

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 :

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

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	24.00	1.910	0.000	1100	15.58	1.240	1.428	3200	12.16	0.967	3.241
20	23.38	1.861	0.039	1200	15.31	1.218	1.531	3400	11.96	0.951	3.338
40	22.86	1.819	0.076	1300	15.06	1.198	1.632	3600	11.77	0.936	3.530
60	22.41	1.783	0.112	1400	14.83	1.180	1.730	3800	11.59	0.922	3.670
80	22.01	1.751	0.147	1500	14.61	1.162	1.826	4000	11.42	0.909	3.807
100	21.65	1.723	0.180	1600	14.40	1.146	1.920	4500	11.03	0.878	4.136
200	20.28	1.614	0.338	1700	14.21	1.131	2.013	5000	10.68	0.850	4.450
300	19.30	1.536	0.483	1800	14.03	1.116	2.104	5500	10.36	0.825	4.750
400	18.55	1.476	0.618	1900	13.85	1.102	2.193	6000	10.07	0.802	5.037
500	17.93	1.427	0.747	2000	13.69	1.089	2.281	6500	9.81	0.780	5.312
600	17.41	1.385	0.870	2200	13.38	1.065	2.453	7000	9.56	0.761	5.577
700	16.96	1.349	0.989	2400	13.10	1.042	2.619	7500	9.33	0.742	5.831
800	16.56	1.318	1.104	2600	12.84	1.021	2.781	8000	9.11	0.725	6.076
900	16.20	1.289	1.215	2800	12.59	1.002	2.938	9000	8.72	0.694	6.540
1000	15.88	1.263	1.323	3000	12.37	0.984	3.092	10000	8.37	0.666	6.970

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 mm)	6	10	16	25	32	50	75	100
Synchroflex	180	330	570	930	1200	1920	2940	3930
Breco M	180	300	540	840	1080	1680	2250	–
Breco V	90	150	270	420	540	840	1125	–
Brecoflex	180	330	570	930	1200	1920	2940	3930