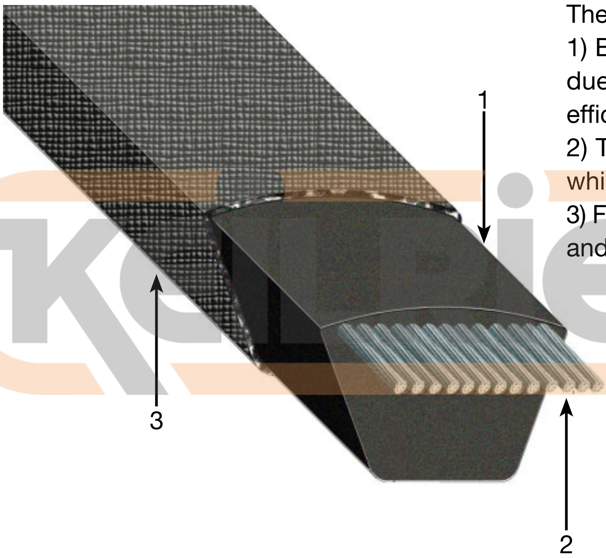
V-BELTS

Rubber V-belts

MEGADYNE

Megadyne V-belts have been used for decades in the most different industries and applications, offering drive solutions to customers all over the world.
Applied technology guarantees such a dimensional precision in V-belts which allows them to be suitable for multiple transmissions. This dimensional stability continues also during belt use.

The variety of belt sizes available allows the application of Megadyne V-belt in a wide range of drive applications, such as:
machine tools
industrial washing machines
textile machines
continuous paper machines
high power mills
stone crushers

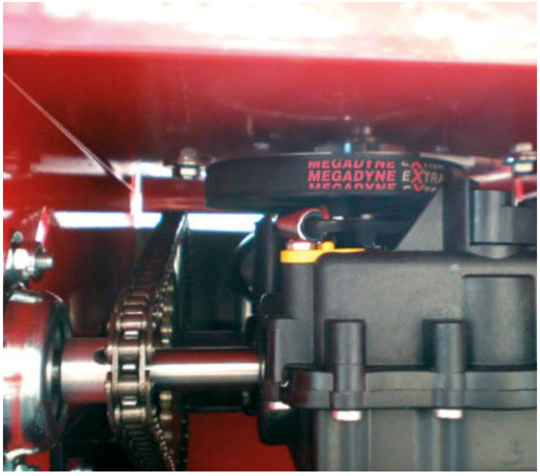


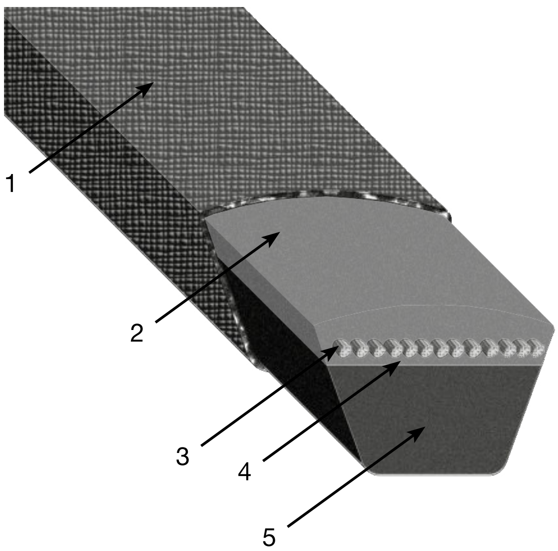
The main V-belt components are:
1) Belt body made of a special rubber compound which provides, due to its excellent mechanical characteristics, high transmission efficiency and assures a minimum rubber wear off;
2) Tensile member consisting in high-strength low-stretch cords, which grant length stability over the belt life time;
3) Fabric jacket or cover made of fabric, protecting the tensile member and permitting the use of back side idler.

MECHANICAL AND CHEMICAL FEATURES

- smooth starting and running
- wide range of driven speed
- low maintenance
- high efficiency
- extremely wide horsepower ranges
- dampen vibration between driver and driven pulleys
- silent operations
- long life service
- easy installation
- reduction in drive dimension
- working temperature range from -30°C to +80/90°C (see details in family pages)
- oil and heat resistance
- antistatic properties

MEGAMATCH MEGA MATCH
All V-belts carrying the MEGA MATCH logo are made and supplied according to the matching set tolerances and limits indicated by the relevant international standards (ISO,RMA, etc)





WRAPPED BELTS

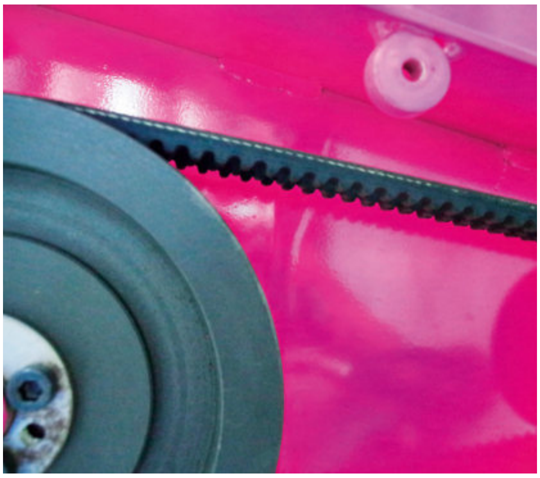
EXTRA
Extra belts were designed to offer durable and reliable performances on light and medium-duty drives. They represent an affordable solution for transmission systems of all industrial sectors.

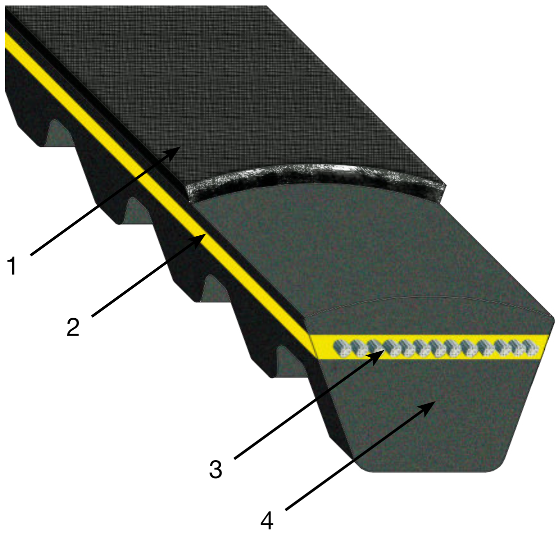
OLEOSTATIC
Oleostatic rubber belts are developed with high resistant tensile elements, they are characterised by high performances, length stability during belts life, conductivity, oil and heat resistance. They are particularly suitable for centrifugal pumps, compressor, tool machines, generators, high power mills and stone mills.

OLEOSTATIC GOLD
Different materials and design features, together with an improved production process, have led to the development of a new class of higher rated wrapped V-belts. The new OLEOSTATIC GOLD V-belts products family can operate in a wide range of industrial applications, within a large spread of load capacities and speeds — offering rated performance from 100 to 8,000 RPM and power capability from 1 to 400 kW, meanwhile granting large cost advantages for the end users.

