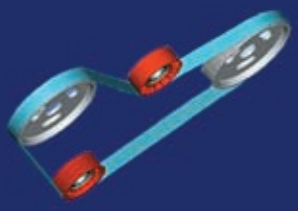
SUMMARY



HUTCHINSON POLY V®

The belt for all applications

HUTCHINSON POLY V®

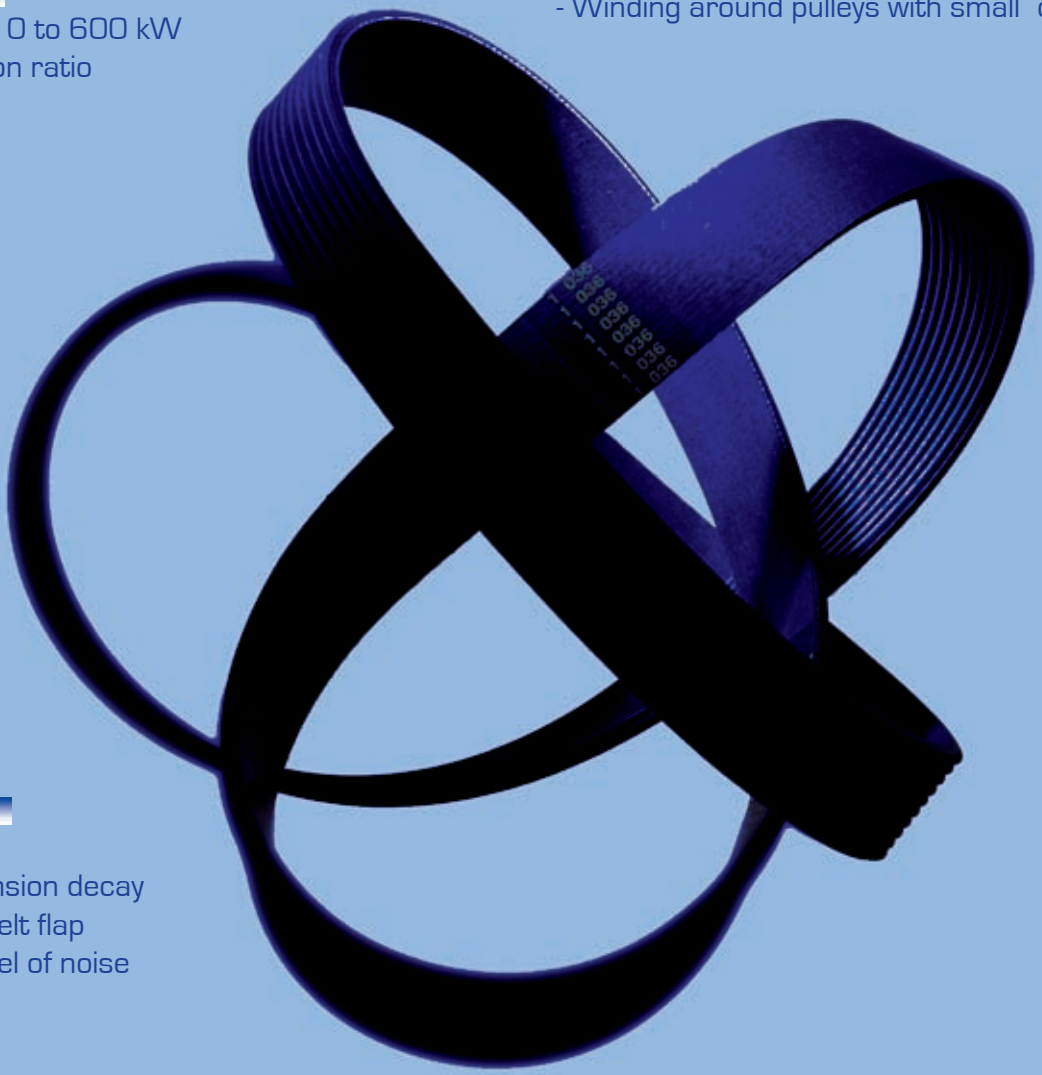
ADVANTAGES

COMPACT

- Reduced congestion
- Only one Poly V® belt per transmission
- Winding around pulleys with small diameters

MULTIPURPOSE

- Range of power from 0 to 600 kW
- Excellent transmission ratio
- Serpentine drives



SILENT

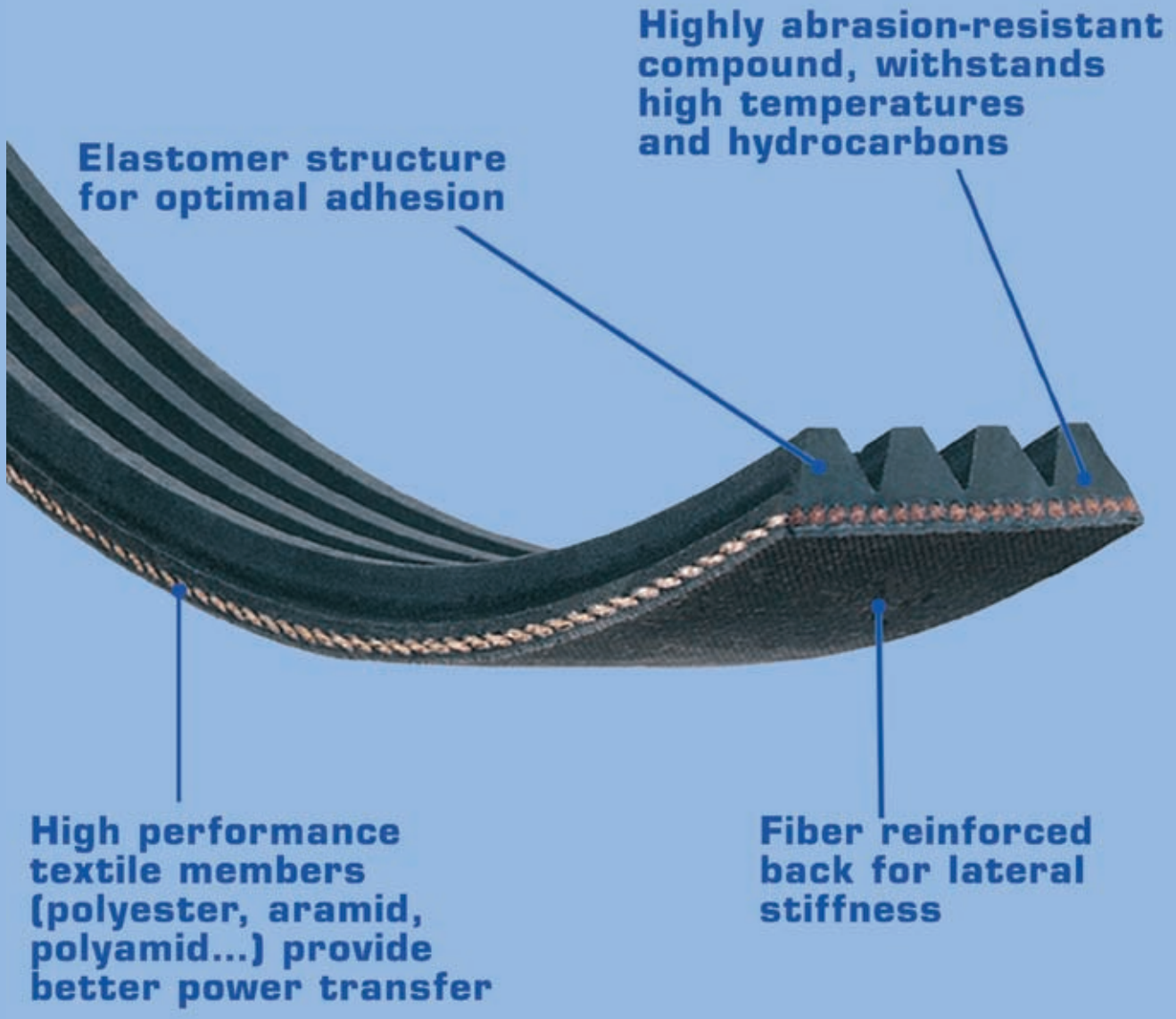
- Reduced vibrations
  - Reduced tension decay
  - Eliminates belt flap
  - Reduced level of noise

