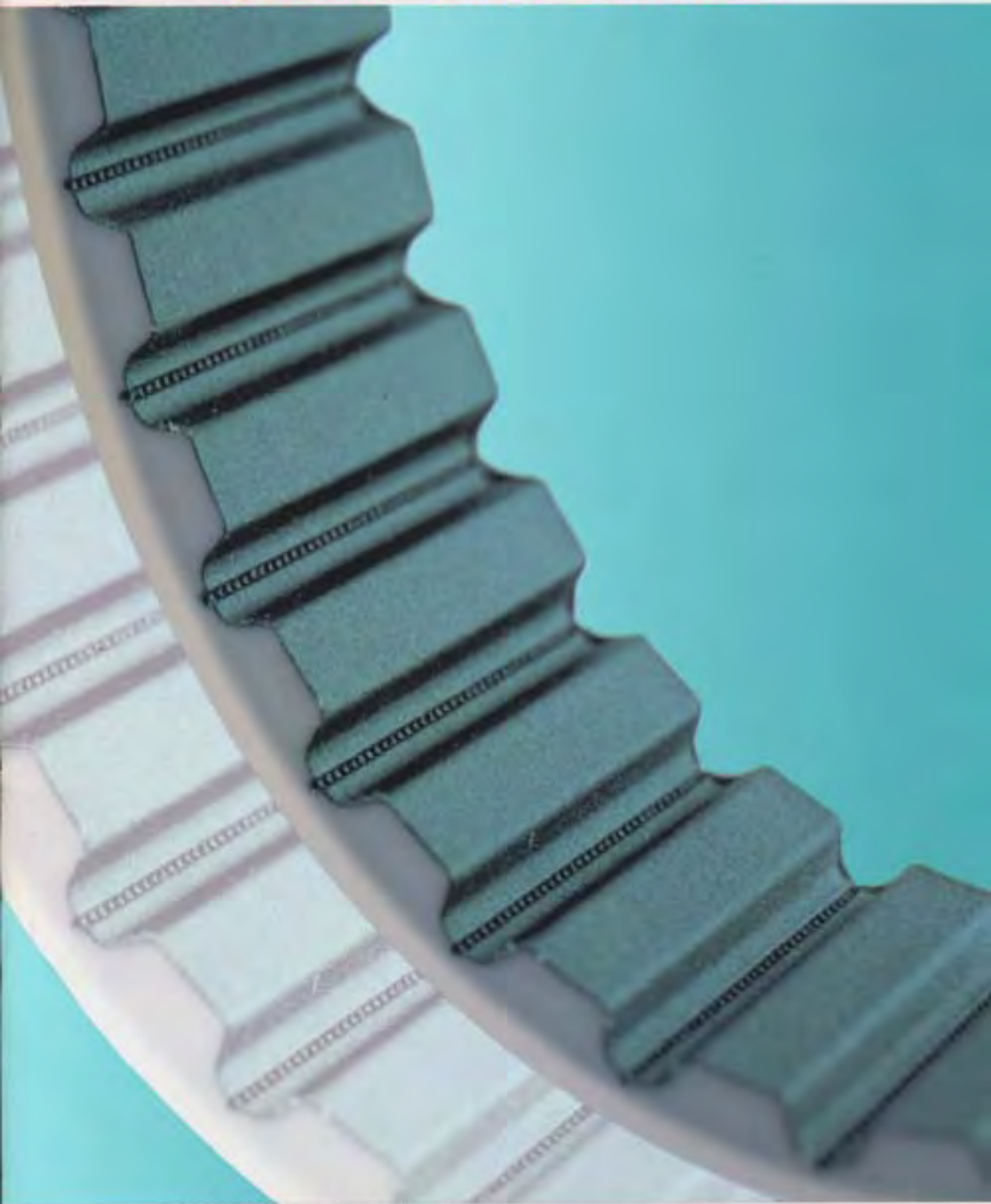
MEGADYNE



MEGAFLEX *TRULY ENDLESS BELTS*

CALCULATION HANDBOOK

Table of Contents

MEGAFLEX CLASSIFICATION

CLASSIFICATIONS

MEGAFLEX TIMING BELTS are manufactured in thermoplastic polyurethane, with continuous spiral steel cords.

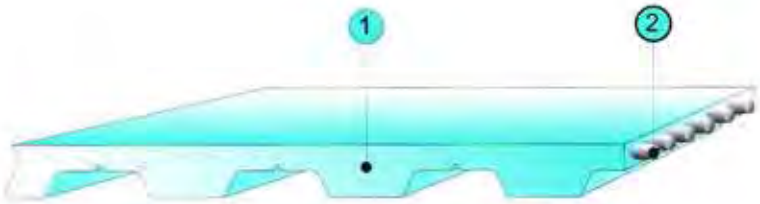
This type of belt, developed by our Research & Development, offers good running characteristics and high traction loads.

They are especially suited for power transmission and conveying with high loads and high speeds (up to 10.000 RPM).

The addition of a nylon coating on the teeth during production enhances the running properties for specific applications and reduces the noise frictional coefficient.

An extra thickness of special coating is also possible on the back of the belt offering extra protection against aggressive or heavy products.

Megaflex belts are truly endless, enabling them to deliver exceptional performance.



1) The body of the belt is polyurethane, characterized by high levels of hardness and tooth wear resistance even in the presence of shock and surge loading.

2) High strength steel tension members allow high breaking load and extremely low elongation.
The combination of these high grade materials improves belt performance which can be summarised as follows:

- exceptional resistance to abrasion and tooth shear
- low coefficient of friction
- high flexibility (high flex cords available)
- ozone and temperature resistance (-30°C / +80°C)
- oil, grease and gasoline resistance

MECHANICAL and CHEMICAL CHARACTERISTICS

- Constant dimensions
- Noiseless
- Maintenance free
- High flexibility
- High resistance steel traction cords, with little stretching and top flexibility
- Linear speeds up to 70 mt/sec.
- Low pretension
- Length constant
- High abrasion resistance
- Ageing, Hydrolysis, Ozone resistant
- Working temperature -30°C : +80°C
- High resistance to Oils, Greases and Gasoline
- Fairly Acid-proof and Alkali-proof

BODY

MEGAFLEX belts are manufactured with thermoplastic Polyurethane 92° shore as standard. Special compounds are available on request (different hardnesses, special properties) please contact our technical staff.

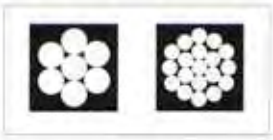
COATING

MEGAFLEX can be manufactured with special coating on the teeth or on the back. Please check our feasibility table.

CORDS

MEGAFLEX is manufactured with steel cords as standard. Special cords are available on request, please check our feasibility table.

HP : High Performance cords have 25% more strength capacity than standard cords.
HF : High Flexibility cords can accept smaller pulley and idler diameters than standard cords.
HPF : High Performance and Flexibility cords have 25% more strength capacity like the HP cords, but they are more flexible than the HP cords.
INOX : Stainless steel cords have 25% less strength capacity than standard cords.



IDENTIFICATION CODE

Using the information in the table below, with our standard codes, it is possible to identify the correct belt for every application.

The code is composed of letters and number as the following examples.

1		2		3		4		5		6
Mfx	+	**50**	+	**AT**	+	**10**	+	**10000**	+	**SPECIAL MANUFACTURES**

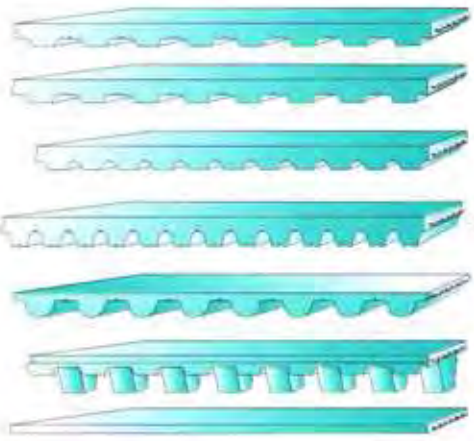
1) **Mfx** : Megaflex Belt
2) **50** : This number indicates the width of the belt requested. The value is in mm for a belt with a pitch in mm, and in inches for a belt with a pitch in inches.
3) **AT** : This code composed by letters indicates the selection of profile
4) **10** : This number indicates the standard pitch of the belt. It is expressed in mm
5) **10000** : The last number indicates the length of the belt always in mm regardless of pitch
6) **SPECIAL MANUFACTURES**: every belt is available with particular manufacture like the following list:
   - double teeth belt
   - NFT (Nylon Fabric on Teeth)
   - special cords (on request it is possible to obtain high performance and high flexibility cord ⇨not for every pitch ⇨ please contact our technical staff)
   - extra coating (please contact our staff to evaluate the thickness of the extra coating and the shore hardness required)
     - AVAFC
     - TENAX
     - LINATEX
     - HONEY COMB
     - PU BLACK CELLULARE
     - PU YELLOW
     - NEOPRENE RUBBER