Oleostatic Gold structure:

1) FABRIC: Double cover ply - CR Dip.
   A reinforced, double fabric cover is plied around the belt to protect it against contamination and moisture. Its increased flexibility allows the belt to bend more easily around the smallest pulleys with far less strain on the fabric, while assuring a smoother running drive.
2) TOP CUSHION: SBR compound + Fibers
3) TENSILE CORD: H.T. Polyester
   The tensile section is made up of a multiple number of high-strength, low elongation polyester cords, completely embedded in the adhesion layers, to enhance resistance to tension and flex-fatigue. Each cord is individually and specially coated to secure a long-lasting bond with the surrounding rubber and to grant a longer operational lifetime. In addition the belt requires significantly less retensioning and take-up due to its cord's consistent length stability. Longer belt life means less frequent replacement, less downtime and lower maintenance costs.
4) BOTTOM CUSHION: SBR compound + Fibers
5) BODY COMPOUND: Polycloroprene (CR) based





RAW EDGE

LINEA-X

These belts have been specifically developed to run where small pulleys diameters and high transmission ratios put a limit to the use of wrapped belts of the same section.

Compared to wrapped belts, the LINEA-X family offers important improvements, like specific compounds and special production technology. In particular the transverse orientation of the fibers improves the cord support capacity of the body section and reinforces its transverse rigidity, while maintaining, (due to the cogged profile and the precision-ground sidewalls) the highest longitudinal flexibility and running stability. These characteristics guarantee an excellent structure with advantages such as: high transmission ratios, improved grip and resistance to continuous bending.

LINEA GOLD

The NEW generation of raw edge belts
New materials, advanced design features and an innovative production process has led MEGADYNE to develop a new generation of raw edge V-belt drives that outperform, in a wide range of industrial applications, all the previous drives equipped with standard raw edge belts, granting large cost advantages for the end users and greater design flexibility for the engineers. The belt has a narrow cross section and a raw edge construction, based on a new EPDM rubber compound which can outstand chemically aggressive environments, ageing, ozone, UV and heat.

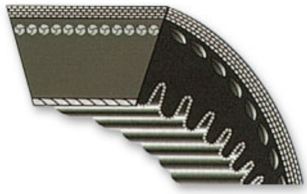
Linea Gold structure:
1) BACKSIDE FABRIC
A textile fabric is plied on the belt backside to protect it against contamination and moisture.
Its flexibility gives the belt excellent reversed bending properties when backside idlers are used and protects the belt against wear.
2) ADHESION LAYERS
An innovative, colored, EPDM compound located immediately above and below the belt cords, guarantees the best possible bonding with the under cord body material.
3) TENSILE CORD
The tensile section is made up of a multiple number of high-strength, low elongation polyester tensile cords which are completely embedded in the adhesion layers and vulcanized as one solid unit to enhance resistance to tensile and flex-fatigue forces. On request, for special extreme requirements, aramid or glassfibre cords are also available.
4) BODY COMPOUND
A newly developed EPDM compound, with high-performance fibers embodied in the rubber matrix, provides to the belt with superior abrasion and wear resistance. The transversal orientation of the fibers improves the cord support capacity of the body section and reinforces its transversal rigidity, while maintaining, in connection with the cogged profile and the precision-ground sidewalls, the utmost longitudinal flexibility and running stability.

SECTIONS

Z	E
A	20
B	25
C	45
D	50

Classical wrapped V-belts

(Extra - Oleostatic - Oleostatic Gold)



SECTIONS

AX
BX
CX

Classical raw edge V-belts

(Linea Gold)

SECTIONS

SPZ
SPA
SPB
SPC

Narrow wrapped V-belts DIN

(Extra - Oleostatic Gold)

SECTIONS

XPZ
XPA
XPB
XPC

Narrow raw edge V-belts DIN

(Linea-X - Linea Gold)

SECTIONS

3V
5V
8V

Narrow wrapped V-belts RMA

(Oleostatic)

SECTIONS

13x6	36x12
17x6	37x10
21x7	42x13
22x8	47x13
26x8	52x16
28x8	55x16
30x10	65x20
32x10	70x20

Variable speed V-belts

(Varisect)

SECTIONS

XDV2-38
XDV2-48
XDV2-58

Xtra Duty V-belts

(XDV2)

SECTIONS

AA
BB
CC

Double V-belts

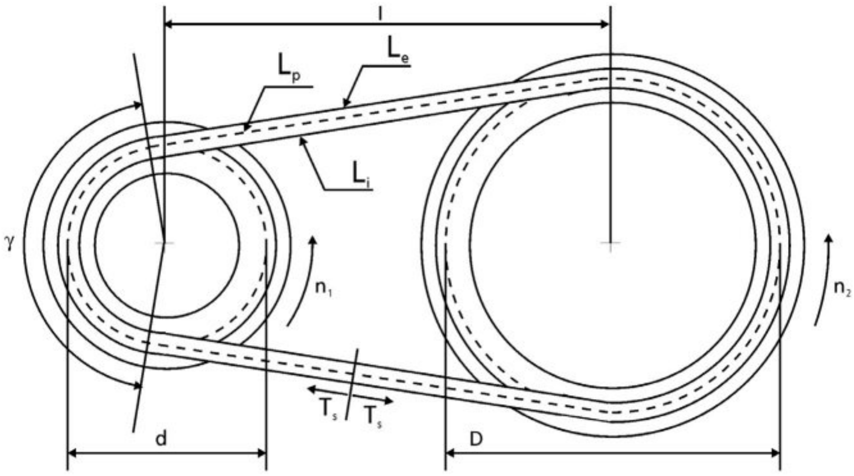
(Esaflex)

SECTIONS

RA	RSPC
RB	R3V
RC	R5V
RSPZ	R8V
RSPA	R3VX
RSPB	R5VX

Banded V-belts

(Pluriband)



Symbol	Unit	Definition	Symbol	Unit	Definition
C_γ		correction factor C_γ	L_p	mm	pitch length (effective)
C_L		correction factor C_L	n_1	RPM	speed of smaller pulley (faster)
C_c		correction factor C_c	n_2	RPM	speed of bigger pulley (slower)
d	mm	pitch diameter of smaller pulley	P	kW	power to be transmitted
D	mm	pitch diameter of bigger pulley	P_a	kW	actual power of the transmission
I	mm	theoretical center distance	P_b	kW	basic performance of a single belt
I_e	mm	effective center distance	P_c	kW	corrected power
i		transmission ratio	P_d	kW	difference to Pb due to K≠1
L'	mm	calculated pitch length	Q		number of belts
L_e	mm	external length ($L_p+\Delta_e$)	T_s	N	static belt tension
L_i	mm	internal length ($L_p-\Delta_i$)	v	m/s	peripheral belt speed
			γ	°	arc of contact

BELT SECTION

Necessary data for selection of the belt section:
P = power to be transmitted in kW
n_1 = speed in RPM of the smaller pulley
n_2 = speed in RPM of the bigger pulley
It is necessary to correct the power P by a coefficient C_c (see table 1 page 6) which considers into account the actual operating conditions.

Corrected power P_c is given by:
$P_c = P \cdot C_c$
The graphs gives a guiding criterion for the section of the belt.

TRANSMISSION RATIO

Transmission ratio is calculated as follows:

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

where D is the pitch diameter of larger pulley and d is the pitch diameter of the smaller pulley.

