low level and axial load can be reduced.
- MXL, P2M, and P3M specifications are all standard.

MXL-530 (Belt pitch 2.032 mm)
P2M-530 (Belt pitch 2 mm)
P3M-530 (Belt pitch 3 mm)

Line-Up

Series	Pitch Size		Endless (Standard)	Open-Ended	Multi	Water Proof
	Type	Pitch mm				
PX BELT	P2M	2.00	○ SHINAYAKA530	○		
	P3M	3.00	○ SHINAYAKA530	○	○	
	P5M	5.00	○	○	○	○
	P8M	8.00	○	○	○	○
	P14M	14.00	○		○	
ULTRA PX BELT HC TYPE	UP3M	3.00	○	○		
	UP5M	5.00	○	○		
	UP8M	8.00	○	○		
	UP14M	14.00	○			
TRAPEZOIDAL BELT	MXL	2.032	○ SHINAYAKA530	○		
	XL	5.080	○	○	○	
	L	9.525	○	○	○	
	H	12.700	○	○	○	
	XH	22.225	○			
	XXH	31.750	○			



Model Identification

PX BELT

BG 500 P 5M 10

- BG: Rubber belt
- 500: Pitch length mm
- P: PX Type
- 5M: Size
- 10: Belt width mm

ULTRA PX BELT

BG 800 UP 8M 40−HC

- BG: Rubber belt
- 800: Pitch length mm
- UP: ULTRA PX Type
- 8M: Size
- 40: Belt width mm
- HC: HC Type

TRAPEZOIDAL BELT

BG 1000 H 150

- BG: Rubber belt
- 1000: Pitch length (Designation)
- H: Type
- 150: Belt width (Designation)

【MXL】

BG 60 MXL 6.4−530

- BG: Rubber belt
- 60: No,of teeth
- MXL: Type
- 6.4: Belt width mm
- 530: SHINAYAKA530

OPEN-ENDED BELT

BG−P 8M 15−HC−10M

- BG: Rubber belt
- P: P : PX / UP : ULTRA / : Trapezoidal
- 8M: Size
- 15: Belt width
- HC: HC Type
- 10M: Belt length m

MULTI TIMING BELT

BG 800 P 8M 15−D

- BG: Rubber belt
- 800: Pitch length mm
- P: P : PX / : Trapezoidal
- 8M: Size
- 15: Belt width mm
- D: Multi Timing Belt

PX BELT WATER PROOF TYPE

BG 800 P 8M 15−W

- BG: Rubber belt
- 800: Pitch length mm
- P: PX Type
- 8M: Size
- 15: Belt width mm
- W: Water Proof Type

SHINAYAKA 530 BELT

BG 300 P 3M 10−530

- BG: Rubber belt
- 300: Belt length mm
- P: PX Type
- 3M: Size
- 10: Belt width mm
- 530: SHINAYAKA530

TIMING PULLEY

PT 30 P 5M 25 AF

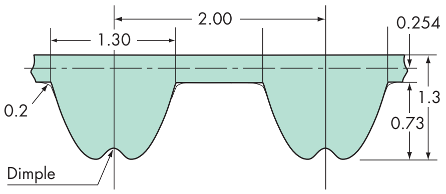
- PT: Pulley
- 30: No,of groove
- P: P : PX / : Trapezoidal
- 5M: Size
- 25: Belt width
- AF: Pulley Type

Belt Types and Dimensions

PX BELT

P2M (P : 2 mm)

■Belt Tooth Profile and Dimensions



■Model Identification

BG 200 P 2M 6−530

- BG: Rubber belt
- 200: Pitch length mm
- P: P : PX
- 2M: Size
- 6: Belt width mm
- 530: SHINAYAKA530

■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
4	1.00	0.006
6	1.59	0.008
10	2.84	0.014

Transmission Capacity Tables P29

■Belt Length

Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth
80	40	**176**	88	**280**	140	**426**	213	**788**	394
84	42	**180**	90	**284**	142	**434**	217	**800**	400
88	44	**186**	93	**290**	145	**440**	220	**808**	404
98	49	**190**	95	**300**	150	**448**	224	**824**	412
100	50	**196**	98	**302**	151	**464**	232	**846**	423
112	56	**200**	100	**310**	155	**488**	244	**866**	433
116	58	**204**	102	**318**	159	**490**	245	**898**	449
118	59	**208**	104	**320**	160	**500**	250	**900**	450
124	62	**212**	106	**324**	162	**516**	258	**940**	470
126	63	**214**	107	**328**	164	**520**	260	**956**	478
132	66	**216**	108	**330**	165	**530**	265	**992**	496
134	67	**220**	110	**334**	167	**560**	280	**1040**	520
136	68	**224**	112	**340**	170	**576**	288	**1110**	555
140	70	**230**	115	**348**	174	**590**	295	**1150**	575
142	71	**234**	117	**354**	177	**600**	300	**1158**	579
144	72	**236**	118	**360**	180	**630**	315	**1182**	591
146	73	**240**	120	**370**	185	**638**	319	**1192**	596
152	76	**244**	122	**378**	189	**656**	328	**1242**	621
154	77	**246**	123	**380**	190	**676**	338	**1410**	705
160	80	**250**	125	**390**	195	**680**	340	**1526**	763
162	81	**258**	129	**400**	200	**704**	352	**1700**	850
166	83	**262**	131	**408**	204	**710**	355	**1820**	910
168	84	**266**	133	**416**	208	**754**	377		
170	85	**270**	135	**420**	210	**764**	382		
172	86	**274**	137	**424**	212	**774**	387		

PX…Stock item

■Pulley Dimensions (Reference)

The pulleys to use should be PX pulleys.

mm

No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD
14	8.91	12	**22**	14.01	17	**30**	19.10	26	**42**	26.74	32
15	9.55	13	**24**	15.28	17	**32**	20.37	28	**44**	28.01	34
16	10.19	13	**25**	15.92	21	**34**	21.65	28	**48**	30.56	36
18	11.46	15	**26**	16.55	21	**36**	22.92	29	**50**	31.83	39
20	12.73	17	**28**	17.83	25	**40**	25.46	32	**60**	38.20	45

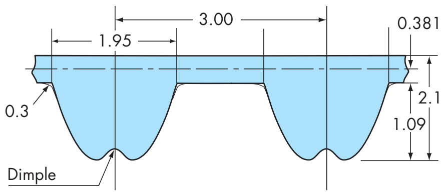
Dimensions of Standard Stock pulleys P59
Custom made pulleys P75

Belt Types and Dimensions

PX BELT/ULTRA PX BELT HC TYPE

P3M／UP3M-HC (P : 3 mm)

■Belt Tooth Profile and Dimensions



■Model Identification

BG 300 P 3M 6－530

Rubber belt
Pitch length mm
P : PX
UP : ULTRA PX
Size
Belt width mm
530 : SHINAYAKA530 (PX only)
HC : HC Type (ULTRA PX only)

■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
6	1.00	0.013
10	1.78	0.022
15	2.84	0.034

Transmission Capacity Tables PX : P30
ULTRA PX HC Type : P34

■Belt Length

Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth
120	40	**231**	77	**345**	115	**489**	163	**804**	268	**1638**	546
123	41	**234**	78	**354**	118	**501**	167	**852**	284	**1689**	563
138	46	**237**	79	**360**	120	**504**	168	**861**	287	**1749**	583
141	47	**240**	80	**363**	121	**507**	169	**879**	293	**1893**	631
144	48	**243**	81	**369**	123	**510**	170	**891**	297	**1947**	649
147	49	**246**	82	**372**	124	**525**	175	**918**	306		
150	50	**252**	84	**378**	126	**537**	179	**933**	311		
153	51	**255**	85	**384**	128	**552**	184	**948**	316		
159	53	**264**	88	**387**	129	**561**	187	**957**	319		
162	54	**270**	90	**393**	131	**588**	196	**972**	324		
171	57	**273**	91	**399**	133	**600**	200	**1005**	335		
174	58	**276**	92	**402**	134	**633**	211	**1023**	341		
177	59	**279**	93	**405**	135	**660**	220	**1041**	347		
183	61	**285**	95	**411**	137	**675**	225	**1050**	350		
186	62	**288**	96	**420**	140	**681**	227	**1059**	353		
192	64	**291**	97	**423**	141	**687**	229	**1080**	360		
195	65	**294**	98	**432**	144	**693**	231	**1110**	370		
198	66	**300**	100	**438**	146	**699**	233	**1170**	390		
201	67	**303**	101	**447**	149	**702**	234	**1191**	397		
207	69	**306**	102	**450**	150	**705**	235	**1281**	427		
210	70	**309**	103	**453**	151	**720**	240	**1305**	435		
213	71	**312**	104	**459**	153	**738**	246	**1338**	446		
219	73	**318**	106	**477**	159	**753**	251	**1344**	448		
222	74	**330**	110	**483**	161	**756**	252	**1380**	460		
225	75	**339**	113	**486**	162	**789**	263	**1443**	481		

PX…Stock item　ULTRA PX HC Type…Made to order, but in short lead time.

■Pulley Dimensions (Reference)

The PX pulleys and ULTRA PX HC Type pulleys to use should be PX pulleys. mm

No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD
10	9.55	12	**18**	17.19	21	**26**	24.83	31	**40**	38.20	45
12	11.46	15	**20**	19.10	25	**28**	26.74	32	**48**	45.84	52
14	13.37	17	**22**	21.01	28	**30**	28.65	34	**50**	47.75	55
15	14.32	17	**24**	22.92	29	**32**	30.56	36	**60**	57.30	65
16	15.28	17	**25**	23.87	31	**36**	34.38	43			

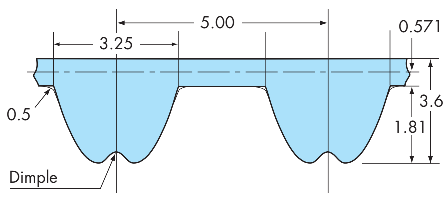
Dimensions of Standard Stock pulleys P60
Custom made pulleys P76

Belt Types and Dimensions

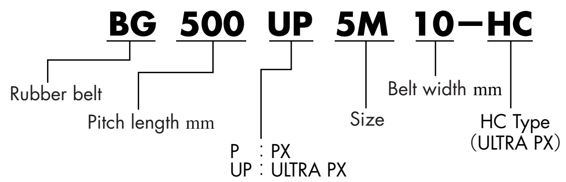
PX BELT/ULTRA PX BELT HC TYPE

P5M／UP5M-HC (P：5 mm)

■Belt Tooth Profile and Dimensions



■Model Identification



■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
10	1.00	0.041
15	1.59	0.062
25	2.84	0.103

Transmission Capacity Tables PX：P31
ULTRA PX HC Type：P35

■Belt Length

Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth
175	35	**520**	104	**740**	148	**1125**	225	**2000**	400
215	43	**525**	105	**750**	150	**1150**	230	**2080**	416
225	45	**530**	106	**765**	153	**1160**	232	**2160**	432
255	51	**545**	109	**770**	154	**1180**	236	**2200**	440
260	52	**550**	110	**775**	155	**1195**	239	**2645**	529
275	55	**555**	111	**780**	156	**1220**	244	**3050**	610
295	59	**560**	112	**800**	160	**1225**	245	**3150**	630
300	60	**565**	113	**810**	162	**1250**	250	**3930**	786
310	62	**570**	114	**830**	166	**1260**	252		
320	64	**575**	115	**835**	167	**1270**	254		
325	65	**595**	119	**850**	170	**1295**	259		
340	68	**600**	120	**865**	173	**1350**	270		
350	70	**605**	121	**880**	176	**1390**	278		
370	74	**625**	125	**900**	180	**1420**	284		
375	75	**635**	127	**905**	181	**1490**	298		
400	80	**645**	129	**920**	184	**1530**	306		
420	84	**650**	130	**940**	188	**1550**	310		
425	85	**670**	134	**950**	190	**1595**	319		
430	86	**675**	135	**965**	193	**1615**	323		
440	88	**690**	138	**985**	197	**1675**	335		
450	90	**695**	139	**1000**	200	**1700**	340		
475	95	**700**	140	**1025**	205	**1800**	360		
490	98	**710**	142	**1050**	210	**1870**	374		
500	100	**725**	145	**1060**	212	**1910**	382		
515	103	**730**	146	**1090**	218	**1960**	392		

PX…Stock item　ULTRA PX HC Type…Made to order, but in short lead time.

■Pulley Dimensions (Reference)

The PX pulleys and ULTRA PX HC Type pulleys to use should be PX pulleys.　mm

No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD
12	19.10	23	**22**	35.01	43	**30**	47.75	55	**48**	76.39	82
14	22.28	28	**24**	38.20	44	**32**	50.93	55	**50**	79.58	86
16	25.46	31	**25**	39.79	45	**36**	57.30	64	**60**	95.49	103
18	28.65	36	**26**	41.38	47	**40**	63.66	67	**72**	114.59	120
20	31.83	36	**28**	44.56	52	**44**	70.03	74			

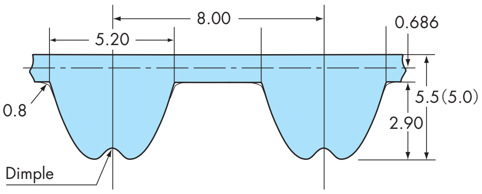
Dimensions of Standard Stock pulleys P61
Custom made pulleys P77

Belt Types and Dimensions

PX BELT/ULTRA PX BELT HC TYPE

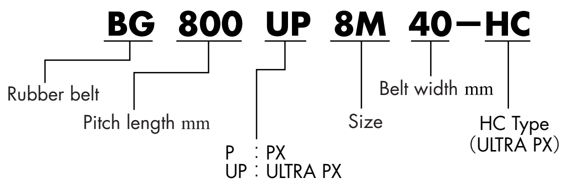
P8M／UP8M-HC (P : 8 mm)

■Belt Tooth Profile and Dimensions



( )…ULTRA PX HC

■Model Identification



■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
15	1.00	0.084(0.076)
25	1.79	0.139(0.127)
40	3.06	0.223(0.203)
60	4.86	0.334(0.304)

( )…ULTRA PX

Transmission Capacity Tables PX : P32
ULTRA PX HC Type : P36

■Belt Length

Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth
※**376**	47	**856**	107	**1280**	160	**2256**	282
※**392**	49	**880**	110	**1304**	163	**2320**	290
※**440**	55	**896**	112	**1320**	165	**2400**	300
480	60	**912**	114	**1344**	168	**2456**	307
512	64	**920**	115	**1352**	169	**2496**	312
520	65	**936**	117	**1360**	170	**2600**	325
536	67	**944**	118	**1400**	175	**2800**	350
560	70	**960**	120	**1424**	178	**2944**	368
584	73	**984**	123	**1440**	180	**3048**	381
600	75	**1000**	125	**1480**	185	**3200**	400
616	77	**1032**	129	**1520**	190	**3304**	413
632	79	**1040**	130	**1576**	197	**3600**	450
640	80	**1056**	132	**1600**	200	**3920**	490
656	82	**1080**	135	**1640**	205	**4400**	550
680	85	**1096**	137	**1680**	210		
712	89	**1120**	140	**1760**	220		
720	90	**1128**	141	**1800**	225		
752	94	**1152**	144	**1816**	227		
760	95	**1160**	145	**1888**	236		
776	97	**1192**	149	**1904**	238		
800	100	**1200**	150	**1960**	245		
816	102	**1208**	151	**2000**	250		
832	104	**1216**	152	**2064**	258		
840	105	**1248**	156	**2160**	270		
848	106	**1264**	158	**2240**	280		

PX…Stock item　ULTRA PX HC Type…Made to order, but in short lead time.
※…Not Available in ULTRA PX HC

■Pulley Dimensions (Reference)

The PX pulleys and ULTRA PX HC Type pulleys to use should be PX pulleys.　mm

No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD
20	50.93	55	**32**	81.49	86	**50**	127.32	135
22	56.02	62	**34**	86.58	91	**60**	152.79	158
24	61.12	66	**36**	91.67	97	**64**	162.97	170
26	66.21	73	**40**	101.86	107	**72**	183.35	190
28	71.30	79	**44**	112.05	119			
30	76.39	82	**48**	122.23	127			

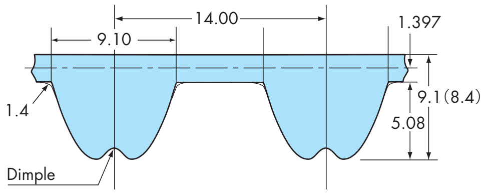
Dimensions of Standard Stock pulleys　P62
Custom made pulleys　P78

Belt Types and Dimensions

PX BELT/ULTRA PX BELT HC TYPE

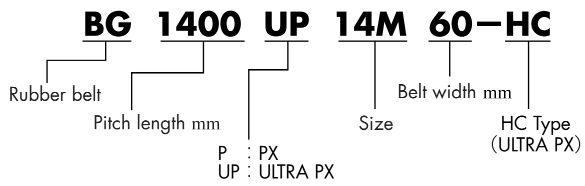
P14M／UP14M-HC (P：14 mm)

■Belt Tooth Profile and Dimensions



( )…ULTRA PX HC

■Model Identification



■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
40	1.00	0.393(0.304)
60	1.59	0.589(0.456)
80	2.20	0.786(0.608)
100	2.84	0.982(0.760)
120	3.50	1.178(0.912)

( )…ULTRA PX

Transmission Capacity Tables PX：P33
ULTRA PX HC Type：P37

■Belt Length

Belt length mm	No. of teeth	Belt length mm	No. of teeth
1120	80	**2100**	150
1190	85	**2240**	160
1246	89	**2310**	165
1344	96	**2380**	170
1400	100	**2450**	175
1540	110	**2590**	185
1610	115	**2660**	190
1652	118	**2800**	200
1680	120	**3150**	225
1736	124	**3360**	240
1778	127	**3500**	250
1806	129	**3850**	275
1890	135	**4004**	286
1960	140	**4508**	322
2002	143		

PX…Stock item　ULTRA PX HC Type…Made to order, but in short lead time.

■Pulley Dimensions (Reference)

The PX pulleys and ULTRA PX HC Type pulleys to use should be PX pulleys.　mm

No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD
28	124.78	136	**38**	169.34	181	**50**	222.82	234
30	133.69	145	**40**	178.25	190	**56**	249.55	－
32	142.60	154	**42**	187.17	198	**60**	267.38	－
34	151.52	163	**44**	196.08	207	**64**	285.21	－
36	160.43	171	**48**	213.90	225	**72**	320.86	－

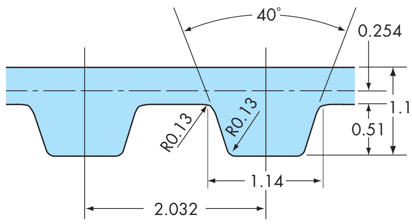
Dimensions of Standard Stock pulleys　P63
Custom made pulleys　P79

Belt Types and Dimensions

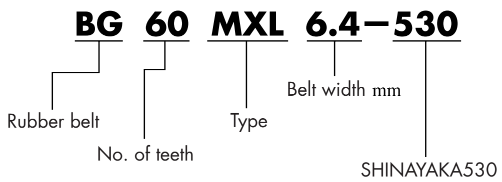
TRAPEZOIDAL BELT

MXL (P : 2.032 mm)

■Belt Tooth Profile and Dimensions



■Model Identification



■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
3.2	1.00	0.004
4.8	1.60	0.006
6.4	2.22	0.008
9.5	3.49	0.012
12.7	4.89	0.016

Transmission Capacity Tables P38

■Belt Length

Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth
40	81.28	40	**76**	154.43	76	**114**	231.65	114	**184**	373.89	184	**324**	658.37	324
41	83.31	41	**77**	156.46	77	**118**	239.78	118	**185**	375.92	185	**325**	660.40	325
42	85.34	42	**78**	158.50	78	**120**	243.84	120	**190**	386.08	190	**327**	664.46	327
43	87.38	43	**79**	160.53	79	**122**	247.90	122	**195**	396.24	195	**330**	670.56	330
45	91.44	45	**80**	162.56	80	**123**	249.94	123	**196**	398.27	196	**334**	678.69	334
48	97.54	48	**81**	164.59	81	**125**	254.00	125	**198**	402.34	198	**339**	688.85	339
50	101.60	50	**82**	166.62	82	**126**	256.03	126	**200**	406.40	200	**347**	705.10	347
52	105.66	52	**83**	168.66	83	**127**	258.06	127	**204**	414.53	204	**350**	711.20	350
53	107.70	53	**85**	172.72	85	**128**	260.10	128	**205**	416.56	205	**354**	719.33	354
54	109.73	54	**87**	176.78	87	**130**	264.16	130	**210**	426.72	210	**355**	721.36	355
55	111.76	55	**88**	178.82	88	**131**	266.19	131	**212**	430.78	212	**365**	741.68	365
56	113.79	56	**89**	180.85	89	**132**	268.22	132	**224**	455.17	224	**371**	753.87	371
57	115.82	57	**90**	182.88	90	**134**	272.29	134	**232**	471.42	232	**380**	772.16	380
58	117.86	58	**91**	184.91	91	**135**	274.32	135	**236**	479.55	236	**386**	784.35	386
59	119.89	59	**92**	186.94	92	**138**	280.42	138	**240**	487.68	240	**400**	812.80	400
60	121.92	60	**93**	188.98	93	**140**	284.48	140	**248**	503.94	248	**419**	851.41	419
61	123.95	61	**94**	191.01	94	**142**	288.54	142	**250**	508.00	250	**433**	879.86	433
62	125.98	62	**95**	193.04	95	**144**	292.61	144	**255**	518.16	255	**437**	887.98	437
63	128.02	63	**96**	195.07	96	**148**	300.74	148	**256**	520.19	256	**442**	898.14	442
65	132.08	65	**97**	197.10	97	**150**	304.80	150	**265**	538.48	265	**487**	989.58	487
66	134.11	66	**98**	199.14	98	**152**	308.86	152	**273**	554.74	273	**508**	1 032.26	508
67	136.14	67	**99**	201.17	99	**155**	314.96	155	**280**	568.96	280	**525**	1 066.80	525
68	138.18	68	**100**	203.20	100	**160**	325.12	160	**281**	570.99	281	**569**	1 156.21	569
69	140.21	69	**101**	205.23	101	**165**	335.28	165	**288**	585.22	288	**612**	1 243.58	612
70	142.24	70	**102**	207.26	102	**169**	343.41	169	**290**	589.28	290			
71	144.27	71	**103**	209.30	103	**170**	345.44	170	**300**	609.60	300			
72	146.30	72	**105**	213.36	105	**171**	347.47	171	**310**	629.92	310			
73	148.34	73	**106**	215.39	106	**174**	353.57	174	**312**	633.98	312			
74	150.37	74	**110**	223.52	110	**175**	355.60	175	**315**	640.08	315			
75	152.40	75	**112**	227.58	112	**180**	365.76	180	**323**	656.34	323			

Stock items

■Pulley Dimensions (Reference)

mm

No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD
15	9.70	13	**25**	16.17	21	**40**	25.87	32
16	10.35	15	**26**	16.82	21	**44**	28.46	—
18	11.64	15	**28**	18.11	21	**48**	31.05	—
20	12.94	17	**30**	19.40	25	**50**	32.34	—
22	14.23	17	**32**	20.70	25	**60**	38.81	—
24	15.52	21	**36**	23.29	29			

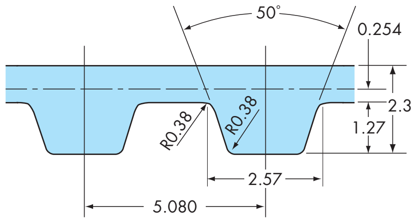
Dimensions of Standard Stock pulleys P64
Custom made pulleys P80

Belt Types and Dimensions

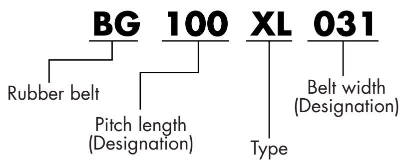
TRAPEZOIDAL BELT

XL (P : 5.080 mm)

■Belt Tooth Profile and Dimensions



■Model Identification



■Belt Width / Width Factor / Unit Mass

Belt width (Designation)	Belt width mm	Belt width factor	Weight kg/m
025	6.4	1.00	0.017
031	7.9	1.40	0.021
037	9.5	1.87	0.026

Transmission Capacity Tables P39

■Belt Length

Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth
50	127.00	25	**116**	294.64	58	**178**	452.12	89	**252**	640.08	126	**364**	924.56	182
58	147.32	29	**118**	299.72	59	**180**	457.20	90	**254**	645.16	127	**376**	955.04	188
60	152.40	30	**120**	304.80	60	**182**	462.28	91	**260**	660.40	130	**380**	965.20	190
64	162.56	32	**122**	309.88	61	**184**	467.36	92	**266**	675.64	133	**384**	975.36	192
68	172.72	34	**124**	314.96	62	**188**	477.52	94	**270**	685.80	135	**386**	980.44	193
70	177.80	35	**126**	320.04	63	**190**	482.60	95	**272**	690.88	136	**390**	990.60	195
74	187.96	37	**128**	325.12	64	**192**	487.68	96	**274**	695.96	137	**396**	1 005.84	198
76	193.04	38	**130**	330.20	65	**194**	492.76	97	**276**	701.04	138	**400**	1 016.00	200
78	198.12	39	**134**	340.36	67	**196**	497.84	98	**278**	706.12	139	**404**	1 026.16	202
80	203.20	40	**136**	345.44	68	**198**	502.92	99	**280**	711.20	140	**408**	1 036.32	204
82	208.28	41	**140**	355.60	70	**200**	508.00	100	**282**	716.28	141	**430**	1 092.20	215
84	213.36	42	**142**	360.68	71	**202**	513.08	101	**290**	736.60	145	**444**	1 127.76	222
88	223.52	44	**144**	365.76	72	**204**	518.16	102	**298**	756.92	149	**452**	1 148.08	226
90	228.60	45	**146**	370.84	73	**206**	523.24	103	**300**	762.00	150	**460**	1 168.40	230
92	233.68	46	**148**	375.92	74	**210**	533.40	105	**310**	787.40	155	**470**	1 193.80	235
94	238.76	47	**150**	381.00	75	**212**	538.48	106	**314**	797.56	157	**478**	1 214.12	239
96	243.84	48	**154**	391.16	77	**220**	558.80	110	**320**	812.80	160	**490**	1 244.60	245
98	248.92	49	**160**	406.40	80	**224**	568.96	112	**330**	838.20	165	**508**	1 290.32	254
100	254.00	50	**162**	411.48	81	**228**	579.12	114	**332**	843.28	166	**576**	1 463.04	288
102	259.08	51	**164**	416.56	82	**230**	584.20	115	**338**	858.52	169	**592**	1 503.68	296
104	264.16	52	**166**	421.64	83	**236**	599.44	118	**340**	863.60	170	**646**	1 640.84	323
106	269.24	53	**168**	426.72	84	**240**	609.60	120	**344**	873.76	172	**828**	2 103.12	414
108	274.32	54	**170**	431.80	85	**244**	619.76	122	**348**	883.92	174	**852**	2 164.08	426
110	279.40	55	**172**	436.88	86	**248**	629.92	124	**352**	894.08	176	**860**	2 184.40	430
114	289.56	57	**176**	447.04	88	**250**	635.00	125	**360**	914.40	180	**900**	2 286.00	450

Stock items

■Pulley Dimensions (Reference)

mm

No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD
10	16.17	23	**19**	30.72	39	**28**	45.28	52	**42**	67.91	74
11	17.79	23	**20**	32.34	39	**30**	48.51	55	**44**	71.15	—
12	19.40	26	**21**	33.96	43	**32**	51.74	58	**48**	77.62	—
14	22.64	29	**22**	35.57	43	**34**	54.98	61	**50**	80.85	—
15	24.26	31	**24**	38.81	45	**36**	58.21	65	**60**	97.02	—
16	25.87	32	**25**	40.43	47	**38**	61.45	67			
18	29.11	36	**26**	42.04	48	**40**	64.68	71			

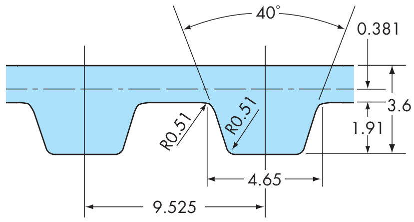
Dimensions of Standard Stock pulleys P65
Custom made pulleys P81

Belt Types and Dimensions

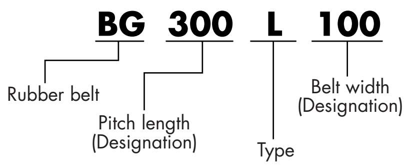
TRAPEZOIDAL BELT

L (P : 9.525 mm)

■Belt Tooth Profile and Dimensions



■Model Identification



■Belt Width / Width Factor / Unit Mass

Belt width (Designation)	Belt width mm	Belt width factor	Weight kg/m
050	12.7	1.00	0.048
075	19.1	1.69	0.073
100	25.4	2.38	0.097

Transmission Capacity Tables P40

■Belt Length

Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth
109	276.2	29	**337**	857.3	90	**788**	2 000.3	210
124	314.3	33	**345**	876.3	92	※**817**	2 076.5	218
135	342.9	36	**360**	914.4	96	**863**	2 190.8	230
150	381.0	40	**367**	933.5	98	**915**	2 324.1	244
154	390.5	41	**375**	952.5	100			
165	419.1	44	**390**	990.6	104			
169	428.6	45	※**405**	1 028.7	108			
173	438.2	46	※**412**	1 047.8	110			
187	476.3	50	**420**	1 066.8	112			
203	514.4	54	**427**	1 085.9	114			
210	533.4	56	**435**	1 104.9	116			
217	552.4	58	**446**	1 133.5	119			
225	571.5	60	**450**	1 143.0	120			
240	609.6	64	**465**	1 181.1	124			
248	628.7	66	**480**	1 219.2	128			
255	647.7	68	**510**	1 295.4	136			
262	666.8	70	**525**	1 333.5	140			
270	685.8	72	**540**	1 371.6	144			
278	704.9	74	**581**	1 476.4	155			
285	723.9	76	**600**	1 524.0	160			
300	762.0	80	**619**	1 571.6	165			
315	800.1	84	**630**	1 600.2	168			
319	809.6	85	**720**	1 828.8	192			
322	819.2	86	※**728**	1 847.9	194			
334	847.7	89	**731**	1 857.4	195			

Blank…Stock item ※…Custom made

■Pulley Dimensions (Reference)

mm

No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD
10	30.32	36	**19**	57.61	66	**28**	84.89	91	**44**	133.40	—
12	36.38	43	**20**	60.64	67	**30**	90.96	97	**48**	145.53	—
14	42.45	49	**21**	63.67	67	**32**	97.02	103	**50**	151.60	—
15	45.48	52	**22**	66.70	73	**34**	103.08	111	**60**	181.91	—
16	48.51	55	**24**	72.77	79	**36**	109.15	115			
17	51.54	56	**25**	75.80	82	**40**	121.28	127			
18	54.57	61	**26**	78.83	86	**42**	127.34	135			

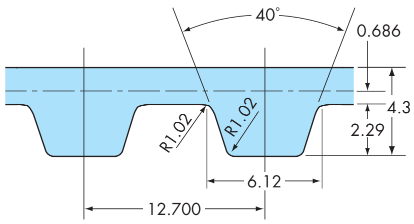
Dimensions of Standard Stock pulleys P66
Custom made pulleys P82

Belt Types and Dimensions

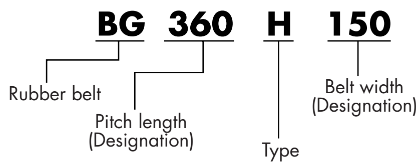
TRAPEZOIDAL BELT

H (P : 12.700 mm)

■Belt Tooth Profile and Dimensions



■Model Identification



■Belt Width / Width Factor / Unit Mass

Belt width (Designation)	Belt width mm	Belt width factor	Weight kg/m
075	19.1	1.00	0.101
100	25.4	1.41	0.135
150	38.1	2.20	0.202
200	50.8	3.01	0.269
300	76.2	4.73	0.404

Transmission Capacity Tables P41

■Belt Length

Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth
240	609.6	48	**460**	1 168.4	92	**850**	2 159.0	170
255	647.7	51	**465**	1 181.1	93	**880**	2 235.2	176
270	685.8	54	**480**	1 219.2	96	**900**	2 286.0	180
280	711.2	56	**490**	1 244.6	98	**950**	2 413.0	190
300	762.0	60	**510**	1 295.4	102	**1000**	2 540.0	200
310	787.4	62	**540**	1 371.6	108	**1100**	2 794.0	220
315	800.1	63	**560**	1 422.4	112	**1140**	2 895.6	228
320	812.8	64	**570**	1 447.8	114	**1250**	3 175.0	250
330	838.2	66	**600**	1 524.0	120	**1350**	3 429.0	270
340	863.6	68	**630**	1 600.2	126	**1400**	3 556.0	280
350	889.0	70	**650**	1 651.0	130	※**1700**	4 318.0	340
360	914.4	72	**660**	1 676.4	132			
370	939.8	74	**680**	1 727.2	136			
375	952.5	75	**700**	1 778.0	140			
390	990.6	78	※**725**	1 841.5	145			
400	1 016.0	80	**750**	1 905.0	150			
410	1 041.4	82	**770**	1 955.8	154			
420	1 066.8	84	**800**	2 032.0	160			
430	1 092.2	86	**810**	2 057.4	162			
450	1 143.0	90	**840**	2 133.6	168			

Blank···Stock item ※···Custom made

■Pulley Dimensions (Reference)

mm

No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD	No. of teeth	Pitch circle dia	Flange OD
14	56.60	62	**21**	84.89	91	**30**	121.28	127	**44**	177.87	—
15	60.64	66	**22**	88.94	94	**32**	129.36	135	**48**	194.04	—
16	64.68	70	**24**	97.02	103	**34**	137.45	143	**50**	202.13	—
18	72.77	79	**25**	101.06	107	**36**	145.53	151	**60**	242.55	—
19	76.81	82	**26**	105.11	111	**40**	161.70	167			
20	80.85	86	**28**	113.19	119	**42**	169.79	—			

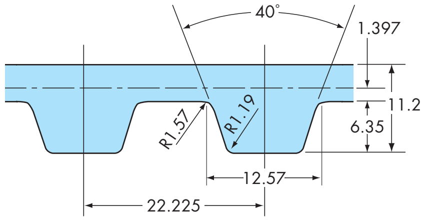
Dimensions of Standard Stock pulleys P67,P68
Custom made pulleys P83,P84

Belt Types and Dimensions

TRAPEZOIDAL BELT

XH (P : 22.225 mm)

■Belt Tooth Profile and Dimensions



■Model Identification

BG 700 XH 200

Rubber belt

Pitch length (Designation)

Type

Belt width (Designation)

■Belt Width / Width Factor / Unit Mass

Belt width (Designation)	Belt width mm	Belt width factor	Weight kg/m
200	50.8	1.00	0.635
300	76.2	1.57	0.953
400	101.6	2.22	1.270

Transmission Capacity Tables P42

■Belt Length

mm

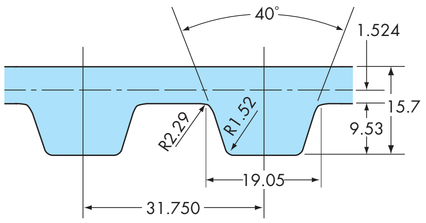
Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth
507	1 289.1	58	**840**	2 133.6	96	**1400**	3 556.0	160
560	1 422.4	64	**875**	2 222.5	100	**1540**	3 911.6	176
630	1 600.2	72	**980**	2 489.2	112	**1750**	4 445.0	200
700	1 778.0	80	**1120**	2 844.8	128			
770	1 955.8	88	**1260**	3 200.4	144			

Custom made items

Custom made pulleys P85

XXH (P : 31.750 mm)

■Belt Tooth Profile and Dimensions



■Model Identification

BG 1000 XXH 300

Rubber belt

Pitch length (Designation)

Type

Belt width (Designation)

■Belt Width / Width Factor / Unit Mass

Belt width (Designation)	Belt width mm	Belt width factor	Weight kg/m
200	50.8	1.00	0.818
300	76.2	1.57	1.227
400	101.6	2.22	1.636
500	127.0	2.87	2.045

Transmission Capacity Tables P43

■Belt Length

Pitch length	Belt length mm	No. of teeth
700	1 778.0	56
800	2 032.0	64
900	2 286.0	72
1000	2 540.0	80
1200	3 048.0	96

Custom made pulleys P86

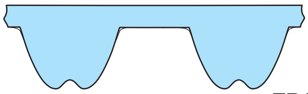
Custom made items

Belt Types and Dimensions

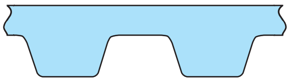
OPEN-ENDED BELT

■Belt Tooth Profile

PX／ULTRA PX HC TYPE



TRAPEZOIDAL



■Model Identification

BG－UP 5M 25 － HC － □□ M

- Rubber belt (BG)
- P : PX
- UP : ULTRA PX
- : TRAPEZOIDAL
- Size (5M)
- Belt width mm (25)
- HC Type ULTRA PX (HC)
- Belt length m (□□)

PX／ULTRA PX HC TYPE

■Manufacturable lengths(list types)

m

Series, Pitch Size \ Belt width mm		4	6	10	15	20	25
PX Belt	**P2M**※	105	70	45	–	–	–
	P3M※	–	110	65	45	–	–
	P5M	–	–	130	85	65	50
	P8M	–	–	–	85	65	50
ULTRA PX Belt HC Type	**UP3M-HC**	–	110	65	45	–	–
	UP5M-HC	–	–	130	85	65	50
	UP8M-HC	–	–	–	85	65	50

Transmission Capacity Tables P29～
Dimensions of Standard Stock pulleys P59～
Custom made pulleys P75～

※ Stock items

TRAPEZOIDAL BELT

■Manufacturable lengths(list types)

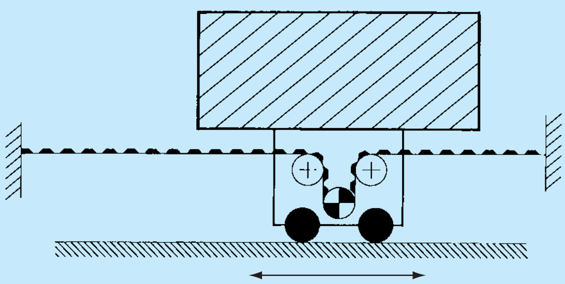
m

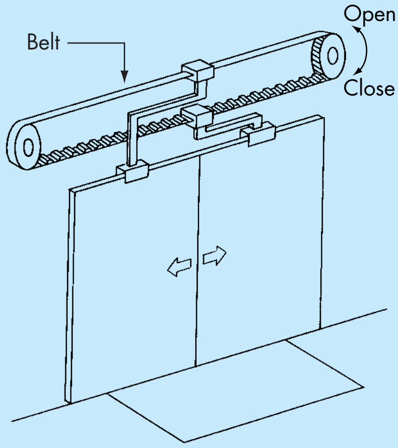
Series, Pitch Size \ Belt width(Designation)		025	031	037	050	075	100	150
	Belt width mm	6.4	7.9	9.5	12.7	19.1	25.4	38.1
TRAPEZOIDAL Belt	**MXL**※	70	55	45	35	–	–	–
	XL	140	110	95	70	45	–	–
	L	–	–	–	70	45	35	–
	H	–	–	–	–	70	50	35

Transmission Capacity Tables P38～
Dimensions of Standard Stock pulleys P64～
Custom made pulleys P80～

※ Stock items

■Application



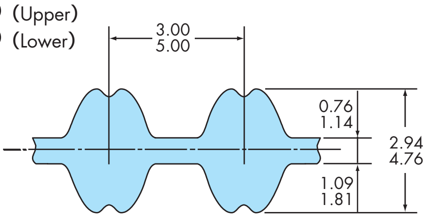


Belt Types and Dimensions

MULTI TIMING BELT

■Belt Tooth Profile and Dimensions

P3M-D (Upper)
P5M-D (Lower)



■Model Identification

BG 300 P 3M 6 − D

- BG: Rubber belt
- 300: Pitch length mm
- P: P : PX
- 3M: Size
- 6: Belt width mm
- D: Multi Timing belt

P3M-D (P : 3 mm)

■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
6	1.00	0.015
10	1.78	0.025
15	2.84	0.038

Transmission Capacity Tables P30
Dimensions of Standard Stock pulleys P60
Custom made pulleys P76

■Belt Length

Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth
300	100	**387**	129	**486**	162	**681**	227	**957**	319	**1638**	546
303	101	**393**	131	**489**	163	**693**	231	**1005**	335	**1689**	563
306	102	**399**	133	**501**	167	**699**	233	**1023**	341	**1749**	583
309	103	**402**	134	**504**	168	**738**	246	**1041**	347	**1893**	631
312	104	**405**	135	**507**	169	**753**	251	**1050**	350		
318	106	**411**	137	**510**	170	**756**	252	**1059**	353		
330	110	**420**	140	**525**	175	**789**	263	**1080**	360		
339	113	**423**	141	**537**	179	**804**	268	**1110**	370		
345	115	**432**	144	**552**	184	**852**	284	**1191**	397		
354	118	**447**	149	**561**	187	**861**	287	**1281**	427		
360	120	**450**	150	**588**	196	**879**	293	**1305**	435		
363	121	**453**	151	**600**	200	**891**	297	**1338**	446		
369	123	**459**	153	**633**	211	**918**	306	**1344**	448		
372	124	**477**	159	**660**	220	**933**	311	**1380**	460		
384	128	**483**	161	**675**	225	**948**	316	**1443**	481		

Made to order, but in short lead time.

P5M-D (P : 5 mm)

■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
10	1.00	0.038
15	1.59	0.058
25	2.84	0.096

Transmission Capacity Tables P31
Dimensions of Standard Stock pulleys P61
Custom made pulleys P77

■Belt Length

Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth
300	60	**490**	98	**635**	127	**800**	160	**1060**	212	**1700**	340
310	62	**500**	100	**645**	129	**810**	162	**1125**	225	**1800**	360
320	64	**515**	103	**650**	130	**830**	166	**1150**	230	**1870**	374
325	65	**520**	104	**670**	134	**835**	167	**1160**	232	**1910**	382
340	68	**525**	105	**675**	135	**850**	170	**1195**	239	**1960**	392
350	70	**530**	106	**690**	138	**865**	173	**1220**	244	**2000**	400
370	74	**550**	110	**695**	139	**900**	180	**1225**	245	**2080**	416
375	75	**555**	111	**700**	140	**905**	181	**1260**	252	**2160**	432
400	80	**560**	112	**710**	142	**940**	188	**1270**	254	**2200**	440
420	84	**570**	114	**725**	145	**950**	190	**1295**	259	**2645**	529
425	85	**575**	115	**730**	146	**965**	193	**1350**	270	**3050**	610
430	86	**595**	119	**740**	148	**985**	197	**1420**	284	**3150**	630
440	88	**600**	120	**750**	150	**1000**	200	**1490**	298	**3930**	786
450	90	**605**	121	**765**	153	**1025**	205	**1595**	319		
475	95	**625**	125	**780**	156	**1050**	210	**1615**	323		

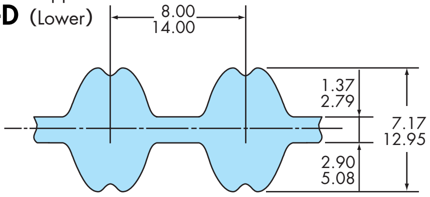
Made to order, but in short lead time.

Belt Types and Dimensions

MULTI TIMING BELT

■Belt Tooth Profile and Dimensions

P8M-D (Upper)
P14M-D (Lower)



■Model Identification

BG 800 P 8M 25 – D

- BG: Rubber belt
- 800: Pitch length mm
- P: P : PX
- 8M: Size
- 25: Belt width mm
- D: Multi Timing belt

P8M-D (P : 8 mm)

■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
15	1.00	0.088
25	1.79	0.148
40	3.06	0.237
60	4.86	0.355

Transmission Capacity Tables P32
Dimensions of Standard Stock pulleys P62
Custom made pulleys P78

■Belt Length

Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth
376	47	**720**	90	**984**	123	**1320**	165	**2064**	258	**3920**	490
392	49	**752**	94	**1000**	125	**1360**	170	**2160**	270	**4400**	550
440	55	**760**	95	**1040**	130	**1400**	175	**2240**	280		
480	60	**800**	100	**1056**	132	**1424**	178	**2256**	282		
512	64	**832**	104	**1080**	135	**1440**	180	**2320**	290		
520	65	**840**	105	**1120**	140	**1520**	190	**2400**	300		
536	67	**848**	106	**1128**	141	**1576**	197	**2456**	307		
560	70	**856**	107	**1160**	145	**1600**	200	**2496**	312		
584	73	**880**	110	**1192**	149	**1680**	210	**2600**	325		
600	75	**896**	112	**1200**	150	**1760**	220	**2800**	350		
632	79	**912**	114	**1208**	151	**1800**	225	**2944**	368		
640	80	**920**	115	**1216**	152	**1816**	227	**3048**	381		
656	82	**936**	117	**1248**	156	**1904**	238	**3200**	400		
680	85	**944**	118	**1264**	158	**1960**	245	**3304**	413		
712	89	**960**	120	**1280**	160	**2000**	250	**3600**	450		

Made to order, but in short lead time.

P14M-D (P : 14 mm)

■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
40	1.00	0.417
60	1.59	0.626
80	2.20	0.835
100	2.84	1.043
120	3.50	1.252

Transmission Capacity Tables P33
Dimensions of Standard Stock pulleys P63
Custom made pulleys P79

■Belt Length

Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth
1120	80	**1778**	127	**2590**	185
1190	85	**1806**	129	**2800**	200
1246	89	**1890**	135	**3150**	225
1344	96	**1960**	140	**3360**	240
1400	100	**2002**	143	**3500**	250
1540	110	**2100**	150	**3850**	275
1610	115	**2240**	160	**4004**	286
1652	118	**2310**	165	**4508**	322
1680	120	**2380**	170		
1736	124	**2450**	175		

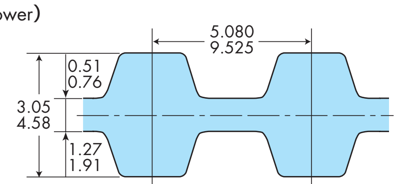
Made to order, but in short lead time.

Belt Types and Dimensions

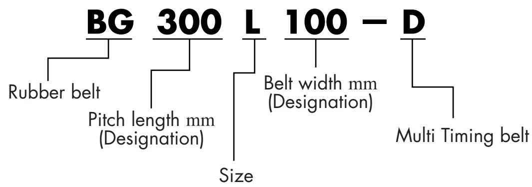
MULTI TIMING BELT

■Belt Tooth Profile and Dimensions

XL-D (Upper)
L-D (Lower)



■Model Identification



XL-D (P : 5.080 mm)

■Belt Width / Width Factor / Unit Mass

Belt width (Designation)	Belt width mm	Belt width factor	Weight kg/m
025	6.4	1.00	0.012
031	7.9	1.40	0.015
037	9.5	1.87	0.018

Transmission Capacity Tables P39
Dimensions of Standard Stock pulleys P65
Custom made pulleys P81

■Belt Length

Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth
120	304.80	60	**164**	416.56	82	**202**	513.08	101	**266**	675.64	133	**340**	863.60	170	**452**	1 148.08	226
122	309.88	61	**166**	421.64	83	**204**	518.16	102	**270**	685.80	135	**344**	873.76	172	**460**	1 168.40	230
124	314.96	62	**168**	426.72	84	**206**	523.24	103	**272**	690.88	136	**348**	883.92	174	**470**	1 193.80	235
126	320.04	63	**170**	431.80	85	**210**	533.40	105	**274**	695.96	137	**352**	894.08	176	**478**	1 214.12	239
128	325.12	64	**172**	436.88	86	**212**	538.48	106	**276**	701.04	138	**360**	914.40	180	**490**	1 244.60	245
130	330.20	65	**176**	447.04	88	**220**	558.80	110	**278**	706.12	139	**364**	924.56	182	**508**	1 290.32	254
134	340.36	67	**178**	452.12	89	**224**	568.96	112	**280**	711.20	140	**376**	955.04	188	**576**	1 463.04	288
136	345.44	68	**180**	457.20	90	**228**	579.12	114	**282**	716.28	141	**380**	965.20	190	**592**	1 503.68	296
140	355.60	70	**182**	462.28	91	**230**	584.20	115	**290**	736.60	145	**384**	975.36	192	**646**	1 640.84	323
142	360.68	71	**184**	467.36	92	**236**	599.44	118	**298**	756.92	149	**386**	980.44	193	**828**	2 103.12	414
144	365.76	72	**188**	477.52	94	**240**	609.60	120	**300**	762.00	150	**390**	990.60	195	**852**	2 164.08	426
146	370.84	73	**190**	482.60	95	**244**	619.76	122	**310**	787.40	155	**396**	1 005.84	198	**860**	2 184.40	430
148	375.92	74	**192**	487.68	96	**248**	629.92	124	**314**	797.56	157	**400**	1 016.00	200	**900**	2 286.00	450
150	381.00	75	**194**	492.76	97	**250**	635.00	125	**320**	812.80	160	**404**	1 026.16	202			
154	391.16	77	**196**	497.84	98	**252**	640.08	126	**330**	838.20	165	**408**	1 036.32	204			
160	406.40	80	**198**	502.92	99	**254**	645.16	127	**332**	843.28	166	**430**	1 092.20	215			
162	411.48	81	**200**	508.00	100	**260**	660.40	130	**338**	858.52	169	**444**	1 127.76	222			

Made to order, but in short lead time.

L-D (P : 9.525 mm)

■Belt Width / Width Factor / Unit Mass

Belt width (Designation)	Belt width mm	Belt width factor	Weight kg/m
050	12.7	1.00	0.042
075	19.1	1.69	0.062
100	25.4	2.38	0.083

Transmission Capacity Tables P40
Dimensions of Standard Stock pulleys P66
Custom made pulleys P82

■Belt Length

Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth
150	381.0	40	**240**	609.6	64	**322**	819.2	86	**435**	1 104.9	116	**619**	1 571.6	165
154	390.5	41	**248**	628.7	66	**334**	847.7	89	**446**	1 133.5	119	**630**	1 600.2	168
165	419.1	44	**255**	647.7	68	**337**	857.3	90	**450**	1 143.0	120	**720**	1 828.8	192
169	428.6	45	**262**	666.8	70	**345**	876.3	92	**465**	1 181.1	124	**731**	1 857.4	195
173	438.2	46	**270**	685.8	72	**360**	914.4	96	**480**	1 219.2	128	**788**	2 000.3	210
187	476.3	50	**278**	704.9	74	**367**	933.5	98	**510**	1 295.4	136	**863**	2 190.8	230
203	514.4	54	**285**	723.9	76	**375**	952.5	100	**525**	1 333.5	140	**915**	2 324.1	244
210	533.4	56	**300**	762.0	80	**390**	990.6	104	**540**	1 371.6	144			
217	552.4	58	**315**	800.1	84	**420**	1 066.8	112	**581**	1 476.4	155			
225	571.5	60	**319**	809.6	85	**427**	1 085.9	114	**600**	1 524.0	160			

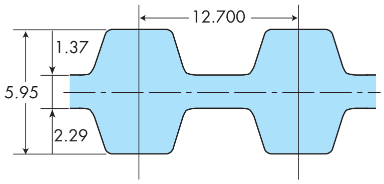
Made to order, but in short lead time.

Belt Types and Dimensions

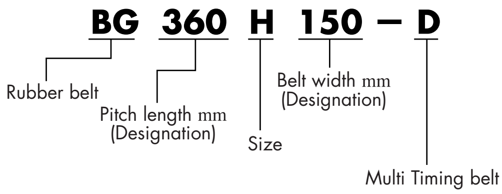
MULTI TIMING BELT

■Belt Tooth Profile and Dimensions

H-D



■Model Identification



H-D (P : 12.700 mm)

■Belt Width / Width Factor / Unit Mass

Belt width (Designation)	Belt width mm	Belt width factor	Weight kg/m
075	19.1	1.00	0.084
100	25.4	1.41	0.112
150	38.1	2.20	0.169
200	50.8	3.01	0.225
300	76.2	4.73	0.337

Transmission Capacity Tables P41
Dimensions of Standard Stock pulleys P67
Custom made pulleys P83,P84

■Belt Length

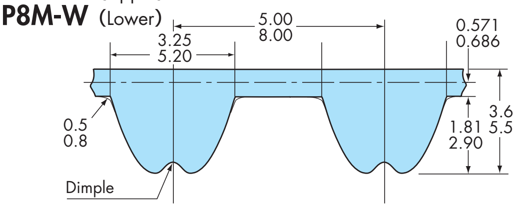
Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth	Pitch length	Belt length mm	No. of teeth
240	609.6	48	**400**	1 016.0	80	**650**	1 651.0	130	**1140**	2 895.6	228
255	647.7	51	**410**	1 041.4	82	**660**	1 676.4	132	**1250**	3 175.0	250
270	685.8	54	**420**	1 066.8	84	**680**	1 727.2	136	**1350**	3 429.0	270
280	711.2	56	**430**	1 092.2	86	**700**	1 778.0	140	**1400**	3 556.0	280
300	762.0	60	**450**	1 143.0	90	**750**	1 905.0	150			
310	787.4	62	**460**	1 168.4	92	**770**	1 955.8	154			
315	800.1	63	**465**	1 181.1	93	**800**	2 032.0	160			
320	812.8	64	**480**	1 219.2	96	**810**	2 057.4	162			
330	838.2	66	**490**	1 244.6	98	**840**	2 133.6	168			
340	863.6	68	**510**	1 295.4	102	**850**	2 159.0	170			
350	889.0	70	**540**	1 371.6	108	**880**	2 235.2	176			
360	914.4	72	**560**	1 422.4	112	**900**	2 286.0	180			
370	939.8	74	**570**	1 447.8	114	**950**	2 413.0	190			
375	952.5	75	**600**	1 524.0	120	**1000**	2 540.0	200			
390	990.6	78	**630**	1 600.2	126	**1100**	2 794.0	220			

Made to order, but in short lead time.

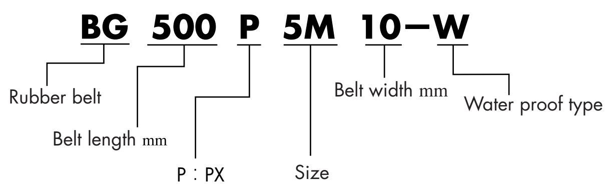
Belt Types and Dimensions

PX BELT WATER PROOF TYPE

■Belt Tooth Profile and Dimensions



■Model Identification



P5M-W (P : 5 mm)

■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
10	1.00	0.041
15	1.59	0.062
25	2.84	0.103

Transmission Capacity Tables P31
Dimensions of Standard Stock pulleys P61
Custom made pulleys P77

■Belt Length

Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth
215	43	**420**	84	**560**	112	**700**	140	**865**	173	**1150**	230	**1550**	310	**3150**	630
225	45	**425**	85	**565**	113	**710**	142	**880**	176	**1160**	232	**1595**	319	**3930**	786
255	51	**430**	86	**570**	114	**725**	145	**900**	180	**1180**	236	**1615**	323		
260	52	**440**	88	**575**	115	**730**	146	**905**	181	**1195**	239	**1675**	335		
275	55	**450**	90	**595**	119	**740**	148	**920**	184	**1220**	244	**1700**	340		
295	59	**475**	95	**600**	120	**750**	150	**940**	188	**1225**	245	**1800**	360		
300	60	**490**	98	**605**	121	**765**	153	**950**	190	**1250**	250	**1870**	374		
310	62	**500**	100	**625**	125	**770**	154	**965**	193	**1260**	252	**1910**	382		
320	64	**515**	103	**635**	127	**775**	155	**985**	197	**1270**	254	**1960**	392		
325	65	**520**	104	**645**	129	**780**	156	**1000**	200	**1295**	259	**2000**	400		
340	68	**525**	105	**650**	130	**800**	160	**1025**	205	**1350**	270	**2080**	416		
350	70	**530**	106	**670**	134	**810**	162	**1050**	210	**1390**	278	**2160**	432		
370	74	**545**	109	**675**	135	**830**	166	**1060**	212	**1420**	284	**2200**	440		
375	75	**550**	110	**690**	138	**835**	167	**1090**	218	**1490**	298	**2645**	529		
400	80	**555**	111	**695**	139	**850**	170	**1125**	225	**1530**	306	**3050**	610		

Made to order, but in short lead time.

P8M-W (P : 8 mm)

■Belt Width / Width Factor / Unit Mass

Belt width mm	Belt width factor	Weight kg/m
15	1.00	0.084
25	1.79	0.139
40	3.06	0.223
60	4.86	0.334

Transmission Capacity Tables P32
Dimensions of Standard Stock pulleys P62
Custom made pulleys P78

■Belt Length

Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth	Belt length mm	No. of teeth
376	47	**712**	89	**936**	117	**1200**	150	**1520**	190	**2256**	282
392	49	**720**	90	**944**	118	**1208**	151	**1576**	197	**2320**	290
440	55	**752**	94	**960**	120	**1216**	152	**1600**	200	**2400**	300
480	60	**760**	95	**984**	123	**1248**	156	**1640**	205	**2456**	307
512	64	**776**	97	**1000**	125	**1264**	158	**1680**	210	**2496**	312
520	65	**800**	100	**1032**	129	**1280**	160	**1760**	220	**2600**	325
536	67	**816**	102	**1040**	130	**1304**	163	**1800**	225	**2800**	350
560	70	**832**	104	**1056**	132	**1320**	165	**1816**	227	**2944**	368
584	73	**840**	105	**1080**	135	**1344**	168	**1888**	236	**3048**	381
600	75	**848**	106	**1096**	137	**1352**	169	**1904**	238	**3200**	400
616	77	**856**	107	**1120**	140	**1360**	170	**1960**	245	**3304**	413
632	79	**880**	110	**1128**	141	**1400**	175	**2000**	250	**3600**	450
640	80	**896**	112	**1152**	144	**1424**	178	**2064**	258	**3920**	490
656	82	**912**	114	**1160**	145	**1440**	180	**2160**	270	**4400**	550
680	85	**920**	115	**1192**	149	**1480**	185	**2240**	280		

Made to order, but in short lead time.

Transmission Capacity Tables

PX BELT

P2M

■Standard Transmission Capacity (Belt width 4 mm)

W

Number of teeth of small pulley	14	15	16	18	20	22	24	25	26	28	30	32	34	36	40	42	44	48	50	60
Pitch circle diameter mm	8.91	9.55	10.19	11.46	12.73	14.01	15.28	15.92	16.55	17.83	19.10	20.37	21.65	22.92	25.46	26.74	28.01	30.56	31.83	38.20
Small pulley revolution r/min																				
20	0.5	0.5	0.5	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.1	1.2	1.4	1.5	1.7	1.9	2.0	2.3	2.5	3.3
40	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6	1.7	1.9	2.1	2.3	2.5	2.7	3.2	3.4	3.7	4.2	4.5	6.0
60	1.2	1.3	1.4	1.6	1.8	2.0	2.2	2.3	2.4	2.7	3.0	3.2	3.5	3.8	4.5	4.8	5.2	5.9	6.3	8.5
100	1.8	2.0	2.1	2.4	2.7	3.1	3.4	3.6	3.8	4.2	4.6	5.0	5.5	5.9	6.9	7.4	8.0	9.1	9.7	12.9
200	3.3	3.6	3.8	4.4	5.0	5.6	6.2	6.5	6.9	7.6	8.3	9.0	9.8	10.6	12.3	13.2	14.2	16.1	17.2	22.7
400	5.9	6.4	6.9	7.9	8.9	10.0	11.1	11.7	12.3	13.5	14.7	16.0	17.4	18.8	21.7	23.3	24.8	28.2	29.9	39.2
600	8.3	8.9	9.6	11.0	12.4	13.9	15.5	16.3	17.1	18.8	20.5	22.3	24.1	26.0	30.0	32.1	34.2	38.6	40.9	53.3
800	10.4	11.3	12.1	13.9	15.7	17.6	19.6	20.6	21.6	23.7	25.8	28.0	30.3	32.6	37.5	40.1	42.7	48.1	50.9	65.8
1 000	12.5	13.5	14.5	16.6	18.8	21.1	23.4	24.6	25.8	28.3	30.8	33.4	36.1	38.8	44.5	47.5	50.5	56.8	60.0	77.2
1 200	14.4	15.6	16.8	19.3	21.8	24.4	27.1	28.4	29.8	32.6	35.5	38.5	41.5	44.6	51.1	54.4	57.8	64.9	68.5	87.7
1 400	16.3	17.6	19.0	21.8	24.6	27.5	30.5	32.1	33.0	36.8	40.0	43.3	46.7	50.2	57.3	61.0	64.7	72.5	76.5	97.5
1 450	16.7	18.1	19.5	22.4	25.3	28.3	31.4	33.0	33.6	37.8	41.1	44.5	48.0	51.5	58.8	62.6	66.4	74.3	78.4	99.8
1 500	17.2	18.6	20.0	23.0	26.0	29.1	32.2	33.9	34.6	38.8	42.2	45.7	49.2	52.8	60.3	64.1	68.1	76.1	80.3	102.1
1 600	18.1	19.6	21.1	24.2	27.3	30.6	33.9	35.6	35.5	40.8	44.3	48.0	51.7	55.4	63.2	67.2	71.3	79.7	84.0	106.6
1 750	19.3	21.0	22.6	25.9	29.3	32.8	36.4	38.2	37.3	43.8	47.5	51.3	55.2	59.2	67.5	71.7	76.0	84.8	89.3	113.1
1 800	19.8	21.4	23.1	26.5	30.0	33.5	37.2	39.0	40.9	44.6	48.5	52.4	56.4	60.5	68.8	73.1	77.5	86.5	91.1	115.1
2 000	21.4	23.2	25.0	28.7	32.5	36.4	40.3	42.3	44.3	48.3	52.5	56.7	61.0	65.3	74.2	78.8	83.4	92.9	97.8	123.2
2 400	24.6	26.7	28.8	33.1	37.4	41.8	46.3	48.6	50.8	55.4	60.1	64.8	69.6	74.5	84.4	89.5	94.6	105.0	110.4	137.9
3 000		31.5	34.1	39.1	44.3	49.5	54.7	57.4	60.0	65.3	70.7	76.2	81.6	87.2	98.4	104.0	109.8	121.3	127.2	157.3
3 600		36.0	39.0	44.8	50.7	56.6	62.6	65.6	68.5	74.5	80.6	86.6	92.7	98.8	111.0	117.2	123.4	135.9	142.1	173.9
4 000		38.9	42.1	48.4	54.8	61.2	67.5	70.7	73.9	80.3	86.7	93.1	99.6	106.0	118.9	125.3	131.8	144.7	151.2	183.7
5 000			49.4	56.9	64.4	71.8	79.2	82.9	86.5	93.8	101.1	108.3	115.5	122.6	136.7	143.6	150.6	164.3	171.1	204.4
6 000			56.1	64.7	73.2	81.6	89.9	94.0	98.1	106.1	114.1	122.0	129.7	137.4	152.3	159.6	166.8	180.9	187.8	220.6
8 000				78.7	89.1	99.2	109.0	113.9	118.6	128.0	137.0	145.8	154.4	162.7	178.5	186.0	193.3	207.1	213.6	242.2
10 000				91.1	103.1	114.7	125.8	131.2	136.5	146.8	156.6	166.0	175.0	183.5	199.3	206.6	213.4	225.7	231.2	252.3
12 000					115.6	128.5	140.7	146.6	152.3	163.2	173.6	183.3	192.3	200.8	215.8	222.4	228.3	238.3	242.4	253.3
14 000					126.9	140.9	154.0	160.2	158.0	177.7	188.3	198.1	207.0	215.1	228.7	234.3	239.0	246.0	248.2	246.8

■Standard Transmission Torque (Belt width 4 mm)

N・m

Number of teeth of small pulley	14	15	16	18	20	22	24	25	26	28	30	32	34	36	40	42	44	48	50	60
Pitch circle diameter mm	8.91	9.55	10.19	11.46	12.73	14.01	15.28	15.92	16.55	17.83	19.10	20.37	21.65	22.92	25.46	26.74	28.01	30.56	31.83	38.20
Small pulley revolution r/min																				
20	0.21	0.23	0.25	0.28	0.32	0.36	0.40	0.42	0.44	0.49	0.54	0.59	0.64	0.70	0.83	0.89	0.95	1.10	1.17	1.58
40	0.20	0.21	0.23	0.26	0.29	0.33	0.37	0.39	0.41	0.45	0.50	0.54	0.59	0.64	0.75	0.81	0.87	1.00	1.06	1.43
60	0.19	0.20	0.22	0.25	0.28	0.31	0.35	0.37	0.39	0.43	0.47	0.51	0.56	0.61	0.71	0.77	0.82	0.94	1.00	1.34
100	0.18	0.19	0.20	0.23	0.26	0.29	0.33	0.34	0.36	0.40	0.44	0.48	0.52	0.57	0.66	0.71	0.76	0.87	0.92	1.23
200	0.16	0.17	0.18	0.21	0.24	0.27	0.30	0.31	0.33	0.36	0.39	0.43	0.47	0.51	0.59	0.63	0.68	0.77	0.82	1.08
400	0.14	0.15	0.16	0.19	0.21	0.24	0.26	0.28	0.29	0.32	0.35	0.38	0.41	0.45	0.52	0.56	0.59	0.67	0.71	0.93
600	0.13	0.14	0.15	0.17	0.20	0.22	0.25	0.26	0.27	0.30	0.33	0.35	0.38	0.41	0.48	0.51	0.54	0.61	0.65	0.85
800	0.12	0.13	0.14	0.17	0.19	0.21	0.23	0.25	0.26	0.28	0.31	0.33	0.36	0.39	0.45	0.48	0.51	0.57	0.61	0.79
1 000	0.12	0.13	0.14	0.16	0.18	0.20	0.22	0.23	0.25	0.27	0.29	0.32	0.34	0.37	0.42	0.45	0.48	0.54	0.57	0.74
1 200	0.11	0.12	0.13	0.15	0.17	0.19	0.22	0.23	0.24	0.26	0.28	0.31	0.33	0.36	0.41	0.43	0.46	0.52	0.54	0.70
1 400	0.11	0.12	0.13	0.15	0.17	0.19	0.21	0.22	0.23	0.25	0.27	0.30	0.32	0.34	0.39	0.42	0.44	0.49	0.52	0.66
1 450	0.11	0.12	0.13	0.15	0.17	0.19	0.21	0.22	0.22	0.25	0.27	0.29	0.32	0.34	0.39	0.41	0.44	0.49	0.52	0.66
1 500	0.11	0.12	0.13	0.15	0.17	0.18	0.21	0.22	0.22	0.25	0.27	0.29	0.31	0.34	0.38	0.41	0.43	0.48	0.51	0.65
1 600	0.11	0.12	0.13	0.14	0.16	0.18	0.20	0.21	0.22	0.24	0.26	0.29	0.31	0.33	0.38	0.40	0.43	0.48	0.50	0.64
1 750	0.11	0.11	0.12	0.14	0.16	0.18	0.20	0.21	0.21	0.24	0.26	0.28	0.30	0.32	0.37	0.39	0.41	0.46	0.49	0.62
1 800	0.10	0.11	0.12	0.14	0.16	0.18	0.20	0.21	0.21	0.24	0.26	0.28	0.30	0.32	0.36	0.39	0.41	0.46	0.48	0.61
2 000	0.10	0.11	0.12	0.14	0.16	0.17	0.19	0.20	0.21	0.23	0.25	0.27	0.29	0.31	0.35	0.38	0.40	0.44	0.47	0.59
2 400	0.10	0.11	0.11	0.13	0.15	0.17	0.18	0.19	0.20	0.22	0.24	0.26	0.28	0.30	0.34	0.36	0.38	0.42	0.44	0.55
3 000		0.10	0.11	0.12	0.14	0.16	0.17	0.18	0.19	0.21	0.23	0.24	0.26	0.28	0.31	0.33	0.35	0.39	0.40	0.50
3 600		0.10	0.10	0.12	0.13	0.15	0.17	0.17	0.18	0.20	0.21	0.23	0.25	0.26	0.29	0.31	0.33	0.36	0.38	0.46
4 000		0.09	0.10	0.12	0.13	0.15	0.16	0.17	0.18	0.19	0.21	0.22	0.24	0.25	0.28	0.30	0.31	0.35	0.36	0.44
5 000			0.09	0.11	0.12	0.14	0.15	0.16	0.17	0.18	0.19	0.21	0.22	0.23	0.26	0.27	0.29	0.31	0.33	0.39
6 000			0.09	0.10	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.21	0.22	0.24	0.25	0.27	0.29	0.30	0.35
8 000				0.09	0.11	0.12	0.13	0.14	0.14	0.15	0.16	0.17	0.18	0.19	0.21	0.22	0.23	0.25	0.25	0.29
10 000				0.09	0.10	0.11	0.12	0.13	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.20	0.22	0.22	0.24
12 000					0.09	0.10	0.11	0.12	0.12	0.13	0.14	0.15	0.15	0.16	0.17	0.18	0.18	0.19	0.19	0.20
14 000					0.09	0.10	0.10	0.11	0.11	0.12	0.13	0.14	0.14	0.15	0.16	0.16	0.16	0.17	0.17	0.17

■Width Factor

Belt width mm	4	6	10
Width Factor	1.00	1.59	2.84

Belt Types and Dimensions P13,P23
Selection and Design P45～

・notes;
The xxx area makes the belt life shorter and should be avoided.

Transmission Capacity Tables

PX BELT

P3M

■Standard Transmission Capacity (Belt width 6 mm)

W

Number of teeth of small pulley	10	12	14	15	16	18	20	22	24	25	26	28	30	32	36	40	48	50	60
Pitch circle diameter mm	9.55	11.46	13.37	14.32	15.28	17.19	19.10	21.01	22.92	23.87	24.83	26.74	28.65	30.56	34.38	38.20	45.84	47.75	57.30
Small pulley revolution r/min																			
20	1	1	1	2	2	2	2	3	3	3	3	4	4	4	5	6	7	8	10
40	2	2	3	3	3	4	4	5	5	6	6	6	7	8	9	10	14	14	19
60	3	3	4	4	5	5	6	7	8	8	8	9	10	11	13	15	19	20	27
100	4	5	6	7	7	8	9	10	12	12	13	14	16	17	20	23	30	32	41
200	7	9	11	12	13	15	17	19	21	22	23	26	28	31	36	41	53	57	73
400	13	16	19	21	23	26	30	33	37	39	41	46	50	54	63	73	94	100	130
600	18	22	27	29	31	36	41	46	52	55	57	63	69	75	88	102	131	138	180
800	22	28	33	36	39	45	52	58	65	69	72	80	87	95	111	128	164	174	225
1 000	26	33	40	43	47	54	62	70	78	82	86	95	104	113	132	152	195	207	268
1 200	30	38	46	50	54	62	71	80	90	94	99	109	120	130	152	175	225	238	307
1 400	34	42	51	56	61	70	80	90	101	106	112	123	135	146	171	197	252	267	345
1 450	35	44	53	58	62	72	82	93	104	109	115	126	138	150	176	202	259	274	354
1 500	37	45	54	59	64	74	85	95	106	112	118	130	142	154	180	207	266	281	363
1 600	41	47	57	62	67	78	89	100	112	118	124	136	149	162	189	218	279	295	381
1 750	40	50	61	66	72	83	95	107	120	126	133	146	159	173	202	233	298	315	407
1 800		51	62	68	73	85	97	109	122	129	135	149	163	177	207	238	304	322	415
2 000		55	67	73	79	92	105	118	132	139	146	161	176	191	223	257	329	348	448
2 400		63	77	84	91	105	120	135	151	159	168	184	201	219	255	293	375	396	510
3 000			90	98	106	124	141	159	178	187	197	216	236	257	300	344	439	464	596
3 600			102	111	121	140	161	181	202	213	224	246	269	292	340	391	498	526	674
4 000			110	120	130	151	173	195	218	229	241	265	289	314	366	420	534	564	723
5 000			127	139	151	176	201	227	253	267	280	308	336	365	425	487	618	652	833
6 000				156	170	198	226	255	285	300	316	347	378	411	477	547	693	731	931
8 000					203	236	271	306	341	360	378	415	452	491	569	651	821	866	1 097
10 000						269	308	348	389	410	430	472	515	558	647	738	927	976	1 232
12 000						297	341	385	430	453	475	522	568	616	712	811	1 015	1 068	1 341
14 000							369	417	465	490	514	564	614	665	768	872	1 089	1 144	1 429

■Standard Transmission Torque (Belt width 6 mm)

N · m

Number of teeth of small pulley	10	12	14	15	16	18	20	22	24	25	26	28	30	32	36	40	48	50	60
Pitch circle diameter mm	9.55	11.46	13.37	14.32	15.28	17.19	19.10	21.01	22.92	23.87	24.83	26.74	28.65	30.56	34.38	38.20	45.84	47.75	57.30
Small pulley revolution r/min																			
20	0.48	0.60	0.71	0.77	0.83	0.96	1.09	1.23	1.37	1.45	1.52	1.68	1.84	2.00	2.35	2.72	3.53	3.74	4.90
40	0.44	0.54	0.65	0.71	0.76	0.88	1.00	1.13	1.26	1.33	1.40	1.54	1.69	1.84	2.16	2.50	3.23	3.43	4.48
60	0.42	0.52	0.62	0.67	0.72	0.84	0.95	1.07	1.20	1.26	1.33	1.46	1.60	1.74	2.04	2.36	3.06	3.24	4.24
100	0.39	0.48	0.57	0.62	0.67	0.78	0.89	1.00	1.11	1.17	1.24	1.36	1.49	1.62	1.90	2.20	2.84	3.01	3.93
200	0.35	0.43	0.52	0.56	0.61	0.70	0.80	0.90	1.00	1.06	1.11	1.22	1.34	1.46	1.71	1.97	2.55	2.70	3.49
400	0.31	0.38	0.46	0.50	0.54	0.62	0.71	0.80	0.89	0.94	0.99	1.09	1.19	1.29	1.51	1.75	2.25	2.39	3.10
600	0.28	0.35	0.42	0.46	0.50	0.58	0.66	0.74	0.83	0.87	0.91	1.01	1.10	1.20	1.40	1.62	2.08	2.20	2.86
800	0.26	0.33	0.40	0.43	0.47	0.54	0.62	0.70	0.78	0.82	0.86	0.95	1.04	1.13	1.32	1.52	1.96	2.07	2.69
1 000	0.25	0.31	0.38	0.41	0.45	0.52	0.59	0.67	0.74	0.78	0.82	0.91	0.99	1.08	1.26	1.45	1.86	1.97	2.55
1 200	0.24	0.30	0.36	0.40	0.43	0.50	0.57	0.64	0.71	0.75	0.79	0.87	0.95	1.03	1.21	1.39	1.79	1.89	2.45
1 400	0.24	0.29	0.35	0.38	0.41	0.48	0.55	0.62	0.69	0.73	0.76	0.84	0.92	1.00	1.17	1.34	1.72	1.82	2.35
1 450	0.24	0.29	0.35	0.38	0.41	0.48	0.54	0.61	0.68	0.72	0.76	0.83	0.91	0.99	1.16	1.33	1.71	1.80	2.33
1 500	0.24	0.28	0.34	0.38	0.41	0.47	0.54	0.61	0.68	0.71	0.75	0.83	0.90	0.98	1.15	1.32	1.69	1.79	2.31
1 600	0.24	0.28	0.34	0.37	0.40	0.46	0.53	0.60	0.67	0.70	0.74	0.81	0.89	0.97	1.13	1.30	1.66	1.76	2.27
1 750	0.22	0.27	0.33	0.36	0.39	0.45	0.52	0.58	0.65	0.69	0.72	0.79	0.87	0.95	1.10	1.27	1.63	1.72	2.22
1 800		0.27	0.33	0.36	0.39	0.45	0.51	0.58	0.65	0.68	0.72	0.79	0.86	0.94	1.10	1.26	1.61	1.71	2.20
2 000		0.26	0.32	0.35	0.38	0.44	0.50	0.57	0.63	0.66	0.70	0.77	0.84	0.91	1.07	1.23	1.57	1.66	2.14
2 400		0.25	0.30	0.33	0.36	0.42	0.48	0.54	0.60	0.63	0.67	0.73	0.80	0.87	1.02	1.17	1.49	1.58	2.03
3 000			0.29	0.31	0.34	0.39	0.45	0.51	0.57	0.60	0.63	0.69	0.75	0.82	0.95	1.09	1.40	1.48	1.90
3 600			0.27	0.30	0.32	0.37	0.43	0.48	0.54	0.56	0.59	0.65	0.71	0.77	0.90	1.04	1.32	1.39	1.79
4 000			0.26	0.29	0.31	0.36	0.41	0.46	0.52	0.55	0.57	0.63	0.69	0.75	0.87	1.00	1.27	1.35	1.72
5 000			0.24	0.27	0.29	0.34	0.38	0.43	0.48	0.51	0.53	0.59	0.64	0.70	0.81	0.93	1.18	1.25	1.59
6 000				0.25	0.27	0.31	0.36	0.41	0.45	0.48	0.50	0.55	0.60	0.65	0.76	0.87	1.10	1.16	1.48
8 000					0.24	0.28	0.32	0.36	0.41	0.43	0.45	0.49	0.54	0.59	0.68	0.78	0.98	1.03	1.31
10 000						0.26	0.29	0.33	0.37	0.39	0.41	0.45	0.49	0.53	0.62	0.70	0.89	0.93	1.18
12 000						0.24	0.27	0.31	0.34	0.36	0.38	0.41	0.45	0.49	0.57	0.64	0.81	0.85	1.07
14 000							0.25	0.28	0.32	0.33	0.35	0.38	0.42	0.45	0.52	0.59	0.74	0.78	0.97

■Width Factor

Belt width mm	6	10	15
Width Factor	1.00	1.78	2.84

Belt Types and Dimensions P14,P23,P24

Selection and Design P45～

・notes;

The xxx area makes the belt life shorter and should be avoided.