RELIABLE

- Optimum contact area
- High belt speed
- Stability and homogeneity of the tension

ECONOMICAL

- Reduction in the Poly V® pulley diameters compared to trapezoidal belt pulleys
- Decreased maintenance costs
- Increased lifespan


Highly abrasion-resistant compound, withstands high temperatures and hydrocarbons
Elastomer structure for optimal adhesion
High performance textile members (polyester, aramid, polyamid...) provide better power transfer
Fiber reinforced back for lateral stiffness

PH PROFILE

Rib Pitch		1.6 mm
Thickness	non truncated	2.6 mm
	truncated	2.3 mm
Linear Mass (M_1		0.0042kg/m/rib
Maximum Belt Speed		80 m/s
Minimum Pulley Diameter		9 mm
Minimum Idler Diameter		15 mm
Installation tension		25 to 35 N/rib/span

PJ PROFILE

Rib Pitch		2.34 mm
Thickness	non truncated	3.5 mm
	truncated	3.3 mm
Linear Mass (M_1)		0.008kg/m/rib
Maximum Belt Speed		60 m/s
Minimum Pulley Diameter		18 mm
Minimum Idler Diameter		40 mm
Installation tension		35 to 50 N/rib/span

PK PROFILE

Rib Pitch	3.56 mm
Thickness	4.9 mm
Linear Mass (M_1)	0.020 kg/m/rib
Maximum Belt Speed	55 m/s
Minimum Pulley Diameter	50 mm
Minimum Idler Diameter	65 mm
Installation tension	90 to 110 N/rib/span

PL PROFILE

Rib Pitch	4.70 mm
Thickness	7.0 mm
Linear Mass (M_1)	0.032 kg/m/rib
Maximum Belt Speed	50 m/s
Minimum Pulley Diameter	70 mm
Minimum Idler Diameter	120 mm
Installation tension	140 to 160 N/rib/span

PM PROFILE

Rib Pitch	9.40 mm
Thickness	12.0 mm
Linear Mass (M_1)	0.110 kg/m/rib
Maximum Belt Speed	40 m/s
Minimum Pulley Diameter	180 mm
Minimum Idler Diameter	280 mm
Installation tension	450 to 550 N/rib/span

PH PROFILE

- Vacuum Cleaner
- Optical Lens Grinder
- Medical Devices (Dental Toothbrush...)
- Laboratory Devices (mixers, shakers...)
- Robotic Swimming Pool Cleaner
- Concrete Mixer
- Hand Tools (wood planer, sander...)
- Small Household Appliances (Meat Slicer, Food Processor...)
- Light Conveying
- Conveyer Rollers
- Paper transporter
- ...

PJ PROFILE

- Exercise Bicycle, Treadmill
- Automatic Door
- Bakery Equipment (Kneader, Molding machine...)
- Small Capacity Centrifuge
- Small Compressor
- Crossing Gates
- Scooter
- Woodworking Machinery (Saw, Debarker, Slicer, Wood Chipper...)
- Concrete Mixer
- Cultivator
- Washing Machine
- Hand Tools
- Helicopter Air Conditioning Unit
- Electric Car
- ....

PK PROFILE

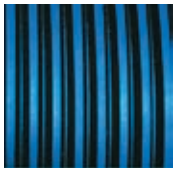
- Tractor
- Fan
- Air Conditioner
- Concrete Saw
- Wood Saw
- Compressor (<30 Kw)
- Air cooler
- Agriculture Equipment (grain grinder, seeder, pulverizer...)
- Machine Tools
- Lifting Equipment
- Ultra Light Aircraft
- Cooling Plant
- Industrial Washing Machine
- Jet Ski – Boat Engines
- ...

PL PROFILE

- Compressor (>30 kW)
- Industrial Washing Machine
- Motor-Driven Pump
- Large Capacity Centrifuge
- Ventilation Fan
- Cooling Pump
- Escalator
- Drill Press
- Grinding Machine
- Agriculture Machinery (combine harvester...)
- Offset Printing Machine
- Moving Sidewalk
- Heavy Conveying
- Flour Mill
- ...

PM PROFILE

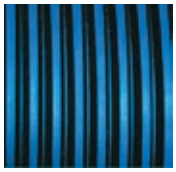
- Quarries
- Compactor
- Marble Saw
- Paper industry
- Metal Mills
- Extruder
- Hammer Mills
- Hydro-Electric Turbine
- Agriculture Machinery (Bale Shredder, Sugar Cane Cutter)
- Cable Manufacturing Plant
- Hydraulic Turbine
- ...