TECHNICAL CALCULATION

Peripheral speed of the belts is determined by

$$v = \frac{d \bullet n_1}{19100}$$

If the drive being calculated is of the V/flat type (one V pulley and one flat pulley) it is necessary to find the corresponding pitch diameter of the flat pulley.
The pitch diameter of the flat faced pulley is obtained by increasing its external diameter by the amount in millimetres shown in the following table:

Z	**A**	**B**	**C**	**D**	**E**	**19**	**20**	**25**
8	10	14	20	24	33	16	15	19

PITCH LENGTH OF THE BELT AND CORRECT CENTER DISTANCE

Whenever the shaft center distance I is not predetermined by the layout of the drive, the optimum distance may be chosen as follows:

$$1<i<3 \qquad I \geq \frac{(i+1) \bullet d}{2} + d$$

$$i>3 \qquad I \geq D$$

The pitch length is determined by:

$$L' = 2 \bullet I + 1{,}57 \bullet (D+d) + \frac{(D-d)^2}{4I}$$

From the list of belt sizes, should be selected the belt pitch lenght L_p nearest to the value of L' above calculated.
Since $L' \neq L_p$ the center distance "**I**" may be varied by subtracting half $L' - L_p$. Therefore the effective center distance of the drive will be:

$$I_e = I - \frac{(L'-L_p)}{2}$$

NUMBER OF BELTS

The basic performance P_b is the power which a single belt transmits under the following conditions:

- $i = 1$

This configuration corresponds to 180° arc of contact belt on both pulleys;

- $i \neq 1$

The difference of kW-rating P_d is the power which the belt transmits in excess of P_b because $i \neq 1$ in service conditions.
The actual kW-rating P_a is the power which the belt transmits in operating conditions and is obtained by means of:

$$P_a = (P_b + P_d) \times C_g \times C_L$$

Table 4 (see belt family pages) gives the values of P_b according to RPM and d (smaller diameter) and the values of P_d according to RPM and i.

Table 2 (bottom of this page) and 3 (see belt family pages) give values of the coefficients C_γ and C_L taking into account the operating conditions.

The arc of contact g of the belt on the smaller pulley is determined by:

$$\gamma = 180° - 57 \bullet \frac{D-d}{l_e}$$

The number of belts Q necessary for the transmission of the power P_c is determined by:

$$Q = \frac{P_c}{P_a}$$

The number of belts actually is obtained in general by rounding up Q to the next highest whole number.

TABLE 1 - TYPE OF MOTOR

Drivers

(1)
AC electric motors: high slip, squirrel cage, synchronous:
DC electric motors: parallel excitation;
multi-cylinder internal combustion engines;
gas or steam turbines.

(2)
AC electric motors: high torque, high slip, single phase, wound rotor, commutator;
DC electric motors: series and compound excitation;
single-cylinder internal combustion engines with direct coupling or with countershaft;
steam engines.

Applications	Daily operating hours					
	0-8(1)	8-16(1)	16-24(1)	0-8(2)	8-16(2)	16-24(2))
Light use Centrifugal pumps and compressors, belt conveyors, (light materials) fans and pumps up to 7,5 kW.	1,1	1,1	1,2	1,1	1,2	1,3
Normal use Shears for steel sheet presses, belt and chain conveyors, (heavy material) sifters, generator sets, machine tools, kneading machines, industrial washing machines, printing presses, fans and pumps over 7,5 kW.	1,1	1,2	1,3	1,2	1,3	1,4
Heavy use Hammer mills, piston compressors, belt conveyors for heavy loads, lifters, textile machines, continuous paper machines, piston and dredging pumps, ripping saws.	1,2	1,3	1,4	1,4	1,5	1,6
Extra heavy use High power mills, stone crushers, calendars, mixer, cranes, diggers, dredgers.	1,3	1,4	1,5	1,5	1,6	1,8

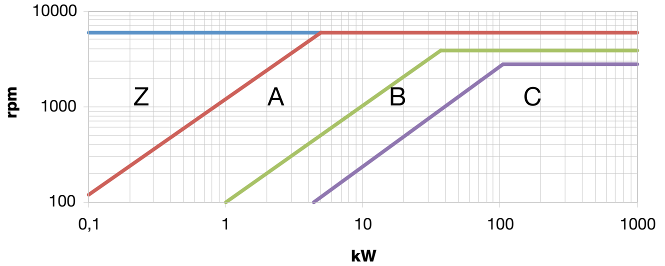
TABLE 2 - Correction factor Cγ (T/T=V/V drives; T/P=V/Flat drives; γ=arc of contact on the smaller pulley)

	γ	180°	175°	170°	165°	160°	155°	150°	145°	140°	135°	130°	125°	120°	115°	110°	105°	100°	90°
C_γ	T/T	1	0,99	0,98	0,96	0,95	0,93	0,92	0,90	0,89	0,87	0,86	0,84	0,82	0,80	0,78	0,76	0,74	0,69
	T/P	0,75	0,76	0,77	0,79	0,80	0,81	0,82	0,83	0,84	0,85	0,86	0,84	0,82	0,80	0,78	0,76	0,74	0,69