Transmission Capacity Tables

PX BELT

P5M

■Standard Transmission Capacity
(Belt width 10 mm)

W

Number of teeth of small pulley	12	14	16	18	20	22	24	25	26	28	30	32	36	40	44	48	50	60	72
Pitch circle diameter mm	19.10	22.28	25.46	28.65	31.83	35.01	38.20	39.79	41.38	44.56	47.75	50.93	57.30	63.66	70.03	76.39	79.58	95.49	114.59
Small pulley revolution r/min																			
20	6	7	8	10	11	13	14	15	16	18	19	21	25	29	33	38	40	53	70
40	10	13	15	18	21	23	26	28	29	33	36	39	46	54	61	70	74	97	128
60	15	18	22	25	29	33	37	40	42	46	51	56	65	76	87	99	105	137	181
100	23	28	34	40	46	52	58	62	65	72	79	86	102	118	135	153	162	212	279
200	41	51	61	71	82	93	105	111	117	129	142	155	182	211	242	273	290	379	498
400	74	91	109	128	147	166	187	197	208	230	252	275	323	374	427	483	512	667	874
500	89	110	131	153	176	200	224	237	249	275	302	330	387	448	511	578	612	797	1 044
600	104	127	152	178	204	232	260	274	289	319	350	382	448	518	591	668	708	920	1 204
800	131	161	192	224	258	292	327	345	364	402	440	480	563	650	742	838	887	1 152	1 505
1 000	157	193	230	268	308	348	391	412	434	479	525	572	670	774	882	996	1 054	1 367	1 784
1 200	181	222	265	309	355	402	451	475	500	552	605	659	772	890	1 014	1 144	1 211	1 569	2 044
1 400	205	251	299	349	400	453	508	536	564	621	681	741	868	1 001	1 140	1 285	1 360	1 759	2 291
1 450		258	308	359	411	466	522	550	579	638	699	762	891	1 027	1 170	1 319	1 396	1 806	2 350
1 500		265	316	368	422	478	535	565	594	655	717	781	914	1 054	1 200	1 353	1 432	1 851	2 409
1 600		279	332	387	444	502	562	593	624	688	753	821	960	1 106	1 259	1 419	1 502	1 941	2 524
1 750		299	356	415	475	538	602	635	668	736	806	878	1 026	1 182	1 346	1 516	1 604	2 071	2 692
1 800			364	424	486	549	615	649	683	752	823	896	1 048	1 207	1 374	1 548	1 638	2 114	2 747
2 000			394	459	526	595	666	702	739	814	891	969	1 133	1 304	1 484	1 671	1 768	2 280	2 960
2 400			452	527	603	682	763	804	846	931	1 019	1 108	1 294	1 489	1 692	1 904	2 013	2 593	3 360
3 000				621	711	803	898	946	995	1 095	1 197	1 301	1 517	1 744	1 980	2 226	2 352	3 022	3 907
3 600				709	811	915	1 023	1 077	1 133	1 245	1 361	1 479	1 728	1 977	2 243	2 519	2 661	3 412	4 401
4 000					874	986	1 101	1 160	1 219	1 340	1 464	1 590	1 851	2 123	2 407	2 702	2 853	3 653	4 705
5 000					1 021	1 151	1 284	1 352	1 420	1 559	1 702	1 847	2 147	2 459	2 783	3 119	3 292	4 201	5 393
6 000						1 301	1 450	1 526	1 602	1 758	1 917	2 079	2 412	2 759	3 118	3 490	3 681	4 684	5 993
8 000							1 742	1 831	1 922	2 105	2 292	2 482	2 872	3 275	3 692	4 122	4 342	5 492	
10 000								2 092	2 194	2 400	2 609	2 821	3 256	3 703	4 164	4 637			
12 000								2 318	2 429	2 653	2 880	3 110	3 580						
14 000									2 633	2 871	3 113	3 357							

■Standard Transmission Torque
(Belt width 10 mm)

N · m

Number of teeth of small pulley	12	14	16	18	20	22	24	25	26	28	30	32	36	40	44	48	50	60	72
Pitch circle diameter mm	19.10	22.28	25.46	28.65	31.83	35.01	38.20	39.79	41.38	44.56	47.75	50.93	57.30	63.66	70.03	76.39	79.58	95.49	114.59
Small pulley revolution r/min																			
20	2.67	3.29	3.95	4.63	5.34	6.07	6.83	7.23	7.63	8.44	9.29	10.16	11.99	13.93	15.97	18.13	19.25	25.26	33.38
40	2.46	3.04	3.64	4.26	4.91	5.58	6.28	6.64	7.01	7.76	8.53	9.33	11.00	12.77	14.64	16.60	17.62	23.10	30.48
60	2.34	2.89	3.45	4.05	4.66	5.30	5.96	6.30	6.65	7.35	8.09	8.84	10.42	12.09	13.85	15.71	16.67	21.83	28.79
100	2.19	2.69	3.23	3.78	4.35	4.94	5.56	5.87	6.19	6.85	7.53	8.23	9.69	11.23	12.87	14.58	15.47	20.23	26.65
200	1.98	2.44	2.91	3.41	3.92	4.46	5.01	5.29	5.58	6.16	6.77	7.39	8.70	10.08	11.53	13.05	13.84	18.07	23.75
400	1.77	2.18	2.60	3.04	3.50	3.97	4.46	4.71	4.96	5.48	6.01	6.56	7.71	8.92	10.19	11.52	12.22	15.91	20.85
500	1.70	2.10	2.50	2.92	3.36	3.81	4.28	4.52	4.76	5.26	5.77	6.29	7.39	8.54	9.76	11.03	11.69	15.21	19.92
600	1.65	2.03	2.42	2.83	3.25	3.68	4.13	4.36	4.60	5.08	5.57	6.07	7.13	8.24	9.41	10.63	11.26	14.64	19.16
800	1.56	1.92	2.29	2.68	3.07	3.48	3.91	4.12	4.34	4.79	5.25	5.73	6.72	7.76	8.85	10.00	10.59	13.74	17.96
1 000	1.50	1.84	2.19	2.56	2.94	3.33	3.73	3.93	4.14	4.57	5.01	5.46	6.40	7.38	8.42	9.50	10.06	13.05	17.02
1 200	1.44	1.77	2.11	2.46	2.82	3.20	3.58	3.78	3.98	4.39	4.81	5.24	6.14	7.08	8.07	9.10	9.64	12.48	16.26
1 400	1.39	1.71	2.04	2.38	2.73	3.09	3.46	3.65	3.84	4.24	4.64	5.06	5.92	6.82	7.77	8.76	9.27	12.00	15.62
1 450		1.70	2.02	2.36	2.71	3.07	3.43	3.62	3.81	4.20	4.60	5.01	5.87	6.76	7.70	8.68	9.19	11.89	15.47
1 500		1.69	2.01	2.34	2.69	3.04	3.41	3.59	3.78	4.17	4.57	4.97	5.82	6.71	7.64	8.61	9.11	11.78	15.33
1 600		1.66	1.98	2.31	2.65	3.00	3.36	3.54	3.72	4.10	4.49	4.89	5.73	6.60	7.51	8.47	8.96	11.58	15.06
1 750		1.63	1.94	2.26	2.59	2.93	3.28	3.46	3.65	4.02	4.40	4.79	5.60	6.45	7.34	8.27	8.75	11.30	14.68
1 800			1.93	2.25	2.58	2.91	3.26	3.44	3.62	3.99	4.37	4.75	5.56	6.40	7.29	8.21	8.68	11.21	14.57
2 000			1.88	2.19	2.51	2.84	3.18	3.35	3.53	3.88	4.25	4.63	5.41	6.23	7.08	7.98	8.44	10.88	14.13
2 400			1.80	2.09	2.40	2.71	3.03	3.20	3.36	3.70	4.05	4.41	5.15	5.92	6.73	7.57	8.01	10.31	13.36
3 000				1.98	2.26	2.56	2.86	3.01	3.17	3.48	3.81	4.14	4.83	5.55	6.30	7.08	7.48	9.62	12.43
3 600				1.88	2.15	2.43	2.71	2.86	3.00	3.30	3.61	3.92	4.57	5.24	5.95	6.68	7.06	9.05	11.67
4 000					2.09	2.35	2.63	2.77	2.91	3.20	3.49	3.79	4.42	5.07	5.74	6.45	6.81	8.72	11.23
5 000					1.95	2.20	2.45	2.58	2.71	2.98	3.25	3.53	4.10	4.69	5.31	5.95	6.28	8.02	10.30
6 000						2.07	2.31	2.43	2.55	2.80	3.05	3.31	3.84	4.39	4.96	5.55	5.86	7.45	9.53
8 000							2.08	2.18	2.29	2.51	2.73	2.96	3.43	3.91	4.41	4.92	5.18	6.55	
10 000								2.00	2.09	2.29	2.49	2.69	3.11	3.54	3.97	4.43			
12 000								1.84	1.93	2.11	2.29	2.47	2.85						
14 000									1.79	1.96	2.12	2.29							

■Width Factor

Belt width mm	10	15	25
Width Factor	1.00	1.59	2.84

Belt Types and Dimensions P15,P23,P24
Selection and Design P45～

· notes;
The xxx area makes the belt life shorter and should be avoided.
The transmission capacity of the PX belt watertight type is 1.2 times the values listed in the above table.

Transmission Capacity Tables

PX BELT

P8M

■Standard Transmission Capacity (Belt width 15 mm)

kW

Number of teeth of small pulley	20	22	24	26	28	30	32	34	36	38	40	44	48	50	56	60	64	72
Pitch circle diameter mm	50.93	56.02	61.12	66.21	71.30	76.39	81.49	86.58	91.67	96.77	101.86	112.05	122.23	127.32	142.60	152.79	162.97	183.35
Small pulley revolution r/min																		
20	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.12	0.13	0.17
40	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.10	0.11	0.11	0.12	0.14	0.16	0.17	0.21	0.24	0.27	0.33
60	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.15	0.16	0.17	0.18	0.21	0.24	0.26	0.31	0.35	0.40	0.50
100	0.18	0.19	0.19	0.20	0.21	0.22	0.24	0.25	0.27	0.29	0.31	0.35	0.40	0.43	0.52	0.58	0.66	0.82
200	0.36	0.37	0.39	0.41	0.43	0.45	0.48	0.50	0.54	0.57	0.61	0.70	0.79	0.84	1.02	1.15	1.30	1.62
300	0.55	0.56	0.58	0.61	0.64	0.67	0.71	0.76	0.80	0.86	0.91	1.04	1.18	1.26	1.51	1.71	1.92	2.39
400	0.73	0.75	0.78	0.82	0.86	0.90	0.95	1.01	1.07	1.14	1.21	1.37	1.56	1.66	2.00	2.25	2.52	3.14
500	0.91	0.94	0.98	1.02	1.07	1.13	1.19	1.26	1.33	1.42	1.51	1.71	1.93	2.06	2.47	2.78	3.11	3.86
600	1.10	1.13	1.18	1.23	1.28	1.35	1.42	1.51	1.60	1.69	1.80	2.03	2.30	2.44	2.93	3.29	3.68	4.56
700	1.28	1.32	1.37	1.43	1.50	1.58	1.66	1.75	1.86	1.97	2.09	2.36	2.66	2.83	3.37	3.78	4.23	5.23
800	1.47	1.51	1.57	1.64	1.71	1.80	1.89	2.00	2.12	2.24	2.38	2.67	3.01	3.20	3.81	4.27	4.76	5.87
900	1.65	1.70	1.77	1.84	1.93	2.02	2.13	2.24	2.37	2.51	2.66	2.99	3.36	3.56	4.23	4.73	5.28	6.49
1 000	1.83	1.89	1.96	2.04	2.14	2.24	2.36	2.48	2.62	2.77	2.94	3.29	3.70	3.92	4.64	5.18	5.77	7.08
1 100	2.01	2.08	2.15	2.24	2.35	2.46	2.59	2.72	2.87	3.04	3.21	3.60	4.03	4.27	5.04	5.62	6.25	7.65
1 200	2.19	2.26	2.34	2.44	2.55	2.68	2.81	2.96	3.12	3.29	3.48	3.89	4.35	4.60	5.43	6.04	6.71	8.19
1 300	2.36	2.44	2.53	2.64	2.76	2.89	3.03	3.19	3.36	3.55	3.75	4.18	4.67	4.93	5.81	6.45	7.15	8.71
1 400	2.53	2.62	2.72	2.83	2.96	3.10	3.26	3.42	3.60	3.80	4.01	4.47	4.98	5.26	6.17	6.84	7.57	9.20
1 450	2.62	2.71	2.81	2.93	3.06	3.21	3.36	3.54	3.72	3.92	4.14	4.61	5.13	5.41	6.34	7.03	7.78	9.44
1 500	2.70	2.80	2.90	3.02	3.36	3.31	3.47	3.65	3.84	4.05	4.26	4.74	5.28	5.57	6.52	7.22	7.98	9.66
1 600	2.87	2.97	3.08	3.21	3.59	3.51	3.69	3.87	4.07	4.29	4.52	5.02	5.57	5.87	6.86	7.58	8.37	10.10
1 750	3.11	3.22	3.35	3.49	3.64	3.81	4.00	4.20	4.41	4.64	4.88	5.41	6.00	6.31	7.34	8.10	8.91	10.72
1 800	3.18	3.30	3.43	3.58	3.74	3.91	4.10	4.30	4.52	4.76	5.00	5.54	6.13	6.45	7.49	8.26	9.09	10.91
2 000	3.48	3.61	3.76	3.92	4.10	4.29	4.50	4.72	4.95	5.20	5.47	6.03	6.66	6.99	8.08	8.88	9.73	11.61
2 400	4.00	4.17	4.36	4.56	4.79	5.00	5.24	5.49	5.75	6.03	6.32	6.94	7.61	7.96	9.10	9.93	10.80	12.71
2 800	4.40	4.62	4.85	5.09	5.34	5.61	5.88	6.16	6.45	6.75	7.06	7.71	8.40	8.77	9.91	10.72	11.58	13.40
3 000	4.55	4.80	5.05	5.32	5.59	5.87	6.15	6.45	6.75	7.07	7.38	8.05	8.74	9.10	10.23	11.03	11.85	13.60
3 600		5.10	5.44	5.78	6.12	6.46	6.80	7.14	7.48	7.82	8.16	8.84	9.52	9.86	10.87	11.55	12.23	13.58
4 000			5.49	5.89	6.29	6.67	7.05	7.42	7.79	8.14	8.49	9.17	9.81	10.13	11.02	11.57	12.10	13.06
5 000				5.32	5.88	6.42	6.92	7.38	7.82	8.22	8.59	9.23	9.73	9.94	10.35			
6 000				3.27	4.07	4.81	5.48	6.08	6.61	7.07	7.47	8.05	8.36	8.41				

■Standard Transmission Torque (Belt width 15 mm)

N・m

Number of teeth of small pulley	20	22	24	26	28	30	32	34	36	38	40	44	48	50	56	60	64	72
Pitch circle diameter mm	50.93	56.02	61.12	66.21	71.30	76.39	81.49	86.58	91.67	96.77	101.86	112.05	122.23	127.32	142.60	152.79	162.97	183.35
Small pulley revolution r/min																		
20	19.09	19.09	19.09	19.09	19.09	19.09	23.86	23.86	23.86	28.64	28.64	33.41	38.18	42.95	47.73	57.27	62.04	81.13
40	16.70	16.70	19.09	19.09	19.09	21.48	21.48	23.86	26.25	26.25	28.64	33.41	38.18	40.57	50.11	57.27	64.43	78.75
60	17.50	17.50	19.09	19.09	20.68	20.68	22.27	23.86	25.45	27.04	28.64	33.41	38.18	41.36	49.32	55.68	63.63	79.54
100	17.18	18.14	18.14	19.09	20.04	21.00	22.91	23.86	25.77	27.68	29.59	33.41	38.18	41.04	49.64	55.36	63.00	78.27
200	17.18	17.66	18.61	19.57	20.52	21.48	22.91	23.86	25.77	27.20	29.11	33.41	37.70	40.09	48.68	54.88	62.04	77.32
300	17.50	17.82	18.45	19.41	20.36	21.32	22.59	24.18	25.45	27.36	28.95	33.09	37.54	40.09	48.04	54.41	61.09	76.04
400	17.42	17.90	18.61	19.57	20.52	21.48	22.67	24.10	25.53	27.20	28.87	32.69	37.23	39.61	47.73	53.69	60.13	74.93
500	17.37	17.94	18.71	19.47	20.43	21.57	22.72	24.05	25.39	27.11	28.83	32.64	36.84	39.33	47.15	53.07	59.37	73.69
600	17.50	17.98	18.77	19.57	20.36	21.48	22.59	24.02	25.45	26.89	28.64	32.29	36.59	38.82	46.61	52.34	58.54	72.54
700	17.45	18.00	18.68	19.50	20.45	21.54	22.64	23.86	25.36	26.86	28.50	32.18	36.27	38.59	45.95	51.54	57.68	71.32
800	17.54	18.02	18.73	19.57	20.40	21.48	22.55	23.86	25.29	26.73	28.40	31.86	35.91	38.18	45.46	50.95	56.79	70.04
900	17.50	18.03	18.77	19.51	20.47	21.42	22.59	23.76	25.14	26.62	28.21	31.71	35.64	37.76	44.86	50.17	56.00	68.83
1 000	17.47	18.04	18.71	19.47	20.43	21.38	22.53	23.67	25.01	26.44	28.06	31.40	35.32	37.42	44.29	49.44	55.08	67.58
1 100	17.44	18.05	18.66	19.44	20.39	21.35	22.47	23.60	24.90	26.38	27.85	31.24	34.97	37.05	43.73	48.77	54.23	66.38
1 200	17.42	17.98	18.61	19.41	20.28	21.32	22.35	23.54	24.82	26.17	27.68	30.94	34.60	36.59	43.19	48.04	53.37	65.15
1 300	17.33	17.92	18.58	19.38	20.27	21.22	22.25	23.42	24.67	26.07	27.53	30.69	34.29	36.20	42.66	47.36	52.50	63.95
1 400	17.25	17.86	18.54	19.29	20.20	21.14	22.23	23.32	24.54	25.91	27.34	30.48	33.95	35.86	42.07	46.64	51.61	62.73
1 450	17.25	17.84	18.50	19.29	20.14	21.13	22.12	23.30	24.49	25.80	27.25	30.35	33.77	35.61	41.74	46.28	51.21	62.14
1 500	17.18	17.82	18.45	19.22	21.38	21.06	22.08	23.23	24.44	25.77	27.11	30.16	33.60	35.44	41.49	45.94	50.78	61.47
1 600	17.12	17.72	18.37	19.15	21.42	20.94	22.01	23.09	24.28	25.59	26.97	29.95	33.23	35.02	40.93	45.22	49.93	60.25
1 750	16.96	17.56	18.27	19.04	19.87	20.78	21.82	22.91	24.05	25.31	26.62	29.51	32.73	34.42	40.04	44.18	48.60	58.47
1 800	16.86	17.50	18.19	18.98	19.82	20.73	21.74	22.80	23.97	25.24	26.51	29.38	32.51	34.20	39.72	43.80	48.20	57.85
2 000	16.61	17.23	17.94	18.71	19.58	20.47	21.48	22.53	23.62	24.82	26.11	28.78	31.79	33.36	38.56	42.38	46.44	55.41
2 400	15.91	16.58	17.34	18.14	18.98	19.89	20.84	21.83	22.87	23.98	25.14	27.60	30.27	31.66	36.19	39.49	42.95	50.55
2 800	15.00	15.75	16.53	17.35	18.20	19.12	20.04	21.00	21.99	23.01	24.07	26.28	28.64	29.90	33.78	36.54	39.48	45.68
3 000	14.48	15.27	16.07	16.93	17.79	18.68	19.57	20.52	21.48	22.49	23.48	25.61	27.81	28.95	32.55	35.09	37.70	43.27
3 600		13.52	14.42	15.33	16.23	17.13	18.03	18.93	19.83	20.73	21.64	23.44	25.24	26.14	28.82	30.62	32.43	36.01
4 000			13.10	14.06	15.01	15.92	16.82	17.71	18.59	19.42	20.26	21.88	23.41	24.17	26.30	27.61	28.87	31.17
5 000				10.16	11.23	12.26	13.21	14.09	14.93	15.69	16.40	17.62	18.57	18.98	19.76			
6 000				5.20	6.47	7.65	8.72	9.67	10.52	11.25	11.88	12.81	13.30	13.38				

■Width Factor

Belt width mm	15	25	40	60
Width Factor	1.00	1.79	3.06	4.86

Belt Types and Dimensions P16,P23,P25

Selection and Design P45~

・notes;

The xxx area makes the belt life shorter and should be avoided.

The pulley speed increases to 33 m/s or over in the xxx area and therefore the pulleys must be kept in good balance.

The transmission capacity of the PX belt watertight type is 1.2 times the values listed in the above table.

Transmission Capacity Tables

PX BELT

P14M

■Standard Transmission Capacity

(Belt width 40 mm) kW

Number of teeth of small pulley		28	30	32	34	36	38	40	42	44	46	48	50	56	60	64	72
Pitch circle diameter mm		124.78	133.69	142.60	151.52	160.43	169.34	178.25	187.17	196.08	204.99	213.90	222.82	249.55	267.38	285.21	320.86
Small pulley revolution r/min	20	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.3	1.4
	40	0.7	0.8	1.0	1.1	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.3	2.4	2.6	2.8
	60	1.0	1.3	1.5	1.7	1.9	2.1	2.2	2.4	2.6	2.7	2.9	3.0	3.4	3.6	3.8	4.2
	100	1.7	2.1	2.5	2.8	3.1	3.4	3.7	4.0	4.2	4.5	4.7	4.9	5.5	5.9	6.2	6.8
	200	3.4	4.2	4.9	5.5	6.1	6.7	7.2	7.7	8.2	8.7	9.1	9.5	10.6	11.3	11.9	13.0
	400	6.7	8.1	9.5	10.7	11.8	12.8	13.8	14.7	15.5	16.3	17.0	17.7	19.6	20.6	21.6	23.4
	500	8.2	10.0	11.6	13.1	14.4	15.7	16.8	17.9	18.8	19.7	20.6	21.3	23.4	24.7	25.8	27.8
	600	9.8	11.9	13.8	15.5	17.0	18.4	19.7	20.9	22.0	22.9	23.9	24.8	27.0	28.3	29.5	31.6
	800	12.9	15.5	17.9	20.0	21.9	23.5	25.0	26.4	27.7	28.8	29.8	30.8	33.2	34.6	35.8	38.0
	1 000	15.8	19.0	21.7	24.2	26.3	28.2	29.8	31.3	32.6	33.8	34.9	35.9	38.3	39.6	40.8	42.8
	1 200	18.7	22.3	25.4	28.1	30.4	32.4	34.1	35.6	37.0	38.1	39.2	40.1	42.4	43.5	44.5	46.2
	1 400	21.5	25.4	28.8	31.7	34.1	36.2	37.9	39.4	40.8	41.8	42.8	43.7	45.6	46.5	47.3	48.6
	1 450	22.1	26.2	29.6	32.5	35.0	37.1	38.8	40.3	41.6	42.7	43.6	44.4	46.2	47.1	47.8	49.0
	1 500	22.8	27.0	30.5	33.4	35.9	37.9	39.7	41.1	42.4	43.5	44.4	45.2	46.9	47.7	48.3	49.4
	1 600	24.1	28.4	32.0	35.0	37.5	39.6	41.3	42.7	44.0	44.9	45.8	46.5	48.0	48.7	49.2	50.0
	1 750	26.1	30.6	34.3	37.4	39.9	41.9	43.6	44.9	46.1	46.9	47.7	48.3	49.4	49.8	50.1	50.6
	1 800	26.7	31.3	35.0	38.1	40.6	42.6	44.3	45.6	46.7	47.5	48.2	48.8	49.7	50.1	50.3	50.7
	2 000	29.2	34.0	37.9	41.0	43.5	45.4	46.9	48.1	49.0	49.7	50.2	50.6	51.0	51.0	50.9	50.8
	2 400	33.9	39.1	43.0	46.1	48.3	50.0	51.2	51.9	52.5	52.7	52.8	52.7	52.0	51.4	50.7	49.4
	3 000	40.4	45.7	49.5	52.2	53.9	54.9	55.4	55.4	55.2	54.7	54.2	53.4	51.0			
	3 600	46.1	51.3	54.7	56.7	57.6	57.8	57.5	56.8	55.8							
	4 000	49.6	54.6	57.6	58.8	59.4	59.0	58.1									

■Standard Transmission Torque

(Belt width 40 mm) N・m

Number of teeth of small pulley		28	30	32	34	36	38	40	42	44	46	48	50	56	60	64	72
Pitch circle diameter mm		124.78	133.69	142.60	151.52	160.43	169.34	178.25	187.17	196.08	204.99	213.90	222.82	249.55	267.38	285.21	320.86
Small pulley revolution r/min	20	162	200	239	272	301	334	358	387	410	434	458	482	544	582	616	682
	40	165	200	236	270	301	332	358	384	410	434	458	480	539	577	611	673
	60	164	200	235	269	301	329	356	382	407	431	453	476	536	571	606	667
	100	162	200	235	267	298	326	353	379	403	426	449	470	527	562	595	653
	200	161	198	231	263	292	319	345	369	392	413	434	453	506	537	567	619
	400	159	194	226	255	281	306	329	350	370	388	406	422	467	492	516	558
	500	157	191	222	250	276	299	321	341	359	376	392	407	447	471	492	530
	600	156	189	219	246	271	293	313	332	349	365	380	394	430	451	470	503
	800	154	185	213	238	261	281	299	315	330	343	356	367	396	413	428	453
	1 000	151	181	208	231	251	269	285	299	312	323	333	342	365	378	389	408
	1 200	149	177	202	223	242	257	271	283	294	303	312	319	337	346	354	368
	1 400	146	173	196	216	232	247	259	269	278	285	292	298	311	317	322	331
	1 450	146	173	195	214	230	244	256	265	274	281	287	292	304	310	315	323
	1 500	145	172	194	212	228	241	253	262	270	276	283	287	298	303	308	314
	1 600	144	170	191	209	224	236	247	255	262	268	273	278	286	290	293	298
	1 750	142	167	187	204	218	229	238	245	251	256	260	263	270	272	273	276
	1 800	141	166	186	202	215	226	235	242	248	252	256	259	264	266	267	269
	2 000	139	162	181	196	207	217	224	229	234	237	240	241	243	243	243	242
	2 400	135	155	171	183	192	199	204	206	209	209	210	210	207	204	201	197
	3 000	128	145	158	166	171	175	176	176	176	174	172	170	162			
	3 600	122	136	145	150	153	153	152	150	148							
	4 000	118	130	137	140	142	141	139									

■Width Factor

Belt width mm	40	60	80	100	120
Width Factor	1.00	1.59	2.20	2.84	3.50

Belt Types and Dimensions P17,P25
Selection and Design P45～

・notes;
The xxx area makes the belt life shorter and should be avoided.
The pulley speed increases to 33 m/s or over in the xxx area and therefore the pulleys must be kept in good balance.

Transmission Capacity Tables

ULTRA PX BELT HC TYPE

UP3M-HC

■Standard Transmission Capacity (Belt width 6 mm)

W

Number of teeth of small pulley	12	14	15	16	18	20	22	24	25	26	28	30	32	36	40	48	50	60
Pitch circle diameter mm	11.5	13.4	14.3	15.3	17.2	19.10	21	22.9	23.9	24.8	26.7	28.7	30.6	34.4	38.20	45.8	47.8	57.30
Small pulley revolution r/min																		
20	2	2	3	3	4	4	5	6	6	6	7	7	8	9	10	12	13	15
40	3	4	5	6	7	8	9	10	11	11	13	14	15	17	19	23	24	29
60	5	6	7	8	10	11	13	15	16	16	18	20	21	24	27	33	34	41
100	7	10	11	13	15	18	21	23	24	26	28	31	33	38	43	51	54	64
200	14	18	21	24	29	33	38	43	45	47	52	56	61	70	78	94	98	118
400	25	34	38	43	52	60	69	77	82	86	94	103	111	127	142	172	179	215
600	35	48	54	61	73	85	98	109	116	121	133	145	156	179	201	243	253	304
800	44	60	69	77	93	109	125	140	147	155	170	185	199	229	256	310	323	388
1 000	53	73	83	93	112	131	150	168	178	187	205	223	241	275	309	373	388	467
1 200	63	86	98	109	132	155	177	198	210	220	241	262	283	324	363	439	457	549
1 400	71	99	113	125	151	176	203	227	240	252	277	301	325	371	417	504	524	631
1 450	74	103	116	130	157	183	210	234	247	260	286	312	336	384	430	520	541	650
1 500	77	105	120	133	162	188	217	242	255	268	295	321	345	395	443	536	558	671
1 600	80	111	127	141	172	200	229	256	272	284	313	340	366	420	470	568	591	711
1 750	89	120	138	154	185	217	248	278	294	309	339	369	396	455	510	615	643	771
1 800		124	140	157	191	222	256	285	301	317	348	378	407	466	522	632	659	791
2 000		137	155	174	210	244	281	315	331	349	381	416	448	514	576	694	724	870
2 400		160	183	202	246	285	329	368	387	407	445	487	523	600	672	810	846	1 015
3 000			222	246	299	348	398	447	472	496	542	591	637	729	817	986	1 024	1 229
3 600			256	286	349	405	465	520	550	575	631	686	742	848	950	1 142	1 193	1 428
4 000			282	315	382	444	506	568	602	631	693	755	812	927	1 037	1 252	1 299	1 557
5 000			337	373	458	530	608	681	717	753	825	898	970	1 108	1 235	1 488	1 548	1 843
6 000				434	520	607	694	781	824	867	947	1 026	1 106	1 265	1 417	1 692	1 764	2 089
8 000					646	752	858	964	1 012	1 060	1 166	1 263	1 359	1 542	1 725	2 053	2 130	2 496
10 000						879	1 000	1 120	1 181	1 241	1 349	1 470	1 578	1 783	1 976	2 325	2 410	2 771
12 000						983	1 128	1 258	1 330	1 388	1 518	1 648	1 749	1 981	2 183	2 530	2 602	2 920
14 000							1 248	1 383	1 451	1 518	1 653	1 788	1 906	2 125	2 328	2 648	2 699	2 918

■Standard Transmission Torque (Belt width 6 mm)

N・m

Number of teeth of small pulley	12	14	15	16	18	20	22	24	25	26	28	30	32	36	40	48	50	60
Pitch circle diameter mm	11.5	13.4	14.3	15.3	17.2	19.10	21	22.9	23.9	24.8	26.7	28.7	30.6	34.4	38.20	45.8	47.8	57.30
Small pulley revolution r/min																		
20	0.83	1.14	1.30	1.45	1.76	2.05	2.35	2.63	2.78	2.92	3.20	3.48	3.76	4.30	4.82	5.82	6.08	7.30
40	0.77	1.07	1.21	1.35	1.64	1.91	2.19	2.45	2.59	2.72	2.99	3.25	3.50	4.00	4.49	5.44	5.66	6.81
60	0.74	1.02	1.16	1.29	1.57	1.82	2.10	2.34	2.48	2.61	2.86	3.11	3.35	3.84	4.31	5.20	5.42	6.51
100	0.70	0.96	1.09	1.22	1.48	1.72	1.98	2.21	2.34	2.46	2.69	2.94	3.16	3.62	4.06	4.91	5.11	6.15
200	0.64	0.88	1.00	1.13	1.36	1.59	1.82	2.04	2.15	2.26	2.48	2.69	2.91	3.32	3.72	4.50	4.70	5.65
400	0.58	0.80	0.91	1.02	1.24	1.44	1.65	1.85	1.96	2.05	2.25	2.45	2.64	3.03	3.40	4.09	4.27	5.14
600	0.56	0.76	0.86	0.97	1.16	1.36	1.56	1.74	1.84	1.93	2.12	2.31	2.49	2.85	3.20	3.86	4.03	4.84
800	0.52	0.72	0.82	0.92	1.11	1.30	1.49	1.67	1.76	1.85	2.03	2.21	2.38	2.73	3.06	3.69	3.85	4.63
1 000	0.50	0.70	0.79	0.89	1.07	1.25	1.43	1.61	1.70	1.78	1.96	2.13	2.30	2.63	2.95	3.56	3.71	4.46
1 200	0.50	0.69	0.78	0.86	1.05	1.23	1.41	1.57	1.67	1.75	1.92	2.08	2.25	2.57	2.89	3.49	3.64	4.37
1 400	0.48	0.67	0.77	0.85	1.03	1.20	1.38	1.55	1.63	1.72	1.89	2.06	2.21	2.53	2.85	3.44	3.57	4.30
1 450	0.49	0.68	0.76	0.86	1.04	1.20	1.38	1.54	1.63	1.71	1.88	2.05	2.21	2.53	2.83	3.42	3.56	4.28
1 500	0.49	0.67	0.76	0.85	1.03	1.20	1.38	1.54	1.62	1.71	1.88	2.05	2.19	2.51	2.82	3.41	3.55	4.27
1 600	0.48	0.66	0.76	0.84	1.02	1.19	1.36	1.52	1.62	1.69	1.87	2.03	2.19	2.51	2.80	3.39	3.53	4.24
1 750	0.48	0.66	0.75	0.84	1.01	1.18	1.35	1.52	1.60	1.69	1.85	2.01	2.16	2.48	2.78	3.35	3.50	4.20
1 800		0.66	0.74	0.83	1.01	1.18	1.36	1.51	1.60	1.68	1.84	2.01	2.16	2.47	2.77	3.35	3.49	4.19
2 000		0.65	0.74	0.83	1.00	1.17	1.34	1.50	1.58	1.67	1.82	1.98	2.14	2.45	2.75	3.31	3.46	4.15
2 400		0.64	0.73	0.80	0.98	1.13	1.31	1.46	1.54	1.62	1.77	1.94	2.08	2.39	2.67	3.22	3.37	4.04
3 000			0.71	0.78	0.95	1.11	1.27	1.42	1.50	1.58	1.72	1.88	2.03	2.32	2.60	3.14	3.26	3.91
3 600			0.68	0.76	0.93	1.07	1.23	1.38	1.46	1.53	1.67	1.82	1.97	2.25	2.52	3.03	3.16	3.79
4 000			0.67	0.75	0.91	1.06	1.21	1.36	1.44	1.50	1.65	1.80	1.94	2.21	2.47	2.99	3.10	3.72
5 000			0.64	0.71	0.87	1.01	1.16	1.30	1.37	1.44	1.58	1.71	1.85	2.12	2.36	2.84	2.96	3.52
6 000				0.69	0.83	0.97	1.10	1.24	1.31	1.38	1.51	1.63	1.76	2.01	2.25	2.69	2.81	3.32
8 000					0.77	0.90	1.02	1.15	1.21	1.27	1.39	1.51	1.62	1.84	2.06	2.45	2.54	2.98
10 000						0.84	0.95	1.07	1.13	1.18	1.29	1.40	1.51	1.70	1.89	2.22	2.30	2.65
12 000						0.78	0.90	1.00	1.06	1.10	1.21	1.31	1.39	1.58	1.74	2.01	2.07	2.32
14 000							0.85	0.94	0.99	1.04	1.13	1.22	1.30	1.45	1.59	1.81	1.84	1.99

■Width Factor

Belt width mm	6	10	15
Width Factor	1.00	1.78	2.84

Belt Types and Dimensions P14,P23
Selection and Design P45～

・notes;
The xxx area makes the belt life shorter and should be avoided.

Transmission Capacity Tables

ULTRA PX BELT HC TYPE

UP5M-HC

■Standard Transmission Capacity

(Belt width 10 mm) W

Number of teeth of small pulley	12	14	16	18	20	22	24	26	28	30	32	36	40	44	48	50	60	72
Pitch circle diameter mm	19.10	22.28	25.46	28.65	31.83	35.01	38.20	41.38	44.56	47.75	50.93	57.30	63.66	70.03	76.39	79.58	95.49	114.59
Small pulley revolution r/min																		
20	10	12	15	17	19	21	24	26	29	31	34	39	45	51	58	61	78	101
40	19	23	28	32	36	40	45	49	54	59	64	74	85	96	108	114	147	187
60	27	32	39	45	50	56	63	69	76	83	90	104	119	135	152	161	206	267
100	41	50	60	69	78	88	97	107	118	128	139	162	185	210	236	249	321	420
200	76	92	111	128	145	162	180	198	215	237	257	298	342	388	436	460	592	774
400	141	170	206	236	267	299	332	366	401	437	474	550	631	715	804	849	1 092	1 430
500	172	207	251	287	325	364	405	446	488	532	577	670	769	871	979	1 034	1 330	1 741
600	202	243	295	338	382	428	475	524	574	625	678	788	903	1 024	1 151	1 216	1 563	2 045
800	260	314	380	436	492	552	613	675	740	806	875	1 016	1 164	1 320	1 483	1 567	2 016	2 637
1 000	316	382	463	531	600	672	747	822	901	982	1 065	1 238	1 418	1 609	1 806	1 909	2 454	3 210
1 200	376	453	550	630	713	799	887	977	1 070	1 167	1 265	1 470	1 685	1 910	2 146	2 266	2 913	3 811
1 400	436	526	637	730	826	924	1 026	1 132	1 240	1 351	1 466	1 702	1 951	2 212	2 484	2 625	3 372	4 409
1 450		544	658	755	854	957	1 061	1 171	1 283	1 397	1 516	1 760	2 017	2 288	2 569	2 714	3 488	4 559
1 500		561	681	780	883	988	1 098	1 209	1 324	1 444	1 566	1 819	2 084	2 364	2 654	2 803	3 601	4 707
1 600		599	724	831	940	1 052	1 169	1 287	1 410	1 537	1 667	1 935	2 218	2 514	2 823	2 984	3 833	5 007
1 750		652	790	907	1 025	1 147	1 275	1 405	1 539	1 677	1 817	2 111	2 420	2 743	3 080	3 254	4 178	5 455
1 800			813	931	1 053	1 179	1 309	1 443	1 582	1 724	1 868	2 171	2 486	2 820	3 165	3 344	4 293	5 605
2 000			902	1 032	1 169	1 309	1 453	1 601	1 754	1 912	2 071	2 407	2 757	3 124	3 508	3 707	4 687	6 201
2 400			1 068	1 222	1 386	1 552	1 720	1 897	2 077	2 262	2 453	2 849	3 261	3 695	4 146	4 378	5 485	7 293
3 000				1 517	1 714	1 918	2 130	2 348	2 570	2 798	3 034	3 520	4 027	4 559	5 108	5 389	6 614	8 885
3 600				1 794	2 029	2 272	2 519	2 774	3 039	3 307	3 584	4 151	4 743	5 361	5 996	6 320	7 629	10 250
4 000					2 245	2 513	2 785	3 067	3 358	3 655	3 956	4 577	5 226	5 895	6 583	6 932	8 040	11 069
5 000					2 747	3 072	3 404	3 747	4 090	4 446	4 807	5 542	6 301	7 066	7 843	8 229	9 048	
6 000					3 217	3 585	3 969	4 359	4 757	5 154	5 559	6 376	7 185	7 995	8 776	9 159		
8 000							5 002	5 455	5 908	6 361	6 795	7 624	8 366	8 993	9 465	9 619		
10 000								6 313	6 747	7 156	7 518	8 072	8 349	8 253				
12 000								6 824	7 142	7 359	7 475	7 316						
14 000								6 848	6 882	6 730								

■Standard Transmission Torque

(Belt width 10 mm) N・m

Number of teeth of small pulley	12	14	16	18	20	22	24	26	28	30	32	36	40	44	48	50	60	72
Pitch circle diameter mm	19.10	22.28	25.46	28.65	31.83	35.01	38.20	41.38	44.56	47.75	50.93	57.30	63.66	70.03	76.39	79.58	95.49	114.59
Small pulley revolution r/min																		
20	4.81	5.80	7.04	8.06	9.13	10.22	11.36	12.51	13.71	14.94	16.20	18.82	21.58	24.46	27.48	29.04	37.34	48.25
40	4.53	5.47	6.62	7.59	8.59	9.61	10.68	11.77	12.89	14.05	15.23	17.70	20.29	23.01	25.85	27.31	35.11	44.53
60	4.23	5.11	6.19	7.09	8.03	8.99	9.98	11.00	12.05	13.14	14.25	16.55	18.97	21.52	24.17	25.54	32.84	42.49
100	3.95	4.76	5.76	6.61	7.48	8.37	9.30	10.25	11.23	12.24	13.27	15.42	17.68	20.04	22.52	23.80	30.60	40.06
200	3.64	4.39	5.32	6.10	6.91	7.73	8.58	9.46	10.26	11.29	12.26	14.23	16.32	18.51	20.79	21.96	28.24	36.96
400	3.36	4.05	4.91	5.63	6.37	7.13	7.92	8.73	9.56	10.42	11.31	13.13	15.05	17.07	19.18	20.26	26.06	34.12
500	3.28	3.95	4.79	5.48	6.21	6.95	7.72	8.51	9.33	10.16	11.02	12.80	14.68	16.64	18.69	19.75	25.40	33.24
600	3.21	3.86	4.69	5.38	6.07	6.80	7.55	8.34	9.13	9.95	10.79	12.53	14.37	16.29	18.30	19.34	24.86	32.54
800	3.10	3.75	4.54	5.20	5.88	6.59	7.32	8.06	8.83	9.62	10.43	12.12	13.89	15.75	17.70	18.70	24.05	31.47
1 000	3.02	3.65	4.42	5.07	5.73	6.42	7.13	7.85	8.60	9.37	10.17	11.81	13.53	15.36	17.24	18.22	23.42	30.64
1 200	2.99	3.61	4.38	5.01	5.67	6.36	7.05	7.77	8.51	9.28	10.07	11.69	13.40	15.19	17.07	18.03	23.17	30.31
1 400	2.97	3.58	4.34	4.97	5.63	6.30	7.00	7.72	8.45	9.21	9.99	11.60	13.30	15.08	16.94	17.90	22.99	30.06
1 450		3.58	4.33	4.97	5.62	6.30	6.99	7.71	8.45	9.20	9.98	11.58	13.28	15.06	16.91	17.86	22.96	30.01
1 500		3.57	4.34	4.96	5.62	6.29	6.99	7.70	8.43	9.19	9.96	11.58	13.26	15.04	16.89	17.84	22.92	29.96
1 600		3.57	4.32	4.96	5.61	6.28	6.97	7.68	8.41	9.17	9.95	11.54	13.23	15.00	16.84	17.80	22.87	29.87
1 750		3.56	4.31	4.95	5.59	6.26	6.96	7.66	8.40	9.15	9.91	11.51	13.20	14.96	16.80	17.75	22.79	29.76
1 800			4.31	4.94	5.58	6.25	6.94	7.65	8.39	9.14	9.91	11.51	13.18	14.95	16.78	17.73	22.77	29.72
2 000			4.31	4.93	5.58	6.25	6.93	7.64	8.37	9.12	9.89	11.49	13.16	14.91	16.74	17.69	22.37	29.59
2 400			4.25	4.86	5.51	6.17	6.84	7.55	8.26	9.00	9.76	11.33	12.97	14.70	16.49	17.41	21.81	29.01
3 000				4.83	5.45	6.10	6.78	7.47	8.18	8.90	9.65	11.20	12.81	14.50	16.25	17.15	21.04	28.27
3 600				4.76	5.38	6.02	6.68	7.36	8.06	8.77	9.50	11.01	12.58	14.22	15.90	16.76	20.23	27.18
4 000					5.36	6.00	6.65	7.32	8.01	8.72	9.44	10.92	12.47	14.07	15.71	16.54	19.19	26.41
5 000					5.24	5.87	6.50	7.15	7.81	8.49	9.18	10.58	12.03	13.49	14.97	15.71	17.27	
6 000					5.12	5.70	6.31	6.93	7.57	8.20	8.84	10.14	11.43	12.72	13.96	14.57		
8 000							5.97	6.51	7.05	7.59	8.11	9.10	9.98	10.73	11.29	11.48		
10 000								6.03	6.44	6.83	7.18	7.71	7.97	7.88				
12 000								5.43	5.68	5.85	5.95	5.82						
14 000								4.67	4.69	4.59								

■Width Factor

Belt width mm	10	15	25
Width Factor	1.00	1.59	2.84

Belt Types and Dimensions P15,P23
Selection and Design P45～

・notes;
The xxx area makes the belt life shorter and should be avoided.

Transmission Capacity Tables

ULTRA PX BELT HC TYPE

UP8M-HC

■Standard Transmission Capacity

(Belt width 15 mm)

kW

Number of teeth of small pulley	20	22	24	26	28	30	32	34	36	38	40	44	48	50	56	60	64	72
Pitch circle diameter mm	50.93	56.02	61.12	66.21	71.30	76.39	81.49	86.58	91.67	96.77	101.86	112.05	122.23	127.32	142.60	152.79	162.97	183.35
Small pulley revolution r/min																		
20	0.11	0.12	0.13	0.14	0.15	0.17	0.18	0.19	0.20	0.21	0.23	0.25	0.28	0.29	0.33	0.36	0.40	0.46
40	0.19	0.21	0.24	0.26	0.28	0.30	0.33	0.36	0.38	0.40	0.42	0.47	0.52	0.55	0.62	0.67	0.73	0.84
60	0.27	0.31	0.34	0.37	0.40	0.44	0.47	0.50	0.53	0.56	0.60	0.67	0.74	0.77	0.89	0.96	1.04	1.20
100	0.43	0.48	0.52	0.57	0.62	0.67	0.71	0.77	0.82	0.88	0.93	1.03	1.14	1.20	1.38	1.50	1.62	1.87
200	0.76	0.84	0.93	1.01	1.10	1.19	1.28	1.37	1.46	1.57	1.69	1.85	2.06	2.16	2.48	2.70	2.93	3.40
300	1.06	1.17	1.29	1.41	1.54	1.66	1.78	1.92	2.05	2.18	2.29	2.59	2.88	3.03	3.48	3.79	4.11	4.79
400	1.32	1.47	1.62	1.78	1.93	2.09	2.25	2.41	2.59	2.75	2.92	3.28	3.65	3.84	4.41	4.81	5.22	6.08
500	1.57	1.75	1.93	2.12	2.30	2.50	2.69	2.89	3.09	3.30	3.50	3.93	4.37	4.60	5.30	5.78	6.29	7.32
600	1.81	2.01	2.22	2.44	2.65	2.88	3.10	3.33	3.57	3.80	4.05	4.54	5.06	5.32	6.14	6.71	7.29	8.51
700	2.04	2.26	2.50	2.75	2.99	3.24	3.50	3.75	4.02	4.29	4.57	5.13	5.72	6.02	6.95	7.59	8.26	9.65
800	2.25	2.51	2.77	3.04	3.31	3.59	3.87	4.17	4.46	4.76	5.07	5.70	6.35	6.69	7.73	8.45	9.20	10.75
900	2.46	2.74	3.03	3.32	3.61	3.92	4.24	4.55	4.88	5.21	5.55	6.25	6.97	7.34	8.48	9.29	10.11	11.83
1 000	2.66	2.96	3.28	3.58	3.91	4.24	4.58	4.93	5.28	5.64	6.02	6.78	7.56	7.96	9.22	10.08	10.99	12.88
1 100	2.86	3.19	3.52	3.87	4.23	4.59	4.95	5.33	5.71	6.10	6.51	7.32	8.18	8.62	9.99	10.93	11.91	13.97
1 200	3.06	3.42	3.78	4.15	4.53	4.92	5.31	5.72	6.13	6.55	6.98	7.87	8.79	9.26	10.74	11.76	12.83	15.05
1 300	3.26	3.64	4.02	4.42	4.82	5.24	5.67	6.10	6.54	6.99	7.45	8.40	9.40	9.90	11.49	12.59	13.73	16.11
1 400	3.46	3.86	4.27	4.69	5.12	5.57	6.01	6.47	6.95	7.43	7.92	8.94	9.99	10.53	12.23	13.40	14.62	17.17
1 450	3.55	3.96	4.39	4.82	5.26	5.72	6.18	6.66	7.15	7.64	8.15	9.20	10.28	10.84	12.59	13.80	15.06	17.69
1 500	3.65	4.07	4.51	4.95	5.41	5.87	6.35	6.85	7.35	7.85	8.38	9.46	10.58	11.15	12.95	14.20	15.50	18.22
1 600	3.83	4.27	4.73	5.21	5.69	6.18	6.69	7.21	7.74	8.28	8.84	9.98	11.16	11.77	13.68	15.00	16.37	19.26
1 750	4.11	4.59	5.08	5.59	6.12	6.64	7.19	7.75	8.32	8.91	9.50	10.74	12.03	12.69	14.75	16.19	17.68	20.81
1 800	4.19	4.69	5.20	5.71	6.25	6.79	7.35	7.92	8.52	9.11	9.72	11.00	12.31	12.99	15.10	16.58	18.11	21.32
2 000	4.56	5.09	5.65	6.21	6.79	7.39	8.00	8.63	9.28	9.93	10.61	11.99	13.44	14.18	16.51	18.14	19.82	23.37
2 400	5.25	5.87	6.51	7.17	7.85	8.54	9.27	10.00	10.75	11.52	12.31	13.95	15.65	16.53	19.27	21.20	23.18	27.38
2 800	5.91	6.61	7.34	8.09	8.87	9.66	10.48	11.32	12.18	13.06	13.97	15.84	17.81	18.81	21.97	24.19	26.49	31.35
3 000	6.22	6.97	7.75	8.54	9.37	10.21	11.09	11.97	12.89	13.82	14.79	16.78	18.87	19.94	23.31	25.68	28.13	33.30
3 600	6.93	7.79	8.66	9.56	10.49	11.45	12.44	13.46	14.50	15.57	16.66	18.94	21.33	22.56	26.44	29.15	31.97	37.94
4 000	7.36	8.29	9.20	10.18	11.18	12.20	13.27	14.36	15.48	16.63	17.81	20.27	22.85	24.18	28.37	31.30	34.36	40.81
5 000	8.29	9.34	10.41	11.52	12.68	13.87	15.10	16.38	17.68	19.02	20.40	23.26	26.29	27.84	32.75	36.20		
6 000	9.05	9.05	11.41	12.65	13.95	15.28	16.66	18.08	19.55	21.06	22.61	25.85	29.24	31.02	36.56	40.46		

■Standard Transmission Torque

(Belt width 15 mm)

N · m

Number of teeth of small pulley	20	22	24	26	28	30	32	34	36	38	40	44	48	50	56	60	64	72
Pitch circle diameter mm	50.93	56.02	61.12	66.21	71.30	76.39	81.49	86.58	91.67	96.77	101.86	112.05	122.23	127.32	142.60	152.79	162.97	183.35
Small pulley revolution r/min																		
20	53.2	58.0	62.9	67.7	72.5	82.2	87.0	91.9	96.7	101.5	111.2	120.9	135.4	140.2	159.5	174.0	188.6	217.6
40	46.1	50.9	58.2	63.0	67.9	72.7	77.6	84.9	89.7	94.6	99.4	111.5	123.7	130.9	147.9	160.0	174.6	201.2
60	43.7	48.6	53.4	58.3	63.1	69.6	74.5	79.3	84.2	89.1	95.5	106.9	118.2	123.1	140.9	152.2	165.2	191.1
100	40.9	45.8	49.7	54.5	59.4	64.3	68.2	73.0	77.9	83.7	88.6	98.3	109.0	114.9	131.4	143.1	154.8	178.2
200	36.1	40.0	44.4	48.3	52.7	56.6	61.0	65.4	69.8	74.7	80.6	88.4	98.1	103.0	118.2	128.9	139.6	162.1
300	33.6	37.2	41.1	45.0	48.9	52.8	56.7	61.0	65.2	69.4	72.7	82.5	91.6	96.5	110.9	120.6	130.7	152.3
400	31.6	35.0	38.7	42.4	46.0	49.9	53.6	57.5	61.7	65.6	69.8	78.3	87.2	91.6	105.3	114.8	124.6	145.2
500	30.0	33.3	36.9	40.4	43.9	47.6	51.4	55.1	59.0	62.9	66.9	75.1	83.5	87.8	101.2	110.4	120.0	139.8
600	28.8	32.0	35.3	38.8	42.2	45.8	49.4	53.0	56.7	60.5	64.4	72.3	80.4	84.7	97.6	106.8	115.9	135.4
700	27.8	30.9	34.1	37.4	40.8	44.2	47.7	51.2	54.8	58.5	62.3	70.0	78.0	82.0	94.8	103.5	112.6	131.5
800	26.9	30.0	33.0	36.2	39.5	42.8	46.2	49.7	53.2	56.8	60.5	68.0	75.8	79.8	92.2	100.8	109.8	128.3
900	26.1	29.0	32.1	35.2	38.3	41.6	45.0	48.3	51.8	55.3	58.9	66.3	73.9	77.9	90.0	98.5	107.2	125.5
1 000	25.4	28.2	31.3	34.2	37.4	40.5	43.8	47.1	50.4	53.9	57.4	64.7	72.2	76.0	88.0	96.3	104.9	122.9
1 100	24.8	27.7	30.6	33.6	36.7	39.8	43.0	46.2	49.5	53.0	56.5	63.6	71.0	74.8	86.7	94.8	103.4	121.2
1 200	24.4	27.2	30.1	33.0	36.1	39.1	42.3	45.5	48.7	52.1	55.5	62.6	70.0	73.7	85.5	93.6	102.0	119.7
1 300	23.9	26.7	29.5	32.5	35.4	38.5	41.6	44.8	48.0	51.3	54.7	61.7	69.0	72.7	84.3	92.4	100.8	118.3
1 400	23.6	26.3	29.1	32.0	34.9	37.9	41.0	44.1	47.4	50.7	54.0	60.9	68.1	71.8	83.4	91.3	99.7	117.1
1 450	23.4	26.1	28.9	31.7	34.7	37.6	40.7	43.8	47.0	50.3	53.6	60.5	67.7	71.4	82.9	90.9	99.2	116.5
1 500	23.2	25.9	28.7	31.5	34.4	37.4	40.4	43.6	46.7	50.0	53.4	60.2	67.3	71.0	82.4	90.4	98.6	116.0
1 600	22.8	25.5	28.2	31.1	34.0	36.9	39.9	43.0	46.2	49.4	52.7	59.5	66.6	70.2	81.6	89.5	97.7	114.9
1 750	22.4	25.0	27.7	30.5	33.4	36.2	39.2	42.3	45.4	48.6	51.8	58.6	65.6	69.2	80.4	88.3	96.5	113.5
1 800	22.2	24.9	27.6	30.3	33.2	36.0	39.0	42.0	45.2	48.3	51.6	58.3	65.3	68.9	80.1	87.9	96.0	113.1
2 000	21.7	24.3	26.9	29.7	32.4	35.3	38.2	41.2	44.3	47.4	50.6	57.2	64.1	67.7	78.8	86.6	94.6	111.5
2 400	20.9	23.3	25.9	28.5	31.2	34.0	36.9	39.8	42.8	45.8	49.0	55.5	62.2	65.7	76.6	84.3	92.2	108.9
2 800	20.1	22.5	25.0	27.6	30.2	32.9	35.7	38.6	41.5	44.5	47.6	54.0	60.7	64.1	74.9	82.5	90.3	106.9
3 000	19.8	22.2	24.7	27.2	29.8	32.5	35.3	38.1	41.0	44.0	47.1	53.4	60.0	63.4	74.2	81.7	89.5	106.0
3 600	18.4	20.6	23.0	25.3	27.8	30.4	33.0	35.7	38.4	41.3	44.2	50.2	56.6	59.8	70.1	77.3	84.8	100.6
4 000	17.6	19.8	22.0	24.3	26.7	29.1	31.7	34.3	36.9	39.7	42.5	48.4	54.5	57.7	67.7	74.7	82.0	97.4
5 000	15.8	17.8	19.9	22.0	24.2	26.5	28.8	31.3	33.7	36.3	38.9	44.4	50.2	53.2	62.5	69.1		
6 000	14.4	14.4	18.1	20.1	22.2	24.3	26.5	28.8	31.1	33.5	36.0	41.1	46.5	49.3	58.2	64.4		

■Width Factor

Belt width mm	15	25	40	60
Width Factor	1.00	1.79	3.06	4.86

Belt Types and Dimensions P16,P23

Selection and Design P45～

· notes;

The xxx area makes the belt life shorter and should be avoided.

The pulley speed increases to 33 m/s or over in the xxx area and therefore the pulleys must be kept in good balance.

Transmission Capacity Tables

ULTRA PX BELT HC TYPE

UP14M-HC

■Standard Transmission Capacity (Belt width 40 mm)

kW

Number of teeth of small pulley	28	30	32	34	36	38	40	42	44	46	48	50	56	60	64	72
Pitch circle diameter mm	124.78	133.69	142.60	151.52	160.43	169.34	178.25	187.17	196.08	204.99	213.90	222.82	249.55	267.38	285.21	320.86
Small pulley revolution r/min																
20	1.0	1.1	1.1	1.2	1.3	1.4	1.5	1.5	1.6	1.7	1.8	1.9	2.1	2.2	2.4	2.7
40	1.9	2.0	2.2	2.3	2.5	2.7	2.8	3.0	3.1	3.4	3.5	3.7	4.1	4.4	4.7	5.3
60	2.7	3.1	3.3	3.5	3.8	4.0	4.2	4.4	4.7	4.9	5.1	5.4	6.0	6.5	6.9	7.8
100	4.5	4.9	5.2	5.6	6.0	6.4	6.2	7.1	7.4	7.9	8.3	8.6	9.7	10.4	11.1	12.6
200	8.3	9.0	9.7	10.4	11.3	11.9	12.6	13.3	14.0	14.6	15.3	16.1	18.1	19.4	20.9	23.6
400	15.2	16.5	17.8	19.0	20.3	21.5	22.8	24.0	25.2	26.5	27.7	28.9	32.5	35.0	37.4	42.3
500	18.4	19.9	21.5	22.9	24.5	26.0	27.4	28.9	30.3	31.8	33.3	34.8	39.1	42.0	45.0	50.7
600	21.6	23.4	25.1	26.8	28.7	30.3	32.1	33.7	35.5	37.2	39.0	40.7	45.6	49.0	52.5	59.2
800	27.8	30.2	32.4	34.6	36.9	39.1	41.3	43.5	45.5	48.0	50.1	52.4	58.9	63.3	67.7	76.4
1 000	33.2	36.1	38.8	41.6	44.6	47.3	50.0	52.7	55.4	58.2	61.0	63.8	71.7	77.1	82.6	93.3
1 200	39.0	42.5	45.7	49.1	52.6	55.7	59.0	62.2	65.4	68.7	72.0	75.2	84.6	91.1	97.5	110.1
1 400	44.7	48.8	52.6	56.5	60.6	64.3	68.0	71.8	75.5	79.4	83.2	87.1	97.9	105.4	112.9	127.6
1 450	46.1	50.3	54.2	58.2	62.6	66.4	70.2	74.1	78.0	81.9	85.8	89.8	101.2	108.9	116.7	131.9
1 500	47.4	51.8	55.9	60.0	64.4	68.5	72.4	76.4	80.5	84.5	88.6	92.8	104.4	112.4	120.5	136.2
1 600	49.4	54.4	58.7	63.1	68.1	72.4	76.6	80.9	85.3	89.8	94.2	98.7	111.2	119.8	128.6	145.5
1 750	52.1	57.8	62.7	67.6	73.3	80.9	82.8	87.6	92.5	97.4	102.3	107.4	121.3	130.8	140.6	159.3
1 800	53.5	59.3	64.4	69.5	75.4	80.2	85.2	90.1	95.1	100.3	105.4	110.6	124.8	134.8	144.9	164.2
2 000	58.5	65.3	71.0	76.8	83.6	89.1	94.6	100.2	105.8	111.6	117.5	123.5	139.4	150.6	162.1	183.9
2 400	67.6	76.2	83.1	90.5	99.0	105.7	112.5	119.4	126.4	133.7	140.9	148.3	167.9	181.7	195.7	222.4
3 000					118.7	127.0	135.5	144.0	152.7	161.8	170.9	180.2	204.4	221.6	239.2	272.2
3 600							136.2	146.1	156.1	166.3	176.5	187.0	218.5	239.5	260.5	301.5
4 000										164.0	177.8	192.1	222.9	247.1	272.4	316.4

■Standard Transmission Torque (Belt width 40 mm)

N・m

Number of teeth of small pulley	28	30	32	34	36	38	40	42	44	46	48	50	56	60	64	72
Pitch circle diameter mm	124.78	133.69	142.60	151.52	160.43	169.34	178.25	187.17	196.08	204.99	213.90	222.82	249.55	267.38	285.21	320.86
Small pulley revolution r/min																
20	483	532	532	580	629	677	725	725	774	822	870	919	1 015	1 064	1 160	1 305
40	461	485	533	558	606	655	679	727	752	800	824	873	970	1 043	1 115	1 261
60	437	486	518	551	599	631	664	696	745	777	810	858	955	1 036	1 101	1 247
100	428	467	497	535	574	613	594	682	711	750	789	818	925	993	1 061	1 207
200	395	430	464	498	537	566	601	635	669	698	732	767	864	928	996	1 128
400	362	394	424	453	485	514	544	573	602	632	661	690	776	835	894	1 009
500	351	380	410	437	469	496	523	551	578	608	635	665	747	802	859	969
600	343	373	399	427	456	482	510	536	564	592	620	647	726	780	836	942
800	332	360	387	413	441	467	492	519	543	572	598	625	702	755	808	911
1 000	317	344	371	397	426	451	477	503	529	555	582	609	684	736	788	891
1 200	310	338	364	390	419	443	469	495	521	546	573	598	673	724	776	876
1 400	305	333	359	385	413	438	464	489	515	541	567	594	668	719	770	870
1 450	303	331	357	383	412	437	462	488	514	539	565	591	666	717	768	868
1 500	302	330	355	382	410	436	461	486	512	538	564	590	664	715	767	867
1 600	294	324	350	376	406	432	457	483	509	535	562	589	663	715	767	868
1 750	284	315	342	369	400	442	451	478	504	531	558	586	661	714	767	869
1 800	284	314	341	369	400	425	452	478	504	532	559	587	662	715	768	871
2 000	279	312	339	367	399	425	452	478	505	533	561	589	665	719	774	878
2 400	269	303	331	360	394	420	447	475	503	532	560	590	668	723	778	884
3 000					378	404	431	458	486	515	544	573	650	705	761	866
3 600							361	387	414	441	468	496	579	635	691	799
4 000										391	424	458	532	590	650	755

■Width Factor

Belt width mm	40	60	80	100	120
Width Factor	1.00	1.59	2.20	2.84	3.50

Belt Types and Dimensions P17
Selection and Design P45～

・notes;
The xxx area makes the belt life shorter and should be avoided.
The pulley speed increases to 33 m/s or over in the xxx area and therefore the pulleys must be kept in good balance.

Transmission Capacity Tables

TRAPEZOIDAL BELT

MXL

■Standard Transmission Capacity
(Belt width 3.2 mm)

W

Number of teeth of small pulley	10	12	14	15	16	18	20	22	24	26	28	30	32	36	40
Pitch circle diameter mm	6.47	7.76	9.06	9.70	10.35	11.64	12.94	14.23	15.52	16.82	18.11	19.40	20.70	23.29	25.87
Small pulley revolution r/min															
100	0.3	0.4	0.5	0.5	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.4
300	1.0	1.2	1.5	1.6	1.7	1.9	2.1	2.3	2.5	2.8	3.0	3.2	3.4	3.8	4.3
500	1.7	2.1	2.5	2.6	2.8	3.2	3.5	3.9	4.3	4.6	5.0	5.3	5.7	6.4	7.1
700	2.5	3.0	3.5	3.7	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	9.0	10.0
900	3.2	3.8	4.5	4.8	5.1	5.8	6.4	7.1	7.7	8.3	9.0	9.6	10.3	11.6	12.9
1 000	3.5	4.3	5.0	5.3	5.7	6.4	7.1	7.8	8.6	9.3	10.0	10.7	11.4	12.9	14.3
1 200	4.3	5.1	6.0	6.4	6.8	7.7	8.6	9.4	10.3	11.1	12.0	12.9	13.7	15.4	17.2
1 500	5.3	6.4	7.5	8.0	8.6	9.6	10.7	11.8	12.9	13.9	15.0	16.1	17.2	19.3	21.5
1 800	6.4	7.7	9.0	9.6	10.3	11.6	12.9	14.2	15.4	16.7	18.0	19.3	20.6	23.2	25.8
2 000	7.1	8.6	10.0	10.7	11.4	12.9	14.3	15.7	17.2	18.6	20.0	21.5	22.9	25.8	28.6
2 400	8.6	10.3	12.0	12.9	13.7	15.4	17.2	18.9	20.6	22.3	24.1	25.8	27.5	30.9	34.4
2 700	9.6	11.6	13.5	14.5	15.4	17.4	19.3	19.3	23.2	25.1	27.1	29.0	30.9	34.8	38.7
3 000	10.7	12.9	15.0	16.1	17.2	19.3	21.5	23.6	25.8	27.9	30.1	32.2	34.4	38.5	42.7
3 500	12.5	15.0	17.5	18.8	20.0	22.5	25.1	25.1	30.1	32.6	35.1	37.5	39.9	44.9	49.7
4 000	14.3	17.2	20.0	21.5	22.9	25.8	28.7	31.5	34.2	37.1	40.1	42.7	45.5	51.2	56.7
5 000	17.9	21.5	25.1	26.8	28.6	32.2	35.7	35.7	43.0	46.2	49.7	53.2	56.7	63.7	70.4
6 000	21.5	25.8	30.1	32.2	34.2	38.7	42.7	46.9	51.2	55.4	59.5	63.7	67.7	75.9	83.9
8 000	28.7	34.4	40.1	43.0	45.5	51.2	56.7	62.2	67.7	73.1	78.6	83.9	89.2	99.5	109.7
10 000	35.8	43.0	50.2	53.7	56.7	64.6	70.4	77.2	83.9	90.5	97.0	103.4	109.7	121.8	133.5

■Standard Transmission Torque
(Belt width 3.2 mm)

N · m

Number of teeth of small pulley	10	12	14	15	16	18	20	22	24	26	28	30	32	36	40
Pitch circle diameter mm	6.47	7.76	9.06	9.70	10.35	11.64	12.94	14.23	15.52	16.82	18.11	19.40	20.70	23.29	25.87
Small pulley revolution r/min															
100	0.029	0.038	0.048	0.048	0.048	0.057	0.067	0.067	0.076	0.086	0.095	0.095	0.105	0.115	0.134
300	0.032	0.038	0.048	0.051	0.054	0.060	0.067	0.073	0.080	0.089	0.095	0.102	0.108	0.121	0.137
500	0.032	0.040	0.048	0.050	0.053	0.061	0.067	0.074	0.082	0.088	0.095	0.101	0.109	0.122	0.136
700	0.034	0.041	0.048	0.050	0.055	0.061	0.068	0.075	0.082	0.089	0.095	0.102	0.109	0.123	0.136
900	0.034	0.040	0.048	0.051	0.054	0.062	0.068	0.075	0.082	0.088	0.095	0.102	0.109	0.123	0.137
1 000	0.033	0.041	0.048	0.051	0.054	0.061	0.068	0.074	0.082	0.089	0.095	0.102	0.109	0.123	0.136
1 200	0.034	0.041	0.048	0.051	0.054	0.061	0.068	0.075	0.082	0.088	0.095	0.103	0.109	0.122	0.137
1 500	0.034	0.041	0.048	0.051	0.055	0.061	0.068	0.075	0.082	0.088	0.095	0.102	0.109	0.123	0.137
1 800	0.034	0.041	0.048	0.051	0.055	0.062	0.068	0.075	0.082	0.089	0.095	0.102	0.109	0.123	0.137
2 000	0.034	0.041	0.048	0.051	0.054	0.062	0.068	0.075	0.082	0.089	0.095	0.103	0.109	0.123	0.136
2 400	0.034	0.041	0.048	0.051	0.054	0.061	0.068	0.075	0.082	0.089	0.096	0.103	0.109	0.123	0.137
2 700	0.034	0.041	0.048	0.051	0.054	0.062	0.068	0.068	0.082	0.089	0.096	0.103	0.109	0.123	0.137
3 000	0.034	0.041	0.048	0.051	0.055	0.061	0.068	0.075	0.082	0.089	0.096	0.102	0.109	0.122	0.136
3 500	0.034	0.041	0.048	0.051	0.055	0.061	0.068	0.068	0.082	0.089	0.096	0.102	0.109	0.122	0.136
4 000	0.034	0.041	0.048	0.051	0.055	0.062	0.068	0.075	0.082	0.089	0.096	0.102	0.109	0.122	0.135
5 000	0.034	0.041	0.048	0.051	0.055	0.061	0.068	0.068	0.082	0.088	0.095	0.102	0.108	0.122	0.134
6 000	0.034	0.041	0.048	0.051	0.054	0.062	0.068	0.075	0.081	0.088	0.095	0.101	0.108	0.121	0.133
8 000	0.034	0.041	0.048	0.051	0.054	0.061	0.068	0.074	0.081	0.087	0.094	0.100	0.106	0.119	0.131
10 000	0.034	0.041	0.048	0.051	0.054	0.062	0.067	0.074	0.080	0.086	0.093	0.099	0.105	0.116	0.127

■Width Factor

Belt width mm	3.2	4.8	6.4	9.5	12.7
Width Factor	1.00	1.60	2.22	3.49	4.89

Belt Types and Dimensions P18,P23
Selection and Design P45～

· notes;
The xxx area makes the belt life shorter and should be avoided.