MEGAFLEX PROGRAM PRODUCTION

AVAILABLE MEGAFLEX TIMING BELT

MEGAFLEX TIMING BELTS are manufactured in the following pitches:

STANDARD



XL - L - H - XH

T5 - T10 - T20

AT5 - AT10 - AT20

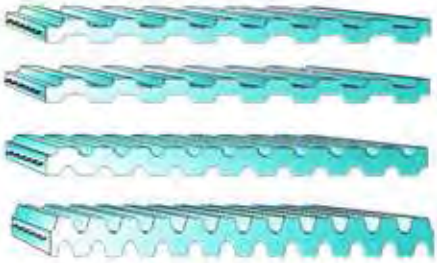
RPP5 - RPP8 - RPP14

MTD8

ATG10

P2

DOUBLE SIDED



FEASIBILITY TABLES

Special MEGAFLEX belts can be manufactured according with the following table:

	T5	T10	T20	AT5	AT10	AT20	ATG10	XL	L	H	XH	RPP5	RPP8	RPP14	HTD8	P2
steel cords	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
HF	M	M	M	M	M	M	X	X	X	X	X	X	X	X	X	X
HP	M	M	M	X	M	M	X	X	X	X	X	X	X	X	X	X
HPF	M	M	M	X	M	X	X	X	X	X	X	X	X	X	X	X
NFT	O	O	O	O	O	O	X	O	O	O	O	O	O	O	O	O
NFB	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
AVAFC 2 mm 85° shore A	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
POROL	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
PU yellow coating 50° shore A	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
TENAX 45° shore A	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
LINATEX 42° shore A	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
honey comb	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
neoprene rubber 70 shore A	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
FDA compound	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
double teeth only stand. cords	M	M	M	M	M	M	X	M	M	M	M	M	M	M	X	X
antistatic suface treatment	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
CLEATS	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
min length	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	-	-	-	1500	1500
min length with NFT	1900	1900	1900	1900	1900	1900	-	1900	1900	1900	1900	1900	1900	1900	1900	1900
max length	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800	19800
max width	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
min n. teeth pulley st. cords	10	12	15	12	15	18	25	10	10	14	18	12	18	32	18	-
min outside idler dia	30	60	120	60	100	180	160	30	60	60	150	60	100	250	100	100
min inside idler dia	30	60	120	60	100	120	80	20	40	60	150	20	45	145	50	50
min n. teeth pulley HF cords	10	12	15	12	15	18	-	-	-	-	-	-	-	-	-	-
min outside idler dia	25	40	100	40	80	150	-	-	-	-	-	-	-	-	-	-
min inside idler dia	25	40	120	25	50	120	-	-	-	-	-	-	-	-	-	-
min n. teeth pulley HP cords	15	18	18	-	25	-	-	-	-	-	-	-	-	-	-	-
min outside idler dia	40	100	150	-	150	-	-	-	-	-	-	-	-	-	-	-
min inside idler dia	40	50	150	-	80	-	-	-	-	-	-	-	-	-	-	-
min n. teeth pulley HPF cords	12	14	16	-	16	-	-	-	-	-	-	-	-	-	-	-
min outside idler dia	30	80	120	-	100	-	-	-	-	-	-	-	-	-	-	-
min inside idler dia	25	50	120	-	60	-	-	-	-	-	-	-	-	-	-	-

LEGEND

O = standard

M = on request with minimum quantity

X = not available

SPECIAL BELT CHARACTERISTICS

NFT
Nylon fabric teeth coating.
The belts teeth are coated with low friction and less noise material. Green colour. Coating used for conveying systems. It has intermediate resistance to oils but good resistance to water.

AVAFC
Polyurethane coating. 85° shore A hardness. Standard thickness 2mm. Transparent colour. Coating used for conveying abrasive materials, with high friction coefficient and very good resistance to oil.

POROL
Open cellulare neoprene (rubber) coating 10° shore A. Black colour. Coating used for conveying fragile materials; material with high friction coefficient, intermediate resistance to oil and grease.

PU YELLOW
Foamed polyurethane coating 50° shore A. Coating used for vacuum conveying systems, with good resistance to friction and good resistance to oil.

TENAX
Natural rubber coating 45° shore A. Vulcanized and truly endless. Red colour. Coating used for conveying abrasive materials, with high friction coefficient, good wear resistance and resistant to water.

LINATEX
Natural rubber coating 42° shore A, jointed and glued. Red colour. Coating used for conveying abrasive materials, with high friction coefficient, good wear resistance and resistant to water.

HONEY COMB
Natural rubber coating 4.5 mm standard thickness. Red colour. Coating used for the packaging industry, natural rubber with good resilience and high wear resistance. Very good water resistance.

NEOPRENE
Synthetic rubber coating 70° shore A grey/black colour. Coating used for conveying delicate and small materials, with good resistance to oil and abrasives, raw material is non flammable and self extinguishing.

FDA
Special polyurethane used to manufacture the belt, on request. The result is a special belt used in the food industry.

DOUBLE TEETH
Double teeth belts can be manufactured on request. The full sleeve must always be purchased .

ANTISTATIC SURFACE TREATMENT
Applications and properties must always be discussed with our technical staff.

CLEATS
Several kind of cleats can be welded on the belt, contact our technical staff for the range available.

MEGAFLEX DIMENSIONS AND TOLERANCE

LENGTHS

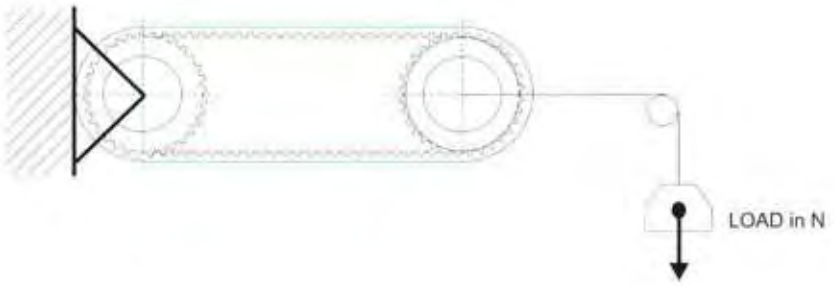
MEGAFLEX are custom made manufactured belts, they are available tooth by tooth on the following range:

from 1.500 m to 19.800 m length

from 1.900 m to 19.800 m length for nylon fabric teeth version.

LENGTH TOLERANCES (mm)							
UP TO		UP TO		UP TO		UP TO	
1700 mm	±1.13	3150 mm	±1.74	5600 mm	±2.72	12000 mm	on request
1900 mm	±1.22	3350 mm	±1.82	6000 mm	±2.92	13000 mm	on request
2120 mm	±1.31	3550 mm	±1.91	6300 mm	±3.04	14000 mm	on request
2240 mm	±1.36	3750 mm	±2.03	6700 mm	±3.19	15000 mm	on request
2360 mm	±1.44	4000 mm	±2.11	7100 mm	±3.35	16000 mm	on request
2500 mm	±1.49	4250 mm	±2.24	7500 mm	±3.51	17000 mm	on request
2650 mm	±1.57	4500 mm	±2.32	8000 mm	±3.70	18000 mm	on request
2800 mm	±1.61	4750 mm	±2.40	9000 mm	±4.09	19000 mm	on request
3000 mm	±1.70	5300 mm	±2.64	11000 mm	±4.80	20000 mm	on request

The above length tolerance are tested with following system.



MEASURING LOAD IN N FOR BELT WIDTH											
TYPE / WIDTH (mm)	6	10	12	16	20	25	32	50	75	100	150
T5	10	20		30	35	45	60	94	140		
T10				45		70	85	135	205	270	405
T20						135	170	270	400	550	830
AT5		25		40		60	80	125	190	250	375
AT10						135	170	270	400	550	810
AT20							430	650	975	1300	1950
HTD8M				90		140	175	275	410	550	825
RPP5		15	25	30	40	48	60	80	125	170	250
RPP8			53	64	86	108	135	170	270	400	550
RPP14						268	335	430	650	975	1300
WIDTH (inch)	025	031	037	050	075	100	150	200	300	400	600
XL	12.5	16	13	20	27	40.5	54	81	108	162	216
L			15	22	30	45	60	90	120	180	240
H					35	55	70	110	140	220	280
XH						215	286.6	430	650	975	1300

Special lengths tolerance on request.

WIDTH

TYPE OF BELT	PITCH [mm]	WIDTH [mm]	WIDTH TOLERANCE [mm]
T5	5	6÷150	± 0.5
T10	10	10÷150	± 0.5
T20	20	25÷150	± 1.0
AT5	5	6÷150	± 0.5
AT10	10	10÷150	± 0.5
ATG10	10	25÷150	± 0.5
AT20	20	25÷150	± 1.0
MTD8	8	10÷150	± 0.5
RPP5	5	6÷150	± 0.5
RPP8	8	10÷150	± 0.5
RPP14	14	25÷150	± 1.0
P2	-	10÷100	± 0.5
XL	5.08	6.35÷152.4	± 0.5
L	9.525	9.53÷152.4	± 0.5
H	12.7	12.7÷152.4	± 0.5
XH	22.225	12.7÷152.4	± 1.0

Special width tolerance on request.