WRAPPED V-BELTS SELECTION CHARTS

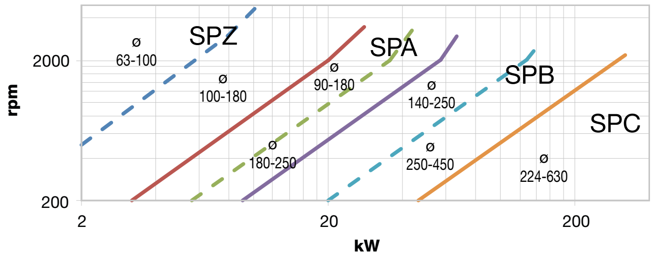
Classical wrapped V-belts

EXTRA

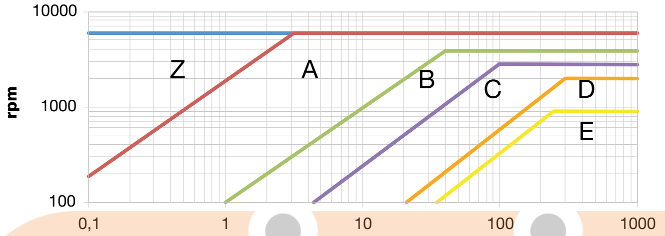


Narrow wrapped V-belts DIN

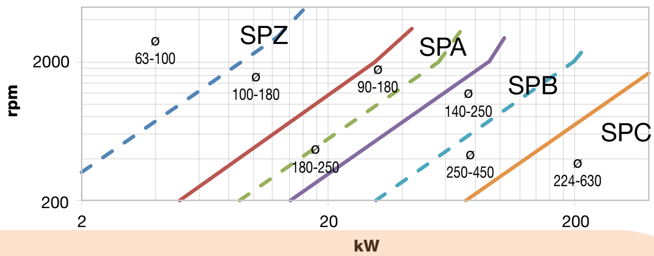
EXTRA



OLEOSTATIC GOLD

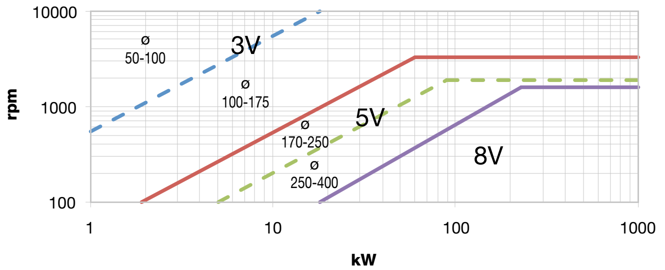


OLEOSTATIC GOLD



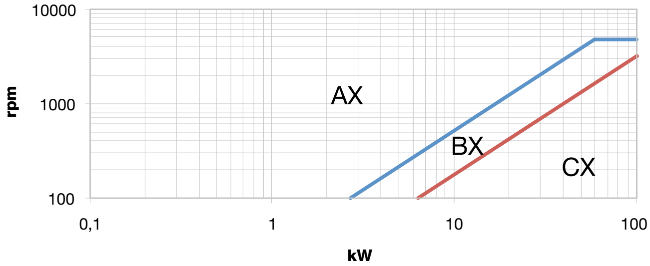
Narrow wrapped V-belts RMA

OLEOSTATIC



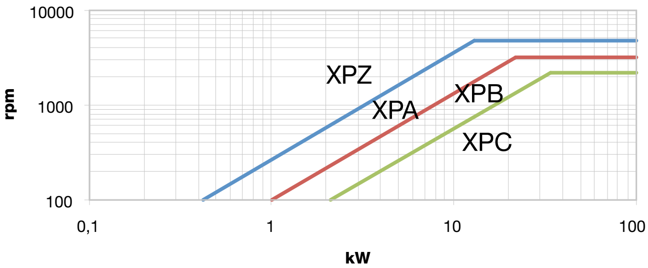
Classical raw edge V-belts

LINEA GOLD

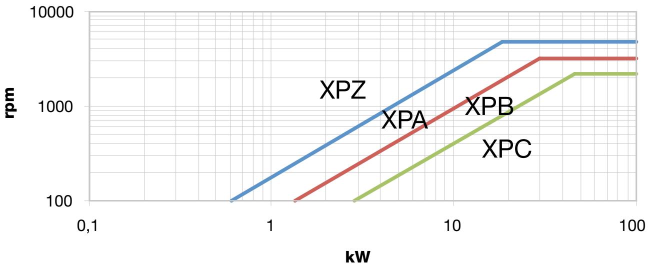


Narrow raw edge V-belts DIN

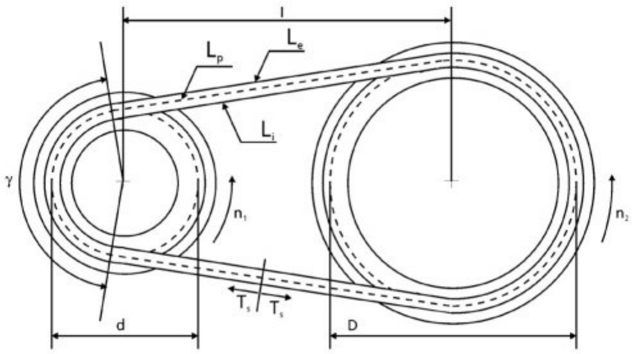
LINEA-X



LINEA GOLD



CALCULATION EXAMPLE



EXAMPLE

$P = 22$ kW

$n_1 = 1200$ RPM

$n_2 = 660$ RPM

Textile machine operating 12 hours a day

Type of motor: ac electric motor, normal torque

The correction coefficient is 1,3 (see table 1)

The corrected power is:

$P_c = 22 \cdot 1{,}3 = 28{,}6$ kW

BELT SELECTION

From selection charts, for $P_c = 28{,}6$ and $n_1 = 1200$ RPM it is appropriate to choose section B.

TRANSMISSION RATIO

The transmission ratio can be calculated as follows:

$$i = \frac{n_1}{n_2} = \frac{1200}{660} = 1{,}82$$

Considering diameter d = 250 mm for the smaller pulley, the pitch diameter of the larger pulley is:

$$D = i \cdot d = 1{,}82 \cdot 250 = 455 \text{ mm}$$

Peripheral speed of the belts is determined by

$$v = \frac{d \cdot n_1}{19100}; \quad v = \frac{0{,}052 \cdot 250 \cdot 1200}{19100} = 15{,}7 \text{ m/s}$$

BELT PITCH LENGTH AND CORRECT CENTER DISTANCE

For i = 1,82 (i.e. 1<i<3) the center distance is given by:

$$I \geq \frac{(i+1) \cdot d}{4} + d \qquad \text{so} \qquad I = 610 \text{ mm}$$

The pitch length of the belt is determined by:

$$L' = 2 \cdot I + 1{,}57 \cdot (D+d) + \frac{(D-d)^2}{4 \cdot I};$$

$$L' = 2 \cdot 610 + 1{,}57 \cdot (455+250) + \frac{(455-250)^2}{4 \cdot 610} = 2344 \text{ mm}$$

From the list of belt sizes (see table on belt family pages), should be selected the belt pitch lenght L_p nearest to the value of L' previously calculated.

The center distance "**I**" may be varied by subtracting half $L'-L_p$. Therefore the effective centre distance of the drive will be:

$$Ie = I - \frac{L'-L_p}{2}$$

Having selected **Oleostatic Gold B 91** ($L_p = 2355$ mm), the actual shaft center distance is calculated by:

$$Ie = 610 - \frac{2344-2355}{2} = 615{,}5 \text{ mm}$$

From table 4 of B section (d=250 mm; 1200 RPM; K=1,82):

$P_b = 11{,}57$ kW

$P_d = 0{,}48$ kW

The arc of contact γ of the belt on the smaller pulley is determined by:

$$\gamma = 180°-57 \bullet \frac{D-d}{l_e} = 180°-57 \bullet \frac{455-250}{616} \cong 161°$$

From table 2 for $\gamma = 161°$

$C\gamma = 0{,}95$

From table 3, pag 19 for **Oleostatic Gold B 91** belt

$C_L = 1{,}00$

Therefore:

$P_a = (11{,}57+0{,}48) \bullet 0{,}95 \bullet 1{,}00 = 11{,}45$ kW

The number of belts Q necessary for transmission of the power P_c is established by:

$$Q = \frac{P_c}{P_a} = \frac{28{,}6}{11{,}45} = 2{,}5$$

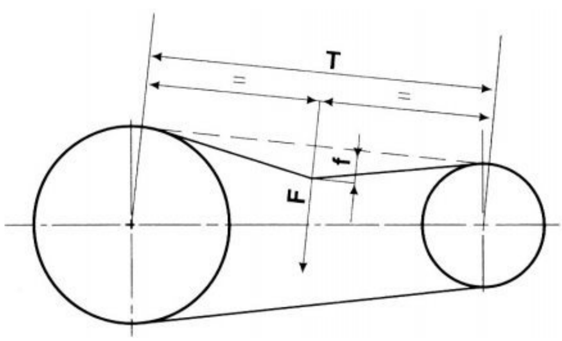
Round up to 3 belts **Oleostatic Gold B 91**.

BELT TENSIONING RECOMMENDATION

The correct belt assembling tension is given by:

$$Ts = 500 \bullet \frac{2{,}5-C_\alpha}{C_\alpha} \bullet \frac{P_C}{Q \bullet v} + m \bullet v^2$$

Symbol	*Unit*	*Definition*
C_α		arc correction factor
m	kg/m	belt linear mass (see belt family page)
P_c	kW	corrected power
Q		number of belts
T_s	N/strand	static belt tension
v	m/s	peripheral belt speed
α	°	arc of contact



Arc corretcion factor:

α [°]	**180**	**174**	**169**	**163**	**157**	**151**	**145**	**139**	**133**	**127**	**120**	**113**	**106**	**99**	**91**	**83**
Cα	1,00	0,98	0,97	0,96	0,94	0,93	0,91	0,89	0,87	0,85	0,82	0,80	0,77	0,73	0,70	0,65

LENGTH MEASURING AND GROOVE PULLEYS

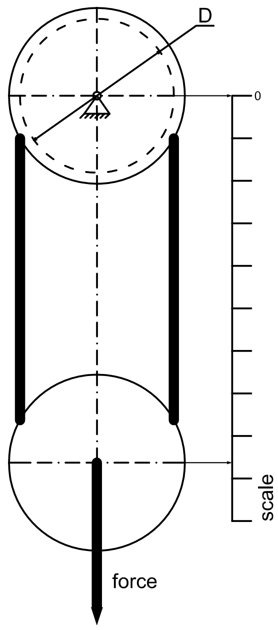
BELT LENGTH MEASURING

The first and easiest way for measuring the V-belt length is by placing the belt on a flat surface, giving the belt a circular shape and finally measuring the internal length L_i by means of a measuring tape. Adding Δ_i and after Δ_e (see belt families pages) to this length, it's possible to calculate respectively L_p and L_e.
This measuring way is not very precise, even if practically easy and feasible with a tape only.