Transmission Capacity Tables

TRAPEZOIDAL BELT

XL

■Standard Transmission Capacity
(Belt width 6.4 (Designation 025)mm)

W

Number of teeth of small pulley		10	11	12	14	15	16	18	20	21	22	24	25	26	28	30
Pitch circle diameter mm		16.17	17.79	19.40	22.64	24.26	25.87	29.11	32.34	33.96	35.57	38.81	40.43	42.04	45.28	48.51
Small pulley revolution r/min	100	2	2	3	3	3	3	4	4	4	4	5	5	6	6	7
	300	6	8	8	10	10	11	12	13	14	15	16	17	18	19	20
	500	11	12	13	16	17	18	20	22	24	25	27	28	29	32	34
	750	17	18	20	23	25	27	30	34	35	37	40	42	44	49	50
	900	19	23	25	29	31	34	37	41	44	45	49	51	53	57	62
	1 000	23	24	27	32	35	37	41	46	48	50	55	57	59	64	69
	1 200	27	30	32	38	41	44	49	55	57	60	66	69	72	76	83
	1 500		38	40	48	51	55	62	68	72	75	83	86	89	96	100
	1 800		45	49	57	62	66	74	83	87	91	100	100	100	110	120
	2 500		63	68	80	85	91	100	110	120	120	130	140	150	160	170
	3 000		75	83	96	100	110	120	130	140	150	160	170	180	190	200
	3 500		88	97	110	120	130	140	160	170	170	190	200	210	220	240
	4 000			110	130	130	140	160	180	190	200	210	220	230	250	270
	5 000			130	150	170	180	200	220	240	240	260	270	280	300	330
	6 000					200	210	240	260	280	290	310	320	340	360	380
	7 000					230	250	270	300	320	330	360	370	380	400	430
	8 000							310	340	360	370	400	410	430	450	470
	10 000							380	410	430	440	470	480	490	510	530

■Standard Transmission Torque
(Belt width 6.4 (Designation 025)mm)

N · m

Number of teeth of small pulley		10	11	12	14	15	16	18	20	21	22	24	25	26	28	30
Pitch circle diameter mm		16.17	17.79	19.40	22.64	24.26	25.87	29.11	32.34	33.96	35.57	38.81	40.43	42.04	45.28	48.51
Small pulley revolution r/min	100	0.19	0.19	0.29	0.29	0.29	0.29	0.38	0.38	0.38	0.38	0.48	0.48	0.57	0.57	0.67
	300	0.19	0.25	0.25	0.32	0.32	0.35	0.38	0.41	0.45	0.48	0.51	0.54	0.57	0.60	0.64
	500	0.21	0.23	0.25	0.31	0.32	0.34	0.38	0.42	0.46	0.48	0.52	0.53	0.55	0.61	0.65
	750	0.22	0.23	0.25	0.29	0.32	0.34	0.38	0.43	0.45	0.47	0.51	0.53	0.56	0.62	0.64
	900	0.20	0.24	0.27	0.31	0.33	0.36	0.39	0.43	0.47	0.48	0.52	0.54	0.56	0.60	0.66
	1 000	0.22	0.23	0.26	0.31	0.33	0.35	0.39	0.44	0.46	0.48	0.52	0.54	0.56	0.61	0.66
	1 200	0.21	0.24	0.25	0.30	0.33	0.35	0.39	0.44	0.45	0.48	0.52	0.55	0.57	0.60	0.66
	1 500		0.24	0.25	0.31	0.32	0.35	0.39	0.43	0.46	0.48	0.53	0.55	0.57	0.61	0.64
	1 800		0.24	0.26	0.30	0.33	0.35	0.39	0.44	0.46	0.48	0.53	0.53	0.53	0.58	0.64
	2 500		0.24	0.26	0.31	0.32	0.35	0.38	0.42	0.46	0.46	0.50	0.53	0.57	0.61	0.65
	3 000		0.24	0.26	0.31	0.32	0.35	0.38	0.41	0.45	0.48	0.51	0.54	0.57	0.60	0.64
	3 500		0.24	0.26	0.30	0.33	0.35	0.38	0.44	0.46	0.46	0.52	0.55	0.57	0.60	0.65
	4 000			0.26	0.31	0.31	0.33	0.38	0.43	0.45	0.48	0.50	0.52	0.55	0.60	0.64
	5 000			0.25	0.29	0.32	0.34	0.38	0.42	0.46	0.46	0.50	0.52	0.53	0.57	0.63
	6 000					0.32	0.33	0.38	0.41	0.45	0.46	0.49	0.51	0.54	0.57	0.60
	7 000					0.31	0.34	0.37	0.41	0.44	0.45	0.49	0.50	0.52	0.55	0.59
	8 000							0.37	0.41	0.43	0.44	0.48	0.49	0.51	0.54	0.56
	10 000							0.36	0.39	0.41	0.42	0.45	0.46	0.47	0.49	0.51

■Width Factor

Belt width mm(Designation)	6.4 (025)	7.9 (031)	9.5 (037)
Width Factor	1.00	1.40	1.87

Belt Types and Dimensions P19,P23
Selection and Design P45～

· notes;
The xxx area makes the belt life shorter and should be avoided.

Transmission Capacity Tables

TRAPEZOIDAL BELT

L

■Standard Transmission Capacity
(Belt width 12.7 (Designation 050)mm)

kW

Small pulley revolution r/min \ Number of teeth of small pulley	10	12	14	15	16	17	18	19	20	21	22	24	25	26	28	30	32	36	40	44	48
Pitch circle diameter mm	30.32	36.38	42.45	45.48	48.51	51.54	54.57	57.61	60.64	63.67	66.70	72.77	75.80	78.83	84.89	90.96	97.02	109.15	121.28	133.40	145.53
100	0.016	0.019	0.02	0.024	0.026	0.027	0.028	0.03	0.031	0.034	0.038	0.041	0.043	0.044	0.047	0.050	0.053	0.060	0.066	0.072	0.08
300	0.049	0.058	0.07	0.074	0.078	0.083	0.088	0.09	0.097	0.10	0.10	0.12	0.13	0.14	0.14	0.14	0.15	0.17	0.19	0.21	0.23
500	0.081	0.097	0.11	0.12	0.13	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.23	0.24	0.26	0.29	0.32	0.35	0.39
750	0.12	0.15	0.17	0.18	0.19	0.21	0.22	0.23	0.24	0.25	0.27	0.29	0.30	0.31	0.34	0.36	0.38	0.43	0.47	0.50	0.56
900	0.14	0.17	0.20	0.21	0.23	0.25	0.26	0.28	0.29	0.31	0.32	0.35	0.36	0.37	0.40	0.43	0.46	0.52	0.57	0.63	0.69
1 000	0.16	0.19	0.23	0.25	0.26	0.28	0.29	0.31	0.33	0.34	0.36	0.39	0.41	0.42	0.45	0.49	0.52	0.58	0.64	0.70	0.76
1 200	0.19	0.23	0.27	0.29	0.31	0.33	0.35	0.37	0.38	0.41	0.42	0.46	0.48	0.50	0.54	0.57	0.61	0.69	0.76	0.83	0.90
1 500	0.24	0.29	0.34	0.36	0.38	0.41	0.43	0.46	0.48	0.50	0.53	0.57	0.60	0.62	0.67	0.72	0.76	0.85	0.94	1.03	1.11
1 800		0.35	0.40	0.43	0.46	0.49	0.52	0.55	0.57	0.60	0.63	0.69	0.72	0.74	0.80	0.85	0.90	1.01	1.11	1.20	1.30
2 100		0.40	0.47	0.50	0.54	0.58	0.61	0.64	0.67	0.70	0.73	0.80	0.83	0.86	0.92	0.98	1.04	1.16	1.27	1.38	1.48
2 400		0.46	0.54	0.57	0.61	0.65	0.69	0.73	0.76	0.80	0.83	0.90	0.94	0.97	1.04	1.11	1.17	1.30	1.42	1.53	1.63
2 700		0.52	0.60	0.64	0.69	0.73	0.77	0.81	0.85	0.89	0.93	1.01	1.04	1.08	1.16	1.23	1.30	1.43	1.55	1.66	1.75
3 000		0.57	0.67	0.71	0.76	0.81	0.85	0.89	0.94	0.98	1.03	1.11	1.15	1.19	1.27	1.34	1.42	1.55	1.67	1.78	1.86
3 300			0.73	0.78	0.83	0.88	0.93	0.98	1.02	1.07	1.12	1.21	1.25	1.29	1.37	1.45	1.52	1.66	1.78	1.87	1.93
3 500			0.78	0.83	0.88	0.93	0.98	1.03	1.08	1.13	1.18	1.27	1.32	1.36	1.44	1.52	1.59	1.73	1.83	1.91	1.96
4 000			0.88	0.94	1.00	1.06	1.11	1.16	1.21	1.27	1.32	1.42	1.46	1.51	1.59	1.67	1.74	1.86	1.94	1.98	1.97
5 000				1.15	1.22	1.29	1.35	1.41	1.46	1.52	1.57	1.67	1.72	1.76	1.83	1.89	1.94	1.96	1.98	1.85	1.66
6 000				1.34	1.43	1.49	1.56	1.61	1.67	1.73	1.78	1.86	1.86	1.93	1.97	1.99	1.98	1.88	1.67	1.31	0.805

■Standard Transmission Torque
(Belt width 12.7 (Designation 050)mm)

N・m

Small pulley revolution r/min \ Number of teeth of small pulley	10	12	14	15	16	17	18	19	20	21	22	24	25	26	28	30	32	36	40	44	48
Pitch circle diameter mm	30.32	36.38	42.45	45.48	48.51	51.54	54.57	57.61	60.64	63.67	66.70	72.77	75.80	78.83	84.89	90.96	97.02	109.15	121.28	133.40	145.53
100	1.53	1.81	2.20	2.29	2.48	2.58	2.67	2.77	2.96	3.25	3.63	3.91	4.10	4.20	4.49	4.77	5.06	5.73	6.30	6.87	7.45
300	1.56	1.85	2.20	2.35	2.48	2.64	2.80	2.93	3.09	3.18	3.18	3.82	4.14	4.45	4.45	4.45	4.77	5.41	6.05	6.68	7.32
500	1.55	1.85	2.10	2.29	2.48	2.48	2.67	2.86	3.05	3.25	3.44	3.63	3.82	4.01	4.39	4.58	4.96	5.54	6.11	6.68	7.45
750	1.53	1.91	2.16	2.29	2.42	2.67	2.80	2.93	3.05	3.18	3.44	3.69	3.82	3.95	4.33	4.58	4.84	5.47	5.98	6.36	7.13
900	1.48	1.80	2.12	2.23	2.44	2.65	2.76	2.97	3.08	3.29	3.39	3.71	3.82	3.92	4.24	4.56	4.88	5.52	6.05	6.68	7.32
1 000	1.53	1.81	2.20	2.39	2.48	2.67	2.77	2.96	3.15	3.25	3.44	3.72	3.91	4.01	4.30	4.68	4.96	5.54	6.11	6.68	7.25
1 200	1.51	1.83	2.15	2.31	2.47	2.62	2.78	2.94	3.02	3.26	3.34	3.66	3.82	3.98	4.30	4.53	4.85	5.49	6.05	6.60	7.16
1 500	1.53	1.85	2.16	2.29	2.42	2.61	2.74	2.93	3.05	3.18	3.37	3.63	3.82	3.95	4.26	4.58	4.84	5.41	5.98	6.55	7.06
1 800		1.86	2.12	2.28	2.44	2.60	2.76	2.92	3.02	3.18	3.34	3.66	3.82	3.92	4.24	4.51	4.77	5.36	5.89	6.36	6.89
2 100		1.82	2.14	2.27	2.45	2.64	2.77	2.91	3.05	3.18	3.32	3.64	3.77	3.91	4.18	4.45	4.73	5.27	5.77	6.27	6.73
2 400		1.83	2.15	2.27	2.43	2.59	2.74	2.90	3.02	3.18	3.30	3.58	3.74	3.86	4.14	4.41	4.65	5.17	5.65	6.09	6.48
2 700		1.84	2.12	2.26	2.44	2.58	2.72	2.86	3.00	3.15	3.29	3.57	3.68	3.82	4.10	4.35	4.60	5.06	5.48	5.87	6.19
3 000		1.81	2.13	2.26	2.42	2.58	2.70	2.83	2.99	3.12	3.28	3.53	3.66	3.79	4.04	4.26	4.52	4.93	5.31	5.66	5.92
3 300			2.11	2.26	2.40	2.55	2.69	2.83	2.95	3.09	3.24	3.50	3.62	3.73	3.96	4.19	4.40	4.80	5.15	5.41	5.58
3 500			2.13	2.26	2.40	2.54	2.67	2.81	2.95	3.08	3.22	3.46	3.60	3.71	3.93	4.15	4.34	4.72	4.99	5.21	5.35
4 000			2.10	2.24	2.39	2.53	2.65	2.77	2.89	3.03	3.15	3.39	3.48	3.60	3.79	3.99	4.15	4.44	4.63	4.72	4.70
5 000				2.20	2.33	2.46	2.58	2.69	2.79	2.90	3.00	3.19	3.28	3.36	3.49	3.61	3.70	3.74	3.78	3.53	3.17
6 000				2.13	2.27	2.37	2.48	2.56	2.66	2.75	2.83	2.96	2.96	3.07	3.13	3.17	3.15	2.99	2.66	2.08	1.28

■Width Factor

Belt width mm(Designation)	12.7 (050)	19.1 (075)	25.4 (100)
Width Factor	1.00	1.69	2.38

Belt Types and Dimensions P20,P23
Selection and Design P45～

・notes;
The xxx area makes the belt life shorter and should be avoided.
The pulley speed increases to 33 m/s or over in the xxx area and therefore the pulleys must be kept in good balance.

Transmission Capacity Tables

TRAPEZOIDAL BELT

H

■Standard Transmission Capacity
(Belt width 19.1 (Designation 075) mm)

kW

Small pulley revolution r/min \ Number of teeth of small pulley	14	15	16	18	19	20	21	22	24	25	26	28	30	32	36	40	44	48
Pitch circle diameter mm	56.60	60.64	64.68	72.77	76.81	80.85	84.89	88.94	97.02	101.06	105.11	113.19	121.28	129.36	145.53	161.70	177.87	194.04
100	0.13	0.14	0.15	0.17	0.18	0.18	0.19	0.20	0.22	0.23	0.24	0.26	0.28	0.30	0.34	0.37	0.41	0.45
300	0.39	0.42	0.45	0.50	0.53	0.56	0.59	0.61	0.67	0.70	0.73	0.78	0.84	0.90	1.01	1.12	1.23	1.34
500	0.65	0.70	0.74	0.84	0.89	0.93	0.98	1.02	1.12	1.17	1.21	1.30	1.40	1.49	1.67	1.86	2.05	2.23
750	0.98	1.05	1.12	1.26	1.33	1.39	1.47	1.53	1.66	1.73	1.80	1.93	2.07	2.20	2.46	2.71	2.96	3.20
900	1.18	1.26	1.34	1.51	1.60	1.68	1.76	1.84	2.01	2.09	2.17	2.34	2.51	2.67	3.00	3.33	3.64	3.97
1 000		1.40	1.49	1.68	1.78	1.86	1.96	2.05	2.24	2.33	2.42	2.60	2.79	2.97	3.33	3.69	4.04	4.40
1 200		1.68	1.79	2.01	2.13	2.23	2.35	2.45	2.67	2.78	2.89	3.11	3.33	3.54	3.97	4.39	4.80	5.22
1 500		2.10	2.23	2.51	2.65	2.78	2.92	3.05	3.32	3.46	3.59	3.86	4.13	4.39	4.91	5.42	5.92	6.40
1 800		2.51	2.67	3.00	3.17	3.32	3.49	3.64	3.97	4.13	4.29	4.60	1.91	5.22	5.82	6.40	6.96	7.51
2 100				3.49	3.68	3.86	4.05	4.23	4.60	4.77	4.96	5.32	5.67	6.01	6.69	7.33	7.94	8.51
2 400				3.97	4.19	4.39	4.61	4.80	5.21	5.41	5.62	6.02	6.40	6.78	7.51	8.18	8.82	9.40
2 700				4.44	4.69	4.91	5.15	5.37	5.81	6.09	6.25	6.69	7.10	7.50	8.28	8.98	9.62	10.10
3 000				4.91	5.17	5.41	5.67	5.92	6.39	6.61	6.87	7.33	7.77	8.18	8.98	9.67	10.20	10.70
3 300				5.37	5.65	5.88	6.19	6.45	6.95	7.27	7.46	7.94	8.39	8.82	9.62	10.20	10.80	11.20
3 500				5.67	5.96	6.23	6.53	6.80	7.32	7.71	7.83	8.33	8.78	9.21	10.00	10.60	11.10	11.40
4 000						7.01	7.33	7.62	8.17	8.38	8.71	9.23	9.67	10.00	10.80	11.20	11.50	11.60
5 000						8.43	8.78	9.10	9.65	9.79	10.10	10.70	11.00	11.20	11.60	11.50	11.00	
6 000						9.41	9.86	10.30	10.70	10.90	11.20	11.50	11.50	11.50	11.20			

■Standard Transmission Torque
(Belt width 19.1 (Designation 075) mm)

N・m

Small pulley revolution r/min \ Number of teeth of small pulley	14	15	16	18	19	20	21	22	24	25	26	28	30	32	36	40	44	48
Pitch circle diameter mm	56.60	60.64	64.68	72.77	76.81	80.85	84.89	88.94	97.02	101.06	105.11	113.19	121.28	129.36	145.53	161.70	177.87	194.04
100	12.41	13.36	14.32	16.23	17.18	17.18	18.14	19.09	21.00	21.95	22.91	24.82	26.73	28.64	32.45	35.32	39.14	42.95
300	12.41	13.36	14.32	15.91	16.86	17.82	18.77	19.41	21.32	22.27	23.23	24.82	26.73	28.64	32.14	35.64	39.14	42.64
500	12.41	13.36	14.13	16.04	16.99	17.75	18.71	19.47	21.38	22.34	23.10	24.82	26.73	28.44	31.88	35.51	39.14	42.57
750	12.47	13.36	14.25	16.04	16.93	17.69	18.71	19.47	21.13	22.02	22.91	24.56	26.34	28.00	31.31	34.49	37.67	40.73
900	12.51	13.36	14.21	16.01	16.97	17.82	18.67	19.51	21.32	22.17	23.01	24.82	26.62	28.32	31.82	35.32	38.61	42.10
1 000		13.36	14.22	16.04	16.99	17.75	18.71	19.57	21.38	22.24	23.10	24.82	26.63	28.35	31.79	35.22	38.56	42.00
1 200		13.36	14.24	15.99	16.94	17.74	18.69	19.49	21.24	22.11	22.99	24.74	26.49	28.16	31.58	34.92	38.18	41.52
1 500		13.36	14.19	15.97	16.86	17.69	18.58	19.41	21.13	22.02	22.84	24.56	26.28	27.94	31.24	34.49	37.67	40.73
1 800		13.31	14.16	15.91	16.81	17.61	18.51	19.30	21.05	21.90	22.75	24.39	10.13	27.68	30.86	33.94	36.91	39.82
2 100				15.86	16.73	17.54	18.41	19.23	20.91	21.68	22.54	24.18	25.77	27.32	30.41	33.32	36.09	38.68
2 400				15.79	16.66	17.46	18.33	19.09	20.72	21.52	22.35	23.94	25.45	26.97	29.87	32.53	35.08	37.39
2 700				15.70	16.58	17.36	18.21	18.98	20.54	21.53	22.10	23.65	25.10	26.51	29.27	31.75	34.01	35.71
3 000				15.62	16.45	17.21	18.04	18.84	20.33	21.03	21.86	23.32	24.72	26.03	28.57	30.77	32.45	34.04
3 300				15.53	16.34	17.01	17.90	18.66	20.10	21.03	21.58	22.97	24.27	25.51	27.83	29.50	31.24	32.40
3 500				15.46	16.25	16.99	17.81	18.54	19.96	21.03	21.35	22.72	23.94	25.12	27.27	28.91	30.27	31.09
4 000						16.73	17.49	18.18	19.50	20.00	20.78	22.03	23.08	23.86	25.77	26.73	27.44	27.68
5 000						16.09	16.76	17.37	18.42	18.69	19.28	20.43	21.00	21.38	22.14	21.95	21.00	
6 000						14.97	15.69	16.39	17.02	17.34	17.82	18.29	18.29	18.29	17.82			

■Width Factor

Belt width mm(Designation)	19.1 (075)	25.4 (100)	38.1 (150)	50.8 (200)	76.2 (300)
Width Factor	1.00	1.41	2.20	3.01	4.73

Belt Types and Dimensions P21,P23
Selection and Design P45～

・notes;
The xxx area makes the belt life shorter and should be avoided.
The pulley speed increases to 33 m/s or over in the xxx area and therefore the pulleys must be kept in good balance.

Transmission Capacity Tables

TRAPEZOIDAL BELT

XH

■Standard Transmission Capacity
(Belt width 50.8(Designation 200)mm)

kW

Number of teeth of small pulley	18	20	22	24	26	28	30	32	40
Pitch circle diameter mm	127.34	141.49	155.64	169.79	183.94	198.08	212.23	226.38	282.98
Small pulley revolution r/min									
100	1.21	1.34	1.48	1.61	1.77	1.88	2.01	2.13	2.68
300	2.41	2.68	2.95	3.22	3.49	3.76	4.02	4.29	5.38
500	6.03	6.70	7.36	8.01	8.68	9.33	9.99	10.70	13.10
750	9.01	9.99	11.00	11.90	12.90	13.90	14.80	15.80	19.40
900	10.70	11.90	13.00	14.20	15.30	16.40	17.40	18.50	22.60
1 000	11.90	13.20	14.50	15.70	16.90	18.10	19.30	20.40	24.80
1 200		15.60	17.10	18.50	19.90	21.30	22.80	23.90	28.50
1 400		18.10	19.70	21.30	22.80	24.30	25.70	27.10	31.70
1 500		19.20	20.90	22.60	24.10	25.70	27.10	28.50	32.90
1 600		20.40	22.20	23.90	25.50	27.10	28.50	30.00	34.20
1 800			24.50	26.30	28.00	29.50	31.00	32.20	35.60
2 000			26.70	28.50	30.20	31.70	33.00	34.20	36.40
2 200			28.70	31.00	32.10	33.50	34.60	35.50	36.10
2 400			30.50	32.20	33.70	34.90	35.70	36.30	34.50
2 600				33.70	35.00	35.90	36.40	36.40	31.80
3 000				35.70	36.40	36.40	35.80	34.50	
3 500				36.40	35.60	33.90	31.30		
4 000				34.50	31.80				

■Standard Transmission Torque
(Belt width 50.8(Designation 200)mm)

N・m

Number of teeth of small pulley	18	20	22	24	26	28	30	32	40
Pitch circle diameter mm	127.34	141.49	155.64	169.79	183.94	198.08	212.23	226.38	282.98
Small pulley revolution r/min									
100	115.5	127.9	141.3	153.7	169.0	179.4	191.9	203.3	255.8
300	115.0	127.9	140.8	153.7	166.6	179.4	191.9	204.7	256.8
500	115.1	127.9	140.5	152.9	165.7	178.1	190.7	204.3	250.1
750	114.7	127.1	140.0	151.5	164.2	176.9	188.4	201.1	246.9
900	113.5	126.2	137.9	150.6	162.3	173.9	184.5	196.2	239.7
1 000	113.6	126.0	138.4	149.9	161.3	172.8	184.2	194.7	236.7
1 200		124.1	136.0	147.2	158.3	169.4	181.4	190.1	226.7
1 400		123.4	134.3	145.2	155.5	165.7	175.2	184.8	216.1
1 500		122.2	133.0	143.8	153.4	163.5	172.4	181.4	209.4
1 600		121.7	132.4	142.6	152.1	161.7	170.0	179.0	204.0
1 800			129.9	139.5	148.5	156.4	164.4	170.8	188.8
2 000			127.4	136.0	144.1	151.3	157.5	163.2	173.7
2 200			124.5	134.5	139.3	145.3	150.1	154.0	156.6
2 400			121.3	128.1	134.0	138.8	142.0	144.4	137.2
2 600				123.7	128.5	131.8	133.6	133.6	116.7
3 000				113.6	115.8	115.8	113.9	109.8	
3 500				99.3	97.1	92.5	85.4		
4 000				82.3	75.9				

■Width Factor

Belt width mm(Designation)	50.8 (200)	76.2 (300)	101.6 (400)
Width Factor	1.00	1.57	2.22

Belt Types and Dimensions P22
Selection and Design P45～

・notes;
The xxx area makes the belt life shorter and should be avoided.
The pulley speed increases to 33 m/s or over in the xxx area and therefore the pulleys must be kept in good balance.
The xxx area is subjected to the above two restrictions and therefore should be avoided wherever possible.

Transmission Capacity Tables

TRAPEZOIDAL BELT

XXH

■Standard Transmission Capacity
(Belt width 50.8(Designation 200)mm)

kW

Number of teeth of small pulley	18	20	22	24	26	30	32	40
Pitch circle diameter mm	181.91	202.13	222.34	242.55	262.76	303.19	323.40	404.25
Small pulley revolution r/min								
100	2.12	2.36	2.60	2.82	3.06	3.52	3.77	4.70
200	4.24	4.70	5.17	5.65	6.13	7.05	7.52	9.37
300	6.35	7.05	7.74	8.44	9.13	10.50	11.20	13.90
400	8.44	9.37	10.20	11.20	12.10	13.90	14.70	18.30
500	10.50	11.60	12.80	13.90	15.00	17.20	18.30	22.50
600	12.60	13.90	15.30	16.60	17.90	20.50	21.70	26.50
700	14.60	16.10	17.70	19.20	20.60	23.50	25.00	30.20
750	15.70	17.30	19.00	20.60	22.20	25.30	26.50	32.40
900	18.60	20.40	22.30	24.10	25.90	29.30	30.90	36.40
1 000	20.40	22.50	24.50	25.90	28.40	31.90	33.50	39.00
1 200		26.50	28.70	30.90	32.90	36.40	38.00	42.50
1 400		30.20	32.50	34.70	36.70	40.00	41.20	43.60
1 500		31.80	34.20	36.30	38.20	41.20	42.30	42.80
1 600		33.50	35.90	38.00	39.80	42.50	43.10	42.00
1 800		36.50	38.70	40.60	42.10	43.60	43.30	37.20
2 000		39.00	41.00	42.50	43.30	43.20		
2 200		41.00	42.60	43.50	43.60	41.10		
2 400		42.50	43.40	42.60	42.60	37.20		
2 600		43.30	43.50	37.20	40.30	37.20		
3 000		43.20	41.10	37.20				

■Standard Transmission Torque
(Belt width 50.8(Designation 200)mm)

N・m

Number of teeth of small pulley	18	20	22	24	26	30	32	40
Pitch circle diameter mm	181.91	202.13	222.34	242.55	262.76	303.19	323.40	404.25
Small pulley revolution r/min								
100	202.4	225.3	248.2	269.2	292.1	336.0	359.9	448.6
200	202.4	224.3	246.7	269.7	292.6	336.5	358.9	447.2
300	202.0	224.3	246.3	268.5	290.5	334.1	356.4	442.3
400	201.4	223.6	243.4	267.3	288.7	331.7	350.8	436.7
500	200.4	221.4	244.4	265.4	286.4	328.4	349.4	429.5
600	200.4	221.1	243.4	264.1	284.8	326.1	345.2	421.6
700	199.1	219.5	241.4	261.8	280.9	320.4	340.9	411.8
750	199.8	220.2	241.8	262.2	282.5	322.0	337.3	412.4
900	197.3	216.4	236.5	255.6	274.7	310.7	327.7	386.1
1 000	194.7	214.8	233.9	247.2	271.1	304.5	319.8	372.3
1 200		210.8	228.3	245.8	261.7	289.5	302.3	338.1
1 400		205.9	221.6	236.6	250.2	272.7	280.9	297.3
1 500		202.4	217.6	231.0	243.1	262.2	269.2	272.4
1 600		199.9	214.2	226.7	237.4	253.5	257.1	250.6
1 800		193.6	205.2	215.3	223.3	231.2	229.6	197.3
2 000		186.1	195.7	202.8	206.7	206.2		
2 200		177.9	184.8	188.7	189.2	178.3		
2 400		169.0	172.6	169.4	169.4	148.0		
2 600		159.0	159.7	136.6	148.0	136.6		
3 000		137.5	130.8	118.4				

■Width Factor

Belt width mm(Designation)	50.8 (200)	76.2 (300)	101.6 (400)
Width Factor	1.00	1.57	2.22

Belt Types and Dimensions P22
Selection and Design P45～

・notes;
The xxx area makes the belt life shorter and should be avoided.
The pulley speed increases to 33 m/s or over in the xxx area and therefore the pulleys must be kept in good balance.
The xxx area is subjected to the above two restrictions and therefore should be avoided wherever possible.

Transmission Capacity Tables

Allowable Drive Tension (Reference)

PX BELT／ULTRA PX BELT

■PX BELT

Type	Belt width mm	Belt width factor	Allowable drive tension (Reference) N{kgf}
P2M	4	1.00	40{ 4.1}
	6	1.59	64{ 6.5}
	10	2.84	114{ 11.7}
P3M	6	1.00	79{ 8.1}
	10	1.78	143{ 14.6}
	15	2.84	227{ 23.1}
P5M	10	1.00	287{ 29.3}
	15	1.59	456{ 46.5}
	25	2.84	817{ 83.3}
P8M	15	1.00	606{ 62.0}
	25	1.79	1 060{108 }
	40	3.06	1 810{185 }
	60	4.86	2 880{294 }
P14M	40	1.00	2 580{263 }
	60	1.59	4 020{410 }
	80	2.20	5 570{568 }
	100	2.84	7 190{733 }
	120	3.50	8 860{903 }

■ULTRA PX BELT

Type	Belt width mm	Belt width factor	Allowable drive tension (Reference) N{kgf}
UP3M	6	1.00	158{ 16.1}
	10	1.78	286{ 29.2}
	15	2.84	454{ 46.3}
UP5M	10	1.00	517{ 52.8}
	15	1.59	821{ 83.8}
	25	2.84	1 634{ 167 }
UP8M	15	1.00	1 090{ 112 }
	25	1.79	1 910{ 194 }
	40	3.06	3 260{ 333 }
	60	4.86	5 180{ 529 }
UP14M	40	1.00	5 160{ 526 }
	60	1.59	8 040{ 820 }
	80	2.20	11 100{1 140 }
	100	2.84	14 400{1 470 }
	120	3.50	17 700{1 810 }

TRAPEZOIDAL BELT

■TRAPEZOIDAL BELT

Type	Belt width mm	Belt width factor	Allowable drive tension (Reference) N{kgf}
MXL	3.2	1.00	11{ 1.1}
	4.8	1.60	17{ 1.7}
	6.4	2.22	24{ 2.4}
	9.5	3.49	37{ 3.8}
	12.7	4.89	52{ 5.3}
XL	6.4 (025)	1.00	27{ 2.8}
	7.9 (031)	1.40	38{ 3.9}
	9.5 (037)	1.87	51{ 5.2}
L	12.7 (050)	1.00	103{ 10.5}
	19.1 (075)	1.69	174{ 17.8}
	25.4 (100)	2.38	245{ 25.0}
H	19.1 (075)	1.00	440{ 45.1}
	25.4 (100)	1.41	620{ 63.6}
	38.1 (150)	2.20	970{ 99.1}
	50.8 (200)	3.01	1 330{136 }
	76.2 (300)	4.73	2 090{213 }
XH	50.8 (200)	1.00	1 820{186 }
	76.2 (300)	1.57	2 850{291 }
	101.6 (400)	2.22	4 040{412 }
XXH	50.8 (200)	1.00	2 230{227 }
	76.2 (300)	1.57	3 490{356 }
	101.6 (400)	2.22	4 950{505 }
	127.0 (500)	2.87	6 400{653 }

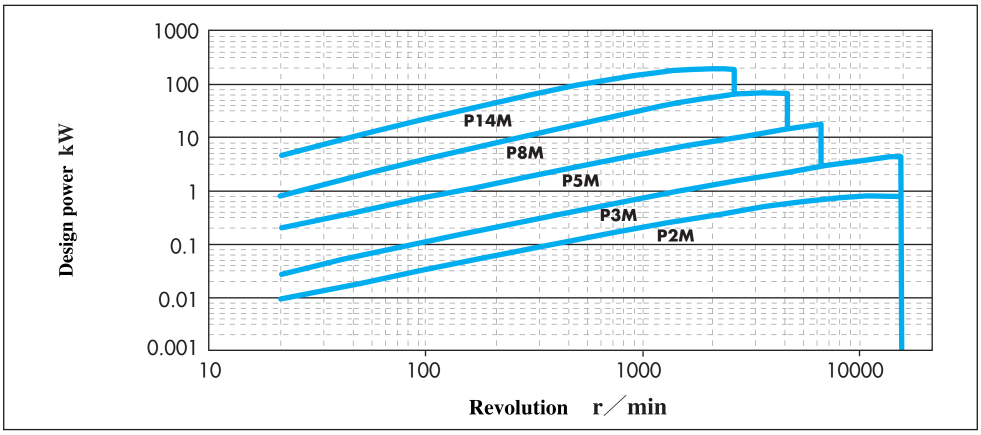
Caution:
The values listed on this page are the values used for "Tension Selection" in the old catalog. Please note that in this catalog, the selection methods have been reviewed in whole and the values in this "Allowable Drive Tension" are not used.

Selection and Design

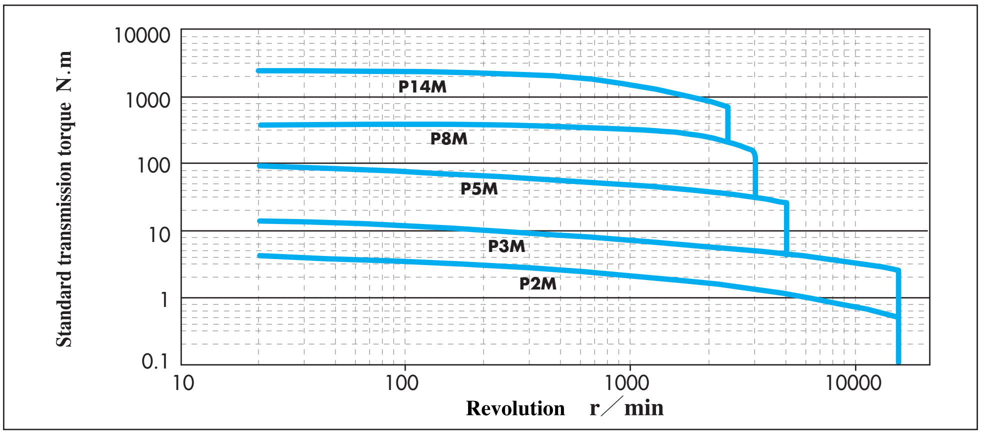
Simplified Selection Tables

PX BELT

Standard transmission capacity

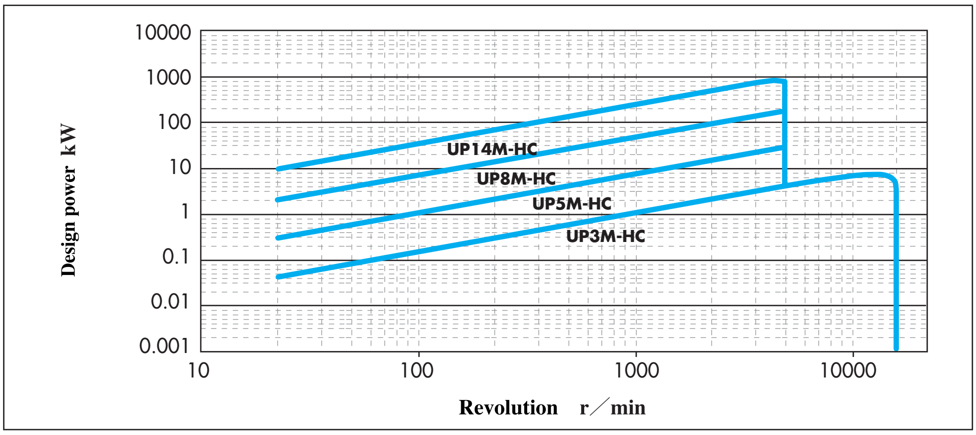


Standard transmission torque

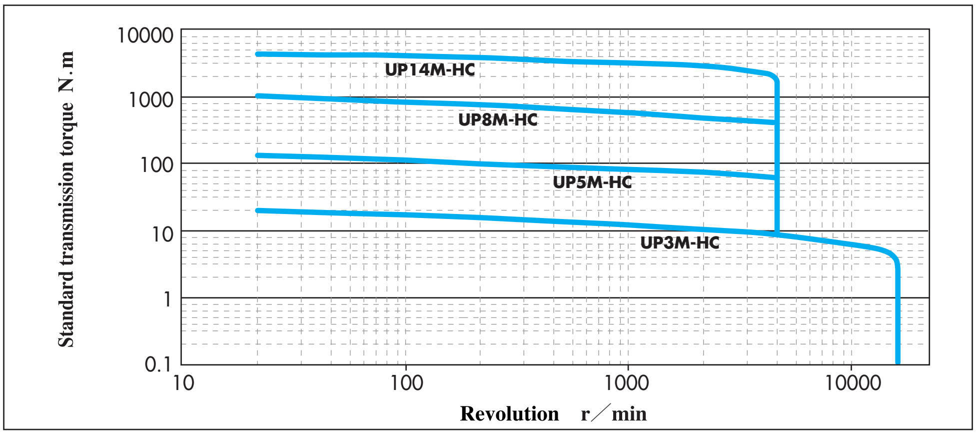


ULTRA PX HC TYPE

Standard transmission capacity



Standard transmission torque

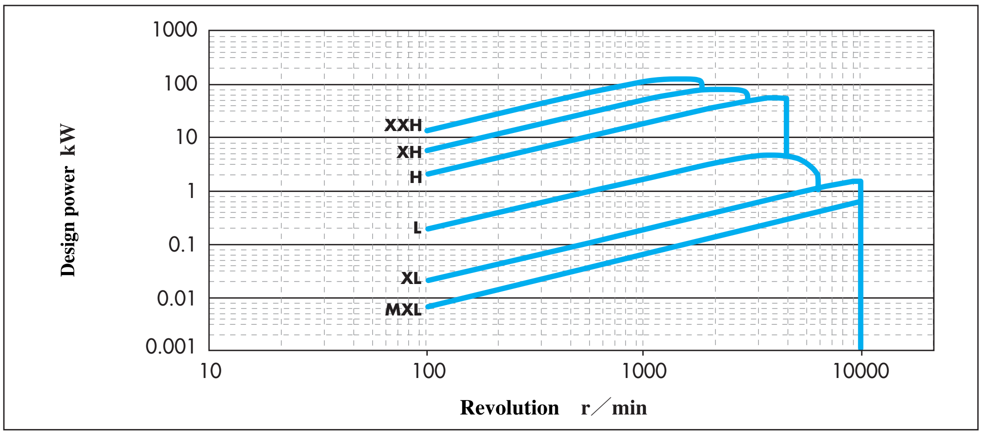


Selection and Design

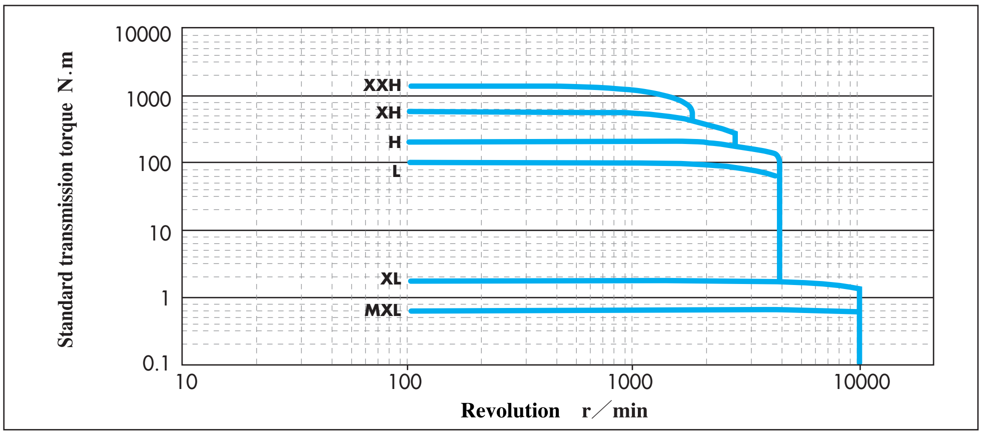
Simplified Selection Tables

TRAPEZOIDAL BELT

Standard transmission capacity



Standard transmission torque



FORMULAE LIST

Item	Formulae	Explanation of sign
Pitch circle diameter Dp mm	$Dp=\dfrac{N\times p}{\pi}$	N : Number of teeth of pulley p : Belt pitch mm
Belt speed V m/s	$V=\dfrac{\pi Dp\times n}{1000\times 60}$	Dp : Pitch circle diameter of pulley mm n : Revolution of pulley r/min
Tension required for drive Fa N {kgf}	$Fa=\dfrac{9.8\times 102\times P}{V}=\dfrac{2T}{\left(\dfrac{Dp}{1000}\right)}$ Gravity unit : $Fa=\dfrac{102\times P}{V}=\dfrac{2T}{\left(\dfrac{Dp}{1000}\right)}$	P : Power kW V : Belt speed m/s T : Torque N・m {kgf・m} Dp : Pitch circle diameter of pulley mm
Power P kW	$P=\dfrac{Fa\times V}{1000}=\dfrac{T\times n}{974\times 9.8}$ Gravity unit : $P=\dfrac{Fa\times V}{120}=\dfrac{T\times n}{974}$	Fa : Tension required for drive N {kgf} V : Belt speed m/s T : Torque N・m {kgf・m} n : Revolution r/min
Torque T N・m {kgf・m}	$T=\dfrac{9.8\times 974\times P}{n}$ Gravity unit : $T=\dfrac{974\times P}{n}$	P : Power kW n : Revolution r/min
Torque due to flywheel effect Tf N・m {kgf・m}	$Tf=\dfrac{I\pi(n_2-n_1)}{30t}$ Gravity unit : $Tf=\dfrac{GD^2\times(n_2-n_1)}{375\times t}$	I : Moment of inertia kg・m^2 n_1 : Revolution before acceleration (deceleration) r/min n_2 : Revolution after acceleration (deceleration) r/min t : Time from n_1 to n_2 s GD^2 : Flywheel effect {kgf・m^2}
Center distance C mm	$C=\dfrac{B+\sqrt{B^2-2(Dp-dp)^2}}{4}$ $B=L-1.57(Dp+dp)$	L : Belt length mm Dp : Pitch circle diameter of large pulley mm dp : Pitch circle diameter of small pulley mm
Belt length L mm	$L=2C+1.57(Dp+dp)+\dfrac{(Dp-dp)^2}{4C}$	Dp : Pitch circle diameter of large pulley mm dp : Pitch circle diameter of small pulley mm C : Center distance mm
Number of meshing teeth of small pulley Zm	$Zm=N\times\dfrac{\phi}{360^\circ}$ $\phi=180^\circ-\dfrac{57^\circ(Dp-dp)}{C}$	N : Number of teeth of small pulley ϕ : Belt contact angle to small pulley degrees degrees Dp : Pitch circle diameter of large pulley mm dp : Pitch circle diameter of small pulley mm C : Center distance mm

Selection and Design

Selection Calculation and Examples of Calculation

SELECTION METHOD

Introduction of design software

For selection of timing belts, please refer to the procedures that begin from this page. You can also utilize the "Tsubaki Timing Belt Design Software" that helps selection on your PC. It can be downloaded from the Tsubaki website.(Japanese only)

Contents:

Selection calculation

When you enter parameters required for selection according to the instructions given on the PC, you can easily select belts and pulleys. The software also includes other functions that, for example, allow you to specify a belt size and type or allow you to choose a selection method according to your requirements.

CAD data

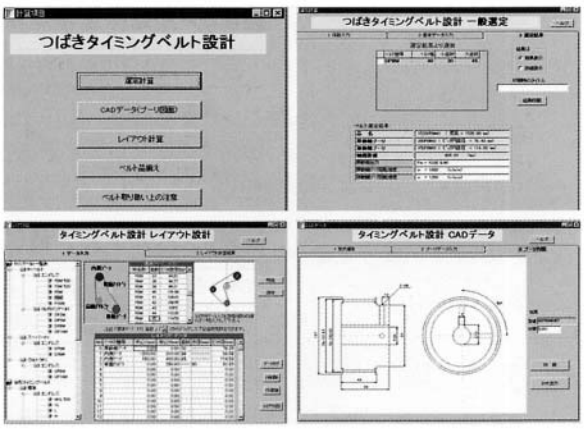
A pulley can be drawn (keyway, tap, bore). The drawn figures may be output on a printer or saved in your CAD machine as CAD data in the DXF format.

Layout calculation

You can study the belt length and pulley layout on the coordinate system.
A layout that suits the standard belt length can be obtained.
This function is very useful in studying the multi-axial layout.

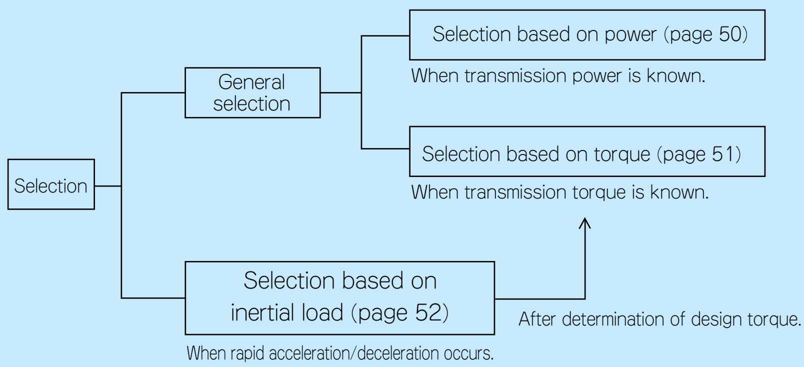
List of belts

You can view a list of Tsubaki standard belts.



Type of selection

Timing belts can be selected by the following methods. Use a method that suits your requirements.



Selection and Design

Selection Calculation and Examples of Calculation

CORRECTION FACTORS

Correction Factors

■Table 1: Load correction factor（Ko）

Ratio of max. load output to motor rated output		≦200%			201%～249%			250%≦		
Run hours per day h		<3	3~10	10<	<3	3~10	10<	<3	3~10	10<
Type of load and examples of application	Relatively smooth drive Example: Measuring instruments, medical equipment, agitators	1.2	1.3	1.4	1.3	1.4	1.4	1.4	1.5	1.6
	Drive with slight shock Example: Injection molding machines, machine tools, conveyors, pumps	1.3	1.4	1.5	1.4	1.5	1.6	1.5	1.6	1.7
	Drive with large shock Example: Robots, high-speed press machines, intermittently driven conveyors	1.4	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.8

For drive that is subjected to very strong shock, a factor greater than 1.8 may be required. For such applications, please contact us.

■Table 2: Correction factor when idler is used（Ki）

Idler mounted on	Inside	Outside
Slack side of belt	0	+0.1
Tension side of belt	+0.1	+0.2

■Table 3: Correction factor for speed increase（Ks）

Increase ratio	Correction factor
1 and over, up to 1.25	0
1.25 and over, up to 1.75	+0.2
1.75 and over, up to 2.5	+0.3
2.5 and over, up to 3.5	+0.4
3.5 and over	+0.5

■Table 4: Start-stop frequency correction factor（Ka）

Frequency of start-stop per day		≦10	11～100	101～999	1000≦
Ratio of max. output to motor rated output	≦200%	1.2	1.3	1.4	1.5
	201%～249%	1.3	1.4	1.5	1.6
	250%≦	1.4	1.6	1.7	1.8

■Table 5: Belt length correction factor（KL）

Type (Pitch) \ Belt length mm	≦200	201～300	301～450	451～600	601～900	901～1300	1301～1800	1801≦
P2M	0.8	0.9	1.0	1.1	1.2	1.2	1.2	1.2
P3M・UP3M-HC	0.8	0.9	1.0	1.1	1.2	1.2	1.2	1.2
P5M・UP5M-HC	–	0.8	0.8	0.9	1.0	1.1	1.2	1.2
P8M・UP8M-HC	–	–	0.8	0.8	0.9	1.0	1.1	1.2
P14M・UP14M-HC	–	–	–	–	–	0.9	1.0	1.1
MXL	0.8	0.9	1.0	1.1	1.2	1.2	–	–
XL	0.8	0.8	0.9	0.9	1.0	1.1	1.2	1.2
L	–	0.8	0.8	0.8	0.9	1.0	1.1	1.2
H	–	–	–	–	0.9	1.0	1.1	1.2
XH	–	–	–	–	–	0.9	1.0	1.1
XXH	–	–	–	–	–	–	0.9	1.0

■Table 6: Meshing correction factor（Km）

Number of meshing teeth of small pulley Zm	6 or over	5	4
Meshing correction factor	1.0	0.7	0.5

Selection and Design

Selection Calculation and Examples of Calculation

SELECTION BASED ON POWER

Parameters required for selection

The parameters required for selection are as follows. Determine each condition.

- ●Output of motor kW、revolution of output shaft r/min、shaft diameter
- ●Type, revolution r/min、shaft diameter of driven machine
- ●Center distance
- ●Hours of use and frequency of start-stop per day
- ●Speed ratio
- ●Use or nonuse of idler
- ●Other conditions (layout restriction, etc.)

Determination of design power

Calculate the design power as follows:

$$Pd = Pk \times (Ko + Ki + Ks) \times Ka$$

Pd : Design power kW
Pk : Transmission power* kW
Ko : Load correction factor　Table 1 on page 49
Ki : Correction factor when idler is used　Table 2 on page 49
Ks : Correction factor for speed increase　Table 3 on page 49
Ka : Start-stop frequency correction factor　Table 4 on page 49

※Transmission power means power to be transmitted. Usually, the motor output is used. However, if the actual transmission power (actual load) is known, use its value.

Determination of belt size and number of teeth of pulleys

(1) Referring to the simplified selection tables (pages 45 – 46), tentatively select a belt size based on the design power and small pulley revolution.

(2) Referring to the standard transmission capacity tables (pages 29 – 43), tentatively select a belt width and the number of teeth of the small pulley. For selection, take the following precautions:
- ･Select the number of teeth of the small pulley from areas other than the colored areas in the standard transmission capacity tables.
- ･Select a small pulley that meets the "pitch circle diameter > belt width."
- ･Verify that the bore usable range of the small pulley satisfies the shaft diameter.

(3) Determine the number of teeth of the large pulley based on the number of teeth of the small pulley and the speed ratio. Verify the bore diameter to use also.

Selection of belt length and center distance

(1) Calculate an approximate belt length (L') and select a belt of the length that is closest to the approximate length from the list of belt types.

$$L' = 2C + 1.57(Dp + dp) + \frac{(Dp - dp)^2}{4C}$$

L' : Approximate belt length mm
C : Center distance mm
Dp : Pitch circle diameter of large pulley mm
dp : Pitch circle diameter of small pulley mm

(2) Calculate the center distance (C) using the selected belt length (L).

$$C = \frac{B + \sqrt{B^2 - 2(Dp - dp)^2}}{4} \qquad B = L - 1.57(Dp + dp)$$

L : Belt length mm

Correction for the number of meshing teeth

The use of a pulley the number of meshing teeth of which is less than 6 is not recommended, but if such a pulley needs to be used, correction for the number of meshing teeth is necessary. After obtaining the number of meshing teeth, determine a meshing correction factor referring to Table 6 on page 49.

$$Zm = N \times \frac{\phi}{360^\circ}$$

$$\phi = 180^\circ - \frac{57^\circ(Dp - dp)}{C}$$

Zm : Number of meshing teeth of small pulley
N : Number of teeth of small pulley
ϕ : Belt contact angle to small pulley degrees
Dp : Pitch circle diameter of large pulley mm
dp : Pitch circle diameter of small pulley mm

Verification of belt width

Verify the belt width that satisfies the design power.

$$Pd \leqq Pu \times Kw \times Km \times KL$$

$$Kw \geqq \frac{Pd}{Pu \times Km \times KL}$$

Pd : Design power kW
Pu : Standard transmission capacity kW
Kw : Belt width factor
Km : Meshing correction factor　Table 6 on page 49
KL : Belt length correction factor　Table 5 on page 49

Selection and Design

Selection Calculation and Examples of Calculation

SELECTION BASED ON TORQUE

Parameters required for selection

The parameters required for selection are as follows. Determine each condition.

- ●Output shaft torque of motor N · m, output shaft revolution r/min, shaft diameter
- ●Type, revolution r/min, shaft diameter of driven machine
- ●Center distance
- ●Hours of use and frequency of start-stop per day
- ●Speed ratio
- ●Use or nonuse of idler
- ●Other conditions

Determination of design torque

Calculate the design torque as follows:

$$Pt = Pm \times (Ko + Ki + Ks) \times Ka$$

Pt : Design torque N · m
Pm : Transmission torque N · m
Ko : Load correction factor — Table 1 on page 49
Ki : Correction factor when idler is used — Table 2 on page 49
Ks : Correction factor for speed increase — Table 3 on page 49
Ka : Start-stop frequency correction factor — Table 4 on page 49

Determination of belt size and number of teeth of pulleys

(1) Referring to the simplified selection tables (pages 45 – 46), tentatively select a belt size based on the design torque and small pulley revolution.

(2) Referring to the standard transmission torque tables (pages 29-43), tentatively select a belt width and the number of teeth of the small pulley. For selection, take the following precautions:

- · Select the number of teeth of the small pulley from areas other than the colored areas in the standard transmission torque tables.
- · Select a small pulley that meets the "pitch circle diameter > belt width."
- · Verify that the bore usable range of the small pulley satisfies the shaft diameter.

(3) Determine the number of teeth of the large pulley based on the number of teeth of the small pulley and the speed ratio. Verify the bore diameter to use also.

Selection of belt length and center distance

(1) Calculate an approximate belt length (L') and select a belt of the length that is closest to the approximate length from the list of belt types.

$$L' = 2C + 1.57(Dp + dp) + \frac{(Dp - dp)^2}{4C}$$

L' : Approximate belt length mm
C : Center distance mm
Dp : Pitch circle diameter of large pulley mm
dp : Pitch circle diameter of small pulley mm

(2) Calculate the center distance (C) using the selected belt length (L).

$$C = \frac{B + \sqrt{B^2 - 2(Dp - dp)^2}}{4} \qquad B = L - 1.57(Dp + dp)$$

L : Belt length mm

Correction for the number of meshing teeth

The use of a pulley the number of meshing teeth of which is less than 6 is not recommended, but if such a pulley needs to be used, correction for the number of meshing teeth is necessary. After obtaining the number of meshing teeth, determine a meshing correction factor referring to Table 6 on page 49.

$$Zm = N \times \frac{\phi}{360^\circ}$$

$$\phi = 180^\circ - \frac{57^\circ(Dp - dp)}{C}$$

Zm : Number of meshing teeth of small pulley
N : Number of teeth of small pulley
ϕ : Belt contact angle to small pulley degrees
Dp : Pitch circle diameter of large pulley mm
dp : Pitch circle diameter of small pulley mm
C : Center distance mm

Verification of belt width

Verify the belt width that satisfies the design torque.

$$Pt \leqq Pr \times Kw \times Km \times KL$$

$$Kw \geqq \frac{Pt}{Pr \times Km \times KL}$$

Pt : Design torque N · m
Pr : Standard transmission torque N · m
Kw : Belt width factor
Km : Meshing correction factor — Table 6 on page 49
KL : Belt length correction factor — Table 5 on page 49

Selection and Design

Selection Calculation and Examples of Calculation

SELECTION BASED ON INERTIAL LOAD

Parameters required for selection

The parameters required for selection are as follows. Determine each condition.

(1) Rotating body
Shape, dimensions, mass, revolution, acceleration (deceleration) time, shaft diameter, center distance, run hours per day, start-stop frequency, speed ratio, use or nonuse of an idler and other conditions.

(2) Linear moving body
Pulley pitch circle diameter, mass of a linear moving body, supporting method, coefficient of friction of supporting mechanism, moving speed, acceleration (deceleration) time, shaft diameter, center distance, run hours per day, start-stop frequency, speed ratio, use or nonuse of an idler and other conditions.

Calculation of moment of inertia

Calculate the moment of inertia as follows:

(1) Rotating body

· Solid cylinder

$$I = \frac{1}{8} mD^2$$

· Hollow cylinder

$$I = \frac{1}{8} m(D^2+d^2)$$

· Rectangular cross section

$$I = \frac{1}{12} m(a^2+b^2)$$

· Eccentric rotating body

$$I = \frac{1}{8} mD^2+me^2$$

(2) Linear moving body

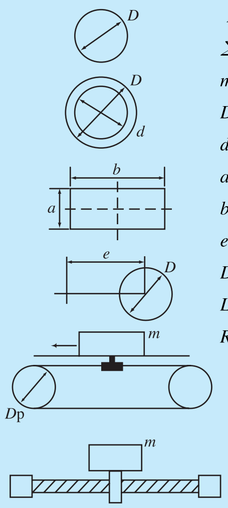
$$I = \frac{1}{4} mDp^2$$

(3) Ball screw drive

$$I = \frac{1}{4} m\left(\frac{L}{\pi}\right)^2$$

(4) Total moment of inertia

$$\Sigma I = (I_1+I_2+\cdots\cdots)R^2$$



I : Moment of inertia of a body kg · m²
ΣI : Total moment of inertia
m : Mass of a rotating or linear moving body kg
D : Outside diameter of a rotating body m
d : Inside diameter of the hollow of a rotating body m
a : Length of a side of the rectangular cross section m
b : Length of a side of the rectangular cross section m
e : Distance of eccentricity m
Dp : Pulley pitch circle diameter m
L : Lead of screw m
R : Reduction ratio (Number of teeth of drive pulley / number of teeth of driven pulley)

※Total the moment of inertia of all moving bodies (including the driven pulley) that are drive by the belt by the equation shown on the left side.

Calculation of acceleration (deceleration) torque

Calculate the acceleration (deceleration) torque as follows:

$$Pa = \frac{\Sigma I \times (n_2 - n_1)}{9.55 \times ta}$$

Pa : Acceleration (deceleration) torque N · m
n_1 : Revolution before acceleration (deceleration) r/min
n_2 : Revolution after acceleration (deceleration) r/min
ta : Acceleration (deceleration) time s

Calculation of continuous load torque

Calculate the continuous load torque as follows:

(1) Horizontal movement

$$Pc = 4.9 \times m\mu Dp$$

(2) Vertical movement

$$Pc = 4.9 \times mDp$$

Pc : Continuous load torque N · m
μ : Coefficient of friction of moving body supporting mechanism

Determination of design torque

Calculate the design torque as follows. For Ko and Ka, use values in the following tables:

$$Pt = (Pa+Pc) \times (Ko+Ki+Ks) \times Ka$$

●Load correction factor

Run hours per day h	<3	3~10	10<
Ko	1.2	1.3	1.5

●Start-stop frequency correction factor

Frequency of start/stop per day	≦10	11~100	101~999	1000≦
Ka	1.1	1.2	1.3	1.5

Pt : Design torque N · m
Pa : Acceleration (deceleration) torque N · m
Pc : Continuous load torque N · m
Ko : Load correction factor Left-side figure
Ki : Correction factor when idler is used Table 2 on page 49
Ks : Correction factor for speed increase Table 3 on page 49
Ka : Start-stop frequency correction facto Left-side figure

※For the following steps, return to "Determination of belt size and number of teeth of pulleys" on page 50.

Selection and Design

Selection Calculation and Examples of Calculation

AN EXAMPLE OF SELECTION CALCULATION (BASED ON POWER)

Parameters required for selection

The parameters required for selection are as follows:

Item	Description
Motor output, revolution, shaft diameter	5.5 kW (peak torque 200%), 1450 r/min, 32 mm
Type, revolution, shaft diameter of driven machine	Pump, 920 r/min, 30 mm
Center distance	415 mm
Run hours per day, start-stop frequency	12 hours/day, 100 times/day
Speed ratio	1 : 1.58 reduction
Use or nonuse of idler	On the back of the slack side
Other conditions	Small pulley to be 100 mm or less in OD for layout reason.

Determination of design power

Obtain the correction factors appropriate for the conditions of use from the tables on page 49 and determine the design power.

Load correction factor (Ko) ································ 1.6
Correction factor when idler is used (Ki) ················ 0.1
Correction factor for speed increase (Ks) ··············· 0
Start-stop frequency correction factor (Ka) ··········· 1.4

Design power: $Pd = Pk \times (Ko + Ki + Ks) \times Ka = 5.5 \times (1.6 + 0.1 + 0) \times 1.4 = 13.1$

Thus, the design power is 13.1 kW.

Determination of belt size and number of teeth of pulleys

(1) Tentatively determine a belt size from the simplified selection tables (page 45). Here, tentatively select "P8M" from the design power (13.1 kW) and motor revolution (1450 r/min).

(2) In consideration of the speed ratio, shaft diameters of the motor and driven machine and other conditions, select a belt width and the number of teeth of a pulley from the standard transmission capacity table (page 32). Here, select 28 teeth (dp=71.30 mm) and 44 teeth (Dp=112.05 mm) of P8M60 (belt width 60 mm).For the dimensions of the pulleys, see pages 59 - 85.

Determination of belt length and center distance

(1) Calculate an approximate belt length (L').

$$L' = 2C + 1.57(Dp + dp) + \frac{(Dp - dp)^2}{4C} = 2 \times 415 + 1.57(112.05 + 71.30) + \frac{(112.05 - 71.30)^2}{4 \times 415} = 1118.86 \text{ mm}$$

The belt which is closest to this approximate length is "1120P8M" (140 teeth) from the list of types and dimensions (page 16).

(2) Calculate the center distance (C).

$$B = L - 1.57(Dp + dp) = 1120 - 1.57(112.05 + 71.30) = 832.14$$

$$C = \frac{B + \sqrt{B^2 - 2(Dp - dp)^2}}{4} = \frac{832.14 + \sqrt{832.14 - 2(112.05 - 71.30)^2}}{4} = 415.57 \text{ mm}$$

Correction for the number of meshing teeth

Obtain the number of teeth of the belt that mesh with the small pulley and determine the meshing correction factor.

$$\phi = 180^\circ - \frac{57^\circ (Dp - dp)}{C} = 180^\circ - \frac{57^\circ (112.05 - 71.30)}{803.94} = 177.11^\circ$$

$$Zm = N \times \frac{\phi}{360^\circ} = \frac{28 \times 177.11}{360^\circ} = 13.8 \text{ teeth}$$

Thus, the meshing correction factor is 1.0 from the table on page 49.

Determination of belt width

Finally determine the belt width that satisfies the design power.

$$Kw \geqq \frac{Pd}{Pu \times Km \times KL} = \frac{13.1}{3.26 \times 1.0 \times 1.0} = 4.02$$

Thus, the belt that satisfies the width factor is P8M60 (belt width 60 mm).

Results of selection

Belt : BG1120P8M60
Small pulley : PT28P8M60AF or BF
Large pulley : PT44P8M60AF or BF
Center distance : 415.57 mm

Selection and Design

Selection Calculation and Examples of Calculation

AN EXAMPLE OF SELECTION CALCULATION (BASED ON INERTIAL LOAD)

Parameters required for selection

The parameters required for selection are as follows:

Item	Description
	(Machine tool table drive)
Pulley pitch circle diameter	50 mm or less
Mass of linear moving body	50 kg
Supporting method and coefficient of friction of supporting mechanism	LM guide, coefficient of friction μ=0.1
Moving speed	1000 r/min
Acceleration (deceleration) time	0.3 s
Shaft diameter	20 mm
Center distance	1400 mm
Run hours per day, start-stop frequency	12 hours/day, 800 times/day
Speed ratio	1 : 1
Use or nonuse of idler	None
Other conditions	None

Calculation of moment of inertia

First, obtain the moment of inertia. For the linear moving body, the following equation applies. Based on the above conditions, tentatively select the pulley "30P5M" (number of teeth 30 , Dp=47.75 mm).

$$I = \frac{1}{4} mDp^2 = \frac{1}{4} \times 50 \times 0.04775^2 = 0.0285 \text{ kg} \cdot \text{m}^2$$

Calculation of acceleration (deceleration) torque and continuous load torque

Obtain the acceleration (deceleration) torque and continuous load torque as follows:

Acceleration (deceleration) torque $$Pa = \frac{I \times (n2 - n1)}{9.55 \times ta} = \frac{0.0285 \times (1000 - 0)}{9.55 \times 0.3} = 9.55 \text{ N} \cdot \text{m}$$

Continuous load torque $$Pc = 4.9 \times m\mu Dp = 4.9 \times 50 \times 0.1 \times 0.04775 = 1.17 \text{ N} \cdot \text{m}$$

Determination of design torque

Obtain the design torque by multiplying a total of the acceleration (deceleration) torque and continuous load torque by each correction factor.

$$Pt = (Pa + Pc) \times (Ko + Ki + Ks) \times Ka = (9.95 + 1.17) \times (1.5 + 0 + 0) \times 1.5 = 25.02 \text{ N} \cdot \text{m}$$

After the determination of the design torque, follow "General selection - Selection based on torque."

Determination of belt size and number of teeth of pulleys

(1) Tentatively select a belt size from the simplified selection tables (page 45). Here, tentatively select "UP5M" from the design torque (25.02 N・m) and motor revolution (1000 r/min).

(2) In consideration of the pulley pitch circle diameter, speed ratio, shaft diameter and other conditions, select a belt width and the number of teeth of the pulley from the standard transmission torque table (page 35). Here, select 30 teeth (Dp=47.75 mm) of UP5M25 (belt width 25 mm).For the dimensions of the pulleys, see pages 59 - 85.

Determination of belt length and center distance

(1) Calculate an approximate belt length (L').

$$L' = 2C + 1.57(Dp + dp) + \frac{(Dp - dp)^2}{4C} = 2 \times 1400 + 1.57(47.75 + 47.75) + \frac{(47.75 - 47.75)^2}{4 \times 1400} = 2950 \text{ mm}$$

The belt which is closest to this approximate length is "3050UP5M" (610 teeth) from the list of types and dimensions (page 15).

(2) Calculate the center distance (C).

$$B = L - 1.57(Dp + dp) = 3050 - 1.57(47.75 + 47.75) = 2900$$

$$C = \frac{B + \sqrt{B^2 - 2(Dp + dp)^2}}{4} = \frac{2900 + \sqrt{2900^2 - 2(47.75 - 47.75)^2}}{4} = 1450 \text{ mm}$$

Correction for the number of meshing teeth

Obtain the number of teeth of the belt that mesh with the small pulley and determine the meshing correction factor. Since the speed ratio is 1:1, the number of meshing teeth is a half of 30 teeth, which is 15 teeth. Thus, the meshing correction factor is 1.0.

Determination of belt width

Finally confirm the belt width that satisfies the design torque.

$$Kw \geqq \frac{Pt}{Pr \times Km \times KL} = \frac{25.02}{9.1 \times 1.0 \times 1.2} = 2.29$$

Thus, the belt that satisfies the width factor is UP5M25 (belt width 25 mm).

Results of selection

Belt : BG3050UP5M25-HC   Pulley : PT30P5M25AF or BF
Center distance : 1450 mm

Selection and Design

Layout Design

DESIGN REFERENCE

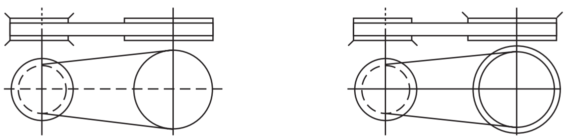
Installation of guide flanges

The timing belt when running tends to deviate in the axial direction of the pulleys. In order to prevent the timing belt from moving out of the pulleys, guide flanges are installed on the pulleys. The guide flange installation standard is as follows:

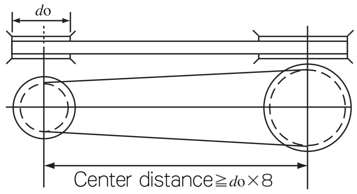
■Horizontal-shaft transmission

Install guide flanges on both sides of either pulley or install a guide flange on one side of one pulley and another flange on the opposite side of the other pulley. (Example 1) Where the pulley center distance is greater than 8 times the outside diameter of the small pulley, install guide flanges on both sides of both pulleys. (Example 2)

(Example 1)

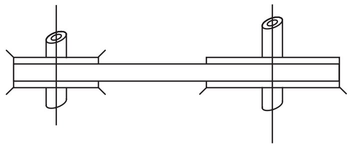


(Example 2)



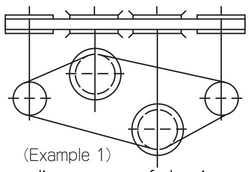
■Vertical-shaft transmission

Since the belt is likely to disengage downward, install guide flanges on both sides of one pulley and another guide flange on the lower side of the other pulley.

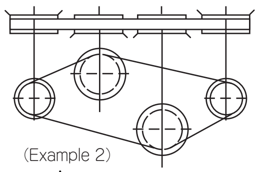


■Multiple-shaft transmission

Install guide flanges on both sides of every other pulley (Example 1) or install guide flanges on one side of all pulleys alternately (Example 2).



(Example 1)



(Example 2)

Use of an idler

An idler is used in the following cases:

- ●The bearing is stationary and an idler is used for adjustment of the installation tension.
- ●The speed ratio is large and the number of meshing teeth of the small pulley needs to be increased.
- ●No belt guide can be used on the drive and driven pulleys.

■Precautions for using the idler

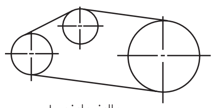
- ●The idler must be stationary and as a rule be used on the slack side.
- ●Note that if the parallelism between the axis of the idler and the axes of both pulleys is poor, the idler may cause the belt to disengage from the pulleys.
- ●Determine the idler diameter according to the following criteria.

Inside idler……A timing pulley having the number of teeth greater than the minimum number of teeth of pulley in the following table.
Outside idler……A flat pulley that is greater than 1.2 times the pitch circle diameter of the pulley in the following table and does not have a crown.

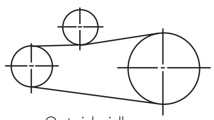
■Minimum number of teeth of pulley for selection of an idler

Type \ Revolution r/min	Up to and incl. 900	Over 900, up to and incl. 1200	Over 1200, up to and incl. 1800	Over 1800, up to and incl. 3600
P2M	16	16	18	20
P3M・UP3M-HC	14	14	16	18
P5M・UP5M-HC	18	20	24	28
P8M・UP8M-HC	24	26	26	28
P14M・UP14M-HC	28	28	28	34

Note: For revolutions above 3600 r/min, refer to the Standard Transmission Capacity Table.



Inside idler



Outside idler

Type \ Revolution r/min	Up to and incl. 900	Over 900, up to and incl. 1200	Over 1200, up to and incl. 1800	Over 1800, up to and incl. 3600	Over 3600, up to and incl. 4200
MXL	10	12	14	16	16
XL	10	10	12	12	14
L	12	12	14	16	18
H	14	16	18	20	22
XH	22	24	26	30	–
XXH	22	24	26	–	–

Note: For revolutions above 4200 r/min, refer to the Standard Transmission Capacity Table.

Installation tension and axial load

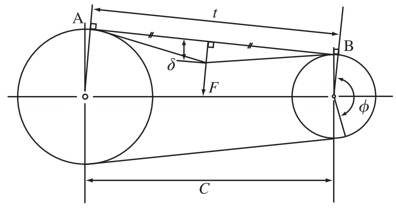
■Belt installation tension

Timing belt drive is meshing type drive, but an adequate installation tension is required to prevent jumping teeth and to ensure smooth drive. A weak installation tension tends to cause mismatching of tooth meshing and a strong tension tends to cause noises, both of which shorten the service life. A sound wave formula belt tension meter that can measure the tension accurately is available. See page 74.

■How to apply an installation tension

1. Accurately establish the parallelism of all shafts including the idler shaft and pulley alignment.
2. Apply a force (F) to the center of the span of the belt.
3. Apply a tension that makes the deflection (δ) of the belt 1.6 mm per 100 mm of span.