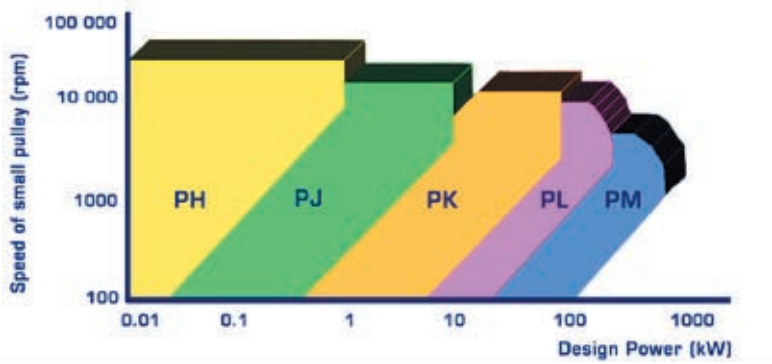
DETERMINE THE SERVICE FACTOR

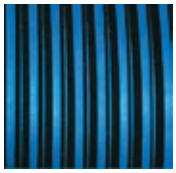
MOTOR CLASS	CLASS A			CLASS B		
D.C. Motors	Shunt wound			Compound and series wound		
A.C. Motors	Normal torque Synchronous Asynchronous			High torque Vector control Reluctance motor		
Internal combustion engines	Multicylinders Speed > 700 rpm			Turbine Speed<700 rpm		
Others	Turbine Brushless D.C. Motor			Line shaft Clutches		
DRIVEN MACHINE *(select category from the list below)*	**DUTY CYCLE CATEGORY**					
	Intermittent < 10H	*Normal 10 to 16H*	*Continu >16H*	*Intermittent < 10H*	*Normal 10 to 16H*	*Continu >16H*
Category 1 : LOW EVEN TORQUE *- Centrifugal Fans – Light Conveyors – Vacuum Cleaners – Magnetic Agitators - Blowers*	1.0	1.1	1.2	1.1	1.2	1.3
Category 2 : MEDIUM EVEN TORQUE *– Machine Tools – Belt Conveyors – Generators – Industrial Washing Machines – Rotary Pumps – Rotary Compressors*	1.1	1.2	1.3	1.2	1.3	1.4
Category 3 : UNEVEN TORQUE *- Axial Fans – Kneaders / Mixers – Exercise Bicycles – Woodworking Machinery – Concrete Saws – Printing Machinery*	1.2	1.3	1.4	1.3	1.4	1.5
Category 4 : VERY UNEVEN TORQUE *- Winches / Cranes – Metal Mills – Piston Pumps – Piston Compressors – Elevators – Bucket Elevators*	1.3	1.4	1.5	1.4	1.5	1.6
Category 5 : UNEVEN TORQUE WITH OVERLOADS *- Agriculture Machinery (Combine Harvester...) – Industrial Rubber Machinery (Extruder, Calender...) – Drilling Equipment – Dredging Equipment – Hammer Mills - Excavators*	1.4	1.5	1.6	1.5	1.6	1.8

Note : A service factor of 2.0 is required for any equipment when shock loads or stalling are possible.



SELECT THE PROFILE



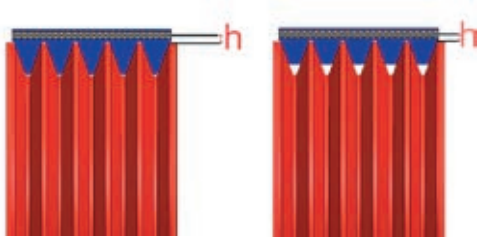


OUTSIDE, EFFECTIVE, AND PITCH DIAMETERS

The effective diameter (d_{eff}) is measured at the bottom of the belt groove. It is used for the calculation of the effective belt length.
For a grooved pulley, consider the outside and the effective diameter as equal.
The pitch diameter (d_p) is measured at the level of the cord. It is used for calculating the belt speed and the speed ratio.

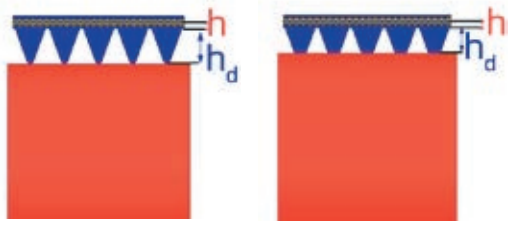
GROOVED PULLEYS

Effective Diameter (d_{eff}) = Outside Diameter (d_{ext})
Pitch Diameter (d_p) = Effective Diameter (d_{eff}) + (2 x h)



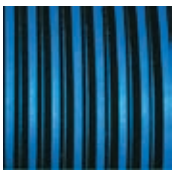
FLAT PULLEYS

Effective Diameter (d_{eff}) = Outside Diameter (d_{ext}) + (2 x h_d)
Pitch Diameter (d_p) = Effective Diameter (d_{eff}) + (2 x h)



Note : For the installation of a flat pulley, please refer to the “Special Drives ” page.

BELT PROFILE	PH	PJ	PK	PL	PM
h (mm)	0.8	1.1	1.6	2.0	2.6
h_d (mm)	1.15	1.7	2.4	3.8	7
h_d (mm) Truncated ribs	0.9	1.5	-	-	-



DETERMINE THE OUTSIDE DIAMETER OF THE SMALL PULLEY (MM)

n (rpm)

Design Power Pc (kW)

	100	300	500	750	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000	15000	20000
0,25	45	40	35,5	35	31,5	30	30	25	25	25	25	25	20	20	20	20	20	20	20	20	20	20	20	12	9
0,5	60	50	45	45	40	35,5	35	31,5	31,5	30	30	30	25	25	25	25	25	25	25	25	20	20	20	12	9
0,75	67	60	56	50	45	40	40	40	35,5	35	31,5	31,5	31,5	30	30	30	30	25	25	25	25	25	25	15	10
1	75	63	60	56	50	45	45	40	40	35,5	35,5	35	35	31,5	31,5	31,5	30	30	30	30	25	25	25	15	10
2	95	80	75	67	63	60	56	50	50	45	45	45	40	40	40	40	35,5	35,5	35	35	31,5	31,5	31,5	18	
3	112	95	85	80	75	67	60	60	56	50	50	50	45	45	45	40	40	40	40	40	35,5	35,5	35,5		
4	125	106	95	85	80	71	67	63	60	56	56	56	50	50	50	45	45	45	45	40	40	40	40		
5	140	112	100	90	85	80	71	67	63	60	60	56	56	50	50	50	50	45	45	45	45	40	40		
7,5	160	125	118	106	100	90	80	75	71	71	67	63	60	60	56	56	56	50	50	50	50	45	45		
10	180	140	125	118	106	95	90	85	80	75	71	71	67	63	63	60	60	56	56	56	56	50	50		
12,5	160	150	140	125	118	106	95	90	85	80	75	75	71	71	67	63	63	60	60	60	56	56	56		
15	200	160	150	132	125	112	100	95	90	85	80	80	75	71	71	67	67	63	63	60	60	60	56		
20	224	180	160	150	132	118	112	106	100	95	90	85	80	80	75	75	71	71	67	67	63	63	60		
25	250	200	170	160	150	132	118	112	106	100	95	90	85	85	80	80	75	75	71	71					
30	250	212	180	170	150	140	125	118	112	106	100	95	90	90	85	85	80	80	75	75					
35	280	224	190	180	160	140	132	125	118	112	106	100	95	95	90	85	85	80	80	75					
40	280	236	200	180	170	150	140	125	118	118	112	106	100	95	95	90	90	85	85	80					
45	315	236	212	190	180	160	140	132	125	118	112	106	106	100	95	95	90	90	85						
50	315	250	224	200	180	160	150	140	132	125	118	112	106	106	100	95	95	90	90						
60		250	236	212	190	170	160	150	140	132	125	118	112	112	106	100	100	95							
70		280	250	224	200	180	160	150	140	140	132	125	118	112	112	106	106	100							
80		280	250	236	212	190	170	160	150	140	132	132	125	118	118	112	106								
90		315	280	236	224	200	180	170	160	150	140	132	125	125	118	118									
100		315	280	250	224	200	180	170	160	150	140	140	132	125	125	118									
125		355	315	280	250	212	200	180	170	160	150	150	140	132	132	125									
150		355	315	280	250	224	212	190	180	170	160	160	150	140	140	132									
175		400	355	315	280	236	224	200	190	180	170	160	160	150	140	140									
200		400	355	315	280	250	224	212	200	190	180	170	160	160	150										
250		400	355	315	280	250	224	212	200	190	180	170													
300			400	355	315	280	250	236	224	212	200	190													
350			400	355	355	315	280	250	236																
400				400	355	315	280	250																	
450				400	355	315	280	280																	
500				400	355	315	280																		