The correct way for measuring the V-belt length is by means of pulleys and dynamometer.
The belt is put on 2 pulleys, specific for the family and size of the belt and having the same pitch diameter. One is fixed while the second can move on a linear graduated scale.
Depending on the belt, a certain force is applied to the second pulley in order to put the complete system under tension. The correct force is tabled the relevant standards referring to the belt family.
To stabilize the system, at least 3 rotations of the pulleys are required.
The pitch length L_p is given by the pulleys pitch diameter D and center distance a in the formula:

$L_p = 2 a * \pi_D$

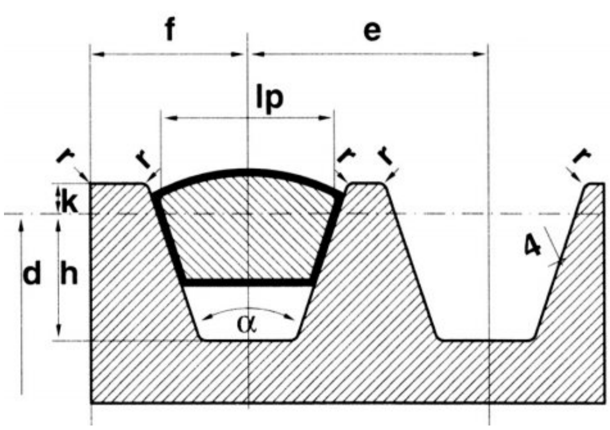
Subtracting Δ_i and adding Δ_e (see belt families pages) it's possible to calculate respectively L_i and L_e.



GROOVE PULLEYS

Groove pulleys for V-belts must be manufactured with care and be made of good quality steel or engineering cast iron. It is most important that the flanks of the grooves shall be perfectly smooth and show no visible sign of machining, that all sharp corners of the grooves shall be rounded off and chamfered and that the external diameter of the face shall be constant overall.
All pulleys must also be statically balanced.
Dynamic balancing is required for speeds over 30 m/second.

Profile and dimension of pulley should be in accordance to DIN 2211, BS 3790, ISO, RMA depending on the belt relevant standard.
In tha drawing are shown the main characteristics and dimensions of groove pulleys for V-belts (example referring to Oleostatic belts).



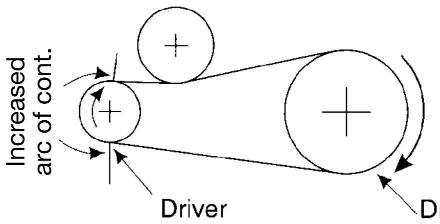
lp = pitch width
k = minimum height of groove above the pitch line
h = minimum depth of groove below the pitch line
α = groove angle
d = pitch diameter
e = distance between the axes of the sections of two grooves
f = distance between the axis of the section of the outer groove and the rim of the pulley

The use of idlers in V-belt drives is not recommended.
However, due to particular drive requirements and limitations, use of idlers may be absolutely necessary.
For using idlers, requirements are as follows:
1. Providing take-up for fixed center drives.
2. Turning corners (as in mule pulley drives).
3. Breaking up long spans where belt whip may be a problem.
4. Maintaining tension, when idler is spring-loaded or weighted.
A power corretcion (see below) is required.

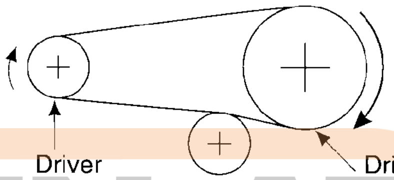
OUTSIDE IDLER

1. An outside idler should be at least one and one-third times as large as the smallest pulley on the drive, unless drive has unusually large pulleys.
2. An outside idler must be flat and without any crown.
3. To find the face width of a flat idler (between flanges if flanged) add 1 ½ times the nominal belt top width to the face width of the grooved pulley used.
4. An outside idler pulley should be located as close as possible to the preceding pulley. This is because V-belts move back and forth slightly on a flat pulley and locating it as far away from the next pulley minimizes the possibility of the belt entering that pulley in a misaligned condition.
5. Idler pulleys should be located only on the slack side of a drive.

RECOMMENDED



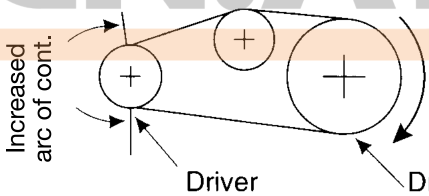
NOT RECOMMENDED



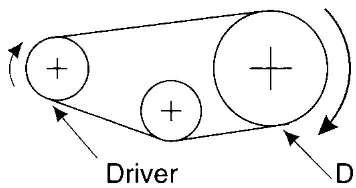
INSIDE IDLER

1. An inside idler will decrease the arc of contact.
2. An inside idler should be at least as large as the smallest pulley on the drive, unless the drive has unusually large pulleys.
3. An inside idler should better be a grooved pulley. In alternative, flat pulleys can be used.
4. A grooved inside idler pulley may be located anywhere along the span, preferably so that it gives nearly equal arcs of contact on the two adjacent pulleys.
5. Idler pulleys should be located only on the slack side of a drive.

RECOMMENDED



NOT RECOMMENDED



RATED POWER CORRECTION

Because idlers impose an additional bending stress point on the V-belt, the transmittable power is reduced.
The smaller the idler diameter, the greater the bending stress, which results in a greater reduction in rated power and belt life.
To compensate this loss, the design power of the drive must be increased.
The following table gives the approximate correction factors according to the number of pulleys in the drive.
The normal power rating should be multiplied by this factor.

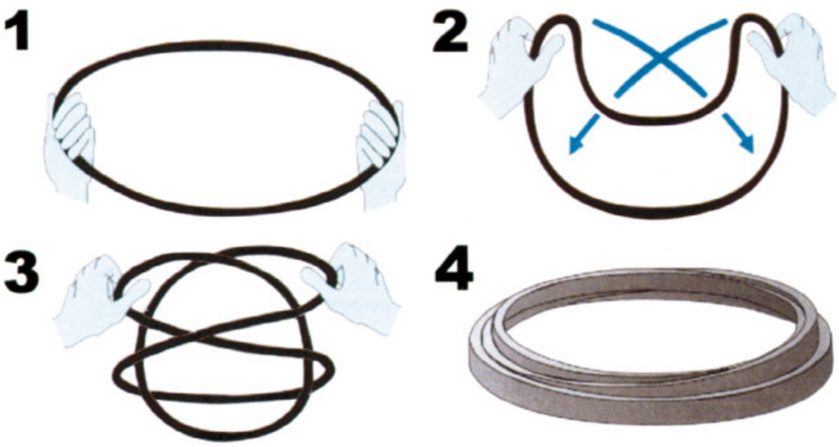
No. of pulleys in drive	2	3 (one idler)	4 (two idlers)
Rating Correction Factor	1,00	0,90	0,80

Note:
As stated, the above listed factors are only approximate values and apply only when idler diameters and their location is in accordance with the above recommendations.

STORAGE MAINTENANCE AND USEFUL ADVICES

HOW TO STORE BELTS

In order to store V-Belts correctly, it is advisable to hang them on “saddles” or on large-diameter tubular brackets. This diameter should be at least ten times the height of belts cross section.
Long belts can be stacked to save space, provided that they are correctly coiled (see figures).
Short belts can be stored on shelves, but be aware that stacks should not be more than 300 mm high, as the bottom belts may be otherwise deformed.
Finally, hooks and nails are unsuitable for suspending the belts.



