

a = Centre distance (mm)
 M_B = Acceleration torque (Nm)
 t_B = Acceleration time (s)
 d = Bore (mm)
 r = Density (kg/dm³)
 M = Torque (Nm)
 n = RPM (min⁻¹)
 d_k = Outside diameter (mm)

P = Power (kW)
 J = Moment of Inertia (kgm²)
 L_B = Belt length (mm)
 i = Ratio
 F_{zul} = Allowable tensile load (N)
 B = Pulley width (mm)
 t = Pitch (mm)
 v = Velocity (m/s)

F_U = Peripheral force (N)
 w = Angular velocity (s⁻¹)
 d_0 = Pitch circle diameter (mm)
 Z = No. of teeth when $i = 1$
 z_1 = No. of teeth of small pulley
 z_2 = No. of teeth of large pulley
 Z_B = No. of teeth in the belt
 z_e = No. of teeth in mesh

Belt length $i \neq 1$

$$L_B \approx \frac{t}{2} (z_2 + z_1) + 2a + \frac{1}{4a} \left[\frac{(z_2 - z_1)t}{p} \right]^2$$

Belt length when $i = 1$

$$L_B = 2a + p \cdot d_0$$

$$L_B = 2a + z \cdot t$$

Peripheral Force

$$F_U = \frac{2 \cdot 10^3 \cdot M}{d_0}$$

$$F_U = \frac{19.1 \cdot 10^6 \cdot P}{n \cdot d_0}$$

$$F_U = \frac{10^3 \cdot P}{v}$$

Torque

$$M = \frac{d_0 \cdot F_U}{2 \cdot 10^3}$$

$$M = \frac{9.55 \cdot 10^3 \cdot P}{n}$$

$$M = \frac{d_0 \cdot P}{2 \cdot v}$$

Power

$$P = \frac{M \cdot n}{9.55 \cdot 10^3}$$

$$P = \frac{F_U \cdot d_0 \cdot n}{19.1 \cdot 10^6}$$

$$P = \frac{F_U \cdot v}{10^3}$$

Angular Velocity

$$w = \frac{p \cdot n}{30}$$

Rpm

$$n = \frac{19.1 \cdot 10^3 \cdot v}{d_0}$$

Velocity

$$v = \frac{d_0 \cdot n}{19.1 \cdot 10^3}$$

Pitch Circle Diameter

$$d_0 = \frac{z \cdot t}{p}$$

Mass Moment of Inertia

$$J = 98.2 \cdot 10_{-15} \cdot B \cdot r \cdot (d_{k4} - d_4)$$

Acceleration Torque

$$M_B = \frac{J \cdot \Delta n}{9.55 \cdot t_B}$$

Centre Distance (approx.) for $i = 1$

$$a \approx \frac{Z_B \cdot z_1}{2} \cdot t$$

Centre Distance (approx.) for $i \neq 1$

$$a \approx \frac{L_B - (p/2)(d_{01} + d_{02})}{4} + \sqrt{\left(\frac{L_B - (p/2)(d_{01} + d_{02})}{4} \right)^2 - \frac{(d_{02} + d_{01})^2}{8}}$$

Synchronous and Breco® Timing Belts and Pulleys

Pulley Tooth Versions

All Ondrives pulleys are supplied with normal backlash tooth gap form. SE and zero backlash are available on request. Please contact our Technical department.

Flexibility

The minimum number of teeth on the pulley / minimum diameter recommended for trouble free operation is based on the belt type selected. When considering drives with reverse bending (contraflexure), it is especially important to remember that the minimum number of teeth on the pulley / minimum diameter must be increased. Values are given at the end of each belt type section.

Pre-tension

The pre-tension F_V is determined by the maximum operating peripheral force F_U . The purpose of pre-tension is to allow both sides of the belt between the pulleys to run without sagging. It is important to recognise the difference between the loaded (tight) and unloaded (slack) side of a drive as when power is applied, the tension increases in the loaded (tight) side and decreases proportionately in the slack side. The pre-tension is correctly set when the unloaded (slack) side of the belt always remains taut under the maximum operating loads. Any sag or flap indicates too low a pre-tension.

For two pulley drives:

Pre-tension $\geq 0.5 \cdot$ Peripheral force
 $F_V \geq 0.5 \cdot F_U$

For multiple pulley and linear drives:

Pre-tension $\geq 1.0 \cdot$ Peripheral force
 $F_V \geq 1.0 \cdot F_U$

Tension Member Tensile Loading F_{zul}

The timing belt is designed correctly when the tension member loading value is not exceeded. Values for each belt can be found on the product page. $F_U < F_{zul}$

Tooth Shear Strength

The belt width (in cm) required to transmit known peripheral force F_U , torque M or power P without exceeding the maximum allowable tooth shear strength is calculated using any of the following formulae and the values from the tables:

$$b = \frac{F_U}{z_e \cdot F_{U\text{spez}}}$$

$$b = \frac{100 \cdot M}{z_1 \cdot z_e \cdot M_{\text{spez}}}$$

$$b = \frac{1000 \cdot P}{z_1 \cdot z_e \cdot P_{\text{spez}}}$$

- b = belt width (in cm)
- $F_{U\text{spez}}$ = specific peripheral force (N/cm)
- M_{spez} = specific torque (N/cm)
- P_{spez} = specific power (W/cm)
- z_1 = No. of teeth on the small pulley
- z_2 = No. of teeth on the large pulley
- t = pitch in mm
- a = centre distance in mm
- z_e = No. of teeth in mesh (see below)
- $z_{e\text{max}}$ = 12 for T, AT, AT-G3 and Breco® M

To calculate the number of teeth in mesh, z_e :

$$z_e = \frac{z_1}{180} \cdot \text{arc cos} \frac{(z_2 - z_1) \cdot t}{2\pi a}$$

T2.5 Specific Tooth Shear Strength

Rpm, n (min ⁻¹)	$F_{U\text{spez}}$ (N/cm)	M_{spez} (Ncm/cm)	P_{spez} (W/cm)	Rpm, n (min ⁻¹)	$F_{U\text{spez}}$ (N/cm)	M_{spez} (Ncm/cm)	P_{spez} (W/cm)	Rpm, n (min ⁻¹)	$F_{U\text{spez}}$ (N/cm)	M_{spez} (Ncm/cm)	P_{spez} (W/cm)
0	9.03	0.359	0.000	1,200	5.51	0.219	0.275	3,600	4.22	0.168	0.632
20	8.72	0.347	0.007	1,300	5.41	0.215	0.293	3,800	4.15	0.165	0.657
40	8.48	0.337	0.014	1,400	5.33	0.212	0.311	4,000	4.09	0.163	0.682
60	8.28	0.329	0.021	1,460	5.28	0.210	0.321	4,500	3.95	0.157	0.740
80	8.10	0.322	0.027	1,500	5.25	0.209	0.328	5,000	3.82	0.152	0.796
100	7.95	0.316	0.033	1,600	5.17	0.206	0.345	5,500	3.71	0.148	0.850
150	7.64	0.304	0.048	1,700	5.10	0.203	0.361	6,000	3.60	0.143	0.901
200	7.39	0.294	0.062	1,800	5.04	0.200	0.378	6,500	3.51	0.140	0.950
300	7.01	0.279	0.088	1,900	4.97	0.198	0.394	7,000	3.42	0.136	0.997
400	6.71	0.267	0.112	2,000	4.91	0.195	0.409	7,500	3.33	0.133	1.042
500	6.48	0.258	0.135	2,200	4.80	0.191	0.440	8,000	3.26	0.130	1.086
600	6.28	0.250	0.157	2,400	4.70	0.187	0.470	8,500	3.18	0.127	1.128
700	6.11	0.243	0.178	2,500	4.65	0.185	0.484	9,000	3.11	0.124	1.168
730	6.07	0.241	0.185	2,600	4.60	0.183	0.499	9,500	3.05	0.121	1.207
800	5.97	0.237	0.199	2,800	4.51	0.180	0.527	10,000	2.99	0.119	1.245
900	5.83	0.232	0.219	3,000	4.43	0.176	0.554	12,000	2.77	0.110	1.384
1,000	5.71	0.227	0.238	3,200	4.36	0.173	0.581	15,000	2.50	0.099	1.561
1,100	5.61	0.223	0.257	3,400	4.28	0.170	0.607	18,000	2.28	0.091	1.708