■How to obtain the push force (F)



$$F=\frac{Ti+\dfrac{t\times Y}{L}}{16}$$

F : Push force required for deflection (δ) at the center of the span(t) N {kgf}
Ti : Installation tension N {kgf}
Y : Correction factor
δ : Deflection mm=0.016 t
t : Span length mm

$$t=\sqrt{C^2-\frac{(Dp-dp)^2}{4}}$$

C : Center distance mm
Dp : Pitch circle diameter of large pulley mm
dp : Pitch circle diameter of small pulley mm
L : Belt length mm

■List of installation tension

Type	Belt Width mm	Installation Tension Ti N {kgf} Recommended	Installation Tension Ti N {kgf} Max. Value	Correction Factor Y	Required Push Force F N {kgf}
P2M	4	5.9 { 0.6}	7.8 { 0.8}	0.6 { 0.06}	0.39 { 0.04}
	6	9.8 { 1.0}	13 { 1.3}	0.9 { 0.09}	0.69 { 0.07}
	10	17 { 1.7}	23 { 2.3}	1.6 { 0.16}	1.08 { 0.11}
P3M	6	20 { 2.0}	26 { 2.7}	1.1 { 0.11}	1.27 { 0.13}
	10	34 { 3.5}	46 { 4.7}	1.9 { 0.19}	2.25 { 0.23}
	15	55 { 5.6}	74 { 7.5}	3.0 { 0.31}	3.63 { 0.37}
UP3M-HC	6	29 { 3.0}	40 { 4.1}	21.6 { 2.2 }	2.2 { 0.22}
	10	54 { 5.5}	72 { 7.3}	34.3 { 3.5 }	3.9 { 0.40}
	15	88 { 9.0}	118 { 12.0}	52.0 { 5.3 }	6.4 { 0.65}
P5M•UP5M-HC	10	108 { 11.0}	147 { 15.0}	56.9 { 5.8 }	6.9 { 0.70}
	15	167 { 17.0}	225 { 23.0}	82.4 { 8.4 }	11.8 { 1.20}
	25	304 { 31.0}	412 { 42.0}	201 { 20.5 }	21.6 { 2.20}
P8M	15	225 { 23.0}	294 { 30.0}	135 { 13.8 }	17.6 { 1.80}
	25	382 { 39.0}	510 { 52.0}	239 { 24.4 }	30.4 { 3.10}
	40	657 { 67.0}	860 { 88.0}	419 { 42.8 }	51.9 { 5.30}
	60	1 040 {106 }	1 370 {140.0}	628 { 64.1 }	81.3 { 8.30}
UP8M-HC	15	177 { 18.0}	235 { 24.0}	135 { 13.8 }	14.1 { 1.44}
	25	304 { 31.0}	408 { 41.6}	239 { 24.4 }	24.3 { 2.48}
	40	530 { 54.0}	690 { 70.4}	419 { 42.7 }	41.5 { 4.23}
	60	834 { 85.0}	1 100 {112.0}	628 { 64.0 }	65.0 { 6.63}
P14M	40	990 {101.0}	1 310 {134.0}	502 { 51.2 }	103.9 { 10.6 }
	60	1 500 {153.0}	2 000 {204.0}	837 { 85.4 }	157.8 { 16.1 }
	80	2 110 {215.0}	2 810 {286.0}	1 000 {102.0 }	222.5 { 22.7 }
	100	2 710 {276.0}	3 610 {368.0}	1 260 {128.0 }	286.2 { 29.2 }
	120	3 340 {341.0}	4 450 {454.0}	1 680 {171.0 }	352.8 { 36.0 }
UP14M-HC	40	794 { 81.0}	1 050 {107.0}	502 { 51.2 }	83.1 { 8.48}
	60	1 200 {122.0}	1 600 {163.0}	837 { 85.3 }	126.2 { 12.88}
	80	1 690 {172.0}	2 250 {229.0}	1 000 {102.0 }	178.0 { 18.24}
	100	2 170 {221.0}	2 880 {294.0}	1 260 {128.0 }	228.9 { 23.36}
	120	2 680 {273.0}	3 560 {363.0}	1 680 {171.0 }	282.2 { 28.80}

Type	Belt Width Designation	Belt Width mm	Installation Tension Ti N {kgf} Recommended	Installation Tension Ti N {kgf} Max. Value	Correction Factor Y	Required Push Force F N {kgf}
MXL	3.2	3.2	2.06 { 0.21}	4.90 { 0.50}	4.22 { 0.43}	0.137 { 0.014}
	4.8	4.8	3.14 { 0.32}	8.33 { 0.85}	6.67 { 0.68}	0.196 { 0.020}
	6.4	6.4	4.12 { 0.42}	11.76 { 1.20}	9.32 { 0.95}	0.274 { 0.028}
	9.5	9.5	6.17 { 0.63}	18.13 { 1.85}	14.6 { 1.49}	0.412 { 0.042}
	12.7	12.7	8.23 { 0.84}	24.99 { 2.55}	20.4 { 2.08}	0.549 { 0.056}
XL	025	6.4	13.7 { 1.4 }	29.4 { 3.0 }	11.8 { 1.20}	0.98 { 0.10 }
	031	7.9	19.6 { 2.0 }	37.2 { 3.8 }	16.4 { 1.67}	1.18 { 0.12 }
	037	9.5	24.5 { 2.5 }	44.1 { 4.5 }	22.0 { 2.24}	1.57 { 0.16 }
L	050	12.7	51.9 { 5.3 }	76.4 { 7.8 }	38.3 { 3.91}	3.23 { 0.33 }
	075	19.1	87.2 { 8.9 }	124.5 { 12.7 }	65.2 { 6.65}	5.49 { 0.56 }
	100	25.4	122.5 { 12.5 }	174.4 { 17.8 }	91.3 { 9.31}	7.84 { 0.80 }
H	075	19.1	221.5 { 22.6 }	293.0 { 29.9 }	193 { 19.7 }	13.7 { 1.4 }
	100	25.4	311.6 { 31.8 }	420.4 { 42.9 }	264 { 26.9 }	18.6 { 1.9 }
	150	38.1	486.1 { 49.6 }	645.8 { 65.9 }	419 { 42.7 }	30.4 { 3.1 }
	200	50.8	667.4 { 68.1 }	888.9 { 90.7 }	558 { 56.9 }	41.2 { 4.2 }
	300	76.2	1 046.64 {106.8 }	1 390.6 {141.9 }	1 004 {102.4 }	64.7 { 6.6 }
XH	200	50.8	908.5 { 92.7 }	1 008.4 {102.9 }	930 { 94.8 }	56.8 { 5.8 }
	300	76.2	1 425.9 {145.5 }	1 581.7 {161.4 }	1 477 {150.6 }	89.2 { 9.1 }
	400	101.6	2 019.8 {206.1 }	2 240.3 {228.6 }	2 092 {213.3 }	122.5 {12.5 }
XXH	200	50.8	1 113.3 {113.6 }	2 469.6 {252.0 }	930 { 94.8 }	103.9 {10.6 }
	300	76.2	1 748.3 {178.4 }	3 880.8 {396.0 }	1 477 {150.6 }	164.6 {16.8 }
	400	101.6	2 477.4 {252.8 }	5 502.7 {561.5 }	2 092 {213.3 }	235.2 {24.0 }
	500	127.0	3 200.7 {326.6 }	7 105.0 {725.0 }	2 643 {269.5 }	302.8 {30.9 }

When there is a margin in the belt capacity for the conditions of use, the initial tension (Ti) may be reduced slightly. However, be sure to conduct on-board test prior to use.

■Axial load

The axial load is obtained by the following equation:

$$\text{Axial load} = 2Ti\times\sin\frac{\phi}{2}$$

Ti : Installation tension N {kgf}
ϕ : Winding angle of small pulley degrees

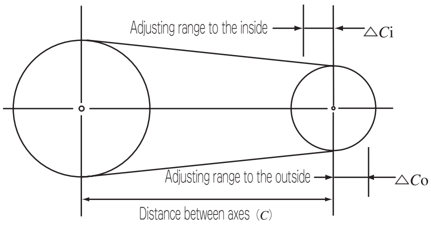
Adjustment of distance between two axes

In the transmission of only driving and driven pulleys, without using an idler, provide the adjusting margin (table below) of the distance between axes at the bearing including the manufacturing length (tolerance) of belt.In case of multi-axial transmission, make additional calculations for each belt span, and make conversion for the bi-axial transmission. Then obtain the adjusting margin.

■Adjusting margin of inter-axial distance

mm

	Type / Belt length	P2M·P3M·P5M UP3M-HC·UP5M-HC	P8M·P14M UP8M-HC·UP14M-HC
$\triangle Co$	Up to and incl. 500	3	3
	500～1000	5	5
	1001～2000	10	10
	Over 2000	15	15
$\triangle Ci$	Common	10	15



mm

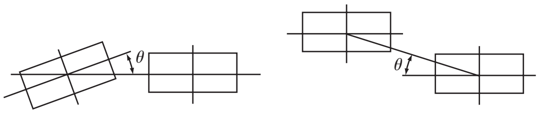
	Type / Belt length	MXL	XL	L	H	XH	XXH
$\triangle Co$	Up to and incl. 200	3	3	3	3	3	3
	201～ 390	5	5	5	5	5	5
	391～ 800	10	10	10	10	10	10
	801～1200	15	15	15	15	15	15
	Over 1201	22	25	25	25	25	25
$\triangle Ci$	Common	5	5	10	15	40	50

Alignment of pulley

Tsubaki synchronous belt does not turn at pulley center even when pulley-alignment is exact, and it is liable to deviate on either side.That force is very weak and when pulley alignment is poor, belt-side may be damaged. In extreme cases, it may run on the guide flange and break. Accordingly, adjust the alignment of pulley within the allowable range listed below.

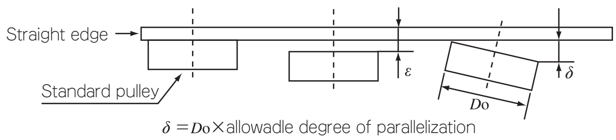
■Allowable range of pulley alignment

Belt Size	All			
Belt width mm	Up to and incl. 30	30～50	50～100	Over 100
Allowadle degree of parallelization	Up to and incl. $\frac{5}{1000}$	Up to and incl. $\frac{4}{1000}$	Up to and incl. $\frac{3}{1000}$	Up to and incl. $\frac{2}{1000}$
θ min	Up to and incl. 17	Up to and incl. 13	Up to and incl. 10	Up to and incl. 6



■How to adjust the pulley:

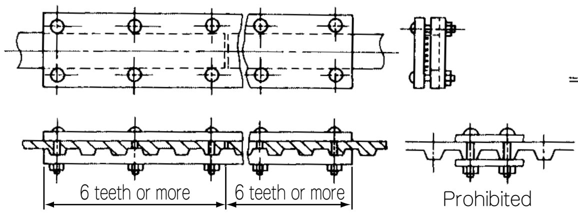
As shown in the diagram, apply the straight edge to the end face of the pulley which is to be standard. Make the other pulley contact with straight edge on all faces (to make $\varepsilon=0$) .It is possible to take axial degree of parallelization simultaneously.



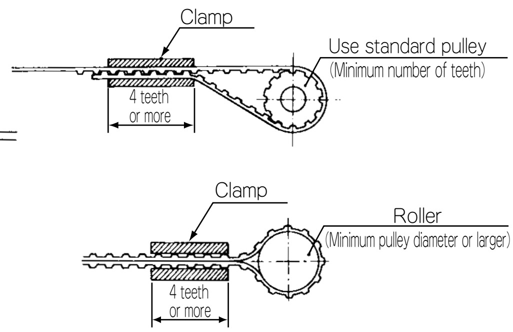
Long belt

■Connecting methods

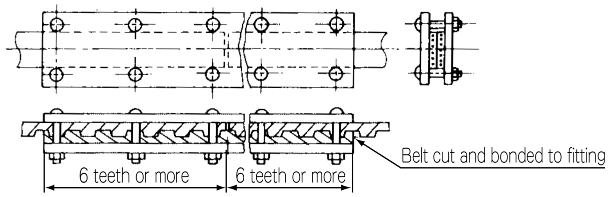
○Use of fitting



○Folding the end of belt



○Use of belt teeth



Caution: Do not make a hole in the belt directly.

Multi Timing Belt

■Layout calculation

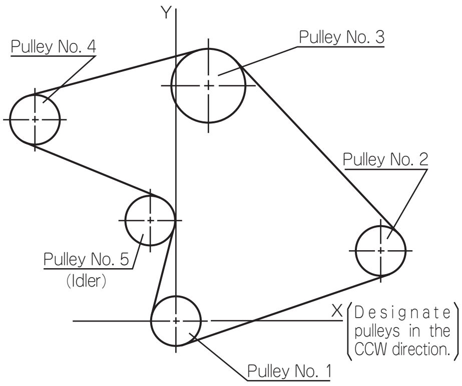
The "Tsubaki Timing Belt Design Software," which can be downloaded from the Tsubakimoto website, helps calculate the layout. If you want us to calculate, please provide us with the following data:

Parameters required for calculation

- Shaft arrangement (Shaft centers shown on the X-Y coordinates)
- Belt size and pitch
- Number of teeth of each pulley
- How to loop a belt on pulleys (inside or outside of pulleys)
- Shafts that can be moved and their movable distance and direction

Example: Belt pitch＝12.700 mm

Pulley No.	Coordinates X	Coordinates Y	Number of Teeth (Pitch Dia)	Pulley Location	Shaft Movement	Move Condition
1	0	0	20	Inside	Not possible	
2	+300	+100	20	Inside	Not possible	
3	+ 50	+350	30	Inside	Not possible	
4	−200	+300	18	Inside	Not possible	
5	− 50	+150	18	Outside	Possible	±20 mm in X direction



Belt dimensional tolerances

■Belt length tolerance

mm

PX Belt ULTRA PX Belt-HC	Trapezoidal Belt	tolerance
up to and incl. 256	up to and incl. 254	±0.41
Over 256, up to and incl. 384	Over 254 , up to and incl. 381	±0.46
Over 384, up to and incl. 512	Over 381 , up to and incl. 508	±0.51
Over 512, up to and incl. 760	Over 508 , up to and incl. 762	±0.61
Over 760, up to and incl.1016	Over 762 , up to and incl. 990.6	±0.66
Over1016, up to and incl.1272	Over 990.6, up to and incl.1219.2	±0.76
Over1272, up to and incl.1528	Over 1219.2, up to and incl.1524	±0.81
Over1528, up to and incl.1776	Over 1524 , up to and incl.1778	±0.86
Over1776, up to and incl.2032	Over 1778 , up to and incl.2032	±0.91
Over2032, up to and incl.2288	Over 2032 , up to and incl.2286	±0.97
Over2288, up to and incl.2544	Over 2286 , up to and incl.2540	±1.02
Over2544, up to and incl.2792	Over 2540 , up to and incl.2794	±1.07
Over2792, up to and incl.3048	Over 2794 , up to and incl.3048	±1.12
Over3048, up to and incl.3304	Over 3048 , up to and incl.3302	±1.17
Over3304, up to and incl.3560	Over 3302 , up to and incl.3556	±1.22
Over3560, up to and incl.3808	Over 3556 , up to and incl.3810	±1.26
Over3808, up to and incl.4064	Over 3810 , up to and incl.4064	±1.32
Over4064, up to and incl.4320	Over 4064 , up to and incl.4318	±1.37
Over4320, up to and incl.4576	Over 4318 , up to and incl.4572	±1.42

■Belt width tolerance

●PX/Ultra PX belt-HC

Belt width	Belt length mm: up to and incl. 840	Over 840, up to and incl. 1680	Over 1680
up to and incl. 10	+0.3 / −0.6	+0.6 / −0.6	−
Over 10, up to and incl. 45	+0.8 / −0.8	+0.8 / −1.2	+0.8 / −1.2
Over 45, up to and incl. 75	+1.2 / −1.6	+1.6 / −1.6	+1.6 / −1.6
Over 75, up to and incl.100	+1.6 / −1.6	+1.6 / −2.0	+2.0 / −2.0
Over 100	+2.4 / −2.4	+2.4 / −2.8	+2.4 / −3.2

●Trapezoidal belt

Type	Belt width Designation	Belt width mm	Belt width tolerance mm: Belt length up to and incl. 838.2	Belt length Over 838.2, up to and incl. 1676.4	Belt length Over 1676.4
MXL	3.2	3.2	+0.3 / −0.6	+0.3 / −0.6	—
	4.8	4.8			
	6.4	6.4			
	9.5	9.5			
	12.7	12.7			
XL	025	6.4	+0.5 / −0.8	+0.5 / −0.8	+0.5 / −0.8
	031	7.9			
	037	9.5			
L	050	12.7	±0.8	+0.8 / −1.3	+0.8 / −1.3
	075	19.1			
	100	25.4			
H	075	19.1	±0.8	+0.8 / −1.3	+0.8 / −1.3
	100	25.4			
	150	38.1			
	200	50.8	+0.8 / −1.3	±1.3	+1.3 / −1.5
	300	76.2	+1.3 / −1.5	±1.5	+1.5 / −2.0
XH	200	50.8	—	±4.8	±4.8
	300	76.2			
	400	101.6			
XXH	200	50.8	—	—	±4.8
	300	76.2			
	400	101.6			
	500	127.0			

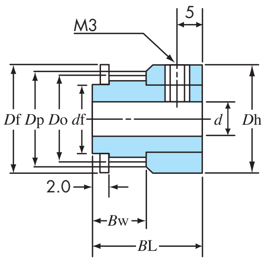
Pulleys

Dimensions of Standard Stock Pulleys

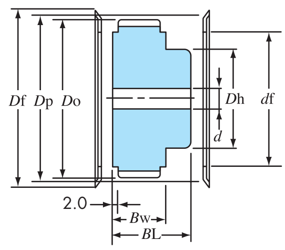
The pulley types listed on this page are standard stock pulleys. If the different number of teeth, size or material is required, see page 75.

P2M (P : 2 mm)

■Pulley Type

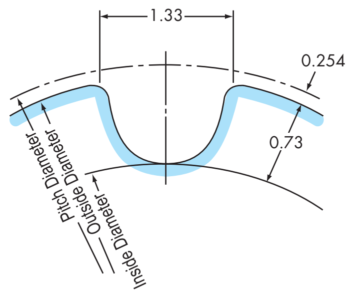


DF type



BF type

■Tooth Shape



■Model Identification

PT 20 P 2M 6 DF

- PT — Pulley
- 20 — No.of groove
- P — P : PX
- 2M — Size
- 6 — Belt width mm
- DF — Pulley type

■Model Identification (Flange)

PT A S 10 170 100

- PT — Pulley
- A — Material A : Aluminum
- S — Shape
- 10 — Thickness t ex : 1.0 mm
- 170 — Outside diameter Df ex : 17.0 mm
- 100 — Inside diameter df ex : 10.0 mm

■Materials

High tensile aluminum

■Pulley Dimensions

mm

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Type	Flange	Hub diameter Dh	Bore size d Min	Bore size d Max	P2M6 (Width=6.0 mm) Bw	P2M6 (Width=6.0 mm) BL
14	**8.91**	**8.40**	**DF**	PTAS1012055	12		4		
15	**9.55**	**9.04**	**DF**	PTAS1013070	13	3	5		
16	**10.19**	**9.68**	**DF**	PTAS1013070					
18	**11.46**	**10.95**	**DF**	PTAS1015080	15		6		
20	**12.73**	**12.22**	**DF**	PTAS10170100				9.5	
22	**14.01**	**13.50**	**DF**	PTAS10170100	17				
24	**15.28**	**14.77**	**DF**	PTAS10170100		4	6.35		
25	**15.92**	**15.41**	**DF**	PTAS10210133	21				
26	**16.55**	**16.04**	**DF**	PTAS10210133					
28	**17.83**	**17.32**	**BF**	PTAS10250150					20
30	**19.10**	**18.59**	**BF**	PTAF10260150	12		8		
32	**20.37**	**19.86**	**BF**	PTAF10280160					
34	**21.65**	**21.14**	**BF**	PTAF10280160	14		9		
36	**22.92**	**22.41**	**BF**	PTAF10290180					
40	**25.46**	**24.96**	**BF**	PTAF10320212	16	5	10	11.5	
42	**26.74**	**26.23**	**BF**	PTAF10320212					
44	**28.01**	**27.50**	**BF**	PTAF10340230	18		12		
48	**30.56**	**30.05**	**BF**	PTAF10360224					
50	**31.83**	**31.32**	**BF**	PTAF10390265	22		15		
60	**38.20**	**37.69**	**BF**	PTAF10450335	28		19		

· The bore diameters of all types have been finished to a tolerance of 0–28 μm.
· The pulley for P2M6 can also be used for the P2M4 belt.
· The flange of the BF type has been packed without being installed on the body.

Cylindrical pulley P69
Belt Types and Dimensions P13,P23
Custom made pulleys P75

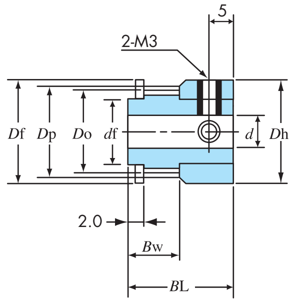
Pulleys

Dimensions of Standard Stock Pulleys

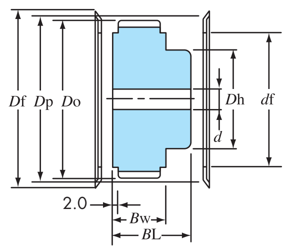
The pulley types listed on this page are standard stock pulleys. If the different number of teeth, size or material is required, see page 76.

P3M (P : 3 mm)

■Pulley Type

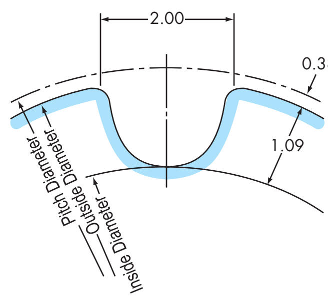


DF type



BF type

■Tooth Shape



■Model Identification

PT 20 P 3M 10 BF－A

- Pulley
- No.of groove
- P : PX
- Size
- Belt width mm
- Pulley type
- Materials
  - S : Carbon steel for machine structural use
  - A : High tensile aluminum

■Model Identification (Flange)

PT S F 10 280 160

- Pulley
- Material
  - S : SPCC
  - A : Aluminum
- Shape
- Thickness t ex : 1.0 mm
- Outside diameter Df ex : 28.0 mm
- Inside diameter df ex : 16.0 mm

■Materials

10T～20T : Carbon steel for machine structural use
22T～32T : Carbon steel for machine structural use
High tensile aluminum
36T～60T : High tensile aluminum

■Pulley Dimensions

mm

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Type	Flange	Hub diameter Dh	Bore size d		P3M10 (Width=10.0 mm)		P3M15 (Width=15.0 mm)	
						Min	Max	Bw	BL	Bw	BL
10	9.55	8.79	DF	PTSS1012055	12	4	4	13	23	19	29
12	11.46	10.70	DF	PTSS1015080	15	4	5	13	23	19	29
14	13.37	12.61	DF	PTSS10170100	17	4	6.35	13	23	19	29
15	14.32	13.56	DF	PTSS10170100	17	4	6.35	13	23	19	29
16	15.28	14.52	DF	PTSS10170100	17	4	6.35	13	23	19	29
18	17.19	16.43	DF	PTSS10210133	20	4	6.35	13	23	19	29
20	19.10	18.34	DF	PTSS10250150	25	4	6.35	13	23	19	29
22	21.01	20.25	BF	PTSF10280160	12	5	8	16	23	21	29
24	22.92	22.16	BF	PTSF10290180	14	5	9	16	23	21	29
25	23.87	23.11	BF	PTSF10310190	14	5	9	16	23	21	29
26	24.83	24.07	BF	PTSF10310190	16	6	10	16	23	21	29
28	26.74	25.98	BF	PTSF10320212	18	6	12	16	23	21	29
30	28.65	27.89	BF	PTSF10340230	18	6	12	16	23	21	29
32	30.56	29.80	BF	PTSF10360224	18	6	12	16	23	21	29
36	34.38	33.62	BF	PTAF10430300	24	6	16	16	23	21	29
40	38.20	37.44	BF	PTAF10450335	26	6	18	16	23	21	29
48	45.84	45.07	BF	PTAF10520400	36	12	24	16	23	21	29
50	47.75	46.98	BF	PTAF10550425	36	12	24	16	23	21	29
60	57.30	56.53	BF	PTAF10650530	46	12	31	16	23	21	29

· The bores have been finished to the minimum shaft diameters. (H9)
· The pulley for P3M10 can also be used for the P3M6 belt.
· The flange of the BF type has been packed without being installed on the body.
· The aluminum pulleys having 22 to 32 teeth are provided with a flange of AF type of the same size.

Cylindrical pulley P69
Belt Types and Dimensions P14,P23,P24
Custom made pulleys P76

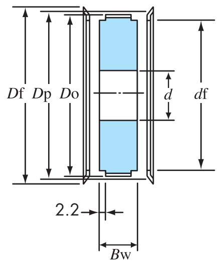
Pulleys

Dimensions of Standard Stock Pulleys

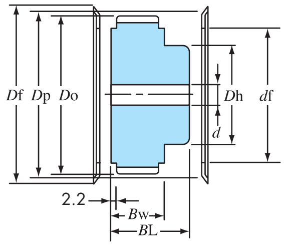
The pulley types listed on this page are standard stock pulleys. If the different number of teeth, size or material is required, see page 77.

P5M (P : 5 mm)

■Pulley Type

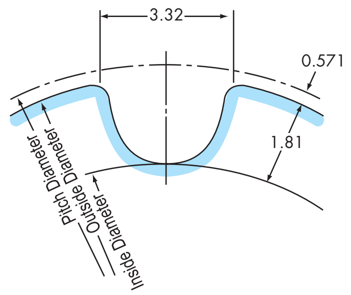


AF type



BF type

■Tooth Shape



■Model Identification

PT 20 P 5M 15 BF

- PT: Pulley
- 20: No.of groove
- P: P : PX
- 5M: Size
- 15: Belt width mm
- BF: Pulley type

■Model Identification (Flange)

PT S F 10 430 300

- PT: Pulley
- S: Material S : SPCC
- F: Shape
- 10: Thickness *t* ex : 1.0 mm
- 430: Outside diameter *Df* ex : 43.0 mm
- 300: Inside diameter *df* ex : 30.0 mm

■Materials

Carbon steel for machine structural use

■Pulley Dimensions

mm

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Type	Flange	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	P5M10 (Width=10.0 mm) *Bw*	P5M10 (Width=10.0 mm) *BL*	P5M15 (Width=15.0 mm) *Bw*	P5M15 (Width=15.0 mm) *BL*	P5M25 (Width=25.0 mm) *Bw*	P5M25 (Width=25.0 mm) *BL*
12	**19.10**	**17.96**	**AF・BF**	PTSF10230130	11	5	6	16	28	21	33	32	44
14	**22.28**	**21.14**	**AF・BF**	PTSF10280160	13								
16	**25.46**	**24.32**	**AF・BF**	PTSF10310190	17		10						
18	**28.65**	**27.51**	**AF・BF**	PTSF10360224	19	6	12						
20	**31.83**	**30.69**	**AF・BF**	PTSF10360224									
22	**35.01**	**33.87**	**AF・BF**	PTSF10430300	25	8	17						
24	**38.20**	**37.06**	**AF・BF**	PTSF10440310									
25	**39.79**	**38.65**	**AF・BF**	PTSF10450335	30	10	20						
26	**41.38**	**40.24**	**AF・BF**	PTSF10470355									
28	**44.56**	**43.42**	**AF・BF**	PTSF10520375	32		22						
30	**47.75**	**46.60**	**AF・BF**	PTSF10550425	35	12	24						
32	**50.93**	**49.79**	**AF・BF**	PTSF10550425	38		26						
36	**57.30**	**56.15**	**AF・BF**	PTSF10640500	44		30						
40	**63.66**	**62.52**	**AF・BF**	PTSF10670560	48		32						
44	**70.03**	**68.89**	**AF・BF**	PTSF10740630	56	15	38						
48	**76.39**	**75.25**	**AF・BF**	PTSF10820670	58								
50	**79.58**	**78.44**	**AF・BF**	PTSF10860710	64		42						
60	**95.49**	**94.35**	**AF・BF**	PTSF101030850	80		54						
72	**114.59**	**113.45**	**AF・BF**	PTSF1012001060	90	18	60						

・The diameter of the prepared hole is "minimum bore – 1 mm."
・The flange has been packed without being installed on the body.

Cylindrical pulley P70
Belt Types and Dimensions P15,P23,P24,P28
Custom made pulleys P77

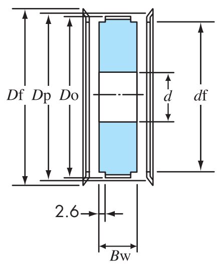
Pulleys

Dimensions of Standard Stock Pulleys

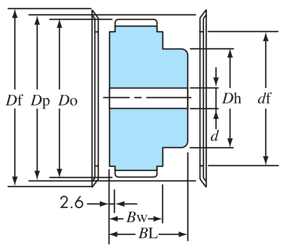
The pulley types listed on this page are standard stock pulleys. If the different number of teeth, size or material is required, see page 78.

P8M (P : 8 mm)

■Pulley Type

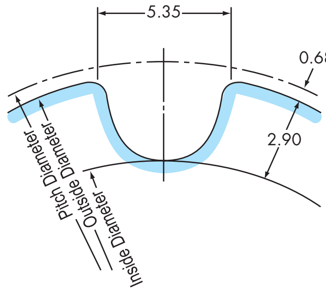


AF type



BF type

■Tooth Shape



■Model Identification

PT 20 P 8M 25 BF

- PT — Pulley
- 20 — No.of groove
- P — P : PX
- 8M — Size
- 25 — Belt width mm
- BF — Pulley type

■Model Identification (Flange)

PT S F 16 550 425

- PT — Pulley
- S — Material S : SPCC
- F — Shape
- 16 — Thickness t ex : 1.6 mm
- 550 — Outside diameter Df ex : 55.0 mm
- 425 — Inside diameter df ex : 42.5 mm

■Materials

Carbon steel for machine structural use

■Pulley Dimensions

mm

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Type	Flange	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	P8M15 (Width=15.0 mm) *Bw*	P8M15 *BL*	P8M25 (Width=25.0 mm) *Bw*	P8M25 *BL*	P8M40 (Width=40.0 mm) *Bw*	P8M40 *BL*	P8M60 (Width=60.0 mm) *Bw*	P8M60 *BL*
20	**50.93**	**49.56**	**AF・BF**	PTSF16550425	36	12	22	22	39	33	50	49	66	70	87
22	**56.02**	**54.65**	**AF・BF**	PTSF16620450	41		25								
24	**61.12**	**59.74**	**AF・BF**	PTSF16660500	46		28								
26	**66.21**	**64.84**	**AF・BF**	PTSF16730560	51	16	30								
28	**71.30**	**69.93**	**AF・BF**	PTSF16790630	55		34								
30	**76.39**	**75.02**	**AF・BF**	PTSF16820670	60		36								
32	**81.49**	**80.12**	**AF・BF**	PTSF16860710	65		38								
34	**86.58**	**85.21**	**AF・BF**	PTSF16910770	70		42								
36	**91.67**	**90.30**	**AF・BF**	PTSF16970800	75		45								
40	**101.86**	**100.49**	**AF・BF**	PTSF161070900	85	20	50								
44	**112.05**	**110.67**	**AF・BF**	PTSF1611901020	90		56		44		55		71		92
48	**122.23**	**120.86**	**AF・BF**	PTSF1612701120	100		62								
50	**127.32**	**125.95**	**AF・BF**	PTSF1613501200											
60	**152.79**	**151.42**	**AF・BF**	PTSF1615801400											
64	**162.97**	**161.60**	**AF・BF**	PTSF1616701520	110		73								
72	**183.35**	**181.97**	**AF・BF**	PTSF1619001700		30									

・The diameter of the prepared hole is "minimum bore – 1 mm."
・The flange has been packed without being installed on the body.

Custom made pulleys P78
Belt Types and Dimensions P16,P23,P24,P28

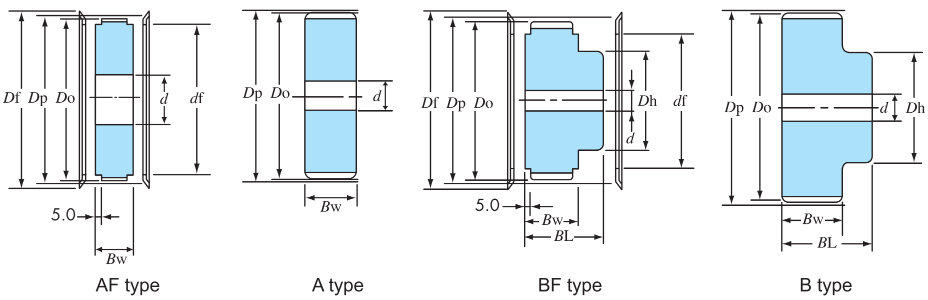
Pulleys

Dimensions of Standard Stock Pulleys

The pulley types listed on this page are standard stock pulleys. If the different number of teeth, size or material is required, see page 79.

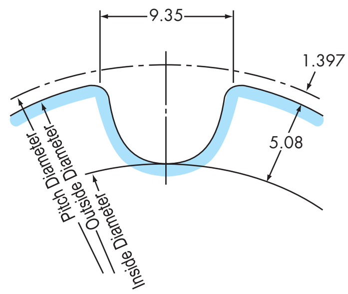
P14M (P : 14 mm)

■Pulley Type



AF type　A type　BF type　B type

■Tooth Shape



■Model Identification

PT 30 P 14M 40 BF

- PT — Pulley
- 30 — No.of groove
- P — P : PX
- 14M — Size
- 40 — Belt width mm
- BF — Pulley type

■Materials

Carbon steel for machine structural use

■Pulley Dimensions

mm

<table>
<tr><th rowspan="2">No. of teeth
n</th><th rowspan="2">Pitch diameter
Dp</th><th rowspan="2">Outside diameter
Do</th><th rowspan="2">Type</th><th colspan="2">Flange</th><th rowspan="2">Hub diameter
Dh</th><th colspan="2">Bore size
d</th><th colspan="2">P14M40
(Width=40.0 mm)</th><th colspan="2">P14M60
(Width=60.0 mm)</th></tr>
<tr><th>Outside diameter</th><th>Inside diameter</th><th>Min</th><th>Max</th><th>Bw</th><th>BL</th><th>Bw</th><th>BL</th></tr>
<tr><td>28</td><td>124.78</td><td>121.98</td><td>AF･BF</td><td>136</td><td>106</td><td>90</td><td rowspan="11">20</td><td>56</td><td rowspan="15">53</td><td rowspan="8">73</td><td rowspan="15">74</td><td rowspan="8">94</td></tr>
<tr><td>30</td><td>133.69</td><td>130.90</td><td>AF･BF</td><td>145</td><td>115</td><td>100</td><td rowspan="2">62</td></tr>
<tr><td>32</td><td>142.60</td><td>139.81</td><td>AF･BF</td><td>154</td><td>124</td><td>110</td></tr>
<tr><td>34</td><td>151.52</td><td>148.72</td><td>AF･BF</td><td>163</td><td>133</td><td rowspan="2">120</td><td rowspan="2">70</td></tr>
<tr><td>36</td><td>160.43</td><td>157.63</td><td>AF･BF</td><td>171</td><td>142</td></tr>
<tr><td>38</td><td>169.34</td><td>166.55</td><td>AF･BF</td><td>181</td><td>151</td><td rowspan="3">135</td><td>75</td></tr>
<tr><td>40</td><td>178.25</td><td>175.46</td><td>AF･BF</td><td>190</td><td>160</td><td rowspan="2">80</td></tr>
<tr><td>42</td><td>187.17</td><td>184.37</td><td>AF･BF</td><td>198</td><td>164</td></tr>
<tr><td>44</td><td>196.08</td><td>193.28</td><td>AF･BF</td><td>207</td><td>178</td><td>155</td><td>85</td><td rowspan="7">78</td><td rowspan="7">99</td></tr>
<tr><td>48</td><td>213.90</td><td>211.11</td><td>AF･BF</td><td>225</td><td>195</td><td rowspan="5">160</td><td rowspan="6">90</td></tr>
<tr><td>50</td><td>222.82</td><td>220.02</td><td>AF･BF</td><td>234</td><td>205</td></tr>
<tr><td>56</td><td>249.55</td><td>246.76</td><td>B</td><td>–</td><td>–</td><td rowspan="3">30</td></tr>
<tr><td>60</td><td>267.38</td><td>264.59</td><td>B</td><td>–</td><td>–</td></tr>
<tr><td>64</td><td>285.21</td><td>282.41</td><td>B</td><td>–</td><td>–</td></tr>
<tr><td>72</td><td>320.86</td><td>318.06</td><td>B</td><td>–</td><td>–</td><td>170</td><td>35</td></tr>
</table>

· The diameter of the prepared hole is “minimum bore – 1 mm.”
· The flange has been packed without being installed on the body.

Custom made pulleys P79　Belt Types and Dimensions P17

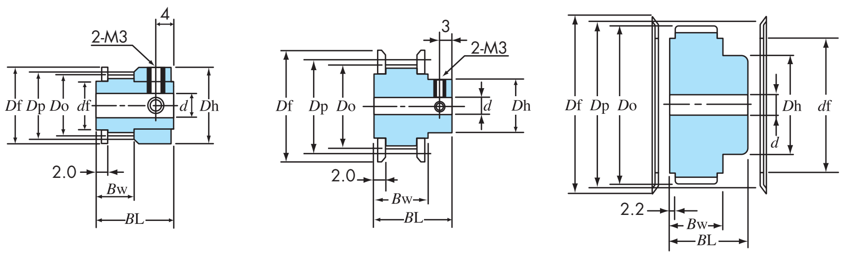
Pulleys

Dimensions of Standard Stock Pulleys

The pulley types listed on this page are standard stock pulleys. If the different number of teeth, size or material is required, see page 80.

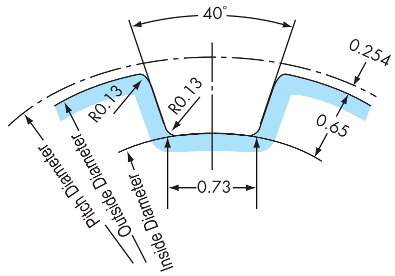
MXL (P : 2.032 mm)

■Pulley Type



DF type　　BF type (Without tap processing(36T,40T))　　BF type

■Tooth Shape



■Model Identification

PT 20 MXL 6.4 BF

- PT: Pulley
- 20: No.of groove
- MXL: Size
- 6.4: Belt width mm
- BF: Pulley type

■Model Identification (Flange)

PT A F 10 290 180

- PT: Pulley
- A: Material A : Aluminum
- F: Shape
- 10: Thickness t ex : 1.0 mm
- 290: Outside diameter Df ex : 29.0 mm
- 180: Inside diameter df ex : 18.0 mm

■Materials

High tensile aluminum

■Pulley Dimensions

mm

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Type	Flange	Hub diameter Dh	Bore size d Min	Bore size d Max	MXL6.4 Bw	MXL6.4 BL
15	**9.70**	**9.19**	**DF**	PTAS1013070	13	4	5	9.5	17.5
16	**10.35**	**9.84**	**DF**	PTAS1015080	15				
18	**11.64**	**11.14**	**DF**	PTAS1015080					
20	**12.94**	**12.43**	**DF**	PTAS10170100	17		6.35		
22	**14.23**	**13.72**	**DF**	PTAS10170100					
24	**15.52**	**15.02**	**BF**	PTAS10210133	12	4.5		11.5	
25	**16.17**	**15.67**	**BF**	PTAS10210133					
26	**16.82**	**16.31**	**BF**	PTAS10210133					
28	**18.11**	**17.61**	**BF**	PTAS10210133					
30	**19.40**	**18.90**	**BF**	PTAS10250150					
32	**20.70**	**20.19**	**BF**	PTAS10250150		5	8		
36	**23.29**	**22.78**	**BF**	PTAF10290180	14				
40	**25.87**	**25.37**	**BF**	PTAF10320212	16		9		19.5
44	**28.46**	**27.95**	**BF**	PTAF10360224			11		
48	**31.05**	**30.54**	**BF**	PTAF10390265	18		12		
50	**32.34**	**31.83**	**BF**	PTAF10390265	20	6	13		
60	**38.81**	**38.30**	**BF**	PTAF10450335	22		15		

- The bores have been finished to the minimum shaft diameters. (H9)
- When machining the DF type, insert a screw in the tapped hole to prevent the flange from turning.
- The flange of the DF and BF types of 15 to 40 teeth has been clinched. (The flange of 44−60 tooth types has not been clinched.)
- The pulley for MXL6.4 can also be used for the MXL3.2 and 4.8 belts.

Cylindrical pulley P71
Belt Types and Dimensions P18,P23
Custom made pulleys P80

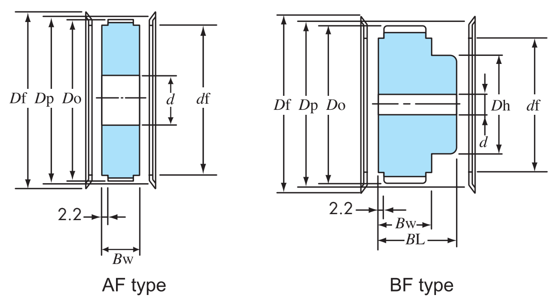
Pulleys

Dimensions of Standard Stock Pulleys

The pulley types listed on this page are standard stock pulleys. If the different number of teeth, size or material is required, see page 81.

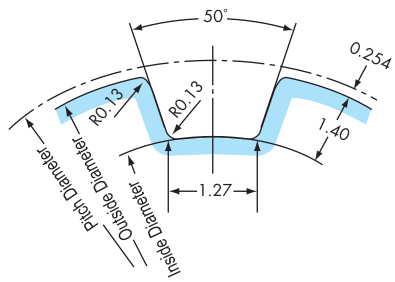
XL (P : 5.080 mm)

■Pulley Type



AF type　　BF type

■Tooth Shape



■Model Identification

PT 20 XL 037 BF

- PT: Pulley
- 20: No.of groove
- XL: Size
- 037: Belt width (Designation)
- BF: Pulley type

■Model Identification (Flange)

PT S F 10 360 224

- PT: Pulley
- S: Material S : SPCC
- F: Shape
- 10: Thickness *t* ex : 1.0 mm
- 360: Outside diameter *Df* ex : 36.0 mm
- 224: Inside diameter *df* ex : 22.4 mm

■Materials

Carbon steel for machine structural use

■Pulley Dimensions

mm

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Type	Flange	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	XL037 *Bw*	XL037 *BL*
10	**16.17**	**15.67**	**BF**	PTSF10230120	10	4	4	15	24
11	**17.79**	**17.28**	**BF**	PTSF10230130	11				
12	**19.40**	**18.90**	**BF**	PTSF10260150		5	6		
14	**22.64**	**22.13**	**BF**	PTSF10290180	14	6	8		
15	**24.26**	**23.75**	**BF**	PTSF10310190	15		9		
16	**25.87**	**25.37**	**BF**	PTSF10320212	17		10		26
18	**29.11**	**28.60**	**BF**	PTSF10360224	19		13		
19	**30.72**	**30.22**	**BF**	PTSF10390265	23		15		
20	**32.34**	**31.83**	**BF**	PTSF10390265		8			
21	**33.96**	**33.45**	**BF**	PTSF10430300	26		18		
22	**35.57**	**35.07**	**BF**	PTSF10430300					
24	**38.81**	**38.30**	**BF**	PTSF10450335					
25	**40.43**	**39.93**	**BF**	PTSF10470355					
26	**42.04**	**41.53**	**BF**	PTSF10480375					
28	**45.28**	**44.78**	**BF**	PTSF10520400	28		19		
30	**48.51**	**48.01**	**BF**	PTSF10550425		10			
32	**51.74**	**51.23**	**AF・BF**	PTSF10580450	30		20		
34	**54.98**	**54.48**	**AF・BF**	PTSF10610490					
36	**58.21**	**57.71**	**AF・BF**	PTSF10650530					
38	**61.45**	**60.94**	**AF・BF**	PTSF10670560					
40	**64.68**	**64.17**	**AF・BF**	PTSF10710600					28
42	**67.91**	**67.41**	**AF・BF**	PTSF10740630	34		22		
44	**71.15**	**70.64**	**BF**	PTSF10820670	35		24		
48	**77.62**	**77.11**	**BF**	PTSF10860710	39		26		
50	**80.85**	**80.34**	**BF**	PTSF10860710	40		27		
60	**97.02**	**96.51**	**BF**	PTSF101030850	48		32		

・The diameter of the prepared hole is "minimum bore − 1 mm." (Only 10T〜28T, finished bore with H8 torelance)
・The pulley for XL037 can also be used for the XL025 and 031 belts.
・The flange has been packed without being installed on the body.

Cylindrical pulley P71
Belt Types and Dimensions P19,P23,P26
Custom made pulleys P81

Pulley

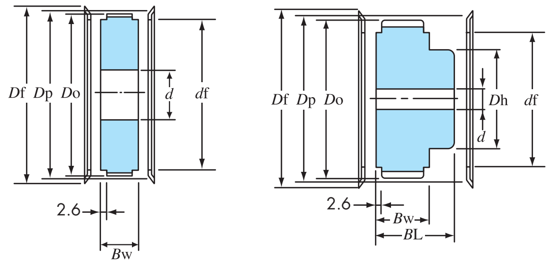
Pulleys

Dimensions of Standard Stock Pulleys

The pulley types listed on this page are standard stock pulleys. If the different number of teeth, size or material is required, see page 82.

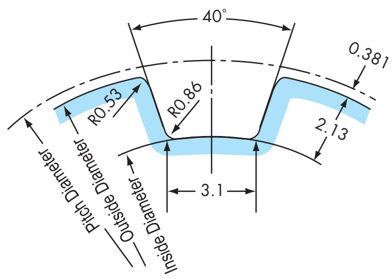
L (P : 9.525 mm)

■Pulley Type



AF type BF type

■Tooth Shape



■Model Identification

PT 20 L 050 BF

- PT: Pulley
- 20: No.of groove
- L: Size
- 050: Belt width (Designation)
- BF: Pulley type

■Model Identification (Flange)

PT S F 16 360 224

- PT: Pulley
- S: Material S : SPCC
- F: Shape
- 16: Thickness *t* ex : 1.6 mm
- 360: Outside diameter *Df* ex : 36.0 mm
- 224: Inside diameter *df* ex : 22.4 mm

■Materials

Carbon steel for machine structural use

■Pulley Dimensions

mm

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Type	Flange	Hub diameter *Dh*	Bore size *d*		L050		L075		L100	
						Min	Max	*Bw*	*BL*	*Bw*	*BL*	*Bw*	*BL*
10	**30.32**	**29.56**	**AF・BF**	PTSF16360224	19	8・5※	12	19.6	30.5	—	—	—	—
12	**36.38**	**35.62**	**AF・BF**	PTSF16430300	26	8・7※	17			26	36.5	—	—
14	**42.45**	**41.68**	**AF・BF**	PTSF16490335	29	10	19					32.3	43
15	**45.48**	**44.72**	**AF・BF**	PTSF16520375	32		20						
16	**48.51**	**47.75**	**AF・BF**	PTSF16550425	35		22		32.5		38.5		45
17	**51.54**	**50.78**	**AF・BF**	PTSF16568420	38								
18	**54.57**	**53.81**	**AF・BF**	PTSF16610450		12	25						
19	**57.61**	**56.84**	**AF・BF**	PTSF16660500	40								
20	**60.64**	**59.88**	**AF・BF**	PTSF16670530			26						
21	**63.67**	**62.91**	**AF・BF**	PTSF16700560									
22	**66.70**	**65.94**	**AF・BF**	PTSF16730560									
24	**72.77**	**72.00**	**AF・BF**	PTSF16790630									
25	**75.80**	**75.04**	**AF・BF**	PTSF16820670	42		28						
26	**78.83**	**78.07**	**AF・BF**	PTSF16860710									
28	**84.89**	**84.13**	**AF・BF**	PTSF16910770	44		30						
30	**90.96**	**90.20**	**AF・BF**	PTSF16970800									
32	**97.02**	**96.26**	**AF・BF**	PTSF161030850									
34	**103.08**	**102.32**	**AF・BF**	PTSF161110950									
36	**109.15**	**108.39**	**AF・BF**	PTSF1611501020		15							
40	**121.28**	**120.51**	**AF・BF**	PTSF1612701120	48		32		35.5		41.5		48
42	**127.34**	**126.58**	**AF・BF**	PTSF1613501200	63		42						
44	**133.40**	**132.64**	**BF**	PTSF1613901250	66		44						
48	**145.53**	**144.77**	**BF**	PTSF1615101370	72		48						
50	**151.60**	**150.83**	**BF**	PTSF1615801400	75		50						
60	**181.91**	**181.15**	**BF**	PTSF1619001700	91		60						

・The diameter of the prepared hole is "minimum bore – 1 mm." (Only 10T～28T, finished bore with H8 torelance) ※…AF Type
・The flange has been packed without being installed on the body.

Custom made pulleys P82 Belt Types and Dimensions P20,P23,P26

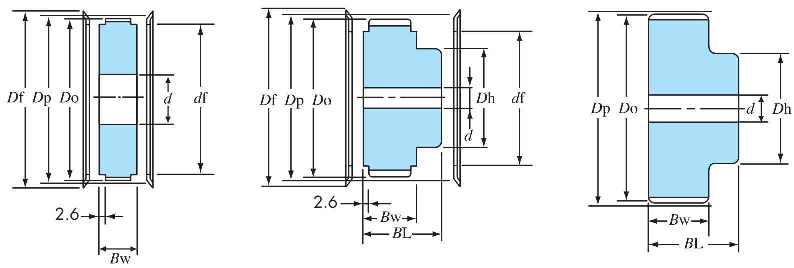
Pulleys

Dimensions of Standard Stock Pulleys

The pulley types listed on this page are standard stock pulleys. If the different number of teeth, size or material is required, see page 82.

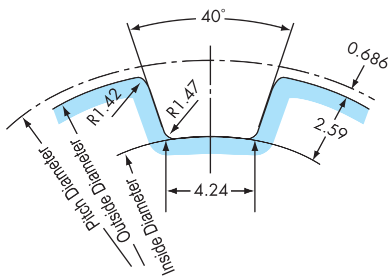
H (P : 12.700 mm) 1

■Pulley Type



AF type　　BF type　　B type

■Tooth Shape



■Model Identification

PT 20 H 100 BF

- PT: Pulley
- 20: No.of groove
- H: Size
- 100: Belt width (Designation)
- BF: Pulley type

■Model Identification (Flange)

PT S F 16 620 450

- PT: Pulley
- S: Material S : SPCC
- F: Shape
- 16: Thickness *t* ex : 1.6 mm
- 620: Outside diameter *Df* ex : 62.0 mm
- 450: Inside diameter *df* ex : 45.0 mm

■Materials

14T～40T :
Carbon steel for machine structural use

■Pulley Dimensions

mm

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Type	Flange	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	H100 *Bw*	H100 *BL*	H150 *Bw*	H150 *BL*
14	56.60	55.22	AF•BF	PTSF16620450	41	15·14※	27		46		59
15	60.64	59.27	AF•BF	PTSF16660500	46		30				
16	64.68	63.31	AF•BF	PTSF16700560	50		34				
18	72.77	71.39	AF•BF	PTSF16790630	58		38				
19	76.81	75.44	AF•BF	PTSF16820670		15					
20	80.85	79.48	AF•BF	PTSF16860710							
21	84.89	83.52	AF•BF	PTSF16910770							
22	88.94	87.56	AF•BF	PTSF16940770					49		62
24	97.02	95.65	AF•BF	PTSF161030850							
25	101.06	99.69	AF•BF	PTSF161070900	60		40				
26	105.11	103.73	AF•BF	PTSF161110950				33.5		46.2	
28	113.19	111.82	AF•BF	PTSF1611901020							
30	121.28	119.90	AF•BF	PTSF1612701120		20					
32	129.36	127.99	AF•BF	PTSF1613501200							
34	137.45	136.07	AF•BF	PTSF1614301280	64		42				
36	145.53	144.16	AF•BF	PTSF1615101370							
40	161.70	160.33	AF•BF	PTSF1616701520	68	25·20※	45				
42	169.79	168.41	B	－	84		56		52		65
44	177.87	176.50	B	－	88		59				
48	194.04	192.67	B	－	96	25	64				
50	202.13	200.75	B	－	100		67				
60	242.55	241.18	B	－	121		80				

・The diameter of the prepared hole is minimum bore －1 mm(if the diameter is less than 20 mm), and is minimum bore －2 mm(if the diameter is over 20 mm).
・※…AF Type
・The flange has been packed without being installed on the body.
・The pulley for H100 can also be used for the H075 belts.

Custom made pulleys P83,P84　Belt Types and Dimensions P21,P23,P27

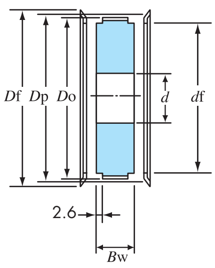
Pulleys

Dimensions of Standard Stock Pulleys

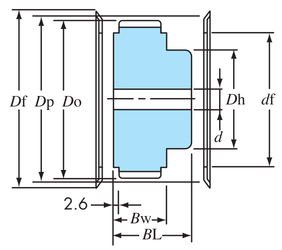
The pulley types listed on this page are standard stock pulleys. If the different number of teeth, size or material is required, see page 83.

H (P : 12.700 mm) 2

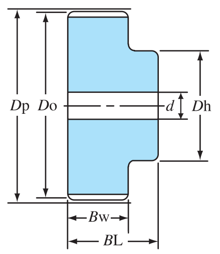
■Pulley Type



AF type

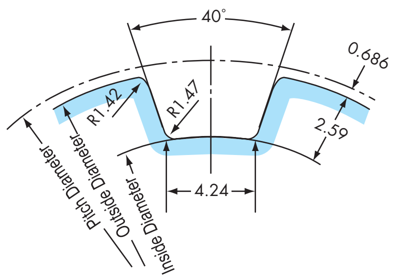


BF type



B type

■Tooth Shape



■Model Identification

PT 20 H 300 AF

- PT: Pulley
- 20: No.of groove
- H: Size
- 300: Belt width (Designation)
- AF: Pulley type

■Model Identification (Flange)

PT S F 16 620 450

- PT: Pulley
- S: Material S : SPCC
- F: Shape
- 16: Thickness *t* ex : 1.6 mm
- 620: Outside diameter *Df* ex : 62.0 mm
- 450: Inside diameter *df* ex : 45.0 mm

■Materials

14T～40T :
Carbon steel for machine structural use

■Pulley Dimensions

mm

<table>
<tr><th rowspan="2">No. of teeth
n</th><th rowspan="2">Pitch diameter
Dp</th><th rowspan="2">Outside diameter
Do</th><th rowspan="2">Type</th><th rowspan="2">Flange</th><th rowspan="2">Hub diameter
Dh</th><th colspan="2">Bore size
d</th><th colspan="2">H200</th><th colspan="2">H300</th></tr>
<tr><th>Min</th><th>Max</th><th>Bw</th><th>BL</th><th>Bw</th><th>BL</th></tr>
<tr><td>14</td><td>56.60</td><td>55.22</td><td>AF・BF</td><td>PTSF16620450</td><td>41</td><td rowspan="5">20・16※</td><td>27</td><td rowspan="22">59.6</td><td>73</td><td>—</td><td>—</td></tr>
<tr><td>15</td><td>60.64</td><td>59.27</td><td>AF・BF</td><td>PTSF16660500</td><td>46</td><td>30</td><td rowspan="4">76</td><td>—</td><td>—</td></tr>
<tr><td>16</td><td>64.68</td><td>63.31</td><td>AF・BF</td><td>PTSF16700560</td><td>50</td><td>34</td><td rowspan="20">86</td><td rowspan="3">102</td></tr>
<tr><td>18</td><td>72.77</td><td>71.39</td><td>AF・BF</td><td>PTSF16790630</td><td rowspan="2">58</td><td rowspan="2">38</td></tr>
<tr><td>19</td><td>76.81</td><td>75.44</td><td>AF・BF</td><td>PTSF16820670</td><td rowspan="7">79</td><td rowspan="7">105</td></tr>
<tr><td>20</td><td>80.85</td><td>79.48</td><td>AF・BF</td><td>PTSF16860710</td><td>64</td><td rowspan="5">20</td><td rowspan="2">42</td></tr>
<tr><td>21</td><td>84.89</td><td>83.52</td><td>AF・BF</td><td>PTSF16910770</td><td rowspan="2">72</td></tr>
<tr><td>22</td><td>88.94</td><td>87.56</td><td>AF・BF</td><td>PTSF16940770</td><td>48</td></tr>
<tr><td>24</td><td>97.02</td><td>95.65</td><td>AF・BF</td><td>PTSF161030850</td><td rowspan="3">75</td><td rowspan="3">50</td></tr>
<tr><td>25</td><td>101.06</td><td>99.69</td><td>AF・BF</td><td>PTSF161070900</td><td rowspan="6">25</td></tr>
<tr><td>26</td><td>105.11</td><td>103.73</td><td>AF・BF</td><td>PTSF161110950</td></tr>
<tr><td>28</td><td>113.19</td><td>111.82</td><td>AF・BF</td><td>PTSF1611901020</td><td>78</td><td>52</td><td rowspan="11">82</td><td rowspan="11">108</td></tr>
<tr><td>30</td><td>121.28</td><td>119.90</td><td>AF・BF</td><td>PTSF1612701120</td><td rowspan="3">80</td><td rowspan="3">54</td></tr>
<tr><td>32</td><td>129.36</td><td>127.99</td><td>AF・BF</td><td>PTSF1613501200</td></tr>
<tr><td>34</td><td>137.45</td><td>136.07</td><td>AF・BF</td><td>PTSF1614301280</td></tr>
<tr><td>36</td><td>145.53</td><td>144.16</td><td>AF・BF</td><td>PTSF1615101370</td><td rowspan="2">80</td><td rowspan="7">30</td><td rowspan="3">56</td></tr>
<tr><td>40</td><td>161.70</td><td>160.33</td><td>AF・BF</td><td>PTSF1616701520</td></tr>
<tr><td>42</td><td>169.79</td><td>168.41</td><td>B</td><td>—</td><td>84</td></tr>
<tr><td>44</td><td>177.87</td><td>176.50</td><td>B</td><td>—</td><td>88</td><td>59</td></tr>
<tr><td>48</td><td>194.04</td><td>192.67</td><td>B</td><td>—</td><td>96</td><td>64</td></tr>
<tr><td>50</td><td>202.13</td><td>200.75</td><td>B</td><td>—</td><td>100</td><td>67</td></tr>
<tr><td>60</td><td>242.55</td><td>241.18</td><td>B</td><td>—</td><td>121</td><td>80</td></tr>
</table>

・The diameter of the prepared hole is minimum bore −1 mm(if the diameter is less than 20 mm), and is minimum bore −2 mm(if the diameter is over 20 mm).
・※…AF Type
・The flange has been packed without being installed on the body.

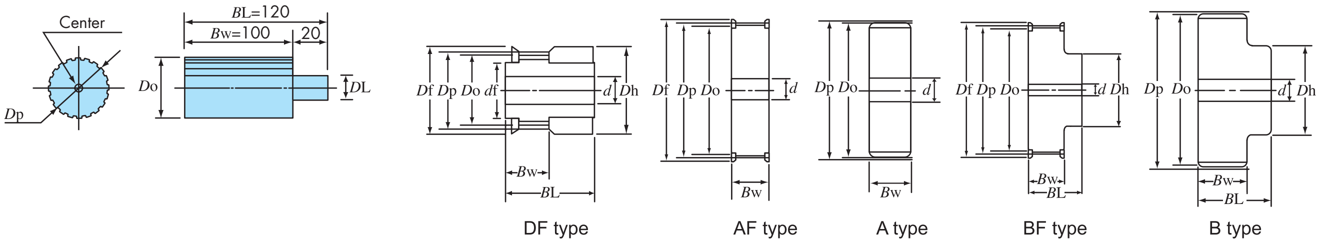
Custom made pulleys P83,P84
Belt Types and Dimensions P21,P23,P27

Pulleys

Dimensions of Standard Stock Pulleys

CYLINDRICAL PULLEY (PX)

■Size



■Model Identification

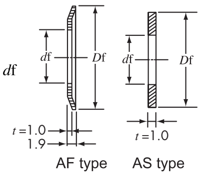
PT 20 P 2M−100L−S

- PT: Pulley
- 20: No.of groove
- P: P : PX
- 2M: Size
- 100L: Cylindrical pulley
- S: With flanges (10 piece)

■Model Identification (Flange)

PT A F 10 360 224

- PT: Pulley
- A: Material S : SPCC, A : Aluminum
- F: Shape
- 10: Thickness t ex : 1.0 mm
- 360: Outside diameter Df ex : 36.0 mm
- 224: Inside diameter df ex : 22.4 mm



■Materials

High tensile aluminum

■Pulley Dimensions (P2M)

mm

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Hub diameter Dh	Flange
10	6.37	5.86	4	PTAS1011040
11	7.00	6.49		
12	7.64	7.13		
13	8.28	7.77		PTAS1012055
14	8.91	8.40	6	
15	9.55	9.04		PTAS1013070
16	10.19	9.68		
17	10.82	10.31		PTAS1015080
18	11.46	10.95	8	
19	12.10	11.59		
20	12.73	12.22		PTAS10170100
21	13.37	12.86	10	
22	14.01	13.50		
23	14.64	14.13		
24	15.28	14.77	12	
25	15.92	15.41		PTAS10210133
26	16.55	16.04		
27	17.19	16.68		
28	17.83	17.32		PTAS10250150
30	19.10	18.59	16	PTAF10260150
32	20.37	19.86		PTAF10280160
36	22.92	22.41		PTAF10290180
40	25.46	24.96		PTAF10320212
44	28.01	27.50		PTAF10340230
48	30.56	30.05		PTAF10360224
50	31.83	31.32		PTAF10390265
60	38.20	37.69		PTAF10450335

■Pulley Dimensions (P3M)

mm

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Hub diameter Dh	Flange
10	9.55	8.79	4	PTAS1012055
11	10.50	9.74	6	PTAS1013070
12	11.46	10.70		PTAS1015080
13	12.41	11.65	8	
14	13.37	12.61		PTAS10170100
15	14.32	13.56	10	
16	15.28	14.52		
18	17.19	16.43	12	PTAS10210133
19	18.14	17.38		
20	19.10	18.34		PTAS10250150
21	20.05	19.29	16	
22	21.01	20.25		PTAF10280160
24	22.92	22.16		PTAF10290180
25	23.87	23.11		PTAF10310190
26	24.83	24.07		
28	26.74	25.98		PTAF10320212
30	28.65	27.89		PTAF10340230
32	30.56	29.80		PTAF10360224
36	34.38	33.62		PTAF10430300
40	38.20	37.44		PTAF10450335
48	45.84	45.07		PTAF10520400
50	47.75	46.98		PTAF10550425
60	57.30	56.53		PTAF10650530

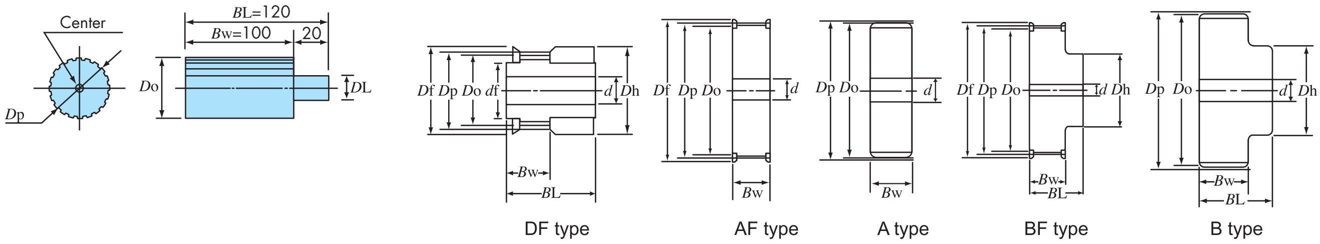
Selection and Design P87
Belt Types and Dimensions P13,P14,P23,P24

Pulleys

Dimensions of Standard Stock Pulleys

CYLINDRICAL PULLEY (PX)

■Size



■Model Identification

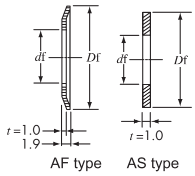
PT 20 P 5M−100L−S

- PT: Pulley
- 20: No.of groove
- P: P : PX
- 5M−100: Size
- L: Cylindrical pulley
- S: With flanges (10 piece)

■Model Identification (Flange)

PT S F 10 640 500−M

- PT: Pulley
- S: Material — S : SPCC, A : Aluminum
- F: Shape
- 10: Thickness t ex : 1.0 mm
- 640: Outside diameter Df ex : 64.0 mm
- 500: Inside diameter df ex : 50.0 mm
- M: With plating



■Materials

High tensile aluminum

■Pulley Dimensions (P5M)

mm

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Hub diameter Dh	Flange
12	19.10	17.96	12	PTAF10230130
14	22.28	21.14	16	PTAF10280160
15	23.87	22.73		PTAF10290180
16	25.46	24.32		PTAF10310190
17	27.06	25.91		PTAF10320212
18	28.65	27.51		PTAF10360224
19	30.24	29.10		
20	31.83	30.69		
21	33.42	32.28		PTAF10390265
22	35.01	33.87		PTAF10430300
24	38.20	37.06		PTAF10440310
25	39.79	38.65		PTAF10450335
26	41.38	40.24		PTAF10470355
28	44.56	43.42		PTAF10520375
30	47.75	46.60		PTAF10550425
32	50.93	49.79		
36	57.30	56.15		PTSF10640500-M
40	63.66	62.52		PTSF10670560-M
44	70.03	68.89		PTSF10740630-M
48	76.39	75.25		PTSF10820670-M
50	79.58	78.44		PTSF10860710-M
60	95.49	94.35		PTSF101030850-M

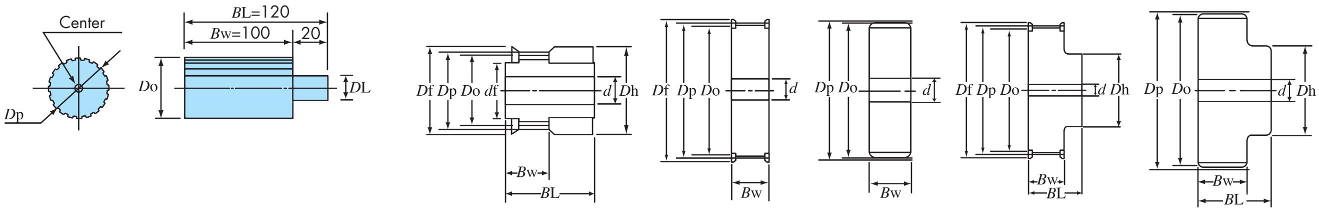
Selection and Design P87
Belt Types and Dimensions P15,P23,P24,P28

Pulleys

Dimensions of Standard Stock Pulleys

CYLINDRICAL PULLEY (TRAPEZOIDAL)

■Size



DF type AF type A type BF type B type

■Model Identification

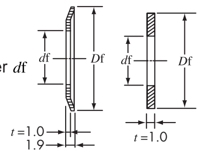
PT 20 MXL－100L－S

- PT: Pulley
- 20: No.of groove
- MXL: Size
- 100L: Cylindrical pulley
- S: With flanges (10 piece)

■Model Identification (Flange)

PT A F 10 360 224

- PT: Pulley
- A: Material — S : SPCC, A : Aluminum
- F: Shape
- 10: Thickness t ex : 1.0 mm
- 360: Outside diameter Df ex : 36.0 mm
- 224: Inside diameter df ex : 22.4 mm



AF type AS type

■Materials

High tensile aluminum

■Pulley Dimensions (MXL)

mm

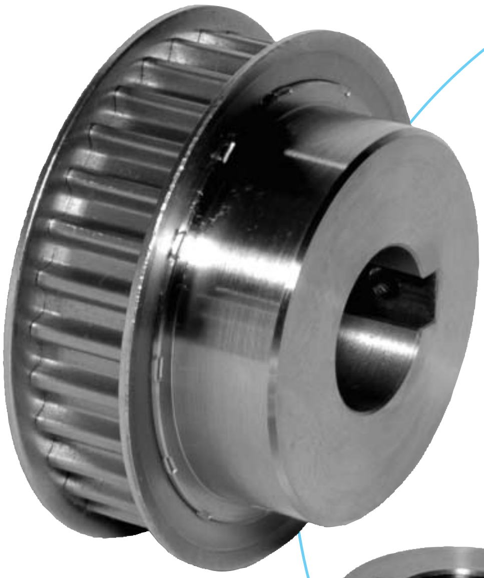
No. of teeth n	Pitch diameter Dp	Outside diameter Do	Hub diameter Dh	Flange
10	6.47	5.96	4	PTAS1011040
11	7.11	6.61		
12	7.76	7.25		
13	8.41	7.90		PTAS1012055
14	9.06	8.55	6	
15	9.70	9.19		PTAS1013070
16	10.35	9.84		
17	11.00	10.49	8	PTAS1015080
18	11.64	11.14		
19	12.29	11.78		
20	12.94	12.43	10	PTAS10170100
21	13.58	13.08		
22	14.23	13.72		
23	14.88	14.37		
24	15.52	15.02	12	PTAS10210133
25	16.17	15.67		
26	16.82	16.31		
27	17.46	16.96		
28	18.11	17.61		
30	19.40	18.90	16	PTAS10250150
32	20.70	20.19		
36	23.29	22.78		PTAF10290180
40	25.87	25.37		PTAF10320212
44	28.46	27.95		PTAF10360224
48	31.05	30.54		PTAF10390265
50	32.34	31.84		
60	38.81	38.30		PTAF10450335

■Pulley Dimensions (XL)

mm

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Hub diameter Dh	Flange
10	16.17	15.67	10	PTAF10230120
11	17.79	17.28	12	PTAF10230130
12	19.40	18.90		PTAF10260150
14	22.64	22.13	16	PTAF10290180
15	24.26	23.75		PTAF10310190
16	25.87	25.37		PTAF10320212
18	29.11	28.60		PTAF10360224
19	30.72	30.22		PTAF10390265
20	32.34	31.83		
21	33.96	33.45		PTAF10430300
22	35.57	35.07		
24	38.81	38.30		PTAF10450335
25	40.43	39.93		PTAF10470355
26	42.04	41.53		PTAF10480375
28	45.28	44.78		PTAF10520400

Selection and Design P87
Belt Types and Dimensions P18,P19,P23,P26



Unpack and use! Use as it is!

No troublesome machining required.

Bore finishing, keyway making and tapping have all been done. When you unpack the pulley, you can use it without additional machining.

Short lead time

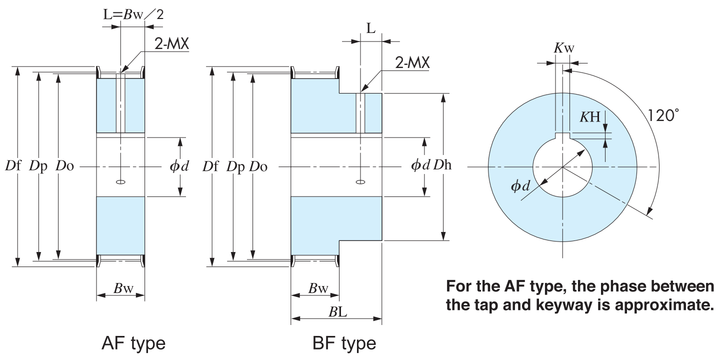
The bore dimensions that are often used are kept in stock. Other types can also be delivered in a short lead time. (Shipped on the third day after acceptance of your order.)

Many types

PX pulley P5M and P8M and trapezoidal pulley L and M are available. Many combinations of bore diameter and number of teeth are ready for use.

TSUBAKI FIT BORE® PULLEY

■Pulley Type (Reference)



For the AF type, the phase between the tap and keyway is approximate.

■Specifications

mm

Bore Size mm	Keyway *Kw*	Tolerance Js9	Keyway *KH*	Tolerance	Tap
Over 10, up to and incl. 12	4	±0.0150	1.8	+0.1 / 0	M4
Over 12, up to and incl. 17	5		2.3		M5
Over 17, up to and incl. 22	6		2.8		M6
Over 22, up to and incl. 30	8	±0.0180	3.3	+0.2 / 0	
Over 30, up to and incl. 38	10				M8
Over 38, up to and incl. 42	12	±0.0215			
Over 42, up to and incl. 50	14		3.8		
Over 50, up to and incl. 58	16		4.3		M10
Over 58, up to and incl. 65	18		4.4		

Finished bore tolerance … H7
Setscrew included.

■Model Identification

PT 30 H 100 AF－20 T J

- PT: Pulley
- 30: No.of groove
- H: Size
- 100: Belt width(Designation)
- AF: Pulley type
- 20: Bore dia mm
- T: Tapping
- J: Keyway (Js9)

■Materials

Pulley : Carbon steel for machine structural use
Frange : SPCC

TSUBAKI BELT TENSION METER T-ACE® PAT.P.

The Tsubaki belt tension meter "T-ACE" is a sound wave formula belt tension meter that correctly and accurately measures the installation tension of a belt without touching it.
The control of the belt installation tension is very important in ensuring that the belt works at its fullest capacity.
The belt tension meter "T-ACE" developed by Tsubaki's original technology is an economical instrument with all the necessary functions incorporated neatly.

Features

- **Light weight and compact**
  The mass of the main unit is as light as 160 g and its size is compact for easy carrying.
- **Large LCD screen**
  Since measurement results and measuring conditions are shown in the same screen, they can easily be checked while taking measurements.
- **Memory function**
  Up to 10 measuring conditions can be kept in memory, which can be invoked by simple operation.
- **Unit display changeover**
  The unit of measurement results can be changed over between "N" and "Hz" as desired.
- **Auto power-off function**
  When the meter is not operated for 3 minutes, the power will automatically be turned off.

Specifications

Model	BDTM101
Measuring range	0.1～9999 N、30～600 Hz
Belt span length	0.001～9.999 m
Unit mass	0.001～9.999 kg/m
Working temperature	−10～60℃
Power supply	Dry Cell AAA×4
Mass/dimensions	160 g (Main body)・L162×W61.6×D30 mm

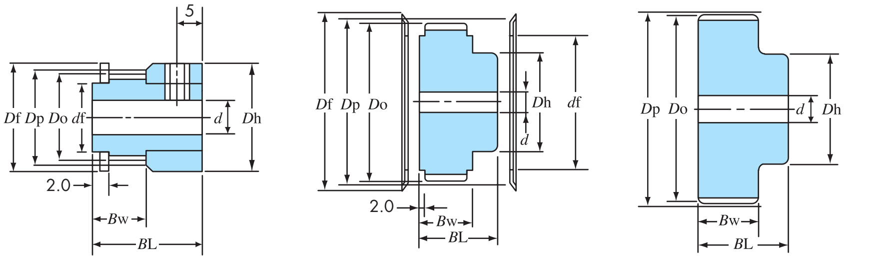
Pulleys

Custom made pulleys (Reference dimensions)

The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

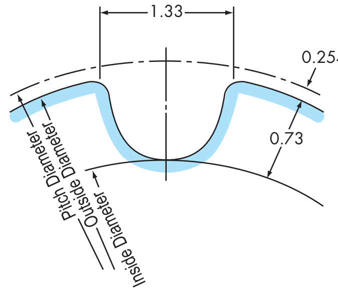
P2M (P : 2 mm)

■Pulley Type (Reference)



DF type BF type B type

■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with such information as machining type and dimensions specified on drawings.

PT 20 P 2M 6 DF

- PT : Pulley
- 20 : No.of groove
- P : PX
- 2M : Size
- 6 : Belt width mm
- DF : Pulley type

■Model Identification (Flange)

The flanges of different materials or sizes are to be made to order. See page 90 for study.