CONDITIONS OF STORAGE

Rubber V-belts can be stored for several years without causing any performance or reliability loss.
For a correct storage, some prescription have to be taken into account.
- Environment
The storage premises should be cool, dry and well ventilated but not draughty.
- Temperature
Storage temperature should be within +5 and +30°C.
Lower temperatures causes stiffening in the belt but are accepted in the storage. In order to avoid damages in the start-up, it becomes necessary to heat the belt up to around 20° before making it run on the machine.
Higher temperatures due to heating are to be avoided. Distance from heating sources should be at least 1 meter.
- Light
Belts should be protected from light, especially direct sunlight and artificial light with high ultraviolet rays (neon light).
- Ozone
Equipments generating ozone, like high voltage electrical machines or fluorescent light sources, should not be installed in the storage.
Also combustion gases and vapours, that can cause ozone, should be avoided.
- Chemicals
Flammable materials, lubricants, acids and any other aggressive material should not be kept in the storage. Belts elastomers may be affected or even irreparably damaged by such agents.

CLEANING

Never clean V-belts. If you need, for any reason, to clean belts use a dry towel or one soaked with a glycerine/alcohol mixture in the ratio 1:10. Other solvents such as petrol or benzene must not be used.
Sharp-edged objects must not be used for cleaning V-belts.

To ensure a long service life and high performances, it is important to design correctly the application and to take care of correct installation, maintenance and storage of the belt.
A drive must be designed in such a way to make proper provision for both installation and tensioning of the V-belts.
For this purpose a take-up device is necessary; a slide adjuster on the motor is recommended to simplify installation and permit optimum tensioning.
Table 5 (see belt family pages) provides minimum variation of center distance permitted for installation and tensioning of the belts.

x = Take up allowance
y = Installation allowance
I = Center distance

Furthermore, the following rules must always be observed:

1) check the alignment of the drive pulleys;
2) make sure that the flanks of the grooves are clean;
3) adjust the tensioner to stretch the belts sufficiently;
4) check the tension (see following section);
5) check correct diameter for tensioning pulley;
6) protect belt from oil and other chemicals;
7) when installing belts, slack off tensioner and avoid using tools or implements which may damage the belts.

Pulleys with large diameters increase belt life. They must be statically balanced up to the speed of 30 m/s and dynamically balanced over this value.

TENSIONING SYSTEM

The satisfactory performance of a transmission equipped with V-belts depends on the correct fitting tension.
It is therefore necessary to proceed in the following way, using the slide adjuster:

Belt tension control by deflection method

The approximate relation among deflection force, belt deflection and belt tension is given by:

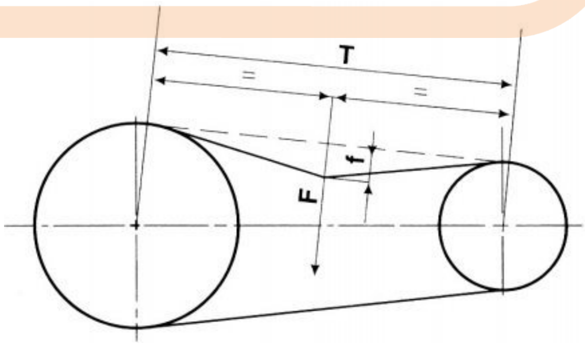
$$T_s \simeq \frac{f \bullet t}{4 \bullet f}$$

Imposing a belt deflection

$$f = \frac{t}{64}$$

the deflection force should be in the range

$$F_{min} \simeq F' = \frac{T_s}{16} \qquad F_{max} \simeq F'' = \frac{1{,}5 \bullet T_s}{16}$$



where:

Symbol	*Unit*	*Definition*
F	N	perpendicular deflection force
f	mm	belt deflection
t	mm	free span length
T_s	N/strand	static belt tension (see page 9)

Belt tension control by vibration method

Belt vibration frequency: $F^2_r = \frac{T_s}{4 \bullet m \bullet t^2}$

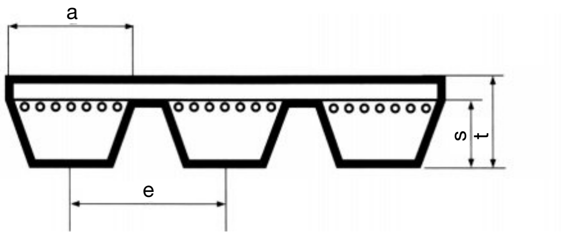
Symbol	*Unit*	*Definition*
F_r	Hz	natural frequency of belt
m	kg/m	specific belt mass
t	m	free span length
T_s	N/strand	static belt tension (see page 9)

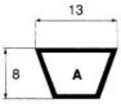

MEGADYNE
PLURIBAND®
R5V1800

BELT CHARACTERISTICS

section	RA	RB	RC	RSPZ	RSPA	RSPB	RSPC	R3V	R5V	R8V	R3VX	R5VX
a (mm)	13	17	22	9.7	12.7	16.3	22	9	15	25	9	15
s (mm)	8	11	14	8	10	13	18	8	13	23	8	13
t (mm)	10	13	16	10,5	12,5	15,5	22,5	10	15	25,5	10	15
e (mm ± 0,3)	15	19	25.5	12	15	19	25,5	10,3	17,5	28,6	10,3	17,5
pitch length - internal length = i (mm)	33	43	62	39	47	61	86	31	54	103		
working temperature	-30°C / +80°C											
relevant standards	ASAE S 211.4 - ISO 8419											
materials	CR / SBR blend - polyester cord											

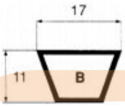
Pluriband are special belts capable of transmiting very high loads. The structure is made to be equivalent in performances to a number of corresponding V-belts: a Pluriband A47-1200-5 has the same performance of 5 A47 belts working in parallel. The procedure for engineering a system using Pluriband belts is the same as described in the technical calculation chapter, using the same performance data as the corresponding V-belt profile.





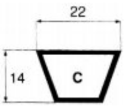
RA SECTION

Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)
RA 47	1200	RA 59	1500	RA 75	1900	RA 100	2540	RA 128	3250	RA 187	4750
RA 51	1300	RA 64	1625	RA 79	2000	RA 104	2650	RA 144	3658	RA 197	5000
RA 56	1422	RA 67	1700	RA 88	2240	RA 112	2845	RA 158	4000	RA 210	5334
RA 57	1450	RA 71	1800	RA 98	2500	RA 120	3048	RA 167	4250	RA 217	5477



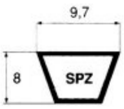
RB SECTION

Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)
RB 70	1778	RB 82	2083	RB 93	2362	RB 106	2692	RB 127	3226	RB 147	3734	RB 167	4242
RB 71	1803	RB 83	2108	RB 94	2388	RB 107	2718	RB 128	3251	RB 148	3759	RB 168	4267
RB 72	1829	RB 84	2134	RB 95	2413	RB 108	2743	RB 130	3302	RB 151	3835	RB 173	4394
RB 73	1854	RB 85	2159	RB 96	2438	RB 110	2794	RB 131	3327	RB 152	3861	RB 175	4445
RB 74	1880	RB 86	2184	RB 97	2464	RB 112	2845	RB 132	3353	RB 154	3912	RB 177	4496
RB 75	1905	RB 87	2210	RB 98	2489	RB 114	2896	RB 133	3378	RB 157	3988	RB 180	4572
RB 76	1930	RB 88	2235	RB 99	2515	RB 115	2921	RB 134	3404	RB 158	4013	RB 186	4724
RB 78	1981	RB 89	2261	RB 100	2540	RB 116	2946	RB 135	3429	RB 161	4089	RB 188	4775
RB 79	2007	RB 90	2286	RB 102	2591	RB 118	2997	RB 136	3454	RB 162	4115	RB 192	4877
RB 80	2032	RB 91	2311	RB 104	2642	RB 120	3048	RB 140	3556	RB 163	4140	RB 195	4953
RB 81	2057	RB 92	2337	RB 105	2667	RB 124	3150	RB 144	3658	RB 165	4191	RB 197	5004