ondrives

Precision Gears

Synchronous and Breco® Timing Belts and Pulleys

T5 Specific Tooth Shear Strength

Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)
0	24.00	1.910	0.000	1,200	15.31	1.218	1.531	3,600	11.77	0.936	3.530
20	23.38	1.861	0.039	1,300	15.06	1.198	1.632	3,800	11.59	0.922	3.670
40	22.86	1.819	0.076	1,400	14.83	1.180	1.730	4,000	11.42	0.909	3.807
60	22.41	1.783	0.112	1,500	14.61	1.162	1.826	4,500	11.03	0.878	4.136
80	22.01	1.751	0.147	1,600	14.40	1.146	1.920	5,000	10.68	0.850	4.450
100	21.65	1.723	0.180	1,700	14.21	1.131	2.013	5,500	10.36	0.825	4.750
200	20.28	1.614	0.338	1,800	14.03	1.116	2.104	6,000	10.07	0.802	5.037
300	19.30	1.536	0.483	1,900	13.85	1.102	2.193	6,500	9.81	0.780	5.312
400	18.55	1.476	0.618	2,000	13.69	1.089	2.210	7,000	9.56	0.761	5.577
500	17.93	1.427	0.747	2,200	13.38	1.065	2.453	7,500	9.33	0.742	5.831
600	17.41	1.385	0.870	2,400	13.10	1.042	2.619	8,000	9.11	0.725	6.076
700	16.96	1.349	0.989	2,600	12.84	1.021	2.781	8,500	8.91	0.709	6.310
800	16.56	1.318	1.104	2,800	12.59	1.002	2.938	9,000	8.72	0.694	6.540
900	16.20	1.289	1.215	3,000	12.37	0.984	3.092	9,500	8.54	0.679	6.760
1,000	15.88	1.263	1.323	3,200	12.16	0.967	3.241	10,000	8.37	0.666	6.970
1,100	15.58	1.240	1.428	3,400	11.96	0.951	3.338				

T10 Specific Tooth Shear Strength

Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)
0	50.5	8.04	0.000	1,200	29.3	4.67	5.87	3,600	20.70	3.30	12.42
20	49.0	7.80	0.163	1,300	28.7	4.57	6.22	3,800	20.30	3.23	12.84
40	47.7	7.60	0.318	1,400	28.2	4.48	6.57	4,000	19.86	3.16	13.24
60	46.6	7.42	0.466	1,500	27.6	4.40	6.91	4,500	18.91	3.01	14.18
80	45.7	7.27	0.609	1,600	27.1	4.32	7.23	5,000	18.06	2.87	15.05
100	44.8	7.13	0.746	1,700	26.7	4.24	7.55	5,500	17.28	2.75	15.84
200	41.4	6.60	1.381	1,800	26.2	4.17	7.86	6,000	16.58	2.64	16.58
300	39.1	6.22	1.953	1,900	25.8	4.10	8.16	6,500	15.93	2.54	17.26
400	37.2	5.92	2.480	2,000	25.4	4.04	8.46	7,000	15.33	2.44	17.88
500	35.7	5.68	2.980	2,200	24.6	3.92	9.03	7,500	14.76	2.35	18.46
600	34.4	5.48	3.440	2,400	23.9	3.81	9.58	8,000	14.24	2.27	18.99
700	33.3	5.31	3.890	2,600	23.3	3.71	10.10	8,500	13.74	2.18	19.47
800	32.4	5.15	4.320	2,800	22.7	3.62	10.60	9,000	13.28	2.11	19.92
900	31.5	5.01	4.730	3,000	22.2	3.53	11.08	9,500	12.84	2.04	20.30
1,000	30.7	4.89	5.120	3,200	21.7	3.45	11.55	10,000	12.42	1.98	20.70
1,100	30.0	4.77	5.500	3,400	21.2	3.36	11.99				

AT5 Specific Tooth Shear Strength

Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)
0	35.3	2.81	0.000	1,200	24.80	1.970	2.48	3,600	18.28	1.454	5.48
20	34.9	2.78	0.058	1,300	24.30	1.936	2.64	3,800	17.93	1.427	5.68
40	34.5	2.75	0.115	1,400	23.90	1.903	2.79	4,000	17.61	1.401	5.87
60	34.1	2.72	0.171	1,500	23.50	1.872	2.94	4,500	16.86	1.342	6.32
80	33.8	2.69	0.225	1,600	23.20	1.843	3.09	5,000	16.18	1.288	6.74
100	33.5	2.66	0.279	1,700	22.80	1.816	3.23	5,500	15.56	1.239	7.13
200	32.0	2.55	0.534	1,800	22.50	1.789	3.37	6,000	15.00	1.194	7.50
300	30.9	2.46	0.771	1,900	22.20	1.764	3.51	6,500	14.48	1.152	7.84
400	29.8	2.37	0.995	2,000	21.90	1.740	3.65	7,000	13.99	1.113	8.16
500	29.0	2.30	1.207	2,200	21.30	1.695	3.91	7,500	13.54	1.077	8.46
600	28.2	2.24	1.409	2,400	20.80	1.654	4.16	8,000	13.11	1.043	8.74
700	27.5	2.19	1.603	2,600	20.30	1.615	4.40	8,500	12.71	1.011	9.00
800	26.8	2.14	1.789	2,800	19.84	1.579	4.63	9,000	12.33	0.981	9.24
900	26.3	2.09	1.969	3,000	19.42	1.545	4.85	9,500	11.97	0.953	9.47
1,000	25.7	2.05	2.140	3,200	19.01	1.513	5.07	10,000	11.63	0.925	9.69
1,100	25.2	2.01	2.310	3,400	18.64	1.483	5.28				

For designs over the quoted speed, please contact our Technical Department.

Synchronous and Breco® Timing Belts and Pulleys

AT10 Specific Tooth Sheer Strength

Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)
0	73.5	11.70	0.000	1,200	47.2	7.51	9.44	3,600	31.90	5.07	19.11
20	72.4	11.53	0.241	1,300	46.2	7.35	10.00	3,800	31.10	4.94	19.67
40	71.4	11.37	0.476	1,400	45.2	7.19	10.54	4,000	30.30	4.82	20.20
60	70.5	11.21	0.705	1,500	44.3	7.04	11.07	4,500	28.50	4.54	21.40
80	69.6	11.07	0.928	1,600	43.4	6.91	11.57	5,000	26.90	4.29	22.50
100	68.7	10.94	1.145	1,700	42.6	6.78	12.06	5,500	25.50	4.06	23.40
200	65.0	10.35	2.170	1,800	41.8	6.65	12.54	6,000	24.20	3.85	24.20
300	62.1	9.88	3.100	1,900	41.0	6.53	13.00	6,500	23.00	3.65	24.90
400	59.5	9.48	3.970	2,000	40.3	6.42	13.44	7,000	21.80	3.47	25.50
500	57.4	9.13	4.780	2,200	39.0	6.20	14.30	7,500	20.80	3.30	26.00
600	55.5	8.83	5.550	2,400	37.8	6.01	15.10	8,000	19.77	3.15	26.40
700	53.7	8.55	6.270	2,600	36.6	5.83	15.86	8,500	18.84	3.00	26.70
800	52.2	8.31	6.960	2,800	35.5	5.66	16.58	9,000	17.95	2.86	26.90
900	50.8	8.08	7.620	3,000	34.5	5.50	17.27	9,500	17.12	2.72	27.10
1,000	49.5	7.88	8.250	3,200	33.6	5.35	17.92	10,000	16.32	2.60	27.20
1,100	48.3	7.69	8.860	3,400	32.7	5.20	18.53				

AT5-G3 Specific Tooth Sheer Strength

Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)
0	44.125	3.513	0.000	1,200	31.000	2.463	3.100	3,600	22.850	1.818	6.850
20	43.625	3.475	0.073	1,300	30.375	2.420	3.300	3,800	22.413	1.784	7.100
40	43.125	3.438	0.144	1,400	29.875	2.379	3.488	4,000	22.013	1.751	7.338
60	42.625	3.400	0.214	1,500	29.375	2.340	3.675	4,500	21.075	1.678	7.900
80	42.250	3.363	0.281	1,600	29.000	2.304	3.863	5,000	20.225	1.610	8.425
100	41.875	3.325	0.349	1,700	28.500	2.270	4.038	5,500	19.450	1.549	8.913
200	40.000	3.188	0.668	1,800	28.125	2.236	4.213	6,000	18.750	1.493	9.375
300	38.625	3.075	0.964	1,900	27.750	2.205	4.388	6,500	18.100	1.440	9.800
400	37.250	2.963	1.244	2,000	27.375	2.175	4.563	7,000	17.488	1.391	10.200
500	36.250	2.875	1.509	2,200	26.625	2.119	4.888	7,500	16.925	1.346	10.575
600	35.250	2.800	1.761	2,400	26.000	2.068	5.200	8,000	16.388	1.304	10.925
700	34.375	2.738	2.004	2,600	25.375	2.019	5.500	8,500	15.888	1.264	11.250
800	33.500	2.675	2.236	2,800	24.800	1.974	5.788	9,000	15.413	1.226	11.550
900	32.875	2.613	2.461	3,000	24.275	1.931	6.063	9,500	14.963	1.191	11.838
1,000	32.125	2.563	2.675	3,200	23.763	1.891	6.338	10,000	14.538	1.156	12.113
1,100	31.500	2.513	2.888	3,400	23.300	1.854	6.600				