PT A F 10 260 150

- PT : Pulley
- A : Material S : SPCC A : Aluminum
- F : Shape
- 10 : Thickness *t* ex : 1.0 mm
- 260 : Outside diameter *Df* ex : 26.0 mm
- 150 : Inside diameter *df* ex : 15.0 mm

■Materials

Aluminum and carbon steel for machine structural use are usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	Flange ※
14	8.91	8.40	12	3	4	PTAS1012055
15	9.55	9.04	13		5	PTAS1013070
16	10.19	9.68				
17	10.82	10.31	15			PTAS1015080
18	11.46	10.95			6	
19	12.10	11.59				
20	12.73	12.22	17	4	6.35	PTAS10170100
21	13.37	12.86				
22	14.01	13.50				
23	14.64	14.13				
24	15.28	14.77				
25	15.92	15.41	21			PTAS10210133
26	16.55	16.04				
27	17.19	16.68				
28	17.83	17.32	12	5		PTAS10250150
29	18.46	17.95				
30	19.10	18.59			8	PTAS10260150
31	19.74	19.23				
32	20.37	19.86				PTAF10280160
33	21.01	20.50	14			
34	21.65	21.14			9	
35	22.28	21.77				PTAF10290180
36	22.92	22.41				

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	Flange ※
37	23.55	23.05	16	5	9	PTAF10310190
38	24.19	23.68			10	
39	24.83	24.32				
40	25.46	24.96				PTAF10320212
41	26.10	25.59	18			
42	26.74	26.23			12	
43	27.37	26.87				PTAF10340230
44	28.01	27.50				
45	28.65	28.14				—
46	29.28	28.78				—
47	29.92	29.41				—
48	30.56	30.05				PTAF10360224
49	31.19	30.69				PTAF10390265
50	31.83	31.32	22		15	
56	35.65	35.14	24		16	PTAF10440310
60	38.20	37.69	28		19	PTAF10450335
64	40.74	40.24		10		—
72	45.84	45.33	34	12	22	—
80	50.93	50.42				—
84	53.48	52.97	36		24	—
90	57.30	56.79				—
96	61.12	60.61	38	15	25	—
112	71.30	70.79				—

Belt / No. of teeth	P2M4		P2M6		P2M10	
	Bw	*BL*	*Bw*	*BL*	*Bw*	*BL*
14～ 27	7	17	9.5	20	14	24
28～112	9	17	11.5	20	16	24

Design pulleys P87
Belt Types and Dimensions P13,P23
Dimensions of Standard Stock pulleys P59

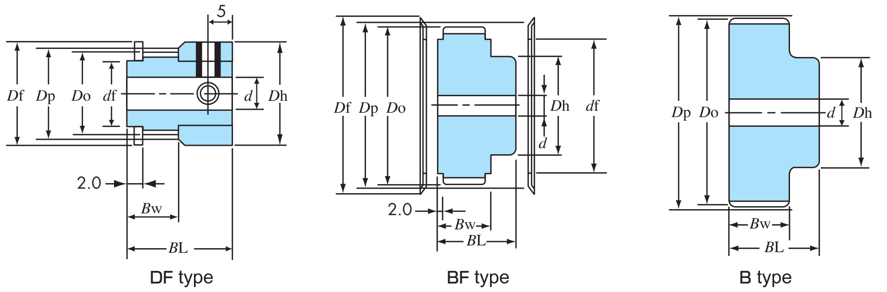
Pulleys

Custom made pulleys (Reference dimensions)

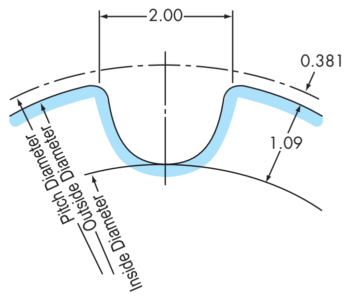
The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

P3M (P : 3 mm)

■Pulley Type (Reference)



■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with such information as machining type and dimensions specified on drawings.

PT 20 P 3M 10 DF

- PT: Pulley
- 20: No.of groove
- P : PX
- 3M: Size
- 10: Belt width mm
- DF: Pulley type

■Model Identification (Flange)

The flanges of different materials or sizes are to be made to order. See page 90 for study.

PT A F 10 430 300

- PT: Pulley
- A: Material — S : SPCC, A : Aluminum
- F: Shape
- 10: Thickness t ex : 1.0 mm
- 430: Outside diameter Df ex : 43.0 mm
- 300: Inside diameter df ex : 30.0 mm

■Materials

Aluminum and carbon steel for machine structural use are usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Hub diameter Dh	Bore size d Min	Bore size d Max	Flange ※
10	9.55	8.79	12	4	4	PTSS1012055
11	10.50	9.74	13		5	PTAS1013070
12	11.46	10.70	15			PTSS1015080
13	12.41	11.65				
14	13.37	12.61	17		6.35	PTAS10170100
15	14.32	13.56				
16	15.28	14.52				
17	16.23	15.47	20			PTAS10210133
18	17.19	16.43				
19	18.14	17.38	25			PTAS10250150
20	19.10	18.34				
21	20.05	19.29	12			
22	21.01	20.25		5	8	PTSF10280160
23	21.96	21.20	14			
24	22.92	22.16			9	PTSF10290180
25	23.87	23.11				PTSF10310190
26	24.83	24.07	16	6	10	
27	25.78	25.02				PTSF10320212
28	26.74	25.98	18		12	
29	27.69	26.93				PTSF10340230
30	28.65	27.89				
31	29.60	28.84				PTSF10360224
32	30.56	29.80				
33	31.51	30.75	22		15	PTSF10390265
34	32.47	31.71				

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Hub diameter Dh	Bore size d Min	Bore size d Max	Flange ※
35	33.42	32.66	24	6	16	PTSF10430300
36	34.38	33.62				
37	35.33	34.57				
38	36.29	35.53	26		18	
39	37.24	36.48				PTSF10440310
40	38.20	37.44				PTSF10450335
41	39.15	38.39	28	10		
42	40.11	39.35				PTSF10470335
43	41.06	40.30	32		20	PTSF10480375
44	42.02	41.25				
45	42.97	42.21	35		22	PTSF10520375
46	43.93	43.16		12		
47	44.88	44.12	36		24	PTSF10520400
48	45.84	45.07				
49	46.79	46.03				PTSF10550425
50	47.75	46.98				
56	53.48	52.71	40		26	PTSF10610490
60	57.30	56.53	46		31	PTSF10650530
64	61.12	60.35	48		32	PTSF10670560
72	68.75	67.99	50			PTSF10740630
80	76.39	75.63	54	15	36	PTSF10820670
84	80.21	79.45	60		40	PTSF10860710
90	85.94	85.18	65		42	–
96	91.67	90.91				–
112	106.95	106.19	70	20	46	–

Belt / No. of teeth	P3M6 Bw	P3M6 BL	P3M10 Bw	P3M10 BL	P3M15 Bw	P3M15 BL
10～ 20	9.5	19	13	23	19	29
21～112	11.5	19	16	23	21	29

Design pulleys P87
Dimensions of Standard Stock pulleys P60
Belt Types and Dimensions P14,P23,P24

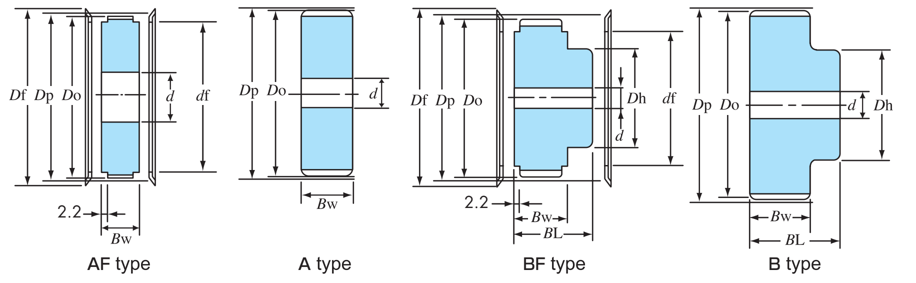
Pulleys

Custom made pulleys (Reference dimensions)

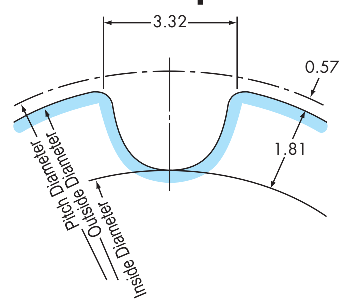
The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

P5M (P : 5 mm)

■Pulley Type (Reference)



■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with such information as machining type and dimensions specified on drawings.

PT 20 P 5M 15 BF

- PT : Pulley
- 20 : No.of groove
- P : PX
- 5M : Size
- 15 : Belt width mm
- BF : Pulley type

■Model Identification (Flange)

The flanges of different materials or sizes are to be made to order. See page 90 for study.

PT S F 10 320 212

- PT : Pulley
- S : Material
  S : SPCC
  A : Aluminum
- F : Shape
- 10 : Thickness *t*
  ex : 1.0 mm
- 320 : Outside diameter *Df*
  ex : 32.0 mm
- 212 : Inside diameter *df*
  ex : 21.2 mm

■Materials

Carbon steel for machine structural and aluminum use are usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

<table>
<tr><th rowspan="2">No. of teeth
n</th><th rowspan="2">Pitch diameter
Dp</th><th rowspan="2">Outside diameter
Do</th><th rowspan="2">Hub diameter
Dh</th><th colspan="2">Bore size
d</th><th rowspan="2">Flange
※</th></tr>
<tr><th>Min</th><th>Max</th></tr>
<tr><td>12</td><td>19.10</td><td>17.96</td><td>11</td><td rowspan="5">5</td><td rowspan="3">6</td><td>PTSF10230130</td></tr>
<tr><td>13</td><td>20.70</td><td>19.56</td><td>12</td><td>PTSF10260150</td></tr>
<tr><td>14</td><td>22.28</td><td>21.14</td><td>13</td><td>PTSF10280160</td></tr>
<tr><td>15</td><td>23.87</td><td>22.73</td><td>15</td><td>8</td><td>PTSF10290180</td></tr>
<tr><td>16</td><td>25.46</td><td>24.32</td><td>17</td><td rowspan="2">10</td><td>PTSF10310190</td></tr>
<tr><td>17</td><td>27.06</td><td>25.91</td><td>18</td><td rowspan="5">6</td><td>PTSF10320212</td></tr>
<tr><td>18</td><td>28.65</td><td>27.51</td><td rowspan="3">19</td><td rowspan="3">12</td><td rowspan="3">PTSF10360224</td></tr>
<tr><td>19</td><td>30.24</td><td>29.10</td></tr>
<tr><td>20</td><td>31.83</td><td>30.69</td></tr>
<tr><td>21</td><td>33.42</td><td>32.28</td><td>23</td><td>14</td><td>PTSF10390265</td></tr>
<tr><td>22</td><td>35.01</td><td>33.87</td><td rowspan="3">25</td><td rowspan="3">8</td><td rowspan="3">17</td><td rowspan="2">PTSF10430300</td></tr>
<tr><td>23</td><td>36.61</td><td>35.46</td></tr>
<tr><td>24</td><td>38.20</td><td>37.06</td><td>PTSF10440310</td></tr>
<tr><td>25</td><td>39.79</td><td>38.65</td><td rowspan="3">30</td><td rowspan="5">10</td><td rowspan="3">20</td><td>PTSF10450335</td></tr>
<tr><td>26</td><td>41.38</td><td>40.24</td><td>PTSF10470355</td></tr>
<tr><td>27</td><td>42.97</td><td>41.83</td><td>PTSF10480375</td></tr>
<tr><td>28</td><td>44.56</td><td>43.42</td><td>32</td><td rowspan="2">22</td><td>PTSF10520375</td></tr>
<tr><td>29</td><td>46.15</td><td>45.01</td><td>33</td><td>PTSF10520400</td></tr>
<tr><td>30</td><td>47.75</td><td>46.60</td><td>35</td><td rowspan="6">12</td><td rowspan="2">24</td><td rowspan="3">PTSF10550425</td></tr>
<tr><td>31</td><td>49.34</td><td>48.20</td><td>36</td></tr>
<tr><td>32</td><td>50.93</td><td>49.79</td><td rowspan="2">38</td><td rowspan="2">26</td></tr>
<tr><td>33</td><td>52.52</td><td>51.38</td><td>PTSF10580450</td></tr>
<tr><td>34</td><td>54.11</td><td>52.97</td><td rowspan="2">42</td><td rowspan="2">28</td><td rowspan="2">PTSF10610490</td></tr>
<tr><td>35</td><td>55.70</td><td>54.56</td></tr>
</table>

<table>
<tr><th rowspan="2">No. of teeth
n</th><th rowspan="2">Pitch diameter
Dp</th><th rowspan="2">Outside diameter
Do</th><th rowspan="2">Hub diameter
Dh</th><th colspan="2">Bore size
d</th><th rowspan="2">Flange
※</th></tr>
<tr><th>Min</th><th>Max</th></tr>
<tr><td>36</td><td>57.30</td><td>56.15</td><td>44</td><td rowspan="6">12</td><td rowspan="4">30</td><td>PTSF10640500</td></tr>
<tr><td>37</td><td>58.89</td><td>57.75</td><td rowspan="2">45</td><td rowspan="2">PTSF10650530</td></tr>
<tr><td>38</td><td>60.48</td><td>59.34</td></tr>
<tr><td>39</td><td>62.07</td><td>60.93</td><td>46</td><td rowspan="2">PTSF10670560</td></tr>
<tr><td>40</td><td>63.66</td><td>62.52</td><td rowspan="2">48</td><td rowspan="2">32</td></tr>
<tr><td>41</td><td>65.25</td><td>64.11</td><td rowspan="2">PTSF10710600</td></tr>
<tr><td>42</td><td>66.85</td><td>65.70</td><td rowspan="2">52</td><td rowspan="11">15</td><td rowspan="2">35</td></tr>
<tr><td>43</td><td>68.44</td><td>67.29</td><td rowspan="3">PTSF10740630</td></tr>
<tr><td>44</td><td>70.03</td><td>68.89</td><td rowspan="2">56</td><td rowspan="5">38</td></tr>
<tr><td>45</td><td>71.62</td><td>70.48</td></tr>
<tr><td>46</td><td>73.21</td><td>72.07</td><td rowspan="3">58</td><td rowspan="3">PTSF10820670</td></tr>
<tr><td>47</td><td>74.80</td><td>73.66</td></tr>
<tr><td>48</td><td>76.39</td><td>75.25</td></tr>
<tr><td>49</td><td>77.99</td><td>76.84</td><td rowspan="2">64</td><td rowspan="2">42</td><td rowspan="2">PTSF10860710</td></tr>
<tr><td>50</td><td>79.58</td><td>78.44</td></tr>
<tr><td>56</td><td>89.13</td><td>87.98</td><td>70</td><td>46</td><td>—</td></tr>
<tr><td>60</td><td>95.49</td><td>94.35</td><td>80</td><td>54</td><td>PTSF101030850</td></tr>
<tr><td>64</td><td>101.86</td><td>100.72</td><td>84</td><td rowspan="3">18</td><td>56</td><td>—</td></tr>
<tr><td>72</td><td>114.59</td><td>113.45</td><td>90</td><td>60</td><td>PTSF1012001060</td></tr>
<tr><td>80</td><td>127.32</td><td>126.18</td><td>98</td><td rowspan="2">65</td><td>—</td></tr>
<tr><td>84</td><td>133.69</td><td>132.55</td><td>100</td><td rowspan="4">20</td><td>—</td></tr>
<tr><td>90</td><td>143.24</td><td>142.10</td><td>106</td><td>70</td><td>—</td></tr>
<tr><td>96</td><td>152.79</td><td>151.65</td><td>110</td><td>75</td><td>—</td></tr>
<tr><td>112</td><td>178.25</td><td>177.11</td><td>120</td><td>80</td><td>—</td></tr>
</table>

Belt / No. of teeth	P5M10		P5M15		P5M25	
	Bw	BL	Bw	BL	Bw	BL
12~112	16	28	21	33	32	44

Design pulleys P87
Dimensions of Standard Stock pulleys P61
Belt Types and Dimensions P15,P23,P24,P28

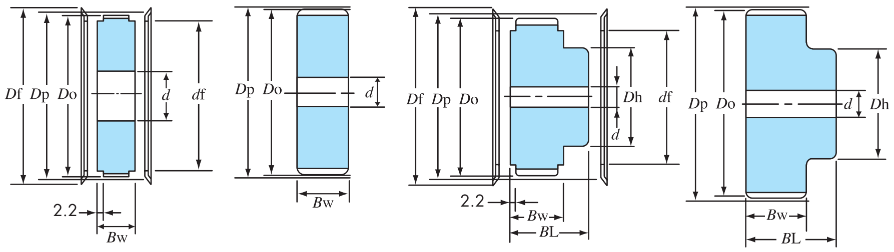
Pulleys

Custom made pulleys (Reference dimensions)

The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

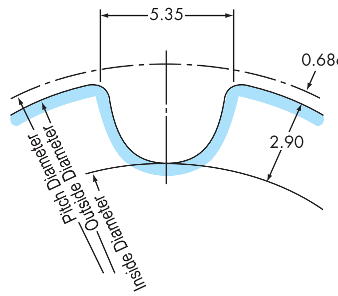
P8M (P : 8 mm)

■Pulley Type (Reference)



AF type   A type   BF type   B type

■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with such information as machining type and dimensions specified on drawings.

PT 20 P 8M 40 BF

- PT : Pulley
- 20 : No.of groove
- P : PX
- 8M : Size
- 40 : Belt width mm
- BF : Pulley type

■Model Identification (Flange)

The flanges of different materials or sizes are to be made to order. See page 90 for study.

PT S F 16 550 425

- PT : Pulley
- S : Material S : SPCC
- F : Shape
- 16 : Thickness *t* ex : 1.6 mm
- 550 : Outside diameter *Df* ex : 55.0 mm
- 425 : Inside diameter *df* ex : 42.5 mm

■Materials

Carbon steel for machine structural use is usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	Flange ※
20	50.93	49.56	36	12	22	PTSF16550425
21	53.48	52.10	39		23	PTSF16610450
22	56.02	54.65	41		25	PTSF16620450
23	58.57	57.20	43		26	PTSF16660500
24	61.12	59.74	46		28	
25	63.66	62.29	49			PTSF16700560
26	66.21	64.84	51	16	30	PTSF16730560
27	68.75	67.38	53		32	
28	71.30	69.93	55		34	PTSF16790630
29	73.85	72.48	58			
30	76.39	75.02	60		36	PTSF16820670
31	78.94	77.57	63			PTSF16860710
32	81.49	80.12	65		38	
33	84.03	82.66	67		40	
34	86.58	85.21	70		42	PTSF16910770
35	89.13	87.75	73			PTSF16940770
36	91.67	90.30	75		45	PTSF16970800
37	94.22	92.85	77		46	PTSF161030850
38	96.77	95.39	80		48	
39	99.31	97.94	83			PTSF161070900
40	101.86	100.49	85	20	50	

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	Flange ※
41	104.41	103.03	86	20	50	PTSF161110950
42	106.95	105.58	87			
43	109.50	108.13	88		52	PTSF1611501020
44	112.05	110.67	90		56	PTSF1611901020
45	114.59	113.22	92		58	
46	117.14	115.77	95		60	PTSF1612701120
47	119.68	118.31	98			
48	122.23	120.86	100		62	
49	124.78	123.41				PTSF1613501150
50	127.32	125.95				PTSF1613501200
56	142.60	141.23				—
60	152.79	151.42				PTSF1615801400
64	162.97	161.60	110			PTSF1616701520
72	183.35	181.97		30		PTSF1619001700
80	203.72	202.35	120		65	—
84	213.90	212.53	126		70	—
90	229.18	227.81	130		75	—
96	244.46	243.09	144	35	80	—
112	285.21	283.83				—
120	305.58	304.21				—

Belt / No. of teeth	P8M15		P8M25		P8M40		P8M60	
	Bw	BL	Bw	BL	Bw	BL	Bw	BL
20～ 41	22	39	33	50	49	66	70	87
42～120	22	44	33	55	49	71	70	92

Design pulleys P87
Belt Types and Dimensions P16,P23,P24,P28
Dimensions of Standard Stock pulleys P62

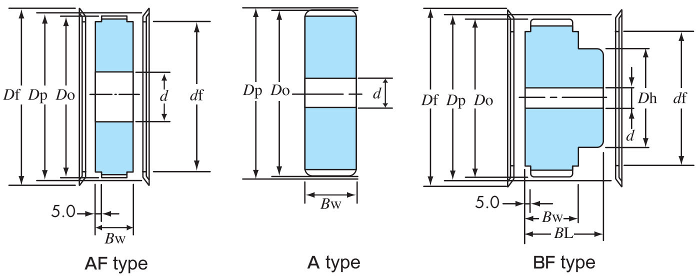
Pulleys

Custom made pulleys (Reference dimensions)

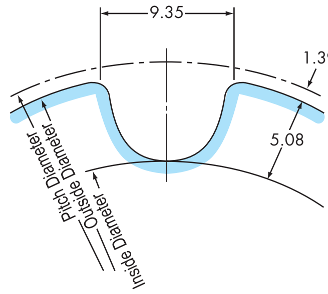
The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

P14M (P : 14 mm)

■Pulley Type (Reference)



■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with such information as machining type and dimensions specified on drawings.

PT 30 P 14M 60 BF

- PT — Pulley
- 30 — No.of groove
- P — P : PX
- 14M — Size
- 60 — Belt width mm
- BF — Pulley type

■Materials

Carbon steel for machine structural use is usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	Flange size Outside diameter
28	124.78	121.98	90	20	56	136
29	129.23	126.44	95	20	60	–
30	133.69	130.90	100	20	62	145
31	138.15	135.36	105	20	62	–
32	142.60	139.81	110	20	62	154
33	147.06	144.27	120	20	70	–
34	151.52	148.72	120	20	70	163
35	155.97	153.18	120	20	70	–
36	160.43	157.63	120	20	70	171
37	164.88	162.09	130	20	75	–
38	169.34	166.55	135	20	75	181
39	173.80	171.01	135	20	80	–
40	178.25	175.46	135	20	80	190
41	182.71	179.92	135	20	80	–
42	187.17	184.37	135	20	80	198
43	191.62	188.83	145	20	85	–
44	196.08	193.29	155	20	85	207

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	Flange size Outside diameter
45	200.54	197.75	155	20	85	–
46	204.99	202.20	160	20	90	–
47	209.45	206.66	160	20	90	–
48	213.90	211.11	160	20	90	225
49	218.36	215.57	160	20	90	–
50	222.82	220.02	160	20	90	234
56	249.55	246.76	160	30	90	–
60	267.38	264.59	160	30	90	–
64	285.21	282.42	160	30	90	–
72	320.86	318.07	170	35	90	–
80	356.51	353.72	170	35	100	–
84	374.33	371.54	180	35	110	–
90	401.07	398.28	200	40	120	–
96	427.81	425.02	240	40	150	–
112	499.11	496.32	250	40	150	–
120	534.76	531.97	300	40	180	–

Belt / No. of teeth	P14M40 Bw	P14M40 BL	P14M60 Bw	P14M60 BL	P14M80 Bw	P14M80 BL	P14M100 Bw	P14M100 BL	P14M120 Bw	P14M120 BL
28～ 43	53	73	74	94	95	115	116	136	137	157
44～120	53	78	74	99	95	120	116	141	137	162

Design pulleys P87
Belt Types and Dimensions P17
Dimensions of Standard Stock pulleys P63

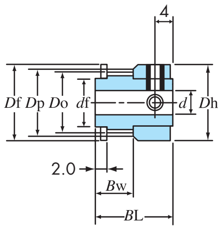
Pulleys

Custom made pulleys (Reference dimensions)

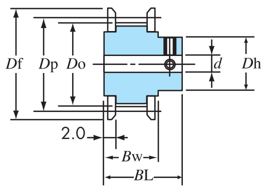
The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

MXL (P : 2.032 mm)

■Pulley Type (Reference)

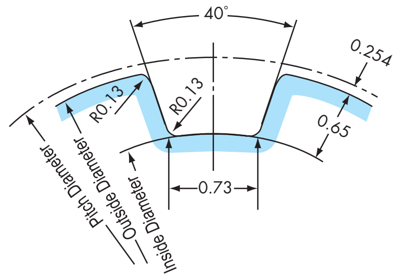


DF type



BF type

■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with such information as machining type and dimensions specified on drawings.

PT 20 MXL 6.4 DF

- PT: Pulley
- 20: No.of groove
- MXL: Size
- 6.4: Belt width mm
- DF: Pulley type

■Model Identification (Flange)

The flanges of different materials or sizes are to be made to order. See page 90 for study.

PT A F 10 290 180

- PT: Pulley
- A: Material S : SPCC A : Aluminum
- F: Shape
- 10: Thickness *t* ex : 1.0 mm
- 290: Outside diameter *Df* ex : 29.0 mm
- 180: Inside diameter *df* ex : 18.0 mm

■Materials

Aluminum and carbon steel for machine structural use are usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	Flange ※
10	6.47	5.96	11	2	2	PTAS1011040
11	7.11	6.61	12			
12	7.76	7.25	13			
13	8.41	7.90	15	3.5	3.5	PTAS1012055
14	9.06	8.55	17			
15	9.70	9.19	13	4	5	PTAS1013070
16	10.35	9.84	15			
17	11.00	10.49				PTAS1015080
18	11.64	11.14				
19	12.29	11.78				
20	12.94	12.43	17		6.35	PTAS10170100
21	13.58	13.08				
22	14.23	13.72				
23	14.88	14.37		4.5		
24	15.52	15.02				
25	16.17	15.67	12			PTAS10210133
26	16.82	16.31				
27	17.46	16.96				
28	18.11	17.61				
29	18.76	18.25				
30	19.40	18.90				—
31	20.05	19.54				PTAS10250150
32	20.70	20.19		5	8	
33	21.34	20.84	12	5	8	PTAS10250150
34	21.99	21.48				PTAF10290180
35	22.64	22.13				
36	23.29	22.78	14			
37	23.93	23.42				PTAF10310190
38	24.58	24.07				PTAF10320212
39	25.23	24.72				
40	25.87	25.37	16		9	
41	26.52	26.01				PTAF10360224
42	27.17	26.66				
43	27.81	27.30				
44	28.46	27.95				
45	29.11	28.60				
46	29.75	29.25				
47	30.40	29.89				
48	31.05	30.54	18		12	
49	31.69	31.19				PTAF10390265
50	32.34	31.83	20	6	13	
56	36.22	35.71				PTAF10440310
60	38.81	38.30	22		14	PTAF10450335
64	41.40	40.89				PTAF10480375
72	46.57	46.06				PTAF10550425

Belt / No. of teeth	MXL3.2 Bw	MXL3.2 BL	MXL4.8 Bw	MXL4.8 BL	MXL6.4 Bw	MXL6.4 BL	MXL9.5 Bw	MXL9.5 BL	MXL12.7 Bw	MXL12.7 BL
10〜23	6.3	14.3	7.9	15.9	9.5	17.5	12.6	20.6	16.6	24.2
23〜39	6.3	14.3	9.9	15.9	11.5	17.5	14.6	20.6	18.2	24.2
40〜72	8.3	16.3	9.9	17.9	11.5	19.5	14.6	22.6	18.2	26.2

Design pulleys P87
Belt Types and Dimensions P18,P23
Dimensions of Standard Stock pulleys P64

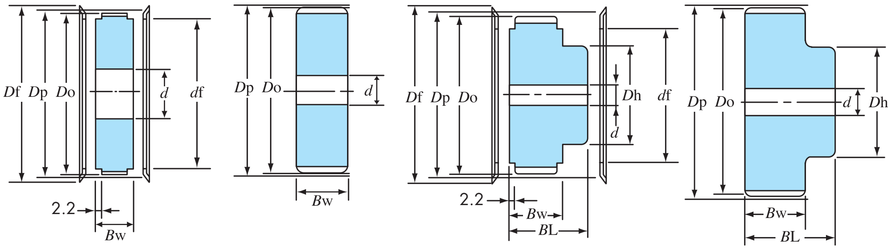
Pulleys

Custom made pulleys (Reference dimensions)

The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

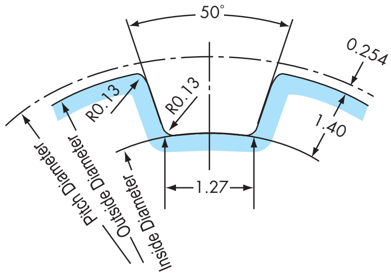
XL (P : 5.080 mm)

■Pulley Type (Reference)



AF type　A type　BF type　B type

■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with such information as machining type and dimensions specified on drawings.

PT 20 XL 025 BF

- PT: Pulley
- 20: No.of groove
- XL: Size
- 025: Belt width(Designation)
- BF: Pulley type

■Model Identification (Flange)

The flanges of different materials or sizes are to be made to order. See page 90 for study.

PT S F 10 290 180

- PT: Pulley
- S: Material　S : SPCC　A : Aluminum
- F: Shape
- 10: Thickness *t*　ex : 1.0 mm
- 290: Outside diameter *Df*　ex : 29.0 mm
- 180: Inside diameter *df*　ex : 18.0 mm

■Materials

Aluminum and carbon steel for machine structural use are usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

<table>
<tr><th rowspan="2">No. of teeth
n</th><th rowspan="2">Pitch diameter
Dp</th><th rowspan="2">Outside diameter
Do</th><th rowspan="2">Hub diameter
Dh</th><th colspan="2">Bore size
d</th><th rowspan="2">Flange
※</th></tr>
<tr><th>Min</th><th>Max</th></tr>
<tr><td>10</td><td>16.17</td><td>15.67</td><td>10</td><td rowspan="2">4</td><td rowspan="2">4</td><td>PTSF10230120</td></tr>
<tr><td>11</td><td>17.79</td><td>17.28</td><td rowspan="3">11</td><td>PTSF10230130</td></tr>
<tr><td>12</td><td>19.40</td><td>18.90</td><td rowspan="2">5</td><td rowspan="2">6</td><td>PTSF10260150</td></tr>
<tr><td>13</td><td>21.02</td><td>20.51</td><td>PTSF10260160</td></tr>
<tr><td>14</td><td>22.64</td><td>22.13</td><td>14</td><td rowspan="6">6</td><td>8</td><td>PTSF10290180</td></tr>
<tr><td>15</td><td>24.26</td><td>23.75</td><td>15</td><td>9</td><td>PTSF10310190</td></tr>
<tr><td>16</td><td>25.87</td><td>25.37</td><td rowspan="2">17</td><td rowspan="2">10</td><td rowspan="2">PTSF10320212</td></tr>
<tr><td>17</td><td>27.49</td><td>26.98</td></tr>
<tr><td>18</td><td>29.11</td><td>28.60</td><td>19</td><td>13</td><td>PTSF10360224</td></tr>
<tr><td>19</td><td>30.72</td><td>30.22</td><td rowspan="2">23</td><td rowspan="2">15</td><td rowspan="2">PTSF10390265</td></tr>
<tr><td>20</td><td>32.34</td><td>31.83</td><td rowspan="10">8</td></tr>
<tr><td>21</td><td>33.96</td><td>33.45</td><td rowspan="6">26</td><td rowspan="6">18</td><td rowspan="3">PTSF10430300</td></tr>
<tr><td>22</td><td>35.57</td><td>35.07</td></tr>
<tr><td>23</td><td>37.19</td><td>36.68</td></tr>
<tr><td>24</td><td>38.81</td><td>38.30</td><td>PTSF10450335</td></tr>
<tr><td>25</td><td>40.43</td><td>39.93</td><td>PTSF10470355</td></tr>
<tr><td>26</td><td>42.04</td><td>41.53</td><td>PTSF10480375</td></tr>
<tr><td>27</td><td>43.66</td><td>43.15</td><td rowspan="6">28</td><td rowspan="6">19</td><td rowspan="2">PTSF10520400</td></tr>
<tr><td>28</td><td>45.28</td><td>44.78</td></tr>
<tr><td>29</td><td>46.89</td><td>46.39</td><td rowspan="3">PTSF10550425</td></tr>
<tr><td>30</td><td>48.51</td><td>48.01</td><td rowspan="3">10</td></tr>
<tr><td>31</td><td>50.13</td><td>49.62</td></tr>
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<table>
<tr><th rowspan="2">No. of teeth
n</th><th rowspan="2">Pitch diameter
Dp</th><th rowspan="2">Outside diameter
Do</th><th rowspan="2">Hub diameter
Dh</th><th colspan="2">Bore size
d</th><th rowspan="2">Flange
※</th></tr>
<tr><th>Min</th><th>Max</th></tr>
<tr><td>33</td><td>53.36</td><td>52.85</td><td>28</td><td rowspan="22">10</td><td rowspan="9">20</td><td>PTSF10580450</td></tr>
<tr><td>34</td><td>54.98</td><td>54.48</td><td rowspan="8">30</td><td>PTSF10610490</td></tr>
<tr><td>35</td><td>56.60</td><td>56.09</td><td>PTSF10640500</td></tr>
<tr><td>36</td><td>58.21</td><td>57.71</td><td>PTSF10650530</td></tr>
<tr><td>37</td><td>59.83</td><td>59.32</td><td rowspan="3">PTSF10670560</td></tr>
<tr><td>38</td><td>61.45</td><td>60.94</td></tr>
<tr><td>39</td><td>63.06</td><td>62.56</td></tr>
<tr><td>40</td><td>64.68</td><td>64.17</td><td rowspan="2">PTSF10710600</td></tr>
<tr><td>41</td><td>66.30</td><td>65.79</td></tr>
<tr><td>42</td><td>67.91</td><td>67.41</td><td rowspan="2">34</td><td rowspan="2">22</td><td>PTSF10740630</td></tr>
<tr><td>43</td><td>69.53</td><td>69.02</td><td>—</td></tr>
<tr><td>44</td><td>71.15</td><td>70.64</td><td rowspan="4">35</td><td rowspan="4">24</td><td>PTSF10820670</td></tr>
<tr><td>45</td><td>72.77</td><td>72.26</td><td>—</td></tr>
<tr><td>46</td><td>74.38</td><td>73.87</td><td>—</td></tr>
<tr><td>47</td><td>76.00</td><td>75.49</td><td>—</td></tr>
<tr><td>48</td><td>77.62</td><td>77.12</td><td rowspan="2">39</td><td rowspan="2">26</td><td>PTSF10860710</td></tr>
<tr><td>49</td><td>79.23</td><td>78.73</td><td>—</td></tr>
<tr><td>50</td><td>80.85</td><td>80.34</td><td rowspan="2">40</td><td rowspan="2">27</td><td>PTSF10860710</td></tr>
<tr><td>56</td><td>90.55</td><td>90.04</td><td>—</td></tr>
<tr><td>60</td><td>97.02</td><td>96.52</td><td rowspan="3">48</td><td rowspan="3">32</td><td>PTSF101030850</td></tr>
<tr><td>64</td><td>103.49</td><td>102.98</td><td>—</td></tr>
<tr><td>72</td><td>116.43</td><td>115.92</td><td>—</td></tr>
</table>

<table>
<tr><th>Belt / No. of teeth</th><th colspan="2">XL025</th><th colspan="2">XL031</th><th colspan="2">XL037</th></tr>
<tr><th></th><th>Bw</th><th>BL</th><th>Bw</th><th>BL</th><th>Bw</th><th>BL</th></tr>
<tr><td>10～17</td><td>11.8</td><td>22.8</td><td>13.4</td><td>22.4</td><td>15</td><td>24</td></tr>
<tr><td>18～41</td><td>11.8</td><td>22.8</td><td>13.4</td><td>24.4</td><td>15</td><td>26</td></tr>
<tr><td>42～72</td><td>11.8</td><td>22.8</td><td>13.4</td><td>24.4</td><td>15</td><td>28</td></tr>
</table>

Design pulleys P87
Dimensions of Standard Stock pulleys P65
Belt Types and Dimensions P19,P23,P26

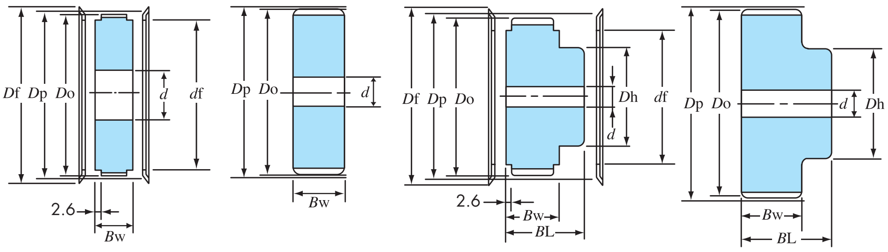
Pulleys

Custom made pulleys (Reference dimensions)

The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

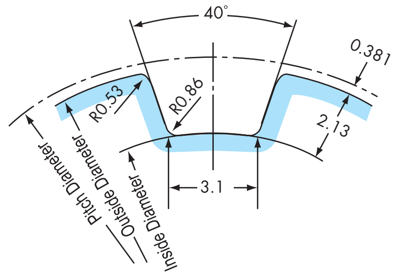
L (P : 9.525 mm)

■Pulley Type (Reference)



AF type　A type　BF type　B type

■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with information as machining type and dimensions specified on drawings.

PT 20 L 050 BF

- PT: Pulley
- 20: No.of groove
- L: Size
- 050: Belt width(Designation)
- BF: Pulley type

■Model Identification (Flange)

The flanges of different materials or sizes are to be made to order. See page 90 for study.

PT S F 16 360 224

- PT: Pulley
- S: Material S : SPCC
- F: Shape
- 16: Thickness *t* ex : 1.6 mm
- 360: Outside diameter *Df* ex : 36.0 mm
- 224: Inside diameter *df* ex : 22.4 mm

■Materials

Aluminum and carbon steel for machine structural use are usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	Flange ※
10	30.32	29.56	19	8	12	PTSF16360224
11	33.35	32.59				—
12	36.38	35.62	26		17	PTSF16430300
13	39.41	38.65				PTSF16490335
14	42.45	41.68	29		19	
15	45.48	44.72	32	10	20	PTSF16520375
16	48.51	47.75	35		22	PTSF16550425
17	51.54	50.78	38			PTSF16560420
18	54.57	53.81			25	PTSF16610450
19	57.61	56.84	40	12		PTSF16660500
20	60.64	59.88			26	PTSF16670530
21	63.67	62.91				PTSF16700560
22	66.70	65.94				PTSF16730560
23	69.73	68.97				PTSF16790630
24	72.77	72.00				
25	75.80	75.04	42		28	PTSF16820670
26	78.83	78.07				PTSF16860710
27	81.86	81.10				—
28	84.89	84.13	44		30	PTSF16910770
29	87.93	87.16				PTSF16940770
30	90.96	90.20				PTSF16970800
31	93.99	93.23				PTSF161030850
32	97.02	96.26				

No. of teeth *n*	Pitch diameter *Dp*	Outside diameter *Do*	Hub diameter *Dh*	Bore size *d* Min	Bore size *d* Max	Flange ※
33	100.05	99.29	44	12	30	PTSF161070900
34	103.08	102.32				PTSF161110950
35	106.12	105.35				—
36	109.15	108.39		15		PTSF1611501020
37	112.18	111.42				PTSF1611901020
38	115.21	114.45				—
39	118.24	117.48				PTSF1612701120
40	121.28	120.51	48		32	
41	124.31	123.55				—
42	127.34	126.58				PTSF1613501200
43	130.37	129.61				PTSF1613901250
44	133.40	132.64				
45	136.44	135.67				PTSF1614301280
46	139.47	138.71				—
47	142.50	141.74				PTSF1615101370
48	145.53	144.77				
49	148.56	147.80				PTSF1615801400
50	151.60	150.83				
56	169.79	169.02				—
60	181.91	181.15	50		34	PTSF1619001700
64	194.04	193.28				—
72	218.30	217.53				—

Belt / No. of teeth	L050 Bw	L050 BL	L075 Bw	L075 BL	L100 Bw	L100 BL
10、11	19.6	30.5	—	—	—	—
12	19.6	30.5	26	36.5	—	—
13~15	19.6	30.5	26	36.5	32.3	43
16~36	19.6	32.5	26	38.5	32.3	45
37~72	19.6	35.5	26	41.5	32.3	48

Design pulleys P87
Dimensions of Standard Stock pulleys P66
Belt Types and Dimensions P20,P23,P26

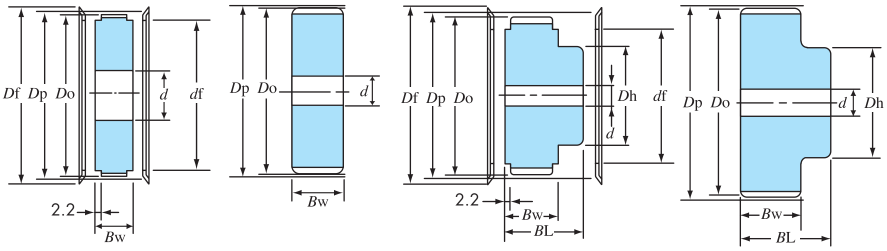
Pulleys

Custom made pulleys (Reference dimensions)

The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

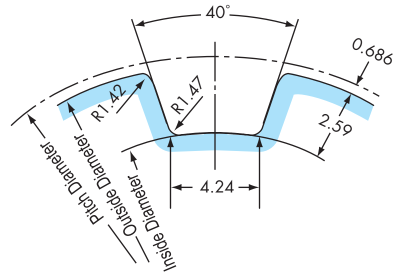
H (P : 12.700 mm) 1

■Pulley Type (Reference)



AF type　A type　BF type　B type

■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with such information as machining type and dimensions specified on drawings.

PT 20 H 100 BF

- PT: Pulley
- 20: No.of groove
- H: Size
- 100: Belt width(Designation)
- BF: Pulley type

■Model Identification (Flange)

The flanges of different materials or sizes are to be made to order. See page 90 for study.

PT S F 16 620 450

- PT: Pulley
- S: Material S : SPCC
- F: Shape
- 16: Thickness t ex : 1.6 mm
- 620: Outside diameter Df ex : 62.0 mm
- 450: Inside diameter df ex : 45.0 mm

■Materials

Carbon steel for machine structural use is usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Hub diameter Dh	Bore size d Min	Bore size d Max	Flange ※
14	56.60	55.22	41	14	27	PTSF16620450
15	60.64	59.27	46		30	PTSF16660500
16	64.68	63.31	50		34	PTSF16700560
17	68.72	67.35				–
18	72.77	71.39	58		38	PTSF16790630
19	76.81	75.44		15		PTSF16820670
20	80.85	79.48				PTSF16860710
21	84.89	83.52				PTSF16910770
22	88.94	87.56				PTSF16940770
23	92.98	91.61				PTSF161030850
24	97.02	95.65				
25	101.06	99.69			40	PTSF161070900
26	105.11	103.73	60			PTSF161110950
27	109.15	107.78				PTSF1611501020
28	113.19	111.82				PTSF1611901020
29	117.23	115.86		20		–
30	121.28	119.90				PTSF1612701120
31	125.32	123.95				–
32	129.36	127.99				PTSF1613501200
33	133.40	132.03	64		42	PTSF1613901250
34	137.45	136.07				PTSF1614301280

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Hub diameter Dh	Bore size d Min	Bore size d Max	Flange ※
35	141.49	140.12				–
36	145.53	144.16				PTSF1615101370
37	149.57	148.20	64		42	PTSF1615801400
38	153.62	152.24		20		
39	157.66	156.29				–
40	161.70	160.33	68			PTSF1616701520
41	165.74	164.37			45	–
42	169.79	168.41				–
43	173.83	172.46				–
44	177.87	176.50	70			–
45	181.91	180.54			46	–
46	185.96	184.58				–
47	190.00	188.63		25		–
48	194.04	192.67				–
49	198.08	196.71	72		48	–
50	202.13	200.76				–
56	226.38	225.01				–
60	242.55	241.18				–
64	258.72	257.35	78		52	–
72	291.06	289.69				–

Belt / No. of teeth	H075 Bw	H075 BL	H100 Bw	H100 BL	H150 Bw	H150 BL
14	27.2	40	33.5	46	46.2	59
15	27.2	40	33.5	46	46.2	59
16〜31	27.2	43	33.5	49	46.2	62
32〜72	27.2	46	33.5	52	46.2	65

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Dimensions of Standard Stock pulleys P67,P68
Belt Types and Dimensions P21,P23,P27

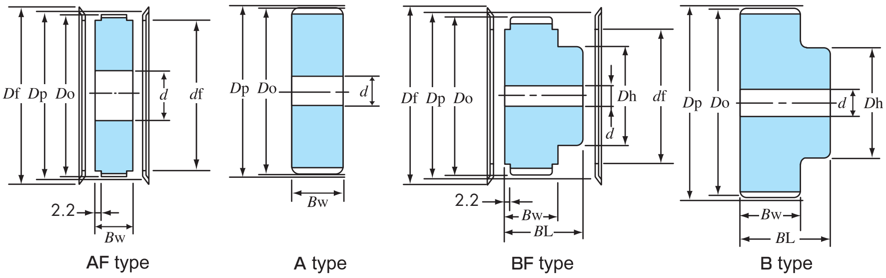
Pulleys

Custom made pulleys (Reference dimensions)

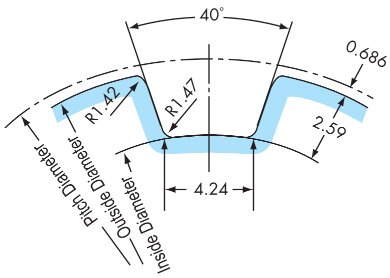
The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

H (P : 12.700 mm) 2

■Pulley Type (Reference)



■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with such information as machining type and dimensions specified on drawings.

PT 20 H 200 BF

- PT: Pulley
- 20: No.of groove
- H: Size
- 200: Belt width(Designation)
- BF: Pulley type

■Model Identification (Flange)

The flanges of different materials or sizes are to be made to order. See page 90 for study.

PT S F 16 620 450

- PT: Pulley
- S: Material S : SPCC
- F: Shape
- 16: Thickness *t* ex : 1.6 mm
- 620: Outside diameter *Df* ex : 62.0 mm
- 450: Inside diameter *df* ex : 45.0 mm

■Materials

Carbon steel for machine structural use is usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

No. of teeth *n*	Pitch diameter *D*p	Outside diameter *D*o	Hub diameter *D*h	Bore size *d* Min	Bore size *d* Max	Flange ※
14	56.60	55.22	41	14	27	PTSF16620450
15	60.64	59.27	46	15	30	PTSF16660500
16	64.68	63.31	50		34	PTSF16700560
17	68.72	67.35	58		38	—
18	72.77	71.39				PTSF16790630
19	76.81	75.44				PTSF16820670
20	80.85	79.48	64		42	PTSF16860710
21	84.89	83.52	72			PTSF16910770
22	88.94	87.56			48	PTSF16940770
23	92.98	91.61				PTSF161030850
24	97.02	95.65	75	20	50	
25	101.06	99.69		25		PTSF161070900
26	105.11	103.73				PTSF161110950
27	109.15	107.78				PTSF1611501020
28	113.19	111.82	78		52	PTSF1611901020
29	117.23	115.86				—
30	121.28	119.90	80		54	PTSF1612701120
31	125.32	123.95				—
32	129.36	127.99				PTSF1613501200
33	133.40	132.03				PTSF1613901250
34	137.45	136.07				PTSF1614301280
35	141.49	140.12	80	25	54	—
36	145.53	144.16	85		56	PTSF1615101370
37	149.57	148.20				PTSF1615801400
38	153.62	152.24				
39	157.66	156.29				—
40	161.70	160.33		30		PTSF1616701520
41	165.74	164.37				—
42	169.79	168.41				—
43	173.83	172.46				—
44	177.87	176.50				—
45	181.91	180.54				—
46	185.96	184.58				—
47	190.00	188.63				—
48	194.04	192.67				—
49	198.08	196.71				—
50	202.13	200.76				—
56	226.38	225.01				—
60	242.55	241.18	90		60	—
64	258.72	257.35				—
72	291.06	289.69				—

Belt / No. of teeth	H200 Bw	H200 BL	H300 Bw	H300 BL
14	59.6	73	—	—
15	59.6	76	—	—
16〜18	59.6	76	86	102
19〜27	59.6	79	86	105
28〜72	59.6	82	86	108

Design pulleys P87
Dimensions of Standard Stock pulleys P67,P68
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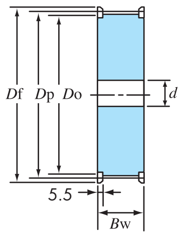
Pulleys

Custom made pulleys (Reference dimensions)

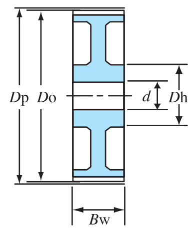
The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

XH (P : 22.225 mm)

■Pulley Type (Reference)

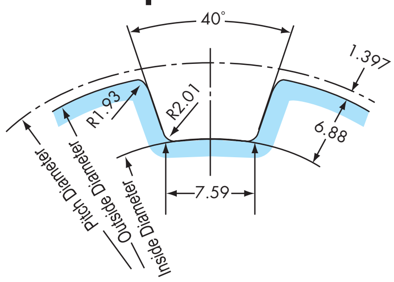


AF type



AA type

■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with such information as machining type and dimensions specified on drawings.

PT 20 XH 200 AA

PT — Pulley
20 — No.of groove
XH — Size
200 — Belt width(Designation)
AA — Pulley type

■Materials

Carbon steel for machine structural use is usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Frange Outside diameter Df	XH200				XH300			
				Teeth width Bw	Hub diameter Dh	Bore size d		Teeth width Bw	Hub diameter Dh	Bore size d	
						Min	Max			Min	Max
18	127.34	124.54	141		—	25	68		—		68
20	141.49	138.69	155		—		76		—	35	76
22	155.64	152.84	169		—		85		—		85
24	169.79	167.00	183		—		92		—		92
26	183.94	181.14	198		—	30	100		—		100
28	198.08	195.29	—							40	
30	212.23	209.44	—	68	85		56	95	100		66
32	226.38	223.59	—								
36	254.68	251.89	—						105		70
40	282.98	280.19	—		100		66			45	
44	311.28	308.49	—			35			110		74
48	339.57	336.78	—		105		70		115	50	76
60	424.47	421.67	—		120		80		130		86

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Frange Outside diameter Df	XH400			
				Teeth width Bw	Hub diameter Dh	Bore size d	
						Min	Max
18	127.34	124.54	141		—		68
20	141.49	138.69	155		—	35	76
22	155.64	152.84	169		—		85
24	169.79	167.00	183		—		92
26	183.94	181.14	198		—		100
28	198.08	195.29	—			40	
30	212.23	209.44	—	122	100		66
32	226.38	223.59	—				
36	254.68	251.89	—		105		70
40	282.98	280.19	—			45	
44	311.28	308.49	—		110		74
48	339.57	336.78	—		115	50	76
60	424.47	421.67	—		130		86

Design pulleys P87
Belt Types and Dimensions P22

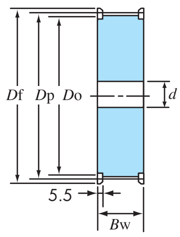
Pulleys

Custom made pulleys (Reference dimensions)

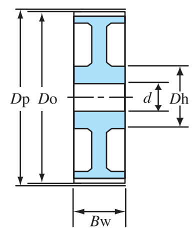
The dimensions listed on this page are presented as reference for studying custom made pulleys.
Pulleys of different dimensions, number of teeth and materials are also available.

XXH (P : 31.750 mm)

■Pulley Type (Reference)

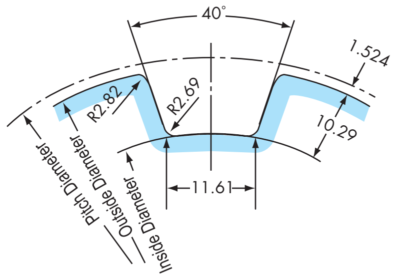


AF type



AA type

■Tooth Shape



■Model Identification

For custom made pulleys, in addition to the model designation, provide us with such information as machining type and dimensions specified on drawings.

PT 30 XXH 300 AA

- PT: Pulley
- 30: No.of groove
- XXH: Size
- 300: Belt width(Designation)
- AA: Pulley type

■Materials

Carbon steel for machine structural use is usually used. Other materials are also possible. Please contact us.

■Surface Treatment

Refer to the 88p.

■Pulley Dimensions

mm

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Frange Outside diameter Df	XXH200 Teeth width Bw	XXH200 Hub diameter Dh	XXH200 Bore size d Min	XXH200 Bore size d Max	XXH300 Teeth width Bw	XXH300 Hub diameter Dh	XXH300 Bore size d Min	XXH300 Bore size d Max
18	181.91	178.87	200		–		100		–		100
20	202.13	199.09	221		–	40	110		–	40	110
22	222.34	219.29	241		–		120		–		120
24	242.55	239.50	261		–		130		–		130
26	262.76	259.72	281		–		140		–		140
28	282.98	279.93	–			45				45	
30	303.19	300.15	–	68	115		76	95	115		76
32	323.40	320.35	–								
36	363.83	360.78	–		120		80		120		80
40	404.25	401.20	–		140	50	92		140	50	92
44	444.68	441.63	–		154		96		154		96
48	485.10	482.06	–		155	55	102		155	55	102
60	606.38	603.33	–		165		110		165		110

No. of teeth n	Pitch diameter Dp	Outside diameter Do	Frange Outside diameter Df	XXH400 Teeth width Bw	XXH400 Hub diameter Dh	XXH400 Bore size d Min	XXH400 Bore size d Max	XXH500 Teeth width Bw	XXH500 Hub diameter Dh	XXH500 Bore size d Min	XXH500 Bore size d Max
18	181.91	178.87	200		–	45	100		–	45	100
20	202.13	199.09	221		–		110		–		110
22	222.34	219.29	241		–	50	120		–	50	120
24	242.55	239.50	261		–		130		–		130
26	262.76	259.72	281		–		140		–		140
28	282.98	279.93	–		125		84		125		
30	303.19	300.15	–	122		55		149		55	84
32	323.40	320.35	–		130		86		130		
36	363.83	360.78	–								86
40	404.25	401.20	–		150	60	100		150	60	
44	444.68	441.63	–								100
48	485.10	482.06	–			65				65	
60	606.38	603.33	–		185		122		185		122

Design pulleys P87
Belt Types and Dimensions P22

Pulleys

Pulley Design

DESIGN REFERENCE

Pulley materials

The following materials are suitable for pulleys:

Materials	Code
Carbon steel for machine structural use	S15C～S55C
High tensile aluminum alloy	A2017—T4
Gray cast iron	FC200～FC300
Stainless steel	SUS303

General equations for pulley calculation

・**Pitch diameter** $Dp = \dfrac{N \times p}{\pi}$

・**Outside diameter** $Do = Dp - 2a = \dfrac{N \times p}{\pi} - 2a$

p : Belt pitch mm
N : Number of teeth of pulley
a : Pitch line depth (PLD) mm

mm

	P3M	P5M	P8M	P14M
Pitch	3.00	5.00	8.00	14.00
a (PLD)	0.381	0.571	0.686	1.397

	MXL	XL	L	H	XH	XXH
Pitch	2.032	5.080	9.525	12.700	22.225	31.750
a (PLD)	0.254	0.254	0.381	0.686	1.397	1.524

Tolerances of pulley dimensions

■**Errors in tooth trace direction (relative to finished bore centerline)**

Parallelism between tooth and bore centerline mm

Belt Width	Tolerance of Error in Tooth Trace Direction
Up to and incl. 50	0.03
Over 50,up to and incl. 100	0.04
Over 100	0.05

■**Runout of addendum circle (relative to finished bore centerline)**

mm

Addendum Circle Dia	Allowable Runout
Up to and incl. 203.20	0.13
Over 203.20	0.13+[(Outside diameter−203.20)×0.0005]

■**Runout of side face (relative to finished bore centerline)**

mm

Addendum Circle Dia	Allowable Runout
Up to and incl. 101.60	0.10
Over 101.60,up to and incl. 254.00	Outside diameter×0.001
Over 254.00	0.25+[(Outside diameter−254.00)×0.0005]

■**Cylindricity of tip cylinder (Gradient = taper x 1/2)**

mm

	Allowance
Up to and incl. 20	0.01
Over 20,up to and incl. 50	0.02
Over 50,up to and incl. 100	0.04
Over 100	0.06

・The tolerances shown in the left-side table are applicable to machined pulleys. For plastic pulleys, please contact us because they differ depending on the conditions of use and layout.
・For tolerances of the addendum circle diameter, please contact us.

Pulleys

Pulley Design

Pulley width

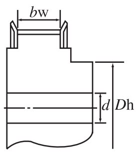


Fig1

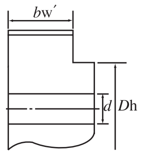


Fig2

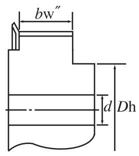


Fig3

■Belte width and Pulley width

mm

Type (Pitch)	Belt width	Pulley width (Standard)		
		Fig1 bw	Fig2 bw'	Fig3 bw"
P2M	4	5.0	9.0	7.0
	6	7.5	11.5	9.5
	10	12.0	16.0	14.0
P3M	6	7.5	11.5	9.5
	10	12.0	16.0	14.0
	15	17.0	21.0	19.0
P5M	10	11.6	16.0	13.8
	15	16.6	21.0	18.8
	25	27.6	32.0	29.8
P8M	15	16.8	22.0	19.4
	25	27.8	33.0	30.4
	40	43.8	49.0	46.4
	60	64.8	70.0	67.4
P14M	40	43.0	53.0	48.0
	60	64.0	74.0	69.0
	80	85.0	95.0	90.0
	100	106.0	116.0	111.0
	120	127.0	137.0	132.0

Type (Pitch)	Designation	Belt width mm	Pulley width (Standard)		
			Fig1 bw	Fig2 bw'	Fig3 bw"
MXL	3.2	3.2	4.3	8.3	6.3
	4.8	4.8	5.9	9.9	7.9
	6.4	6.4	7.5	11.5	9.5
	9.5	9.5	10.6	14.6	12.6
	12.7	12.7	14.2	18.2	16.6
XL	025	6.4	7.5	11.8	9.6
	031	7.9	9.0	13.4	11.2
	037	9.5	10.6	15.0	12.8
L	050	12.7	14.4	19.6	17.0
	075	19.1	20.8	26.0	23.4
	100	25.4	27.1	32.3	29.7
H	075	19.1	22.0	27.2	24.6
	100	25.4	28.3	33.5	30.9
	150	38.1	41.0	46.2	43.6
	200	50.8	54.4	59.6	57.0
	300	76.2	80.8	86.0	83.4
XH	200	50.8	57	68	62.5
	300	76.2	84	95	89.5
	400	101.6	111	122	116.5
XXH	200	50.8	57	68	62.5
	300	76.2	84	95	89.6
	400	101.6	111	122	116.5
	500	127.0	138	149	143.5

Surface treatment

Various surface treatments are available according to applications.

Type of Surface Treatment	Effect	Applicable Material
Electrogalvanizing	Rust prevention, decoration	Carbon steel
Blackening	Rust prevention, decoration	Carbon steel
Alumite	Rust prevention	Aluminum alloy
Hard alumite	Rust prevention, wear resistance	Aluminum alloy
Electroless nickel plating	Rust prevention, decoration	Carbon steel

Special tooth Shape

For timing belt engagement, a backlash is usually provided. However, for timing belt drive used for robots, electronic component assembling machines, NC machines, printers, plotters, etc. that require highly accurate rotation, pulleys having a special backlash-less tooth profile with minimal backlash to minimize rotating angle errors are also available. Please contact us.

Pulleys

Pulley Design

Coupling the pulley and shaft

(1) By use of key

A general method to secure the pulley based on the following bore-shaft fitting dimensional tolerances and keyway tolerances.

(2) By use of frictional force

A method to secure the pulley by use of a taper ring. A merit is that there is no looseness after securing. Tsubakimoto offers lock pulleys that utilize the frictional coupling system. When you want to study such pulleys, please contact us.

■Bore and shaft fitting dimensional tolerances (JIS B0401)

μm

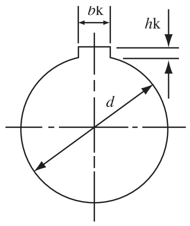
Dimension Range mm	Bore Dimensional Tolerance		Shaft Dimensional Tolerance	
	H7	H8	h7	h8
Over 3, up to and incl. 6	+12~0	+18~0	0~−12	0~−18
Over 6, up to and incl. 10	+15~0	+22~0	0~−15	0~−22
Over 10, up to and incl. 18	+18~0	+27~0	0~−18	0~−27
Over 18, up to and incl. 30	+21~0	+33~0	0~−21	0~−33
Over 30, up to and incl. 50	+25~0	+39~0	0~−25	0~−39
Over 50, up to and incl. 80	+30~0	+46~0	0~−30	0~−46
Over 80, up to and incl.120	+35~0	+54~0	0~−35	0~−54

●New JIS keys Js9 (Part name designation: J)

Bore Dia	Key	Keyway Height $d+h$	Keyway Dimensional Tolerance bk
Over 6, up to and incl. 8	2 × 2	$d+1.0$	2±0.0125
Over 8, up to and incl.10	3 × 3	$d+1.4$	3±0.0125
Over10, up to and incl.12	4 × 4	$d+1.8$	4±0.0150
Over12, up to and incl.17	5 × 5	$d+2.3$	5±0.0150
Over17, up to and incl.22	6 × 6	$d+2.8$	6±0.0150
Over22, up to and incl.30	8 × 7	$d+3.3$	8±0.0180
Over30, up to and incl.38	10 × 8	$d+3.3$	10±0.0180
Over38, up to and incl.44	12 × 8	$d+3.3$	12±0.0215
Over44, up to and incl.50	14 × 9	$d+3.8$	14±0.0215
Over50, up to and incl.58	16 × 10	$d+4.3$	16±0.0215
Over58, up to and incl.65	18 × 11	$d+4.4$	18±0.0215
Over65, up to and incl.75	20 × 12	$d+4.9$	20±0.0260
Over75, up to and incl.85	22 × 14	$d+5.4$	22±0.0260
Over85, up to and incl.95	25 × 14	$d+5.4$	25±0.0260

●Old JIS keys E9 (Part name designation: E)

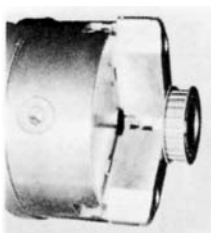
Bore Dia	Key	Keyway Height $d+h$	Keyway Dimensional Tolerance bk
Over10, up to and incl.13	4 × 4	$d+1.5$	$4^{+0.050}_{+0.020}$
Over13, up to and incl.20	5 × 5	$d+2.0$	$5^{+0.050}_{+0.020}$
Over20, up to and incl.30	7 × 7	$d+3.0$	$7^{+0.061}_{+0.025}$
Over30, up to and incl.40	10 × 8	$d+3.5$	$10^{+0.061}_{+0.025}$
Over40, up to and incl.50	12 × 8	$d+3.5$	$12^{+0.035}_{+0.032}$
Over50, up to and incl.60	15 × 10	$d+5.0$	$15^{+0.075}_{+0.032}$
Over60, up to and incl.70	18 × 12	$d+6.0$	$18^{+0.075}_{+0.032}$
Over70, up to and incl.80	20 × 13	$d+6.0$	$20^{+0.092}_{+0.040}$
Over80, up to and incl.95	24 × 16	$d+8.0$	$24^{+0.092}_{+0.040}$



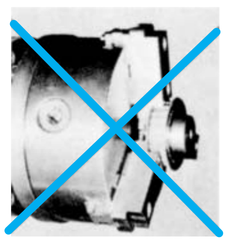
When you want us to make a keyway, please provided us with dimensions and tolerance. If no such information is given, the tolerances shown in the above tables are used.

Machining of bores of standard stock pulleys

When machining a bore of a timing pulley, the best method is to chuck the outside diameter of the tooth part. However, the Tsubaki standard pulleys other than the AF type have their concentricity between the outside diameter of the tooth part and the outside diameter of the hub machined accurately. For this reason, when machining a bore, a recommended method is to chuck the outside diameter of the hub. When machining DF type pulleys, the flange rotates. To prevent it from rotating, insert a screw in the tapped hole.



An example of chucking BF type

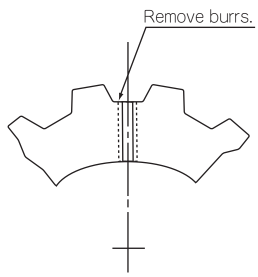


Never chuck flange part

Other additional machining

■Tapping

When tapping the bottom, remove burrs completely as they will damage the belt. (For pulleys with hub, tap the hub.)



Other additional machining

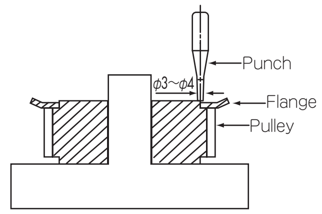
■Securing the flange

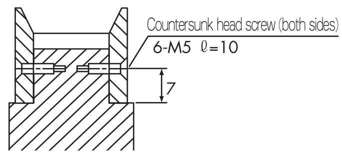
●Clinching

Normally, pressed flanges and turned flanges are secured by clinching using a punch as shown below.The number of places to clinch is as follows:

Addendum Circle Diameter mm	Up to and incl. 30	Over 30, up to and incl. 50	Over 50, up to and incl. 120	Over 120, up to and incl. 250
Number of places to clinch	4	8	12	16

Precautions:
- · Place a pulley on a flat table and clinch the flange using a punch.
- · When clinching a place opposite the hub, inset the hub to a cylindrical fixture placed on the table to ensure it is stable.





● Securing with screws

Turned flanges for the large number of teeth of P8M, P14M, XH and XXH may be secured to the pulley with countersunk head screws depending on applications. The number of screws shown in the following table is the minimum number.

Addendum Circle Diameter mm	Up to and incl. 120	Over 120, up to and incl. 250	Over 250, up to and incl. 450	Over 450, up to and incl. 650
Number of Screws	4	6	8	12

●Securing by knurling

Another method often used for securing is knurling created with a lathe.

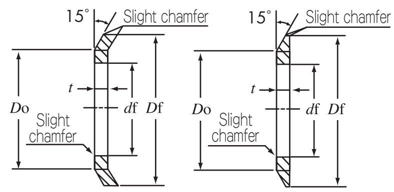
Guide flange

■General shape and standard dimensions

mm

Type (Pitch)	Thickness t Recommended Press	Thickness t Recommended Turning	Thickness t Normally used thickness	OD Df Minimum	ID df
P2M	1.0	1.6	1.0～1.6	Do+ 4	Do−5
P3M				Do+ 4.5	
P5M		2.0	1.0～2.0	Do+ 6.3	Do−8
P8M	1.6	2.5	1.6～2.5	Do+ 8	Do−10
P14M	–	4.0	4.0～5.0	Do+14	Do−20
MXL	1.0	1.6	1.0～1.6	Do+ 4	Do−5
XL				Do+ 6.4	
L	1.6	2.0	1.0～2.0		Do−8
H		2.5	1.6～2.5		Do−10
XH	–	4.0	4.0～5.0	Do+16.4	Do−38
XXH		6.0	5.0～6.0	Do+21.7	Do−45

Depending on standard flanges to use, the OD or ID may be different from those in the above table.



Press type **Turning type**

Pulleys

Pulley Design

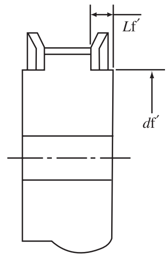
Guide flange

■Pulley dimensions when using a standard flange

●Dimensional tolerances of flange fitting part

mm

Fitting Part Dimension *df'*	Up to and incl. 25	Over 25, up to and incl. 50	Over 50 up to and incl. 100	Over 100 up to and incl. 180
Tolerance mm	−0.02 −0.05	−0.03 −0.07	−0.05 −0.10	−0.05 −0.15



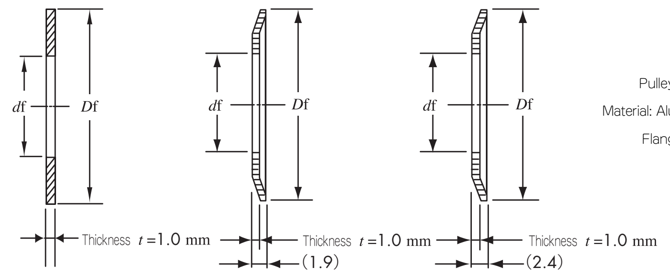
●Stepped part length

mm

Type (Pitch)	**P3M**	**P5M**	**P8M**	**P14M**
Stepped part length *Lf'* mm	2.0	2.2	2.6	5.0

Type (Pitch)	**MXL**	**XL**	**L**	**H**
Stepped part length *Lf'* mm	2.0	2.2	2.6	2.6

■Flange designation



AS type…Material: Aluminum **AF type…Material: Aluminum** **SF type…Material: SPCC**

An example of designation

PT A F 10 650 530

- PT: Pulley
- A: Material: Aluminum
- F: Flange type
- 10: Thickness *t*: 1.0 mm
- 650: Outside diameter *Df*: 65.0 mm
- 530: Inside diameter *df*: 53.0 mm

Unit mass of pulley materials

■Unit mass of pulley materials

g/cm³

Material	Unit Mass
Carbon steel for machine structural use (S35C)	7.85
Gray cast iron (FC200)	7.3
Aluminum (A2017−T4)	2.8
Stainless steel	7.8

Pulley Design

FLANGE DIMENSION

■Flange Dimension(Aluminum)

●Thickness t = 1.0 mm

Type	Dimension mm		Number of teeth				
	Outside (*Df*)	Inside (*df*)	P2M	P3M	P5M	MXL	XL
PTAS1011040	11	4	10、11、12	—	—	10、11、12	—
PTAS1012055	12	5.5	13、14	10	—	13、14	—
PTAS1013070	13	7	15、16	11	—	15、16	—
PTAS1015080	15	8	17、18、19	12、13	—	17、18、19	—
PTAS10170100	17	10	20~24	14、15、16	—	20~23	—
PTAS10210133	21	13.3	25、26、27	17、18	—	24~29	—
PTAS10250150	25	15	28、29	19~21	—	30~33	—
PTAF10230120	23	12	—	—	—	—	10
PTAF10230130	23	13	—	—	12	—	11
PTAF10260150	26	15	30、31	—	13	—	12
PTAF10280160	28	16	32~34	22、23	14	—	—
PTAF10290180	29	18	35、36	24	15	34~36	14
PTAF10310190	31	19	37~39	25、26	16	37	15
PTAF10320212	32	21.2	40~42	27、28	17	38~40	16
PTAF10340230	34	23	43、44	29、30	—	—	—
PTAF10360224	36	22.4	48	31、32	18、19、20	40~48	18
PTAF10390265	39	26.5	49、50	33、34	21	49、50	19、20
PTAF10430300	43	30	—	35~38	22、23	—	21、22
PTAF10440310	44	31	—	39	24	56	—
PTAF10450335	45	33.5	60	40、41	25	60	24
PTAF10470355	47	35.5	—	42	26	—	25
PTAF10480375	48	37.5	—	43、44	27	64	26
PTAF10520375	52	37.5	—	45、46	28	—	—
PTAF10520400	52	40	—	47、48	29	—	28
PTAF10550425	55	42.5	—	49、50	30、31、32	72	30
PTAF10580450	58	45	—	—	33	—	32
PTAF10610490	61	49	—	56	34、35	—	34
PTAF10650530	65	53	—	60	—	—	36

■Flange Dimension(SPCC)

●Thickness t = 1.0 mm

Type	Dimension mm		Number of teeth				
	Outside (*Df*)	Inside (*df*)	P2M	P3M	P5M	MXL	XL
PTSF10230120	23	12	—	—	—	22、23、24	10
PTSF10230130	23	13	—	—	12	25、26、27	11
PTSF10260150	26	15	29、30	—	13	28、29、30	12
PTSF10280160	28	16	31~34	22、23	14	31、32、33	—
PTSF10290180	29	18	35、36	24	15	34、35、36	14
PTSF10310190	31	19	37、38、39	25、26	16	37	15
PTSF10320212	32	21.2	40、41、42	27、28	17	38、39、40	16
PTSF10340230	34	23	43、44、45	29、30	18	—	—
PTSF10360224	36	22.4	48	31、32	18、19、20	41~47	18
PTSF10390265	39	26.5	49、50、51	33、34	21	48、49、50	19、20
PTSF10430300	43	30	52~57	35~38	22、23	51~55	21、22
PTSF10440310	44	31	58、59	39	24	56、57、58	—
PTSF10450335	45	33.5	60、61、62	40、41	25	59、60	24
PTSF10470355	47	35.5	63	42	26	61、62	25
PTSF10480375	48	37.5	64、65、66	43、44	27	63、64、65	26
PTSF10520375	52	37.5	67、68、69	45、46	28	—	—
PTSF10520400	52	40	70、71、72	47、48	29	66~70	28
PTSF10550425	55	42.5	73~77	49~52	30、31、32	71~76	30
PTSF10580450	58	45	78~82	53、54、55	33	77~81	32
PTSF10610490	61	49	83~87	56、57、58	34、35	82、83、84	34
PTSF10640500	64	50	88、89	59	36	85、86、87	—
PTSF10650530	65	53	90、91、92	60、61、62	37、38	88、89、90	36
PTSF10670560	67	56	93~98	63~66	39、40	91~96	37、38
PTSF10710600	71	60	99~103	67、68、69	41、42	97~101	40
PTSF10740630	74	63	104~107	70、71、72	43、44、45	102~105	42
PTSF10820670	82	67	110~120	74、80	46、47、48	108~116	44、45、46
PTSF10860710	86	71	121~126	81~85	49、50、51	117~123	47、48、49
PTSF101030850	103	85	—	—	56、59、60	—	—
PTSF1012001060	120	106	—	—	72	—	70

Pulleys

Pulley Design

FLANGE DIMENSION

●Thickness t = 1.6 mm

Type	Dimension mm		Number of teeth		
	Outside (*Df*)	Inside (*df*)	P8M	L	H
PTSF16360224	36	22.4	−	10	−
PTSF16430300	43	30	−	12	−
PTSF16490335	49	33.5	−	13、14	−
PTSF16520375	52	37.5	−	15	−
PTSF16550425	55	42.5	20	16	−
PTSF16568420	56.8	42	−	17	−
PTSF16610450	61	45	21	18	−
PTSF16620450	62	45	22	−	14
PTSF16660500	66	50	23、24	19	15
PTSF16670530	67	53	−	20	−
PTSF16700560	70	56	25	21	16
PTSF16730560	73	56	26	22	−
PTSF16790630	79	63	28	23、24	18
PTSF16820670	82	67	30	25	19
PTSF16860710	86	71	31、32、33	26	20
PTSF16910770	91	77	34	28	21
PTSF16940770	94	77	35	29	22
PTSF16970800	97	80	36	30	−
PTSF161030850	103	85	37、38	31、32	23、24
PTSF161070900	107	90	39、40	33	25
PTSF161110950	111	95	41、42	34	26
PTSF1611501020	115	102	43	36	−
PTSF1611901020	119	102	44、45	37	28
PTSF1612701120	127	112	46、47、48	39、40	30
PTSF1613501200	135	120	50、51	42	32
PTSF1613901250	139	125	52、53	43、44	33
PTSF1614301280	143	128	54	45	34
PTSF1615101370	151	137	57	47、48	36
PTSF1615801400	158	140	58、59、60	49、50	37、38
PTSF1616701520	167	152	63、64	52、53	40

Instruction Manual

Precautions

Precautions for handling timing belts

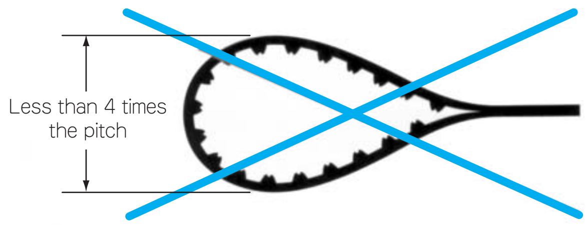
- ●The timing belts are flexible but stretch little and therefore cannot be set on a pulley by stretching it. If it is forced over the flange, a serious accident may result. Either shorten the center distance or keep the idler loose to set a timing belt.
- ●If the timing belt is to be used in a place where it is wetted by a large amount of water, protect the belt with a cover or other means.
- ●Use the timing belts in a clean environment in a temperature range of -15℃ to 80℃. If the belt is to be used in oily or dusty places, attach a cover to protect the belt.
- ●Do not use the timing belts in places where a large amount of oil or solution is used.