Note : The small pulley diameter should be at least equal to minimum recommended diameter.

n = speed of the small pulley

Effective diameter (mm)	PJ PROFILE Number of ribs							PK PROFILE Number of ribs							PL PROFILE Number of ribs							PM PROFILE Number of ribs						
	4	6	8	10	12	16	20	4	6	8	10	12	16	20	4	6	8	10	12	16	20	4	6	8	10	12	16	20
20	●	●	●		●	●																						
25	●	●	●		●	●																						
30	●	●	●		●	●																						
35	●	●	●		●	●																						
40	●	●	●		●	●																						
45	●	●	●		●	●																						
50	●	●	●		●	●		●		●																		
56	●	●	●		●	●		●		●																		
60	●	●	●		●	●		●		●																		
63	●	●	●		●	●		●		●																		
67	●	●	●		●	●		●		●																		
71	●	●	●		●	●		●		●																		
75	●	●	●		●	●		●		●					●	●	●	●										
80	●	●	●		●	●		●		●					●	●	●	●										
85	●	●	●		●	●		●		●					●	●	●	●	●									
90	●	●	●		●	●		●		●					●	●	●	●	●									
95	●	●	●		●	●		●		●					●	●	●	●	●									
100	●	●	●		●	●		●		●					●	●	●	●	●									
106	●	●	●		●	●		●		●					●	●	●	●	●									
112	●	●	●		●	●		●		●					●	●	●	●	●									
118	●	●	●		●	●		●		●					●	●	●	●	●	●								
125	●	●	●		●	●		●		●					●	●	●	●	●	●								
132	●	●	●		●	●		●		●					●	●	●	●	●	●								
140	●		●		●	●		●		●					●	●	●	●	●	●								
150								●		●					●	●	●	●	●	●								
160	●		●		●	●		●		●					●	●	●	●	●	●								
170								●		●					●	●	●	●	●	●								
180	●		●		●	●		●		●					●	●	●	●	●	●								
190								●		●					●	●	●	●	●	●								
200	●		●		●	●		●		●					●	●	●	●	●	●								
212															●	●	●	●	●	●								
224	●		●		●	●									●	●	●	●	●	●								
236															●	●	●	●	●	●								
250	●		●		●	●									●	●	●	●	●	●								
280	●		●		●	●									●	●	●	●	●	●								
315	●		●		●	●									●	●	●	●	●	●								
355	●		●		●	●									●	●	●	●	●	●								
400	●		●		●	●									●	●	●	●	●	●								
450																												
500																												
560																												
630																												
710																												
800																												

PH Pulleys : The development of the PH belt transmissions requires pulley diameters specifically optimized for the application. Consult us for your PH pulley requirements.

PH PROFILE
Truncated ribs

Eff. Length mm	Eff. Length ins	No of Ribs (max)
197	7,8	310
207	8,2	310
222	8,7	310
234	9,2	310
285	11,2	310
307	12,1	310
425	16,7	310
432	17,0	310
457	18,0	310
483	19,0	310
529	20,8	310

Consult us for our longer belt range.

PJ PROFILE
Non truncated ribs except *

Eff. Length mm	Eff. Length ins	No of Ribs (max)
197	7,8	190
207	8,2	190
234	9,2	190
254	10,0	190
267	10,5	190
274	10,8	190
305	12,0	190
330	13,0	190
356	14,0	190
381	15,0	190
406	16,0	190
432	17,0	190
457	18,0	190
483	19,0	190
508	20,0	190
533	21,0	190
559	22,0	190
584	23,0	190
610	24,0	190
660	26,0	190
711	28,0	190
723	28,5	190
762	30,0	190
787	31,0	190
813	32,0	190
864	34,0	190
914	36,0	190
938	36,9	190
960	37,8	190
995	39,2	190
1016	40,0	190
1059	41,7	190
1080	42,5	190
1092	43,0	190
1105	43,5	190
1115	43,9	190
1123	44,2	190
1126	44,3	190
1130	44,5	190
1150	45,3	190
1168	46,0	190
1200	47,2	190
1222	48,1	190
1233	48,5	190
1244	49,0	190
1270	50,0	190
1280	50,4	190
1301	51,2	190
1315	51,8	190
1321	52,0	190
1355	53,3	190
1372	54,0	190
1397	55,0	190
1428	56,2	190
1473	58,0	190
1549	61,0	190
1600	63,0	190
1651	65,0	190
1663	65,5	190
1752	69,0	190
1854	73,0	190
1895	74,6	190
1910	75,2	190
1956	77,0	190
1965	77,4	190
1992	78,4	190
2083	82,0	190
2210	87,0	190
2337	92,0	190
2413	95,0	190
2489	98,0	190

PK PROFILE
Truncated ribs

Eff. Length mm	Eff. Length ins	No of Ribs (max)
526	20,7	132
560	22,1	132
575	22,6	132
582	22,9	132
597	23,5	132
655	25,8	132
673	26,5	132
682	26,9	132
698	27,5	132
710	28,0	132
740	29,1	132
755	29,7	132
775	30,5	132
790	31,1	132
805	31,7	132
818	32,2	132
841	33,1	132
870	34,3	132
884	34,8	132
903	35,6	132
915	36,0	132
926	36,5	132
938	36,9	132
954	37,6	132
970	38,2	132
995	39,2	132
1015	40,0	132
1030	40,6	132
1050	41,3	132
1080	42,5	132
1110	43,7	132
1146	45,1	132
1165	45,9	132
1194	47,0	132
1230	48,4	132
1253	49,3	132
1295	51,0	132
1330	52,4	132
1360	53,5	132
1387	54,6	132
1425	56,1	132
1460	57,5	132
1496	58,9	132
1530	60,2	132
1560	61,4	132
1580	62,2	132
1601	63,0	132
1626	64,0	132
1658	65,3	132
1682	66,2	132
1725	67,9	132
1760	69,3	132
1795	70,7	132
1830	72,1	132
1863	73,3	132
1900	74,8	132
1930	76,0	132
1949	76,7	132
1971	77,6	132
1980	78,0	132
2030	79,9	132
2050	80,7	132
2080	81,9	132
2100	82,7	132
2145	84,4	132
2205	86,8	132
2257	88,9	132
2330	91,7	132
2385	93,9	132
2440	96,1	132
2480	97,6	132
2530	99,6	132
2585	101,8	132
2612	102,8	132
2680	105,5	132
2835	111,6	132