AT10-G3 Specific Tooth Sheer Strength

Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)	Rpm, n (min ⁻¹)	F _{U Spez} (N/cm)	M _{Spez} (Ncm/cm)	P _{Spez} (W/cm)
0	91.88	14.63	0.00	1,200	59.00	9.39	11.80	3,600	39.88	6.34	23.89
20	90.50	14.41	0.30	1,300	57.75	9.19	12.50	3,800	38.88	6.18	24.59
40	89.25	14.21	0.60	1,400	56.50	8.99	13.18	4,000	37.88	6.03	25.25
60	88.13	14.01	0.88	1,500	55.38	8.80	13.84	4,500	35.63	5.68	26.75
80	87.00	13.84	1.16	1,600	54.25	8.64	14.46	5,000	33.63	5.36	28.13
100	85.88	13.68	1.43	1,700	53.25	8.48	15.08	5,500	31.88	5.08	29.25
200	81.25	12.94	2.71	1,800	52.25	8.31	15.68	6,000	30.25	4.81	30.25
300	77.63	12.35	3.88	1,900	51.25	8.16	16.25	6,500	28.75	4.56	31.13
400	74.38	11.85	4.96	2,000	50.38	8.03	16.80	7,000	27.25	4.34	31.88
500	71.75	11.41	5.98	2,200	48.75	7.75	17.88	7,500	26.00	4.13	32.50
600	69.38	11.04	6.94	2,400	47.25	7.51	18.88	8,000	24.71	3.94	33.00
700	67.13	10.69	7.84	2,600	45.75	7.29	19.83	8,500	23.55	3.75	33.38
800	65.25	10.39	8.70	2,800	44.38	7.08	20.73	9,000	22.44	3.58	33.63
900	63.50	10.10	9.53	3,000	43.13	6.88	21.59	9,500	21.40	3.40	33.88
1,000	61.88	9.85	10.31	3,200	42.00	6.69	22.40	10,000	20.40	3.25	34.00
1,100	60.38	9.61	11.08	3,400	40.88	6.50	23.16				

For designs over the quoted speed, please contact our Technical Department.

Technical - Pulleys & Belts

Synchronous Drive Belt Width b

The synchronous drive belt width b in mm results from the power P to be transmitted, corrected by the overall service factor c_0 and the power rating P_R corrected by the teeth in mesh factor c_1 and the length factor c_5 . The following applies to standard belt width:

$P \cdot c_0 \leq P_R \cdot c_1 \cdot c_5$ If $P \cdot c_0 > P_R \cdot c_1 \cdot c_5$ The next larger standard width should be applied.

To obtain a synchronous drive belt width as narrow as possible, the toothed pulleys should be selected as large as possible.

This will result in a longer service life at a lower bending load.

Overall Service Factor c_0

The overall service factor c_0 takes into consideration safety factors for special operating conditions caused by loading conditions, acceleration and fatigue. It is calculated on the basis of the following factors: $c_0 = c_2 + c_3 + c_4$

An initial selection is made using the belt graphs based on P , c_0 and speed of the small pulley. This is then checked against $P_R \cdot c_1 \cdot c_2$. P_R is taken from the Power Rating Tables. Where the graph offers two possible pitches a check should be made of both.

Number of Teeth in Mesh Factor c_1

Ze: 2 = 0.2, 3 = 0.4, 4 = 0.6, 5 = 0.8, $\geq 6 = 1.0$

Acceleration Factor c_3

Ratio: 1.00-1.24 = 0, 1.25-1.74 = 0.1, 1.75-2.49 = 0.2, 2.50-3.49 = 0.3, $\geq 3.50 = 0.4$

Fatigue Factor c_4

Daily Period of Operation: 10-16 hours = +0.2, Daily period of operation 16+ hours = +0.4,

Additional Belt Deflection (e.g. by means of tensioning rolls): = +0.2, Intermittent operation = -0.2

Length Factor c_5

5M Belt Length L_B : <441 = 0.0, 441-500 = 0.9, 501-800 = 1.0, 801-1100 = 1.1, >1100 = 1.2

8M Belt Length L_B : <640 = 0.8, 640-959 = 0.9, 960-1279 = 1.0, 1280-1799 = 1.1, >1799 = 1.2

14M Belt Length L_B : <1400 = 0.8, 1400-1777 = 0.9, 1778-2099 = 0.95, 2100-2589 = 1.0, 2590-3499 = 1.05, >3499 = 1.1

Load Factor c_2

The load factor considers the type of prime mover (driver) and driven machine. Values are reference only.

Electric Motors with slow starting torque (up to 1.5 times the rated torque). Water and steam turbines, internal combustion engines with 8 and more cylinders

Electric Motors with medium starting torque (1.5 to 2.5 times the rated torque). Internal combustion engines with 4-6 cylinders

Electric Motors with high starting torque and braking torque (more than 2.5 times the rated torque). Internal combustion engines up to 4 cylinders

Conveyor Systems : Belt conveyors for light materials	1.1	1.2	1.3
Conveyor Systems : Belt conveyors for ore, coal, sand – for heavy materials : Elevators, screw conveyors	1.2	1.4	1.6
Stirrers : Mixers, liquid	1.4	1.6	1.8
Stirrers : Mixers, Semi-liquid	1.2	1.4	1.6
Machine Tools: Lathes	1.3	1.5	1.7
Machine Tools: For drilling, grinding, milling, planing	1.2	1.4	1.6
Brickworks Machinery : Milling machines	1.3	1.5	1.7
Brickworks Machinery : Loam mills	1.4	1.6	1.8
Textile Machinery : Bobbin winding and warping	1.6	1.8	2.0
Textile Machinery : Spinning, twisting and weaving	1.2	1.4	1.6
Paper Making : Agitators, calenders, drying	1.3	1.5	1.7
Paper Making : Pumps, beaters, pumps, grinders	1.2	1.4	1.6
Printing Machinery : Cutting, slitting, folding	1.4	1.6	1.8
Printing Machinery : Rotary presses	1.2	1.4	1.6
Fans / Blowers : Exhausters, radial blowers	1.3	1.5	1.7
Fans / Blowers : Pit ventilators, axial blowers	1.4	1.6	1.8
Pumps : Centrifugal and gear pumps	1.6	1.8	2.0
Pumps : Reciprocating	1.2	1.4	1.6
Generators : Generators and exciters	1.7	1.9	2.1
Elevators : Elevators and hoists	1.4	1.6	1.8
Centrifuges	1.4	1.6	1.8
Mills : Hammer mills	1.5	1.7	1.9
Mills : Ball, roller and gravel mills	1.5	1.7	1.9
Mills : Ball, roller and gravel mills	1.7	1.9	2.1

