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## Introduction

ELATECH® manufactures polyurethane belts for linear motion, conveying and power transmission applications. The combination of a polyurethane body reinforced with special steel or aramid tension members, makes the belt to fulfil the most severe requirements in all industrial applications.

The unique manufacturing processes, realized with the newest generation technologies, the modern and efficient test and control equipment, allow delivering superior products with the highest flexible service.

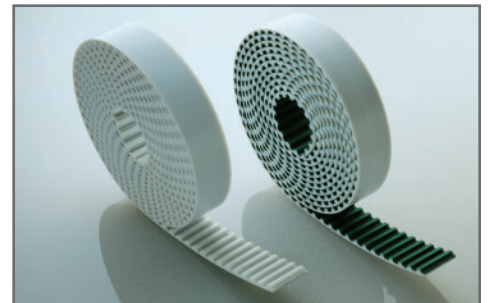
ELATECH® offers the widest range of tooth profile to enable the design engineer the use of the best drive for every application.

In addition to that, for special applications, ELATECH® studies and delivers innovative and unique solutions to even the most complex requirements.

## Product range

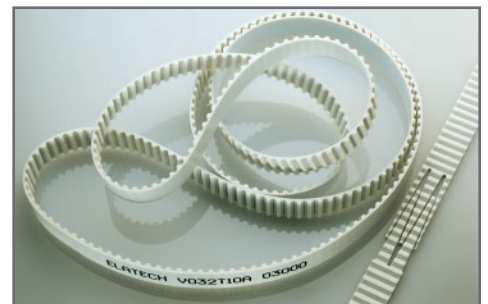
### ELATECH® M - open end

ELATECH® M belts are produced in standard roll length of 100 m and delivered to any desired length. The excellent precision and dimensional stability, the high abrasion resistance make them ideal in all linear motion applications.



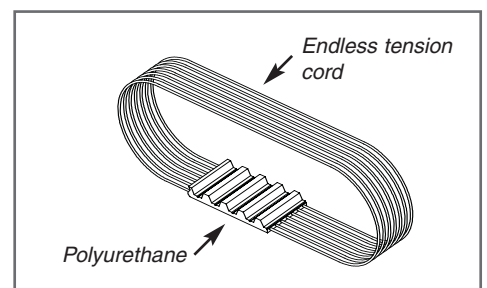
### ELATECH® V - jointed

They are jointed belts obtained from open-end belts. The special manufacturing process, allows obtaining any desired length. Due to the high flexibility and to the unique precision in positioning offered, ELATECH V belts are ideal for all conveying applications where synchronisation is needed.

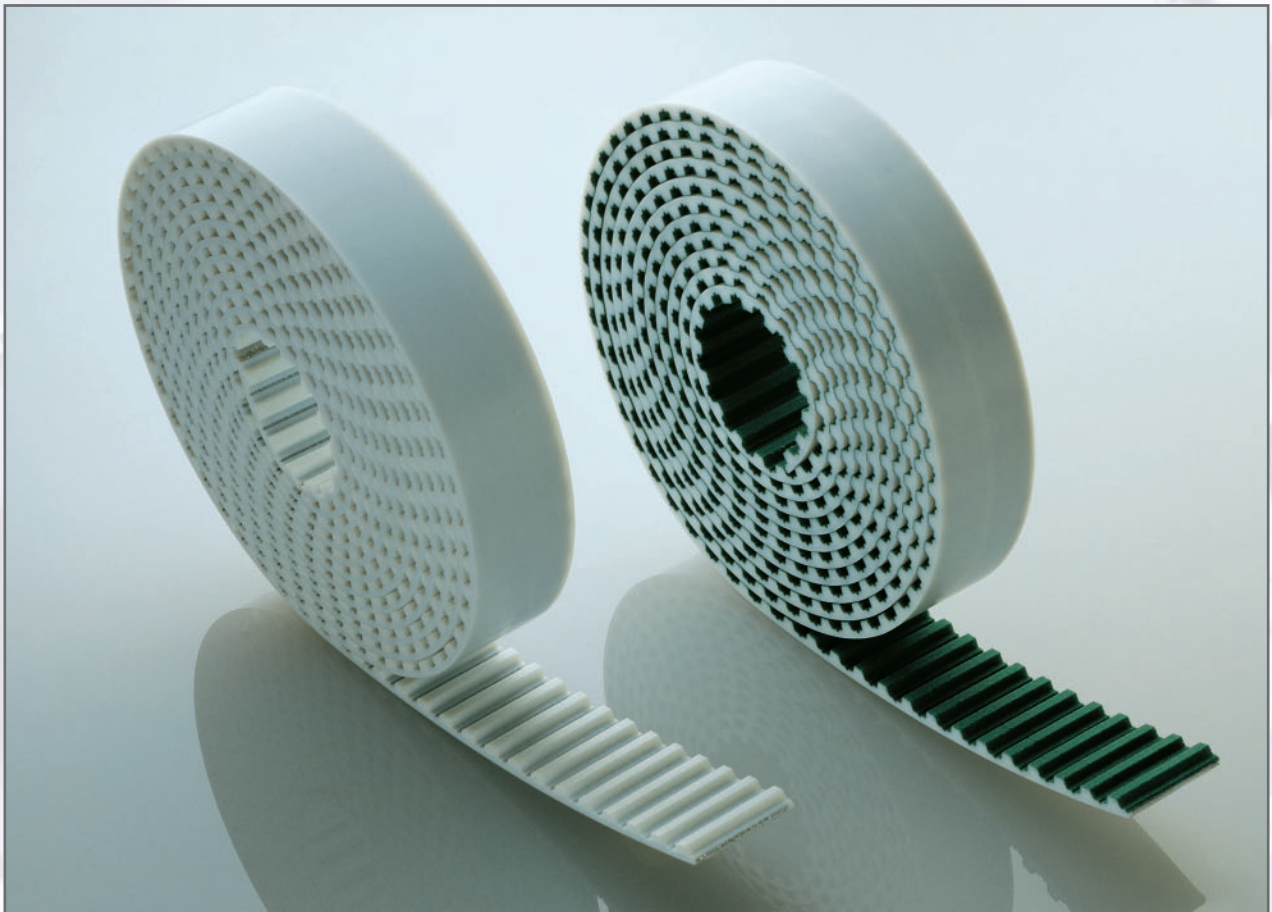


### ELA-flex SD™

ELA-flex SD™ Synchro Drive belts are manufactured with truly endless steel tension cords. Having no splice or welding, they have no weak cross section and are therefore ideal for power transmission and high load conveying applications. They are available in a wide range of profiles and pitches and in any length tooth by tooth from 1500 mm to 22000 mm.



# ELATECH® M and V

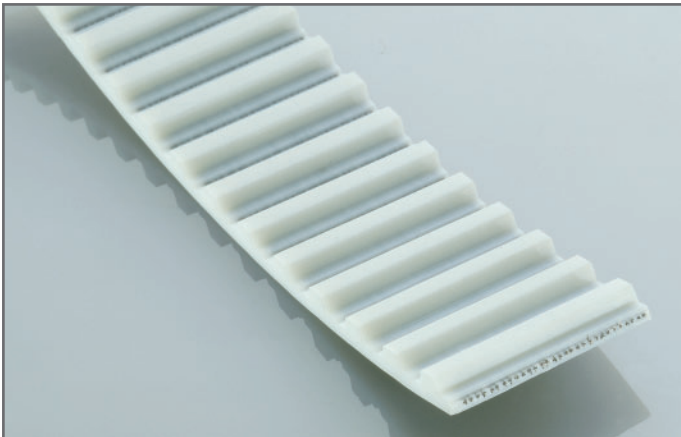




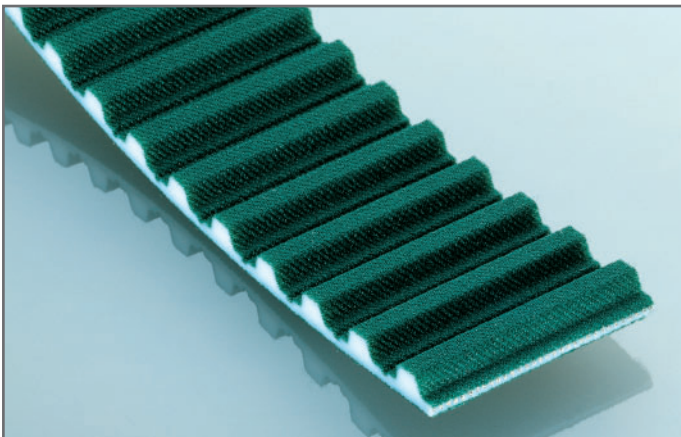
## Introduction

The timing belts manufactured by ELATECH® have been designed to comply to every need of the design engineer in linear motion, power transmission and in conveying applications where precise synchronisation is needed. ELATECH® timing belts are manufactured with the body in thermoplastic polyurethane with excellent wear resistance and with high tensile strength steel cords. A special polyamide fabric on the tooth (on request) reduces the coefficient of friction, improves the tooth engagement and reduces noise.