THICKNESS

TYPE OF BELT	NOMINAL THICKNESS [mm]	THICKNESS TOLERANCE [mm]
T5	2.2	± 0.15
T10	4.5	± 0.3
T20	8	± 0.45
AT5	2.7	± 0.2
AT10	4.5	± 0.3
ATG10	4.5	± 0.3
AT20	8	± 0.45
MTD8	5.6	± 0.3
RPP5	3.8	± 0.2
RPP8	5.4	± 0.3
RPP14	10	± 0.4
P2	2	± 0.3
XL	2.3	± 0.3
L	3.6	± 0.3
H	4.3	± 0.3
XH	11.2	± 0.5

All MEGAFLEX belts are grinded in the back. Special thickness and special tolerance are available on request.

WEIGHT

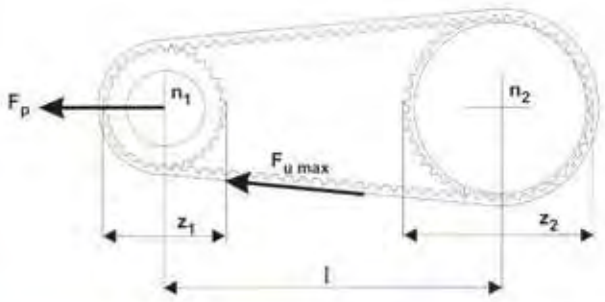
BELT WEIGTH (gr./mt)										
TYPE WIDTH (mm)	10	16	25	32	50	75	100	150		
T5	25	40	65	80	110	160	210	320		
T10	53	72	133	144	256	398	530	750		
T20			200	250	400	600	800	1100		
AT5	30	48	75	96	160	245	328	490		
AT10		97	150	190	300	450	600	900		
AT20			270	350	500	750	1000	1420		
RPP5	39	59	98	125	195	290	390	590		
RPP8	66	105	164	197	328	490	656	990		
RPP14			295	380	590	880	1175	1770		
MTD8	65	104	162	210	325	487	650	975		
P2										
WIDTH (inch)	025	037	050	075	100	150	200	300	400	600
XL	16	23	31	46	61	91	122	183	244	366
L		33	45	68	90	135	180	270	360	540
H		38	55	83	110	160	220	325	430	650
XH					265	400	530	800	1060	1600

The table refers to standard belts and standard cords.

MEGAFLEX POWER TRANSMISSION CALCULATION

CALCULATION PROCESS KNOWING THE POWER RATE AND REVOLUTION

1) Choice of belt pitch, pulleys teeth and belt length.
2) Choice of the belt width.
3) Cord control.
4) Flexibility control.



Legend

P	KW	power engine
z_1		n° teeth of driver pulley
z_2		n° teeth of driven pulley
n_1	1/min	Rpm speed
n_2	1/min	Rpm speed
L_w	mm	belt length
b	mm	belt width
Z_m		n° teeth in mesh on driver pulley
I	mm	interaxe
C_s		safety factor
D_{p1}	mm	primitive diam. driver pulley
D_{p2}	mm	primitive diam. driven pulley
F_{umax}	N	max force to be transmitted
P_{spec}	N	power transmitted by 1 tooth / 1 cm width
F_p	N	pretension

1) Choice of belt pitch, pulleys teeth and belt length

a) To choose the belt pitch use table in pag. 12 ; for new applications RPP pitches are suggested.
up to 5KW RPP5
up to 10KW RPP8
over 10 KW RPP14

b) To choose the n° of teeth (z_1, z_2) of the pulleys try to use all the radial space available, a minimum of 12 teeth in mesh is suggested. Primitive diameter pulley= $\frac{\text{n° teeth} \cdot \text{pitch}}{\pi}$

c) The belt length will be (approximately) speed ratio 1:1 Length = $(z_1 \cdot \text{pitch}) + (2 \cdot \text{centre distance})$
speed ratio ≠ 1 Length = $2 \cdot I + 1.57 \cdot (D_{p1} + D_{p2}) + \frac{(D_{p2} - D_{p1})^2}{4 \cdot I}$

For specific length please contact our staff.

2) Choice of the belt width

$$b = \frac{P \cdot C_s \cdot 10.000}{P_{spec} \cdot Z_m \cdot Z_1}$$

z_m = n° teeth in mesh on driver pulley MAX COMPUTABLE TEETH =12
P_{spec} = W/cm Power transmitted by each tooth in mesh and each cm of belt width.
Cs= safety factor (see safety factor table pag. 13)

3) Cords control

The traction resistance of the belt must meet the following formula:

$$\text{Max traction load choosed belt} > F_p + (F_{u\,max} \cdot C_s)$$

4) Flexibility control

Check that all the criteria of the belt data flexibility has been considered
(the flexibility items in the belt data)

POWER TRANSMISSION

Data:

Motor	:	2 KW
Revolution	:	1500 1/min
Centre distance	:	900 mm
speed ratio request	:	1 : 2
Max radial space	:	65 mm in the driven pulley
Low shock load		

1) Choice of belt pitch, pulleys teeth and belt length

a) The power is 2 KW, so we choose an RPP5 belt

b) $Dp = \frac{z \cdot pitch}{\pi}$ $\quad z_1 = \frac{Dp \cdot \pi}{pitch} \Rightarrow \frac{65 \cdot \pi}{5} = 40$ teeth (exact Dp= 63.69 mm)

$z_2 = z_1 \cdot$ speed ratio $= 40 \cdot 2 = 80$ teeth (exact Dp= 127.38 mm)

c) $L_w = 2 \cdot I + 1.57 \cdot (D_{p1} + D_{p2}) + \frac{(D_{p2} - D_{p1})^2}{4 \cdot I} =$

$= 2 \cdot 900 + 1.57 \cdot (63.69 + 127.38) + \frac{(127.38 - 63.69)^2}{4 \cdot 900} = 2101$ ⇒ 2100 mm length belt requested

2) Choice of the belt width

P = from data 2KW

C_s = from page 13 = 1.4

P_{spec} = from page 24 = 3 W/cm

z_m = > 12 teeth in mesh

z_1 = 40 teeth

$b = \frac{P \cdot C_s \cdot 10000}{P_{spec} \cdot Z_m \cdot Z_1} \Rightarrow \frac{2 \cdot 1.4 \cdot 10000}{3 \cdot 12 \cdot 40} = 19.4$ mm ⇒ 25 mm the nearest standard width

So we need MEGAFLEX **25 RPP5 2100**

3) Cords control

The cord of the belt will be ok if it is satisfied by the following

max traction load $\geq F_p + (F_{u\,max} \cdot C_s)$

$F_p = 2 F_v \cdot \cos\beta$ (see pag. 30) $\quad F_p = 250$ N

$F_{umax} = \frac{P \cdot 974 \cdot 20000}{n \cdot r_1} = 408$ N

max traction load 25 RPP5 = 2375 N (see pag. 24)

so 2375 > 250 + (408 · 1.4) It is Ok

4) Flexibility control

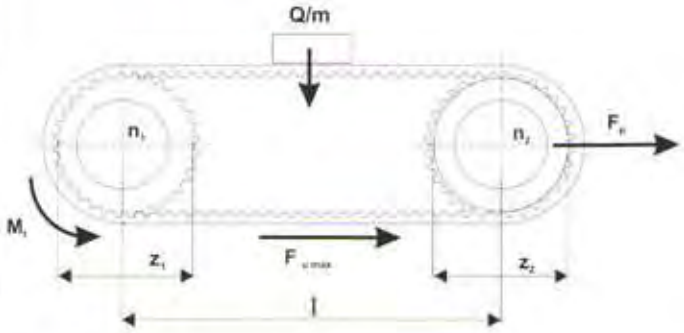
Checking RPP5 Flexibility data in page 24 we have **z_1 = 40 > than 12 It is OK**

NO outside idler It is Ok

MEGAFLEX CONVEYOR TRANSMISSION CALCULATION

CALCULATION PROCESS KNOWING THE TORQUE RATE AND MASS OF CARRIAGE

1) Choice of belt pitch, pulleys teeth and belt length.
2) Choice of the belt width.
3) Cord control.
4) Flexibility control.