Pre-tension

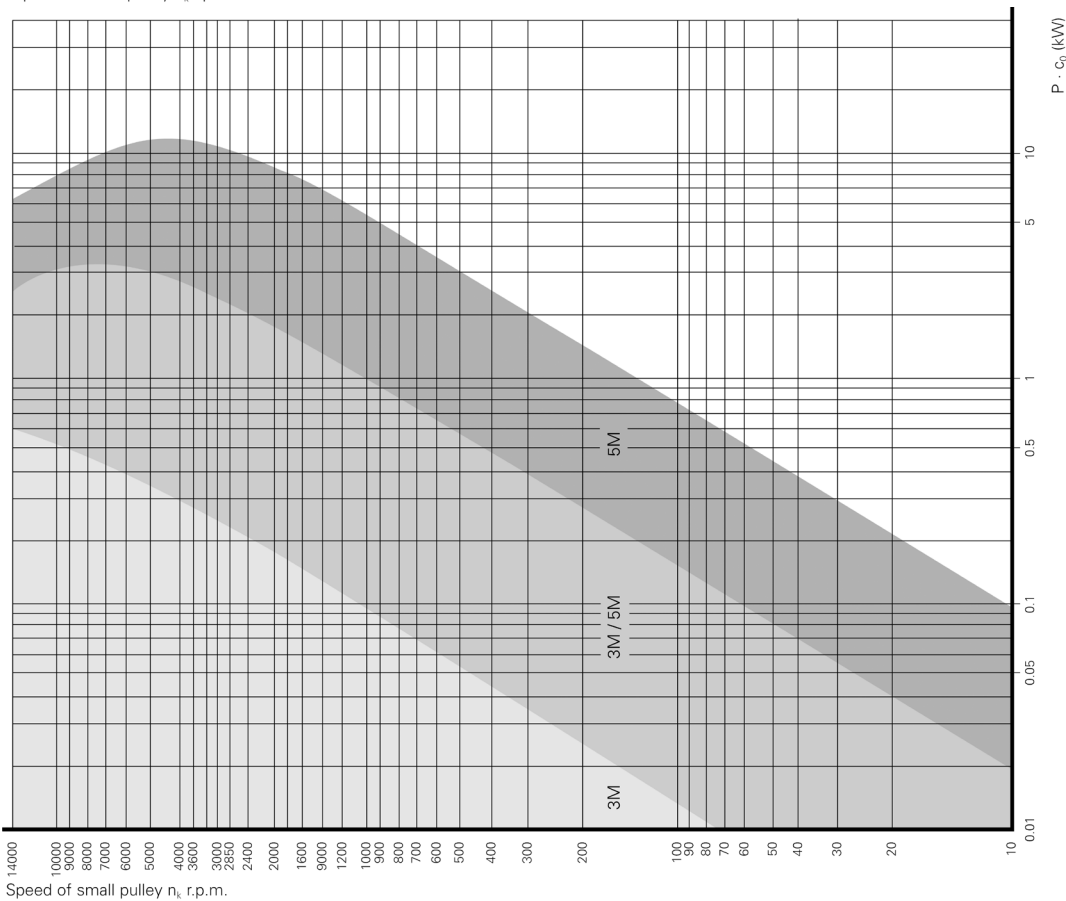
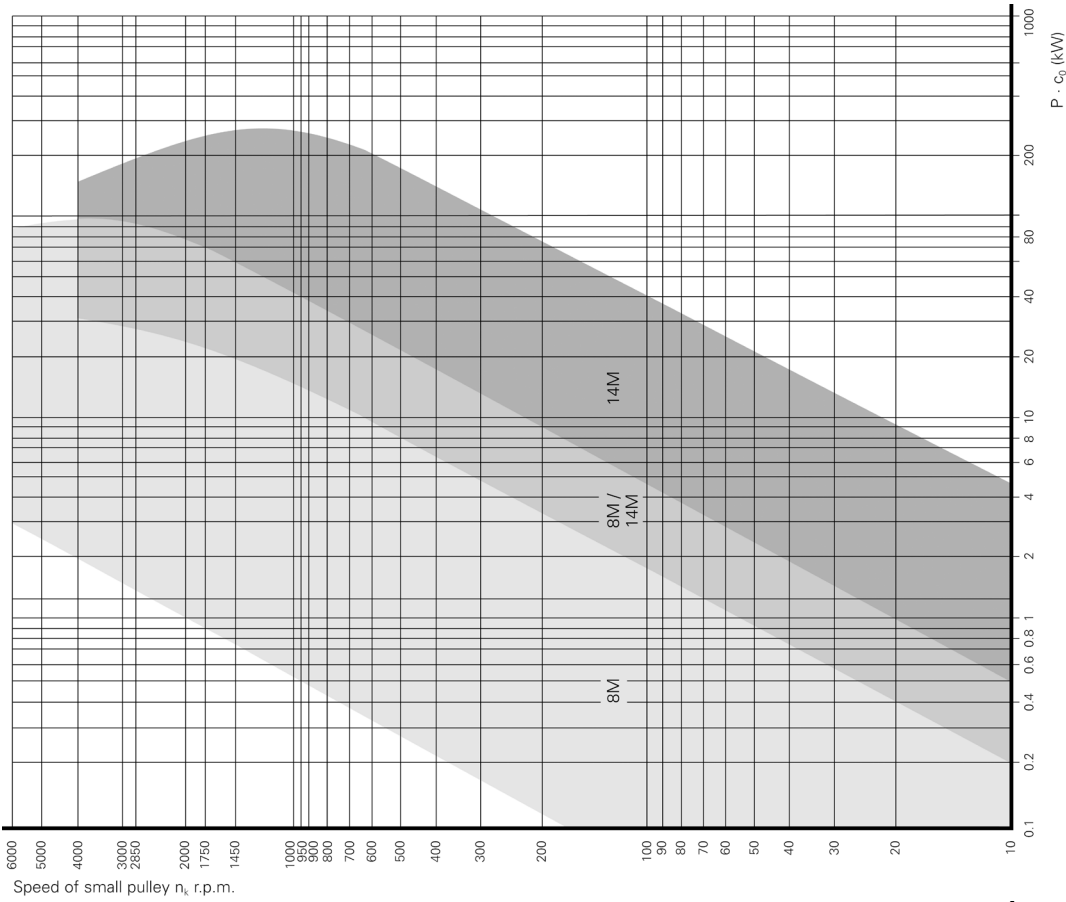
After an initial selection has been made our Technical department would be happy to advise on checking the belt tension and its correct setting.

Tension Member Tensile Loading F_{zul}

The timing belt is designed correctly when the tension member loading value is not exceeded.

Values for each belt can be found on the product page. $F_u < F_{zul}$

Precision Gears HTD Timing Belts and Pulleys



HTD Timing Belts and Pulleys

5M 25mm Belt Width

Power Rating

Speed of small toothed pulley n_1 r.p.m.	No. of teeth of small toothed pulley z_1														
	14	16	18	20	24	28	32	36	40	44	48	56	64	72	80
	Pitch ϕ d_w (mm)														
20	0.015	0.018	0.021	0.023	0.030	0.036	0.043	0.051	0.058	0.067	0.076	0.091	0.104	0.117	0.130
40	0.030	0.036	0.041	0.047	0.059	0.072	0.086	0.101	0.117	0.134	0.151	0.182	0.207	0.233	0.259
60	0.046	0.054	0.062	0.070	0.089	0.108	0.129	0.152	0.175	0.201	0.227	0.272	0.311	0.350	0.389
100	0.076	0.089	0.103	0.117	0.148	0.180	0.215	0.253	0.292	0.334	0.379	0.454	0.519	0.584	0.648
200	0.152	0.179	0.206	0.235	0.296	0.361	0.431	0.506	0.585	0.669	0.757	0.908	1.037	1.167	1.297
300	0.208	0.243	0.280	0.319	0.400	0.488	0.581	0.679	0.784	0.893	1.009	1.207	1.379	1.551	1.724
400	0.259	0.303	0.349	0.396	0.497	0.604	0.717	0.837	0.964	1.097	1.236	1.477	1.688	1.898	2.109
500	0.307	0.359	0.413	0.469	0.587	0.712	0.845	0.985	1.132	1.287	1.448	1.727	1.973	2.220	2.466
600	0.353	0.413	0.474	0.538	0.673	0.815	0.966	1.125	1.291	1.465	1.647	1.962	2.242	2.522	2.801
700	0.397	0.464	0.533	0.605	0.765	0.814	1.082	1.258	1.443	1.636	1.836	2.186	2.497	2.808	3.118
800	0.440	0.514	0.590	0.669	0.834	1.009	1.193	1.386	1.588	1.799	2.017	2.400	2.741	3.082	3.422
900	0.481	0.562	0.645	0.731	0.911	1.101	1.301	1.510	1.729	1.956	2.192	2.605	2.975	3.345	3.713
950	0.502	0.585	0.672	0.761	0.948	1.146	1.353	1.571	1.797	2.033	2.277	2.705	3.089	3.472	3.864
1000	0.522	0.609	0.699	0.791	0.985	1.190	1.405	1.630	1.865	2.108	2.360	2.804	3.201	3.598	3.993
1200	0.600	0.699	0.802	0.908	1.129	1.362	1.606	1.860	2.125	2.399	2.682	3.182	3.631	4.078	4.523
1400	0.675	0.786	0.901	1.020	1.267	1.526	1.797	2.079	2.372	2.675	2.987	3.539	4.036	4.530	5.020
1450	0.693	0.808	0.926	1.047	1.300	1.566	1.844	2.133	2.432	2.742	3.061	3.625	4.134	4.639	5.140
1600	0.747	0.870	0.997	1.128	1.399	1.684	1.981	2.289	2.609	2.938	3.277	3.878	4.419	4.956	5.487
1800	0.818	0.952	1.090	1.232	1.527	1.836	2.157	2.491	2.836	3.190	3.554	4.200	4.783	5.358	5.925
2000	0.886	1.031	1.180	1.334	1.651	1.983	2.328	2.686	3.054	3.433	3.820	4.508	5.128	5.738	6.337
2400	1.018	1.184	1.354	1.529	1.890	2.265	2.655	3.056	3.469	3.831	4.321	5.083	5.768	6.435	7.084
2850	1.161	1.348	1.541	1.738	2.144	2.665	3.000	3.447	3.903	4.367	4.838	5.670	6.411	7.123	7.803
3200	1.267	1.471	1.680	1.894	2.333	2.787	3.255	3.733	4.219	4.712	5.210	6.085	6.855	7.586	8.272
3600	1.385	1.607	1.834	2.066	2.541	3.030	3.531	4.042	4.559	5.080	5.603	6.515	7.304	8.038	8.707
4000	1.500	1.739	1.983	2.231	2.740	3.262	3.794	4.333	4.876	5.420	5.962	6.896	7.688	8.403	9.030
5000	1.773	2.052	2.335	2.622	3.205	3.796	4.390	4.983	5.570	6.147	6.710	7.634	8.347	8.908	9.300
6000	2.029	2.343	2.660	2.980	3.624	4.267	4.902	5.522	6.122	6.694	7.233	8.039	8.534	8.769	8.710
7000	2.269	2.615	2.962	3.309	3.999	4.675	5.327	5.946	6.522	7.047	7.511	8.075	8.192		
8000	2.496	2.868	3.240	3.608	4.329	5.018	5.661	6.246	6.759	7.188	7.521	7.701			
10000	2.908	3.321	3.725	4.115	4.847	5.493	6.030	6.435	6.685	6.757	6.630				
12000	3.265	3.699	4.111	4.495	5.161	5.659	5.953	6.004	5.775						
14000	3.566	3.999	4.391	4.734	5.245	5.474	5.363								

