## Safety factors

The width of a timing belt is correct when the permissible values for tooth shear strength, tension cord strength and flexibility are not exceeded under unfavourable operating conditions. In our catalog, load limits are stated which have been reliably proven and confirmed by bench tests and results obtained in practice. A safety factor is only required for drives with transmission into higher speed.

It is important, that the unfavourable load types occuring in the drive are known resp. correctly estimated by the engineer. With a positive fit transmission, even short-period overloads act via the timing belt being the drive member. Some instructions to this issue:

**Rated operation**
Design timing belts for the operating condition of the rated load. The rated load is the operating condition at which the drive should transmit the torque or the power at rated speeds under normal conditions.

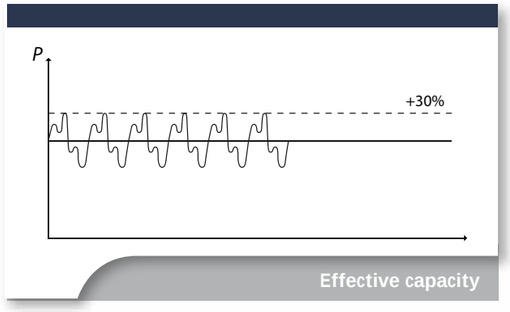
**Start-up characteristics**

a) Drive side: The max. torque of the drive machine under start-up conditions is to be taken into consideration. The start-up torque, e.g. for three-phase squirrel cage motors amounts to 2 to 2.5 times the rated value.

b) On the drive side: If necessary, „initial torques“ affective to the drive part timing belt are to be taken into consideration under start-up characteristics.

Check load case a) or b) with rotational speed n=0.

**Brakes**
It might have to be defined whether braking leads to loads which fully act via the timing belt and possibly exceed the type of load produced by the rated operation or the start-up characteristics. In the braking operation the torque reversal is to be taken into consideration.




**Unevennesses (variations, impact shocks)**
In addition to the rated load, superimposed vibration and impact shocks could act on the timing belt as the transmission member. For the illustrated example, increase the calculated belt width by the factor of 1.3.

**Moments of inertia**
Moments of inertia and/or centrifugal masses in the drives generally create a uniform running behaviour. Depending on the acceleration and deceleration characteristic it has to be differentiated and checked whether the moments of inertia create an additional load on the timing belt.

**Step-up transmission**
The following safety factors are to be applied for step-up transmissions:

| | |
|---|---|
| i = 0,66 to 1,00 | S= 1,1 |
| i = 0,40 to 0,66 | S= 1,2 |
| i < 0,40 | S= 1,3 |

In the braking operation may occur a torque reversal and the reduction can change into a step-up transmission.





**Length tolerances for BRECOFLEX® timing belts**
Stated dimensions in mm, referred to the belt length

| Belt length [mm] | Length tolerance [mm] | Belt length [mm] | Length tolerance [mm] |
|---|---|---|---|
| 300 | ± 0,41 | 3550 | ± 1,91 |
| 500 | ± 0,53 | 3750 | ± 2,03 |
| 700 | ± 0,64 | 4000 | ± 2,11 |
| 900 | ± 0,75 | 4250 | ± 2,24 |
| 1100 | ± 0,85 | 4500 | ± 2,32 |
| 1300 | ± 0,95 | 4750 | ± 2,40 |
| 1500 | ± 1,04 | 5000 | ± 2,52 |
| 1900 | ± 1,13 | 5300 | ± 2,64 |
| 2120 | ± 1,22 | 5600 | ± 2,72 |
| 2240 | ± 1,31 | 6000 | ± 2,92 |
| 2360 | ± 1,36 | 6300 | ± 3,04 |
| 2500 | ± 1,44 | 6700 | ± 3,19 |
| 2650 | ± 1,49 | 7100 | ± 3,35 |
| 2800 | ± 1,57 | 7500 | ± 3,51 |
| 3000 | ± 1,61 | 8000 | ± 3,70 |
| 3150 | ± 1,74 | 9000 | ± 4,09 |
| 3350 | ± 1,82 | | |

| **Length tolerances for BRECO® timing belts*** *except for ATL timing belts | ± 0,8 mm/m |
|---|---|

**Width tolerance for BRECO® and BRECOFLEX® timing belts M/V**

| Belt type Pitch | Tolerance | Belt type Pitch | Tolerance |
|---|---|---|---|
| T2,5 | ± 0,5 | ATS15 / SFAT15 / BAT15 / BATK15 | ± 1,0 |
| T5 / TK5 | ± 0,5 | AT20 / ATK20 / ATL20 / ATN20 / SFAT20 | ± 1,0 |
| T10 / TK10 | ± 0,5 | ATP10 | ± 0,5 |
| T20 | ± 1,0 | ATP15 | ± 1,0 |
| AT3 | ± 0,5 | XL | ± 0,5 |
| AT5 / ATK5 / ATL5 | ± 0,5 | L | ± 0,5 |
| AT10 / ATK10 / ATL10 / ATN10 / SFAT10 / BAT10 / BATK10 | ± 0,5 | H | ± 0,5 |
| ATN12,7 | ± 0,5 | XH | ± 1,0 |

# Tolerances

## CONTI SYNCHROFLEX® Timing Belts Tolerances

**Length tolerances for standard CONTI SYNCHROFLEX® Polyurethane Timing Belts**

Belt length measurement is carried out to DIN 7721, in relation to the centre distance.

| Belt length | Length tolerance in relation to centre distance |
|---|---|
| up to 320 mm | ± 0,15 mm |
| 320 – 630 mm | ± 0,18 mm |
| 630 – 1000 mm | ± 0,25 mm |
| 1000 – 1960 mm | ± 0,40 mm |
| 1960 – 3500 mm | ± 0,50 mm |
| 3500 – 4500 mm | ± 0,80 mm |
| 4500 – 6000 mm | ± 1,20 mm |

**Width tolerances for standard CONTI SYNCHROFLEX® Polyurethane Timing Belts**

| Type / group | up to 50 mm | 50 – 100 mm | over 100 mm in % der Belt width |
|---|---|---|---|
| K 1 | ± 0,3 mm | ± 0,5 mm | ± 0,5 % |
| K 1,5 | ± 0,3 mm | ± 0,5 mm | ± 0,5 % |
| T 2 | ± 0,3 mm | ± 0,5 mm | ± 0,5 % |
| M (MXL) | ± 0,3 mm | ± 0,5 mm | ± 0,5 % |
| T 2,5 | ± 0,3 mm | ± 0,5 mm | ± 0,5 % |
| T 5 | ± 0,3 mm | ± 0,5 mm | ± 0,5 % |
| T 5-DL | ± 0,3 mm | ± 0,5 mm | ± 0,5 % |
| T 10 | ± 0,5 mm | ± 0,5 mm | ± 0,5 % |
| T 10-DL | ± 0,5 mm | ± 0,5 mm | ± 0,5 % |
| T 20 | ± 1,0 mm | ± 1,0 mm | ± 1,0 % |
| T 20-DL | ± 1,0 mm | ± 1,0 mm | ± 1,0 % |
| AT 3 | ± 0,3 mm | ± 0,5 mm | ± 0,5 % |
| AT 5 | ± 0,5 mm | ± 0,5 mm | ± 0,5 % |
| AT 10 | ± 1,0 mm | ± 1,0 mm | ± 1,0 % |
| ATP 10 / ATP 15 | ± 1,0 mm | ± 1,0 mm | ± 1,0 % |
| ATP 20 | ± 1,0 mm | ± 1,0 mm | ± 1,0 % |

**Please note:**

Tolerance for special tension members upon request.