Precautions for handling timing pulleys

- ●Do not damage the tooth face of timing pulleys. A force is transmitted by a pressure angle between a timing belt and a pulley with the timing belt wound around the addendum circle of the pulley. For this reason, unlike other gears, the addendum circle plays a very important role in power transmission.

Storage of timing belts

- ●Do not curl timing belts at a small radius. The limit of curling is four times the pitch. If they are curled at a smaller radius, the core wires will be broken to result in a significant drop in the performance.



- ●A desirable place to store timing belts is a dry place at normal temperature. Do not store them in very hot, cold or humid places.

For other handling precautions, see “For safe use of timing belts and pulleys” (page 96) also.

Instruction Manual

Troubleshooting

Problem	Cause	Corrective Action
1.Premature breakage of belt	Overload	Check the inertia of the driven object, motor, conditions of use, etc.
	Shock load	Increase the belt size or install a shock damping mechanism.
	Bent belt	Exercise caution during belt transportation, storage and installation.
	Too small pulley diameter	Increase the number of pulley teeth above the allowable minimum number of teeth.
2.Wear of belt teeth	Overload	Modify the design.
	Too high installation tension	Adjust the installation tension.
	Incorrect pulley tooth profile or incorrect dimensions of the tooth part	Use a pulley having the correct tooth profile and dimensions.
	Use in dusty atmosphere	Improve the atmosphere or install a cover.
3.Belt tooth jumping	Shock load	Increase the belt size.
	Insufficient belt installation tension	Apply an adequate installation tension.
	Insufficient number of meshed teeth	Either increase the number of pulley teeth or increase the number of meshed teeth by using an idler.
	Insufficient rigidity of frame on which belt is used	Use a frame having sufficient rigidity.
4.Shear breakage of belt teeth	Ultimate symptom of Problems 2 and 3	Same action as for Problems 2 and 3.
5.Tear and wear of belt side face	Poor parallelism between shafts	Make the shafts parallel.
	Poor pulley alignment	Align the pulleys accurately.
	Insufficient rigidity of frame on which belt is used	Use a frame having sufficient rigidity.
	Bent flange	Replace the bent flange with a good one or remedy the bent flange.
6.Longitudinal scratches on belt tooth surface	Belt running on edges of pulley	Align the pulleys and make the shafts parallel.
	Belt running on flange	Apply an adequate installation tension.
7.Partial cut of belt	Stuck foreign matter	Improve environment or install a cover.
	Belt running on flange	Apply an adequate belt installation tension and make the shafts parallel accurately.
8.Shrinkage of belt	Swelling due to oil	Either improve environment so that the belt is not wetted by oil or install a cover.
9.Apparent elongation of belt	Approaching shafts due to movement of shafts	Secure the bearing rigidly. If shock is strong, use a stopper to prevent the bearing from moving.
10.Sticky or softened rubber on back of belt	Slipping of back pushing idler	Apply an adequate installation tension. Reduce the inertia of the idler.
	Adhesion of oil	Either improve environment so that the belt is not wetted by oil or install a cover.
	Use in high temperature atmosphere	Lower the atmosphere temperature.
11.Wear of rubber on back of belt	Poor parallelism of back pushing idler shaft	Make the idler shaft parallel.
	Poor rotation of back pushing idler	Improve idler rotation.
12.Crack on rubber on back of belt	Too small pulley diameter	Increase the pulley diameter.
	Use in low temperature atmosphere	Optimize atmosphere temperature.
13.Wear of pulley teeth	Inadequate pulley material	Impart wear resistance to the pulley by using harder material, hardening the tooth surface or surface treatment.
	Use in dusty atmosphere	Improve the atmosphere or install a cover.
14.Noise	Too high installation tension	Apply an adequate installation tension.
	Overload	Increase the belt size.
	Poor shaft parallelism or poor pulley alignment	Make the shafts parallel and align the pulleys.

Instruction Manual

Timing Belt Safety Use

In order to ensure correct handling of the products, please make sure to read the belt catalog and instructions thoroughly upon use paying close attention to the items below, which have been classified according to the degree of influence on safety.

Terms	Definition
⚠ Danger	When it is assumed that death or serious personal injury is imminent as a result of incorrect handling.
⚠ Warning	When it is assumed that death or serious personal injury is possible as a result of incorrect handling.
⚠ Caution	When it is assumed that there is a risk of personal injury and/or material damage as a result of incorrect handling.

■Applications and Objectives of Use

⚠ Danger	When it is foreseen that idling and equipment stoppage caused by cutting of the belt will lead to an accident resulting in death or serious personal injury, make sure to install a safety device.
⚠ Danger	Do not use the belt as a harness or tow rope.
⚠ Warning	When it is foreseen that static electricity generated by operation of the belt may lead to the mistaken use of a fire extinguisher, please install a static electricity prevention device in the equipment.
⚠ Caution	Do not use the belt as an insulator. Since insulating properties vary depending on the type of belt, please consult Tsubaki.
⚠ Caution	When the belt comes into direct contact with food, make sure to use a belt which complies with the Food Sanitation Law.
⚠ Caution	Do not carry out additional processin gon the belt. Quality and perfomance of the belt is likely to deteriorate as a result.

■Function and Performance

⚠ Caution	Do not use the belt in any way other than indicated in each belt catalog, design data, etc. or outside the tolerance levels. Premature breakage of the belt may occur.
⚠ Caution	Adhesion of water, oil, chemicals, paint, dust, etc. to the pulley or belt will result in deterioration of transmission power and possibly cause premature breakage.
⚠ Caution	Noise may become large during high-speed operation of the belt. In this case, please install a sound insulation cover.

■Storage and Transportation

⚠ Caution	When tansporting or handling heavy belts and pulleys, make sure to use transportation equipment/apparatuses, etc. suitable for the weight involved.
⚠ Caution	Do not forcefully bend or place heavy items on the belt during transportation or storage, as this will result in creasing/damage and cause premature breakage of the belt.
⚠ Caution	Keep the belt stored at a temperature range of -10℃ to +40℃ in a low humidity place.

■Installation and Mobility

⚠ Danger	Make sure to install a safety cover over all rotating parts including the belt and pulley. There is a possibility of hair, gloves, clothes, etc. getting caught in the belt and pulley. Moreover, breakage of the belt or pulley may cause an injury from flying fragments.
⚠ Danger	Abide by the following during maintenance, inspection or replacement of the belt and pulley. (1) Make sure to disconnect the power and wait for the belt and pulley to stop completely before starting. (2) Where there is a possibility of the machine starting from removal of the belt, secure the machine in advance before starting work. (3) Ensure that the power can not be switched on accidentally.
⚠ Caution	When replacing the belt or pulley, ensure that the same type is used. Replacement with a different type may lead to premature breakage.
⚠ Caution	Deviation in the pulley alignment will cause premature breakage or flange omission. Please carry out adjustments as required.
⚠ Caution	Loosen the belt tension when replaceing it. Do not force the belt over the flange of the pulley by using a screwdriver or similar implement, as this will cause premature breakage of the belt.
⚠ Caution	When installing the belt, make sure to use proper tension as indicated in the catalog and design data. Impropre tension may result in premature breakage of the belt and shaft.
⚠ Caution	Carry out the following when additional processing on the pulley is required before use : (1) Remove burrs and sharp corners ; (2) Check precision of dimensions after processing ; (3) Check strength of pulley after processing.
⚠ Caution	When attaching the flange to the pulley, make sure no foreign particles exist between the pulley and flange, and secure them to prevent rattling in the flange by calking. Unsuitable fitting will cause the flange to come off.

■Inspection

⚠ Caution	Carry out regular inspections of the belt and pulley, and replace them when you notice anything out of the ordinary.

■Handling of Used Items

⚠ Caution	Do not burn the belt. Harmful gasses may be generated.

Center Distance Coefficient Table

The “center distance coefficient table” lists coefficients to express the relationship between the belt length, the number of teeth and the center distance. It is used for obtaining the belt length or the center distance.

Configuration

This table is configured as shown below:

	Number of teeth of belt − number of teeth of small pulley ($Lp-N_1$)
Number of teeth of large pulley − number of teeth of small pulley (N_2-N_1)	Cp A value obtained by dividing the center distance by the pitch.

How to use

■When the number of teeth of large pulley, the number of teeth of small pulley and the belt length (number of teeth) are known and to obtain the center distance:

① Calculate ($Lp-N_1$) and (N_2-N_1).

② Find a value of ($Lp-N_1$) on the horizontal axis in the table.

③ Obtain a value at the point of intersection of the values of ($Lp-N_1$) and (N_2-N_1). (=Cp)

④ Multiply Cp by the belt pitch to obtain the center distance.

<An example of calculation>

Belt type : P5M

Number of teeth of belt (Lp) : 70

Number of teeth of large pulley (N_2) : 30

Number of teeth of small pulley (N_1) : 20

① $Lp-N_1=50$

$N_2-N_1=10$

② From $Lp-N_1=50$, find a value of 50 on the horizontal axis in the table.

③ Obtain a value at the point of intersection of ($Lp-N_1$) and (N_2-N_1).

Cp=22.444

④ Multiply Cp by the belt pitch to obtain the center distance.

$22.444\times5=$ 112.22 mm

N_2-N_1	Lp-N₁ 37	38	48	49	50	51
1	18.250			24.250	24.750	25.250
2	17.998			23.998	24.498	24.998
3	17.744			23.746	24.246	24.746
9	16.187	16.689	21.703	22.204	22.705	23.206
10	15.921	16.423	21.441	21.943	22.444	22.945
11	15.652	16.156	21.178	21.680	22.181	22.683

■When the number of teeth of large pulley, the number of teeth of small pulley and the center distance are known and to obtain the belt length (number of teeth):

① Express the center distance by the pitch.

② Calculate (N_2-N_1).

③ Find a value of (N_2-N_1) on the vertical axis and go to the right on that line to find a value which is close to the value obtained in ①.

④ Go up from the value of ③ to obtain a value of $Lp-N_1$.

⑤ From the value obtained in ④, calculate the number of teeth of belt (Lp) to obtain the belt length.

⑥ Obtain the exact center distance. L=Cp×pitch

<An example of calculation>

Belt type : P8M (Belt pitch 8 mm)

Center distance : Approx. 415 mm

Number of teeth of large pulley (N_2) : 44

Number of teeth of large pulley (N_1) : 28

① $Cp=415\div8=51.875$

② $N_2-N_1=16$

③ Locate “$N_2-N_1=16$” on the vertical axis in the table and go to the right on that line to find a value which is close to 51.875. →Cp=51.938

④ Go up from 51.938 to find $Lp-N_1=112$

⑤ From $Lp-N_1=112$,

$Lp=112+N_1=112+28=140$

Number of teeth of belt used : 140

Belt length : 1120 mm (140×8)

⑥ L=Cp×pitch =51.938×8= 415.5 mm

N_2-N_1	Lp-N₁ 112	113	114	115	116	117
1	55.750	56.250	56.750	57.250	57.570	58.250
2	55.500	56.000	56.500	57.000	57.500	58.000
3	55.248	55.748	56.248	56.748	57.248	57.748
14	52.453	52.954	53.454	53.954	54.455	54.955
15	52.196	52.696	53.197	53.697	54.198	54.698
16	51.938	52.439	52.939	53.440	53.940	54.441
17	51.680	52.180	52.681	53.182	53.682	54.183
18	51.421	51.921	52.422	52.923	53.424	53.924

Equal speed

When the speed is equal ($N_2=N_1$), use the following equation:

■When the number of teeth of pulley and the belt length (number of teeth) are known and to obtain the center distance:

$$\text{Center distance mm} = \frac{\text{Belt length} - \text{number of teeth of pulley} \times \text{pitch}}{2}$$

■When the number of teeth of pulley and the center distance are known and to obtain the belt length (number of teeth):

Belt length = Center distance×2+number of teeth of pulley×pitch

Number of teeth of belt = Belt length/pitch

Center Distance Coefficient Table

N2-N1	Lp-N1														
	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	3.247	3.747	4.248	4.748	5.248	5.748	6.248	6.749	7.249	7.749	8.249	8.749	9.249	9.749	10.249
2		3.486	3.988	4.489	4.990	5.491	5.992	6.493	6.993	7.494	7.994	8.495	8.995	9.495	9.995
3			3.720	4.223	4.726	5.229	5.731	6.232	6.734	7.235	7.736	8.237	8.737	9.238	9.739
4				3.949	4.455	4.960	5.463	5.966	6.469	6.971	7.473	7.975	8.477	8.978	9.479
5					4.174	4.682	5.189	5.694	6.199	6.703	7.206	7.709	8.212	8.714	9.216
6						4.396	4.907	5.416	5.923	6.429	6.934	7.439	7.943	8.446	8.949
7							4.615	5.128	5.640	6.149	6.657	7.164	7.669	8.174	8.679
8							4.311	4.831	5.348	5.861	6.372	6.882	7.391	7.898	8.404
9								4.521	5.045	5.565	6.080	6.594	7.106	7.615	8.124
10									4.730	5.257	5.779	6.298	6.814	7.327	7.838
11										4.936	5.467	5.993	6.514	7.031	7.546
12											5.141	5.676	6.204	6.728	7.247
13												5.345	5.883	6.414	6.940
14													5.547	6.088	6.622
15														5.747	6.292
16															5.946

N2-N1	Lp-N1														
	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1	10.749	11.249	11.749	12.249	12.749	13.250	13.750	14.250	14.750	15.250	15.750	16.250	16.750	17.250	17.750
2	10.496	10.998	11.496	11.996	12.496	12.997	13.497	13.997	14.497	14.997	15.497	15.997	16.497	16.997	17.498
3	10.239	10.740	11.240	11.741	12.241	12.742	13.242	13.742	14.242	14.743	15.243	15.743	16.243	16.744	17.244
4	9.980	10.481	10.982	11.483	11.984	12.484	12.985	13.485	13.986	14.486	14.987	15.487	15.988	16.488	16.989
5	9.718	10.219	10.721	11.222	11.723	12.225	12.726	13.227	13.727	14.228	14.729	15.230	15.730	16.231	16.731
6	9.452	9.955	10.457	10.959	11.461	11.962	12.464	12.965	13.467	13.968	14.469	14.970	15.471	15.972	16.473
7	9.183	9.686	10.190	10.692	11.195	11.697	12.200	12.702	13.203	13.705	14.207	14.708	15.210	15.711	16.212
8	8.909	9.414	9.919	10.423	10.926	11.429	11.932	12.435	12.938	13.440	13.942	14.444	14.946	15.448	15.950
9	8.631	9.138	9.644	10.149	10.654	11.158	11.662	12.166	12.669	13.173	13.675	14.178	14.681	15.183	15.685
10	8.348	8.857	9.365	9.872	10.378	10.884	11.389	11.894	12.398	12.902	13.406	13.909	14.413	14.916	15.418
11	8.060	8.571	9.081	9.590	10.098	10.606	11.112	11.618	12.124	12.629	13.134	13.638	14.142	14.646	15.149
12	7.764	8.279	8.792	9.304	9.814	10.323	10.832	11.339	11.846	12.353	12.858	13.364	13.869	14.373	14.878
13	7.462	7.981	8.497	9.012	9.525	10.036	10.547	11.056	11.565	12.073	12.580	13.087	13.593	14.098	14.604
14	7.150	7.675	8.196	8.714	9.230	9.745	10.258	10.769	11.280	11.789	12.298	12.806	13.314	13.820	14.327
15	6.829	7.360	7.886	8.409	8.929	9.447	9.963	10.477	10.990	11.502	12.012	12.522	13.031	13.539	14.047
16	6.495	7.034	7.568	8.097	8.622	9.144	9.663	10.180	10.696	11.210	11.723	12.234	12.745	13.255	13.764
17	6.145	6.696	7.239	7.775	8.306	8.833	9.356	9.878	10.396	10.913	11.429	11.943	12.455	12.967	13.478
18		6.342	6.896	7.442	7.981	8.514	9.043	9.568	10.091	10.611	11.130	11.646	12.161	12.675	13.188
19			6.537	7.095	7.644	8.185	8.720	9.251	9.779	10.303	10.825	11.345	11.863	12.379	12.894
20				6.732	7.294	7.845	8.388	8.926	9.459	9.988	10.515	11.038	11.559	12.079	12.596
21				6.348	6.927	7.491	8.045	8.591	9.131	9.666	10.198	10.725	11.250	11.773	12.293
22					6.538	7.120	7.688	8.245	8.793	9.335	9.873	10.406	10.935	11.461	11.985
23						6.727	7.313	7.884	8.443	8.994	9.539	10.078	10.613	11.144	11.672
24							6.915	7.505	8.079	8.641	9.195	9.742	10.282	10.819	11.352
25								7.103	7.697	8.273	8.839	9.395	9.943	10.486	11.024
26									7.291	7.887	8.468	9.035	9.593	10.144	10.689
27										7.477	8.078	8.661	9.231	9.791	10.344
28											7.664	8.267	8.853	9.426	9.989
29												7.850	8.456	9.045	9.620
30													8.035	8.645	9.236
31														8.219	8.833
32															8.404

Center Distance Coefficient Table

N2-N1	Lp-N1														
	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
1	18.250	18.750	19.250	19.750	20.250	20.750	21.250	21.750	22.250	22.750	23.250	23.750	24.250	24.750	25.250
2	17.998	18.498	18.998	19.498	19.998	20.498	20.998	21.498	21.998	22.498	22.998	23.498	23.998	24.498	24.998
3	17.744	18.244	18.744	19.245	19.745	20.245	20.745	21.245	21.745	22.245	22.745	23.246	23.746	24.246	24.746
4	17.489	17.989	18.489	18.990	19.490	19.990	20.491	20.991	21.491	21.991	22.491	22.992	23.492	23.992	24.492
5	17.232	17.733	18.233	18.734	19.234	19.734	20.235	20.735	21.236	21.736	22.236	22.737	23.237	23.737	24.237
6	16.974	17.474	17.975	18.476	18.976	19.477	19.978	20.478	20.979	21.479	21.980	22.480	22.981	23.481	23.981
7	16.713	17.214	17.715	18.216	18.717	19.218	19.719	20.220	20.721	21.221	21.722	22.223	22.723	23.224	23.724
8	16.451	16.953	17.454	17.955	18.457	18.958	19.459	19.960	20.461	20.962	21.463	21.964	22.464	22.965	23.466
9	16.187	16.689	17.191	17.692	18.194	18.696	19.197	19.698	20.200	20.701	21.202	21.703	22.204	22.705	23.206
10	15.921	16.423	16.926	17.428	17.930	18.432	18.934	19.435	19.937	20.438	20.940	21.441	21.943	22.444	22.945
11	15.652	16.156	16.658	17.161	17.664	18.166	18.668	19.170	19.673	20.174	20.676	21.178	21.680	22.181	22.683
12	15.382	15.886	16.389	16.892	17.396	17.898	18.401	18.904	19.406	19.909	20.411	20.913	21.415	21.917	22.419
13	15.109	15.613	16.117	16.622	17.125	17.629	18.132	18.635	19.139	19.641	20.144	20.647	21.149	21.652	22.154
14	14.833	15.338	15.844	16.348	16.853	17.357	17.861	18.365	18.869	19.372	19.875	20.379	20.881	21.384	21.887
15	14.554	15.061	15.567	16.073	16.578	17.083	17.588	18.093	18.597	19.101	19.605	20.109	20.612	21.115	21.618
16	14.273	14.781	15.288	15.795	16.301	16.807	17.313	17.818	18.323	18.828	19.333	19.837	20.341	20.845	21.348
17	13.988	14.497	15.006	15.514	16.021	16.529	17.035	17.541	18.047	18.553	19.058	19.563	20.068	20.572	21.077
18	13.700	14.211	14.721	15.230	15.739	16.247	16.755	17.262	17.769	18.275	18.782	19.287	19.793	20.298	20.803
19	13.408	13.921	14.433	14.943	15.454	15.963	16.472	16.980	17.488	17.996	18.503	19.009	19.516	20.022	20.527
20	13.112	13.627	14.141	14.653	15.165	15.676	16.186	16.696	17.205	17.714	18.222	18.729	19.236	19.743	20.250
21	12.812	13.329	13.845	14.360	14.873	15.386	15.898	16.409	16.919	17.429	17.938	18.447	18.955	19.463	19.970
22	12.507	13.027	13.545	14.062	14.578	15.092	15.606	16.119	16.630	17.142	17.652	18.162	18.671	19.180	19.688
23	12.197	12.720	13.241	13.761	14.279	14.795	15.311	15.825	16.339	16.851	17.363	17.874	18.385	18.895	19.404
24	11.881	12.408	12.932	13.455	13.975	14.494	15.012	15.528	16.044	16.558	17.071	17.584	18.096	18.607	19.118
25	11.559	12.090	12.618	13.143	13.667	14.189	14.709	15.228	15.745	16.261	16.776	17.291	17.804	18.317	18.828
26	11.229	11.765	12.297	12.827	13.354	13.879	14.402	14.923	15.443	15.961	16.478	16.994	17.509	18.023	18.537
27	10.891	11.433	11.971	12.505	13.036	13.564	14.090	14.614	15.136	15.657	16.176	16.694	17.211	17.727	18.242
28	10.544	11.093	11.636	12.175	12.711	13.243	13.773	14.300	14.826	15.349	15.871	16.391	16.910	17.428	17.944
29	10.186	10.743	11.293	11.839	12.380	12.917	13.451	13.981	14.510	15.036	15.561	16.084	16.605	17.125	17.643
30	9.814	10.382	10.941	11.494	12.041	12.583	13.122	13.657	14.189	14.719	15.247	15.772	16.296	16.818	17.339
31	9.427	10.008	10.577	11.139	11.693	12.242	12.786	13.326	13.863	14.396	14.927	15.456	15.983	16.507	17.031
32	9.020	9.617	10.200	10.772	11.336	11.892	12.443	12.989	13.530	14.068	14.603	15.135	15.665	16.193	16.719
33	8.587	9.207	9.807	10.392	10.966	11.532	12.090	12.642	13.190	13.733	14.273	14.809	15.342	15.873	16.402
34		8.770	9.393	9.996	10.584	11.160	11.728	12.288	12.842	13.392	13.936	14.477	15.014	15.549	16.081
35			8.953	9.579	10.185	10.775	11.354	11.923	12.485	13.042	13.592	14.138	14.680	15.219	15.755
36				9.136	9.765	10.373	10.966	11.547	12.118	12.683	13.240	13.792	14.340	14.883	15.423
37					9.318	9.950	10.561	11.156	11.739	12.313	12.879	13.438	13.992	14.541	15.086
38						9.500	10.135	10.749	11.346	11.932	12.508	13.075	13.636	14.191	14.741
39							9.682	10.320	10.936	11.536	12.124	12.701	13.270	13.833	14.390
40								9.863	10.504	11.123	11.725	12.315	12.894	13.465	14.030
41									10.044	10.688	11.310	11.914	12.506	13.087	13.660
42										10.255	10.872	11.496	12.102	12.696	13.279
43											10.406	11.055	11.681	12.290	12.886
44												10.586	11.238	11.867	12.478
45													10.765	11.420	12.052
46														10.945	11.603
47															11.124
48															
49															
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56															
57															
58															
59															
60															

Center Distance Coefficient Table

N2-N1	Lp-N1														
	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
1	25.750	26.250	26.750	27.250	27.750	28.250	28.750	29.250	29.750	30.250	30.750	31.250	31.750	32.250	32.750
2	25.498	25.999	26.499	26.999	27.499	27.999	28.499	28.999	29.499	29.999	30.499	30.999	31.499	31.999	32.499
3	25.246	25.746	26.246	26.746	27.246	27.746	28.246	28.746	29.247	29.747	30.247	30.747	31.247	31.747	32.247
4	24.992	25.493	25.993	26.493	26.993	27.493	27.993	28.493	28.993	29.494	29.994	30.494	30.994	31.494	31.994
5	24.738	25.238	25.738	26.238	26.739	27.239	27.739	28.239	28.739	29.240	29.740	30.240	30.740	31.240	31.740
6	24.482	24.982	25.483	25.983	26.483	26.984	27.484	27.984	28.484	28.985	29.485	29.985	30.486	30.986	31.486
7	24.225	24.725	25.226	25.726	26.227	26.727	27.228	27.728	28.228	28.729	29.229	29.730	30.230	30.730	31.231
8	23.967	24.467	24.968	25.469	25.969	26.470	26.970	27.471	27.971	28.472	28.972	29.473	29.973	30.474	30.974
9	23.707	24.208	24.709	25.210	25.711	26.211	26.712	27.213	27.713	28.214	28.715	29.215	29.716	30.217	30.717
10	23.446	23.948	24.449	24.950	25.451	25.952	26.453	26.953	27.454	27.955	28.456	28.957	29.457	29.958	30.459
11	23.184	23.686	24.187	24.688	25.190	25.691	26.192	26.693	27.194	27.695	28.196	28.697	29.198	29.699	30.200
12	22.921	23.423	23.924	24.426	24.927	25.429	25.930	26.431	26.933	27.434	27.935	28.436	28.937	29.438	29.940
13	22.656	23.158	23.660	24.162	24.664	25.165	25.667	26.169	26.670	27.172	27.673	28.174	28.676	29.177	29.678
14	22.389	22.892	23.394	23.896	24.399	24.901	25.403	25.905	26.406	26.908	27.410	27.911	28.413	28.915	29.416
15	22.122	22.624	23.127	23.630	24.132	24.635	25.137	25.639	26.141	26.643	27.145	27.647	28.149	28.651	29.153
16	21.852	22.355	22.858	23.362	23.864	24.367	24.870	25.373	25.875	26.377	26.880	27.382	27.884	28.386	28.888
17	21.581	22.085	22.588	23.092	23.595	24.098	24.602	25.105	25.607	26.110	26.613	27.115	27.618	28.120	28.622
18	21.308	21.812	22.316	22.820	23.324	23.828	24.332	24.835	25.338	25.842	26.345	26.847	27.350	27.853	28.356
19	21.033	21.538	22.043	22.547	23.052	23.556	24.060	24.564	25.068	25.571	26.075	26.578	27.081	27.585	28.088
20	20.756	21.262	21.767	22.273	22.778	23.283	23.787	24.292	24.796	25.300	25.804	26.308	26.811	27.315	27.818
21	20.477	20.984	21.490	21.996	22.502	23.007	23.512	24.018	24.522	25.027	25.531	26.036	26.540	27.044	27.547
22	20.196	20.704	21.211	21.718	22.224	22.730	23.236	23.742	24.247	24.752	25.257	25.762	26.267	26.771	27.275
23	19.913	20.421	20.930	21.437	21.944	22.451	22.958	23.464	23.970	24.476	24.982	25.487	25.992	26.497	27.002
24	19.628	20.137	20.646	21.155	21.663	22.171	22.678	23.185	23.692	24.198	24.705	25.211	25.716	26.222	26.727
25	19.340	19.850	20.360	20.870	21.379	21.888	22.396	22.904	23.412	23.919	24.426	24.932	25.439	25.945	26.451
26	19.049	19.561	20.072	20.583	21.093	21.603	22.112	22.621	23.129	23.637	24.145	24.652	25.159	25.666	26.173
27	18.756	19.269	19.782	20.294	20.805	21.316	21.826	22.336	22.845	23.354	23.862	24.371	24.878	25.386	25.893
28	18.460	18.975	19.489	20.002	20.514	21.026	21.538	22.049	22.559	23.069	23.578	24.087	24.596	25.104	25.612
29	18.161	18.677	19.193	19.707	20.221	20.735	21.247	21.759	22.270	22.781	23.292	23.802	24.311	24.820	25.329
30	17.858	18.377	18.894	19.410	19.926	20.440	20.954	21.467	21.980	22.492	23.003	23.514	24.024	24.534	25.044
31	17.552	18.073	18.592	19.110	19.627	20.143	20.658	21.173	21.687	22.200	22.712	23.224	23.736	24.247	24.757
32	17.243	17.765	18.287	18.807	19.325	19.843	20.360	20.876	21.391	21.906	22.419	22.933	23.445	23.957	24.468
33	16.929	17.454	17.978	18.500	19.021	19.540	20.059	20.576	21.093	21.609	22.124	22.638	23.152	23.665	24.178
34	16.611	17.139	17.665	18.189	18.712	19.234	19.755	20.274	20.792	21.310	21.826	22.342	22.857	23.371	23.885
35	16.288	16.819	17.348	17.875	18.401	18.925	19.447	19.968	20.488	21.007	21.526	22.043	22.559	23.075	23.590
36	15.961	16.495	17.027	17.557	18.085	18.611	19.136	19.659	20.182	20.702	21.222	21.741	22.259	22.776	23.292
37	15.627	16.166	16.701	17.234	17.765	18.294	18.821	19.347	19.871	20.394	20.916	21.436	21.956	22.474	22.992
38	15.288	15.830	16.370	16.907	17.441	17.973	18.503	19.031	19.558	20.083	20.606	21.129	21.650	22.170	22.690
39	14.942	15.489	16.033	16.574	17.112	17.647	18.180	18.711	19.240	19.768	20.294	20.818	21.341	21.863	22.384
40	14.588	15.141	15.690	16.236	16.777	17.316	17.853	18.387	18.919	19.449	19.977	20.504	21.029	21.553	22.076
41	14.226	14.786	15.340	15.891	16.437	16.980	17.521	18.058	18.593	19.126	19.657	20.186	20.714	21.240	21.765
42	13.854	14.422	14.983	15.539	16.091	16.639	17.183	17.724	18.263	18.799	19.333	19.865	20.395	20.923	21.450
43	13.471	14.048	14.617	15.180	15.737	16.291	16.840	17.385	17.928	18.467	19.004	19.539	20.072	20.603	21.132
44	13.076	13.663	14.241	14.812	15.376	15.935	16.490	17.040	17.587	18.130	18.671	19.209	19.745	20.279	20.811
45	12.665	13.265	13.854	14.434	15.006	15.572	16.133	16.689	17.240	17.788	18.333	18.875	19.414	19.951	20.485
46	12.237	12.852	13.454	14.045	14.627	15.201	15.768	16.330	16.887	17.440	17.989	18.535	19.078	19.618	20.156
47	11.784	12.420	13.039	13.642	14.235	14.818	15.394	15.963	16.527	17.085	17.639	18.189	18.736	19.280	19.821
48	11.303	11.966	12.605	13.225	13.831	14.425	15.010	15.587	16.158	16.723	17.283	17.838	18.390	18.938	19.482
49		11.482	12.148	12.789	13.411	14.019	14.615	15.202	15.781	16.353	16.919	17.480	18.037	18.589	19.138
50			11.660	12.329	12.972	13.597	14.207	14.805	15.394	15.974	16.547	17.115	17.677	18.235	18.788
51			11.131	11.839	12.510	13.155	13.782	14.394	14.994	15.584	16.166	16.741	17.310	17.874	18.432
52				11.307	12.017	12.691	13.339	13.967	14.582	15.183	15.775	16.358	16.935	17.505	18.070
53					11.482	12.195	12.871	13.521	14.153	14.768	15.372	15.965	16.550	17.128	17.699
54						11.656	12.372	13.051	13.704	14.337	14.955	15.560	16.155	16.742	17.321
55							11.831	12.550	13.232	13.887	14.522	15.141	15.748	16.345	16.933
56								12.006	12.728	13.412	14.069	14.706	15.327	15.936	16.534
57									12.180	12.905	13.591	14.251	14.890	15.513	16.123
58										12.355	13.082	13.771	14.432	15.073	15.699
59											12.529	13.259	13.950	14.614	15.257
60												12.702	13.435	14.129	14.795

Center Distance Coefficient Table

N2-N1	Lp-N1														
	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81
1	33.250	33.750	34.250	34.750	35.250	35.750	36.250	36.750	37.250	37.750	38.250	38.750	39.250	39.750	40.250
2	32.999	33.499	33.999	34.499	34.999	35.499	35.999	36.499	36.999	37.499	37.999	38.499	38.999	39.499	39.999
3	32.747	33.247	33.747	34.247	34.747	35.247	35.747	36.247	36.747	37.247	37.747	38.247	38.748	39.248	39.748
4	32.494	32.994	33.494	33.994	34.495	34.995	35.495	35.995	36.495	36.995	37.495	37.995	38.495	38.995	39.495
5	32.241	32.741	33.241	33.741	34.241	34.741	35.241	35.742	36.242	36.742	37.242	37.742	38.242	38.742	39.242
6	31.986	32.486	32.987	33.487	33.987	34.487	34.987	35.488	35.988	36.488	36.988	37.488	37.988	38.489	38.989
7	31.731	32.231	32.732	33.232	33.732	34.232	34.733	35.233	35.733	36.233	36.734	37.234	37.734	38.234	38.734
8	31.475	31.975	32.475	32.976	33.476	33.977	34.477	34.977	35.478	35.978	36.478	36.979	37.479	37.979	38.479
9	31.218	31.718	32.219	32.719	33.220	33.720	34.220	34.721	35.221	35.722	36.222	36.723	37.223	37.723	38.224
10	30.960	31.460	31.961	32.461	32.962	33.463	33.963	34.464	34.964	35.465	35.965	36.466	36.966	37.467	37.967
11	30.701	31.201	31.702	32.203	32.704	33.204	33.705	34.206	34.706	35.207	35.708	36.208	36.709	37.209	37.710
12	30.441	30.941	31.442	31.943	32.444	32.945	33.446	33.947	34.448	35.948	35.449	35.950	36.450	36.951	37.452
13	30.179	30.681	31.182	31.683	32.184	32.685	33.186	33.687	34.188	34.689	35.190	35.690	36.191	36.692	37.193
14	29.917	30.419	30.920	31.421	31.923	32.424	32.925	33.426	33.927	34.428	34.929	35.430	35.931	36.432	36.933
15	29.654	30.156	30.657	31.159	31.660	32.162	32.663	33.165	33.666	34.167	34.668	35.169	35.671	36.172	36.673
16	29.390	29.892	30.394	30.895	31.397	31.899	32.400	32.902	33.403	33.905	34.406	34.908	35.409	35.910	36.411
17	29.125	29.627	30.129	30.631	31.133	31.635	32.136	32.638	33.140	33.642	34.143	34.645	35.146	35.648	36.149
18	28.858	29.361	29.863	30.365	30.867	31.370	31.872	32.374	32.876	33.377	33.879	34.381	34.883	35.384	35.886
19	28.590	29.093	29.596	30.098	30.601	31.103	31.606	32.108	32.610	33.112	33.614	34.116	34.618	35.120	35.622
20	28.321	28.825	29.328	29.830	30.333	30.836	31.339	31.841	32.344	32.846	33.348	33.851	34.353	34.855	35.357
21	28.051	28.555	29.058	29.561	30.064	30.568	31.071	31.573	32.076	32.579	33.081	33.584	34.086	34.589	35.091
22	27.779	28.283	28.787	29.291	29.794	30.298	30.801	31.304	31.808	32.311	32.813	33.316	33.819	34.322	34.824
23	27.507	28.011	28.515	29.019	29.523	30.027	30.531	31.034	31.538	32.041	32.544	33.048	33.551	34.054	34.556
24	27.232	27.737	28.242	28.746	29.251	29.755	30.259	30.763	31.267	31.771	32.274	32.778	33.281	33.784	34.287
25	26.956	27.462	27.967	28.472	28.977	29.482	29.986	30.490	30.995	31.499	32.003	32.507	33.010	33.514	34.017
26	26.679	27.185	27.691	28.196	28.702	29.207	29.712	30.217	30.721	31.226	31.730	32.234	32.739	33.243	33.746
27	26.400	26.907	27.413	27.919	28.425	28.931	29.436	29.942	30.447	30.952	31.456	31.961	32.466	32.970	33.474
28	26.119	26.627	27.134	27.640	28.147	28.653	29.159	29.665	30.171	30.676	31.181	31.687	32.191	32.696	33.201
29	25.837	26.345	26.853	27.360	27.867	28.374	28.881	29.387	29.893	30.399	30.905	31.411	31.916	32.421	32.926
30	25.553	26.062	26.570	27.078	27.586	28.094	28.601	29.108	29.615	30.121	30.628	31.134	31.639	32.145	32.651
31	25.267	25.777	26.286	26.795	27.303	27.812	28.320	28.827	29.335	29.842	30.349	30.855	31.362	31.868	32.374
32	24.979	25.490	26.000	26.510	27.019	27.528	28.037	28.545	29.053	29.561	30.068	30.575	31.082	31.589	32.096
33	24.690	25.201	25.713	26.223	26.733	27.243	27.752	28.261	28.770	29.278	29.786	30.294	30.802	31.309	31.816
34	24.398	24.910	25.422	25.934	26.445	26.955	27.466	27.975	28.485	28.994	29.503	30.011	30.519	31.027	31.535
35	24.104	24.617	25.131	25.643	26.155	26.666	27.178	27.688	28.198	28.708	29.218	29.727	30.236	30.744	31.253
36	23.808	24.322	24.837	25.350	25.863	26.376	26.888	27.399	27.910	28.421	28.931	29.441	29.951	30.460	30.969
37	23.509	24.025	24.540	25.055	25.569	26.083	26.596	27.108	27.620	28.132	28.643	29.154	29.664	30.174	30.684
38	23.208	23.725	24.242	24.758	25.273	25.788	26.302	26.816	27.328	27.841	28.353	28.865	29.376	29.886	30.397
39	22.904	23.423	23.941	24.459	24.975	25.491	26.006	26.521	27.035	27.548	28.061	28.574	29.086	29.597	30.108
40	22.598	23.118	23.638	24.157	24.675	25.192	25.708	26.224	26.739	27.253	27.767	28.281	28.794	29.306	29.818
41	22.288	22.811	23.332	23.852	24.372	24.890	25.408	25.925	26.441	26.957	27.472	27.986	28.500	29.014	29.526
42	21.976	22.500	23.023	23.545	24.066	24.586	25.105	25.624	26.141	26.658	27.174	27.690	28.205	28.719	29.233
43	21.660	22.186	22.711	23.235	23.758	24.279	24.800	25.320	25.839	26.357	26.874	27.391	27.907	28.422	28.937
44	21.341	21.869	22.396	22.922	23.447	23.970	24.492	25.014	25.534	26.054	26.572	27.090	27.607	28.124	28.640
45	21.018	21.549	22.078	22.606	23.133	23.658	24.182	24.705	25.227	25.748	26.268	26.787	27.306	27.823	28.341
46	20.691	21.225	21.757	22.287	22.815	23.343	23.869	24.393	24.917	25.440	25.961	26.482	27.002	27.521	28.039
47	20.360	20.897	21.431	21.964	22.495	23.024	23.552	24.079	24.604	25.129	25.652	26.174	26.695	27.216	27.735
48	20.025	20.564	21.102	21.637	22.171	22.703	23.233	23.761	24.289	24.815	25.340	25.864	26.387	26.909	27.430
49	19.684	20.228	20.768	21.307	21.843	22.377	22.910	23.441	23.970	24.498	25.025	25.551	26.075	26.599	27.121
50	19.339	19.886	20.430	20.972	21.511	22.048	22.583	23.117	23.648	24.179	24.707	25.235	25.761	26.286	26.811
51	18.987	19.539	20.087	20.632	21.175	21.715	22.253	22.789	23.323	23.856	24.387	24.916	25.444	25.971	26.497
52	18.630	19.186	19.739	20.288	20.834	21.377	21.919	22.457	22.994	23.529	24.063	24.594	25.125	25.654	26.181
53	18.266	18.827	19.384	19.938	20.488	21.035	21.580	22.122	22.662	23.199	23.735	24.269	24.802	25.333	25.862
54	17.894	18.461	19.024	19.582	20.137	20.688	21.236	21.782	22.325	22.865	23.404	23.941	24.475	25.009	25.540
55	17.513	18.088	18.656	19.220	19.780	20.336	20.888	21.437	21.983	22.527	23.069	23.608	24.146	24.681	25.215
56	17.124	17.706	18.281	18.851	19.416	19.977	20.534	21.087	21.637	22.185	22.730	23.272	23.812	24.350	24.887
57	16.723	17.314	17.898	18.475	19.046	19.612	20.174	20.732	21.286	21.837	22.386	22.931	23.475	24.016	24.555
58	16.311	16.912	17.505	18.089	18.668	19.240	19.808	20.371	20.930	21.485	22.037	22.586	23.133	23.677	24.219
59	15.884	16.498	17.101	17.695	18.281	18.860	19.434	20.003	20.567	21.127	21.683	22.237	22.787	23.334	23.879
60	15.440	16.069	16.684	17.289	17.884	18.472	19.053	19.628	20.198	20.763	21.324	21.882	22.436	22.987	23.535

Center Distance Coefficient Table

N2-N1	Lp-N1														
	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
1	40.750	41.250	41.750	42.250	42.750	43.250	43.750	44.250	44.750	45.250	45.750	46.250	46.750	47.250	47.750
2	40.499	40.999	41.499	41.999	42.499	42.999	43.499	43.999	44.499	44.999	45.499	45.999	46.499	46.999	47.499
3	40.248	40.748	41.248	41.748	42.248	42.748	43.248	43.748	44.248	44.748	45.248	45.748	46.248	46.748	47.248
4	39.995	40.495	40.996	41.496	41.996	42.496	42.996	43.496	43.996	44.496	44.996	45.496	45.996	46.496	46.996
5	39.742	40.243	40.743	41.243	41.743	42.243	42.743	43.243	43.743	44.243	44.743	45.243	45.744	46.244	46.744
6	39.489	39.989	40.489	40.989	41.489	41.990	42.490	42.990	43.490	43.990	44.490	44.990	45.490	45.991	46.491
7	39.235	39.735	40.235	40.735	41.235	41.736	42.236	42.736	43.236	43.736	44.236	44.737	45.237	45.737	46.237
8	38.980	39.480	39.980	40.480	40.981	41.481	41.981	42.481	42.982	43.482	43.982	44.482	44.982	45.483	45.983
9	38.724	39.224	39.725	40.225	40.725	41.226	41.726	42.226	42.726	43.227	43.727	44.227	44.728	45.228	45.728
10	38.468	38.968	39.468	39.969	40.469	40.970	41.470	41.970	42.471	42.971	43.471	43.972	44.472	44.972	45.473
11	38.210	38.711	39.211	39.712	40.212	40.713	41.213	41.714	42.214	42.715	43.215	43.715	44.216	44.716	45.217
12	37.952	38.453	38.954	39.454	39.955	40.455	40.956	41.456	41.957	42.458	42.958	43.458	43.959	44.459	44.960
13	37.694	38.194	38.695	39.196	39.697	40.197	40.698	41.199	41.699	42.200	42.700	43.201	43.701	44.202	44.703
14	37.434	37.935	38.436	38.937	39.438	39.938	40.439	40.940	41.441	41.941	42.442	42.943	43.443	43.944	44.445
15	37.174	37.675	38.176	38.677	39.178	39.679	40.180	40.680	41.181	41.682	42.183	42.684	43.184	43.685	44.186
16	36.913	37.414	37.915	38.416	38.917	39.418	39.919	40.420	40.921	41.422	41.923	42.424	42.925	43.426	43.927
17	36.650	37.152	37.653	38.154	38.656	39.157	39.658	40.159	40.660	41.161	41.663	42.164	42.665	43.166	43.667
18	36.388	36.889	37.391	37.892	38.394	38.895	39.396	39.898	40.399	40.900	41.401	41.902	42.404	42.905	43.406
19	36.124	36.626	37.127	37.629	38.130	38.632	39.134	39.635	40.136	40.638	41.139	41.641	42.142	42.643	43.144
20	35.859	36.361	36.863	37.365	37.867	38.368	38.870	39.372	39.873	40.375	40.876	41.378	41.879	42.381	42.882
21	35.593	36.096	36.598	37.100	37.602	38.104	38.606	39.108	39.609	40.111	40.613	41.115	41.616	42.118	42.619
22	35.327	35.829	36.332	36.834	37.336	37.838	38.340	38.843	39.345	39.846	40.348	40.850	41.352	41.854	42.356
23	35.059	35.562	36.065	36.567	37.070	37.572	38.074	38.577	39.079	39.581	40.083	40.585	41.087	41.589	42.091
24	34.791	35.294	35.796	36.299	36.802	37.305	37.807	38.310	38.812	39.315	39.817	40.319	40.822	41.324	41.826
25	34.521	35.024	35.527	36.031	36.534	37.037	37.539	38.042	38.545	39.048	39.550	40.053	40.555	41.057	41.560
26	34.250	34.754	35.257	35.761	36.264	36.767	37.270	37.774	38.277	38.779	39.282	39.785	40.288	40.790	41.293
27	33.978	34.482	34.986	35.490	35.994	36.497	37.001	37.504	38.007	38.510	39.014	39.517	40.020	40.522	41.025
28	33.705	34.210	34.714	35.218	35.722	36.226	36.730	37.233	37.737	38.240	38.744	39.247	39.750	40.254	40.757
29	33.431	33.936	34.441	34.945	35.450	35.954	36.458	36.962	37.466	37.970	38.473	38.977	39.480	39.984	40.487
30	33.156	33.661	34.166	34.671	35.176	35.681	36.185	36.689	37.194	37.698	38.202	38.706	39.209	39.713	40.217
31	32.880	33.385	33.891	34.396	34.901	35.406	35.911	36.416	36.920	37.425	37.929	38.433	38.937	39.441	39.945
32	32.602	33.108	33.614	34.120	34.625	35.131	35.636	36.141	36.646	37.151	37.656	38.160	38.665	39.169	39.673
33	32.323	32.829	33.336	33.842	34.348	34.854	35.360	35.865	36.371	36.876	37.381	37.886	38.391	38.895	39.400
34	32.042	32.550	33.057	33.563	34.070	34.576	35.082	35.588	36.094	36.600	37.105	37.611	38.116	38.621	39.126
35	31.761	32.268	32.776	33.283	33.790	34.297	34.804	35.310	35.816	36.322	36.828	37.334	37.840	38.345	38.850
36	31.478	31.986	32.494	33.002	33.509	34.017	34.524	35.031	35.538	36.044	36.550	37.057	37.563	38.068	38.574
37	31.193	31.702	32.211	32.719	33.227	33.735	34.243	34.750	35.258	35.765	36.271	36.778	37.284	37.791	38.297
38	30.907	31.417	31.926	32.435	32.944	33.452	33.961	34.468	34.976	35.484	35.991	36.498	37.005	37.512	38.018
39	30.619	31.130	31.640	32.149	32.659	33.168	33.677	34.185	34.694	35.202	35.710	36.217	36.725	37.232	37.739
40	30.330	30.841	31.352	31.862	32.372	32.882	33.392	33.901	34.410	34.919	35.427	35.935	36.443	36.951	37.458
41	30.039	30.551	31.062	31.574	32.085	32.595	33.105	33.615	34.125	34.634	35.143	35.652	36.160	36.668	37.176
42	29.746	30.259	30.772	31.284	31.795	32.306	32.817	33.328	33.838	34.348	34.858	35.367	35.876	36.385	36.893
43	29.452	29.965	30.479	30.992	31.504	32.016	32.528	33.039	33.550	34.061	34.571	35.081	35.590	36.100	36.609
44	29.155	29.670	30.184	30.698	31.212	31.724	32.237	32.749	33.260	33.772	34.283	34.793	35.304	35.814	36.323
45	28.857	29.373	29.888	30.403	30.917	31.431	31.944	32.457	32.969	33.481	33.993	34.504	35.015	35.526	36.036
46	28.557	29.074	29.590	30.106	30.621	31.136	31.650	32.164	32.677	33.190	33.702	34.214	34.726	35.237	35.748
47	28.254	28.772	29.290	29.807	30.323	30.839	31.354	31.868	32.383	32.896	33.410	33.922	34.435	34.947	35.458
48	27.950	28.469	28.988	29.506	30.023	30.540	31.056	31.572	32.087	32.601	33.115	33.629	34.142	34.655	35.167
49	27.643	28.164	28.684	29.203	29.721	30.239	30.756	31.273	31.789	32.304	32.819	33.334	33.848	34.362	34.875
50	27.334	27.856	28.377	28.898	29.417	29.936	30.455	30.972	31.489	32.006	32.522	33.037	33.552	34.067	34.581
51	27.022	27.546	28.068	28.590	29.111	29.632	30.151	30.670	31.188	31.706	32.223	32.739	33.255	33.770	34.285
52	26.708	27.233	27.757	28.281	28.806	29.325	29.845	30.365	30.885	31.403	31.921	32.439	32.956	33.492	33.988
53	26.391	26.918	27.444	27.969	28.492	29.015	29.538	30.059	30.579	31.099	31.618	32.137	32.655	33.172	33.689
54	26.071	26.600	27.127	27.654	28.179	28.704	29.228	29.750	30.272	30.793	31.313	31.833	32.352	32.870	33.388
55	25.748	26.279	26.808	27.337	27.864	28.390	28.915	29.439	29.962	30.485	31.006	31.527	32.047	32.567	33.086
56	25.421	25.955	26.486	27.017	27.546	28.073	28.600	29.126	29.651	30.174	30.697	31.219	31.741	32.261	32.781
57	25.092	25.627	26.161	26.694	27.224	27.754	28.283	28.810	29.336	29.862	30.386	30.909	31.432	31.954	32.475
58	24.759	25.297	25.833	26.367	26.900	27.432	27.962	28.492	29.020	29.546	30.072	30.597	31.121	31.644	32.167
59	24.422	24.963	25.501	26.038	26.573	27.107	27.639	28.170	28.700	29.229	29.756	30.283	30.808	31.333	31.856
60	24.081	24.624	25.166	25.705	26.243	26.779	27.313	27.846	28.378	28.908	29.438	29.966	30.493	31.019	31.544

Center Distance Coefficient Table

N2-N1	Lp-N1														
	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
1	48.250	48.750	49.250	49.750	50.250	50.750	51.250	51.750	52.250	52.750	53.250	53.750	54.250	54.750	55.250
2	47.999	48.499	48.999	49.499	49.999	50.499	50.999	51.499	51.999	52.499	52.999	53.500	54.000	54.500	55.000
3	47.748	48.248	48.748	49.248	49.748	50.248	50.748	51.248	51.748	52.248	52.748	53.248	53.748	54.248	54.748
4	47.496	47.996	48.496	48.996	49.496	49.996	50.496	50.996	51.497	51.997	52.497	52.997	53.497	53.997	54.497
5	47.244	47.744	48.244	48.744	49.244	49.744	50.244	50.744	51.244	51.744	52.244	52.744	53.245	53.745	54.245
6	46.991	47.491	47.991	48.491	48.991	49.491	49.991	50.491	50.992	51.492	51.992	52.492	52.992	53.492	53.992
7	46.737	47.237	47.737	48.238	48.738	49.238	49.738	50.238	50.738	51.238	51.738	52.239	52.739	53.239	53.739
8	46.483	46.983	47.483	47.984	48.484	48.984	49.484	49.984	50.484	50.985	51.485	51.985	52.485	52.985	53.485
9	46.228	46.728	47.229	47.729	48.229	48.729	49.230	49.730	50.230	50.730	51.230	51.731	52.231	52.731	53.231
10	45.973	46.473	46.973	47.474	47.974	48.474	48.975	49.475	49.975	50.475	50.976	51.476	51.976	52.476	52.977
11	45.717	46.217	46.718	47.218	47.718	48.219	48.719	49.219	49.720	50.220	50.720	51.221	51.721	52.221	52.721
12	45.460	45.961	46.461	46.962	47.462	47.962	48.463	48.963	49.464	49.964	50.464	50.965	51.465	51.965	52.466
13	45.203	45.704	46.204	46.705	47.205	47.706	48.206	48.707	49.207	49.707	50.208	50.708	51.209	51.709	52.209
14	44.945	45.446	45.946	46.447	46.948	47.448	47.949	48.449	48.950	49.450	49.951	50.451	50.952	51.452	51.953
15	44.687	45.187	45.688	46.189	46.689	47.190	47.691	48.191	48.692	49.192	49.693	50.194	50.694	51.195	51.695
16	44.427	44.928	45.429	45.930	46.431	46.931	47.432	47.933	48.434	48.934	49.435	49.935	50.436	50.937	51.437
17	44.168	44.669	45.169	45.670	46.171	46.672	47.173	47.674	48.174	48.675	49.176	49.677	50.178	50.678	51.179
18	43.907	44.408	44.909	45.410	45.911	46.412	46.913	47.414	47.915	48.416	48.917	49.417	49.918	50.419	50.920
19	43.646	44.147	44.648	45.149	45.650	46.151	46.652	47.153	47.654	48.155	48.656	49.157	49.658	50.159	50.660
20	43.384	43.885	44.386	44.888	45.389	45.890	46.391	46.892	47.394	47.895	48.396	48.897	49.398	49.899	50.400
21	43.121	43.622	44.124	44.625	45.127	45.628	46.129	46.631	47.132	47.633	48.134	48.636	49.137	49.638	50.139
22	42.857	43.359	43.861	44.362	44.864	45.365	45.867	46.368	46.870	47.371	47.872	48.374	48.875	49.376	49.877
23	42.593	43.095	43.597	44.098	44.600	45.102	45.603	46.105	46.607	47.108	47.610	48.111	48.613	49.114	49.615
24	42.328	42.830	43.332	43.834	44.336	44.838	45.339	45.841	46.343	46.845	47.346	47.848	48.349	48.851	49.353
25	42.062	42.564	43.067	43.569	44.071	44.573	45.075	45.577	46.079	46.580	47.082	47.584	48.086	48.587	49.089
26	41.795	42.298	42.800	43.303	43.805	44.307	44.809	45.311	45.813	46.315	46.817	47.319	47.821	48.323	48.825
27	41.528	42.031	42.533	43.036	43.538	44.041	44.543	45.045	45.548	46.050	46.552	47.054	47.556	48.058	48.560
28	41.260	41.762	42.265	42.768	43.271	43.773	44.276	44.779	45.281	45.783	46.286	46.788	47.290	47.793	48.295
29	40.990	41.493	41.997	42.500	43.003	43.505	44.008	44.511	45.014	45.516	46.019	46.521	47.024	47.526	48.029
30	40.720	41.224	41.727	42.230	42.733	43.237	43.740	44.243	44.745	45.248	45.751	46.254	46.756	47.259	47.762
31	40.449	40.953	41.457	41.960	42.464	42.967	43.470	43.973	44.477	44.980	45.483	45.986	46.488	46.991	47.494
32	40.177	40.681	41.185	41.689	42.193	42.696	43.200	43.703	44.207	44.710	45.213	45.716	46.220	46.723	47.226
33	39.904	40.409	40.913	41.417	41.921	42.425	42.929	43.433	43.936	44.440	44.943	45.447	45.950	46.453	46.956
34	39.630	40.135	40.640	41.144	41.648	42.153	42.657	43.161	43.665	44.169	44.672	45.176	45.680	46.183	46.687
35	39.356	39.861	40.365	40.870	41.375	41.879	42.384	42.888	43.392	43.897	44.401	44.905	45.408	45.912	46.416
36	39.080	39.585	40.090	40.595	41.100	41.605	42.110	42.615	43.119	43.624	44.128	44.632	45.136	45.640	46.144
37	38.803	39.309	39.814	40.320	40.825	41.330	41.835	42.340	42.845	43.350	43.854	44.359	44.863	45.368	45.872
38	38.525	39.031	39.537	40.043	40.549	41.054	41.560	42.065	42.570	43.075	43.580	44.085	44.590	45.094	45.599
39	38.246	38.752	39.259	39.765	40.271	40.777	41.283	41.789	42.294	42.800	43.305	43.810	44.315	44.820	45.325
40	37.965	38.473	38.979	39.486	39.993	40.499	41.005	41.511	42.017	42.523	43.029	43.534	44.040	44.545	45.050
41	37.684	38.192	38.699	39.206	39.713	40.220	40.727	41.233	41.739	42.245	42.751	43.257	43.763	44.269	44.774
42	37.402	37.910	38.417	38.925	39.433	39.940	40.447	40.954	41.460	41.967	42.473	42.980	43.486	43.992	44.497
43	37.118	37.626	38.135	38.643	39.151	39.659	40.166	40.673	41.180	41.687	42.194	42.701	43.207	43.714	44.220
44	36.833	37.342	37.851	38.359	38.868	39.376	39.884	40.392	40.899	41.407	41.914	42.421	42.928	43.435	43.941
45	36.546	37.056	37.566	38.075	38.584	39.093	39.601	40.109	40.617	41.125	41.633	42.140	42.648	43.155	43.662
46	36.259	36.769	37.279	37.789	38.299	38.808	39.317	39.826	40.334	40.843	41.351	41.859	42.366	42.874	43.381
47	35.970	36.481	36.992	37.502	38.012	38.522	39.031	39.541	40.050	40.559	41.067	41.576	42.084	42.592	43.100
48	35.679	36.191	36.702	37.214	37.724	38.235	38.745	39.255	39.764	40.274	40.783	41.292	41.800	42.309	42.817
49	35.388	35.900	36.412	36.924	37.435	37.946	38.457	38.967	39.478	39.988	40.497	41.007	41.516	42.025	42.533
50	35.094	35.607	36.120	36.633	37.145	37.656	38.168	38.679	39.190	39.700	40.210	40.720	41.230	41.740	42.249
51	34.799	35.313	35.827	36.340	36.853	37.365	37.877	38.389	38.900	39.412	39.922	40.433	40.943	41.453	41.963
52	34.503	35.018	35.532	36.046	36.560	37.073	37.586	38.098	38.610	39.122	39.633	40.144	40.655	41.166	41.676
53	34.203	34.721	35.236	35.751	36.265	36.779	37.292	37.805	38.318	38.831	39.343	39.854	40.366	40.877	41.388
54	33.905	34.422	34.938	35.454	35.969	36.483	36.998	37.512	38.025	38.538	39.051	39.563	40.075	40.587	41.099
55	33.604	34.121	34.638	35.155	35.671	36.186	36.702	37.216	37.730	38.244	38.758	39.271	39.783	40.296	40.808
56	33.300	33.819	34.337	34.855	35.372	35.888	36.404	36.919	37.434	37.949	38.463	38.977	39.490	40.003	40.516
57	32.995	33.515	34.034	34.553	35.070	35.588	36.105	36.621	37.137	37.652	38.167	38.682	39.196	39.710	40.223
58	32.688	33.209	33.729	34.249	34.768	35.286	35.804	36.321	36.838	37.354	37.870	38.385	38.900	39.414	39.929
59	32.379	32.901	33.422	33.943	34.463	34.982	35.501	36.019	36.537	37.054	37.571	38.087	38.603	39.118	39.633
60	32.068	32.591	33.114	33.638	34.157	34.677	35.197	35.716	36.235	36.753	37.270	37.787	38.304	38.820	39.336

Center Distance Coefficient Table

N2-N1	Lp-N1														
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126
1	55.750	56.250	56.750	57.250	57.750	58.250	58.750	59.250	59.750	60.250	60.750	61.250	61.750	62.250	62.750
2	55.500	56.000	56.500	57.000	57.500	58.000	58.500	59.000	59.500	60.000	60.500	61.000	61.500	62.000	62.500
3	55.248	55.748	56.248	56.748	57.248	57.748	58.249	58.749	59.249	59.749	60.249	60.749	61.249	61.749	62.249
4	54.997	55.497	55.997	56.497	56.997	57.497	57.997	58.497	58.997	59.497	59.997	60.497	60.997	61.497	61.997
5	54.745	55.245	55.745	56.245	56.745	57.245	57.745	58.245	58.745	59.245	59.745	60.245	60.745	61.245	61.745
6	54.492	54.992	55.492	55.992	56.492	56.992	57.493	57.993	58.493	58.993	59.493	59.993	60.493	60.993	61.493
7	54.239	54.739	55.239	55.739	56.239	56.740	57.240	57.740	58.240	58.740	59.240	59.740	60.240	60.740	61.240
8	53.985	54.486	54.986	55.486	55.986	56.486	56.986	57.486	57.986	58.487	58.987	59.487	59.987	60.487	60.987
9	53.731	54.232	54.732	55.232	55.732	56.232	56.732	57.232	57.733	58.233	58.733	59.233	59.733	60.233	60.734
10	53.477	53.977	54.477	54.977	55.478	55.978	56.478	56.978	57.478	57.979	58.479	58.979	59.479	59.979	60.479
11	53.222	53.722	54.222	54.722	55.223	55.723	56.223	56.723	57.224	57.724	58.224	58.724	59.225	59.725	60.225
12	52.966	53.466	53.967	54.467	54.967	55.468	55.968	56.468	56.968	57.469	57.969	58.469	58.970	59.470	59.970
13	52.710	53.210	53.711	54.211	54.711	55.212	55.712	56.212	56.713	57.213	57.713	58.214	58.714	59.214	59.715
14	52.453	52.954	53.454	53.954	54.455	54.955	55.456	55.956	56.456	56.957	57.457	57.958	58.458	58.958	59.459
15	52.196	52.696	53.197	53.697	54.198	54.698	55.199	55.699	56.200	56.700	57.201	57.701	58.201	58.702	59.202
16	51.938	52.439	52.939	53.440	53.940	54.441	54.941	55.442	55.943	56.443	56.943	57.444	57.944	58.445	58.945
17	51.680	52.180	52.681	53.182	53.682	54.183	54.684	55.184	55.685	56.185	56.686	57.186	57.687	58.188	58.688
18	51.421	51.921	52.422	52.923	53.424	53.924	54.425	54.926	55.426	55.927	56.428	56.928	57.429	57.930	58.430
19	51.161	51.662	52.163	52.664	53.164	53.665	54.166	54.667	55.168	55.668	56.169	56.670	57.170	57.671	58.172
20	50.901	51.402	51.903	52.404	52.905	53.406	53.906	54.407	54.908	55.409	55.910	56.411	56.911	57.412	57.913
21	50.640	51.141	51.642	52.143	52.644	53.145	53.646	54.147	54.648	55.149	55.650	56.151	56.652	57.153	57.654
22	50.379	50.880	51.381	51.882	52.383	52.885	53.386	53.887	54.388	54.889	55.390	55.891	56.392	56.893	57.394
23	50.117	50.618	51.119	51.621	52.122	52.623	53.124	53.625	54.127	54.628	55.129	55.630	56.131	56.632	57.133
24	49.854	50.355	50.857	51.358	51.860	52.361	52.862	53.364	53.865	54.366	54.867	55.369	55.870	56.371	56.872
25	49.591	50.092	50.594	51.095	51.597	52.098	52.600	53.101	53.603	54.104	54.605	55.107	55.608	56.109	56.611
26	49.327	49.829	50.330	50.832	51.334	51.835	52.337	52.838	53.340	53.841	54.343	54.844	55.346	55.847	56.348
27	49.062	49.564	50.066	50.568	51.070	51.571	52.073	52.575	53.076	53.578	54.080	54.581	55.083	55.584	56.086
28	48.797	49.299	49.801	50.303	50.805	51.307	51.809	52.311	52.812	53.314	53.816	54.318	54.819	55.321	55.822
29	48.531	49.033	49.535	50.037	50.540	51.042	51.544	52.046	52.548	53.050	53.551	54.053	54.555	55.057	55.559
30	48.264	48.767	49.269	49.771	50.274	50.776	51.278	51.780	52.282	52.784	53.286	53.788	54.290	54.792	55.294
31	47.997	48.499	49.002	49.504	50.007	50.509	51.012	51.514	52.016	52.519	53.021	53.523	54.025	54.527	55.029
32	47.728	48.231	48.734	49.237	49.739	50.242	50.745	51.247	51.750	52.252	52.754	53.257	53.759	54.261	54.763
33	47.460	47.963	48.466	48.969	49.471	49.974	50.477	50.980	51.482	51.985	52.487	52.990	53.492	53.995	54.497
34	47.190	47.693	48.196	48.699	49.203	49.706	50.209	50.711	51.214	51.717	52.220	52.723	53.225	53.728	54.230
35	46.919	47.423	47.926	48.430	48.933	49.436	49.939	50.443	50.946	51.449	51.952	52.454	52.957	53.460	53.963
36	46.648	47.152	47.656	48.159	48.663	49.166	49.670	50.173	50.676	51.179	51.683	52.186	52.689	53.192	53.694
37	46.376	46.880	47.384	47.888	48.392	48.895	49.399	49.903	50.406	50.910	51.413	51.916	52.419	52.923	53.426
38	46.103	46.608	47.112	47.616	48.120	48.624	49.128	49.632	50.135	50.639	51.142	51.646	52.149	52.653	53.156
39	45.829	46.334	46.839	47.343	47.847	48.352	48.856	49.360	49.864	50.368	50.871	51.375	51.879	52.382	52.886
40	45.555	46.060	46.565	47.069	47.574	48.078	48.583	49.087	49.591	50.095	50.599	51.103	51.607	52.111	52.615
41	45.279	45.785	46.290	46.795	47.300	47.804	48.309	48.814	49.318	49.823	50.327	50.831	51.335	51.839	52.343
42	45.003	45.509	46.014	46.519	47.025	47.530	48.035	48.539	49.044	49.549	50.053	50.558	51.062	51.567	52.071
43	44.726	45.232	45.737	46.243	46.749	47.254	47.759	48.264	48.769	49.274	49.779	50.284	50.789	51.293	51.798
44	44.448	44.954	45.460	45.966	46.472	46.978	47.483	47.989	48.494	48.999	49.504	50.009	50.514	51.019	51.524
45	44.169	44.675	45.182	45.688	46.194	46.700	47.206	47.712	48.218	48.723	49.229	49.734	50.239	50.744	51.249
46	43.888	44.395	44.902	45.409	45.916	46.422	46.928	47.434	47.940	48.446	48.952	49.458	49.963	50.469	50.974
47	43.607	44.115	44.622	45.129	45.636	46.143	46.649	47.156	47.662	48.168	48.675	49.180	49.686	50.192	50.698
48	43.325	43.833	44.341	44.848	45.356	45.863	46.370	46.877	47.383	47.890	48.396	48.903	49.409	49.915	50.421
49	43.042	43.550	44.058	44.566	45.074	45.582	46.089	46.596	47.103	47.610	48.117	48.624	49.130	49.637	50.143
50	42.758	43.267	43.775	44.283	44.792	45.300	45.807	46.315	46.823	47.330	47.837	48.344	48.851	49.358	49.864
51	42.472	42.982	43.491	44.000	44.508	45.017	45.525	46.033	46.541	47.049	47.556	48.063	48.571	49.078	49.585
52	42.186	42.696	43.205	43.715	44.224	44.733	45.241	45.750	46.258	46.766	47.274	47.782	48.290	48.797	49.304
53	41.898	42.409	42.919	43.429	43.938	44.448	44.957	45.466	45.974	46.483	46.991	47.499	48.007	48.515	49.023
54	41.610	42.121	42.631	43.142	43.652	44.161	44.671	45.181	45.690	46.199	46.708	47.216	47.724	48.233	48.741
55	41.320	41.831	42.342	42.853	43.364	43.874	44.384	44.894	45.404	45.913	46.423	46.932	47.441	47.949	48.458
56	41.029	41.541	42.052	42.564	43.075	43.586	44.097	44.607	45.117	45.627	46.137	46.646	47.156	47.665	48.174
57	40.736	41.249	41.761	42.273	42.785	43.297	43.808	44.319	44.829	45.340	45.850	46.360	46.870	47.379	47.889
58	40.442	40.956	41.469	41.981	42.494	43.006	43.518	44.029	44.540	45.051	45.562	46.073	46.583	47.093	47.603
59	40.147	40.661	41.175	41.688	42.201	42.714	43.226	43.739	44.250	44.762	45.273	45.784	46.295	46.805	47.316
60	39.851	40.366	40.880	41.394	41.908	42.421	42.934	43.447	43.959	44.471	44.983	45.495	46.006	46.517	47.028

Center Distance Coefficient Table

N2-N1	Lp-N1														
	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141
1	63.250	63.750	64.250	64.750	65.250	65.750	66.250	66.750	67.250	67.750	68.250	68.750	69.250	69.750	70.250
2	63.000	63.500	64.000	64.500	65.000	65.500	66.000	66.500	67.000	67.500	68.000	68.500	69.000	69.500	70.000
3	62.749	63.249	63.749	64.249	64.749	65.249	65.749	66.249	66.749	67.249	67.749	68.249	68.749	69.249	69.749
4	62.497	62.997	63.497	63.997	64.497	64.997	65.497	65.997	66.497	66.997	67.497	67.997	68.497	68.998	69.498
5	62.245	62.745	63.245	63.745	64.246	64.746	65.246	65.746	66.246	66.746	67.246	67.746	68.246	68.746	69.246
6	61.993	62.493	62.993	63.493	63.993	64.493	64.993	65.493	65.994	66.494	66.994	67.494	67.994	68.494	68.994
7	91.740	62.240	62.741	63.241	63.741	64.241	64.741	65.241	65.741	66.241	66.741	67.241	67.741	68.241	68.741
8	61.487	61.987	62.487	62.988	63.488	63.988	64.488	64.988	65.488	65.988	66.488	66.988	67.488	67.989	68.489
9	61.234	61.734	62.234	62.734	63.234	63.734	64.235	64.735	65.235	65.735	66.235	66.735	67.235	67.735	68.235
10	60.980	61.480	61.980	62.480	62.980	63.480	63.981	64.481	64.981	65.481	65.981	66.481	66.982	67.482	67.982
11	60.725	61.225	61.726	62.226	62.726	63.226	63.726	64.227	64.727	65.227	65.727	66.227	66.727	67.228	67.728
12	60.470	60.971	61.471	61.971	62.471	62.972	63.472	63.972	64.472	64.972	65.473	65.973	66.473	66.973	67.473
13	60.215	60.715	61.215	61.716	62.216	62.716	63.217	63.717	64.217	64.717	65.218	65.718	66.218	66.718	67.219
14	59.959	60.459	60.960	61.460	61.960	62.461	62.961	63.461	63.962	64.462	64.962	65.463	65.963	66.463	66.963
15	59.703	60.203	60.703	61.204	61.704	62.205	62.705	63.205	63.706	64.206	64.706	65.207	65.707	66.207	66.708
16	59.446	59.946	60.447	60.947	61.448	61.948	62.449	62.949	63.449	63.950	64.450	64.951	65.451	65.951	66.452
17	59.189	59.689	60.190	60.690	61.191	61.691	62.192	62.692	63.193	63.693	64.193	64.694	65.194	65.695	66.195
18	58.931	59.431	59.932	60.433	60.933	61.434	61.934	62.435	62.935	63.436	63.936	64.437	64.937	65.438	65.938
19	58.672	59.173	59.674	60.174	60.675	61.176	61.676	62.177	62.677	63.178	63.679	64.179	64.680	65.180	65.681
20	58.414	58.914	59.415	59.916	60.417	60.917	61.418	61.919	62.419	62.920	63.421	63.921	64.422	64.922	65.423
21	58.154	58.655	59.156	59.657	60.158	60.658	61.159	61.660	62.161	62.661	63.162	63.663	64.163	64.664	65.165
22	57.895	58.395	58.896	59.397	59.898	60.399	60.900	61.401	61.901	62.402	62.903	63.404	63.905	64.405	64.906
23	57.634	58.135	58.636	59.137	59.638	60.139	60.640	61.141	61.642	62.143	62.643	63.144	63.645	64.146	64.647
24	57.373	57.874	58.375	58.877	59.378	59.879	60.380	60.881	61.382	61.883	62.383	62.884	63.385	63.886	64.387
25	57.112	57.613	58.114	58.615	59.117	59.618	60.119	60.620	61.121	61.622	62.123	62.624	63.125	63.626	64.127
26	56.850	57.351	57.852	58.354	58.855	59.356	59.857	60.359	60.860	61.361	61.862	62.363	62.864	63.365	63.866
27	56.587	57.089	57.590	58.091	58.593	59.094	59.595	60.097	60.598	61.099	61.600	62.102	62.603	63.104	63.605
28	56.324	56.826	57.327	57.829	58.330	58.832	59.333	59.834	60.336	60.837	61.338	61.840	62.341	62.842	63.344
29	56.060	56.562	57.064	57.565	58.067	58.568	59.070	59.572	60.073	60.574	61.076	61.577	62.079	62.580	63.081
30	55.796	56.298	56.800	57.301	57.803	58.305	58.807	59.308	59.810	60.311	60.813	61.314	61.816	62.317	62.819
31	55.531	56.033	56.535	57.037	57.539	58.041	58.542	59.044	59.546	60.048	60.549	61.051	61.553	62.054	62.556
32	55.266	55.768	56.270	56.772	57.274	57.776	58.278	58.780	59.282	59.783	60.285	60.787	61.289	61.790	62.292
33	54.999	55.502	56.004	56.506	57.008	57.510	58.013	58.515	59.017	59.519	60.020	60.522	61.024	61.526	62.028
34	54.733	55.235	55.738	56.240	56.742	57.245	57.747	58.249	58.751	59.253	59.755	60.257	60.759	61.261	61.763
35	54.465	54.968	55.471	55.973	56.476	56.978	57.480	57.983	58.485	58.987	59.489	59.992	60.494	60.996	61.498
36	54.197	54.700	55.203	55.706	56.208	56.711	57.213	57.716	58.218	58.721	59.223	59.725	60.228	60.730	61.232
37	53.929	54.432	54.935	55.437	55.940	56.443	56.946	57.448	57.951	58.454	58.956	59.459	59.961	60.464	60.966
38	53.659	54.162	54.666	55.169	55.672	56.175	56.677	57.180	57.683	58.186	58.689	59.191	59.694	60.196	60.699
39	53.389	53.893	54.396	54.899	55.402	55.906	56.409	56.912	57.415	57.918	58.420	58.923	59.426	59.929	60.431
40	53.119	53.622	54.126	54.629	55.133	55.636	56.139	56.642	57.145	57.649	58.152	58.655	59.158	59.660	60.163
41	52.847	53.351	53.855	54.358	54.862	55.365	55.869	56.372	56.876	57.379	57.882	58.385	58.889	59.392	59.895
42	52.575	53.079	53.583	54.087	54.591	55.094	55.598	56.102	56.605	57.109	57.612	58.116	58.619	59.122	59.625
43	52.302	52.806	53.311	53.815	54.319	54.823	55.327	55.830	56.334	56.838	57.342	57.845	58.349	58.852	59.355
44	52.028	52.533	53.037	53.542	54.046	54.550	55.054	55.559	56.063	56.566	57.070	57.574	58.078	58.581	59.085
45	51.754	52.259	52.764	53.268	53.773	54.277	54.782	55.286	55.790	56.294	56.798	57.302	57.806	58.310	58.814
46	51.479	51.984	52.489	52.994	53.499	54.003	54.508	55.013	55.517	56.021	56.526	57.030	57.534	58.038	58.542
47	51.203	51.708	52.214	52.719	53.224	53.729	54.234	54.739	55.243	55.748	56.252	56.757	57.261	57.765	58.270
48	50.926	51.432	51.938	52.443	52.948	53.454	53.959	54.464	54.969	55.474	55.978	56.483	56.988	57.492	57.997
49	50.649	51.155	51.661	52.166	52.672	53.178	53.683	54.188	54.694	55.199	55.704	56.209	56.713	57.218	57.723
50	50.371	50.877	51.383	51.889	52.395	52.901	53.406	53.912	54.418	54.923	55.428	55.933	56.439	56.944	57.448
51	50.091	50.598	51.104	51.611	52.117	52.623	53.129	53.635	54.141	54.647	55.152	55.658	56.163	56.668	57.173
52	49.811	50.318	50.825	51.332	51.838	52.345	52.851	53.357	53.863	54.369	54.875	55.381	55.887	56.392	56.897
53	49.530	50.038	50.545	51.052	51.559	52.066	52.572	53.079	53.585	54.091	54.598	55.104	55.609	56.115	56.621
54	49.249	49.756	50.264	50.771	51.279	51.786	52.293	52.799	53.306	53.813	54.319	54.825	55.332	55.838	56.344
55	48.966	49.474	49.982	50.490	50.997	51.505	52.012	52.519	53.026	53.533	54.040	54.547	55.053	55.559	56.066
56	48.682	49.191	49.699	50.207	50.715	51.223	51.731	52.238	52.746	53.253	53.760	54.267	54.774	55.280	55.787
57	48.398	48.907	49.415	49.924	50.432	50.941	51.449	51.956	52.464	52.972	53.479	53.986	54.494	55.001	55.507
58	48.112	48.622	49.131	49.640	50.148	50.657	51.165	51.674	52.182	52.690	53.198	53.705	54.213	54.720	55.227
59	47.826	48.335	48.845	49.354	49.864	50.373	50.881	51.390	51.899	52.407	52.915	53.423	53.931	54.439	54.946
60	47.538	48.048	48.558	49.068	49.578	50.087	50.597	51.106	51.615	52.123	52.632	53.140	53.648	54.156	54.664