8M 20mm Belt Width

Speed of small toothed pulley n_1 r.p.m.	No. of teeth of small toothed pulley z_1																
	22	24	26	28	30	32	34	36	38	40	44	48	52	56	64	72	80
	Pitch ϕ d_w (mm)																
10	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.09	0.10	0.11
20	0.03	0.04	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.17	0.19	0.21
50	0.08	0.09	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.31	0.33	0.36	0.38	0.43	0.48	0.53
100	0.16	0.18	0.22	0.27	0.31	0.36	0.41	0.47	0.52	0.56	0.62	0.67	0.72	0.77	0.87	0.96	1.06
200	0.33	0.37	0.45	0.53	0.62	0.72	0.82	0.93	1.05	1.13	1.24	1.34	1.44	1.54	1.73	1.93	2.12
300	0.49	0.53	0.65	0.77	0.90	1.04	1.19	1.34	1.51	1.64	1.78	1.93	2.07	2.22	2.50	2.77	3.05
400	0.65	0.71	0.84	0.99	1.16	1.34	1.54	1.74	1.96	2.12	2.31	2.50	2.68	2.87	3.23	3.59	3.94
500	0.81	0.89	1.02	1.22	1.42	1.64	1.88	2.13	2.39	2.59	2.82	3.05	3.27	3.50	3.94	4.37	4.80
600	0.98	1.07	1.21	1.43	1.67	1.93	2.21	2.51	2.82	3.05	3.32	3.59	3.85	4.11	4.63	5.13	5.63
700	1.14	1.24	1.38	1.64	1.92	2.22	2.54	2.88	3.23	3.50	3.81	4.11	4.41	4.71	5.30	5.88	6.44
800	1.30	1.42	1.56	1.85	2.17	2.50	2.86	3.24	3.64	3.94	4.29	4.63	4.97	5.30	5.96	6.60	7.23
950	1.55	1.69	1.83	2.16	2.52	2.91	3.33	3.77	4.24	4.59	4.99	5.38	5.78	6.16	6.92	7.66	8.38
1000	1.63	1.77	1.93	2.26	2.64	3.05	3.49	3.95	4.44	4.80	5.22	5.63	6.04	6.44	7.23	8.00	8.76
1200	1.95	2.13	2.31	2.65	3.10	3.58	4.09	4.64	5.21	5.63	6.12	6.60	7.08	7.54	8.46	9.34	10.20
1450	2.35	2.57	2.79	3.14	3.66	4.23	4.83	5.47	6.15	6.64	7.21	7.78	8.33	8.87	9.92	10.93	11.90
1600	2.60	2.83	3.07	3.42	3.99	4.61	5.27	5.96	6.69	7.23	7.85	8.46	9.05	9.63	10.76	11.83	12.86
1800	2.92	3.18	3.45	3.79	4.42	5.11	5.83	6.60	7.41	8.00	8.68	9.34	9.99	10.62	11.83	12.99	14.07
2000	3.24	3.53	3.83	4.19	4.84	5.59	6.38	7.22	8.11	8.76	9.49	10.20	10.89	11.57	12.86	14.07	15.20
2200	3.56	3.87	4.20	4.59	5.26	6.06	6.92	7.83	8.73	9.49	10.27	11.03	11.77	12.48	13.84	15.09	16.25
2500	4.03	4.39	4.76	5.20	5.86	6.75	7.71	8.71	9.78	10.55	11.40	12.23	13.02	13.78	15.20	16.49	17.63
2850	4.58	4.98	5.40	5.89	6.53	7.53	8.59	9.71	10.88	11.74	12.66	13.54	14.38	15.18	16.64	17.90	18.97
3000	4.81	5.23	5.67	6.19	6.81	7.85	8.95	10.12	11.34	12.23	13.17	14.07	14.93	15.74	17.19	18.43	19.44
3500	5.58	6.06	6.56	7.15	7.76	8.88	10.12	11.43	12.80	13.78	14.79	15.74	16.61	17.42	18.79	19.84	20.53
4000	6.34	6.87	7.42	8.09	8.76	9.84	11.20	12.64	14.15	15.20	16.25	17.19	18.05	18.79	19.96	20.65	
4500	7.07	7.66	8.26	8.98	9.71	10.73	12.20	13.75	15.37	16.49	17.53	18.43	19.21	19.84	20.65		
5000	7.79	8.42	9.07	9.84	10.62	11.53	13.10	14.75	16.47	17.63	18.62	19.44	20.08	20.53			
5500	8.49	9.16	9.84	10.65	11.47	12.28	13.90	15.63	17.43	18.62	19.51	20.18	20.62				
6000	9.16	9.86	10.57	11.42	12.26	13.09	14.60	16.39	18.25	19.44	20.18	20.65					