PL PROFILE
Truncated ribs

Eff. Length mm	ins	No of Ribs (max)
954	37,6	100
991	39,0	100
1 075	42,3	100
1 270	50,0	100
1 333	52,5	100
1 371	54,0	100
1 397	55,0	100
1 422	56,0	100
1 480	58,3	100
1 562	61,5	100
1 613	63,5	100
1 664	65,5	100
1 715	67,5	100
1 764	69,4	100
1 803	71,0	100
1 841	72,5	100
1 943	76,5	100
1 981	78,0	100
2 020	79,5	100
2 070	81,5	100
2 096	82,5	100
2 134	84,0	100
2 197	86,5	100
2 235	88,0	100
2 324	91,5	100
2 362	93,0	100
2 476	97,5	100
2 515	99,0	100
2 705	106,5	100
2 743	108,0	100
2 845	112,0	100
2 895	114,0	100
2 921	115,0	100
2 997	118,0	100
3 086	121,5	100
3 124	123,0	100
3 289	129,5	100
3 327	131,0	100
3 492	137,5	100
3 696	145,5	100
4 051	159,5	100
4 191	165,0	100
4 470	176,0	100
4 622	182,0	100
5 029	198,0	100
5 385	212,0	100
6 096	240,0	100

PM PROFILE
Truncated ribs

Eff. Length mm	ins	No of Ribs (maxi)
2 286	90,0	48
2 388	94,0	48
2 515	99,0	48
2 693	106,0	48
2 832	111,5	48
2 921	115,0	48
3 010	118,5	48
3 124	123,0	48
3 327	131,0	48
3 531	139,0	48
3 734	147,0	48
4 089	161,0	48
4 191	165,0	48
4 470	176,0	48
4 648	183,0	48
5 029	198,0	48
5 410	213,0	48
6 121	241,0	48
6 883	271,0	48
7 646	301,0	48
8 408	331,0	48
9 169	361,0	48
9 931	391,0	48
10 693	421,0	48
12 217	481,0	48
13 741	541,0	48
15 266	601,0	48

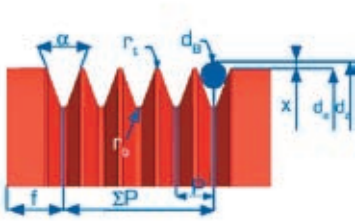
Consult us for any other reference.

PULLEYS

- Should be manufactured to ISO 9982 (Pulleys and V-ribbed belts for industrial applications) that presents the following information :

- ❑ Designation
- ❑ Geometry
- ❑ Roughness
- ❑ Run-Out

PULLEY PROFILE		PH	PJ	PK	PL	PM
α	(°)	40 ± 0.5	40 ± 0.5	40 ± 0.5	40 ± 0.5	40 ± 0.5
P	(mm)	1.6 ± 0.03	2.34 ± 0.03	3.56 ± 0.05	4.70 ± 0.05	9.40 ± 0.08
Tolerance on ΣP		± 0.3	± 0.3	± 0.3	± 0.3	± 0.3
r_t mini.	(mm)	0.15	0.20	0.25	0.40	0.75
r_b maxi.	(mm)	0.30	0.40	0.50	0.40	0.75
f mini.	(mm)	1.3	1.8	2.5	3.3	6.4
d_b	(mm)	1 ± 0.01	1.5 ± 0.01	2.5 ± 0.01	3.5 ± 0.01	7.0 ± 0.01
$2x = d_z - d_e$	(mm)	0.11	0.23	0.99	2.36	4.53



- The pulley grooves must have a surface finish Ra ≤ 3.2 µm.
- The pulleys can be full, sectioned, reduced mass (made with holes).

IDLERS

- The width of the pulley should be equal to the belt width plus twice the rib pitch (p) for less then 10 ribs, and plus four times the rib pitch for more than 10 ribs.

- ❑ No. ribs < 10 : $l_{idler} \geq$ (no. ribs + 2) x P
- ❑ No. ribs ≥ 10 : $l_{idler} \geq$ (no. ribs + 4) x P
- ❑ The factors do not take into account any geometrical defects of the drive: pulley out of true, shaft parallelism, etc. It is therefore advisable to increase the factors by a value equivalent to any drive defect.

- Idler surface finish must be Ra ≤ 3.2 µm

- The positioning of an idler is usually located on the belt as close as possible to the small pulley. In the case of a drive with alternating direction, the idler will be in contact intermittently with the belt. When this occurs, the use of a dynamic idler is recommended.

AXIAL OR RADIAL RUN-OUT

- The radial run-out has to be between the following values :

Effective Diameter d_{eff}	Maximum Value
$d_{eff} \leq 74$ mm	0.13 mm
$74 < d_{eff} \leq 250$ mm	0.25 mm
$d_{eff} > 250$ mm	$0.25 + 0.0004 * (d_{eff} - 250)$

- The axial run-out should be less than 0.003 mm per mm of effective diameter.
- The axial, or radial, run-out is measured using a gauge. Values represent the maximum variation amplitudes indicated on the gauge display.

BALANCING OF THE PULLEYS AND IDLERS

Poor balancing creates premature wear of bearings and can be the cause of severe vibration problems. In extreme cases unbalanced components can cause shaft breakage. Balancing is normally done by the pulley and idler manufacturer.

- Static balancing of all pulleys is highly recommended.

- In addition, dynamic balancing is required when the belt speed exceeds 20 m/sec.

MATERIALS

- Several types of materials can be used such as cast iron, steel, aluminum or plastics.

- The choice of a material, in addition to the economic aspect, is related on the applicability and operating conditions of the belt drive.
Please contact us for further information.

METHOD OF ATTACHMENT

Standard pulleys are equipped with keyed removable hubs.

We advise against lubricating the shaft at the time of assembly of the pulleys. With certain systems of tightening (eg. conical hubs), the effect of locking the pulley or the idler, on the shaft is limited and can lead to a progressive misalignment.
There are multiple methods of attaching pulleys, or idlers, to the shaft. Most of the manufacturers propose their own method. **Please contact us for further information.**

SHAFT PARALLELISM

Systems, which are very simple to use, easy adjustment of alignment and parallelism.
Generally, the shaft parallelism tolerance maximum is 2°. With flat pulleys, this tolerance is 1°.