Legend

Q	N	load to be conveying
z_1		n° teeth of driver pulley
z_2		n° teeth of driven pulley
n_1	1/min	Rpm speed
n_2	1/min	Rpm speed
L_w	mm	belt length
b	mm	belt width
Z_m		n° teeth in mesh on driver pulley
I	mm	interaxe
C_s		safety factor
D_{p1}	mm	primitive diam. driver pulley
D_{p2}	mm	primitive diam. driven pulley
F_{umax}	N	max force to be transmitted
F_p	N	pretension
F_{usp}	N/cm	force transmitted by 1 tooth / 1 cm width
μ		friction coefficient
m	N	mass
a	m/s^2	acceleration

1) Choice of belt pitch, pulleys teeth and belt length

a) To choose the belt pitch use table in pag. 12 ; for new applications RPP pitches are suggested.

up to $F_u \leq$ 3000 N RPP5
up to $F_u \leq$ 6000 N RPP8
over $F_u >$ 6000 N RPP14

$$F_u = Q \cdot \mu + m \cdot a$$

b) To choose the n° of teeth (z_1, z_2) of the pulleys try to use all the radial space available, a minimum of 12 teeth in mesh is suggested. Primitive diameter pulley= $\frac{\text{n° teeth} \cdot \text{pitch}}{\pi}$

c) The belt length will be (approximately) speed ratio 1:1 $\text{Length} = (z_1 \cdot \text{pitch}) + (2 \cdot \text{centre distance})$

speed ratio ≠ 1 $\text{Length} = 2 \cdot I + 1.57 \cdot (D_{p1} + D_{p2}) + \frac{(D_{p2} - D_{p1})^2}{4 \cdot I}$

For specific length please contact our staff.

2) Choice of the belt width

$$b = \frac{F_{umax} \cdot C_s \cdot 10}{F_{usp} \cdot Z_m}$$

z_m = n° teeth in mesh on driver pulley MAX COMPUTABLE TEETH =12
F_{usp} = Force transmitted by each tooth in mesh and each cm of belt width.
Cs= safety factor (see safety factor table pag. 13)

3) Cords control

The traction resistance of the belt must meet the following formula:

$$\text{Max traction load choosed belt} > F_p + (F_{u\,max} \cdot C_s)$$

4) Flexibility control

Check that all the criteria of the belt data flexibility has been considered
(the flexibility items in the belt data)

CONVEYOR TRANSMISSION

Data:

Load to be conveying	:	Q = 5000 N
Revolution	:	200 1/min
acceleration	:	2 m/s^2
Centre distance	:	3000 mm
speed ratio request	:	1 : 1
Max radial space	:	100 mm in the driven pulley
guide of belt	:	steel
kind of conveying	:	low shock load

1) Choice of belt pitch, pulleys teeth and belt length

a) Fu = 5000 · 0.7 + 500 · 2 = 4500 N

Q = 5000 N from data

μ = 0.7 from page 13

m = 500 N Q/gravity

a = 2 m/s^2 from data

so we choice **RPP8** belt

b) teeth pulley = $\frac{D \cdot \pi}{\text{pitch}} = \frac{100 \cdot 3.14}{8}$ = 39 teeth (Dp = 99.36 mm)

$z_2 = z_1$

c) Belt length = (39 · 8) + (3000 · 2) = 6312 mm

so we choice a belt **RPP8 6312**

2) Choice of the belt width

$b = \frac{F_{umax} \cdot C_s \cdot 10}{F_{usp} \cdot Z_m} \Rightarrow \frac{4500 \cdot 1.4 \cdot 10}{70 \cdot 12}$ = 75 mm ⇒ 85 mm the nearest width

F_u = 4500 N see item 1

C_s = from page 13 = 1.4

F_{usp} = from page 25 = 70 N

z_m = 12 teeth in mesh MAX COMPUTABLE

choised belt is **85 RPP8 6312**

3) Cords control

The cord of the belt will be ok if it is satisfied by the following

max traction load $\geq F_p + (F_{u\,max} \cdot C_s)$

$F_p = 2\,F_v = 4500$ **N** (see pag. 30)

$F_u = 4500$ **N** (from first item)

max traction load $\geq 4500 + (4500 \cdot 1.4) = 10800$

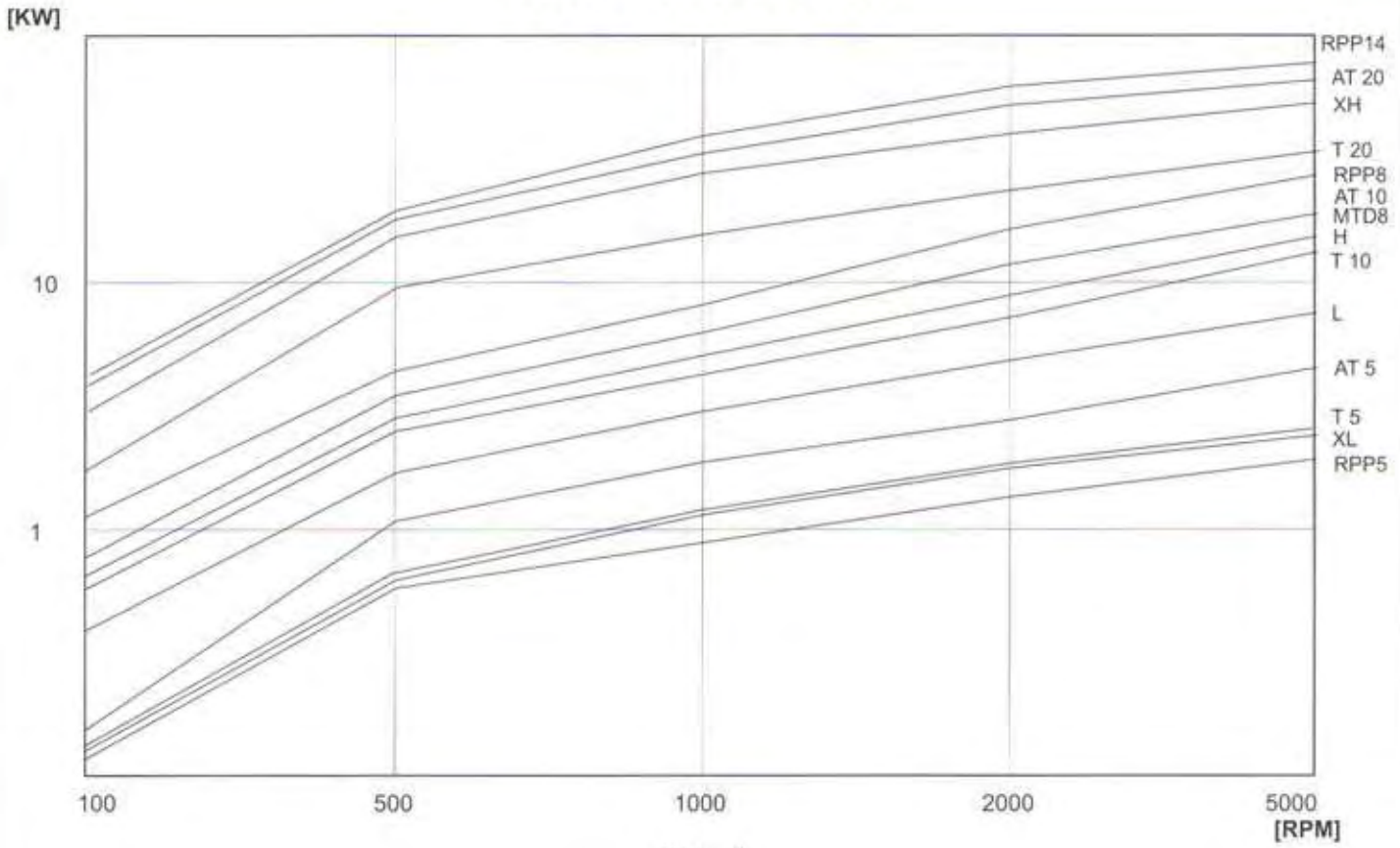
From page 25 we know that 85 RPP8 has a max traction load of 12650 N so the cords are **Ok**

4) Flexibility control

Checking in page 25 the flexibility item we can say **it is Ok**.