### Standard belt



### Belt with Polyamide fabric on teeth PAZ



## Tension Cords

In order to maximize the application of ELATECH® timing belts, construction with special cords is available on request:



- HPL high performance cords: the cord cross section is increased compared with standard. This results in a lower belt elongation and more precise positioning accuracy.
- HFE high Flexibility cords: the cord cross section is spread on a higher number of single filaments. This results in a lower bending stress and therefore in a higher resistance at reverse bending of the cords. They allow using pulleys and idlers up to 30% smaller in diameter compared to standard.
- INOX stainless steel cords are suitable for application in aggressive environments. They have lower tensile strength than standard cords.
- Aramid: increases belt flexibility and decreases belt weight.

It is to be noted that steel cords offer the best technical performances and dimensional stability of the belts.

For application with special cords ask our engineering department.

### Product certification

On request, it is possible to deliver belts according to 94/9/CE

ATEX  II2G-22D.

### Colour

ELATECH® timing belts are produced as standard in white colour. On demand it is possible to deliver belts in different colours.

### Mechanical properties:

- Excellent dimensional stability
- High abrasion resistance
- Low pretension and shaft load
- Maintenance free
- High linear and angular positioning precision
- High efficiency

### Chemical properties:

High resistance to:

- Hydrolysis
- Ozone
- UVA
- Ageing
- Oils, greases and fats
- Gasoline
- Good resistance to acids
- Working temperatures range -10°C +80°C (peaks up to 110°C)  
For very low temperature special compound material is available on request.
- Silicon free production

## Executions

### ELATECH® M

They are manufactured in rolls with standard length of 100 m. On request longer or shorter lengths are available. Main applications are linear drives.

#### Ordering example T :

25 T 10 - M- PAZ 100 m

- Fabric on tooth PAZ
- ELATECH® timing belt type "M"
- open end belt
- Pitch 10 mm
- Profile "T"
- Width 25 mm

#### Ordering example H :

100 H - M- PAR 100 m

- Fabric on back PAR
- ELATECH® timing belt type "M"
- open end belt
- Type / Profile
- Belt width (x 0,254 = mm)

#### Ordering example HTD cut to length:

50 HTD - 8M 1800 - M - PAZ-PAR 20 pcs

- Fabric on tooth and back PAZ + PAR
- ELATECH® timing belt type "M" cut to length
- Lenght 1800 mm
- Pitch 8 mm
- Profile "HTD"
- Width 50 mm

#### Ordering example H cut to length:

100 H 1000 -M- z= 200 20 pcs

- Belt number of teeth
- ELATECH® timing belt type "M"
- Belt lenght (x 2,54 = mm)
- Type / Profile
- Belt width (x 0,254 = mm)

### ELATECH® V

They are jointed belts manufactured from open-end ELATECH® belts. Thanks to the specific manufacturing process, any length may be obtained tooth by tooth with a minimum of 800 mm length. Free combinations with special backing materials and welded profiles, make ELATECH® V belts ideal in synchronized conveying and highly specialised applications.

#### Ordering example AT :

20 AT 5 / 3410 - V 10 pcs

- ELATECH® timing belt type "V" jointed
- Lenght 3410 mm
- Pitch 5 mm
- Profile "AT"
- Width 20 mm

#### Ordering example STD :

50 STD S8M 1800 - V

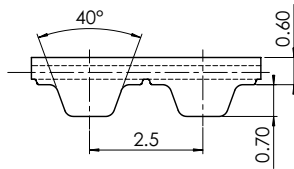
- ELATECH® timing belt type "V" jointed
- Lenght 1800 mm
- Pitch 8 mm
- Profile "STD"
- Width 50 mm

#### Ordering example XL :

150 XL/ 750 -V- z= 375 20 pcs

- Belt number of teeth
- ELATECH® timing belt type "V" jointed
- Belt lenght (x 2,54 = mm)
- Type / Pitch
- Belt width (x 0,254 = mm)

## T2,5



### Belt characteristics

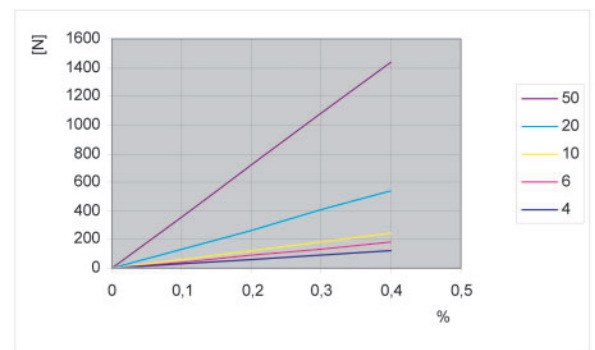
- Polyurethane timing belt with steel tension cords
- Trapezoidal tooth profile according to DIN 7721 T1
- Metric pitch 2,5 mm
- Ideal for drives where high belt flexibility is requested
- Widely used for conveying, linear drive and light power transmission applications

- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 4                       | 120                                                      | 60                                                       | 500                                           | 30000                                        | 0,004            |
| 6                       | 180                                                      | 90                                                       | 750                                           | 45000                                        | 0,007            |
| 10                      | 240                                                      | 120                                                      | 1000                                          | 60000                                        | 0,011            |
| 20                      | 540                                                      | 270                                                      | 2250                                          | 135000                                       | 0,022            |
| 50                      | 1440                                                     | 720                                                      | 6000                                          | 360000                                       | 0,055            |

### Load / Elongation [ % ]

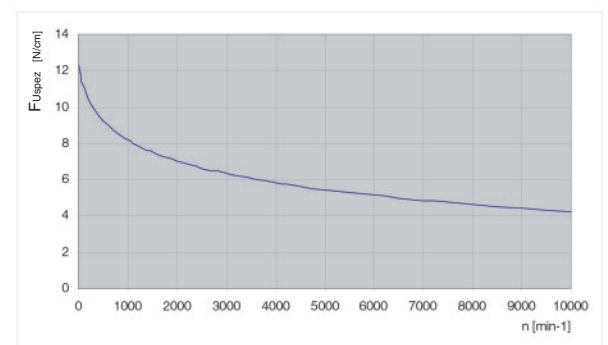


Other widths are available on request.

### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 12,35                 | 800  | 8,51                  | 1900 | 7,11                  | 4500  | 5,63                  |
| 20  | 12,04                 | 900  | 8,33                  | 2000 | 7,02                  | 5000  | 5,44                  |
| 40  | 11,77                 | 1000 | 8,16                  | 2200 | 6,86                  | 5500  | 5,28                  |
| 60  | 11,53                 | 1100 | 8,01                  | 2400 | 6,71                  | 6000  | 5,12                  |
| 80  | 11,32                 | 1200 | 7,87                  | 2600 | 6,57                  | 6500  | 4,98                  |
| 100 | 11,14                 | 1300 | 7,74                  | 2800 | 6,45                  | 7000  | 4,85                  |
| 200 | 10,45                 | 1400 | 7,61                  | 3000 | 6,33                  | 7500  | 4,73                  |
| 300 | 9,95                  | 1440 | 7,57                  | 3200 | 6,22                  | 8000  | 4,62                  |
| 400 | 9,55                  | 1500 | 7,50                  | 3400 | 6,11                  | 8500  | 4,51                  |
| 500 | 9,23                  | 1600 | 7,39                  | 3600 | 6,02                  | 9000  | 4,41                  |
| 600 | 8,96                  | 1700 | 7,29                  | 3800 | 5,92                  | 9500  | 4,31                  |
| 700 | 8,72                  | 1800 | 7,20                  | 4000 | 5,83                  | 10000 | 4,22                  |

### Tooth shear strength / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

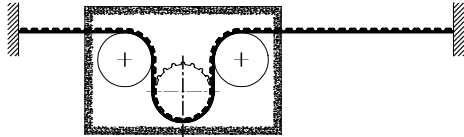
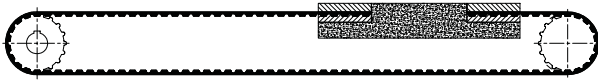
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

- Timing pulley  $z_{min}$  10
- Idler running on belt teeth  $d_{min}$  [mm] 30

Drive with reverse bending

- Timing pulley  $z_{min}$  15
- Idler running on belt back  $d_{min}$  [mm] 30

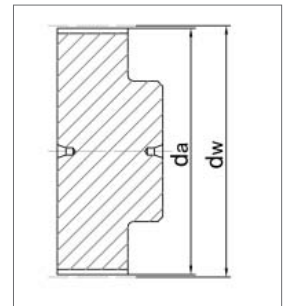
## Timing pulleys

| z  | da    | dw    |
|----|-------|-------|
| 10 | 7,46  | 7,96  |
| 11 | 8,25  | 8,75  |
| 12 | 9,05  | 9,55  |
| 13 | 9,85  | 10,35 |
| 14 | 10,64 | 11,14 |
| 15 | 11,44 | 11,94 |
| 16 | 12,23 | 12,73 |
| 17 | 13,03 | 13,53 |
| 18 | 13,82 | 14,32 |
| 19 | 14,62 | 15,12 |
| 20 | 15,42 | 15,92 |
| 21 | 16,21 | 16,71 |
| 22 | 17,01 | 17,51 |
| 23 | 17,80 | 18,30 |
| 24 | 18,60 | 19,10 |
| 25 | 19,39 | 19,89 |
| 26 | 20,19 | 20,69 |
| 27 | 20,99 | 21,49 |
| 28 | 21,78 | 22,28 |
| 29 | 22,58 | 23,08 |
| 30 | 23,37 | 23,87 |
| 31 | 24,17 | 24,67 |
| 32 | 24,97 | 25,47 |
| 33 | 25,76 | 26,26 |
| 34 | 26,56 | 27,06 |
| 35 | 27,35 | 27,85 |
| 36 | 28,15 | 28,65 |
| 37 | 28,94 | 29,44 |
| 38 | 29,74 | 30,24 |
| 39 | 30,54 | 31,04 |
| 40 | 31,33 | 31,83 |
| 41 | 32,13 | 32,63 |
| 42 | 32,92 | 33,42 |

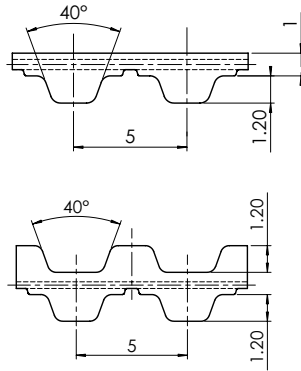
| z  | da    | dw    |
|----|-------|-------|
| 43 | 33,72 | 34,22 |
| 44 | 34,52 | 35,02 |
| 45 | 35,31 | 35,81 |
| 46 | 36,11 | 36,61 |
| 47 | 36,90 | 37,40 |
| 48 | 37,70 | 38,20 |
| 49 | 38,49 | 38,99 |
| 50 | 39,29 | 39,79 |
| 51 | 40,09 | 40,59 |
| 52 | 40,88 | 41,38 |
| 53 | 41,68 | 42,18 |
| 54 | 42,47 | 42,97 |
| 55 | 43,27 | 43,77 |
| 56 | 44,06 | 44,56 |
| 57 | 44,86 | 45,36 |
| 58 | 45,66 | 46,16 |
| 59 | 46,45 | 46,95 |
| 60 | 47,25 | 47,75 |
| 61 | 48,04 | 48,54 |
| 62 | 48,84 | 49,34 |
| 63 | 49,64 | 50,14 |
| 64 | 50,43 | 50,93 |
| 65 | 51,23 | 51,73 |
| 66 | 52,02 | 52,52 |
| 67 | 52,82 | 53,32 |
| 68 | 53,61 | 54,11 |
| 69 | 54,41 | 54,91 |
| 70 | 55,21 | 55,71 |
| 71 | 56,00 | 56,50 |
| 72 | 56,80 | 57,30 |
| 73 | 57,59 | 58,09 |
| 74 | 58,39 | 58,89 |
| 75 | 59,18 | 59,68 |

| z   | da    | dw    |
|-----|-------|-------|
| 76  | 59,98 | 60,48 |
| 77  | 60,78 | 61,28 |
| 78  | 61,57 | 62,07 |
| 79  | 62,37 | 62,87 |
| 80  | 63,16 | 63,66 |
| 81  | 63,96 | 64,46 |
| 82  | 64,76 | 65,26 |
| 83  | 65,55 | 66,05 |
| 84  | 66,35 | 66,85 |
| 85  | 67,14 | 67,64 |
| 86  | 67,94 | 68,44 |
| 87  | 68,73 | 69,23 |
| 88  | 69,53 | 70,03 |
| 89  | 70,33 | 70,83 |
| 90  | 71,12 | 71,62 |
| 91  | 71,92 | 72,42 |
| 92  | 72,71 | 73,21 |
| 93  | 73,51 | 74,01 |
| 94  | 74,31 | 74,81 |
| 95  | 75,10 | 75,60 |
| 96  | 75,90 | 76,40 |
| 97  | 76,69 | 77,19 |
| 98  | 77,49 | 77,99 |
| 99  | 78,28 | 78,78 |
| 100 | 79,08 | 79,58 |
| 101 | 79,88 | 80,38 |
| 102 | 80,67 | 81,17 |
| 103 | 81,47 | 81,97 |
| 104 | 82,26 | 82,76 |
| 105 | 83,06 | 83,56 |
| 106 | 83,85 | 84,35 |
| 107 | 84,65 | 85,15 |
| 108 | 85,45 | 85,95 |

| z   | da     | dw     |
|-----|--------|--------|
| 109 | 86,24  | 86,74  |
| 110 | 87,04  | 87,54  |
| 111 | 87,83  | 88,33  |
| 112 | 88,63  | 89,13  |
| 113 | 89,43  | 89,93  |
| 114 | 90,22  | 90,72  |
| 115 | 91,02  | 91,52  |
| 116 | 91,81  | 92,31  |
| 117 | 92,61  | 93,11  |
| 118 | 93,40  | 93,90  |
| 119 | 94,20  | 94,70  |
| 120 | 95,00  | 95,50  |
| 121 | 95,79  | 96,29  |
| 122 | 96,59  | 97,09  |
| 123 | 97,38  | 97,88  |
| 124 | 98,18  | 98,68  |
| 125 | 98,97  | 99,47  |
| 126 | 99,77  | 100,27 |
| 127 | 100,57 | 101,07 |
| 128 | 101,36 | 101,86 |
| 129 | 102,16 | 102,66 |
| 130 | 102,95 | 103,45 |
| 131 | 103,75 | 104,25 |
| 132 | 104,55 | 105,05 |
| 133 | 105,34 | 105,84 |
| 134 | 106,14 | 106,64 |
| 135 | 106,93 | 107,43 |
| 136 | 107,73 | 108,23 |
| 137 | 108,52 | 109,02 |
| 138 | 109,32 | 109,82 |
| 139 | 110,12 | 110,62 |
| 140 | 110,91 | 111,41 |