Technical - Pulleys & Belts

HTD Timing Belts and Pulleys

8M 30mm Belt Width

Power Rating

Speed of small toothed pulley n_k r.p.m.	No. of teeth of small toothed pulley z_k																
	22	24	26	28	30	32	34	36	38	40	44	48	52	56	64	72	80
	Pitch ϕd_w (mm)																
10	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.10	0.11	0.11	0.12	0.14	0.15	0.17
20	0.05	0.06	0.07	0.08	0.10	0.11	0.13	0.15	0.17	0.18	0.19	0.21	0.23	0.24	0.27	0.30	0.33
50	0.13	0.15	0.18	0.21	0.24	0.28	0.32	0.37	0.41	0.44	0.49	0.53	0.57	0.61	0.68	0.76	0.84
100	0.26	0.29	0.35	0.42	0.49	0.57	0.65	0.73	0.83	0.83	0.97	1.05	1.13	1.21	1.37	1.52	1.67
200	0.51	0.58	0.70	0.84	0.98	1.13	1.25	1.47	1.65	1.78	1.95	2.11	2.27	2.42	2.73	3.04	3.34
300	0.77	0.84	1.02	1.21	1.41	1.63	1.87	2.12	2.38	2.58	2.81	3.04	3.27	3.49	3.94	4.38	4.81
400	1.03	1.12	1.32	1.57	1.83	2.12	2.42	2.75	3.09	3.34	3.64	3.94	4.23	4.52	5.09	5.66	6.21
500	1.28	1.40	1.61	1.92	2.24	2.59	2.96	3.35	3.78	4.08	4.45	4.81	5.16	5.52	6.21	6.90	7.57
600	1.54	1.68	1.90	2.26	2.64	3.05	3.49	3.95	4.44	4.81	5.24	5.66	6.07	6.49	7.30	8.10	8.88
700	1.80	1.96	2.18	2.59	3.03	3.50	4.00	4.54	5.10	5.52	6.00	6.49	6.96	7.43	8.36	9.27	10.17
800	2.05	2.24	2.46	2.92	3.42	3.95	4.51	5.11	5.74	6.21	6.76	7.30	7.83	8.36	9.40	10.42	11.41
950	2.44	2.66	2.89	3.40	3.98	4.60	5.25	5.95	6.69	7.23	7.87	8.49	9.11	9.72	10.92	12.09	13.23
1000	2.57	2.80	3.04	3.56	4.17	4.81	5.50	6.23	7.00	7.57	8.23	8.88	9.53	10.17	11.41	12.63	13.82
1200	3.08	3.36	3.64	4.19	4.90	5.65	6.45	7.31	8.22	8.88	9.66	10.42	11.17	11.90	13.35	14.75	16.10
1450	3.71	4.05	4.40	4.95	5.78	6.67	7.62	8.63	9.70	10.48	11.38	12.27	13.14	13.99	16.66	17.26	18.80
1600	4.09	4.46	4.85	5.39	6.30	7.27	8.31	9.40	10.56	11.41	12.39	13.35	14.28	15.20	16.99	18.69	20.33
1800	4.60	5.01	5.44	5.98	6.98	8.06	9.20	10.41	11.69	12.63	13.70	14.75	15.77	16.77	18.69	20.53	22.26
2000	5.11	5.56	6.04	6.60	7.65	8.82	10.07	11.40	12.79	13.82	14.98	16.10	17.20	18.27	20.33	22.26	24.06
2200	5.61	6.11	6.63	7.25	8.30	9.57	10.92	12.36	13.87	14.98	16.22	17.42	18.59	19.72	21.88	23.89	25.73
2500	6.36	6.92	7.51	8.21	9.25	10.66	12.17	13.76	15.44	16.66	18.01	19.32	20.58	21.79	24.06	26.13	27.97
2850	7.23	7.86	8.52	9.31	10.31	11.89	13.56	15.33	17.19	18.54	20.00	21.41	22.74	24.02	26.36	28.42	30.16
3000	7.59	8.26	8.95	9.77	10.76	12.40	14.14	15.98	17.92	19.32	20.82	22.26	23.62	24.91	27.26	29.28	30.94
3500	8.81	9.57	10.36	11.30	12.26	14.03	15.99	18.06	20.24	21.79	23.40	24.91	26.32	27.62	29.87	31.62	32.83
4000	10.01	10.86	11.73	12.78	13.85	15.56	17.72	19.99	22.38	24.06	25.73	27.26	28.65	29.87	31.83	33.07	
4500	11.17	12.11	13.06	14.21	15.37	16.98	19.31	21.77	24.34	26.13	27.80	29.28	30.56	31.62	33.07		
5000	12.31	13.32	14.34	15.58	16.82	18.27	20.76	23.38	26.12	27.97	29.58	30.94	32.03	32.83			
5500	13.42	14.49	15.57	16.88	18.18	19.48	22.06	24.81	27.68	29.58	31.06	32.21	33.01				
6000	14.49	15.61	16.74	18.10	19.46	20.79	23.21	26.06	29.03	30.94	32.21	33.07					

8M 50mm Belt Width

Speed of small toothed pulley n_k r.p.m.	No. of teeth of small toothed pulley z_k																
	22	24	26	28	30	32	34	36	38	40	44	48	52	56	64	72	80
	Pitch ϕd_w (mm)																
10	0.04	0.05	0.06	0.07	0.08	0.10	0.11	0.13	0.14	0.15	0.17	0.18	0.20	0.21	0.24	0.26	0.29
20	0.09	0.11	0.12	0.14	0.17	0.20	0.22	0.25	0.29	0.31	0.34	0.37	0.39	0.42	0.47	0.53	0.58
50	0.22	0.25	0.30	0.36	0.42	0.49	0.56	0.64	0.72	0.77	0.84	0.91	0.98	1.05	1.18	1.32	1.45
100	0.45	0.50	0.61	0.72	0.85	0.98	1.12	1.27	1.43	1.54	1.69	1.83	1.96	2.10	2.37	2.63	2.90
200	0.89	1.01	1.22	1.45	1.70	1.96	2.24	2.54	2.86	3.08	3.38	3.65	3.93	4.20	4.74	5.27	5.79
300	1.34	1.46	1.76	2.09	2.45	2.83	3.24	3.67	4.13	4.47	4.87	5.27	5.66	6.05	6.82	7.58	8.33
400	1.78	1.94	2.29	2.71	3.18	3.67	4.20	4.76	5.35	5.79	6.31	6.82	7.33	7.83	8.82	9.80	10.76
500	2.22	2.43	2.80	3.32	3.88	4.49	5.13	5.81	6.84	7.07	7.70	8.33	8.94	9.55	10.76	11.94	13.11
600	2.67	2.91	3.29	3.91	4.57	5.28	6.04	6.85	7.70	8.33	9.07	9.80	10.52	11.24	12.64	14.03	15.39
700	3.11	3.40	3.78	4.49	5.25	6.07	6.93	7.86	8.83	9.55	10.40	11.24	12.06	12.88	14.49	16.06	17.61
800	3.56	3.88	4.26	5.06	5.92	6.83	7.81	8.85	9.95	10.76	11.71	12.64	13.57	14.49	16.28	18.05	19.77
950	4.22	4.61	5.00	5.90	6.89	7.96	9.10	10.31	11.58	12.53	13.63	14.71	15.78	16.84	18.91	20.94	22.92
1000	4.44	4.85	5.26	6.17	7.21	8.33	9.52	10.79	12.12	13.11	14.26	15.39	16.51	17.61	19.77	21.88	23.94
1200	5.33	5.81	6.31	7.25	8.48	9.79	11.19	12.67	14.23	15.39	16.73	18.05	19.34	20.62	23.13	25.55	27.91
1450	6.43	7.01	7.61	8.57	10.01	11.56	13.21	14.95	16.80	18.16	19.72	21.26	22.76	24.25	27.13	29.92	32.60
1600	7.09	7.73	8.39	9.34	10.92	12.60	14.39	16.29	18.30	19.77	21.47	23.13	24.75	26.35	29.45	32.42	35.26
1800	7.97	8.69	9.43	10.35	12.09	13.96	15.94	18.04	20.26	21.88	23.74	25.55	27.33	29.07	32.42	35.60	38.63
2000	8.85	9.64	10.46	11.44	13.25	15.28	17.45	19.75	22.17	23.94	25.95	27.91	29.82	31.69	35.26	38.63	41.78
2200	9.72	10.58	11.48	12.56	14.37	16.58	18.93	21.41	24.04	25.95	28.11	30.20	32.23	34.21	37.97	41.47	44.71
2500	11.02	11.99	13.01	14.22	16.02	18.48	21.08	23.85	26.76	28.87	31.22	33.50	35.69	37.80	41.78	45.40	48.66
2850	12.52	13.62	14.76	16.13	17.88	20.61	23.51	26.57	29.81	32.14	34.69	37.14	39.48	41.70	45.81	49.44	52.54
3000	13.16	14.32	15.51	16.94	18.65	21.50	24.51	27.71	31.07	33.50	36.12	38.63	41.01	43.27	47.40	50.97	53.94
3500	15.27	16.60	17.96	19.60	21.26	24.34	27.74	31.33	35.11	37.80	40.62	43.27	45.75	48.04	52.03	55.19	57.43
4000	17.34	18.83	20.35	22.17	24.02	27.00	30.75	34.70	38.85	41.78	44.71	47.40	49.85	52.03	55.57	57.89	
4500	19.38	21.00	22.66	24.66	26.68	29.48	33.54	37.81	42.29	45.40	48.35	50.97	53.26	55.19	57.89		
5000	21.36	23.11	24.90	27.05	29.21	31.75	36.08	40.64	45.41	48.66	51.51	53.94	55.93	57.43			
5500	23.29	25.15	27.05	29.32	31.60	33.88	38.38	43.17	48.18	51.51	54.16	55.27	57.79				
6000	25.15	27.12	29.10	31.48	33.85	36.20	40.41	45.39	50.58	53.94	56.27	57.89					

