

Tooth shear strength, tension member tensile strength and flexibility determine belt dimensions. See p.102.

1) 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 table:

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

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

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

b = belt width (in cm)

$F_{U\text{spez}}$ = specific peripheral force(N/cm)

M_{spez} = specific torque (Ncm/cm)

P_{spez} = specific power (W/cm)

z_1 = No. of teeth on the small pulley

z_2 = No. of teeth in 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 Brecoflex®, Synchroflex® or Breco® M

$z_{e\text{max}}$ = 6 for Breco® V timing belts

To calculate the number of teeth in mesh, z_e :

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

Specific Tooth Shear Strength Tables

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	24.40	1.973	0.000	1100	15.84	1.281	1.475	3200	12.36	0.999	3.350
20	23.80	1.922	0.040	1200	15.57	1.259	1.582	3400	12.16	0.983	3.500
40	23.20	1.879	0.079	1300	15.31	1.238	1.685	3600	11.96	0.967	3.650
60	22.80	1.842	0.116	1400	15.07	1.219	1.787	3800	11.78	0.953	3.790
80	22.40	1.809	0.152	1500	14.85	1.201	1.886	4000	11.61	0.939	3.930
100	22.00	1.780	0.186	1600	14.64	1.184	1.984	4500	11.21	0.907	4.270
200	20.60	1.667	0.349	1700	14.45	1.168	2.080	5000	10.86	0.878	4.600
300	19.63	1.587	0.498	1800	14.26	1.153	2.170	5500	10.54	0.852	4.910
400	18.86	1.525	0.639	1900	14.08	1.139	2.270	6000	10.24	0.828	5.200
500	18.23	1.474	0.772	2000	13.91	1.125	2.360	6500	9.97	0.806	5.490
600	17.70	1.431	0.899	2200	13.60	1.100	2.530	7000	9.72	0.786	5.760
700	17.24	1.394	1.022	2400	13.31	1.076	2.710	7500	9.49	0.767	6.020
800	16.83	1.361	1.140	2600	13.05	1.055	2.870	8000	9.27	0.749	6.280
900	16.47	1.332	1.255	2800	12.80	1.035	3.060	9000	8.86	0.717	6.760
1000	16.14	1.305	1.367	3000	12.57	1.017	3.190	10000	8.51	0.688	7.200

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

2) Tensile Strength of Tension Member

Allowable tensile load F_{zul} on belt cross section in Newtons

BELT WIDTH (in hundredths of an inch)	025	031	037	050	075	100	150	200
Synchroflex	-	-	-	-	-	-	-	-
Breco M	210	240	330	390	630	840	-	-
Breco V	105	120	165	195	315	420	-	-
Brecoflex	180	240	300	420	690	930	1400	1900