INSTALLING THE PULLEYS

Pulleys should be mounted as close as possible to the bearings in order to reduce overhung loading.

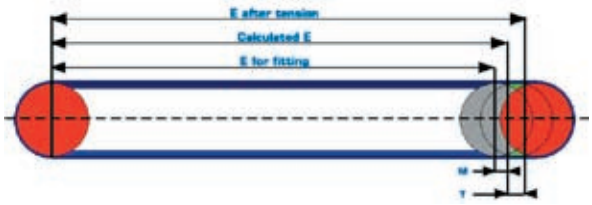
ALIGNING THE PULLEYS

The maximum misalignment allowed is 3 mm of meter center distance with a maximum of 15 mm.
This also holds true for idlers unless their width allows for greater misalignment.

FITTING AND TAKE-UP RECOMMENDATIONS

Margins are defined in the following table :

L	PH		PJ		PK		PL		PM	
(mm)	M	T	M	T	M	T	M	T	M	T
< 750	-9	+8	-10	+10	-11	+13				
750 to 1200	-9	+12	-10	+15	-12	+16	-15	+20		
1200 to 2000	-12	+16	-15	+20	-16	+22	-20	+25		
2000 to 3500	-17	+25	-20	+30	-23	+32	-30	+35	-40	+50
3500 to 6000							-40	+50	-50	+70
> 6000									-100	+130



TENSIONING THE BELT

- It is absolutely necessary that a belt is tensioned correctly and with great care. Under or over-tensioning can cause functional problems and lead to premature belt failure. To control the tension of the belt, Hutchinson recommends the vibrating cord method, a precise method requiring the use of a tension meter.
Hutchinson offers you its universal laser tensiometer EASYTEC

EASYTEC is an electronic measurement instrument composed of a laser probe and a microprocessor. It makes it possible to measure the frequency and thus check the tension of your belt (measurements in Hertz or Newtons).
EASYTEC allows you to measure the frequency of all types of belts between 10 and 340 Hz.

VIBRATING CORD METHOD

The tension of the belt cannot be measured unless the belt drive is stopped.

1. Turn on the EASYTEC
2. Hold the laser probe 2 to 3 mm above the belt, aim at the middle of the belt.
3. Tap the back of the belt with your index finger or a screwdriver so that it starts to vibrate naturally.

Measure tension with EASYTEC

4. A beep and the message «Measurement» will notify you of a successful measurement.
5. The values are given in Hz or N.
6. Tension is calculated from parameters previously entered (weight, length of the belt span on which measurement is done), the measured frequency and the following formula:

$$T_{span}\ (N) = 4 * M_l * \text{no. of ribs} * l_b^2 * F^2.$$

F : Measured Frequency (Hz)
l_b : Length of the belt span (m)
M_l : Linear Mass (kg/m/rib)

7. Compare the measured tension with the values recommended by the design calculation.
8. If necessary, adjust the tension and take another measurement.

Note : Take 2 to 3 measurements, between each measurement the belt should go through one rotation.

9. Run the drive under load for 6 minutes.
10. Measure the tension of the belt again and adjust, if necessary, to the values recommended by Hutchinson.

For very large belt drives (PL or PM) with large widths, we recommend using the elongation method.

ELONGATION METHOD :

- Requires no special equipment.
- Used for high power drives or center distances greater than 1m.

1. Fit the belts on the pulleys with no tension.
2. Draw 2 lines perpendicularly across the back of the belt, one full span apart (1m apart if possible).
3. Increase the distance between the lines by 0.7% (7mm for 1m).
4. Run the drive under load for about 6 minutes.
5. Check the tension of the belt (i.e. the spacing between the 2 lines) and adjust to the following values if necessary :

PL	PM
0.6%	0.6%

Whichever method is used, it is imperative to operate the belt drive (for approximately 6 minutes with load) and to readjust, if necessary, the tension of the belt to the values indicated by Hutchinson.

ARAMID CORD BELT

Hutchinson offers a range of Poly V® belts with aramid tensile members.

The high strength of the aramid cable allows for greater loads per rib, approximately 30% more. This structure is particularly suitable for high power applications. It also allows for an optimization of the belt width, thus reducing the size of the belt drive significantly.

The limit of its use must however be taken into account: applications exposed to strong jolts are not recommended to use aramid cables due to the poor resistance to micro-cracking related to these particular modes. Thus, the use of a aramid cables should only be done on specific applications validated by Hutchinson.

SERPENTINE DRIVES

The flexibility of Poly V® belts is particularly suited to serpentine drives, providing the following advantages:
- A single belt can drive several accessories.
- Accessories can be driven off the back of the belt.
- Very compact drives can be designed.

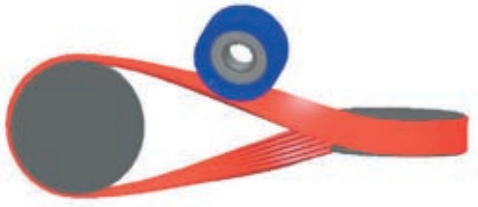
Recommended minimum diameters are indicated in previous charts.

QUARTER TURN DRIVES

Poly V® belts can drive pulleys in 2 different planes. However, in such cases it is better to limit their application to low power drives.

For quarter turn drives with an idler (when dealing with high speed ratios and relatively small center distances), the idler must be inclined. The angle of inclination depends on the center distance and diameter of the pulleys.

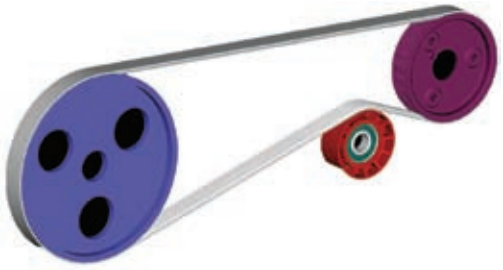
Consult us for the 3D position of the pulleys and idler.



Poly V® belts can be adapted to suit complex drives. For unlisted applications, please contact us.

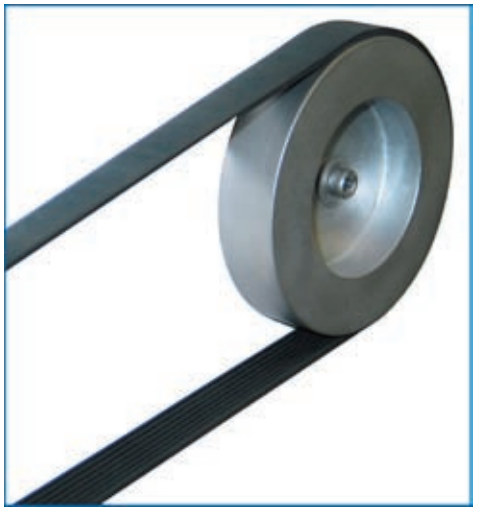
OUTSIDE IDLERS

Outside idlers must be installed on the slack span, as near as possible to the motor pulley. Outside idlers have numerous advantages, notably :
- Tensioning the pulley on a fixed center distance
- Increasing pulley/belt arcs of contact.
- Dampening of span vibrations with large center distances.
- Recommended minimum diameters are indicated in the previous charts.