## T5



### Belt characteristics

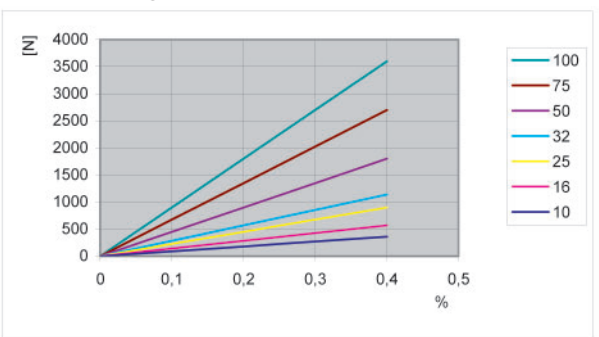
- Polyurethane timing belt with steel tension cords
- Trapezoidal tooth profile according to DIN 7721 T1
- Metric pitch 5 mm
- Ideal for drives where high belt flexibility is requested
- Widely used for conveying, linear drive and light power transmission applications

- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 10                      | 360                                                      | 180                                                      | 1500                                          | 90000                                        | 0,021            |
| 16                      | 570                                                      | 285                                                      | 2375                                          | 142500                                       | 0,034            |
| 25                      | 900                                                      | 450                                                      | 3750                                          | 225000                                       | 0,053            |
| 32                      | 1140                                                     | 570                                                      | 4750                                          | 285000                                       | 0,067            |
| 50                      | 1800                                                     | 900                                                      | 7500                                          | 450000                                       | 0,105            |
| 75                      | 2700                                                     | 1350                                                     | 11250                                         | 675000                                       | 0,158            |
| 100                     | 3600                                                     | 1800                                                     | 15000                                         | 900000                                       | 0,210            |

### Load / Elongation [ % ]

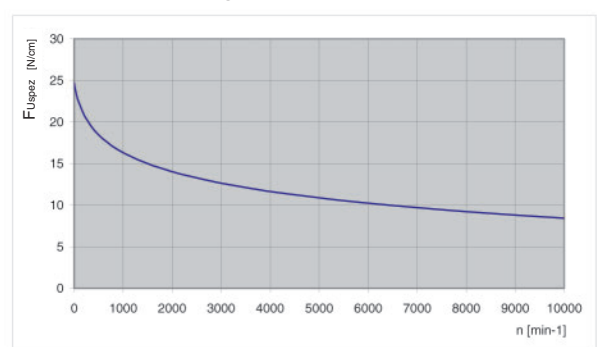


Other widths are available on request.

## Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 24,70                 | 800  | 17,02                 | 1900 | 14,21                 | 4500  | 11,25                 |
| 20  | 24,07                 | 900  | 16,65                 | 2000 | 14,03                 | 5000  | 10,88                 |
| 40  | 23,53                 | 1000 | 16,32                 | 2200 | 13,71                 | 5500  | 10,55                 |
| 60  | 23,05                 | 1100 | 16,01                 | 2400 | 13,42                 | 6000  | 10,24                 |
| 80  | 22,64                 | 1200 | 15,73                 | 2600 | 13,14                 | 6500  | 9,96                  |
| 100 | 22,28                 | 1300 | 15,47                 | 2800 | 12,89                 | 7000  | 9,70                  |
| 200 | 20,90                 | 1400 | 15,22                 | 3000 | 12,65                 | 7500  | 9,46                  |
| 300 | 19,89                 | 1440 | 15,13                 | 3200 | 12,43                 | 8000  | 9,23                  |
| 400 | 19,10                 | 1500 | 15,00                 | 3400 | 12,22                 | 8500  | 9,01                  |
| 500 | 18,45                 | 1600 | 14,78                 | 3600 | 12,03                 | 9000  | 8,81                  |
| 600 | 17,91                 | 1700 | 14,58                 | 3800 | 11,84                 | 9500  | 8,62                  |
| 700 | 17,44                 | 1800 | 14,39                 | 4000 | 11,66                 | 10000 | 8,44                  |

### Tooth shear strength / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

= max. no of teeth in mesh to be considered for the calculation of the drive

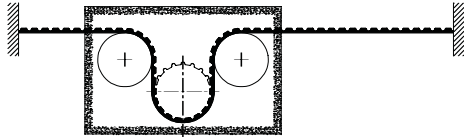
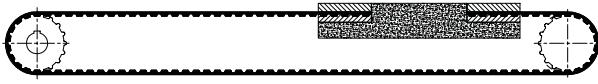
= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm



## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

- Timing pulley  $z_{\min} = 10$
- Idler running on belt teeth  $d_{\min} = 30 \text{ mm}$

Drive with reverse bending

- Timing pulley  $z_{\min} = 15$
- Idler running on belt back  $d_{\min} = 30 \text{ mm}$

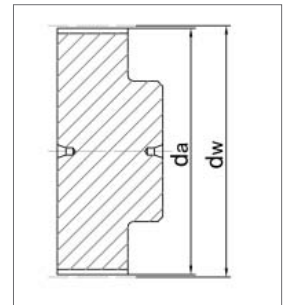
## Timing pulleys

| z  | da    | dw    |
|----|-------|-------|
| 10 | 15,05 | 15,92 |
| 11 | 16,65 | 17,51 |
| 12 | 18,25 | 19,10 |
| 13 | 19,85 | 20,70 |
| 14 | 21,45 | 22,29 |
| 15 | 23,05 | 23,88 |
| 16 | 24,60 | 25,47 |
| 17 | 26,20 | 27,06 |
| 18 | 27,80 | 28,65 |
| 19 | 29,40 | 30,25 |
| 20 | 31,00 | 31,83 |
| 21 | 32,70 | 33,43 |
| 22 | 34,25 | 35,02 |
| 23 | 35,85 | 36,62 |
| 24 | 37,40 | 38,21 |
| 25 | 39,00 | 39,80 |
| 26 | 40,60 | 41,39 |
| 27 | 42,20 | 42,98 |
| 28 | 43,75 | 44,58 |
| 29 | 45,35 | 46,17 |
| 30 | 46,95 | 47,76 |
| 31 | 48,55 | 49,35 |
| 32 | 50,10 | 50,94 |
| 33 | 51,70 | 52,54 |
| 34 | 53,25 | 54,13 |
| 35 | 54,85 | 55,72 |
| 36 | 56,45 | 57,31 |
| 37 | 58,05 | 58,90 |
| 38 | 59,65 | 60,50 |

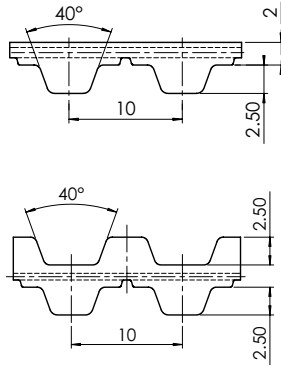
| z  | da     | dw     |
|----|--------|--------|
| 39 | 61,25  | 62,09  |
| 40 | 62,85  | 63,66  |
| 41 | 64,40  | 65,27  |
| 42 | 66,00  | 66,86  |
| 43 | 67,70  | 68,46  |
| 44 | 69,20  | 70,05  |
| 45 | 70,80  | 71,64  |
| 46 | 72,40  | 73,23  |
| 47 | 73,95  | 74,82  |
| 48 | 75,55  | 76,42  |
| 49 | 77,15  | 78,01  |
| 50 | 78,75  | 79,60  |
| 51 | 80,35  | 81,19  |
| 52 | 81,95  | 82,78  |
| 53 | 83,50  | 84,38  |
| 54 | 85,10  | 85,97  |
| 55 | 86,70  | 87,54  |
| 56 | 88,30  | 89,15  |
| 57 | 89,90  | 90,74  |
| 58 | 91,50  | 92,34  |
| 59 | 93,05  | 93,93  |
| 60 | 94,65  | 95,52  |
| 61 | 96,25  | 97,11  |
| 62 | 97,85  | 98,70  |
| 63 | 99,45  | 100,30 |
| 64 | 101,05 | 101,89 |
| 65 | 102,65 | 103,48 |
| 66 | 104,20 | 105,07 |
| 67 | 105,80 | 106,66 |

