

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	6.58	0.209	0.000	1100	4.08	0.130	0.150	3200	3.17	0.101	0.338
20	6.36	0.202	0.004	1200	4.01	0.128	0.160	3400	3.12	0.099	0.354
40	6.18	0.197	0.008	1300	3.94	0.125	0.171	3600	3.07	0.098	0.368
60	6.03	0.192	0.012	1400	3.88	0.124	0.181	3800	3.02	0.096	0.383
80	5.90	0.188	0.016	1500	3.82	0.122	0.191	4000	2.98	0.095	0.397
100	5.79	0.184	0.019	1600	3.77	0.120	0.201	5000	2.78	0.088	0.463
200	5.38	0.171	0.036	1700	3.72	0.118	0.211	6000	2.63	0.084	0.526
300	5.10	0.162	0.051	1800	3.67	0.117	0.220	7000	2.49	0.079	0.581
400	4.89	0.156	0.065	1900	3.62	0.115	0.229	8000	2.37	0.075	0.632
500	4.72	0.150	0.079	2000	3.58	0.114	0.239	9000	2.27	0.072	0.681
600	4.58	0.146	0.092	2200	3.50	0.111	0.257	10000	2.18	0.069	0.727
700	4.45	0.142	0.104	2400	3.42	0.109	0.274	12000	2.02	0.064	0.808
800	4.35	0.138	0.116	2600	3.35	0.107	0.290	15000	1.82	0.058	0.910
900	4.25	0.135	0.127	2800	3.29	0.105	0.307	18000	1.66	0.053	0.996
1000	4.16	0.132	0.139	3000	3.23	0.103	0.323	20000	1.57	0.050	1.047

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)	4	6	10	16	25	32
Synchroflex	39	65	117	195	312	403
Breco M	-	-	-	-	-	-
Breco V	-	-	-	-	-	-
Brecoflex	-	-	-	-	-	-