Technical - Pulleys & Belts

HTD Timing Belts and Pulleys

8M 85mm Belt Width

Power Rating

Speed of small toothed pulley n_s (min ⁻¹)	No. of teeth of small toothed pulley z_s														
	32	34	36	38	40	44	48	52	56	60	64	68	72	76	80
	Pitch ϕd_w (mm)														
10	0.17	0.20	0.22	0.25	0.27	0.29	0.32	0.34	0.37	0.39	0.41	0.44	0.46	0.48	0.50
20	0.34	0.39	0.44	0.50	0.54	0.59	0.64	0.68	0.73	0.78	0.82	0.87	0.92	0.96	1.01
50	0.85	0.98	1.11	1.24	1.34	1.47	1.59	1.71	1.83	1.94	2.06	2.18	2.29	2.40	2.52
100	1.70	1.95	2.21	2.49	2.68	2.94	3.18	3.42	3.65	3.89	4.12	4.35	4.58	4.81	5.04
200	3.41	3.90	4.42	4.98	5.36	5.87	6.35	6.83	7.30	7.77	8.24	8.70	9.16	9.62	10.07
300	4.93	5.63	6.39	7.18	7.77	8.47	9.16	9.85	10.52	11.20	11.86	12.53	13.18	13.84	14.49
400	6.39	7.30	8.28	9.31	10.07	10.97	11.86	12.75	13.62	14.43	15.35	16.20	17.04	17.88	18.72
500	7.80	8.93	10.12	11.37	12.31	13.40	14.49	15.56	16.62	17.67	18.72	19.75	20.78	21.79	22.80
600	9.19	10.51	11.91	13.39	14.49	15.77	17.04	18.30	19.54	20.78	22.00	23.21	24.41	25.59	26.77
700	10.55	12.06	13.67	15.36	16.62	18.09	19.54	20.98	22.40	23.81	25.20	26.58	27.94	29.30	30.64
800	11.89	13.59	15.39	17.30	18.72	20.37	22.00	23.61	25.20	26.77	28.33	29.87	31.40	32.91	34.40
950	13.85	15.83	17.93	20.15	21.79	23.71	26.59	27.46	29.30	31.11	32.91	34.68	36.43	38.17	39.88
1000	14.49	16.57	18.76	21.09	22.80	24.80	26.77	28.72	30.64	32.53	34.40	36.25	38.08	39.88	41.66
1200	17.03	19.46	22.04	24.76	26.77	29.10	31.40	33.66	35.88	38.08	40.24	42.37	44.47	46.54	48.58
1450	20.11	22.98	26.02	29.22	31.69	34.31	36.98	39.61	42.19	44.73	47.22	49.67	52.07	54.43	56.74
1600	21.92	25.04	28.34	31.83	34.40	37.35	40.24	43.07	45.88	48.58	51.25	53.87	56.43	58.94	61.39
1800	24.28	27.73	31.38	35.24	38.08	41.31	44.47	47.56	50.59	53.54	56.43	59.25	61.99	64.67	67.27
2000	26.59	30.36	34.36	38.57	41.66	45.16	48.58	51.91	55.15	58.31	61.39	64.37	67.27	70.07	72.78
2200	28.85	32.94	37.26	41.83	45.16	48.91	52.56	56.11	59.55	62.89	66.12	69.24	72.25	75.14	77.92
2500	32.15	36.69	41.50	46.57	50.25	54.35	58.31	62.14	65.83	69.38	72.78	76.04	79.14	82.08	84.85
2850	35.87	40.91	46.25	51.88	55.95	60.40	64.67	68.75	72.65	76.35	79.86	83.15	86.23	89.08	91.70
3000	37.41	42.67	48.23	54.09	58.31	62.89	67.27	71.44	75.40	79.14	82.64	85.91	88.94	91.70	94.20
3500	42.38	48.30	54.55	61.13	65.83	70.76	75.40	79.74	83.76	87.46	90.81	93.81	96.43	98.66	100.49
4000	47.03	53.56	60.44	67.68	72.78	77.92	82.64	86.95	90.81	94.20	97.11	99.49	101.34		
4500	51.36	58.43	65.88	73.70	79.14	84.31	88.94	92.99	96.43	99.22	101.34				
5000	55.34	62.90	70.85	79.17	84.85	89.89	94.20	97.75	100.49	102.36					
5500	59.08	66.94	75.31	84.05	89.89	94.59	98.37	101.14							
6000	63.15	70.53	79.23	88.30	94.20	98.37	101.34								

14M 40mm Belt Width

Speed of small toothed pulley n_s r.p.m.	No. of teeth of small toothed pulley z_s															
	28	29	30	32	34	36	38	40	42	44	46	48	52	56	64	80
	Pitch ϕd_w (mm)															
10	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.7
20	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0	1.0	1.2	1.3
40	0.7	0.8	0.8	1.0	1.1	1.2	1.4	1.4	1.5	1.6	1.7	1.8	1.9	2.1	2.4	3.0
60	1.1	1.2	1.3	1.5	1.7	1.9	2.0	2.2	2.3	2.4	2.5	2.7	2.9	3.1	3.6	4.5
100	1.8	1.9	2.1	2.4	2.8	3.1	3.4	3.6	3.8	4.0	4.2	4.4	4.9	5.2	6.0	7.5
200	3.6	3.9	4.2	4.8	5.5	6.2	6.8	7.2	7.6	8.0	8.4	8.9	9.7	10.5	12.0	15.0
300	4.9	5.3	5.7	6.6	7.5	8.5	9.2	9.7	10.3	10.8	11.4	12.0	13.1	14.2	16.5	21.3
400	6.1	6.6	7.1	8.2	9.3	10.5	11.4	12.0	12.7	13.3	14.0	14.7	16.0	17.4	20.1	25.8
500	7.2	7.8	8.4	9.6	11.0	12.3	13.3	14.1	14.8	15.6	16.4	17.2	18.7	20.2	23.3	29.6
600	8.2	8.9	9.5	11.0	12.5	14.0	15.1	15.9	16.8	17.6	18.5	19.4	21.1	22.7	26.1	32.9
700	9.1	9.9	10.6	12.2	13.8	15.6	16.8	17.7	18.6	19.5	20.5	21.4	23.2	25.0	28.5	36.7
800	10.0	10.8	11.6	13.3	15.1	17.0	18.3	19.3	20.2	21.2	22.2	23.2	25.1	27.0	30.7	38.1
950	11.2	12.1	13.0	14.9	16.9	19.0	20.4	21.4	22.5	23.5	24.6	25.7	27.7	29.7	33.5	41.0
1000	11.6	12.5	13.5	15.4	17.5	19.6	21.0	22.1	23.2	24.3	25.3	26.4	28.5	30.4	34.3	41.7
1200	13.0	14.1	15.1	17.3	19.5	21.8	23.4	24.5	25.6	26.8	27.9	29.0	31.1	33.1	37.0	43.8
1450	14.6	15.7	16.9	19.2	21.7	24.2	25.8	27.0	28.2	29.3	30.5	31.6	33.6	35.6	38.9	44.2
1600	15.4	16.6	17.8	20.2	22.8	25.4	27.1	28.2	29.4	30.5	31.6	32.7	34.7	36.4	39.4	43.3
1800	16.4	17.6	18.9	21.4	24.0	26.8	28.4	29.6	30.7	31.8	32.8	33.8	35.5	37.0	39.2	40.5
2000	17.2	18.5	19.8	22.4	25.1	27.9	29.5	30.6	31.6	32.6	33.5	34.4	35.8	36.9	38.1	38.0
2200	18.5	19.2	20.5	23.2	25.9	28.7	30.3	31.3	32.2	33.1	33.8	34.5	35.5	36.1	36.0	34.2
2400	20.0	20.6	21.1	23.8	26.5	29.3	30.8	31.7	32.4	33.1	33.7	34.1	34.6	34.5	32.9	
2600	21.3	21.9	22.5	24.2	26.9	29.6	31.0	31.7	32.3	32.7	33.0	33.2	33.1	32.2	29.2	
2850	22.9	23.6	24.1	25.3	27.1	29.7	30.8	31.2	31.5	31.6	31.6	31.4	30.5	29.9		
3000	23.8	24.5	25.0	26.2	27.2	29.5	30.5	30.7	30.8	30.6	30.5	30.6	30.2	29.1		
3500	26.5	27.1	27.6	28.6	29.3	29.9	30.3	30.5	30.5	30.3	29.8	29.1				
4000	28.6	29.0	29.4	30.1	30.4	30.6	30.4	29.9	29.1							