| z  | da     | dw     |
|----|--------|--------|
| 68 | 107,40 | 108,26 |
| 69 | 109,00 | 109,85 |
| 70 | 110,60 | 111,44 |
| 71 | 112,20 | 113,03 |
| 72 | 113,75 | 114,62 |
| 73 | 115,35 | 116,22 |
| 74 | 116,95 | 117,81 |
| 75 | 118,55 | 119,40 |
| 76 | 120,15 | 120,99 |
| 77 | 121,75 | 122,58 |
| 78 | 123,30 | 124,18 |
| 79 | 124,90 | 125,77 |
| 80 | 126,50 | 127,36 |
| 81 | 128,10 | 128,95 |
| 82 | 129,70 | 130,54 |
| 83 | 131,30 | 132,14 |
| 84 | 132,85 | 133,73 |
| 85 | 134,45 | 135,32 |
| 86 | 136,05 | 136,91 |
| 87 | 137,65 | 138,50 |
| 88 | 139,25 | 140,10 |
| 89 | 140,85 | 141,69 |
| 90 | 142,45 | 143,28 |
| 91 | 144,00 | 144,87 |
| 92 | 145,60 | 146,46 |
| 93 | 147,20 | 148,06 |
| 94 | 148,80 | 149,65 |
| 95 | 150,40 | 151,24 |
| 96 | 152,00 | 152,83 |

| z   | da     | dw     |
|-----|--------|--------|
| 97  | 153,55 | 154,42 |
| 98  | 155,15 | 156,02 |
| 99  | 156,75 | 157,61 |
| 100 | 158,35 | 159,20 |
| 101 | 159,95 | 160,79 |
| 102 | 161,55 | 162,38 |
| 103 | 163,10 | 163,97 |
| 104 | 164,70 | 165,57 |
| 105 | 166,30 | 167,16 |
| 106 | 167,90 | 168,75 |
| 107 | 169,50 | 170,34 |
| 108 | 171,10 | 171,94 |
| 109 | 172,65 | 173,53 |
| 110 | 174,25 | 175,12 |
| 111 | 175,85 | 176,71 |
| 112 | 177,45 | 178,30 |
| 113 | 179,05 | 179,84 |
| 114 | 180,65 | 181,49 |
| 115 | 182,23 | 183,08 |
| 116 | 183,82 | 184,67 |
| 117 | 185,42 | 186,26 |
| 118 | 187,01 | 187,86 |
| 119 | 188,61 | 189,45 |
| 120 | 190,21 | 191,04 |



## T10



### Belt characteristics

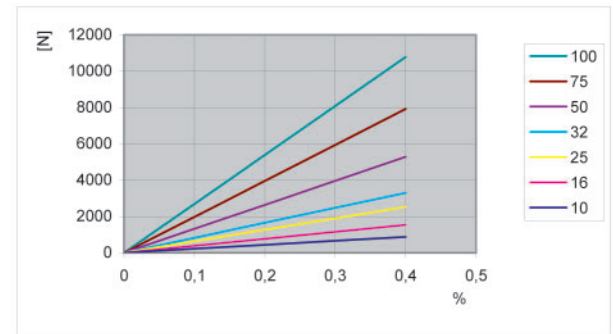
- Polyurethane timing belt with steel tension cords
- Trapezoidal tooth profile according to DIN 7721 T1
- Metric pitch 10 mm
- Ideal for drives where high belt flexibility is requested
- Widely used for conveying, linear drive and medium power transmission applications

- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>F <sub>Tzul</sub><br>[N] | Allowable<br>tensile load<br>Type V<br>F <sub>Tzul</sub><br>[N] | Breaking<br>load<br>Type M<br>F <sub>Br</sub><br>[N] | Specific<br>spring rate<br>C <sub>spez</sub><br>[N] | Weight<br>[kg/m] |
|-------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|------------------|
| 10                      | 880                                                             | 440                                                             | 3200                                                 | 220000                                              | 0,05             |
| 16                      | 1540                                                            | 770                                                             | 5600                                                 | 385000                                              | 0,07             |
| 25                      | 2530                                                            | 1265                                                            | 9200                                                 | 632500                                              | 0,11             |
| 32                      | 3300                                                            | 1650                                                            | 12000                                                | 825000                                              | 0,15             |
| 50                      | 5280                                                            | 2640                                                            | 19200                                                | 1320000                                             | 0,23             |
| 75                      | 7920                                                            | 3960                                                            | 28800                                                | 1980000                                             | 0,34             |
| 100                     | 10780                                                           | 5390                                                            | 39200                                                | 2695000                                             | 0,45             |

### Load / Elongation [ % ]

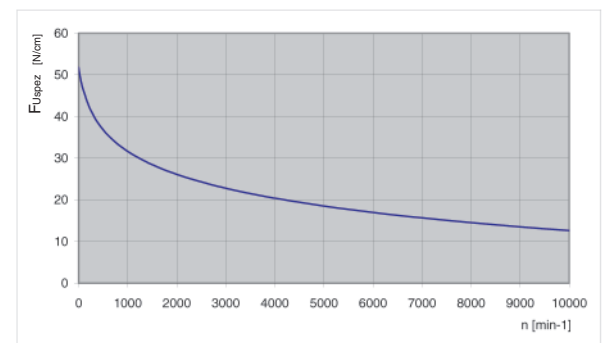


Other widths are available on request.

### Tooth shear strength

| rpm | F <sub>Uspez</sub><br>[N/cm] | rpm  | F <sub>Uspez</sub><br>[N/cm] | rpm  | F <sub>Uspez</sub><br>[N/cm] | rpm   | F <sub>Uspez</sub><br>[N/cm] |
|-----|------------------------------|------|------------------------------|------|------------------------------|-------|------------------------------|
| 0   | 51,80                        | 800  | 33,34                        | 1900 | 26,53                        | 4500  | 19,40                        |
| 20  | 50,32                        | 900  | 32,44                        | 2000 | 26,12                        | 5000  | 18,51                        |
| 40  | 49,04                        | 1000 | 31,63                        | 2200 | 25,34                        | 5500  | 17,70                        |
| 60  | 47,92                        | 1100 | 30,89                        | 2400 | 24,63                        | 6000  | 16,97                        |
| 80  | 46,95                        | 1200 | 30,21                        | 2600 | 23,97                        | 6500  | 16,29                        |
| 100 | 46,11                        | 1300 | 29,58                        | 2800 | 23,36                        | 7000  | 15,66                        |
| 200 | 42,75                        | 1400 | 28,99                        | 3000 | 22,78                        | 7500  | 15,07                        |
| 300 | 40,28                        | 1440 | 28,76                        | 3200 | 22,25                        | 8000  | 14,52                        |
| 400 | 38,36                        | 1500 | 28,44                        | 3400 | 21,74                        | 8500  | 14,00                        |
| 500 | 36,80                        | 1600 | 27,92                        | 3600 | 21,27                        | 9000  | 13,51                        |
| 600 | 35,49                        | 1700 | 27,43                        | 3800 | 20,81                        | 9500  | 13,05                        |
| 700 | 34,35                        | 1800 | 26,97                        | 4000 | 20,39                        | 10000 | 12,61                        |

### Tooth shear strenght / rpm



The specific load F<sub>Uspez</sub> is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load F<sub>u</sub> transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

F<sub>u</sub> [N]