FLAT PULLEYS

It is possible to drive flat pulleys with a Poly V® belt. However, drive design precautions should be taken as the contact area of a flat pulley is lower than that of a grooved pulley.
Generally, the use of the flat pulley is limited to drives with speed ratios ≥ 4 and only on the large pulley (for a center distance 2 times the sum of the diameters of the pulleys).



SPECIAL BACKING

Initially designed for power drives, Poly V® belts can also be used as conveyors belts :
- Production lines
- Escalator handrail drives
- Cable and tube pulling machines

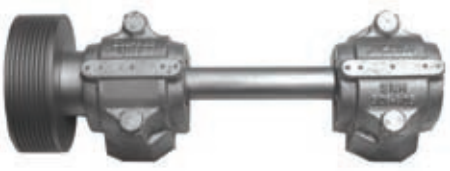
The back of the belt has to be adapted and reinforced according to the material transported (textile reinforcement, extra thickness , etc.).

In addition, Hutchinson has a wide range of rubber compounds adapted to hostile environments :
- Tropical climates.
- Chemical aggression (oils, fuels, etc.).
- Electrical conductivity (insulating or conductive compounds, etc.).

CALCULATE THE LOADS ON THE BEARINGS

The load on the bearings is defined by :
$F_p(N) = T_{shaft}(N)*0,8$

When the width of the belt is greater than the diameter of the pulley, we recommend the sheave between 2 bearings :



OVERHUNG SHEAVE

SHEAVE BETWEEN BEARINGS

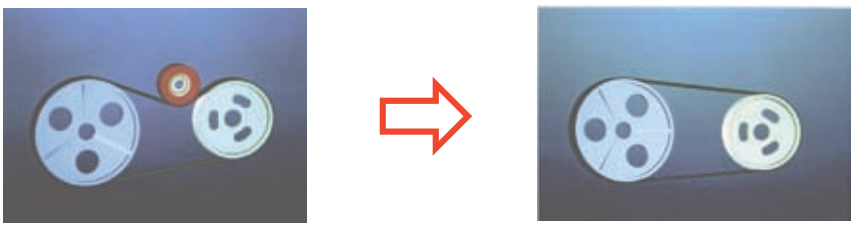
ADVANTAGES

HIGH QUALITY DRIVE

- Compact Drive
- Reduced Vibration due to damping effect
- Reduced Noise Level
- Increrased effective power transmission
- Uniform Tension across belt width

COST SAVINGS

- Self tensioning – no need for tensioning devices
- Reduced maintenance costs
  - No “take up” re-tensioning required
  - Increased belt life
- Quick and simple to fit in the field
  - Fixed center distances with standard Poly V® profile pulleys
- Increased life of belt drive
  - Damping effect reduces shock loading on bearings



FIELDS OF APPLICATIONS

- Industrial Washing Machines,
- Industrial Dryers,
- Compressors,
- Wood Planers / Sanders,
- Treadmill,
- Exercise bicycle,
- Scooter,
- Ultra Light Aircraft,
- Cement Mixers,
- Cooling Plants,
- Air Conditioners,
- Electric Generators,
- Lawn Mowers,
- Food Mixers,
- Food Processors,
- Tractors,
- Agricultural Machinery,
- Boat Motors,
- Grinders,
- Optical Lens Grinders,
- Concrete Cutting Saw,
- Vacuum Cleaners,
- Automatic Doors,
- Tree Debarker,
- Optical Machinery,
- Woodworking Machinery,
- Floor polisher,
- ...

STRUCTURE

- Elastic Polyamid Tension Cord

- Increased Flexibility

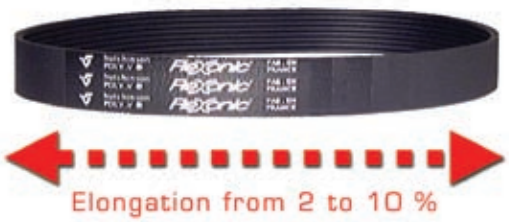
- Belt tension is engineered to suit each drive

- Designed for extreme temperatures : -40°C to +130°C

- Power can be transmitted in a wide range : 0 to 40 kW

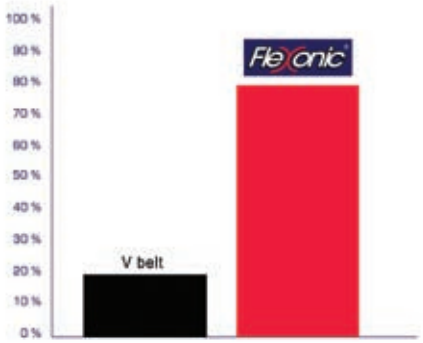
- Standard Poly V® Pulleys made to ISO 9982 can be used

- Used for simple 2 pulley drives and multiple pulley serpentine drives



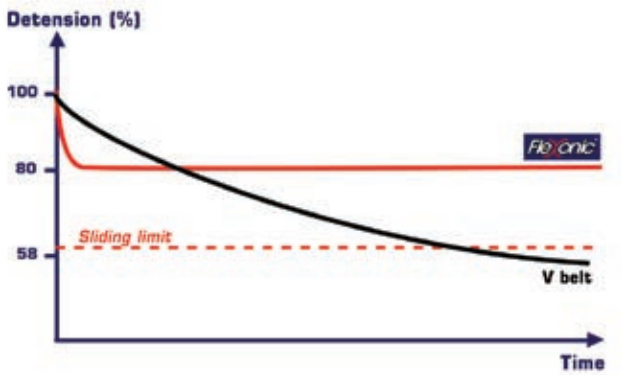
	Flexonic® PH	Flexonic® PJ	Flexonic® PK
Thickness	2.3 mm/ 2.5 mm	3.2 mm/ 3.3 mm/ 3.5 mm	4.7 mm
Minimum pulley diameter	8 mm	16 mm	45 mm
Maximum linear speed	80 m/s	60 m/s	55 m/s
Linear Mass	0.0042 kg/m/rib	0.008 kg/m/rib	0.020 kg/m/rib
Setting tension	20 to 30 N/rib/span	30 to 50 N/rib/span	70 to 90 N/rib/span

ABSORBED VIBRATIONS



Under certain conditions, the Flexonic® belt absorbs vibrations induced by the drive by more than 60 % compared to a trapezoidal belt.

TENSION STABILITY



Under normal operating conditions, the detension of the Flexonic® belt is instantaneous (approximately 5 minutes). The belt then maintains constant tension.

The assembly of the Flexonic® belt must respect the criteria of shaft parallelism and pulley alignment (2° and 3mm per meter respectively).

Fitting the Flexonic® belt is easy : the pulleys do not need to be removed.