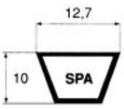
RC SECTION

Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)	Code	Internal length LI (mm)
RC 98	2489	RC 104	2642	RC 112	2845	RC 128	3251	RC 142	3607	RC 160	4064	RC 180	4572
RC 99	2515	RC 105	2667	RC 115	2921	RC 130	3302	RC 144	3658	RC 165	4191	RC 195	4953
RC 100	2540	RC 106	2692	RC 118	2997	RC 134	3404	RC 148	3759	RC 166	4216	RC 210	5334
RC 101	2565	RC 108	2743	RC 120	3048	RC 136	3454	RC 153	3886	RC 168	4267		
RC 102	2591	RC 110	2794	RC 124	3150	RC 140	3556	RC 158	4013	RC 173	4394		



RSPZ SECTION

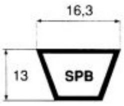
Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)
RSPZ 1400	1400	RSPZ 1700	1700	RSPZ 2000	2000	RSPZ 2360	2360	RSPZ 2800	2800	RSPZ 3350	3350
RSPZ 1500	1500	RSPZ 1800	1800	RSPZ 2120	2120	RSPZ 2500	2500	RSPZ 3000	3000	RSPZ 3550	3550
RSPZ 1600	1600	RSPZ 1900	1900	RSPZ 2240	2240	RSPZ 2650	2650	RSPZ 3150	3150		



RSPA SECTION

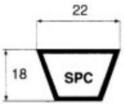
Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)
		RSPA 1700	1700	RSPA 2000	2000	RSPA 2360	2360	RSPA 2800	2800	RSPA 3350	3350	RSPA 4000	4000
RSPA 1500	1500	RSPA 1800	1800	RSPA 2120	2120	RSPA 2500	2500	RSPA 3000	3000	RSPA 3550	3550	RSPA 4250	4250
RSPA 1600	1600	RSPA 1900	1900	RSPA 2240	2240	RSPA 2650	2650	RSPA 3150	3150	RSPA 3750	3750	RSPA 4500	4500

BANDED V-BELTS - Pluriband



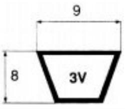
RSPB SECTION

Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)
RSPB 2000	2000	RSPB 2500	2500	RSPB 3150	3150	RSPB 4000	4000	RSPB 5000	5000	RSPB 6300	6300	RSPB 8000	8000
RSPB 2120	2120	RSPB 2650	2650	RSPB 3350	3350	RSPB 4250	4250	RSPB 5300	5300	RSPB 6700	6700		
RSPB 2240	2240	RSPB 2800	2800	RSPB 3550	3550	RSPB 4500	4500	RSPB 5600	5600	RSPB 7100	7100		
RSPB 2360	2360	RSPB 3000	3000	RSPB 3750	3750	RSPB 4750	4750	RSPB 6000	6000	RSPB 7500	7500		



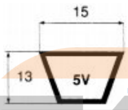
RSPC SECTION

Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)	Code	Pitch length LW (mm)
RSPC 3000	3000	RSPC 3750	3750	RSPC 4750	4750	RSPC 6000	6000	RSPC 7500	7500	RSPC 9500	9500	RSPC 11800	11800
RSPC 3150	3150	RSPC 4000	4000	RSPC 5000	5000	RSPC 6300	6300	RSPC 8000	8000	RSPC 10000	10000	RSPC 12500	12500
RSPC 3350	3350	RSPC 4250	4250	RSPC 5300	5300	RSPC 6700	6700	RSPC 8500	8500	RSPC 10600	10600		
RSPC 3550	3550	RSPC 4500	4500	RSPC 5600	5600	RSPC 7100	7100	RSPC 9000	9000	RSPC 11200	11200		



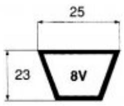
R3V SECTION

Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)
R3V 335	850	R3V 425	1080	R3V 530	1345	R3V 670	1700	R3V 850	2160	R3V 1060	2690	R3V 1320	3350
R3V 355	900	R3V 450	1145	R3V 560	1420	R3V 710	1800	R3V 900	2290	R3V 1120	2840	R3V 1400	3550
R3V 375	950	R3V 475	1205	R3V 600	1525	R3V 750	1900	R3V 950	2410	R3V 1180	3000		
R3V 400	1015	R3V 500	1270	R3V 630	1600	R3V 800	2030	R3V 1000	2540	R3V 1250	3180		



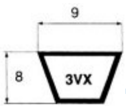
R5V SECTION

Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)
R5V 500	1270	R5V 670	1700	R5V 900	2290	R5V 1250	3180	R5V 1700	4320	R5V 2240	5690	R5V 3000	7620
R5V 530	1345	R5V 710	1800	R5V 950	2410	R5V 1320	3350	R5V 1800	4570	R5V 2360	6000	R5V 3150	8000
R5V 560	1420	R5V 750	1900	R5V 1000	2540	R5V 1400	3550	R5V 1900	4830	R5V 2500	6350	R5V 3350	8500
R5V 600	1525	R5V 800	2030	R5V 1120	2840	R5V 1500	3810	R5V 2000	5080	R5V 2650	6730	R5V 3550	9000
R5V 630	1600	R5V 850	2160	R5V 1180	3000	R5V 1600	4060	R5V 2120	5380	R5V 2800	7100		



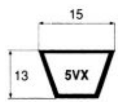
R8V SECTION

Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)
R8V 1000	2540	R8V 1320	3350	R8V 1800	4570	R8V 2360	6000	R8V 3150	8000	R8V 4250	10800	R8V 6000	15250
R8V 1060	2690	R8V 1400	3550	R8V 1900	4830	R8V 2500	6350	R8V 3350	8500	R8V 4500	11430		
R8V 1120	2840	R8V 1500	3810	R8V 2000	5080	R8V 2650	6730	R8V 3550	9000	R8V 4750	12060		
R8V 1180	3000	R8V 1600	4060	R8V 2120	5380	R8V 2800	7100	R8V 3750	9500	R8V 5000	12700		
R8V 1250	3180	R8V 1700	4320	R8V 2240	5690	R8V 3000	7620	R8V 4000	10160	R8V 5600	14200		



R3VX SECTION

Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)
R3VX 250	630	R3VX 335	850	R3VX 450	1145	R3VX 600	1525	R3VX 800	2030	R3VX 1060	2690	R3VX 1400	3550
R3VX 265	670	R3VX 355	900	R3VX 475	1205	R3VX 630	1600	R3VX 850	2160	R3VX 1120	2840		
R3VX 280	710	R3VX 375	950	R3VX 500	1270	R3VX 670	1700	R3VX 900	2290	R3VX 1180	3000		
R3VX 300	760	R3VX 400	1015	R3VX 530	1345	R3VX 710	1800	R3VX 950	2410	R3VX 1250	3180		
R3VX 315	800	R3VX 425	1080	R3VX 560	1420	R3VX 750	1900	R3VX 1000	2540	R3VX 1320	3350		