F<sub>Uspez</sub> [N/cm]

z<sub>e</sub>

z<sub>emax</sub>

z<sub>emax</sub>

z<sub>emax</sub>

b [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

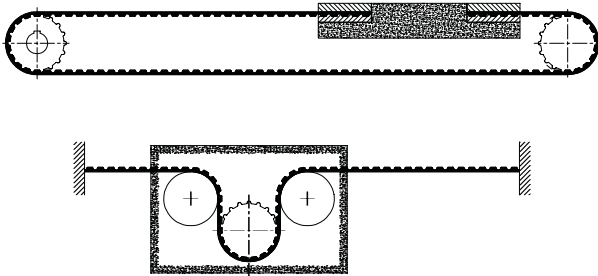
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

- Timing pulley  $z_{\min} = 12$
- Idler running on belt teeth  $d_{\min} = 60 \text{ mm}$

Drive with reverse bending

- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 60 \text{ mm}$

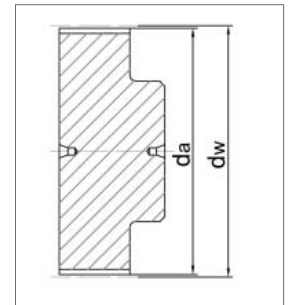
## Timing pulleys

| z  | da     | dw     |
|----|--------|--------|
| 10 | 30,05  | 31,84  |
| 11 | 33,25  | 35,02  |
| 12 | 36,35  | 38,20  |
| 13 | 39,50  | 41,38  |
| 14 | 42,70  | 44,56  |
| 15 | 45,90  | 47,75  |
| 16 | 49,05  | 50,93  |
| 17 | 52,25  | 54,11  |
| 18 | 55,45  | 57,29  |
| 19 | 58,65  | 60,48  |
| 20 | 61,80  | 63,66  |
| 21 | 65,00  | 66,84  |
| 22 | 68,15  | 70,03  |
| 23 | 71,35  | 73,20  |
| 24 | 74,55  | 76,39  |
| 25 | 77,70  | 79,58  |
| 26 | 80,90  | 82,76  |
| 27 | 84,10  | 85,95  |
| 28 | 87,25  | 89,12  |
| 29 | 90,45  | 92,21  |
| 30 | 93,65  | 95,49  |
| 31 | 96,85  | 98,67  |
| 32 | 100,00 | 101,86 |
| 33 | 103,20 | 105,04 |
| 34 | 106,40 | 108,22 |
| 35 | 109,55 | 111,41 |
| 36 | 112,75 | 114,59 |
| 37 | 115,90 | 117,77 |
| 38 | 119,10 | 120,95 |

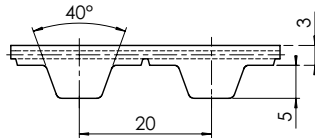
| z  | da     | dw     |
|----|--------|--------|
| 39 | 122,30 | 124,14 |
| 40 | 125,45 | 127,32 |
| 41 | 128,65 | 130,50 |
| 42 | 131,85 | 133,69 |
| 43 | 135,00 | 136,87 |
| 44 | 138,20 | 140,05 |
| 45 | 141,40 | 143,24 |
| 46 | 144,60 | 146,42 |
| 47 | 147,75 | 149,60 |
| 48 | 150,95 | 152,78 |
| 49 | 154,10 | 155,97 |
| 50 | 157,30 | 159,15 |
| 51 | 160,50 | 162,33 |
| 52 | 163,65 | 165,52 |
| 53 | 166,85 | 168,70 |
| 54 | 170,05 | 171,88 |
| 55 | 173,20 | 175,06 |
| 56 | 176,40 | 178,25 |
| 57 | 179,60 | 181,43 |
| 58 | 182,75 | 184,61 |
| 59 | 185,95 | 187,80 |
| 60 | 189,10 | 190,98 |
| 61 | 192,30 | 194,16 |
| 62 | 195,50 | 197,35 |
| 63 | 198,65 | 200,53 |
| 64 | 201,85 | 203,71 |
| 65 | 205,05 | 206,90 |
| 66 | 208,20 | 210,08 |
| 67 | 211,40 | 213,26 |

| z  | da     | dw     |
|----|--------|--------|
| 68 | 214,60 | 216,44 |
| 69 | 217,75 | 219,63 |
| 70 | 220,95 | 222,81 |
| 71 | 224,15 | 225,99 |
| 72 | 227,30 | 229,18 |
| 73 | 230,50 | 232,36 |
| 74 | 233,70 | 235,54 |
| 75 | 236,90 | 238,72 |
| 76 | 240,05 | 241,94 |
| 77 | 243,25 | 245,09 |
| 78 | 246,40 | 248,27 |
| 79 | 249,60 | 251,46 |
| 80 | 252,80 | 254,64 |
| 81 | 256,00 | 257,82 |
| 82 | 259,15 | 261,00 |
| 83 | 262,30 | 264,19 |
| 84 | 265,50 | 267,37 |
| 85 | 268,70 | 270,55 |
| 86 | 271,90 | 273,74 |
| 87 | 275,05 | 276,92 |
| 88 | 278,25 | 280,10 |
| 89 | 281,45 | 283,28 |
| 90 | 284,60 | 286,47 |
| 91 | 287,80 | 289,65 |
| 92 | 291,00 | 292,84 |
| 93 | 294,20 | 296,02 |
| 94 | 297,35 | 299,20 |
| 95 | 300,55 | 302,39 |
| 96 | 303,75 | 305,57 |

| z   | da     | dw     |
|-----|--------|--------|
| 97  | 306,90 | 308,75 |
| 98  | 310,10 | 311,93 |
| 99  | 313,25 | 315,12 |
| 100 | 316,45 | 318,30 |
| 101 | 319,65 | 321,48 |
| 102 | 322,80 | 324,66 |
| 103 | 326,00 | 327,85 |
| 104 | 329,20 | 331,03 |
| 105 | 332,35 | 334,21 |
| 106 | 335,55 | 337,40 |
| 107 | 338,75 | 340,58 |
| 108 | 341,95 | 343,76 |
| 109 | 345,15 | 346,95 |
| 110 | 348,30 | 350,13 |
| 111 | 351,45 | 353,31 |
| 112 | 354,65 | 356,50 |
| 113 | 357,80 | 359,68 |
| 114 | 361,00 | 362,86 |
| 115 | 364,19 | 366,04 |
| 116 | 367,39 | 369,23 |
| 117 | 370,56 | 372,41 |
| 118 | 373,76 | 375,59 |
| 119 | 376,93 | 378,78 |
| 120 | 380,11 | 381,96 |



## T20



### Belt characteristics

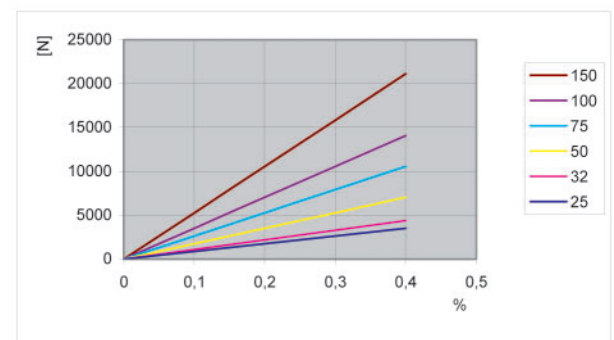
- Polyurethane timing belt with steel tension cords
- Trapezoidal tooth profile according to DIN 7721 T1
- Metric pitch 20 mm
- Ideal for drives where high belt flexibility is requested
- Widely used for conveying, linear drive and heavy power transmission applications

- Width tolerance:  $\pm 1,0$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,4$  [mm]

## Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 25                      | 3520                                                     | 1760                                                     | 15200                                         | 880000                                       | 0,18             |
| 32                      | 4400                                                     | 2200                                                     | 19000                                         | 1100000                                      | 0,24             |
| 50                      | 7040                                                     | 3520                                                     | 30400                                         | 1760000                                      | 0,37             |
| 75                      | 10560                                                    | 5280                                                     | 45600                                         | 2640000                                      | 0,55             |
| 100                     | 14080                                                    | 7040                                                     | 60800                                         | 3520000                                      | 0,73             |
| 150                     | 21120                                                    | 10560                                                    | 91200                                         | 5280000                                      | 1,10             |

### Load / Elongation [ % ]

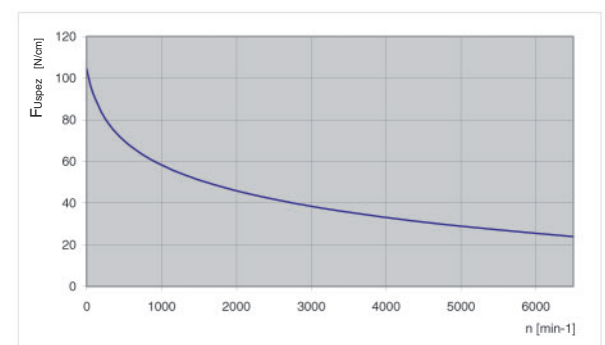


Other widths are available on request.

## Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|
| 0   | 104,50                | 800  | 62,15                 | 1900 | 46,88                 | 4500 | 30,92                 |
| 20  | 101,10                | 900  | 60,13                 | 2000 | 45,94                 | 5000 | 28,93                 |
| 40  | 98,15                 | 1000 | 58,31                 | 2200 | 44,20                 | 5500 | 27,14                 |
| 60  | 95,58                 | 1100 | 56,64                 | 2400 | 42,61                 | 6000 | 25,49                 |
| 80  | 93,35                 | 1200 | 55,11                 | 2600 | 41,13                 | 6500 | 23,97                 |
| 100 | 91,41                 | 1300 | 53,70                 | 2800 | 39,77                 |      |                       |
| 200 | 83,50                 | 1400 | 52,38                 | 3000 | 38,49                 |      |                       |
| 300 | 77,84                 | 1440 | 51,87                 | 3200 | 37,29                 |      |                       |
| 400 | 73,49                 | 1500 | 51,14                 | 3400 | 36,16                 |      |                       |
| 500 | 69,96                 | 1600 | 49,98                 | 3600 | 35,10                 |      |                       |
| 600 | 66,98                 | 1700 | 48,89                 | 3800 | 34,09                 |      |                       |
| 700 | 64,41                 | 1800 | 47,86                 | 4000 | 33,13                 |      |                       |

### Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_U$  transmissible by the belt in the drive is calculated by:

$$F_U [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_U$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

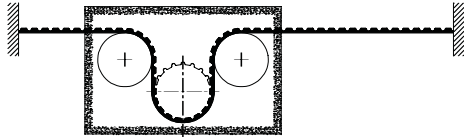
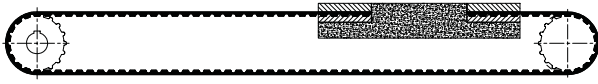
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

- Timing pulley  $z_{\min} = 15$
- Idler running on belt teeth  $d_{\min} = 120 \text{ mm}$

Drive with reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 120 \text{ mm}$

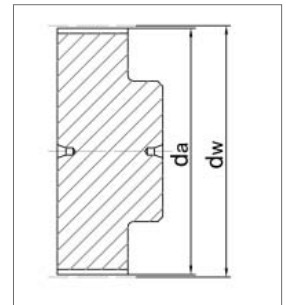
## Timing pulleys

| z  | da     | dw     |
|----|--------|--------|
| 15 | 92,65  | 95,49  |
| 16 | 99,00  | 101,86 |
| 17 | 105,40 | 108,22 |
| 18 | 111,75 | 114,59 |
| 19 | 118,10 | 120,96 |
| 20 | 124,50 | 127,32 |
| 21 | 130,75 | 133,69 |
| 22 | 137,20 | 140,06 |
| 23 | 143,55 | 146,43 |
| 24 | 149,95 | 152,78 |
| 25 | 156,30 | 159,15 |
| 26 | 162,65 | 165,52 |
| 27 | 169,00 | 171,89 |
| 28 | 175,40 | 178,25 |
| 29 | 181,75 | 184,62 |
| 30 | 188,10 | 190,99 |
| 31 | 194,50 | 197,35 |
| 32 | 200,85 | 203,72 |
| 33 | 207,20 | 210,09 |
| 34 | 213,60 | 216,44 |
| 35 | 219,95 | 222,81 |
| 36 | 226,35 | 229,18 |
| 37 | 232,70 | 235,54 |
| 38 | 239,05 | 241,91 |
| 39 | 245,40 | 248,28 |
| 40 | 251,75 | 254,65 |
| 41 | 258,15 | 261,02 |
| 42 | 264,50 | 267,37 |
| 43 | 270,85 | 273,74 |

| z  | da     | dw     |
|----|--------|--------|
| 44 | 277,25 | 280,10 |
| 45 | 283,60 | 286,47 |
| 46 | 289,95 | 292,84 |
| 47 | 296,35 | 299,21 |
| 48 | 302,70 | 305,58 |
| 49 | 309,10 | 311,93 |
| 50 | 315,45 | 318,30 |
| 51 | 321,80 | 324,67 |
| 52 | 328,15 | 331,03 |
| 53 | 334,50 | 337,40 |
| 54 | 340,90 | 343,76 |
| 55 | 347,25 | 350,13 |
| 56 | 353,60 | 356,50 |
| 57 | 360,00 | 362,86 |
| 58 | 366,35 | 369,23 |
| 59 | 372,75 | 375,59 |
| 60 | 379,10 | 381,96 |
| 61 | 385,45 | 388,33 |
| 62 | 391,85 | 394,70 |
| 63 | 398,20 | 401,06 |
| 64 | 404,55 | 407,43 |
| 65 | 410,95 | 413,80 |
| 66 | 417,30 | 420,17 |
| 67 | 423,65 | 426,52 |
| 68 | 430,05 | 432,89 |
| 69 | 436,40 | 439,26 |
| 70 | 442,80 | 445,63 |
| 71 | 449,15 | 451,99 |
| 72 | 455,50 | 458,36 |

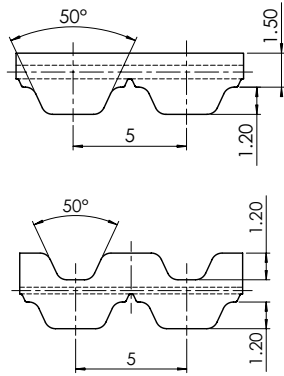
| z   | da     | dw     |
|-----|--------|--------|
| 73  | 461,85 | 464,73 |
| 74  | 468,25 | 471,08 |
| 75  | 474,60 | 477,45 |
| 76  | 480,95 | 483,82 |
| 77  | 487,35 | 490,19 |
| 78  | 493,70 | 496,56 |
| 79  | 500,05 | 502,91 |
| 80  | 506,45 | 509,28 |
| 81  | 512,80 | 515,65 |
| 82  | 519,15 | 522,02 |
| 83  | 525,55 | 528,39 |
| 84  | 531,90 | 534,74 |
| 85  | 538,25 | 541,11 |
| 86  | 544,60 | 547,48 |
| 87  | 551,00 | 553,85 |
| 88  | 557,35 | 560,22 |
| 89  | 563,70 | 566,57 |
| 90  | 570,10 | 572,94 |
| 91  | 576,45 | 579,31 |
| 92  | 582,85 | 585,67 |
| 93  | 589,20 | 592,04 |
| 94  | 595,55 | 598,41 |
| 95  | 601,90 | 604,77 |
| 96  | 608,30 | 611,14 |
| 97  | 614,65 | 617,51 |
| 98  | 621,00 | 623,88 |
| 99  | 627,35 | 630,25 |
| 100 | 633,75 | 636,60 |
| 101 | 640,10 | 642,97 |

| z   | da     | dw     |
|-----|--------|--------|
| 102 | 646,50 | 649,34 |
| 103 | 652,85 | 655,71 |
| 104 | 659,20 | 662,06 |
| 105 | 665,60 | 668,43 |
| 106 | 671,95 | 674,80 |
| 107 | 678,30 | 681,17 |
| 108 | 684,70 | 687,54 |
| 109 | 691,05 | 693,89 |
| 110 | 697,40 | 700,26 |
| 111 | 703,80 | 706,63 |
| 112 | 710,15 | 712,99 |
| 113 | 716,50 | 719,36 |
| 114 | 722,90 | 725,73 |
| 115 | 729,24 | 732,09 |
| 116 | 735,61 | 738,46 |
| 117 | 741,96 | 744,83 |
| 118 | 748,34 | 751,19 |
| 119 | 754,70 | 757,56 |
| 120 | 761,07 | 763,93 |