Center Distance Coefficient Table

N2-N1	Lp-N1														
	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156
1	70.750	71.250	71.750	72.250	72.750	73.250	73.750	74.250	74.750	75.250	75.750	76.250	76.750	77.250	77.750
2	70.500	71.000	71.500	72.000	72.500	73.000	73.500	74.000	74.500	75.000	75.500	76.000	76.500	77.000	77.500
3	70.249	70.749	71.249	71.749	72.249	72.749	73.249	73.749	74.249	74.749	75.249	75.749	76.249	76.749	77.249
4	69.998	70.498	70.998	71.498	71.998	72.498	72.998	73.498	73.998	74.498	74.998	75.498	75.998	76.498	76.998
5	69.746	70.246	70.746	71.246	71.746	72.246	72.746	73.246	73.746	74.246	74.746	75.246	75.746	76.246	76.746
6	69.494	69.994	70.494	70.994	71.494	71.994	72.494	72.994	73.494	73.994	74.494	74.994	75.494	75.994	76.494
7	69.241	69.742	70.242	70.742	71.242	71.742	72.242	72.742	73.242	73.742	74.242	74.742	75.242	75.742	76.242
8	68.989	69.489	69.989	70.489	70.989	71.489	71.989	72.489	72.989	73.489	73.990	74.490	74.990	75.490	75.990
9	68.736	69.236	69.736	70.236	70.736	71.236	71.736	72.236	72.736	73.236	73.737	74.237	74.737	75.237	75.737
10	68.482	68.982	69.482	69.982	70.482	70.983	71.483	71.983	72.483	72.983	73.483	73.983	74.483	74.984	75.484
11	68.228	68.728	69.228	69.728	70.229	70.729	71.229	71.729	72.229	72.729	73.230	73.730	74.230	74.730	75.230
12	67.974	68.474	68.974	69.474	69.974	70.475	70.975	71.475	71.975	72.475	72.975	73.476	73.976	74.476	74.976
13	67.719	68.219	68.719	69.220	69.720	70.220	70.720	71.220	71.721	72.221	72.721	73.221	73.721	74.222	74.722
14	67.464	67.964	68.464	68.964	69.465	69.965	70.465	70.965	71.466	71.966	72.466	72.966	73.467	73.967	74.467
15	67.208	67.708	68.209	68.709	69.209	69.710	70.210	70.710	71.210	71.711	72.211	72.711	73.212	73.712	74.212
16	66.952	67.452	67.953	68.453	68.953	69.454	69.954	70.454	70.955	71.455	71.955	72.456	72.956	73.456	73.957
17	66.696	67.196	67.696	68.197	68.697	69.198	69.698	70.198	70.699	71.199	71.699	72.200	72.700	73.200	73.701
18	66.439	66.939	67.440	67.940	68.440	68.941	69.441	69.942	70.442	70.943	71.443	71.943	72.444	72.944	73.445
19	66.181	66.682	67.182	67.683	68.183	68.684	69.184	69.685	70.185	70.686	71.186	71.687	72.187	72.688	73.188
20	65.924	66.424	66.925	67.425	67.926	68.426	68.927	69.427	69.928	70.428	70.929	71.430	71.930	72.430	72.931
21	65.665	66.166	66.667	67.167	67.668	68.169	68.669	69.170	69.670	70.171	70.671	71.172	71.672	72.173	72.674
22	65.407	65.907	66.408	66.909	67.410	67.910	68.411	68.911	69.412	69.913	70.413	70.914	71.415	71.915	72.416
23	65.148	65.648	66.149	66.650	67.151	67.651	68.152	68.653	69.154	69.654	70.155	70.656	71.156	71.657	72.158
24	64.888	65.389	65.890	66.391	66.891	67.392	67.893	68.394	68.895	69.395	69.896	70.397	70.898	71.398	71.899
25	64.628	65.129	65.630	66.131	66.632	67.133	67.633	68.134	68.635	69.136	69.637	70.138	70.638	71.139	71.640
26	64.367	64.868	65.369	65.870	66.371	66.872	67.373	67.874	68.375	68.876	69.377	69.878	70.379	70.880	71.380
27	64.106	64.607	65.109	65.610	66.111	66.612	67.113	67.614	68.115	68.616	69.117	69.618	70.119	70.620	71.121
28	63.845	64.346	64.847	65.348	65.850	66.351	66.852	67.353	67.854	68.355	68.856	69.357	69.858	70.359	70.860
29	63.583	64.084	64.585	65.087	65.588	66.089	66.590	67.092	67.593	68.094	68.595	69.096	69.597	70.098	70.599
30	63.320	63.822	64.323	64.825	65.326	65.827	66.329	66.830	67.331	67.832	68.334	68.835	69.336	69.837	70.338
31	63.057	63.559	64.060	64.562	65.063	65.565	66.066	66.568	67.069	67.570	68.072	68.573	69.074	69.575	70.077
32	62.794	63.295	63.797	64.299	64.800	65.302	65.803	66.305	66.806	67.308	67.809	68.311	68.812	69.313	69.815
33	62.530	63.032	63.533	64.035	64.537	65.038	65.540	66.041	66.543	67.045	67.546	68.048	68.549	69.051	69.552
34	62.265	62.767	63.269	63.771	64.273	64.774	65.276	65.778	66.279	66.781	67.283	67.784	68.286	68.787	69.289
35	62.000	62.502	63.004	63.506	64.008	64.510	65.012	65.514	66.015	66.517	67.019	67.521	68.022	68.524	69.026
36	61.734	62.237	62.739	63.241	63.743	64.245	64.747	65.249	65.751	66.253	66.754	67.256	67.758	68.260	68.762
37	61.468	61.970	62.473	62.975	63.477	63.979	64.481	64.983	65.486	65.988	66.489	66.991	67.493	67.995	68.497
38	61.201	61.704	62.206	62.709	63.211	63.713	64.215	64.718	65.220	65.722	66.224	66.726	67.228	67.730	68.232
39	60.934	61.437	61.939	62.442	62.944	63.447	63.949	64.451	64.954	65.456	65.958	66.460	66.963	67.465	67.967
40	60.666	61.169	61.672	62.174	62.677	63.179	63.682	64.185	64.687	65.189	65.692	66.194	66.696	67.199	67.701
41	60.398	60.900	61.403	61.906	62.409	62.912	63.414	63.917	64.420	64.922	65.425	65.927	66.430	66.932	67.434
42	60.129	60.632	61.135	61.638	62.141	62.643	63.146	63.649	64.152	64.655	65.157	65.660	66.162	66.665	67.168
43	59.859	60.362	60.865	61.368	61.872	62.375	62.878	63.381	63.884	64.386	64.889	65.392	65.895	66.397	66.900
44	59.588	60.092	60.595	61.099	61.602	62.105	62.608	63.112	63.615	64.118	64.621	65.124	65.626	66.129	66.632
45	59.318	59.821	60.325	60.828	61.332	61.835	62.339	62.842	63.345	63.848	64.352	64.855	65.358	65.861	66.364
46	59.046	59.550	60.054	60.557	61.061	61.565	62.068	62.572	63.075	63.578	64.082	64.585	65.088	65.591	66.095
47	58.774	59.278	59.782	60.286	60.790	61.293	61.797	62.301	62.804	63.308	63.811	64.315	64.818	65.322	65.825
48	58.501	59.005	59.509	60.014	60.518	61.022	61.526	62.029	62.533	63.037	63.541	64.044	64.548	65.051	65.555
49	58.227	58.732	59.236	59.741	60.245	60.749	61.253	61.757	62.261	62.765	63.269	63.773	64.277	64.780	65.284
50	57.953	58.458	58.963	59.467	59.972	60.476	60.980	61.485	61.989	62.493	62.997	63.501	64.005	64.509	65.013
51	57.678	58.183	58.688	59.193	59.698	60.202	60.707	61.211	61.716	62.220	62.725	63.229	63.733	64.237	64.741
52	57.403	57.908	58.413	58.918	59.423	59.928	60.433	60.938	61.442	61.947	62.451	62.956	63.460	63.964	64.469
53	57.127	57.632	58.137	58.643	59.148	59.653	60.158	60.663	61.168	61.673	62.177	62.682	63.187	63.691	64.195
54	56.850	57.355	57.861	58.367	58.872	59.377	59.883	60.388	60.893	61.398	61.903	62.408	62.913	63.417	63.922
55	56.572	57.078	57.584	58.090	58.595	59.101	59.607	60.112	60.617	61.123	61.628	62.133	62.638	63.143	63.648
56	56.293	56.800	57.306	57.812	58.318	58.824	59.330	59.835	60.341	60.847	61.352	61.857	62.362	62.868	63.373
57	56.014	56.521	57.027	57.534	58.040	58.546	59.052	59.558	60.064	60.570	61.075	61.581	62.087	62.592	63.097
58	55.734	56.241	56.748	57.255	57.761	58.268	58.774	59.280	59.786	60.292	60.798	61.304	61.810	62.315	62.821
59	55.453	55.961	56.468	56.975	57.482	57.988	58.495	59.002	59.508	60.014	60.521	61.027	61.533	62.038	62.544
60	55.172	55.680	56.187	56.694	57.202	57.709	58.215	58.722	59.229	59.736	60.242	60.748	61.255	61.761	62.267

Center Distance Coefficient Table

N2-N1	Lp-N1														
	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171
1	78.250	78.750	79.250	79.750	80.250	80.750	81.250	81.750	82.250	82.750	83.250	83.750	84.250	84.750	85.250
2	78.000	78.500	79.000	79.500	80.000	80.500	81.000	81.500	82.000	82.500	83.000	83.500	84.000	84.500	85.000
3	77.749	78.249	78.749	79.249	79.749	80.249	80.749	81.249	81.749	82.249	82.749	83.249	83.749	84.249	84.749
4	77.498	77.998	78.498	78.998	79.498	79.998	80.498	80.998	81.498	81.998	82.498	82.998	83.498	83.998	84.498
5	77.246	77.746	78.246	78.746	79.246	79.747	80.247	80.747	81.247	81.747	82.247	82.747	83.247	83.747	84.247
6	76.995	77.495	77.995	78.495	78.995	79.495	79.995	80.495	80.995	81.495	81.995	82.495	82.995	83.495	83.995
7	76.742	77.242	77.742	78.243	78.743	79.243	79.743	80.243	80.743	81.243	81.743	82.243	82.743	83.243	83.743
8	76.490	76.990	77.490	77.990	78.490	78.990	79.490	79.990	80.490	80.990	81.491	81.991	82.491	82.991	83.491
9	76.237	76.737	77.237	77.737	78.237	78.737	79.238	79.738	80.238	80.738	81.238	81.738	82.238	82.738	83.238
10	75.984	76.484	76.984	77.484	77.984	78.484	78.984	79.485	79.985	80.485	80.985	81.485	81.985	82.485	82.985
11	75.730	76.230	76.730	77.231	77.731	78.231	78.731	79.231	79.731	80.231	80.731	81.232	81.732	82.232	82.732
12	75.476	75.976	76.477	76.977	77.477	77.977	78.477	78.977	79.478	79.978	80.478	80.978	81.478	81.978	82.478
13	75.222	75.722	76.222	76.723	77.223	77.723	78.223	78.723	79.223	79.724	80.224	80.724	81.224	81.724	82.224
14	74.967	75.468	75.968	76.468	76.968	77.468	77.969	78.469	78.969	79.469	79.969	80.470	80.970	81.470	81.970
15	74.712	75.213	75.713	46.213	76.713	77.214	77.714	78.214	78.714	79.214	79.715	80.215	80.715	81.215	81.716
16	74.457	74.957	75.457	75.958	76.458	76.958	77.459	77.959	78.459	78.959	79.460	79.960	80.460	80.960	81.461
17	74.201	74.701	75.202	75.702	76.202	76.703	77.203	77.703	78.204	78.704	79.204	79.705	80.205	80.705	81.205
18	73.945	74.445	74.946	75.446	75.946	76.447	76.947	77.447	77.948	78.448	78.948	79.449	79.949	80.449	80.950
19	73.688	74.189	74.689	75.190	75.690	76.190	76.691	77.191	77.692	78.192	78.692	79.193	79.693	80.193	80.694
20	73.431	73.932	74.432	74.933	75.433	75.934	76.434	76.935	77.435	77.935	78.436	78.936	79.437	79.937	80.437
21	73.174	73.675	74.175	74.676	75.176	75.677	76.177	76.678	77.178	77.679	78.179	78.679	79.180	79.680	80.181
22	72.916	73.417	73.918	74.418	74.919	75.419	75.920	76.420	76.921	77.421	77.922	78.422	78.923	79.423	79.924
23	72.658	73.159	73.659	74.160	74.661	75.161	75.662	76.162	76.663	77.164	77.664	78.165	78.665	79.166	79.666
24	72.400	72.900	73.401	73.902	74.402	74.903	75.404	75.904	76.405	76.906	77.406	77.907	78.407	78.908	79.409
25	72.141	72.641	73.142	73.643	74.144	74.644	75.145	75.646	76.146	76.647	77.148	77.648	78.149	78.650	79.150
26	71.881	72.382	72.883	73.384	73.885	74.385	74.886	75.387	75.888	76.388	76.889	77.390	77.891	78.391	78.892
27	71.621	72.122	72.623	73.124	73.625	74.126	74.627	75.128	75.628	76.129	76.630	77.131	77.632	78.132	78.633
28	71.361	71.862	72.363	72.864	73.365	73.866	74.367	74.868	75.369	75.870	76.370	76.871	77.372	77.873	78.374
29	71.101	71.602	72.103	72.604	73.105	73.606	74.107	74.608	75.109	75.609	76.110	76.611	77.112	77.613	78.114
30	70.839	71.341	71.842	72.343	72.844	73.345	73.846	74.347	74.848	75.349	75.850	76.351	76.852	77.353	77.854
31	70.578	71.079	71.580	72.082	72.583	73.084	73.585	74.086	74.587	75.088	75.589	76.090	76.592	77.093	77.594
32	70.316	70.817	71.319	71.820	72.321	72.822	73.324	73.825	74.326	74.827	75.328	75.829	76.330	76.832	77.333
33	70.053	70.555	71.056	71.558	72.059	72.560	73.062	73.563	74.064	74.565	75.067	75.568	76.069	76.570	77.071
34	69.791	70.292	70.797	71.295	71.796	72.298	72.799	73.301	73.802	74.303	74.805	75.306	75.807	76.308	76.810
35	69.527	70.029	70.530	71.032	71.533	72.035	72.536	73.038	73.539	74.041	74.542	75.044	75.545	76.048	76.548
36	69.263	69.765	70.267	70.768	71.270	71.772	72.273	72.775	73.276	73.778	74.279	74.781	75.282	75.784	76.285
37	68.999	69.501	70.003	70.504	71.006	71.508	72.010	72.511	73.013	73.514	74.016	74.518	75.019	75.521	76.022
38	68.734	69.236	69.738	70.240	70.742	71.244	71.745	72.247	72.749	73.251	73.752	74.254	74.756	75.257	75.759
39	68.469	68.971	69.473	69.975	70.477	70.979	71.481	71.983	72.485	72.986	73.488	73.990	74.492	74.993	75.495
40	68.203	68.705	69.207	69.710	70.212	70.714	71.216	71.718	72.220	72.722	73.224	73.725	74.227	74.729	75.231
41	67.937	68.439	68.941	69.444	69.946	70.448	70.950	71.452	71.954	72.456	72.958	73.460	73.962	74.464	74.966
42	67.670	68.172	68.675	69.177	69.680	70.182	70.684	71.186	71.689	72.191	72.693	73.195	73.697	74.199	74.701
43	67.403	67.905	68.408	68.910	69.413	69.915	70.418	70.920	71.422	71.925	72.427	72.929	73.431	73.933	74.436
44	67.135	67.638	68.140	68.643	69.146	69.648	70.151	70.653	71.156	71.658	72.160	72.663	73.165	73.667	74.170
45	66.867	67.369	67.872	68.375	68.878	69.380	69.883	70.386	70.888	71.391	71.893	72.396	72.898	73.401	73.903
46	66.598	67.101	67.604	68.107	68.609	69.112	69.615	70.118	70.621	71.123	71.626	72.129	72.631	73.134	73.636
47	66.328	66.831	67.335	67.838	68.341	68.844	69.347	69.850	70.352	70.855	71.358	71.861	72.363	72.866	73.369
48	66.058	66.562	67.065	67.568	68.071	68.574	69.078	69.581	70.084	70.587	71.090	71.592	72.095	72.598	73.101
49	65.788	66.291	66.795	67.298	67.801	68.305	68.808	69.311	69.814	70.318	70.821	71.324	71.827	72.330	72.833
50	65.517	66.020	66.524	67.028	67.531	68.035	68.538	69.041	69.545	70.048	70.551	71.054	71.558	72.061	72.564
51	65.245	65.749	66.253	66.756	67.260	67.764	68.267	68.771	69.274	69.778	70.281	70.785	71.288	71.791	72.294
52	64.973	65.477	65.981	66.485	66.989	67.492	67.996	68.500	69.004	69.507	70.011	70.514	71.018	71.521	72.024
53	64.700	65.204	65.708	66.212	66.716	67.221	67.724	68.228	68.732	69.236	69.740	70.243	70.747	71.251	71.754
54	64.426	64.931	65.435	65.940	66.444	66.948	67.452	67.956	68.460	68.964	69.468	69.972	70.476	70.980	71.483
55	64.152	64.657	65.162	65.666	66.171	66.675	67.179	67.684	68.188	68.692	69.196	69.700	70.204	70.708	71.212
56	63.878	64.383	64.887	65.392	65.897	66.401	66.906	67.410	67.915	68.419	68.923	69.428	69.932	70.436	70.940
57	63.602	64.107	64.613	65.118	65.622	66.127	66.632	67.137	67.641	68.146	68.650	69.155	69.659	70.163	70.667
58	63.326	63.832	64.337	64.842	65.347	65.852	66.357	66.862	67.367	67.872	68.376	68.881	69.385	69.890	70.394
59	63.050	63.556	64.061	64.566	65.072	65.577	66.082	66.587	67.092	67.597	68.102	68.607	69.112	69.616	70.121
60	62.773	63.279	63.784	64.290	64.796	65.301	65.806	66.312	66.817	67.322	67.827	68.332	68.837	69.342	69.847

Center Distance Coefficient Table

N2-N1	Lp-N1														
	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186
1	85.750	86.250	86.750	87.250	87.750	88.250	88.750	89.250	89.750	90.250	90.750	91.250	91.750	92.250	92.750
2	85.500	86.000	86.500	87.000	87.500	88.000	88.500	89.000	89.500	90.000	90.500	91.000	91.500	92.000	92.500
3	85.249	85.749	86.249	86.749	87.249	87.749	88.249	88.749	89.249	89.749	90.249	90.749	91.249	91.749	92.249
4	84.998	85.498	85.998	86.498	86.998	87.498	87.998	88.498	88.998	89.498	89.998	90.498	90.998	91.498	91.998
5	84.747	85.247	85.747	86.247	86.747	87.247	87.747	88.247	88.747	89.247	89.747	90.247	90.747	91.247	91.747
6	84.495	84.995	85.495	85.995	86.495	86.995	87.495	87.995	88.495	88.995	89.495	89.995	90.495	90.995	91.495
7	84.243	84.743	85.243	85.743	86.243	86.743	87.243	87.743	88.243	88.743	89.243	89.744	90.244	90.744	91.244
8	83.991	84.491	84.991	85.491	85.991	86.491	86.991	87.491	87.991	88.491	88.991	89.491	89.991	90.492	90.992
9	83.738	84.238	84.738	85.238	85.738	86.239	86.739	87.239	87.739	88.239	88.739	89.239	89.739	90.239	90.739
10	83.485	83.985	84.485	84.986	85.486	85.986	86.486	86.986	87.486	87.986	88.486	88.986	89.486	89.986	90.486
11	83.232	83.732	84.232	84.732	85.232	85.733	86.233	86.733	87.233	87.733	88.233	88.733	89.233	89.733	90.233
12	82.978	83.479	83.979	84.479	84.979	85.479	85.979	86.479	86.979	87.480	87.980	88.480	88.980	89.480	89.980
13	82.725	83.225	83.725	84.225	84.725	85.225	85.725	86.226	86.726	87.226	87.726	88.226	88.726	89.226	89.727
14	82.470	82.971	83.471	83.971	84.471	84.971	85.471	85.972	86.472	86.972	87.472	87.972	88.472	88.973	89.473
15	82.216	82.716	83.216	83.716	84.217	84.717	85.217	85.717	86.217	86.718	87.218	87.718	88.218	88.718	89.219
16	81.961	82.461	82.961	83.462	83.962	84.462	84.962	85.463	85.963	86.463	86.963	87.463	87.964	88.464	88.964
17	81.706	82.206	82.706	83.206	83.707	84.207	84.707	85.208	85.708	86.208	86.708	87.208	87.709	88.209	88.709
18	81.450	81.950	82.451	82.951	83.451	83.952	84.452	84.952	85.452	85.953	86.453	86.953	87.454	87.954	88.454
19	81.194	81.694	82.195	82.695	83.195	83.696	84.196	84.696	85.197	85.697	86.197	86.698	87.198	87.698	88.199
20	80.938	81.438	81.939	82.439	82.939	83.440	83.940	84.440	84.941	85.441	85.941	86.442	86.942	87.442	87.943
21	80.681	81.182	81.682	82.182	82.683	83.183	83.684	84.184	84.684	85.185	85.685	86.186	86.686	87.186	87.687
22	80.424	80.925	81.425	81.926	82.426	82.927	83.427	83.927	84.428	84.928	85.429	85.929	86.430	86.930	87.430
23	80.167	80.667	81.168	81.668	82.169	82.669	83.170	83.670	84.171	84.671	85.172	85.672	86.173	86.673	87.174
24	79.909	80.410	80.910	81.411	81.911	82.412	82.912	83.413	83.913	84.414	84.915	85.415	85.915	86.416	86.917
25	79.651	80.152	80.652	81.153	81.653	82.154	82.655	83.155	83.656	84.156	84.657	85.157	85.658	86.159	86.659
26	79.393	79.893	80.394	80.895	81.395	81.896	82.397	82.897	83.398	83.898	84.399	84.900	85.400	85.901	86.401
27	79.134	79.634	80.135	80.636	81.137	81.637	82.138	82.639	83.139	83.640	84.141	84.641	85.142	85.643	86.143
28	78.875	79.375	79.876	80.377	80.878	81.378	81.879	82.380	82.881	83.381	83.882	84.383	84.883	85.384	85.885
29	78.615	79.116	79.617	80.117	80.618	81.119	81.620	82.121	82.621	83.122	83.623	84.124	84.625	85.125	85.626
30	78.355	78.856	79.357	79.858	80.359	80.859	81.360	81.861	82.362	82.863	83.364	83.865	84.365	84.866	85.367
31	78.095	78.596	79.097	79.598	80.098	80.599	81.100	81.601	82.102	82.603	83.104	83.605	84.106	84.607	85.107
32	77.834	78.335	78.836	79.337	79.838	80.339	80.840	81.341	81.842	82.343	82.844	83.345	83.846	84.347	84.848
33	77.573	78.074	78.575	79.076	79.577	80.078	80.579	81.080	81.581	82.082	82.583	83.084	83.585	84.086	84.587
34	77.311	77.812	78.313	78.815	79.316	79.817	80.318	80.819	81.320	81.821	82.323	82.824	83.325	83.826	84.327
35	77.049	77.550	78.052	78.553	79.054	79.555	80.057	80.558	81.059	81.560	82.061	82.562	83.064	83.565	84.066
36	76.787	77.288	77.789	78.291	78.792	79.293	79.795	80.296	80.797	81.299	81.800	82.301	82.802	83.303	83.805
37	76.524	77.025	77.527	78.028	78.530	79.031	79.532	80.034	80.535	81.036	81.538	82.039	82.540	83.042	83.543
38	76.261	76.762	77.264	77.765	78.267	78.768	79.270	79.771	80.273	80.774	81.275	81.777	82.278	82.779	83.281
39	75.997	76.499	77.000	77.502	78.003	78.505	79.007	79.508	80.010	80.511	81.013	81.514	82.015	82.517	83.018
40	75.733	76.235	76.736	77.238	77.740	78.241	78.743	79.245	79.746	80.248	80.749	81.251	81.752	82.254	82.755
41	75.468	75.970	76.472	76.974	77.475	77.977	78.479	78.981	79.482	79.984	80.486	80.987	81.489	81.991	82.492
42	75.203	75.705	76.207	76.709	77.211	77.713	78.215	78.716	79.218	79.720	80.222	80.724	81.225	81.727	82.229
43	74.938	75.440	75.942	76.444	76.946	77.448	77.950	78.452	78.954	79.456	79.957	80.459	80.961	81.463	81.965
44	74.672	75.174	75.676	76.178	76.680	77.183	77.685	78.187	78.689	79.191	79.693	80.195	80.696	81.198	81.700
45	74.405	74.908	75.410	75.912	76.415	76.917	77.419	77.921	78.423	78.925	79.427	79.929	80.431	80.933	81.435
46	74.139	74.641	75.144	75.646	76.148	76.651	77.153	77.655	78.157	78.660	79.162	79.664	80.166	80.668	81.170
47	73.871	74.374	74.876	75.379	75.881	76.384	76.886	77.389	77.891	78.393	78.896	79.398	79.900	80.402	80.904
48	73.604	74.106	74.609	75.112	75.614	76.117	76.619	77.122	77.624	78.127	78.629	79.131	79.634	80.136	80.638
49	73.335	73.838	74.341	74.844	75.346	75.849	76.352	76.854	77.357	77.860	78.362	78.865	79.367	79.869	80.372
50	73.067	73.570	74.073	74.575	75.078	75.581	76.084	76.587	77.089	77.592	78.095	78.597	79.100	79.602	80.105
51	72.797	73.301	73.804	74.307	74.810	75.313	75.816	76.318	76.821	77.324	77.827	78.329	78.832	79.335	79.837
52	72.528	73.031	73.534	74.037	74.541	75.044	75.547	76.050	76.553	77.056	77.558	78.061	78.564	79.067	79.570
53	72.258	72.761	73.264	73.768	74.271	74.774	75.277	75.780	76.284	76.787	77.290	77.793	78.296	78.799	79.301
54	71.987	72.490	72.994	73.497	74.001	74.504	75.008	75.511	76.014	76.517	77.020	77.524	78.027	78.530	79.033
55	71.716	72.219	72.723	73.227	73.730	74.234	74.737	75.241	75.744	76.247	76.751	77.254	77.757	78.260	78.764
56	71.444	71.948	72.452	72.955	73.459	73.963	74.466	74.970	75.474	75.977	76.481	76.984	77.487	77.991	78.494
57	71.171	71.676	72.180	72.684	73.187	73.691	74.195	74.699	75.203	75.706	76.290	76.713	77.217	77.720	78.224
58	70.899	71.403	71.907	72.411	72.915	73.419	73.923	74.427	74.931	75.435	75.939	76.442	76.946	77.450	77.953
59	70.625	71.130	71.634	72.138	72.643	73.147	73.651	74.155	74.659	75.163	75.667	76.171	76.675	77.179	77.682
60	70.351	70.856	71.361	71.865	72.370	72.874	73.378	73.882	74.387	74.891	75.395	75.899	76.403	76.907	77.411

Center Distance Coefficient Table

N2-N1	Lp-N1														
	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201
1	93.250	93.750	94.250	94.750	95.250	95.750	96.250	96.750	97.250	97.750	98.250	98.750	99.250	99.750	100.250
2	93.000	93.500	94.000	94.500	95.000	95.500	96.000	96.500	97.000	97.500	98.000	98.500	99.000	99.500	100.000
3	92.749	93.249	93.749	94.249	94.749	95.249	95.749	96.249	96.749	97.249	97.749	98.249	98.749	99.249	99.749
4	92.498	92.998	93.498	93.998	94.498	94.998	95.498	95.998	96.498	96.998	97.498	97.998	98.498	98.998	99.498
5	92.247	92.747	93.247	93.747	94.247	94.747	95.247	95.747	96.247	96.747	97.247	97.747	98.247	98.747	99.247
6	91.995	92.496	92.996	93.496	93.996	94.496	94.996	95.496	95.996	96.496	96.996	97.496	97.996	98.496	98.996
7	91.744	92.244	92.744	93.244	93.744	94.244	94.744	95.244	95.744	96.244	96.744	97.244	97.744	98.244	98.744
8	91.492	91.992	92.492	92.992	93.492	93.992	94.492	94.992	95.492	95.992	96.492	96.992	97.492	97.992	98.492
9	91.239	91.739	92.239	92.739	93.239	93.740	94.240	94.740	95.240	95.740	96.240	96.740	97.240	97.740	98.240
10	90.987	91.487	91.987	92.487	92.987	93.487	93.987	94.487	94.987	95.487	95.987	96.487	96.987	97.487	97.988
11	90.734	91.234	91.734	92.234	92.734	93.234	93.734	94.234	94.734	95.234	95.734	96.235	96.735	97.235	97.735
12	90.480	90.980	91.480	91.981	92.481	92.981	93.481	93.981	94.481	94.981	95.481	95.981	96.482	96.982	97.482
13	90.227	90.727	91.227	91.727	92.227	92.727	93.227	93.728	94.228	94.728	95.228	95.728	96.228	96.728	97.228
14	89.973	90.473	90.973	91.473	91.973	92.474	92.974	93.474	93.974	94.474	94.974	95.474	95.975	96.475	96.975
15	89.719	90.219	90.719	91.219	91.719	92.220	92.720	93.220	93.720	94.220	94.720	95.221	95.721	96.221	96.721
16	89.464	89.964	90.465	90.965	91.465	91.965	92.465	92.966	93.466	93.966	94.466	94.966	95.466	95.967	96.467
17	89.209	89.710	90.210	90.710	91.210	91.711	92.211	92.711	93.211	93.711	94.212	94.712	95.212	95.712	96.212
18	88.954	89.455	89.955	90.455	90.955	91.456	91.956	92.456	92.956	93.457	93.957	94.457	94.957	95.457	95.958
19	88.699	89.199	89.699	90.200	90.700	91.200	91.701	92.201	92.701	93.201	93.702	94.202	94.702	95.202	95.703
20	88.443	88.943	89.444	89.944	90.444	90.945	91.445	91.945	92.446	92.946	93.446	93.947	94.447	94.947	95.447
21	88.187	88.687	89.188	89.688	90.189	90.689	91.189	91.690	92.190	92.690	93.191	93.691	94.191	94.691	95.192
22	87.931	88.431	88.932	89.432	89.932	90.433	90.933	91.433	91.934	92.434	92.934	93.435	93.935	94.436	94.936
23	87.674	88.174	88.675	89.175	89.676	90.176	90.677	91.177	91.677	92.178	92.678	93.179	93.679	94.179	94.680
24	87.417	87.917	88.418	88.918	89.419	89.919	90.420	90.920	91.421	91.921	92.421	92.922	93.422	93.923	94.423
25	87.160	87.660	88.161	88.661	89.162	89.662	90.163	90.663	91.164	91.664	92.165	92.665	93.165	93.666	94.166
26	86.902	87.402	87.903	88.404	88.904	89.405	89.905	90.406	90.906	91.407	91.907	92.408	92.908	93.409	93.909
27	86.644	87.144	87.645	88.146	88.646	89.147	89.647	90.148	90.649	91.149	91.650	92.150	92.651	93.151	93.652
28	86.385	86.886	87.387	87.887	88.388	88.889	89.389	89.890	90.391	90.891	91.392	91.892	92.393	92.894	93.394
29	86.127	86.627	87.128	87.629	88.130	88.630	89.131	89.632	90.132	90.633	91.134	91.634	92.135	92.635	93.136
30	85.868	86.368	86.869	87.370	87.871	88.371	88.872	89.373	89.874	90.374	90.875	91.376	91.876	92.377	92.878
31	85.608	86.109	86.610	87.111	87.611	88.112	88.613	89.114	89.615	90.115	90.616	91.117	91.618	92.118	92.619
32	85.348	85.849	86.350	86.851	87.352	87.853	88.354	88.854	89.355	89.856	90.357	90.858	91.358	91.859	92.360
33	85.088	85.589	86.090	86.591	87.092	87.593	88.094	88.595	89.096	89.596	90.097	90.598	91.099	91.600	92.101
34	84.828	85.329	85.830	86.331	86.832	87.333	87.834	88.335	88.836	89.336	89.837	90.338	90.839	91.340	91.841
35	84.567	85.068	85.569	86.070	86.571	87.072	87.573	88.074	88.575	89.076	89.577	90.078	90.579	91.080	91.581
36	84.306	84.807	85.308	85.809	86.310	86.811	87.312	87.813	88.315	88.816	89.317	89.818	90.319	90.820	91.321
37	84.044	84.545	85.047	85.548	86.049	86.550	87.051	87.552	88.053	88.555	89.056	89.557	90.058	90.559	91.060
38	83.782	84.283	84.785	85.286	85.787	86.288	86.790	87.291	87.792	88.293	88.794	89.296	89.797	90.298	90.799
39	83.520	84.021	84.522	85.024	85.525	86.026	86.528	87.029	87.530	88.032	88.533	89.034	89.535	90.036	90.538
40	83.257	83.758	84.260	84.761	85.263	85.764	86.265	86.767	87.268	87.769	88.271	88.772	89.273	89.775	90.276
41	82.994	83.495	83.997	84.498	85.000	85.501	86.003	86.504	87.006	87.507	88.008	88.510	89.011	89.513	90.014
42	82.730	83.232	83.733	84.235	84.737	85.238	85.740	86.241	86.743	87.244	87.746	88.247	88.749	89.250	89.751
43	82.466	82.968	83.470	83.971	84.473	84.975	85.476	85.978	86.479	86.981	87.483	87.984	88.486	88.987	89.489
44	82.202	82.704	83.206	83.707	84.209	84.711	85.213	85.714	86.216	86.718	87.219	87.721	88.222	88.724	89.226
45	81.937	82.439	82.941	83.443	83.945	84.447	84.948	85.450	85.952	86.454	86.955	87.457	87.959	88.460	88.962
46	81.672	82.174	82.676	83.178	83.680	84.182	84.684	85.186	85.688	86.189	86.691	87.193	87.695	88.196	88.698
47	81.407	81.909	82.411	82.913	83.415	83.917	84.419	84.921	85.423	85.925	86.427	86.928	87.430	87.932	88.434
48	91.141	81.643	82.145	82.647	83.149	83.651	84.153	84.656	85.158	85.660	86.162	86.663	87.165	87.667	88.169
49	80.874	81.376	81.879	82.381	82.883	83.386	83.888	84.390	84.892	85.394	85.896	86.398	86.900	87.402	87.904
50	80.607	81.110	81.612	82.115	82.617	83.119	83.622	84.124	84.626	85.128	85.630	86.133	86.635	87.137	87.639
51	80.340	80.843	81.345	81.848	82.350	82.853	83.355	83.857	84.360	84.862	85.364	85.867	86.369	86.871	87.373
52	80.072	80.575	81.078	81.580	82.083	82.585	83.088	83.590	84.093	84.595	85.098	85.600	86.102	86.605	87.107
53	79.804	80.307	80.810	81.313	81.815	82.318	82.820	83.323	83.826	84.328	84.831	85.333	85.836	86.338	86.840
54	79.536	80.039	80.542	81.044	81.547	82.050	82.553	83.055	83.558	84.061	84.563	85.066	85.568	86.071	86.574
55	79.267	79.770	80.273	80.776	81.279	81.782	82.284	82.787	83.290	83.793	84.296	84.798	85.301	85.804	86.306
56	78.997	79.500	80.003	80.507	81.010	81.513	82.016	82.519	83.022	83.524	84.027	84.530	85.033	85.536	86.038
57	78.727	79.231	79.734	80.237	80.740	81.243	81.747	82.250	82.753	83.256	83.759	84.262	84.765	85.267	85.770
58	78.457	78.960	79.464	79.967	80.470	80.974	81.477	81.980	82.483	82.987	83.490	83.993	84.496	84.999	85.502
59	78.186	78.690	79.193	79.697	80.200	80.704	81.207	81.710	82.214	82.717	83.220	83.723	84.226	84.730	85.233
60	77.915	78.418	78.922	79.426	79.929	80.433	80.936	81.440	81.943	82.447	82.950	83.454	83.957	84.460	84.963

Center Distance Coefficient Table

N_2-N_1	L_p-N_1														
	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81
61	14.976	15.623	16.253	16.870	17.477	18.074	18.663	19.245	19.821	20.392	20.959	21.521	22.079	22.634	23.187
62	14.486	15.156	15.805	16.438	17.057	17.664	18.263	18.854	19.437	20.015	20.587	21.154	21.717	22.277	22.833
63	13.964	14.665	15.337	15.988	16.622	17.243	17.852	18.452	19.044	19.629	20.208	20.781	21.349	21.914	22.474
64	13.396	14.140	14.843	15.517	16.170	16.806	17.428	18.040	18.641	19.234	19.820	20.400	20.975	21.544	22.110
65		13.569	14.315	15.021	15.698	16.352	16.990	17.614	18.227	18.830	19.424	20.011	20.593	21.168	21.739
66			13.742	14.491	15.199	15.878	16.534	17.174	17.800	18.414	19.018	19.614	20.202	20.785	21.361
67				13.915	14.667	15.377	16.058	16.717	17.358	17.985	18.600	19.206	19.803	20.393	20.977
68					14.088	14.842	15.554	16.238	16.898	17.541	18.170	18.787	19.394	19.992	20.583
69						14.260	15.017	15.732	16.417	17.080	17.724	18.355	18.973	19.581	20.181
70							14.433	15.193	15.910	16.597	17.261	17.907	18.539	19.159	19.769
71								14.606	15.368	16.087	16.776	17.442	18.090	18.723	19.345
72									14.778	15.542	16.264	16.955	17.623	18.272	18.907
73										14.950	15.717	16.441	17.134	17.803	18.455
74											15.123	15.892	16.617	17.312	17.984
75												15.294	16.066	16.794	17.490
76													15.466	16.240	16.970
77														15.638	16.414
78															15.809
79															

N_2-N_1	L_p-N_1														
	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
61	23.736	24.282	24.827	25.369	25.909	26.448	26.984	27.519	28.053	28.585	29.116	29.646	30.175	30.702	31.229
62	23.386	23.936	24.484	25.029	25.572	26.113	26.652	27.189	27.725	28.259	28.792	29.324	29.854	30.384	30.912
63	23.031	23.585	24.136	24.685	25.231	25.774	26.316	26.856	27.394	27.931	28.466	28.999	29.531	30.062	30.592
64	22.671	23.229	23.784	24.336	24.885	25.432	25.977	26.519	27.060	27.598	28.136	28.671	29.205	29.738	30.270
65	22.305	22.868	23.427	23.982	24.535	25.085	25.633	26.178	26.722	27.263	27.803	28.340	28.877	29.412	29.945
66	21.933	22.501	23.064	23.624	24.181	24.734	25.285	25.834	26.380	26.924	27.466	28.006	28.545	29.082	29.617
67	21.554	22.127	22.696	23.260	23.821	24.379	24.933	25.485	26.034	26.581	27.126	27.669	28.210	28.749	29.287
68	21.168	21.747	22.321	22.891	23.456	24.018	24.577	25.132	25.685	26.235	26.782	27.328	27.872	28.413	28.953
69	20.774	21.360	21.940	22.515	23.085	23.652	24.215	24.774	25.330	25.884	26.435	26.983	27.530	28.074	28.616
70	20.370	20.964	21.551	22.132	22.708	23.280	23.847	24.411	24.971	25.528	26.083	26.634	27.184	27.731	28.276
71	19.956	20.558	21.153	21.742	22.324	22.901	23.474	24.042	24.607	25.168	25.726	26.281	26.834	27.384	27.932
72	19.530	20.143	20.747	21.343	21.932	22.516	23.094	23.668	24.237	24.803	25.365	25.924	26.480	27.033	27.584
73	19.091	19.716	20.330	20.935	21.532	22.123	22.708	23.287	23.862	24.432	24.998	25.561	26.121	26.678	27.232
74	18.637	19.275	19.901	20.516	21.123	21.721	22.313	22.899	23.479	24.055	24.626	25.194	25.758	26.318	26.876
75	18.164	18.818	19.458	20.085	20.702	21.310	21.910	22.503	23.090	23.672	24.248	24.821	25.389	25.954	26.515
76	17.669	18.344	19.000	19.642	20.270	20.888	21.498	22.099	22.693	23.281	23.863	24.441	25.014	25.584	26.149
77	17.146	17.847	18.524	19.182	19.825	20.455	21.075	21.685	22.287	22.883	23.472	24.055	24.634	25.208	25.778
78	16.588	17.323	18.025	18.704	19.363	20.008	20.640	21.261	21.872	22.476	23.072	23.662	24.247	24.827	25.402
79	15.981	16.762	17.499	18.203	18.884	19.545	20.191	20.824	21.446	22.059	22.664	23.261	23.852	24.438	25.019
80		16.152	16.936	17.675	18.381	19.063	19.727	20.374	21.008	21.632	22.246	22.852	23.450	24.043	24.629
81			16.324	17.110	17.850	18.559	19.243	19.908	20.556	21.192	21.817	22.432	23.039	23.639	24.232
82				16.495	17.283	18.026	18.737	19.422	20.088	20.739	21.376	22.002	22.618	23.227	23.828
83					16.666	17.457	18.202	18.914	19.601	20.269	20.921	21.559	22.187	22.805	23.414
84						16.837	17.631	18.378	19.091	19.780	20.450	21.103	21.743	22.372	22.991
85							17.009	17.804	18.553	19.269	19.959	20.630	21.285	21.926	22.556
86								17.180	17.977	18.728	19.446	20.138	20.810	21.467	22.109
87									17.351	18.150	18.903	19.623	20.317	20.991	21.648
88										17.522	18.323	19.078	19.799	20.495	21.171
89											17.692	18.496	19.253	19.976	20.673
90												17.862	18.669	19.427	20.152
91													18.033	18.841	19.602
92														18.203	19.014
93															18.374

Center Distance Coefficient Table

N2-N1	Lp-N1														
	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
61	31.754	32.279	32.803	33.326	33.848	34.370	34.891	35.411	35.931	36.450	36.968	37.488	38.003	38.520	39.037
62	31.439	31.965	32.490	33.015	33.538	34.061	34.583	35.104	35.625	36.145	36.664	37.183	37.702	38.219	38.737
63	31.121	31.648	32.175	32.701	33.226	33.750	34.273	34.796	35.317	35.838	36.359	36.879	37.398	37.917	38.435
64	30.800	31.330	31.858	32.385	32.911	33.437	33.961	34.485	35.008	35.530	36.052	36.573	37.093	37.613	38.132
65	30.477	31.008	31.538	32.067	32.595	33.121	33.647	34.172	34.696	35.220	35.743	36.265	36.786	37.307	37.827
66	30.151	30.684	31.216	31.746	32.276	32.804	33.331	33.858	34.383	34.908	35.432	35.955	36.477	36.999	37.520
67	29.823	30.358	30.891	31.423	31.954	32.484	33.013	33.541	34.068	34.594	35.119	35.643	36.167	36.690	37.212
68	29.491	30.028	30.563	31.097	31.630	32.162	32.692	33.221	33.750	34.277	34.804	35.329	35.854	36.378	36.902
69	29.157	29.696	30.233	30.769	31.304	31.837	32.369	32.900	33.430	33.959	34.487	35.014	35.540	36.065	36.590
70	28.819	29.360	29.900	30.438	30.974	31.510	32.043	32.576	33.108	33.638	34.167	34.696	35.223	35.750	36.276
71	28.478	29.021	29.563	30.104	30.642	31.179	31.715	32.250	32.783	33.315	33.846	34.376	34.905	35.433	35.960
72	28.133	28.679	29.224	29.766	30.307	30.846	31.384	31.921	32.456	32.989	33.522	34.054	34.584	35.113	35.642
73	27.784	28.333	28.880	29.425	29.969	30.510	31.050	31.589	32.126	32.661	33.196	33.729	34.261	34.792	35.322
74	27.431	27.983	28.533	29.081	29.627	30.171	30.713	31.254	31.793	32.331	32.867	33.402	33.935	34.468	34.999
75	27.074	27.629	28.183	28.733	29.282	29.829	30.373	30.916	31.457	31.997	32.535	33.072	33.607	34.142	34.675
76	26.712	27.271	27.828	28.382	28.933	29.482	30.030	30.575	31.119	31.660	32.201	32.739	33.277	33.813	34.348
77	26.345	26.908	27.468	28.026	28.580	29.133	29.683	30.231	30.777	31.321	31.863	32.404	32.944	33.482	34.018
78	25.973	26.540	27.104	27.665	28.223	28.779	29.332	29.883	30.431	30.978	31.523	32.066	32.607	33.147	33.686
79	25.595	26.167	26.735	27.300	27.862	28.421	28.977	29.531	30.082	30.632	31.179	31.725	32.268	32.810	33.351
80	25.211	25.788	26.361	26.930	27.496	28.059	28.618	29.175	29.730	30.282	30.832	31.380	31.926	32.471	33.013
81	24.820	25.403	25.981	26.555	27.125	27.692	28.255	28.815	29.373	29.928	30.481	31.032	31.581	32.127	32.672
82	24.422	25.011	25.595	26.174	26.748	27.319	27.887	28.451	29.012	29.571	30.127	30.680	31.232	31.781	32.329
83	24.016	24.612	25.202	25.786	26.366	26.942	27.514	28.082	28.647	29.209	29.768	30.325	30.879	31.431	31.981
84	23.601	24.204	24.801	25.392	25.977	26.558	27.135	27.708	28.277	28.843	29.405	29.965	30.523	31.078	31.631
85	23.176	23.788	24.392	24.990	25.582	26.169	26.750	27.328	27.901	28.471	29.038	29.602	30.162	30.721	31.276
86	22.741	23.362	23.975	24.580	25.179	25.772	26.360	26.942	27.521	28.095	28.666	29.233	29.798	30.359	30.918
87	22.292	22.925	23.548	24.162	24.768	25.368	25.962	26.550	27.134	27.713	28.289	28.860	29.428	29.994	30.556
88	21.830	22.475	23.109	23.733	24.348	24.956	25.557	26.151	26.741	27.325	27.906	28.482	29.054	29.623	30.189
89	21.350	22.011	22.657	23.292	23.918	24.534	25.143	25.745	26.341	26.931	27.517	28.098	28.675	29.248	29.818
90	20.851	21.530	22.192	22.840	23.476	24.103	24.721	25.330	25.933	26.530	27.121	27.708	28.290	28.868	29.442
91	20.329	21.029	21.709	22.373	23.022	23.660	24.288	24.906	25.517	26.121	26.719	27.312	27.899	28.482	29.060
92	19.777	20.505	21.207	21.889	22.554	23.205	23.844	24.472	25.092	25.704	26.309	26.908	27.501	28.090	28.673
93	19.187	19.951	20.681	21.385	22.068	22.735	23.387	24.027	24.657	25.278	25.891	26.497	27.097	27.691	28.280
94	18.544	19.359	20.126	20.857	21.563	22.248	22.916	23.569	24.210	24.841	25.463	26.078	26.685	27.285	27.881
95		18.714	19.531	20.300	21.034	21.741	22.427	23.096	23.751	24.393	25.026	25.649	26.264	26.872	27.474
96			18.884	19.704	20.474	21.210	21.919	22.606	23.277	23.933	24.576	25.210	25.834	26.450	27.059
97				19.055	19.876	20.649	21.386	22.096	22.785	23.457	24.114	24.759	25.394	26.019	26.636
98					19.225	20.049	20.823	21.561	22.273	22.964	23.637	24.296	24.942	25.577	26.204
99						19.395	20.221	20.997	21.737	22.450	23.142	23.817	24.477	25.124	25.761
100							19.565	20.393	21.170	21.913	22.628	23.321	23.997	24.658	25.307
101								19.735	20.564	21.344	22.088	22.805	23.499	24.177	24.839
102									19.904	20.736	21.518	22.263	22.981	23.678	24.356
103										20.074	20.908	21.691	22.438	23.158	23.855
104											20.243	21.079	21.864	22.613	23.334
105												20.413	21.251	22.038	22.788
106													20.582	21.422	22.211
107														20.752	21.594
108															20.921
109															
110															
111															
112															
113															
114															
115															
116															
117															
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Center Distance Coefficient Table

N2-N1	Lp-N1														
	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126
61	39.553	40.068	40.584	41.098	41.613	42.127	42.640	43.154	43.667	44.179	44.692	45.204	45.716	46.227	46.738
62	39.254	39.770	40.286	40.801	41.316	41.831	42.345	42.859	43.373	43.886	44.399	44.912	45.424	45.936	46.448
63	38.953	39.470	39.987	40.503	41.019	41.534	42.049	42.564	43.078	43.592	44.106	44.619	45.132	45.645	46.157
64	38.650	39.168	39.686	40.203	40.720	41.236	41.752	42.267	42.782	43.297	43.811	44.325	44.838	45.352	45.865
65	38.346	38.865	39.384	39.902	40.419	40.936	41.453	41.969	42.485	43.000	43.515	44.029	44.544	45.058	45.571
66	38.041	38.561	39.080	39.599	40.117	40.635	41.152	41.669	42.186	42.702	43.217	43.733	44.248	44.762	45.276
67	37.733	38.254	38.775	39.295	39.814	40.332	40.851	41.368	41.886	42.402	42.919	43.435	43.950	44.466	44.980
68	37.424	37.946	38.468	38.988	39.509	40.028	40.547	41.066	41.584	42.102	42.619	43.136	43.652	44.168	44.683
69	37.114	37.637	38.159	38.681	39.202	39.723	40.243	40.762	41.281	41.799	42.317	42.835	43.352	43.869	44.385
70	36.801	37.325	37.849	38.371	38.894	39.415	39.936	40.457	40.976	41.496	42.015	42.533	43.051	43.568	44.085
71	36.486	37.012	37.536	38.060	38.584	39.106	39.628	40.150	40.670	41.191	41.710	42.229	42.748	43.266	43.784
72	36.170	36.696	37.222	37.747	38.272	38.795	39.318	39.841	40.363	40.884	41.404	41.924	42.444	42.963	43.482
73	35.851	36.379	36.906	37.432	37.958	38.483	39.007	39.530	40.053	40.575	41.097	41.618	42.138	42.658	43.178
74	35.530	36.059	36.588	37.116	37.643	38.169	38.694	39.218	39.742	40.265	40.788	41.310	41.831	42.352	42.872
75	35.207	35.738	36.268	36.797	37.325	37.852	38.379	38.904	39.429	39.954	40.477	41.000	41.523	42.044	42.566
76	34.881	35.414	35.945	36.476	37.005	37.534	38.062	38.589	39.115	39.640	40.165	40.689	41.212	41.735	42.257
77	34.554	35.088	35.621	36.153	36.684	37.214	37.743	38.271	38.798	39.325	39.851	40.376	40.900	41.424	41.947
78	34.223	34.759	35.294	35.827	36.360	36.891	37.422	37.951	38.480	39.008	39.535	40.061	40.587	41.111	41.636
79	33.890	34.428	34.964	35.500	36.034	36.567	37.099	37.630	38.160	38.689	39.217	39.745	40.271	40.797	41.322
80	33.554	34.094	34.632	35.169	35.705	36.240	36.773	37.306	37.837	38.368	38.897	39.426	39.954	40.481	41.007
81	33.216	33.758	34.298	34.837	35.374	35.911	36.446	36.980	37.513	38.045	38.576	39.106	39.635	40.163	40.691
82	32.874	33.418	33.960	34.501	35.041	35.579	36.116	36.651	37.186	37.719	38.252	38.783	39.314	39.843	40.372
83	32.529	33.076	33.620	34.163	34.705	35.245	35.783	36.321	36.857	37.392	37.926	38.459	38.991	39.521	40.052
84	32.181	32.730	33.277	33.822	34.366	34.908	35.448	35.987	36.525	37.062	37.597	38.132	38.665	39.198	39.729
85	31.830	32.381	32.930	33.478	34.024	34.568	35.110	35.652	36.191	36.730	37.267	37.803	38.338	38.872	39.405
86	31.474	32.029	32.581	33.131	33.679	34.225	34.770	35.313	35.855	36.395	36.934	37.472	38.008	38.544	39.078
87	31.115	31.673	32.227	32.780	33.331	33.879	34.426	34.972	35.515	36.058	36.598	37.138	37.676	38.213	38.749
88	30.752	31.312	31.870	32.426	32.979	33.530	34.080	34.627	35.173	35.718	36.260	36.802	37.342	37.880	38.418
89	30.385	30.948	31.509	32.068	32.624	33.178	33.730	34.280	34.828	35.375	35.919	36.463	37.005	37.545	38.085
90	30.012	30.580	31.144	31.706	32.265	32.822	33.377	33.929	34.480	35.029	35.576	36.121	36.665	37.208	37.749
91	29.635	30.207	30.775	31.340	31.903	32.462	33.020	33.575	34.128	34.680	35.229	35.777	36.323	36.867	37.410
92	29.253	29.829	30.401	30.970	31.536	32.099	32.659	33.218	33.774	34.327	34.879	35.429	35.978	36.524	37.069
93	28.865	29.445	30.022	30.595	31.164	31.731	32.295	32.856	33.415	33.972	34.526	35.079	35.629	36.178	36.725
94	28.471	29.056	29.637	30.215	30.788	31.359	31.926	32.491	33.053	33.612	34.170	34.725	35.278	35.829	36.378
95	28.070	28.661	29.247	29.829	30.407	30.982	31.553	32.121	32.687	33.249	33.810	34.367	34.923	35.477	36.029
96	27.662	28.259	28.851	29.438	30.021	30.600	31.175	31.747	32.316	32.882	33.446	34.006	34.565	35.121	35.676
97	27.246	27.850	28.448	29.041	29.629	30.213	30.792	31.369	31.941	32.511	33.078	33.642	34.203	34.762	35.319
98	26.822	27.433	28.038	28.637	29.231	29.820	30.404	30.985	31.562	32.135	32.705	33.273	33.838	34.400	34.960
99	26.389	27.008	27.620	28.226	28.826	29.420	30.010	30.595	31.177	31.754	32.329	32.900	33.468	34.033	34.596
100	25.945	26.573	27.194	27.807	28.414	29.014	29.610	30.200	30.787	31.369	31.947	32.522	33.094	33.663	34.229
101	25.489	26.128	26.758	27.379	27.993	28.601	29.203	29.799	30.390	30.977	31.560	32.140	32.715	33.288	33.857
102	25.020	25.671	26.311	26.942	27.565	28.180	28.788	29.391	29.988	30.580	31.168	31.752	32.332	32.908	33.482
103	24.535	25.200	25.853	26.494	27.126	27.750	28.366	28.976	29.579	30.177	30.770	31.359	31.943	32.524	33.101
104	24.034	24.715	25.381	26.035	26.678	27.311	27.935	28.552	29.163	29.767	30.366	30.960	31.549	32.135	32.716
105	23.511	24.212	24.894	25.562	26.217	26.860	27.494	28.120	28.738	29.350	29.955	30.555	31.149	31.740	32.326
106	22.963	23.687	24.389	25.073	25.743	26.398	27.043	27.678	28.305	28.924	29.536	30.142	30.743	31.339	31.930
107	22.384	23.138	23.864	24.567	25.253	25.923	26.580	27.226	27.862	28.490	29.110	29.723	30.330	30.932	31.528
108	21.765	22.558	23.313	24.040	24.745	25.432	26.103	26.761	27.408	28.046	28.674	29.295	29.909	30.517	31.120
109	21.090	21.936	22.731	23.488	24.217	24.923	25.611	26.283	26.943	27.591	28.229	28.859	29.481	30.096	30.705
110		21.260	22.108	22.904	23.663	24.393	25.100	25.790	26.463	27.124	27.773	28.412	29.043	29.666	30.282
111			21.429	22.279	23.077	23.837	24.569	25.278	25.968	26.643	27.305	27.955	28.596	29.227	29.851
112				21.598	22.450	23.250	24.012	24.745	25.455	26.147	26.823	27.486	28.137	28.779	29.411
113					21.768	22.621	23.423	24.186	24.921	25.632	26.325	27.003	27.667	28.319	28.962
114						21.937	22.792	23.595	24.360	25.096	25.809	26.504	27.182	27.847	28.501
115							22.106	22.963	23.768	24.535	25.272	25.986	26.682	27.362	28.028
116								22.275	23.134	23.941	24.709	25.448	26.163	26.860	27.541
117									22.443	23.304	24.113	24.882	25.623	26.340	27.038
118										22.612	23.475	24.285	25.056	25.798	26.516
119											22.781	23.646	24.457	25.230	25.973
120												22.949	23.816	24.630	25.404

Center Distance Coefficient Table

N2-N1	Lp-N1														
	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141
61	47.249	47.760	48.271	48.781	49.291	49.801	50.311	50.820	51.330	51.839	52.348	52.856	53.365	53.873	54.382
62	46.960	47.471	47.982	48.493	49.004	49.514	50.024	50.534	51.044	51.553	52.062	52.572	53.081	53.589	54.098
63	46.669	47.181	47.693	48.204	48.715	49.226	49.736	50.247	50.757	51.267	51.777	52.286	52.795	53.305	53.814
64	46.377	46.890	47.402	47.914	48.425	48.936	49.448	49.958	50.469	50.979	51.490	52.000	52.509	53.019	53.528
65	46.084	46.597	47.110	47.622	48.134	48.646	49.158	49.669	50.180	50.691	51.202	51.712	52.222	52.732	53.242
66	45.790	46.304	46.817	47.330	47.843	48.355	48.867	49.379	49.891	50.402	50.913	51.424	51.934	52.445	52.955
67	45.495	46.009	46.523	47.036	47.550	48.063	48.575	49.088	49.600	50.112	50.623	51.135	51.646	52.157	52.667
68	45.198	45.713	46.228	46.742	47.256	47.769	48.282	48.795	49.308	49.820	50.332	50.844	51.356	51.867	52.378
69	44.901	45.416	45.931	46.446	46.960	47.475	47.988	48.502	49.015	49.528	50.041	50.553	51.065	51.577	52.088
70	44.602	45.118	45.634	46.149	46.664	47.179	47.693	48.207	48.721	49.235	49.748	50.261	50.773	51.286	51.798
71	44.301	44.818	45.335	45.851	46.367	46.882	47.397	47.912	48.426	48.940	49.454	49.967	50.480	50.993	51.506
72	44.000	44.517	45.035	45.551	46.068	46.584	47.099	47.615	48.130	48.644	49.159	49.673	50.186	50.700	51.213
73	43.697	44.215	44.733	45.251	45.768	46.284	46.801	47.317	47.832	48.348	48.863	49.377	49.891	50.405	50.919
74	43.392	43.911	44.430	44.948	45.466	45.984	46.501	47.018	47.534	48.050	48.565	49.080	49.595	50.110	50.624
75	43.086	43.606	44.126	44.645	45.164	45.682	46.200	46.717	47.234	47.751	48.267	48.783	49.298	49.813	50.328
76	42.779	43.300	43.820	44.340	44.860	45.379	45.897	46.415	46.933	47.450	47.967	48.484	49.000	49.516	50.031
77	42.470	42.992	43.513	44.034	44.554	45.074	45.593	46.112	46.631	47.149	47.666	48.183	48.700	49.217	49.733
78	42.159	42.682	43.204	43.726	44.247	44.768	45.288	45.808	46.327	46.846	47.364	47.882	48.399	48.917	49.433
79	41.847	42.371	42.894	43.417	43.939	44.460	44.981	45.502	46.022	46.542	47.061	47.579	48.097	48.615	49.133
80	41.533	42.058	42.582	43.106	43.629	44.152	44.673	45.195	45.716	46.236	46.756	47.275	47.794	48.313	48.831
81	41.217	41.744	42.269	42.794	43.318	43.841	44.364	44.886	45.408	45.929	46.450	46.970	47.490	48.009	48.528
82	40.900	41.427	41.954	42.479	43.005	43.529	44.053	44.576	45.099	45.621	46.142	46.663	47.184	47.704	48.223
83	40.581	41.109	41.637	42.164	42.690	43.215	43.740	44.264	44.788	45.311	45.833	46.355	46.877	47.397	47.918
84	40.260	40.789	41.318	41.846	42.373	42.900	43.426	43.951	44.476	45.000	45.523	46.046	46.568	47.090	47.611
85	39.936	40.467	40.997	41.527	42.055	42.583	43.110	43.636	44.162	44.687	45.211	45.735	46.258	46.780	47.302
86	39.611	40.144	40.675	41.206	41.735	42.264	42.792	43.320	43.846	44.372	44.897	45.422	45.946	46.470	46.993
87	39.284	39.818	40.351	40.882	41.413	41.943	42.473	43.001	43.529	44.056	44.582	45.108	45.633	46.158	46.681
88	38.954	39.490	40.024	40.557	41.090	41.621	42.151	42.681	43.210	43.738	44.266	44.792	45.318	45.844	46.369
89	38.623	39.159	39.695	40.230	40.764	41.296	41.828	42.359	42.889	43.419	43.947	44.475	45.002	45.529	46.054
90	38.288	38.827	39.364	39.901	40.436	40.970	41.503	42.035	42.567	43.097	43.627	44.156	44.684	45.212	45.739
91	37.952	38.492	39.031	39.569	40.106	40.641	41.176	41.710	42.242	42.774	43.305	43.835	44.365	44.893	45.421
92	37.613	38.155	38.696	39.235	39.773	40.311	40.847	41.382	41.916	42.449	42.981	43.513	44.043	44.573	45.102
93	37.271	37.815	38.358	38.899	39.439	39.978	40.515	41.052	41.588	42.122	42.656	43.188	43.720	44.251	44.781
94	36.926	37.472	38.017	38.560	39.102	39.642	40.182	40.720	41.257	41.793	42.328	42.862	43.395	43.927	44.459
95	36.579	37.127	37.674	38.219	38.762	39.305	39.846	40.386	40.924	41.462	41.998	42.534	43.068	43.602	44.134
96	36.228	36.779	37.327	37.875	38.420	38.965	39.507	40.049	40.589	41.128	41.666	42.203	42.739	43.274	43.808
97	35.874	36.427	36.978	37.528	38.076	38.622	39.166	39.710	40.252	40.793	41.332	41.871	42.408	42.944	43.480
98	35.517	36.073	36.626	37.178	37.728	38.276	38.823	39.368	39.912	40.455	40.996	41.536	42.075	42.613	43.150
99	35.157	35.715	36.271	36.825	37.377	37.928	38.477	39.024	39.570	40.114	40.657	41.199	41.740	42.279	42.817
100	34.792	35.353	35.912	36.469	37.024	37.577	38.128	38.677	39.225	39.771	40.316	40.860	41.402	41.943	42.483
101	34.424	34.988	35.550	36.110	36.667	37.222	37.776	38.327	38.877	39.426	39.972	40.518	41.062	41.605	42.146
102	34.052	34.619	35.184	35.747	36.307	36.865	37.421	37.974	38.527	39.077	39.626	40.173	40.719	41.264	41.807
103	33.675	34.246	34.814	35.380	35.943	36.504	37.062	37.619	38.173	38.726	39.277	39.826	40.374	40.921	41.466
104	33.294	33.869	34.440	35.009	35.575	36.139	36.700	37.259	37.817	38.372	38.925	39.477	40.027	40.575	41.122
105	32.908	33.487	34.062	34.634	35.204	35.771	36.335	36.897	37.457	38.014	38.570	39.124	39.676	40.227	40.775
106	32.517	33.100	33.679	34.255	34.828	35.398	35.966	36.531	37.093	37.654	38.212	38.768	39.323	39.875	40.426
107	32.120	32.708	33.291	33.872	34.448	35.022	35.593	36.161	36.726	37.290	37.851	38.409	38.966	39.521	40.074
108	31.717	32.310	32.898	33.483	34.064	34.641	35.215	35.787	36.356	36.922	37.486	38.047	38.607	39.164	39.720
109	31.308	31.906	32.500	33.089	33.674	34.256	34.834	35.409	35.981	36.550	37.117	37.682	38.244	38.804	39.362
110	30.892	31.496	32.095	32.689	33.279	33.865	34.447	35.026	35.602	36.175	36.745	37.312	37.877	38.440	39.001
111	30.468	31.079	31.684	32.284	32.879	33.469	34.056	34.639	35.219	35.795	36.369	36.939	37.507	38.073	38.636
112	30.036	30.654	31.266	31.871	32.472	33.068	33.659	34.247	34.831	35.411	35.988	36.562	37.133	37.702	38.268
113	29.595	30.221	30.840	31.452	32.059	32.660	33.257	33.849	34.438	35.022	35.603	36.181	36.756	37.328	37.897
114	29.144	29.779	30.406	31.026	31.639	32.246	32.849	33.446	34.039	34.628	35.213	35.795	36.373	36.949	37.521
115	28.683	29.327	29.963	30.591	31.211	31.825	32.434	33.037	33.635	34.229	34.819	35.404	35.987	36.566	37.142
116	28.208	28.864	29.510	30.146	30.775	31.397	32.012	32.621	33.225	33.824	34.418	35.009	35.595	36.178	36.758
117	27.720	28.388	29.045	29.692	30.330	30.959	31.582	32.198	32.808	33.413	34.012	34.608	35.199	35.786	36.370
118	27.216	27.899	28.569	29.227	29.875	30.513	31.144	31.767	32.384	32.995	33.600	34.201	34.797	35.389	35.977
119	26.693	27.394	28.078	28.749	29.408	30.057	30.697	31.328	31.952	32.570	33.182	33.788	34.389	34.986	35.579
120	26.149	26.870	27.571	28.258	28.929	29.590	30.239	30.880	31.512	32.137	32.756	33.368	33.975	34.577	35.175