R5VX SECTION

Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)	Code	Nominal external length (mm)
R5VX 500	1270	R5VX 630	1600	R5VX 850	2160	R5VX 1060	2690	R5VX 1320	3350	R5VX 1700	4320
R5VX 530	1345	R5VX 670	1700	R5VX 900	2290	R5VX 1120	2840	R5VX 1400	3550	R5VX 1800	4570
R5VX 560	1420	R5VX 710	1800	R5VX 950	2410	R5VX 1180	3000	R5VX 1500	3810	R5VX 1900	4830
R5VX 600	1525	R5VX 800	2030	R5VX 1000	2540	R5VX 1250	3180	R5VX 1600	4060	R5VX 2000	5080

SPEED

$$v = \frac{d_1 \cdot n_1}{19100} \qquad n_1 = \frac{v \cdot 19100}{d_1} \qquad n_1 = \frac{v \cdot 19100}{n_1}$$

v: peripheral speed [m/s]
n1: rotation speed [RPM]
d1: pulley diameter [mm]

FORCE AND TORQUE

$$F_u = \frac{19{,}1 \cdot 10^6 \cdot P}{d_1 \cdot n_1} \qquad F_u = \frac{2000 \cdot m}{d_1} \qquad F_u = \frac{P \cdot 10^3}{d_1}$$

$$M_t = \frac{P \cdot 9550}{n_1} \qquad M_t = \frac{F_u \cdot d_1}{2000} \qquad M_t = \frac{P \cdot d_1}{2 \cdot v}$$

Fu: peripheral force [N]
Mt: drive torque [Nm]
P: power [kW]
n1: rotation speed [RPM]
d1: pulley diameter [mm]
v: peripheral speed [m/s]

POWER

$$P = \frac{F_u \cdot d_1 \cdot n_1}{19{,}1 \cdot 10^6} \qquad P = \frac{M_t \cdot n_1}{9550} \qquad P = \frac{F_u \cdot v}{1000}$$

P: power [kW]
Fu: peripheral force [N]
Mt: drive torque [Nm]
n1: rotation speed [RPM]
d1: pulley diameter [mm]

To convert from	to	multiply by
CV	HP	0,9863201
CV	kcal/h	63,24151
CV	W	735,4988
CV	kW	0,7354988
CV	kgf ⇔ m/s	75
CV	lbf ⇔ ft/s	542,476
HP	CV	1,01387
HP	kcal/h	641,1865
HP	W	745,6999
HP	kW	0,7456999
HP	kgf ⇔ m/s	76,04022
HP	lbf ⇔ ft/s	550
in	m	0,0254
in	cm	2,54
in	mm	25,4
in	ft	0,083
in^2	m^2	0,00064516
in^2	cm^2	6,4516
in^2	mm^2	645,16
in^2	ft^2	0,006944444
in^3	m^3	1,63871·10-5
in^3	cm^3	16,38706
in^3	mm^3	16387,06
in^3	ft^3	0,000578704

To convert from	to	multiply by
J	CV ⇔ h	3,77673·10-7
J	HP ⇔ h	3,72506·10-7
J	kWh	2,77778·10-7
kg	lb	2,204623
kgf	N	9,80665
kgf	lbf	2,204623
kgf ⇔ m/s	CV	0,01333333
kgf ⇔ m/s	W	9,80665
kgf ⇔ m/s	kW	0,00980665
kW	CV	1,359622
kW	kcal/h	859,8452
kW	W	1000
kW	kgf ⇔ m/s	101,9716
kW	lbf ⇔ ft/s	737,5621
lb	kg	0,4535924
lb	kgf	0,4535924
lb	N	4,448222
N	kgf	0,1019716
N	lbf	0,2248089
W	CV	0,001359622
W	HP	0,001341022
W	kcal/h	0,8598452
W	kW	0,001
W	kgf ⇔ m/s	0,1019716
W	lbf ⇔ ft/s	0,7375621

NOTES

DATA SHEET FOR CALCULATION

CUSTOMER DATA

Date ____/_____/_____

Company Name ____

Address ______________________________ Zip Code ____________

City __________________ State __________ Country ____________

Customer Name/Surname ____________________________________

Office__________________ Tel. ___________ Fax _______________

e-mail ____

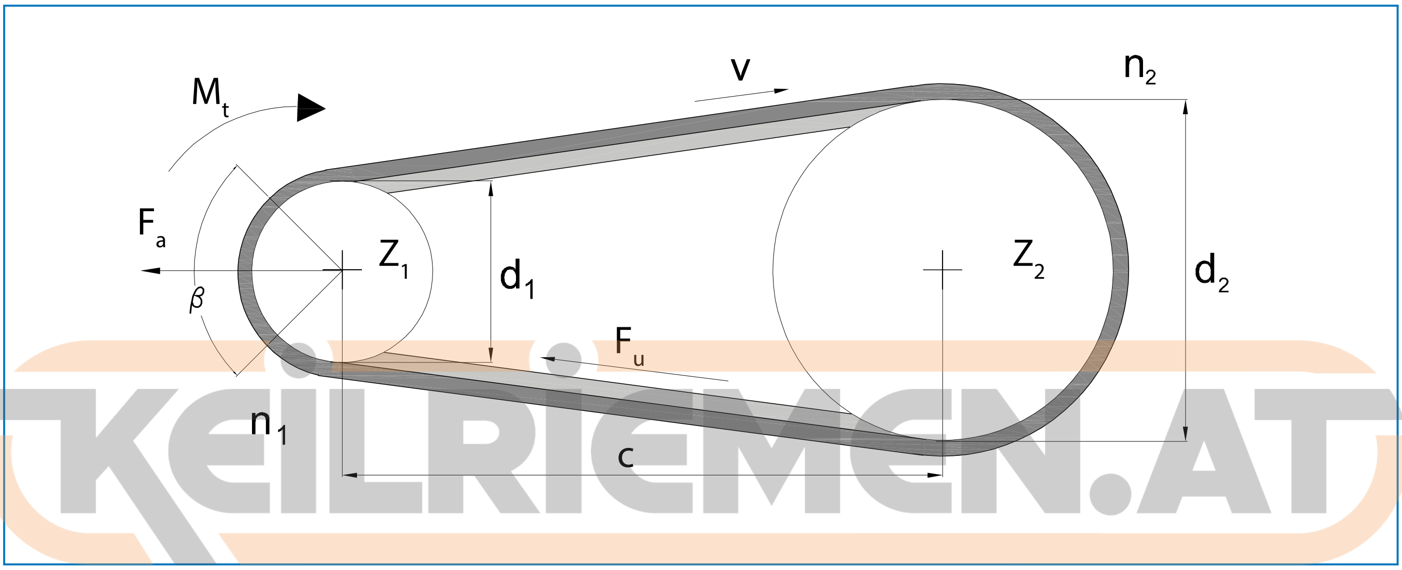
Application field ______________________________ New | Existing*

Volume: ______________________________________

*Please enclose to this request all the details of the existing application (competitor's belt, current data, etc..)

POWER TRANSMISSION

TRANSMISSION LAYOUT



If layout is different please sketch it below

DRIVE INFORMATION

MOTOR:

☐ AC ☐ DC ☐ Soft Start ☐ Inverter

Power: ______________________________

Speed: ______________________________

Torque: _____________________________

Acceleration: _________________________

Working time: ☐ < 8h ☐ From 8h up to 16h ☐ >16h

APPLICATION:

Driver pulley diameter: ________________________

Driven pulley diameter: ________________________

Center distance: _______________________________

Minimum safety factor required: _________________

Are there any size limitation? ☐ Yes ☐ No

(if yes please indicate):

diameter (min. and/or max.): ___________________

width (min. and/or max.): ______________________

center distance: (min. and/or max.) _____________