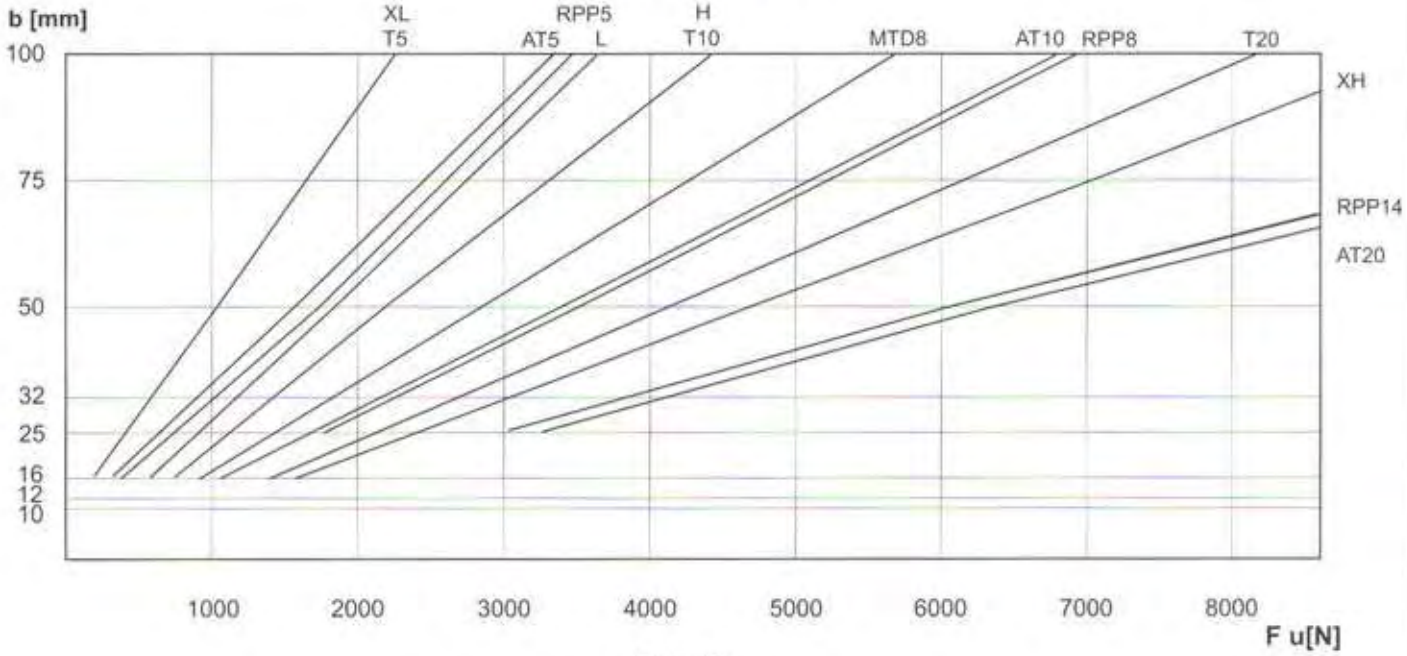
MEGAFLEX BELT SELECTION TABLE

BELT PITCH SELECTION



Tab. A

BELT WIDTH SELECTION



Tab. B

Table n. 3
Friction coefficient

Rolling Friction	
Polyurethane / STEEL	$\mu = 0.7$
Polyurethane / NYLON	$\mu = 0.35$
Polyurethane NFT/ STEEL	$\mu = 0.35$
Polyurethane NFT/ NYLON	$\mu = 0.15$
Volvent Friction	
BEARING	$\mu = 0.015$

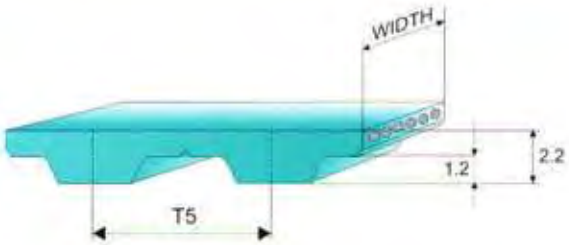
Table n. 4
Safety factor

The choice of the **Safety factor s**, depends on the operating conditions. The following table shows the value to be used:

STEADY LOAD		1
SHOCK LOAD	LOW	1.4
	AVERAGE	1.7
	HIGH	2

MEGAFLEX T5 belt data

TOOTH DIMENSIONS



TOOTH RESISTANCE

Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	24	0.000	500	18	0.75
20	23	0.038	750	17	1.06
40	23	0.077	1000	15	1.25
60	22	0.110	1500	14	1.75
80	22	0.147	2000	13	2.17
100	21	0.18	3000	12	3.00
200	20	0.33	4000	11	3.67
300	19	0.48	5000	9	3.75
400	19	0.63	8000	8	5.33

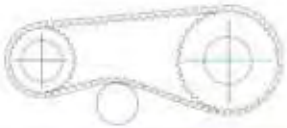
Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)	6	10	16	25	32	50	75	100	150
MAX TRACTION LOAD (N)	165	330	595	960	1260	1990	3020	4080	6130

FLEXIBILITY

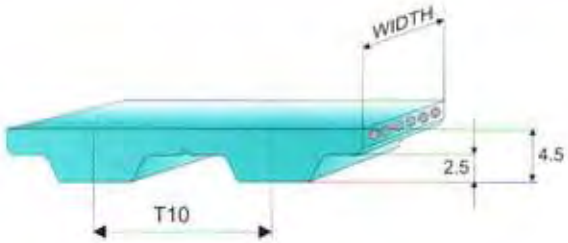
- minimum n° of teeth pulley accepted — z 10
- minimum diameter for inside idler — ∅ 30 mm.



- minimum n° of teeth of the pulley on the back of double teeth belt — z 15
- minimum diameter for outside idler — ∅ 30 mm.

MEGAFLEX T10 belt data

TOOTH DIMENSIONS



TOOTH RESISTANCE

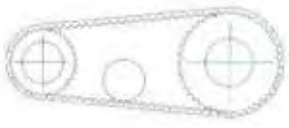
Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	50	0.000	500	35	2.92
20	49	0.163	750	33	4.13
40	48	0.320	1000	31	5.17
60	47	0.470	1500	28	7.00
80	46	0.613	2000	25	8.33
100	45	0.75	3000	22	11.00
200	41	1.37	4000	19	12.67
300	39	1.95	5000	16	13.33
400	37	2.47	8000	13	17.33

Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

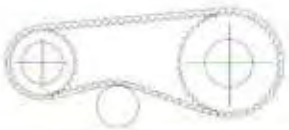
TRACTION RESISTANCE

WIDTH BELT (mm)			16	25	32	50	75	100	150
MAX TRACTION LOAD (N)			1290	2130	2770	4440	6750	9050	13600

FLEXIBILITY



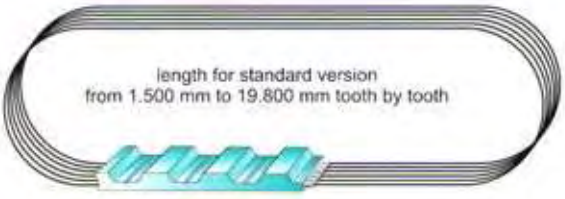
- minimum n° of teeth pulley accepted — z 12
- minimum diameter for inside idler — ∅ 60 mm.

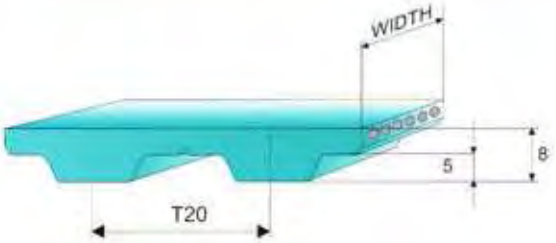


- minimum n° of teeth of the pulley on the back of double teeth belt — z 20
- minimum diameter for outside idler — ∅ 60 mm.

MEGAFLEX T20 belt data

TOOTH DIMENSIONS





TOOTH RESISTANCE

Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	101	0.000	500	68	11.33
20	98	0.653	750	62	15.50
40	95	1.267	1000	57	19.00
60	93	1.860	1500	50	25.00
80	91	2.427	2000	44	29.33
100	89	2.97	3000	38	38.00
200	81	5.40	4000	33	44.00
300	76	7.60	5000	28	46.67
400	72	9.60	8000	-	-

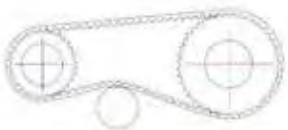
Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)			16	25	32	50	75	100	150
MAX TRACTION LOAD (N)			1980	3330	4380	7500	11500	15300	23800

FLEXIBILITY

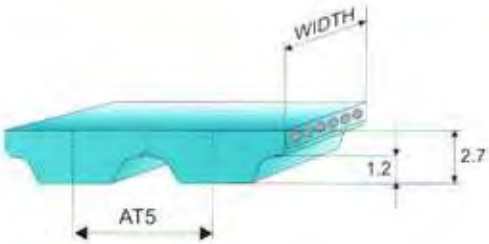
- minimum n° of teeth pulley accepted — z 15
- minimum diameter for inside idler — ∅ 120 mm.



- minimum n° of teeth of the pulley on the back of double teeth belt — z 25
- minimum diameter for outside idler — ∅ 120 mm.