Technical - Pulleys & Belts

ondrives

Precision Gears

HTD Timing Belts and Pulleys

14M 55mm Belt Width

Power Rating

Speed of small toothed pulley n_k r.p.m.	No. of teeth of small toothed pulley z_k																
	28	29	30	32	34	36	38	40	42	44	46	48	52	56	64	72	80
	Pitch ϕd_w (mm)																
10	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.1
20	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.6	1.8	2.0	2.2
40	1.1	1.2	1.3	1.4	1.6	1.9	2.0	2.1	2.3	2.4	2.5	2.6	2.9	3.1	3.6	4.0	4.5
60	1.6	1.7	1.9	2.2	2.5	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.3	4.7	5.4	6.0	6.7
100	2.7	2.9	3.1	3.6	4.1	4.7	5.0	5.3	5.7	6.0	6.3	6.6	7.2	7.8	8.9	10.1	11.2
200	5.4	5.8	6.3	7.2	8.2	9.3	10.1	10.7	11.3	11.9	12.6	13.2	14.5	15.7	17.9	20.1	22.3
300	7.3	7.9	8.6	9.9	11.2	12.7	13.7	14.5	15.3	16.2	17.0	17.9	19.5	21.2	24.6	28.1	31.8
400	9.1	9.9	10.6	12.2	13.9	15.7	16.9	17.9	18.9	19.9	20.9	22.0	24.0	25.9	30.0	34.2	38.4
500	10.7	11.6	12.5	14.4	16.4	18.4	19.9	21.0	22.1	23.3	24.4	25.6	27.9	30.1	34.7	39.4	44.2
600	12.2	13.2	14.2	16.4	18.6	20.9	22.5	23.8	25.1	26.3	27.6	28.9	31.4	33.9	38.9	44.0	49.1
700	13.6	14.7	15.9	18.2	20.7	23.2	25.0	26.4	27.8	29.1	30.6	31.9	34.6	37.3	42.7	48.0	53.4
800	15.0	16.2	17.4	19.9	22.6	25.4	22.3	28.8	30.2	31.7	33.2	34.7	37.5	40.4	45.9	51.5	57.1
950	16.8	18.1	19.5	22.3	25.3	28.3	30.4	32.0	33.6	35.2	36.8	38.4	41.4	44.4	50.2	56.9	61.4
1000	17.4	18.7	20.1	23.0	26.1	29.2	31.4	33.0	34.6	36.2	37.9	39.5	42.6	45.5	51.4	57.1	62.6
1200	19.5	21.0	22.6	25.8	29.1	32.6	34.9	36.6	38.4	40.1	41.8	43.4	46.6	49.6	55.4	60.8	65.9
1450	21.8	23.5	25.2	28.7	32.4	36.2	38.6	40.4	42.2	43.9	45.6	47.3	50.4	53.3	58.6	63.1	66.9
1600	23.1	24.8	26.6	30.3	34.1	38.0	40.5	42.3	44.0	45.8	47.4	49.1	52.1	54.7	59.4	63.2	65.9
1800	24.5	26.4	28.2	32.1	36.0	40.1	42.6	44.4	46.1	47.7	49.3	50.8	53.5	55.8	59.5	61.8	62.6
2000	25.8	27.7	29.6	33.6	37.6	41.8	44.3	46.0	47.6	49.1	50.5	51.9	54.1	55.9	58.1	58.6	57.0
2200	27.8	28.8	30.8	34.8	38.9	43.1	45.6	47.1	48.5	49.9	51.1	52.2	53.9	55.0	55.4	53.5	
2400	30.0	30.9	31.8	35.8	39.9	44.1	46.4	47.8	49.0	50.1	51.1	51.9	52.8	53.0	51.3		
2600	32.1	33.0	33.9	36.5	40.6	44.7	46.9	48.0	48.9	49.7	50.3	50.8	50.8	50.0	46.5		
2850	34.5	35.5	36.4	38.2	41.0	44.9	46.8	47.5	48.1	48.4	48.6	48.4	47.5	47.1			
3000	35.9	36.9	37.8	39.6	41.2	44.8	46.4	46.9	47.1	47.1	47.1	47.4	47.3	46.3			
3500	40.1	41.0	41.9	43.5	44.8	45.9	46.7	47.2	47.5	47.4	47.0	46.3					
4000	43.5	44.3	45.0	46.2	47.0	47.4	47.5	47.1	46.3								

14M 85mm Belt Width

Speed of small toothed pulley n_k r.p.m.	No. of teeth of small toothed pulley z_k																
	28	29	30	32	34	36	38	40	42	44	46	48	52	56	64	72	80
	Pitch ϕd_w (mm)																
10	0.4	0.5	0.5	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.3	1.5	1.7	1.9
20	0.9	1.0	1.0	1.2	1.4	1.5	1.7	1.8	1.9	2.0	2.1	2.2	2.4	2.6	3.0	3.3	3.7
40	1.8	1.9	2.1	2.4	2.7	3.1	3.3	3.6	3.8	4.0	4.2	4.4	4.8	5.2	5.9	6.7	7.4
60	2.7	2.9	3.1	3.6	4.1	4.6	5.0	5.3	5.6	5.5	6.3	6.6	7.2	7.8	8.9	10.0	11.1
100	4.4	4.8	5.2	6.0	6.8	7.7	8.4	8.9	9.4	9.9	10.4	11.0	12.0	13.0	14.9	16.7	18.6
200	8.9	9.6	10.4	12.0	13.7	15.5	16.7	17.7	18.8	19.8	20.9	21.9	24.0	26.0	29.7	33.4	37.1
300	12.2	13.2	14.2	16.4	18.7	21.1	22.8	24.1	25.5	26.9	28.3	29.7	32.4	35.2	40.9	46.7	52.8
400	15.1	16.4	17.6	20.3	23.1	26.1	28.1	29.7	31.4	33.1	34.7	36.4	39.8	43.1	49.8	56.7	63.8
500	17.8	19.3	20.8	23.9	27.1	30.6	33.0	34.8	36.7	38.6	40.6	42.5	46.3	50.0	57.7	65.5	73.4
600	20.3	22.0	23.7	27.2	30.9	34.7	37.4	39.5	41.6	43.7	45.9	48.0	52.2	56.3	64.7	73.1	81.7
700	22.7	24.6	26.3	30.2	34.3	38.6	41.8	43.8	46.1	48.4	50.7	53.0	57.5	62.0	70.9	79.8	88.8
800	24.8	26.8	28.9	33.1	37.5	42.2	45.3	47.8	50.2	52.7	55.1	57.6	62.4	67.0	76.4	85.7	94.9
950	27.9	30.1	32.3	37.0	41.9	47.1	52.1	53.2	56.8	58.6	61.1	63.8	68.8	73.7	83.4	93.0	102.3
1000	28.8	31.1	33.4	38.3	43.3	48.6	52.1	54.8	57.5	60.2	62.9	65.6	70.8	75.7	85.5	95.0	104.3
1200	32.4	34.9	37.5	42.8	48.4	54.2	58.0	60.9	63.8	66.6	69.4	72.3	77.6	82.6	92.3	101.5	110.0
1450	36.3	39.1	41.9	47.8	53.8	60.1	64.2	67.2	70.2	73.1	76.0	78.8	84.0	88.9	97.8	105.7	112.4
1600	38.3	41.3	44.2	50.3	56.7	63.2	67.4	70.4	73.3	76.2	79.1	81.9	86.9	91.4	99.5	106.2	111.1
1800	40.8	43.9	47.0	53.4	60.0	66.7	71.0	73.9	76.8	79.6	82.3	84.9	89.5	93.5	99.9	104.3	106.4
2000	43.0	46.1	49.3	55.9	62.7	69.7	73.9	76.7	79.4	82.0	84.5	86.9	90.8	93.9	98.2	99.7	97.9
2200	46.3	48.1	51.3	58.1	65.0	72.0	76.1	78.7	81.2	83.5	85.7	87.7	90.7	92.8	94.3	92.0	
2400	50.0	51.5	53.0	59.8	66.7	73.7	77.7	80.0	82.2	84.1	85.8	87.4	89.3	90.0	88.1		
2600	53.5	55.1	56.7	61.1	67.9	74.8	78.5	80.5	82.3	83.7	85.0	85.9	86.4	85.5	80.9		
2850	57.7	69.4	61.0	64.0	68.7	76.4	78.7	80.1	81.2	81.9	82.3	82.4	81.5	81.5			
3000	60.1	51.8	63.4	66.4	69.2	75.3	78.3	79.3	79.9	80.1	80.4	81.2	81.7	80.7			
3500	67.4	69.0	70.5	73.3	75.8	77.8	79.5	80.7	81.4								
4000	73.3	74.8	76.1	78.3	80.0	81.2	81.7	81.5	80.7								

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