

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	35.3	2.81	0.000	1100	25.2	2.010	2.310	3200	19.01	1.513	5.070
20	34.9	2.78	0.058	1200	24.8	1.970	2.480	3400	18.64	1.483	5.280
40	34.5	2.75	0.115	1300	24.3	1.936	2.640	3600	18.28	1.454	5.480
60	34.1	2.72	0.171	1400	23.9	1.903	2.790	3800	17.93	1.427	5.680
80	33.8	2.69	0.225	1500	23.5	1.872	2.940	4000	17.61	1.401	5.870
100	33.5	2.66	0.279	1600	23.2	1.843	3.090	4500	16.86	1.342	6.320
200	32.0	2.55	0.534	1700	22.8	1.816	3.230	5000	16.18	1.288	6.740
300	30.9	2.46	0.771	1800	22.5	1.789	3.370	5500	16.56	1.239	7.130
400	29.8	2.37	0.995	1900	22.2	1.764	3.510	6000	15.56	1.194	7.500
500	29.0	2.30	1.207	2000	21.9	1.740	3.650	6500	14.48	1.152	7.840
600	28.2	2.24	1.409	2200	21.3	1.695	3.910	7000	13.99	1.113	8.160
700	27.5	2.19	1.603	2400	20.8	1.654	4.160	7500	13.54	1.077	8.460
800	26.8	2.14	1.789	2600	20.3	1.615	4.400	8000	13.11	1.043	8.740
900	26.3	2.09	1.969	2800	19.8	1.579	4.630	9000	12.33	0.981	9.240
1000	25.7	2.05	2.140	3000	19.4	1.545	4.850	10000	11.63	0.925	9.690

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	350	700	1260	2030	2660	4200	6370	8610
Breco M	–	700	1120	1820	2240	3500	4760	–
Breco V	–	350	560	910	1120	1750	2380	–
Brecoflex	–	700	1260	2030	2660	4200	6370	8610