

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	95.50	15.199	0.000	1100	62.77	9.990	11.507	3200	43.64	6.946	23.276
20	94.10	14.976	0.314	1200	61.33	9.761	12.265	3400	42.49	6.762	24.075
40	92.79	14.767	0.619	1300	59.98	9.546	12.994	3600	41.39	6.588	24.834
60	91.55	14.571	0.915	1400	58.71	9.344	13.698	3800	40.35	6.422	25.554
80	90.39	14.385	1.205	1500	57.51	9.154	14.377	4000	39.36	6.264	26.239
100	89.28	14.210	1.488	1600	56.35	8.968	15.025	4500	37.07	5.900	27.803
200	86.76	13.449	2.817	1700	55.31	8.803	15.671	5000	35.01	5.572	29.175
300	84.51	12.835	4.032	1800	54.29	8.641	16.287	5500	33.14	5.274	30.374
400	80.64	12.312	5.157	1900	53.32	8.487	16.884	6000	31.42	5.000	31.417
500	74.54	11.863	6.211	2000	52.40	8.339	17.464	6600	29.83	4.748	32.316
600	72.05	11.467	7.205	2200	50.66	8.062	18.572	7000	28.36	4.513	33.082
700	69.83	11.114	8.147	2400	49.05	7.807	19.619	7500	26.98	4.294	33.724
800	67.83	10.796	9.043	2600	47.56	7.570	20.609	8000	25.69	4.089	34.252
900	66.00	10.505	9.900	2800	46.17	7.349	21.546	9000	23.33	3.713	34.989
1000	64.33	10.238	10.720	3000	44.87	7.141	22.434	10000	21.21	3.375	35.342

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)	16	25	32	50	75	100	150
Synchroflex	2000	3500	4750	7750	12000	16000	24500
Breco M	2000	4250	5500	8500	12750	17000	22000
Breco V	1000	2125	2250	4250	6375	8500	11000
Brecoflex	2000	3500	4750	7750	12000	16000	24500