Center Distance Coefficient Table

N2-N1	Lp-N1														
	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156
61	54.890	55.398	55.905	56.413	56.920	57.428	57.935	58.442	58.949	59.456	59.963	60.469	60.976	61.482	61.989
62	54.606	55.115	55.623	56.131	56.639	57.146	57.654	58.161	58.669	59.176	59.683	60.190	60.697	61.203	61.710
63	54.322	54.831	55.340	55.848	56.356	56.864	57.372	57.880	58.387	58.895	59.402	59.909	60.417	60.923	61.430
64	54.038	54.547	55.055	55.564	56.073	56.581	57.089	57.597	58.105	58.613	59.121	59.628	60.136	60.643	61.150
65	53.752	54.261	54.771	55.280	55.789	56.297	56.806	57.314	57.823	58.331	58.839	59.346	59.854	60.362	60.869
66	53.465	53.975	54.485	54.994	55.503	56.013	56.522	57.030	57.539	58.047	58.556	59.064	59.572	60.080	60.588
67	53.178	53.688	54.198	54.708	55.218	55.727	56.236	56.746	57.255	57.763	58.272	58.781	59.289	59.797	60.305
68	52.889	53.400	53.910	54.421	54.931	55.441	55.950	56.460	56.969	57.479	57.988	58.496	59.005	59.514	60.022
69	52.600	53.111	53.622	54.133	54.643	55.154	55.664	56.174	56.683	57.193	57.702	58.211	58.721	59.229	59.738
70	52.310	52.821	53.333	53.844	54.355	54.865	55.376	55.886	56.396	56.906	57.416	57.926	58.435	58.944	59.454
71	52.018	52.530	53.042	53.554	54.065	54.576	55.087	55.598	56.109	56.619	57.129	57.639	58.149	58.659	59.168
72	51.726	52.238	52.751	53.263	53.775	54.286	54.798	55.309	55.820	56.331	56.841	57.352	57.862	58.372	58.882
73	51.433	51.946	52.459	52.971	53.483	53.996	54.507	55.019	55.531	56.042	56.553	57.064	57.574	58.085	58.595
74	51.138	51.652	52.165	52.678	53.191	53.704	54.216	54.728	55.240	55.752	56.263	56.774	57.285	57.796	58.307
75	50.843	51.357	51.871	52.385	52.898	53.411	53.924	54.436	54.949	55.461	55.973	56.484	56.996	57.507	58.018
76	50.546	51.061	51.575	52.090	52.604	53.117	53.631	54.144	54.656	55.169	55.681	56.194	56.705	57.217	57.729
77	50.249	50.764	51.279	51.794	52.308	52.822	53.336	53.850	54.363	54.876	55.389	55.902	56.414	56.926	57.438
78	49.950	50.466	50.981	51.497	52.012	52.527	53.041	53.555	54.069	54.583	55.096	55.609	56.122	56.634	57.147
79	49.650	50.166	50.683	51.199	51.714	52.230	52.745	53.259	53.774	54.288	54.802	55.315	55.829	56.342	56.854
80	49.349	49.866	50.383	50.899	51.416	51.932	52.447	52.962	53.477	53.992	54.506	55.021	55.534	56.048	56.561
81	49.046	49.564	50.082	50.599	51.116	51.633	52.149	52.665	53.180	53.695	54.210	54.725	55.239	55.753	56.267
82	48.743	49.261	49.780	50.298	50.815	51.332	51.849	52.366	52.882	53.398	53.913	54.428	54.943	55.458	55.972
83	48.438	48.957	49.476	49.995	50.513	51.031	51.548	52.066	52.582	53.099	53.615	54.130	54.646	55.161	55.676
84	48.132	48.652	49.172	49.691	50.210	50.728	51.247	51.764	52.282	52.799	53.315	53.832	54.348	54.863	55.379
85	47.824	48.345	48.866	49.386	49.905	50.425	50.943	51.462	51.980	52.498	53.015	53.532	54.048	54.565	55.081
86	47.515	48.037	48.558	49.079	49.600	50.120	50.639	51.158	51.677	52.195	52.713	53.231	53.748	54.265	54.781
87	47.205	47.727	48.250	48.771	49.293	49.813	50.334	50.853	51.373	51.892	52.410	52.929	53.447	53.964	54.481
88	46.893	47.417	47.940	48.462	48.984	49.506	50.027	50.547	51.068	51.587	52.107	52.625	53.144	53.662	54.180
89	46.580	47.104	47.628	48.152	48.674	49.197	49.719	50.240	50.761	51.281	51.801	52.321	52.840	53.359	53.877
90	46.265	46.790	47.315	47.840	48.363	48.887	49.409	49.931	50.453	50.974	51.495	52.015	52.535	53.055	53.574
91	45.948	46.475	47.001	47.526	48.051	48.575	49.098	49.621	50.144	50.666	51.187	51.709	52.229	52.749	53.269
92	45.630	46.158	46.685	47.211	47.737	48.262	48.786	49.310	49.833	50.356	50.879	51.400	51.922	52.443	52.963
93	45.311	45.839	46.367	46.895	47.421	47.947	48.473	48.997	49.522	50.045	50.568	51.091	51.613	52.135	52.656
94	44.989	45.519	46.048	46.576	47.104	47.631	48.157	48.683	49.208	49.733	50.257	50.780	51.303	51.826	52.348
95	44.666	45.197	45.727	46.257	46.785	47.313	47.841	48.367	48.893	49.419	49.944	50.468	50.992	51.515	52.038
96	44.341	44.873	45.405	45.935	46.465	46.994	47.522	48.050	48.577	49.104	49.629	50.155	50.679	51.203	51.727
97	44.014	44.548	45.080	45.612	46.143	46.673	47.203	47.731	48.259	48.787	49.314	49.840	50.365	50.890	51.415
98	43.685	44.220	44.754	45.287	45.819	46.351	46.881	47.411	47.940	48.468	48.996	49.523	50.050	50.576	51.101
99	43.354	43.891	44.426	44.960	45.494	46.026	46.558	47.089	47.619	48.149	48.677	49.205	49.733	50.260	50.786
100	43.021	43.559	44.096	44.631	45.166	45.700	46.233	46.765	47.296	47.827	48.357	48.886	49.415	49.942	50.470
101	42.686	43.226	43.764	44.301	44.837	45.372	45.906	46.440	46.972	47.504	48.035	48.565	49.095	49.623	50.152
102	42.349	42.890	43.429	43.968	44.505	45.042	45.578	46.112	46.646	47.179	47.711	48.242	48.773	49.303	49.832
103	42.009	42.552	43.093	43.633	44.172	44.710	45.247	45.783	46.318	46.852	47.386	47.918	48.450	48.981	49.511
104	41.667	42.212	42.754	43.296	43.837	44.376	44.914	45.452	45.988	46.524	47.058	47.592	48.125	48.657	49.188
105	41.323	41.869	42.414	42.957	43.499	44.040	44.580	45.119	45.656	46.193	46.729	47.264	47.798	48.331	48.864
106	40.976	41.524	42.070	42.615	43.159	43.702	44.243	44.784	45.323	45.861	46.398	46.934	47.470	48.004	48.538
107	40.626	41.176	41.724	42.271	42.817	43.361	43.904	44.446	44.987	45.527	46.065	46.603	47.140	47.675	48.210
108	40.273	40.825	41.376	41.925	42.472	43.018	43.563	44.107	44.649	45.190	45.730	46.269	46.807	47.344	47.881
109	39.918	40.472	41.025	41.576	42.125	42.673	43.220	43.765	44.309	44.852	45.393	45.934	46.473	47.012	47.549
110	39.559	40.116	40.671	41.224	41.775	42.325	42.874	43.421	43.966	44.511	45.054	45.596	46.137	46.677	47.216
111	39.197	39.757	40.314	40.869	41.423	41.975	42.525	43.074	43.622	44.168	44.713	45.256	45.799	46.340	46.881
112	38.832	39.394	39.954	40.511	41.067	41.622	42.174	42.725	43.274	43.822	44.369	44.914	45.459	46.001	46.543
113	38.464	39.028	39.591	40.151	40.709	41.265	41.820	42.373	42.925	43.475	44.023	44.570	45.116	45.661	46.204
114	38.091	38.659	39.224	39.787	40.348	40.906	41.463	42.019	42.572	43.124	43.674	44.223	44.771	45.317	45.862
115	37.715	38.286	38.854	39.420	39.983	40.544	41.104	41.661	42.217	42.771	43.323	43.874	44.424	44.972	45.518
116	37.335	37.909	38.480	39.049	39.615	40.179	40.741	41.301	41.859	42.415	42.970	43.523	44.074	44.624	45.172
117	36.950	37.528	38.102	38.674	39.243	39.810	40.375	40.937	41.498	42.056	42.613	43.168	43.722	44.273	44.824
118	36.561	37.143	37.721	38.296	38.868	39.438	40.005	40.571	41.134	41.695	42.254	42.811	43.366	43.920	44.473
119	36.167	36.753	37.334	37.913	38.489	39.062	39.632	40.200	40.766	41.330	41.891	42.451	43.009	43.565	44.119
120	35.768	36.358	36.944	37.526	38.106	38.682	39.256	39.827	40.395	40.961	41.526	42.088	42.648	43.206	43.763

Center Distance Coefficient Table

N2-N1	Lp-N1														
	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171
61	62.495	63.001	63.507	64.013	64.519	65.024	65.530	66.036	66.541	67.046	67.552	68.057	68.562	69.067	69.572
62	62.216	62.723	63.229	63.735	64.241	64.747	65.253	65.759	66.264	66.770	67.275	67.781	68.286	68.792	69.297
63	61.937	62.444	62.950	63.457	63.963	64.469	64.975	65.481	65.987	66.493	66.999	67.504	68.010	68.515	69.021
64	61.657	62.164	62.671	63.178	63.684	64.191	64.697	65.203	65.709	66.215	66.721	67.227	67.733	68.239	68.744
65	61.377	61.884	62.391	62.898	63.405	63.911	64.418	64.924	65.431	65.937	66.443	66.950	67.456	67.962	68.467
66	61.095	61.603	62.110	62.617	63.124	63.631	64.138	64.645	65.152	65.658	66.165	66.671	67.178	67.684	68.190
67	60.813	61.321	61.829	62.336	62.844	63.351	63.858	64.365	64.872	65.379	65.886	66.392	66.899	67.405	67.912
68	60.530	61.038	61.546	62.054	62.562	63.070	63.577	64.084	64.592	65.099	65.606	66.113	66.619	67.126	67.633
69	60.247	60.755	61.264	61.772	62.280	62.788	63.295	63.803	64.311	64.818	65.325	65.832	66.339	66.846	67.353
70	59.962	60.471	60.980	61.488	61.997	62.505	63.013	63.521	64.029	64.536	65.044	65.551	66.059	66.566	67.076
71	59.677	60.187	60.695	61.204	61.713	62.222	62.730	63.238	63.746	64.254	64.762	65.270	65.777	66.285	66.792
72	59.391	59.901	60.410	60.919	61.428	61.937	62.446	62.955	63.463	63.971	64.480	64.988	65.495	66.003	66.511
73	59.105	59.615	60.124	60.634	61.143	61.652	62.161	62.670	63.179	63.688	64.196	64.705	65.213	65.721	66.229
74	58.817	59.328	59.838	60.348	60.857	61.367	61.876	62.385	62.894	63.403	63.912	64.421	64.929	65.438	65.946
75	58.529	59.040	59.550	60.060	60.570	61.080	61.590	62.100	62.609	63.118	63.627	64.136	64.645	65.154	65.662
76	58.240	58.751	59.262	59.772	60.283	60.793	61.303	61.813	62.323	62.833	63.342	63.851	64.360	64.869	65.378
77	57.950	58.461	58.972	59.484	59.994	60.505	61.016	61.526	62.036	62.546	63.056	63.565	64.075	54.584	65.093
78	57.659	58.171	58.682	59.194	59.705	60.216	60.727	61.238	61.748	62.259	62.769	63.279	63.789	64.298	64.808
79	57.367	57.879	58.391	58.903	59.415	59.927	60.438	60.949	61.460	61.971	62.481	62.991	63.502	64.012	64.521
80	57.074	57.587	58.100	58.612	59.124	59.636	60.148	60.659	61.171	61.682	62.193	62.703	63.214	63.724	64.234
81	56.781	57.294	57.807	58.320	58.832	59.345	59.857	60.369	60.880	61.392	61.903	62.414	62.925	63.436	63.947
82	56.486	57.000	57.513	58.027	58.540	59.052	59.565	60.077	60.589	61.101	61.613	62.125	62.636	63.147	63.658
83	56.190	56.705	57.219	57.732	58.246	58.759	59.272	59.785	60.298	60.810	61.322	61.834	62.346	62.857	63.369
84	55.894	56.409	56.923	57.437	57.951	58.465	58.979	59.492	60.005	60.518	61.030	61.543	62.055	62.567	63.078
85	55.596	56.112	56.627	57.141	57.656	58.170	58.684	59.198	59.711	60.225	60.738	61.250	61.763	62.275	62.787
86	55.298	55.814	56.329	56.844	57.359	57.874	58.389	58.903	59.417	59.931	60.444	60.957	61.470	61.983	62.496
87	54.998	55.515	56.031	56.547	57.062	57.577	58.092	58.607	59.121	59.636	60.150	60.663	61.177	61.690	62.203
88	54.697	55.214	55.731	56.248	56.764	57.279	57.795	58.310	58.825	59.340	59.854	60.368	60.882	61.396	61.909
89	54.396	54.913	55.431	55.948	56.464	56.981	57.497	58.012	58.528	59.043	59.558	60.073	60.587	61.101	61.615
90	54.093	54.611	55.129	55.646	56.164	56.681	57.197	57.714	58.230	58.745	59.261	59.776	60.291	60.805	61.320
91	53.789	54.308	54.826	55.344	55.862	56.380	56.897	57.414	57.930	58.447	58.963	59.478	59.994	60.509	61.024
92	53.483	54.003	54.522	55.041	55.560	56.078	56.596	57.113	57.630	58.147	58.663	59.180	59.696	60.211	60.726
93	53.177	53.697	54.217	54.737	55.256	55.775	56.293	56.811	57.329	57.846	58.363	58.880	59.396	59.913	60.428
94	52.869	53.390	53.911	54.431	54.951	55.470	55.990	56.508	57.027	57.545	58.062	58.579	59.096	59.613	60.130
95	52.560	53.082	53.604	54.125	54.645	55.165	55.685	56.204	56.723	57.242	57.760	58.278	58.795	59.313	59.830
96	52.250	52.773	53.295	53.817	54.338	54.859	55.379	55.899	56.419	56.938	57.457	57.975	58.493	59.011	59.529
97	51.939	52.462	52.985	53.507	54.029	54.551	55.072	55.593	56.113	56.633	57.152	57.672	58.190	58.709	59.227
98	51.626	52.150	52.674	53.197	53.720	54.242	54.764	55.285	55.806	56.327	56.847	57.367	57.886	58.405	58.924
99	51.312	51.837	52.361	52.885	53.409	53.932	54.455	54.977	55.498	56.020	56.540	57.061	57.581	58.101	58.620
100	50.996	51.522	52.048	52.572	53.097	53.621	54.144	54.667	55.189	55.711	56.233	56.754	57.275	57.795	58.315
101	50.679	51.206	51.732	52.258	52.783	53.308	53.832	54.356	54.879	55.402	55.924	56.446	56.967	57.488	58.009
102	50.361	50.888	51.416	51.942	52.468	52.994	53.519	54.043	54.567	55.091	55.614	56.136	56.658	57.180	57.701
103	50.040	50.569	51.098	51.625	52.152	52.679	53.204	53.730	54.254	54.779	55.303	55.826	56.349	56.871	57.393
104	49.719	50.249	50.778	51.307	51.835	52.362	52.889	53.415	53.940	54.465	54.990	55.514	56.038	56.561	57.083
105	49.396	49.927	50.457	50.986	51.515	52.044	52.571	53.098	53.625	54.151	54.676	55.201	55.725	56.249	56.773
106	49.071	49.603	50.134	50.665	51.195	51.724	52.253	52.781	53.308	53.835	54.361	54.887	55.412	55.937	56.461
107	48.744	49.277	49.810	50.342	50.873	51.403	51.932	52.461	52.990	53.517	54.045	54.571	55.097	55.623	56.148
108	48.416	48.950	49.484	50.017	50.549	51.080	51.611	52.141	52.670	53.199	53.727	54.254	54.781	55.307	55.833
109	48.086	48.621	49.156	49.690	50.223	50.756	51.288	51.818	52.349	52.878	53.407	53.936	54.463	54.991	55.517
110	47.754	48.291	48.827	49.362	49.896	50.430	50.963	51.495	52.026	52.557	53.087	53.616	54.145	54.673	55.200
111	47.420	47.958	48.496	49.032	49.568	50.102	50.636	51.169	51.702	52.233	52.764	53.295	53.824	54.353	54.882
112	47.084	47.624	48.162	48.700	49.237	49.773	50.308	50.842	51.376	51.909	52.441	52.972	53.503	54.033	54.562
113	46.746	47.287	47.827	48.367	48.905	49.442	49.978	50.514	51.048	51.582	52.115	52.648	53.179	53.710	54.241
114	46.406	46.949	47.490	48.031	48.570	49.109	49.647	50.183	50.719	51.254	51.788	52.322	52.855	53.387	53.918
115	46.064	46.608	47.151	47.693	48.234	48.774	49.313	49.851	50.388	50.924	51.460	51.994	52.528	53.061	53.594
116	45.720	46.265	46.810	47.354	47.896	48.437	48.978	49.517	50.055	50.593	51.130	51.665	52.200	52.734	53.268
117	45.373	45.920	46.467	47.012	47.556	48.099	48.640	49.181	49.721	50.260	50.798	51.335	51.871	52.406	52.940
118	45.024	45.573	46.121	46.668	47.214	47.758	48.301	48.843	49.384	49.925	50.464	51.002	51.539	52.076	52.611
119	44.672	45.223	45.773	46.322	46.869	47.415	47.960	48.503	49.046	49.588	50.128	50.668	51.206	51.744	52.281
120	44.318	44.871	45.423	45.973	46.522	47.070	47.616	48.161	48.706	49.249	49.790	50.331	50.871	51.410	51.948

Center Distance Coefficient Table

N2-N1	Lp-N1														
	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186
61	70.077	70.582	71.086	71.591	72.096	72.600	73.105	73.606	74.114	74.618	75.122	75.626	76.131	76.635	77.139
62	69.802	70.307	70.812	71.317	71.822	72.326	72.831	73.336	73.840	74.345	74.849	75.353	75.858	76.362	76.866
63	69.526	70.031	70.537	71.042	71.547	72.052	72.557	73.061	73.566	74.071	74.575	75.080	75.584	76.089	76.593
64	69.250	69.755	70.261	70.766	71.271	71.776	72.282	72.787	73.292	73.796	74.301	74.806	75.311	75.815	76.320
65	68.973	69.479	69.984	70.490	70.995	71.501	72.006	72.511	73.016	73.521	74.026	74.531	75.036	75.541	76.046
66	68.696	69.202	69.708	70.213	70.719	71.224	71.730	72.235	72.741	73.246	73.751	74.256	74.761	75.266	75.771
67	68.418	68.924	69.430	69.936	70.442	70.948	71.453	71.959	72.464	72.970	73.475	73.981	74.486	74.991	75.496
68	68.139	68.646	69.152	69.658	70.164	70.670	71.176	71.682	72.188	72.693	73.199	73.704	74.210	74.715	75.221
69	67.860	68.367	68.873	69.379	69.886	70.392	70.898	71.404	71.910	72.416	72.922	73.428	73.933	74.439	74.944
70	67.580	68.087	68.594	69.100	69.607	70.113	70.620	71.126	71.632	72.138	72.644	73.150	73.656	74.162	74.668
71	67.300	67.807	68.314	68.821	69.327	69.834	70.341	70.847	71.354	71.860	72.366	72.873	73.379	73.885	74.391
72	67.018	67.526	68.033	68.540	69.047	69.554	70.061	70.568	71.075	71.581	72.088	72.594	73.100	73.607	74.113
73	66.737	67.244	67.752	68.259	68.767	69.274	69.781	70.288	70.795	71.302	71.808	72.315	72.822	73.328	73.834
74	66.454	66.962	67.470	67.978	68.485	68.993	69.500	70.007	70.515	71.022	71.529	72.036	72.542	73.049	73.556
75	66.171	66.679	67.187	67.695	68.203	68.711	69.219	69.726	70.234	70.741	71.248	71.755	72.262	72.769	73.276
76	65.887	66.396	66.904	67.412	67.921	68.429	68.937	69.444	69.952	70.460	70.967	71.474	71.982	72.489	72.996
77	65.602	66.111	66.620	67.129	67.637	68.146	68.654	69.162	69.670	70.178	70.685	71.193	71.701	72.208	72.715
78	65.317	65.826	66.335	66.844	67.353	67.862	68.370	68.879	69.387	69.895	70.403	70.911	71.419	71.926	72.434
79	65.031	65.541	66.050	66.559	67.068	67.577	68.086	68.595	69.103	69.612	70.120	70.628	71.136	71.644	72.152
80	64.744	65.254	65.764	66.274	66.783	67.292	67.801	68.310	68.819	69.328	69.837	70.345	70.853	71.362	71.870
81	64.457	64.967	65.477	65.987	66.497	67.006	67.516	68.025	68.534	69.043	69.552	70.061	70.570	71.078	71.587
82	64.169	64.679	65.190	64.700	66.210	66.720	67.230	67.739	68.249	68.758	69.267	69.776	70.285	70.794	71.303
83	63.880	64.391	64.901	65.412	65.922	66.433	66.943	67.453	67.963	68.472	68.982	69.491	70.000	70.509	71.018
84	63.590	64.101	64.612	65.123	65.634	66.145	66.655	67.165	67.676	68.186	68.695	69.205	69.715	70.224	70.733
85	63.299	63.811	64.323	64.834	65.345	66.856	66.367	66.877	67.388	67.898	68.408	68.918	69.428	69.938	70.448
86	63.008	63.520	64.032	64.544	65.055	65.567	66.078	66.589	67.100	67.610	68.121	68.631	69.141	69.651	70.161
87	62.716	63.228	63.741	64.253	64.765	65.276	64.788	66.299	66.810	67.321	67.832	68.343	68.853	69.364	69.874
88	62.423	62.936	63.448	63.961	64.473	64.985	65.497	66.009	66.521	67.032	67.543	68.054	68.565	69.076	69.586
89	62.129	62.642	63.155	63.668	64.181	64.693	65.206	65.718	66.230	66.742	67.253	67.765	68.276	68.787	69.298
90	61.834	62.348	62.861	63.375	63.888	64.401	64.914	65.426	65.938	66.451	66.963	67.474	67.986	68.497	69.008
91	61.538	62.052	62.567	63.080	63.594	64.107	64.621	65.133	65.646	66.159	66.671	67.183	67.695	68.207	68.719
92	61.242	61.756	62.270	62.785	63.299	63.813	64.327	64.840	65.353	65.866	66.379	66.891	67.404	67.916	68.428
93	60.944	61.459	61.974	62.489	63.004	63.518	64.032	64.546	65.059	65.573	66.086	66.599	67.112	67.624	68.136
94	60.646	61.161	61.677	62.192	62.707	63.222	63.736	64.251	64.765	65.278	65.792	66.305	66.819	67.331	67.844
95	60.346	60.863	61.379	61.894	62.410	62.925	63.440	63.955	64.469	64.983	65.497	66.011	66.525	67.038	67.551
96	60.046	60.563	61.079	61.596	62.112	62.627	63.143	63.658	64.173	64.688	65.202	65.716	66.230	66.744	67.257
97	59.745	60.262	60.779	61.296	61.812	62.329	62.845	63.360	63.876	64.391	64.906	65.420	65.935	66.449	66.963
98	59.442	59.960	60.478	60.995	61.512	62.029	62.545	63.062	63.577	64.093	64.608	65.124	65.638	66.153	66.667
99	59.139	59.657	60.176	60.693	61.211	61.728	62.245	62.762	63.278	63.795	64.310	64.826	65.341	65.856	66.371
100	58.834	59.354	59.872	60.391	60.909	61.427	61.944	62.462	62.979	63.495	64.011	64.528	65.043	65.559	66.074
101	58.529	59.049	59.568	60.087	60.606	61.124	61.642	62.160	62.678	63.195	63.712	64.228	64.745	65.261	65.776
102	58.222	58.743	59.263	59.782	60.302	60.821	61.339	61.858	62.376	62.893	63.411	63.928	64.445	64.961	65.478
103	57.915	58.436	58.956	59.477	59.997	60.516	61.035	61.554	62.073	62.591	63.109	63.627	64.144	64.661	65.178
104	57.606	58.127	58.649	59.170	59.690	60.211	60.730	61.250	61.769	62.288	62.806	63.325	63.842	64.360	64.877
105	57.296	57.818	58.340	58.862	59.383	59.904	60.424	60.945	61.464	61.984	62.503	63.022	63.540	64.058	64.576
106	56.984	57.508	58.030	58.553	59.075	59.596	60.117	60.638	61.159	61.678	62.198	62.717	63.236	63.755	64.273
107	56.672	57.196	57.720	58.243	58.765	59.287	59.809	60.331	60.852	61.372	61.892	62.412	62.932	63.451	63.970
108	56.358	56.883	57.407	57.931	58.455	58.977	59.500	60.022	60.544	61.065	61.586	62.106	62.626	63.146	63.666
109	56.043	56.569	57.094	57.619	58.143	58.666	59.189	59.712	60.235	60.757	61.278	61.799	62.320	62.840	63.360
110	55.727	56.254	56.779	57.305	57.830	58.354	58.878	59.401	59.924	60.447	60.969	61.491	62.012	62.533	63.054
111	55.410	55.937	56.464	56.990	57.515	58.040	58.565	59.089	59.613	60.136	60.659	61.182	61.704	62.225	62.747
112	55.091	55.619	56.146	56.673	57.200	57.726	58.251	58.776	59.301	59.825	60.348	60.871	61.394	61.916	62.438
113	54.770	55.299	55.828	56.356	56.883	57.410	57.936	58.462	58.987	59.512	60.036	60.560	61.083	61.606	62.129
114	54.449	54.979	55.508	56.037	56.565	57.092	57.619	58.146	58.672	59.198	59.723	60.247	60.771	61.295	61.818
115	54.125	54.656	55.187	55.716	56.245	56.774	57.302	57.829	58.356	58.882	59.408	59.933	60.458	60.983	61.507
116	53.801	54.332	54.864	55.394	55.924	56.454	56.983	57.511	58.039	58.566	59.092	59.618	60.144	60.669	61.194
117	53.474	54.007	54.540	55.071	55.602	56.132	56.662	57.191	57.720	58.248	58.775	59.302	59.828	60.354	60.880
118	53.146	53.680	54.214	54.746	55.278	55.810	56.340	56.870	57.400	57.929	58.457	58.985	59.512	60.038	60.565
119	52.817	53.352	53.887	54.420	54.953	55.485	56.017	56.548	57.078	57.608	58.137	58.666	59.194	59.721	60.248
120	52.486	53.022	53.558	54.092	54.626	55.160	55.692	56.224	56.756	57.286	57.816	58.346	58.875	59.403	59.931

Center Distance Coefficient Table

N2-N1	Lp-N1														
	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201
61	77.643	78.147	78.650	79.154	79.658	80.162	80.666	81.169	81.673	82.176	82.680	83.183	83.687	84.190	84.693
62	77.370	77.874	78.378	78.882	79.386	79.890	80.394	80.898	81.402	81.905	82.409	82.913	83.416	83.920	84.423
63	77.098	77.602	78.106	78.610	79.114	79.618	80.122	80.626	81.130	81.634	82.138	82.641	83.145	83.649	84.152
64	76.824	77.329	77.833	78.337	78.842	79.346	79.850	80.354	80.858	81.362	81.866	82.370	82.874	83.377	83.881
65	76.550	77.055	77.560	78.064	78.568	79.073	79.577	80.081	80.585	81.090	81.594	82.998	82.602	83.106	83.610
66	76.276	76.781	77.285	77.790	78.295	78.799	79.304	79.808	80.313	80.817	81.321	81.825	82.329	82.834	83.338
67	76.001	76.506	77.011	77.516	78.021	78.525	79.030	79.535	80.039	80.544	81.048	81.552	82.057	82.561	83.065
68	75.726	76.231	76.736	77.241	77.746	78.251	78.756	79.260	79.765	80.270	80.774	81.279	81.783	82.288	82.792
69	75.450	75.955	76.460	76.966	77.471	77.976	78.481	78.986	79.491	79.995	80.500	81.005	81.510	82.014	82.519
70	75.173	75.679	76.184	76.690	77.195	77.700	78.206	78.711	79.216	79.721	80.226	80.731	81.235	81.740	82.245
71	74.896	75.402	75.908	76.413	76.919	77.424	77.930	78.435	78.940	79.445	79.951	80.456	80.961	81.465	81.970
72	74.619	75.125	75.631	76.136	76.642	77.148	77.653	78.159	78.664	79.170	79.675	80.180	80.685	81.190	81.695
73	74.341	74.847	75.353	75.859	76.365	76.871	77.377	77.882	78.388	78.893	79.399	79.904	80.410	80.915	81.420
74	74.062	74.568	75.075	75.581	76.087	76.593	77.099	77.605	78.111	78.617	79.122	79.628	80.133	80.639	81.144
75	73.783	74.289	74.796	75.302	75.809	76.315	76.821	77.327	77.833	78.339	78.845	79.351	79.857	80.362	80.868
76	73.503	74.010	74.517	75.023	75.530	76.036	76.543	77.049	77.555	78.061	78.568	79.074	79.579	80.085	80.591
77	73.222	73.730	74.237	74.744	75.250	75.757	76.264	76.770	77.277	77.783	78.289	78.796	79.302	79.808	80.314
78	72.942	73.449	73.956	74.463	74.970	75.477	75.984	76.491	76.998	77.504	78.011	78.517	79.023	79.530	80.036
79	72.660	73.167	73.675	74.182	74.690	75.197	75.704	76.211	76.718	77.225	77.731	78.238	79.745	79.251	79.757
80	72.378	72.885	73.393	73.901	74.408	74.916	75.423	75.930	76.438	76.945	77.452	77.958	78.465	78.972	79.478
81	72.095	72.603	73.111	73.619	74.127	74.634	75.142	75.649	76.157	76.664	77.171	77.678	78.185	78.692	79.199
82	71.811	72.320	72.828	73.336	73.844	74.352	74.860	75.368	75.875	76.383	76.890	77.398	77.905	78.412	78.919
83	71.527	72.036	72.544	73.053	73.561	74.069	74.577	75.085	75.593	76.101	76.609	77.116	77.624	78.131	78.638
84	71.242	71.751	72.260	72.769	73.277	73.786	74.294	74.803	75.311	75.819	76.327	76.834	77.342	77.850	78.357
85	70.957	71.466	71.975	72.484	72.993	73.502	74.011	74.519	75.027	75.536	76.044	76.552	77.060	77.568	78.075
86	70.671	71.180	71.690	72.199	72.708	73.217	73.726	74.235	74.744	75.252	75.761	76.269	76.777	77.285	77.793
87	70.384	70.894	71.404	71.913	72.423	72.932	73.441	73.950	74.459	74.968	75.477	75.985	76.494	77.002	77.510
88	70.097	70.607	71.117	71.627	72.137	72.646	73.156	73.665	74.174	74.683	75.192	75.701	76.210	76.718	77.227
89	69.808	70.319	70.829	71.340	71.850	72.360	72.869	73.379	73.889	74.398	74.907	75.416	75.925	76.434	76.943
90	69.519	70.030	70.541	71.052	71.562	72.072	72.582	73.092	73.602	74.112	74.621	75.131	75.640	76.149	76.658
91	69.230	69.741	70.252	70.763	71.274	71.784	72.295	72.805	73.315	73.825	74.335	74.845	75.354	75.864	76.373
92	68.940	69.451	69.963	70.474	70.985	71.496	72.007	72.517	73.028	73.538	74.048	74.558	75.068	75.578	76.087
93	68.648	69.160	69.672	70.184	70.695	71.206	71.718	72.228	72.739	73.250	73.760	74.271	74.781	75.291	75.801
94	68.357	68.869	69.381	69.893	70.405	71.916	71.428	71.939	72.450	72.961	73.472	73.983	74.493	75.003	75.514
95	68.064	68.577	69.089	69.602	70.114	70.626	71.138	71.649	72.161	72.672	73.183	73.694	74.205	74.715	75.226
96	67.771	68.284	68.797	69.309	69.822	70.334	70.846	71.358	71.870	72.382	72.893	73.404	73.916	74.427	74.937
97	67.477	67.990	68.503	69.017	69.529	70.042	70.555	71.067	71.579	72.091	72.603	73.114	73.626	74.137	74.648
98	67.182	67.696	68.209	68.723	69.236	69.749	70.262	70.775	71.287	71.800	72.312	72.824	73.335	73.847	74.359
99	66.886	67.400	67.914	68.428	68.942	69.455	69.969	70.482	70.995	71.507	72.020	72.532	73.044	73.556	74.068
100	66.589	67.104	67.619	68.133	68.647	69.161	69.675	70.183	70.701	71.214	71.727	72.240	72.753	73.265	73.777
101	66.292	66.807	67.322	67.837	68.351	68.866	69.380	69.894	70.407	70.921	71.434	71.947	72.460	72.973	73.485
102	65.993	66.509	67.025	67.540	68.055	68.570	69.084	69.598	70.113	70.626	71.140	71.653	72.167	72.680	73.193
103	65.694	66.211	66.726	67.242	67.758	68.273	68.788	69.302	69.817	70.331	70.845	71.359	71.873	72.386	72.899
104	65.394	65.911	66.427	66.944	67.459	67.975	68.490	69.006	69.521	70.035	70.550	71.064	71.578	72.092	72.605
105	65.093	65.610	66.127	66.644	67.160	67.677	68.192	68.708	69.223	69.738	70.253	70.768	71.282	71.797	72.311
106	64.791	65.309	65.827	66.344	66.861	67.377	67.893	68.410	68.925	69.441	69.956	70.471	70.986	71.501	72.015
107	64.489	65.007	65.525	66.042	66.560	67.077	67.594	68.110	68.626	69.142	69.658	70.174	70.689	71.204	71.719
108	64.185	64.704	65.222	65.740	66.258	66.776	67.293	67.810	68.327	68.843	69.359	69.875	70.391	70.907	71.422
109	63.880	64.399	64.918	65.437	65.956	66.474	66.991	67.509	68.026	68.543	69.060	69.576	70.092	70.608	71.124
110	63.574	64.094	64.614	65.133	65.652	66.171	66.689	67.207	67.725	68.242	68.759	69.276	69.793	70.309	70.825
111	63.268	63.788	64.308	64.828	65.348	65.867	66.386	66.904	67.422	67.940	68.458	68.957	69.493	70.009	70.526
112	62.960	63.481	64.002	64.522	65.042	65.562	66.081	66.600	67.119	67.638	68.156	68.674	69.191	69.709	70.226
113	62.651	63.173	63.694	64.215	64.736	65.256	65.776	66.296	66.815	67.334	67.853	68.371	68.889	69.407	69.925
114	62.341	62.863	63.385	63.907	64.428	64.949	65.470	65.990	66.510	67.030	67.549	68.068	68.586	69.105	69.623
115	62.030	62.553	63.076	63.598	64.120	64.642	65.163	65.683	66.204	66.724	67.244	67.763	68.282	68.801	69.320
116	61.718	62.242	62.765	63.288	63.811	64.333	64.854	65.376	65.897	66.418	66.938	67.458	67.978	68.497	69.016
117	61.405	61.929	62.453	62.977	63.500	64.023	64.545	65.067	65.589	66.110	66.631	67.152	67.672	68.192	68.711
118	61.090	61.616	62.140	62.665	63.188	63.712	64.235	64.758	65.280	65.802	66.323	66.844	67.365	67.886	68.406
119	60.775	61.301	61.826	62.351	62.876	63.400	63.924	64.447	64.970	65.492	66.014	66.536	67.058	67.579	68.099
120	60.458	60.985	61.511	62.037	62.562	63.087	63.611	64.135	64.659	65.182	65.705	66.227	66.749	67.271	67.792

Pitch and Outside Diameter

PX PULLEY

P2M						P3M						P5M					
No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
			81	51.57	51.06	**10**	9.55	8.79	**81**	77.35	76.59				**81**	128.92	127.77
			82	52.20	51.69	**11**	10.50	9.74	**82**	78.30	77.54				**82**	130.51	129.37
			83	52.84	52.33	**12**	11.46	10.70	**83**	79.26	78.50				**83**	132.10	130.96
			84	53.48	52.97	**13**	12.41	11.65	**84**	80.21	79.45				**84**	133.69	132.55
14	8.91	8.40	**85**	54.11	53.60	**14**	13.37	12.61	**85**	81.17	80.41	**14**	22.28	21.14	**85**	135.28	134.14
15	9.55	9.04	**86**	54.75	54.24	**15**	14.32	13.56	**86**	82.12	81.36	**15**	23.87	22.73	**86**	136.87	135.73
16	10.19	9.68	**87**	55.39	54.88	**16**	15.28	14.52	**87**	83.08	82.32	**16**	25.46	24.32	**87**	138.46	137.32
17	10.82	10.31	**88**	56.02	55.51	**17**	16.23	15.47	**88**	84.03	83.27	**17**	27.06	25.91	**88**	140.06	138.91
18	11.46	10.95	**89**	56.66	56.15	**18**	17.19	16.43	**89**	84.99	84.23	**18**	28.65	27.51	**89**	141.65	140.51
19	12.10	11.59	**90**	57.30	56.79	**19**	18.14	17.38	**90**	85.94	85.18	**19**	30.24	29.10	**90**	143.24	142.10
20	12.73	12.22	**91**	57.93	57.42	**20**	19.10	18.34	**91**	86.90	86.14	**20**	31.83	30.69	**91**	144.83	143.69
21	13.37	12.86	**92**	58.57	58.06	**21**	20.05	19.29	**92**	87.85	87.09	**21**	33.42	32.28	**92**	146.42	145.28
22	14.01	13.50	**93**	59.21	58.70	**22**	21.01	20.25	**93**	88.81	88.05	**22**	35.01	33.87	**93**	148.01	146.87
23	14.64	14.13	**94**	59.84	59.33	**23**	21.96	21.20	**94**	89.76	89.00	**23**	36.61	35.46	**94**	149.61	148.46
24	15.28	14.77	**95**	60.48	59.97	**24**	22.92	22.16	**95**	90.72	89.96	**24**	38.20	37.06	**95**	151.20	150.06
25	15.92	15.41	**96**	61.12	60.61	**25**	23.87	23.11	**96**	91.67	90.91	**25**	39.79	38.65	**96**	152.79	151.65
26	16.55	16.04	**97**	61.75	61.24	**26**	24.83	24.07	**97**	92.63	91.87	**26**	41.38	40.24	**97**	154.38	153.24
27	17.19	16.68	**98**	62.39	61.88	**27**	25.78	25.02	**98**	93.58	92.82	**27**	42.97	41.83	**98**	155.97	154.83
28	17.83	17.32	**99**	63.03	62.52	**28**	26.74	25.98	**99**	94.54	93.78	**28**	44.56	43.42	**99**	157.56	156.42
29	18.46	17.95	**100**	63.66	63.15	**29**	27.69	26.93	**100**	95.49	94.73	**29**	46.15	45.01	**100**	159.15	158.01
30	19.10	18.59	**101**	64.30	63.79	**30**	28.65	27.89	**101**	96.45	95.69	**30**	47.75	46.60	**101**	160.75	159.60
31	19.74	19.23	**102**	64.94	64.43	**31**	29.60	28.84	**102**	97.40	96.64	**31**	49.34	48.20	**102**	162.34	161.20
32	20.37	19.86	**103**	65.57	65.06	**32**	30.56	29.80	**103**	98.36	97.60	**32**	50.93	49.79	**103**	163.93	162.79
33	21.01	20.50	**104**	66.21	65.70	**33**	31.51	30.75	**104**	99.31	98.55	**33**	52.52	51.38	**104**	165.52	164.38
34	21.65	21.14	**105**	66.85	66.34	**34**	32.47	31.71	**105**	100.27	99.51	**34**	54.11	52.97	**105**	167.11	165.97
35	22.28	21.77	**106**	67.48	66.97	**35**	33.42	32.66	**106**	101.22	100.46	**35**	55.70	54.56	**106**	168.70	167.56
36	22.92	22.41	**107**	68.12	67.61	**36**	34.38	33.62	**107**	102.18	101.42	**36**	57.30	56.15	**107**	170.30	169.15
37	23.55	23.05	**108**	68.75	68.25	**37**	35.33	34.57	**108**	103.13	102.37	**37**	58.89	57.75	**108**	171.89	170.75
38	24.19	23.68	**109**	69.39	68.88	**38**	36.29	35.53	**109**	104.09	103.33	**38**	60.48	59.34	**109**	173.48	172.34
39	24.83	24.32	**110**	70.03	69.52	**39**	37.24	36.48	**110**	105.04	104.28	**39**	62.07	60.93	**110**	175.07	173.93
40	25.46	24.96	**111**	70.66	70.16	**40**	38.20	37.44	**111**	106.00	105.24	**40**	63.66	62.52	**111**	176.66	175.52
41	26.10	25.59	**112**	71.30	70.79	**41**	39.15	38.39	**112**	106.95	106.19	**41**	65.25	64.11	**112**	178.25	177.11
42	26.74	26.23	**113**	71.94	71.43	**42**	40.11	39.35	**113**	107.91	107.15	**42**	66.85	65.70	**113**	179.85	178.70
43	27.37	26.87	**114**	72.57	72.07	**43**	41.06	40.30	**114**	108.86	108.10	**43**	68.44	67.29	**114**	181.44	180.29
44	28.01	27.50	**115**	73.21	72.70	**44**	42.02	41.25	**115**	109.82	109.05	**44**	70.03	68.89	**115**	183.03	181.89
45	28.65	28.14	**116**	73.85	73.34	**45**	42.97	42.21	**116**	110.77	110.01	**45**	71.62	70.48	**116**	184.62	183.48
46	29.28	28.78	**117**	74.48	73.98	**46**	43.93	43.16	**117**	111.73	110.96	**46**	73.21	72.07	**117**	186.21	185.07
47	29.92	29.41	**118**	75.12	74.61	**47**	44.88	44.12	**118**	112.68	111.92	**47**	74.80	73.66	**118**	187.80	186.66
48	30.56	30.05	**119**	75.76	75.25	**48**	45.84	45.07	**119**	113.64	112.87	**48**	76.39	75.25	**119**	189.39	188.25
49	31.19	30.69	**120**	76.39	75.89	**49**	46.79	46.03	**120**	114.59	113.83	**49**	77.99	76.84	**120**	190.99	189.84
50	31.83	31.32	**121**	77.03	76.52	**50**	47.75	46.98	**121**	115.55	114.78	**50**	79.58	78.44	**121**	192.58	191.44
51	32.47	31.96	**122**	77.67	77.16	**51**	48.70	47.94	**122**	116.50	115.74	**51**	81.17	80.03	**122**	194.17	193.03
52	33.10	32.60	**123**	78.30	77.80	**52**	49.66	48.89	**123**	117.46	116.69	**52**	82.76	81.62	**123**	195.76	194.62
53	33.74	33.23	**124**	78.94	78.43	**53**	50.61	49.85	**124**	118.41	117.65	**53**	84.35	83.21	**124**	197.35	196.21
54	34.38	33.87	**125**	79.58	79.07	**54**	51.57	50.80	**125**	119.37	118.60	**54**	85.94	84.80	**125**	198.94	197.80
55	35.01	34.51	**126**	80.21	79.71	**55**	52.52	51.76	**126**	120.32	119.56	**55**	87.54	86.39	**126**	200.54	199.39
56	35.65	35.14	**127**	80.85	80.34	**56**	53.48	52.71	**127**	121.28	120.51	**56**	89.13	87.98	**127**	202.13	200.98
57	36.29	35.78	**128**	81.49	80.98	**57**	54.43	53.67	**128**	122.23	121.47	**57**	90.72	89.58	**128**	203.72	202.58
58	36.92	36.42	**129**	82.12	81.62	**58**	55.39	54.62	**129**	123.19	122.42	**58**	92.31	91.17	**129**	205.31	204.17
59	37.56	37.05	**130**	82.76	82.25	**59**	56.34	55.58	**130**	124.14	123.38	**59**	93.90	92.76	**130**	206.90	205.76
60	38.20	37.69	**131**	83.40	82.89	**60**	57.30	56.53	**131**	125.10	124.33	**60**	95.49	94.35	**131**	208.49	207.35
61	38.83	38.33	**132**	84.03	83.53	**61**	58.25	57.49	**132**	126.05	125.29	**61**	97.08	95.94	**132**	210.08	208.94
62	39.47	38.96	**133**	84.67	84.16	**62**	59.21	58.44	**133**	127.01	126.24	**62**	98.68	97.53	**133**	211.68	210.53
63	40.11	39.60	**134**	85.31	84.80	**63**	60.16	59.40	**134**	127.96	127.20	**63**	100.27	99.13	**134**	213.27	212.13
64	40.74	40.24	**135**	85.94	85.44	**64**	61.12	60.35	**135**	128.92	128.15	**64**	101.86	100.72	**135**	214.86	213.72
65	41.38	40.87	**136**	86.58	86.07	**65**	62.07	61.31	**136**	129.87	129.11	**65**	103.45	102.31	**136**	216.45	215.31
66	42.02	41.51	**137**	87.22	86.71	**66**	63.03	62.26	**137**	130.83	130.06	**66**	105.04	103.90	**137**	218.04	216.90
67	42.65	42.15	**138**	87.85	87.35	**67**	63.98	63.22	**138**	131.78	131.02	**67**	106.63	105.49	**138**	219.63	218.49
68	43.29	42.78	**139**	88.49	87.98	**68**	64.94	64.17	**139**	132.74	131.97	**68**	108.23	107.08	**139**	221.23	220.08
69	43.93	43.42	**140**	89.13	88.62	**69**	65.89	65.13	**140**	133.69	132.93	**69**	109.82	108.67	**140**	222.82	221.67
70	44.56	44.06	**141**	89.76	89.26	**70**	66.85	66.08	**141**	134.65	133.88	**70**	111.41	110.27	**141**	224.41	223.27
71	45.20	44.69	**142**	90.40	89.89	**71**	67.80	67.04	**142**	135.60	134.84	**71**	113.00	111.86	**142**	226.00	224.86
72	45.84	45.33	**143**	91.04	90.53	**72**	68.75	67.99	**143**	136.55	135.79	**72**	114.59	113.45	**143**	227.59	226.45
73	46.47	45.97	**144**	91.67	91.17	**73**	69.71	68.95	**144**	137.51	136.75	**73**	116.18	115.04	**144**	229.18	228.04
74	47.11	46.60	**145**	92.31	91.80	**74**	70.66	69.90	**145**	138.46	137.70	**74**	117.77	116.63	**145**	230.77	229.63
75	47.75	47.24	**146**	92.95	92.44	**75**	71.62	70.86	**146**	139.42	138.66	**75**	119.37	118.22	**146**	232.37	231.22
76	48.38	47.88	**147**	93.58	93.08	**76**	72.57	71.81	**147**	140.37	139.61	**76**	120.96	119.82	**147**	233.96	232.82
77	49.02	48.51	**148**	94.22	93.71	**77**	73.53	72.77	**148**	141.33	140.57	**77**	122.55	121.41	**148**	235.55	234.41
78	49.66	49.15	**149**	94.86	94.35	**78**	74.48	73.72	**149**	142.28	141.52	**78**	124.14	123.00	**149**	237.14	236.00
79	50.29	49.78	**150**	95.49	94.98	**79**	75.44	74.68	**150**	143.24	142.48	**79**	125.73	124.59	**150**	238.73	237.59
80	50.93	50.42				**80**	76.39	75.63				**80**	127.32	126.18			

Pitch and Outside Diameter

PX PULLEY

P8M						P14M					
No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
			81	206.26	204.89				**81**	360.96	358.17
			82	208.81	207.44				**82**	365.42	362.63
			83	211.36	209.99				**83**	369.88	367.08
			84	213.90	212.53				**84**	374.33	371.54
			85	216.45	215.08				**85**	378.79	375.99
			86	219.00	217.63				**86**	383.25	380.45
			87	221.54	220.17				**87**	387.70	384.91
			88	224.09	222.72				**88**	392.16	389.36
			89	226.64	225.27				**89**	396.61	393.82
			90	229.18	227.81				**90**	401.07	398.28
20	50.93	49.56	**91**	231.73	230.36				**91**	405.53	402.73
21	53.48	52.10	**92**	234.28	232.90				**92**	409.98	407.19
22	56.02	54.65	**93**	236.82	235.45				**93**	414.44	411.65
23	58.57	57.20	**94**	239.37	238.00				**94**	418.90	416.10
24	61.12	59.75	**95**	241.92	240.54				**95**	423.35	420.56
25	63.66	62.29	**96**	244.46	243.09				**96**	427.81	425.01
26	66.21	64.84	**97**	247.01	245.64				**97**	432.26	429.47
27	68.75	67.38	**98**	249.55	248.18				**98**	436.72	433.93
28	71.30	69.93	**99**	252.10	240.73	**28**	124.78	121.98	**99**	441.18	438.38
29	73.85	72.48	**100**	254.65	253.28	**29**	129.23	126.44	**100**	445.63	442.84
30	76.39	75.02	**101**	257.19	255.82	**30**	133.69	130.90	**101**	450.09	447.30
31	78.94	77.57	**102**	259.74	258.37	**31**	138.15	135.35	**102**	454.55	451.75
32	81.49	80.12	**103**	262.29	260.92	**32**	142.60	139.81	**103**	459.00	456.21
33	84.03	82.66	**104**	264.83	263.46	**33**	147.06	144.27	**104**	463.46	460.67
34	86.58	85.21	**105**	267.38	266.01	**34**	151.52	148.72	**105**	467.92	465.12
35	89.13	87.75	**106**	269.93	268.55	**35**	155.97	153.18	**106**	472.37	469.58
36	91.67	90.30	**107**	272.47	271.10	**36**	160.43	157.63	**107**	476.83	474.03
37	94.22	92.85	**108**	275.02	273.65	**37**	164.88	162.09	**108**	481.28	478.49
38	96.77	95.39	**109**	277.57	276.19	**38**	169.34	166.55	**109**	485.74	482.95
39	99.31	97.94	**110**	280.11	278.74	**39**	173.80	171.00	**110**	490.20	487.40
40	101.86	100.49	**111**	282.66	281.29	**40**	178.25	175.46	**111**	494.65	491.86
41	104.41	103.03	**112**	285.21	283.83	**41**	182.71	179.92	**112**	499.11	496.32
42	106.95	105.58	**113**	287.75	286.38	**42**	187.17	184.37	**113**	503.57	500.77
43	109.50	108.13	**114**	290.30	288.93	**43**	191.62	188.83	**114**	508.02	505.23
44	112.05	110.67	**115**	292.85	291.47	**44**	196.08	193.28	**115**	512.48	509.68
45	114.59	113.22	**116**	295.39	294.02	**45**	200.54	197.74	**116**	516.94	514.14
46	117.14	115.77	**117**	297.94	296.57	**46**	204.99	202.20	**117**	521.39	518.60
47	119.68	118.31	**118**	300.48	299.11	**47**	209.45	206.65	**118**	525.85	523.05
48	122.23	120.86	**119**	303.03	301.66	**48**	213.90	211.11	**119**	530.30	527.51
49	124.78	123.41	**120**	305.58	304.21	**49**	218.36	215.57	**120**	534.76	531.97
50	127.32	125.95	**121**	308.12	306.75	**50**	222.82	220.02	**121**	539.22	536.42
51	129.87	128.50	**122**	310.67	309.30	**51**	227.27	224.48	**122**	543.67	540.88
52	132.42	131.04	**123**	313.22	311.84	**52**	231.73	228.94	**123**	548.13	545.34
53	134.96	133.59	**124**	315.76	314.39	**53**	236.19	233.39	**124**	552.59	549.79
54	137.51	136.14	**125**	318.31	316.94	**54**	240.64	237.85	**125**	557.04	554.25
55	140.06	138.68	**126**	320.86	319.48	**55**	245.10	242.30	**126**	561.50	558.70
56	142.60	141.23	**127**	323.40	322.03	**56**	249.55	246.76	**127**	565.95	563.16
57	145.15	143.78	**128**	325.95	324.58	**57**	254.01	251.22	**128**	570.41	567.62
58	147.70	146.32	**129**	328.50	327.12	**58**	258.47	255.67	**129**	574.87	572.07
59	150.24	148.87	**130**	331.04	329.67	**59**	262.92	260.13	**130**	579.32	576.53
60	152.79	151.42	**131**	333.59	332.22	**60**	296.38	264.59	**131**	583.78	580.99
61	155.34	153.96	**132**	336.14	334.76	**61**	271.84	269.04	**132**	588.24	585.44
62	157.88	156.51	**133**	338.68	337.31	**62**	276.29	273.50	**133**	592.69	589.90
63	160.43	159.06	**134**	341.23	339.86	**63**	280.75	277.96	**134**	597.15	594.36
64	162.97	161.60	**135**	343.77	342.40	**64**	285.21	282.41	**135**	601.61	598.81
65	165.52	164.15	**136**	346.32	344.95	**65**	289.66	286.87	**136**	606.06	603.27
66	168.07	166.70	**137**	348.87	347.50	**66**	294.12	291.32	**137**	610.52	607.72
67	170.61	169.24	**138**	351.41	350.04	**67**	298.57	295.78	**138**	614.97	612.18
68	173.16	171.79	**139**	353.96	352.59	**68**	303.03	300.24	**139**	619.43	616.64
69	175.71	174.34	**140**	356.51	355.14	**69**	307.49	304.69	**140**	623.89	621.09
70	178.25	176.88	**141**	359.05	357.68	**70**	311.94	309.15	**141**	628.34	625.55
71	180.80	179.43	**142**	361.60	360.23	**71**	316.40	313.61	**142**	632.80	630.01
72	183.35	181.97	**143**	364.15	362.77	**72**	320.86	318.06	**143**	637.26	634.46
73	185.89	184.52	**144**	366.69	365.32	**73**	325.31	322.52	**144**	641.71	638.92
74	188.44	187.07	**145**	369.24	367.87	**74**	329.77	326.98	**145**	646.17	643.38
75	190.99	189.61	**146**	371.89	370.41	**75**	334.23	331.43	**146**	650.63	647.83
76	193.53	192.16	**147**	374.33	372.96	**76**	338.68	335.89	**147**	655.08	652.29
77	196.08	194.71	**148**	374.88	375.51	**77**	343.14	340.34	**148**	659.54	656.74
78	198.63	197.25	**149**	379.43	378.05	**78**	347.59	344.80	**149**	663.99	661.20
79	201.17	199.80	**150**	381.97	380.60	**79**	352.05	349.26	**150**	668.45	665.66
80	203.72	202.35				**80**	356.51	353.71			

Pitch and Outside Diameter

TRAPEZOIDAL PULLEY

MXL					
No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
10	6.47	5.96	**81**	52.39	51.89
11	7.11	6.61	**82**	53.04	52.53
12	7.76	7.26	**83**	53.68	53.18
13	8.41	7.90	**84**	54.33	53.83
14	9.06	8.55	**85**	54.98	54.47
15	9.70	9.19	**86**	55.63	55.12
16	10.35	9.84	**87**	56.27	55.77
17	11.00	10.49	**88**	56.92	56.41
18	11.64	11.14	**89**	57.57	57.06
19	12.29	11.78	**90**	58.21	57.71
20	12.94	12.43	**91**	58.86	58.35
21	13.58	13.08	**92**	59.51	59.00
22	14.23	13.72	**93**	60.15	59.65
23	14.88	14.37	**94**	60.80	60.29
24	15.52	15.02	**95**	61.45	60.94
25	16.17	15.67	**96**	62.09	61.59
26	16.82	16.31	**97**	62.74	62.24
27	17.46	16.96	**98**	63.39	62.88
28	18.11	17.61	**99**	64.03	63.53
29	18.76	18.25	**100**	64.68	64.18
30	19.40	18.90	**101**	65.33	64.82
31	20.05	19.55	**102**	65.97	65.47
32	20.70	20.19	**103**	66.62	66.12
33	21.34	20.84	**104**	67.27	66.76
34	21.99	21.49	**105**	67.91	67.41
35	22.64	22.13	**106**	68.56	68.06
36	23.29	22.78	**107**	69.21	68.70
37	23.93	23.43	**108**	69.86	69.35
38	24.58	24.07	**109**	70.50	70.00
39	25.23	24.72	**110**	71.15	70.64
40	25.87	25.37	**111**	71.80	71.29
41	26.52	26.01	**112**	72.44	71.94
42	27.17	26.66	**113**	73.09	72.58
43	27.81	27.31	**114**	73.74	73.23
44	28.46	27.95	**115**	74.38	73.88
45	29.11	28.60	**116**	75.03	74.52
46	29.75	29.25	**117**	75.68	75.17
47	30.40	29.89	**118**	76.32	75.82
48	31.05	30.54	**119**	76.97	76.46
49	31.69	31.19	**120**	77.62	77.11
50	32.34	31.84	**121**	78.26	77.76
51	32.99	32.48	**122**	78.91	78.41
52	33.63	33.13	**123**	79.56	79.05
53	34.28	33.78	**124**	80.20	79.70
54	34.93	34.42	**125**	80.85	80.35
55	35.57	35.07	**126**	81.50	80.99
56	36.22	35.72	**127**	82.14	81.64
57	36.87	36.36	**128**	82.79	82.29
58	37.51	37.01	**129**	83.44	82.93
59	38.16	37.66	**130**	84.08	83.58
60	38.81	38.30	**131**	84.73	84.23
61	39.46	38.95	**132**	85.38	84.87
62	40.10	39.60	**133**	86.03	85.52
63	40.75	40.24	**134**	86.67	86.17
64	41.40	40.89	**135**	87.32	86.81
65	42.04	41.54	**136**	87.97	87.46
66	42.69	42.18	**137**	88.61	88.11
67	43.34	42.83	**138**	89.26	88.75
68	43.98	43.48	**139**	89.91	89.40
69	44.63	44.12	**140**	90.55	90.05
70	45.28	44.78	**141**	91.20	90.69
71	45.92	45.42	**142**	91.85	91.34
72	46.57	46.07	**143**	92.49	91.99
73	47.22	46.71	**144**	93.14	92.64
74	47.86	47.36	**145**	93.79	93.28
75	48.51	48.01	**146**	94.43	93.93
76	49.16	48.65	**147**	95.08	94.58
77	49.80	49.30	**148**	95.73	95.22
78	50.45	49.95	**149**	96.37	95.87
79	51.10	50.59	**150**	97.02	96.51
80	51.74	51.24			

XL					
No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
10	16.17	15.67	**81**	130.98	130.48
11	17.79	17.28	**82**	132.60	132.09
12	19.40	18.90	**83**	134.21	133.71
13	21.02	20.52	**84**	135.83	135.33
14	22.64	22.13	**85**	137.45	136.94
15	24.26	23.75	**86**	139.06	138.56
16	25.87	25.37	**87**	140.68	140.18
17	27.49	26.98	**88**	142.30	141.79
18	29.11	28.60	**89**	143.91	143.41
19	30.72	30.22	**90**	145.53	145.03
20	32.34	31.83	**91**	147.15	146.64
21	33.96	33.45	**92**	148.77	148.26
22	35.57	35.07	**93**	150.38	149.88
23	37.19	36.68	**94**	152.00	151.49
24	38.81	38.30	**95**	153.62	153.11
25	40.43	39.92	**96**	155.23	154.73
26	42.04	41.53	**97**	156.85	156.34
27	43.66	43.16	**98**	158.47	157.97
28	45.28	44.78	**99**	160.08	159.58
29	46.89	46.38	**100**	161.70	161.19
30	48.51	48.01	**101**	163.32	162.81
31	50.13	49.63	**102**	164.94	164.43
32	51.74	51.23	**103**	166.55	166.04
33	53.36	52.86	**104**	168.17	167.66
34	54.98	54.48	**105**	169.79	169.28
35	56.60	56.09	**106**	171.40	170.90
36	58.21	57.71	**107**	173.02	172.51
37	59.83	59.32	**108**	174.64	174.13
38	61.45	60.94	**109**	176.25	175.75
39	63.06	62.56	**110**	177.87	177.36
40	64.68	64.17	**111**	179.49	178.98
41	66.30	65.79	**112**	181.11	180.60
42	67.91	67.41	**113**	182.72	182.21
43	69.53	69.02	**114**	184.34	183.83
44	71.15	70.64	**115**	185.96	185.45
45	72.77	72.27	**116**	187.57	187.07
46	74.38	73.87	**117**	189.19	188.68
47	76.00	75.49	**118**	190.81	190.30
48	77.62	77.12	**119**	192.42	191.92
49	79.23	78.72	**120**	194.04	193.53
50	80.85	80.34	**121**	195.66	195.15
51	82.47	81.97	**122**	197.28	196.77
52	84.08	83.57	**123**	198.89	198.38
53	85.70	85.20	**124**	200.51	200.00
54	87.32	86.82	**125**	202.13	201.62
55	88.94	88.43	**126**	203.74	203.24
56	90.55	90.05	**127**	205.36	204.85
57	92.17	91.67	**128**	206.98	206.47
58	93.79	93.28	**129**	208.59	208.09
59	95.40	94.90	**130**	210.21	209.70
60	97.02	96.52	**131**	211.83	211.32
61	98.64	98.13	**132**	213.45	212.94
62	100.25	99.75	**133**	215.06	214.55
63	101.87	101.37	**134**	216.68	216.17
64	103.49	102.99	**135**	218.30	217.79
65	105.11	104.60	**136**	219.91	219.41
66	106.72	106.22	**137**	221.53	221.02
67	108.34	107.83	**138**	223.15	222.64
68	109.96	109.45	**139**	224.77	224.26
69	111.57	111.07	**140**	226.38	225.87
70	113.19	112.68	**141**	228.00	227.49
71	114.81	114.30	**142**	229.62	229.11
72	116.43	115.93	**143**	231.23	230.73
73	118.04	117.53	**144**	232.85	232.34
74	119.66	119.15	**145**	234.47	233.96
75	121.28	120.78	**146**	236.08	235.58
76	122.89	122.38	**147**	237.70	237.20
77	124.51	124.00	**148**	239.32	238.82
78	126.13	125.63	**149**	240.94	240.54
79	127.74	127.23	**150**	242.55	242.05
80	129.36	128.86			

L					
No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
10	30.32	29.56	**81**	245.58	244.82
11	33.35	32.59	**82**	248.62	247.85
12	36.38	35.62	**83**	251.65	250.89
13	39.41	38.65	**84**	254.68	253.92
14	42.45	41.68	**85**	257.71	256.95
15	45.48	44.72	**86**	260.74	259.98
16	48.51	47.75	**87**	263.78	263.01
17	51.54	50.78	**88**	266.81	266.05
18	54.57	53.81	**89**	269.84	269.08
19	57.61	56.84	**90**	272.87	272.11
20	60.64	59.88	**91**	275.90	275.14
21	63.67	62.91	**92**	278.94	278.17
22	66.70	65.94	**93**	281.97	281.20
23	69.73	68.97	**94**	285.00	284.24
24	72.77	72.00	**95**	288.03	287.27
25	75.80	75.04	**96**	291.06	290.30
26	78.83	78.07	**97**	294.09	293.33
27	81.86	81.10	**98**	297.13	296.36
28	84.89	84.13	**99**	300.16	299.40
29	87.93	87.16	**100**	303.19	302.43
30	90.96	90.20	**101**	306.22	305.46
31	93.99	93.23	**102**	309.25	308.49
32	97.02	96.26	**103**	312.29	311.52
33	100.05	99.29	**104**	315.32	314.56
34	103.08	102.32	**105**	318.35	317.59
35	106.12	105.35	**106**	321.38	320.62
36	109.15	108.39	**107**	324.41	323.65
37	112.18	111.42	**108**	327.45	326.68
38	115.21	114.45	**109**	330.48	329.72
39	118.24	117.48	**110**	333.51	332.75
40	121.28	120.51	**111**	336.54	335.78
41	124.31	123.55	**112**	339.57	338.81
42	127.34	126.58	**113**	342.60	341.84
43	130.37	129.61	**114**	345.64	344.87
44	133.40	132.64	**115**	348.67	347.91
45	136.44	135.67	**116**	351.70	350.94
46	139.47	138.71	**117**	354.73	353.97
47	142.50	141.74	**118**	357.76	357.00
48	145.53	144.77	**119**	360.80	360.03
49	148.56	147.80	**120**	363.83	363.07
50	151.60	150.83	**121**	366.86	366.10
51	154.63	153.83	**122**	369.89	369.13
52	157.66	156.90	**123**	372.92	372.16
53	160.69	159.93	**124**	375.96	375.19
54	163.72	162.96	**125**	378.99	378.23
55	166.75	165.99	**126**	382.02	381.26
56	169.79	169.02	**127**	385.05	384.29
57	172.82	172.06	**128**	388.08	387.32
58	175.85	175.09	**129**	391.12	390.35
59	178.88	178.12	**130**	394.15	393.39
60	181.91	181.15	**131**	397.18	396.42
61	184.95	184.18	**132**	400.21	399.45
62	187.98	187.22	**133**	403.24	402.48
63	191.01	190.25	**134**	406.27	405.51
64	194.04	193.28	**135**	409.31	408.54
65	197.07	196.31	**136**	412.34	411.58
66	200.11	199.34	**137**	415.37	414.61
67	203.14	202.38	**138**	418.40	417.64
68	206.17	205.41	**139**	421.43	420.67
69	209.20	208.44	**140**	424.47	423.70
70	212.23	211.47	**141**	427.50	426.74
71	215.27	214.50	**142**	430.53	429.77
72	218.30	217.53	**143**	433.56	432.80
73	221.33	220.57	**144**	436.59	435.83
74	224.36	223.60	**145**	439.63	438.86
75	227.39	226.63	**146**	442.66	441.93
76	230.42	229.66	**147**	445.69	444.93
77	233.46	232.69	**148**	448.72	447.96
78	236.49	235.73	**149**	451.75	450.99
79	239.52	238.76	**150**	454.79	454.02
80	242.55	241.79			

Pitch and Outside Diameter

TRAPEZOIDAL PULLEY

H						XH						XXH					
No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter	No. of teeth	Pitch diameter	Outside diameter
			81	327.45	326.07				**81**	573.03	570.23				**81**	818.61	815.57
			82	331.49	330.12				**82**	580.10	577.31				**82**	828.72	825.68
			83	335.53	334.16				**83**	587.18	584.38				**83**	838.83	835.79
			84	339.57	338.20				**84**	594.25	591.46				**84**	848.93	845.89
14	56.60	55.22	**85**	343.62	342.24				**85**	601.33	598.53				**85**	859.04	855.99
15	60.64	59.27	**86**	347.66	346.29				**86**	608.40	605.61				**86**	869.15	866.10
16	64.68	63.31	**87**	351.70	350.33				**87**	615.48	612.68				**87**	879.25	876.20
17	68.72	67.35	**88**	355.74	354.37				**88**	622.55	619.76				**88**	889.36	886.31
18	72.77	71.39	**89**	359.79	358.41	**18**	127.34	124.54	**89**	629.63	626.83	**18**	181.91	178.87	**89**	899.46	896.42
19	76.81	75.44	**90**	363.83	362.46	**19**	134.41	131.62	**90**	636.70	633.91	**19**	192.02	188.98	**90**	909.57	906.53
20	80.85	79.48	**91**	367.87	366.50	**20**	141.49	138.69	**91**	643.77	640.97	**20**	202.13	199.09	**91**	919.68	916.64
21	84.89	83.52	**92**	371.91	370.54	**21**	148.56	145.77	**92**	650.85	648.06	**21**	212.23	209.19	**92**	929.78	926.74
22	88.94	87.56	**93**	375.96	374.58	**22**	155.64	152.84	**93**	657.92	655.12	**22**	222.34	219.29	**93**	939.89	936.84
23	92.98	91.61	**94**	380.00	378.63	**23**	162.71	159.92	**94**	665.00	662.21	**23**	232.45	229.40	**94**	950.00	946.95
24	97.02	95.65	**95**	384.04	382.67	**24**	169.79	167.00	**95**	672.07	669.27	**24**	242.55	239.50	**95**	960.10	957.05
25	101.06	99.69	**96**	388.08	386.71	**25**	176.86	174.07	**96**	679.15	679.35	**25**	252.66	249.61	**96**	970.21	967.16
26	105.11	103.73	**97**	392.13	390.75	**26**	183.94	181.14	**97**	686.22	683.43	**26**	262.76	259.72	**97**	980.32	977.27
27	109.15	107.78	**98**	396.17	394.80	**27**	191.01	188.22	**98**	693.29	690.50	**27**	272.87	269.82	**98**	990.42	987.37
28	113.19	111.82	**99**	400.21	398.84	**28**	198.08	195.29	**99**	700.37	697.58	**28**	282.98	279.93	**99**	1000.53	997.48
29	117.23	115.86	**100**	404.25	402.88	**29**	205.16	202.37	**100**	707.44	704.65	**29**	293.08	290.04	**100**	1010.63	1007.59
30	121.28	119.90	**101**	408.30	406.92	**30**	212.23	209.44	**101**	714.52	711.72	**30**	303.19	300.15	**101**	1020.74	1017.69
31	125.32	123.95	**102**	412.34	410.97	**31**	219.31	216.51	**102**	721.59	718.80	**31**	313.30	310.25	**102**	1030.85	1027.80
32	129.36	127.99	**103**	416.38	415.01	**32**	226.38	223.59	**103**	728.67	725.87	**32**	323.40	320.35	**103**	1040.95	1037.91
33	133.40	132.03	**104**	420.42	419.05	**33**	233.46	230.66	**104**	735.74	732.95	**33**	333.51	330.46	**104**	1051.06	1048.01
34	137.45	136.07	**105**	424.47	423.09	**34**	240.53	237.74	**105**	742.82	740.02	**34**	343.62	340.57	**105**	1061.17	1058.12
35	141.49	140.12	**106**	428.51	427.14	**35**	247.61	244.81	**106**	749.89	747.10	**35**	353.72	350.67	**106**	1071.27	1068.22
36	145.53	144.16	**107**	432.55	431.18	**36**	254.68	251.89	**107**	756.96	754.17	**36**	363.83	360.78	**107**	1081.38	1078.33
37	149.57	148.20	**108**	436.59	435.22	**37**	261.75	258.96	**108**	764.04	761.25	**37**	373.93	370.89	**108**	1091.48	1088.44
38	153.62	152.24	**109**	440.64	439.26	**38**	268.83	266.04	**109**	771.11	768.32	**38**	384.04	381.00	**109**	1101.59	1098.54
39	157.66	156.29	**110**	444.68	443.31	**39**	275.90	273.10	**110**	778.19	775.39	**39**	394.15	391.11	**110**	1111.68	1108.65
40	161.70	160.33	**111**	448.72	447.35	**40**	282.98	280.19	**111**	785.26	782.47	**40**	404.25	401.20	**111**	1121.80	1118.76
41	165.74	164.37	**112**	452.76	451.39	**41**	290.05	287.25	**112**	792.34	789.54	**41**	414.36	411.31	**112**	1131.91	1128.86
42	169.79	168.41	**113**	456.81	455.44	**42**	297.13	294.34	**113**	799.41	796.62	**42**	424.47	421.42	**113**	1142.02	1138.97
43	173.83	172.46	**114**	460.85	459.48	**43**	304.20	301.40	**114**	806.49	803.69	**43**	434.57	431.52	**114**	1152.12	1149.07
44	177.87	176.50	**115**	464.89	463.52	**44**	311.28	308.49	**115**	813.56	810.77	**44**	444.68	441.63	**115**	1162.23	1159.18
45	181.91	180.54	**116**	468.93	467.56	**45**	318.35	315.55	**116**	820.63	817.84	**45**	454.79	451.74	**116**	1172.34	1169.29
46	185.96	184.59	**117**	472.98	471.61	**46**	325.42	322.63	**117**	827.71	824.92	**46**	464.89	461.85	**117**	1182.44	1179.39
47	190.00	188.63	**118**	477.02	475.65	**47**	332.50	329.70	**118**	834.78	831.99	**47**	475.00	471.96	**118**	1192.55	1189.50
48	194.04	192.67	**119**	481.06	479.69	**48**	339.57	336.78	**119**	841.86	839.06	**48**	485.10	482.06	**119**	1202.65	1199.61
49	198.08	196.71	**120**	485.10	483.73	**49**	346.65	343.86	**120**	848.93	846.14	**49**	495.21	492.16	**120**	1212.76	1209.71
50	202.13	200.76	**121**	489.15	487.78	**50**	353.72	350.93	**121**	856.01	853.21	**50**	505.32	502.27	**121**	1222.87	1219.82
51	206.17	204.80	**122**	493.19	491.82	**51**	360.80	358.01	**122**	863.08	860.29	**51**	515.42	512.37	**122**	1232.97	1229.93
52	210.21	208.84	**123**	497.23	495.86	**52**	367.87	365.08	**123**	870.16	867.36	**52**	525.53	522.48	**123**	1243.08	1240.03
53	214.25	212.88	**124**	501.27	499.90	**53**	374.95	372.16	**124**	877.23	874.44	**53**	535.64	532.59	**124**	1253.19	1250.14
54	218.30	216.93	**125**	505.32	503.95	**54**	382.02	379.23	**125**	884.30	881.51	**54**	545.74	542.70	**125**	1263.29	1260.24
55	222.34	220.97	**126**	509.36	507.99	**55**	389.09	386.30	**126**	891.38	888.59	**55**	555.85	552.81	**126**	1273.40	1270.35
56	226.38	225.01	**127**	513.40	512.03	**56**	396.17	393.37	**127**	898.45	895.06	**56**	565.96	562.91	**127**	1283.51	1280.46
57	230.42	229.05	**128**	517.44	516.07	**57**	403.24	400.45	**128**	905.53	902.73	**57**	576.06	573.02	**128**	1293.61	1290.56
58	234.47	233.10	**129**	521.49	520.12	**58**	410.32	407.52	**129**	912.60	909.81	**58**	586.17	583.12	**129**	1303.72	1300.67
59	238.51	237.14	**130**	525.53	524.16	**59**	417.39	414.60	**130**	919.68	916.88	**59**	596.27	593.22	**130**	1313.82	1310.78
60	242.55	241.18	**131**	529.57	528.20	**60**	424.47	421.67	**131**	926.75	923.96	**60**	606.38	603.33	**131**	1323.93	1320.88
61	246.59	245.22	**132**	533.61	532.24	**61**	431.54	428.75	**132**	933.83	931.03	**61**	616.49	613.44	**132**	1334.04	1330.99
62	250.64	249.27	**133**	537.66	536.29	**62**	438.62	435.82	**133**	940.90	938.11	**62**	626.59	623.54	**133**	1344.14	1341.10
63	254.68	253.31	**134**	541.70	540.33	**63**	445.69	442.90	**134**	947.97	945.18	**63**	636.70	633.65	**134**	1354.25	1351.20
64	258.72	257.35	**135**	545.74	544.37	**64**	452.76	449.96	**135**	955.05	952.26	**64**	646.81	643.76	**135**	1364.36	1361.31
65	262.77	261.39	**136**	549.78	548.41	**65**	459.84	457.05	**136**	962.12	957.33	**65**	656.91	653.87	**136**	1374.46	1371.41
66	266.81	265.44	**137**	553.83	552.46	**66**	466.91	464.11	**137**	969.20	966.40	**66**	667.02	663.98	**137**	1384.57	1381.52
67	270.85	269.48	**138**	557.87	556.50	**67**	473.99	471.20	**138**	976.27	973.48	**67**	677.12	674.07	**138**	1394.68	1391.63
68	274.89	273.52	**139**	561.91	560.54	**68**	481.06	478.26	**139**	983.35	980.55	**68**	687.23	684.18	**139**	1404.78	1401.73
69	278.94	277.56	**140**	565.96	564.58	**69**	488.14	485.35	**140**	990.42	987.63	**69**	697.34	694.29	**140**	1414.89	1411.84
70	282.98	281.61	**141**	570.00	568.63	**70**	495.21	492.41	**141**	997.50	994.70	**70**	707.44	704.39	**141**	1424.99	1421.95
71	287.02	285.65	**142**	574.04	572.67	**71**	502.29	499.49	**142**	1004.57	1001.78	**71**	717.55	714.50	**142**	1435.10	1432.05
72	291.06	289.69	**143**	578.08	576.71	**72**	509.36	506.57	**143**	1011.64	1008.85	**72**	727.66	724.61	**143**	1445.21	1442.16
73	295.11	293.73	**144**	582.13	580.75	**73**	516.43	513.64	**144**	1018.72	1015.93	**73**	737.76	734.72	**144**	1455.31	1452.27
74	299.15	297.78	**145**	586.17	584.80	**74**	523.51	520.71	**145**	1025.79	1023.00	**74**	747.87	744.83	**145**	1465.42	1462.37
75	303.19	301.82	**146**	590.21	588.84	**75**	530.58	527.79	**146**	1032.87	1030.07	**75**	757.98	754.94	**146**	1475.53	1472.48
76	307.23	305.86	**147**	594.25	592.88	**76**	537.66	534.87	**147**	1039.94	1037.15	**76**	768.08	765.03	**147**	1485.63	1482.58
77	311.28	309.90	**148**	598.30	596.92	**77**	544.73	541.94	**148**	1047.02	1044.22	**77**	778.19	775.14	**148**	1495.74	1492.69
78	315.32	313.95	**149**	602.34	600.96	**78**	551.81	549.02	**149**	1054.09	1051.30	**78**	788.29	785.24	**149**	1505.84	1502.80
79	319.36	317.99	**150**	606.38	605.00	**79**	558.88	556.09	**150**	1061.17	1058.37	**79**	798.40	795.35	**150**	1515.95	1512.90
80	323.40	322.03				**80**	565.96	563.17				**80**	808.51	805.46			

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