MEGAFLEX AT5 belt data

TOOTH DIMENSIONS



TOOTH RESISTANCE

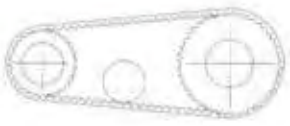
Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	36	0.000	500	29	1.21
20	35	0.058	750	26	1.63
40	34	0.113	1000	25	2.08
60	34	0.170	1500	23	2.88
80	33	0.220	2000	21	3.50
100	33	0.28	3000	19	4.75
200	32	0.53	4000	17	5.67
300	31	0.78	5000	15	6.25
400	30	1.00	8000	13	8.67

Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)		10	16	25	32	50	75	100	150
MAX TRACTION LOAD (N)		640	1100	1820	2350	3950	5750	7600	11500

FLEXIBILITY

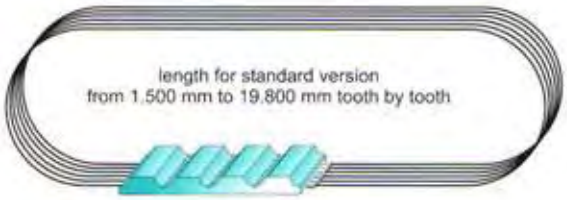


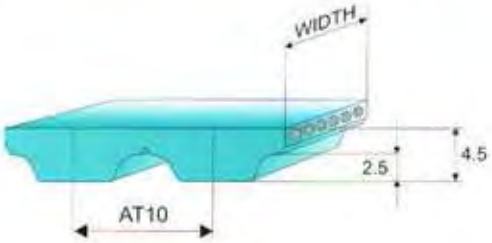
- minimum n° of teeth pulley accepted — z 12
- minimum diameter for inside idler — ∅ 25 mm.

- minimum n° of teeth of the pulley on the back of double teeth belt — z 15
- minimum diameter for outside idler — ∅ 60 mm.

MEGAFLEX AT10 belt data

TOOTH DIMENSIONS





TOOTH RESISTANCE

Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	73	0.000	500	58	4.83
20	72	0.240	750	54	6.75
40	71	0.473	1000	50	8.33
60	70	0.700	1500	45	11.25
80	70	0.933	2000	40	13.33
100	69	1.15	3000	35	17.50
200	65	2.17	4000	30	20.00
300	62	3.10	5000	27	22.50
400	60	4.00	8000	-	-

Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)			16	25	32	50	75	100	150
MAX TRACTION LOAD (N)			1980	3330	4380	7500	11500	15300	23800

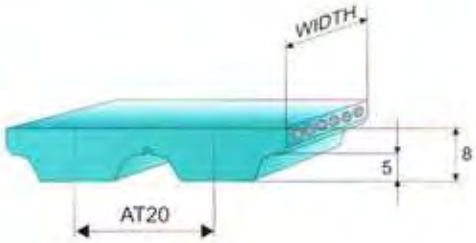
FLEXIBILITY

- minimum n° of teeth pulley accepted — z 15
- minimum diameter for inside idler — ∅ 50 mm.

- minimum n° of teeth of the pulley on the back of double teeth belt — z 25
- minimum diameter for outside idler — ∅ 120 mm.

MEGAFLEX AT20 belt data

TOOTH DIMENSIONS



TOOTH RESISTANCE

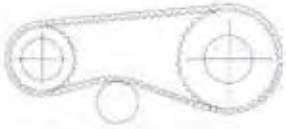
Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	147	0.000	500	107	17.83
20	144	0.960	750	96	24.00
40	141	1.880	1000	88	29.33
60	139	2.780	1500	76	38.00
80	137	3.653	2000	67	44.67
100	135	4.50	3000	53	53.00
200	126	8.40	4000	43	57.33
300	117	11.70	5000	35	58.33
400	112	14.93	8000	-	-

Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)				25	32	50	75	100	150
MAX TRACTION LOAD (N)				5620	7150	11250	16100	22500	33200

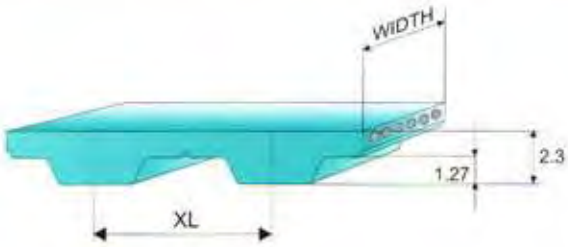
FLEXIBILITY



- minimum n° of teeth pulley accepted — z 18
- minimum diameter for inside idler — ∅ 120 mm.
- minimum n° of teeth of the pulley on the back of double teeth belt — z 25
- minimum diameter for outside idler — ∅ 180 mm.

MEGAFLEX XL belt data

TOOTH DIMENSIONS



TOOTH RESISTANCE

Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	24	0.000	500	18	0.76
20	24	0.041	750	17	1.08
40	23	0.078	1000	16	1.36
60	23	0.117	1500	15	1.91
80	22	0.149	2000	14	2.37
100	22	0.19	3000	12	3.05
200	21	0.36	4000	11	3.73
300	20	0.51	5000	10	4.24
400	19	0.64	8000	9	6.10

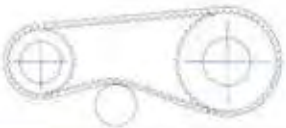
Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)		12.7	19.1	25.4	38.1	50.8	76.2	101.6	152.4
MAX TRACTION LOAD (N)		420	670	910	1390	1880	2850	3820	5750

FLEXIBILITY

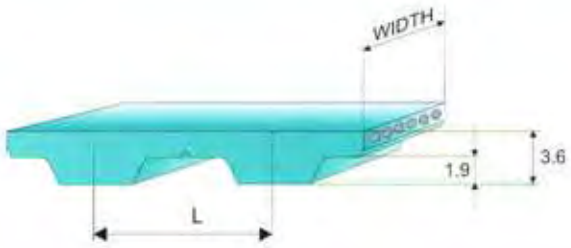
- minimum n° of teeth pulley accepted — z 10
- minimum diameter for inside idler — ∅ 30 mm.



- minimum n° of teeth of the pulley on the back of double teeth belt — z 15
- minimum diameter for outside idler — ∅ 30 mm.

MEGAFLEX L belt data

TOOTH DIMENSIONS



TOOTH RESISTANCE

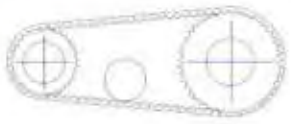
Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	37	0.000	500	26	2.06
20	36	0.114	750	24	2.86
40	35	0.222	1000	23	3.65
60	34	0.324	1500	20	4.76
80	34	0.432	2000	19	6.03
100	33	0.52	3000	17	8.10
200	31	0.98	4000	15	9.52
300	29	1.38	5000	13	10.32
400	27	1.85	8000	10	12.70

Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)		12.7	19.1	25.4	38.1	50.8	76.2	101.6	152.4
MAX TRACTION LOAD (N)		610	1030	1430	2250	3070	4710	6350	9640

FLEXIBILITY

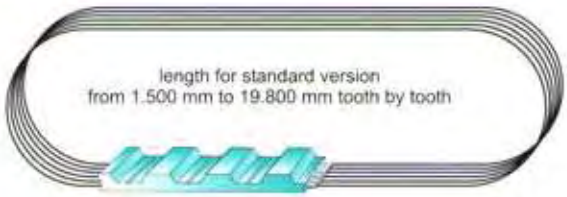


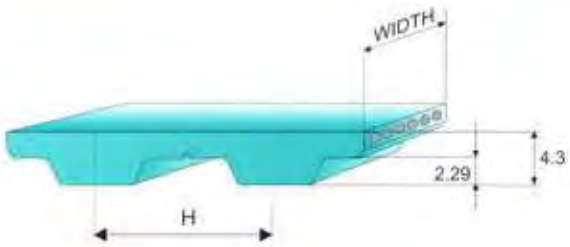
- minimum n° of teeth pulley accepted — z 15
- minimum diameter for inside idler — ∅ 60 mm.

- minimum n° of teeth of the pulley on the back of double teeth belt — z 20
- minimum diameter for outside idler — ∅ 60 mm.

MEGAFLEX H belt data

TOOTH DIMENSIONS





TOOTH RESISTANCE

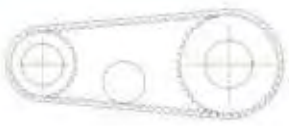
Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	44	0.000	500	31	3.28
20	43	0.182	750	28	4.45
40	42	0.356	1000	27	5.72
60	41	0.521	1500	24	7.62
80	40	0.677	2000	22	9.31
100	39	0.83	3000	19	12.07
200	36	1.52	4000	17	14.39
300	34	2.16	5000	15	15.88
400	32	2.71	8000	-	-

Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)		12.7	19.1	25.4	38.1	50.8	76.2	101.6	152.4
MAX TRACTION LOAD (N)		820	1320	1800	2780	3760	5720	7680	11600

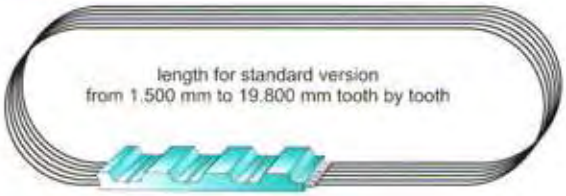
FLEXIBILITY

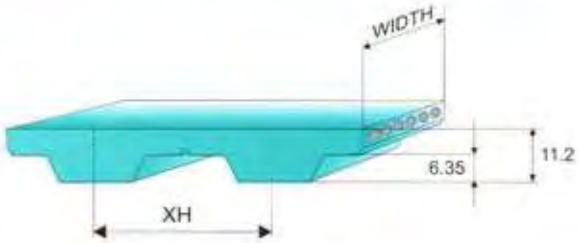


- minimum n° of teeth pulley accepted — z 14
- minimum diameter for inside idler — ∅ 80 mm
- minimum n° of teeth of the pulley on the back of double teeth belt — z 20
- minimum diameter for outside idler — ∅ 80 mm.