IN MOST CASES, THE FLEXONIC® BELT CAN BE FITTED BY HAND ON PULLEYS AT FIXED CENTER DISTANCES.

To fit the Flexonic® belt, Hutchinson proposes the universal fitting tool (patent #0306754).

In some instances fitting the belt requires a specific tool.
The conditions requiring the use of a tool are :
- Pulley Ratio of 1:1
- Pulley Ratio close to 1:1 with high elongation
- Pulleys with limited access

Contact us for the development of specific fitting tools.

Measuring the tension after 6 minutes can be done with the universal laser tension meter offered by Hutchinson. EASYTEC

BELT TENSION :

Hutchinson belts, if they are properly fitted and tensioned, will prevent expensive maintenance actions.

CONSEQUENCES OF INCORRECT BELT TENSION

- Under-tension generates a fast degradation of the belt which does not transmit all of the required power. Vibration problems can also be experienced.

- Over-tension generates a fast degradation of the belt which is not designed to carry such loads. The high load on the belt is critical and can lead to a premature degradation of the entire belt drive (belt, bearings, pulleys, idlers).

RE-FITTING THE BELT

Before removing the belt, do not forget to measure the tension in order to apply the same parameters when the belt is re-fitted.

Run the belt through one revolution and check the tension.

RISK OF HEATING THE BELT

Bad tension can cause the belt to be heated. Too much slip can generate premature wear. Check the tension to avoid any problem.

OPERATING TEMPERATURES :

Our belts are designed to continuously operate in temperatures ranging between -40°C and +100°C. In addition, Hutchinson has developed specific elastomers capable of operating in temperatures reaching 140°C.

STORAGE CONDITIONS :

We recommend that you store our belts out of direct light, flat in their original package, at a temperature between 10°C and 35°C. The storage period should not exceed 2 years.

INFORMATION FORM : POLY V® & Flexonic

HUTCHINSON

Company : ..... Distributor : .....
Contact : ..... Date : .....
Adress : ..... City : ..... Zip Code : .....
Tel : ..... Fax : ..... e-mail : .....

APPLICATION

Type : .....
❒ Conversion of an existing drive
❒ Conversion from Poly V® →Flexonic®
❒ New application
Number of units per year : .....
Maximum belt length (mm) : .....

❒ Chain
❒ Belt

Type : .....
Reference : .....
Pair ❒ Number .....

EXITING GEOMETRY :
ø motor .....mm, ø Driven .....mm
ø idler .....mm, Center Distance .....mm

MOTOR

Type : .....
Nominal power (kW) : .....
Nominal Speed (rpm) : .....
Ø Motor pulley (mm) : .....Ø Shaft =.....
❒ Flat ❒ Grooved
Maximum load on bearings (N) : .....

	Class 1	Class 2	Class 3
Motor Speed (rpm)			
Nominal Power (kW)			
% of use			

DRIVEN

Nominal Speed (rpm) : .....
Speed Ratio : .....
Ø Driven Pulley (mm) : ..... Ø Shaft =.....
❒ Flat ❒ Grooved
Maximum load on bearings (N) : .....

❒ Regular Loads
❒ Slight Overloads
❒ High Overloads
❒ Torque

Free Starting.....(N.m)
Loaded Starting.....(N.m)
While functioning.....(N.m)

CENTER DISTANCE

Desired Center Distance (mm) : .....
Minimum Center Distance (mm) : .....
Maximum Center Distance (mm) : .....

OPERATING CONDITIONS

Duty Cycle Conditions/day : .....h
Number of stars-ups/day : .....
Change of direction : ❒ yes ❒ no
Frequency : .....

TENSIONING

❒ By increasing center distance ❒ By idler

ENVIRONMENT

Ambient Temperature ..... °C
❒ Dust ❒ Water ❒ Oil ❒ Hydrocarbon

MULTIPLE PULLEY / IDLER

Accessories (pulleys, idlers)	Nature			Diameter	Speed	Absorbed Power	Coordinates (mm)	
	Flat	Grooved	Material				X	Y
Motor pulley n°0							0	0
Motor pulley n°1								
Motor pulley n°2								
Motor pulley n°3								
Motor pulley n°4								
Motor pulley n°5								

HUTCHINSON TRANSMISSION **FAX : + 33 2 47 48 38 34** **Tel : + 33 2 47 48 39 99**
e-mail : polyv.service@hutchinson.fr

VISIT OUR INDUSTRIAL WEB SITE, WITH CALCULATION SOFTWARE ON-LINE
hutchinsontransmission.com

INFORMATION FORM : POLY V® & Flexonic

HUTCHINSON

Company : ..... Distributor : .....
Contact : ..... Date : .....
Adress : ..... City : ..... Zip Code : .....
Tel : ..... Fax : ..... e-mail : .....

APPLICATION

Type : .....
❒ Conversion of an existing drive
❒ Conversion from Poly V® →Flexonic®
❒ New application
Number of units per year : .....
Maximum belt length (mm) : .....

❒ Chain
❒ Belt

Type : .....
Reference : .....
Pair ❒ Number .....

EXITING GEOMETRY :
ø motor .....mm, ø Driven .....mm
ø idler .....mm, Center Distance .....mm

MOTOR

Type : .....
Nominal power (kW) : .....
Nominal Speed (rpm) : .....
Ø Motor pulley (mm) : .....Ø Shaft =.....
❒ Flat ❒ Grooved
Maximum load on bearings (N) : .....

	Class 1	Class 2	Class 3
Motor Speed (rpm)			
Nominal Power (kW)			
% of use			

DRIVEN

Nominal Speed (rpm) : .....
Speed Ratio : .....
Ø Driven Pulley (mm) : ..... Ø Shaft =.....
❒ Flat ❒ Grooved
Maximum load on bearings (N) : .....

❒ Regular Loads
❒ Slight Overloads
❒ High Overloads
❒ Torque

Free Starting.....(N.m)
Loaded Starting.....(N.m)
While functioning.....(N.m)

CENTER DISTANCE

Desired Center Distance (mm) : .....
Minimum Center Distance (mm) : .....
Maximum Center Distance (mm) : .....

OPERATING CONDITIONS

Duty Cycle Conditions/day : .....h
Number of stars-ups/day : .....
Change of direction : ❒ yes ❒ no
Frequency : .....

TENSIONING

❒ By increasing center distance ❒ By idler

ENVIRONMENT

Ambient Temperature ..... °C
❒ Dust ❒ Water ❒ Oil ❒ Hydrocarbon

MULTIPLE PULLEY / IDLER

Accessories (pulleys, idlers)	Nature			Diameter	Speed	Absorbed Power	Coordinates (mm)	
	Flat	Grooved	Material				X	Y
Motor pulley n°0							0	0
Motor pulley n°1								
Motor pulley n°2								
Motor pulley n°3								
Motor pulley n°4								
Motor pulley n°5								

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