MEGAFLEX XH belt data

TOOTH DIMENSIONS





TOOTH RESISTANCE

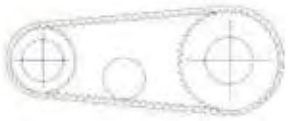
Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	126	0.000	500	85	15.92
20	122	0.914	750	77	21.63
40	118	1.768	1000	71	26.59
60	115	2.584	1500	63	35.39
80	113	3.386	2000	56	41.95
100	110	4.12	3000	47	52.81
200	101	7.57	4000	41	61.42
300	94	10.56	5000	-	-
400	89	13.33	8000	-	-

Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)					38.1	50.8	76.2	101.6	152.4
MAX TRACTION LOAD (N)					5570	8700	12100	17200	25000

FLEXIBILITY

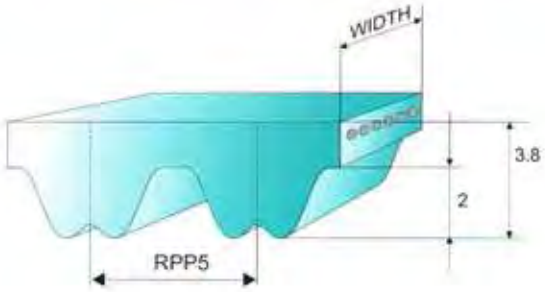


- minimum n° of teeth pulley accepted — z 18
- minimum diameter for inside idler — ∅ 150 mm.

- minimum n° of teeth of the pulley on the back of double teeth belt — z 25
- minimum diameter for outside idler — ∅ 180 mm.

MEGAFLEX RPP5 belt data

TOOTH DIMENSIONS



TOOTH RESISTANCE

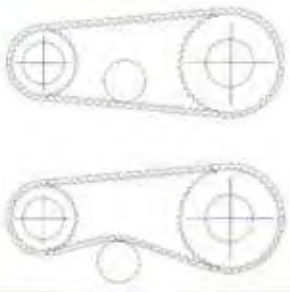
Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	37	0.000	500	30	1.25
20	36	0.060	750	27	1.69
40	36	0.120	1000	27	2.25
60	35	0.175	1500	24	3.00
80	35	0.233	2000	23	3.83
100	35	0.29	3000	20	5.00
200	33	0.55	4000	18	6.00
300	32	0.80	5000	16	6.67
400	31	1.03	8000	14	9.33

Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)		10	15	25	30	50	85	100	150
MAX TRACTION LOAD (N)		875	1330	2375	2660	4750	8330	9830	14800

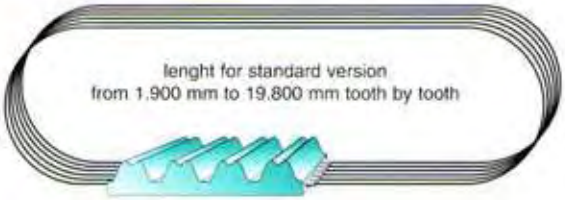
FLEXIBILITY

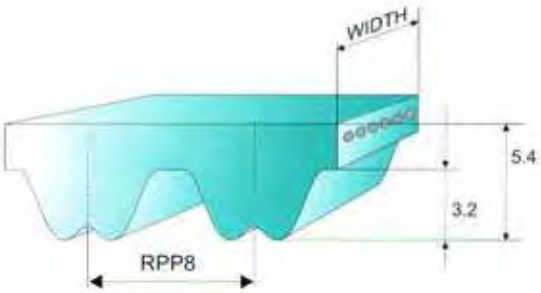


- minimum n° of teeth pulley accepted — z 12
- minimum diameter for inside idler — -
- minimum n° of teeth of the pulley on the back of double teeth belt — z 15
- minimum diameter for outside idler — ∅ 60 mm.

MEGAFLEX RPP8 belt data

TOOTH DIMENSIONS





TOOTH RESISTANCE

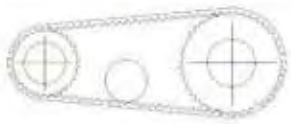
Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	76	0.000	500	59	4.92
20	75	0.250	750	54	6.75
40	74	0.493	1000	51	8.50
60	73	0.730	1500	46	11.50
80	72	0.960	2000	41	13.67
100	71	1.18	3000	35	17.50
200	70	2.33	4000	31	20.67
300	64	3.20	5000	28	23.33
400	61	4.07	8000		

Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)			15	20	30	50	85	100	150
MAX TRACTION LOAD (N)			2000	3020	4480	7100	12650	13800	23800

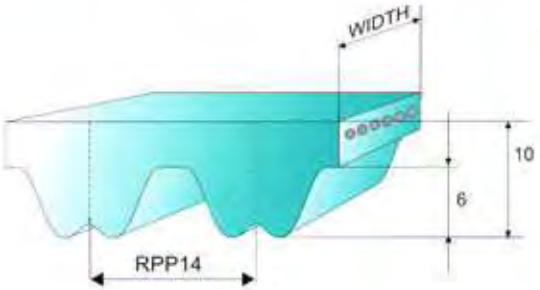
FLEXIBILITY



- minimum n° of teeth pulley accepted — z 18
- minimum diameter for inside idler — -
- minimum n° of teeth of the pulley on the back of double teeth belt — z 25
- minimum diameter for outside idler — ∅ 100 mm.

MEGAFLEX RPP14 belt data

TOOTH DIMENSIONS



TOOTH RESISTANCE

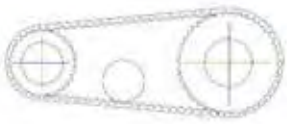
Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	140	0.000	500	102	17.00
20	137	0.913	750	92	23.00
40	135	1.800	1000	84	28.00
60	134	2.680	1500	72	36.00
80	130	3.467	2000	64	42.67
100	128	4.27	3000	50	50.00
200	119	7.93	4000	41	54.67
300	112	11.20	5000	34	56.67
400	107	14.27	8000	-	-

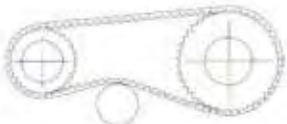
Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)				25	40	55	85	100	150
MAX TRACTION LOAD (N)				6700	12300	16750	28500	33500	51000

FLEXIBILITY

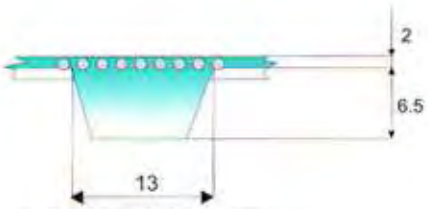




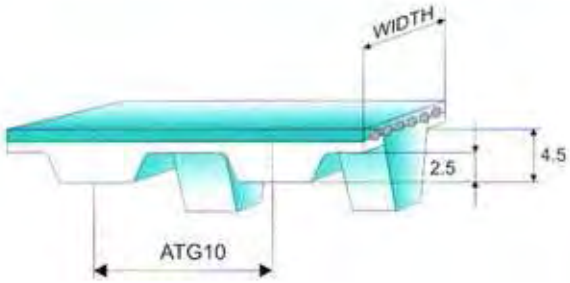
- minimum n° of teeth pulley accepted — z 32
- minimum diameter for inside idler —
- minimum n° of teeth of the pulley on the back of double teeth belt — z 40
- minimum diameter for outside idler — ∅ 250 mm.

MEGAFLEX ATG10 belt data

TOOTH DIMENSIONS



length for standard version
from 1.500 mm to 19.800 mm tooth by tooth



TOOTH RESISTANCE

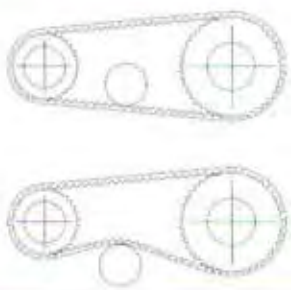
Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	37	0.000	500	29	2.42
20	36	0.120	750	26	3.25
40	36	0.240	1000	25	4.17
60	35	0.350	1500	22	5.50
80	35	0.467	2000	20	6.67
100	34	0.57	3000	17	8.50
200	32	1.07	4000	15	10.00
300	31	1.55	5000	13	10.83
400	30	2.00	8000	-	-

Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT mm)									150
MAX TRACTION LOAD (N)									23800

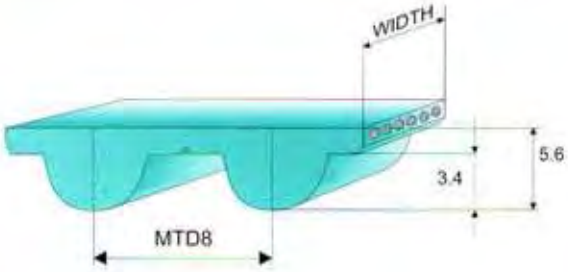
FLEXIBILITY



- minimum n° of teeth pulley accepted — z 25
- minimum diameter for inside idler — ∅ 80 mm.
- minimum n° of teeth of the pulley on the back of double teeth belt —
- minimum diameter for outside idler — ∅ 120 mm.

MEGAFLEX MTD8 belt data

TOOTH DIMENSIONS



TOOTH RESISTANCE

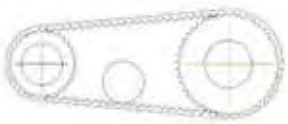
Rpm 1/min	Fu sp N/cm	Pspec W/cm	Rpm 1/min	Fu sp N/cm	Pspec W/cm
0	68	0.000	500	53	4.42
20	67	0.223	750	48	6.00
40	66	0.440	1000	46	7.67
60	65	0.650	1500	41	10.25
80	64	0.853	2000	37	12.33
100	63	1.05	3000	32	16.00
200	60	2.00	4000	28	18.67
300	57	2.85	5000	25	20.83
400	55	3.67	8000	-	-

Rpm = Revolutions per minute
Fusp = Force transmitted by each tooth in mesh and each cm of belt width
Pspec = Power transmitted by each tooth in mesh and each cm of belt width

TRACTION RESISTANCE

WIDTH BELT (mm)			16	25	32	50	75	100	150
MAX TRACTION LOAD (N)			2000	3950	4700	7100	11100	13800	23800

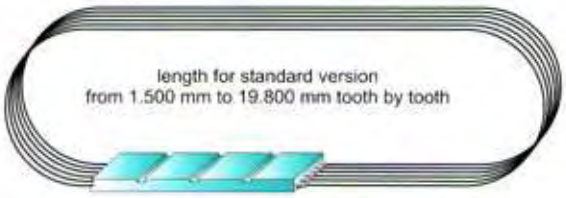
FLEXIBILITY

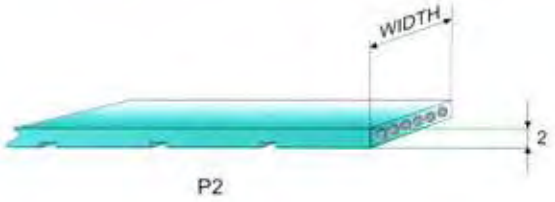


- minimum n° of teeth pulley accepted — z 22
- minimum diameter for inside idler —
- minimum n° of teeth of the pulley on the back of double teeth belt —
- minimum diameter for outside idler — ∅ 100 mm.

MEGAFLEX P2 belt data

TOOTH DIMENSIONS





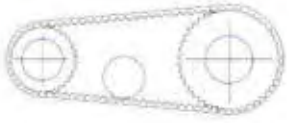
TOOTH RESISTANCE

Belt for conveyor systems only, please contact our technical staff.

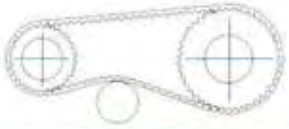
TRACTION RESISTANCE

WIDTH BELT (mm)						25	50	75	100
MAX TRACTION LOAD (N)						2130	4440	6750	9050

FLEXIBILITY



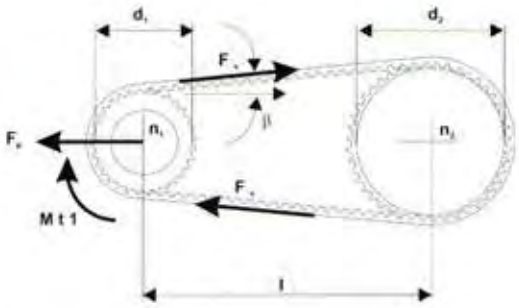
- minimum n° of teeth pulley accepted -
- minimum diameter for inside idler ∅ 40 mm.



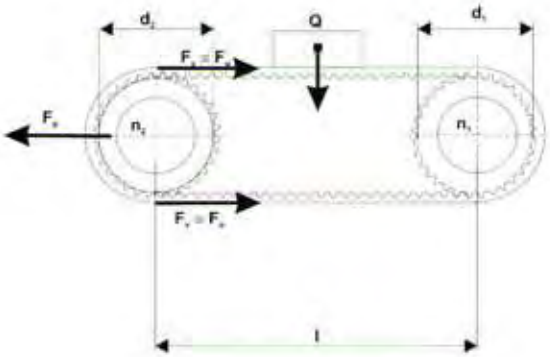
- minimum n° of teeth of the pulley on the back of double teeth belt -
- minimum diameter for outside idler ∅ 40 mm.

HOW TO INSTALL THE BELT AND CHOOSE THE RIGHT VALUE OF PRETENSION

1) POWER TRANSMISSION



2) CONVEYOR TRANSMISSION



F_p is the force needed to put tension in to the system, the timing belt could work without pretension but it is necessary to pretension to avoid the belt running on the pulley as in the example below:

To choose the value of the pretension it is necessary to analyse the two cases:

1) Power transmission

$$F_p = 2\,F_v \cdot \cos\beta$$

a) if number of teeth in driver pulley is smaller than 60 the pretension will be:

($z \leq 60$) $\quad F_v = 1/3\ F_u$

b) if number of teeth in driver pulley is included from 60 to 150 the pretension will be:

($60 < z \leq 150$) $\quad F_v = 1/2\ F_u$

c) if number of teeth in driver pulley is bigger than 150 the pretension will be:

($z \geq 150$) $\quad F_v = 2/3\ F_u$

Generally in power transmission the speed ratio is not 1 so it is important to evaluate the pretension using the three examples above.

2) Conveyor transmission

In this case the speed ratio is 1 : 1 (the dimensions of driver and driven pulley are the same).

The value of pretension will be

$$F_p = 2F_v \qquad F_v = 1/2\ F_u$$

A major difficulty installing transmission belts is in achieving the correct belt tension. Lifetime of support bearings and transmission belts and therefore reliability of the complete system largely depends on optimally adjusted belt tension. In the case of linear actuators, only a correctly adjusted belt tension provides the best possible positional accuracy.

The belt tension measuring device **RSM2000** allows the measurement of the actual belt tension. The **RSM2000** is applicable with all industrially used types of transmission belts, such as: flat belts, V belts, timing belts, poly-V belts, etc.

The microcontroller based **RSM2000** measures vibrations, through a highly sensitive sensor and calculates by numerical filtering the Eigen frequency of tensioned belts. In addition - given the specific mass of a belt and its free vibrating length - the **RSM2000** provides the corresponding belt tension in Newtons.

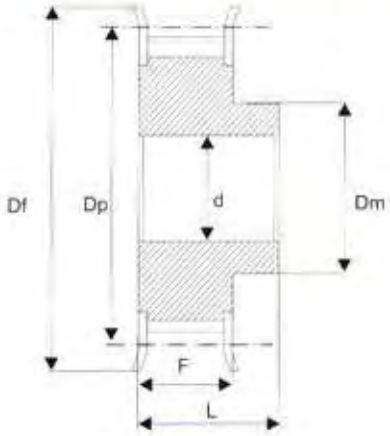
The **RSM2000** comes with several useful features, such as language switch, user programmable standard values for specific mass and belt length and an "in sensor" body integrated trigger button. Optionally an **RS232** port for data output of the last 50 measurements is available.

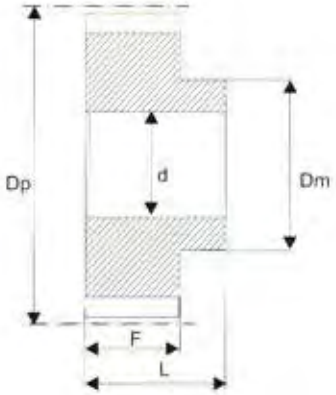
Refer to technical data pages 8 and 10 for belt weight per meter.

MEGAFLEX PULLEYS

MEGAFLEX STANDARD PULLEYS

MEGAFLEX belts can use standard pulleys for every pitch. Standard pulleys have hubs, an available flanged or unflanged, in steel or aluminium.
The most common pulleys on the market suitable for MEGAFLEX are the two following types. MEGADYNE is able to supply special pulleys custom made with specific surface treatment or special working according to the customer drawing.





F = width of toothed face (normally we use width belt +8 mm)
L = total width of pulley
Dm = diameter of hub
d = diameter of hole for the shaft
Dp = primitive diameter
Df = flanges diameter

The feasibility tabel on pag. 4 gives the minimum n° of teeth pulley required for each pitch and profile.

CUSTOM MADE PULLEYS CAN BE MADE IN ANY PITCH AND MATERIAL.