## AT5



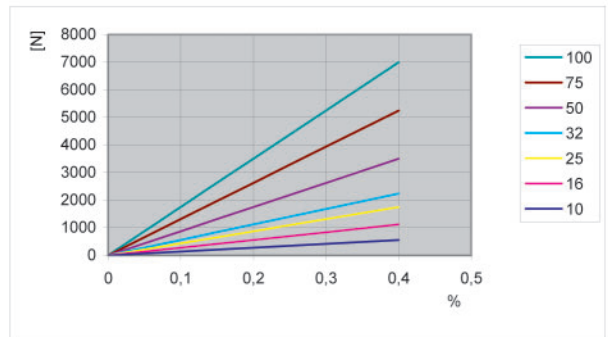
### Belt characteristics

- Polyurethane timing belt with steel tension cords.
- Metric pitch 5 mm
- Tooth profile and dimension are optimised to guarantee uniform load distribution and minimum deformation under load.
- High resistance and low stretch steel cords to guarantee high stability and low elongation
- Reduced polygonal effect with reduced drive vibration.
- Particularly suitable for linear drives and light power transmission applications with high axial and angular positioning accuracy.
- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 10                      | 560                                                      | 280                                                      | 2000                                          | 140000                                       | 0,03             |
| 16                      | 1120                                                     | 560                                                      | 4000                                          | 280000                                       | 0,05             |
| 25                      | 1750                                                     | 875                                                      | 6250                                          | 437500                                       | 0,09             |
| 32                      | 2240                                                     | 1120                                                     | 8000                                          | 560000                                       | 0,11             |
| 50                      | 3500                                                     | 1750                                                     | 12500                                         | 875000                                       | 0,17             |
| 75                      | 5250                                                     | 2625                                                     | 18750                                         | 1312500                                      | 0,26             |
| 100                     | 7000                                                     | 3500                                                     | 25000                                         | 1750000                                      | 0,34             |

### Load / Elongation [ % ]

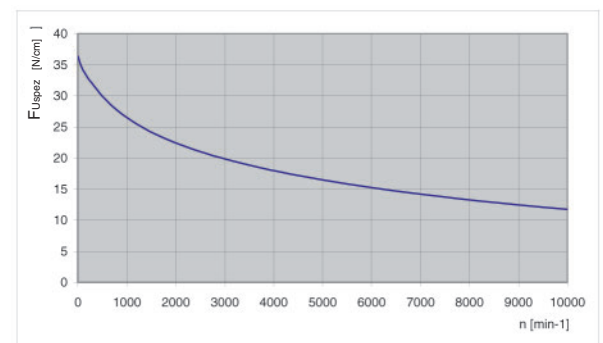


Other widths are available on request.

### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 36,40                 | 800  | 27,69                 | 1900 | 22,73                 | 4500  | 17,18                 |
| 20  | 35,88                 | 900  | 27,06                 | 2000 | 22,42                 | 5000  | 16,47                 |
| 40  | 35,40                 | 1000 | 26,49                 | 2200 | 21,82                 | 5500  | 15,83                 |
| 60  | 34,97                 | 1100 | 25,96                 | 2400 | 21,28                 | 6000  | 15,24                 |
| 80  | 34,59                 | 1200 | 25,47                 | 2600 | 20,77                 | 6500  | 14,69                 |
| 100 | 34,24                 | 1300 | 25,01                 | 2800 | 20,29                 | 7000  | 14,18                 |
| 200 | 32,92                 | 1400 | 24,57                 | 3000 | 19,85                 | 7500  | 13,71                 |
| 300 | 31,92                 | 1440 | 24,41                 | 3200 | 19,43                 | 8000  | 13,26                 |
| 400 | 30,89                 | 1500 | 24,16                 | 3400 | 19,03                 | 8500  | 12,85                 |
| 500 | 29,95                 | 1600 | 23,78                 | 3600 | 18,66                 | 9000  | 12,45                 |
| 600 | 29,12                 | 1700 | 23,41                 | 3800 | 18,30                 | 9500  | 12,07                 |
| 700 | 28,37                 | 1800 | 23,07                 | 4000 | 17,96                 | 10000 | 11,72                 |

### Tooth shear strength / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

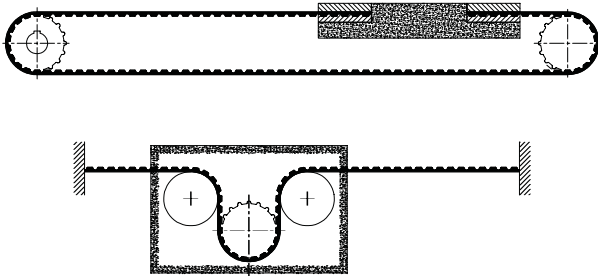
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

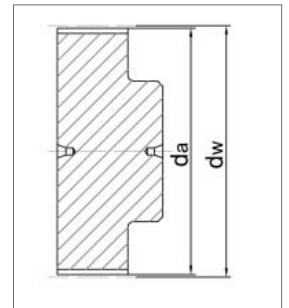
- Timing pulley  $z_{\min} = 15$
- Idler running on belt teeth  $d_{\min} = 30 \text{ mm}$

Drive with reverse bending

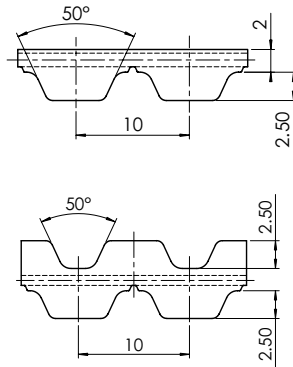
- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 60 \text{ mm}$

## Timing pulleys

| z  | d <sub>a</sub> | d <sub>w</sub> | z  | d <sub>a</sub> | d <sub>w</sub> | z   | d <sub>a</sub> | d <sub>w</sub> | z   | d <sub>a</sub> | d <sub>w</sub> |
|----|----------------|----------------|----|----------------|----------------|-----|----------------|----------------|-----|----------------|----------------|
| 15 | 22,65          | 23,88          | 44 | 68,80          | 70,05          | 73  | 114,95         | 116,22         | 102 | 161,15         | 162,38         |
| 16 | 24,20          | 25,47          | 45 | 70,40          | 71,64          | 74  | 116,55         | 117,81         | 103 | 162,70         | 163,97         |
| 17 | 25,80          | 27,06          | 46 | 72,00          | 73,23          | 75  | 118,15         | 119,40         | 104 | 164,30         | 165,57         |
| 18 | 27,40          | 28,65          | 47 | 73,55          | 74,82          | 76  | 119,75         | 120,99         | 105 | 165,90         | 167,16         |
| 19 | 29,00          | 30,25          | 48 | 75,15          | 76,42          | 77  | 121,35         | 122,58         | 106 | 167,50         | 168,75         |
| 20 | 30,60          | 31,83          | 49 | 76,75          | 78,01          | 78  | 122,90         | 124,18         | 107 | 169,10         | 170,34         |
| 21 | 32,20          | 33,43          | 50 | 78,35          | 79,60          | 79  | 124,50         | 125,77         | 108 | 170,70         | 171,94         |
| 22 | 33,80          | 35,02          | 51 | 79,95          | 81,19          | 80  | 126,10         | 127,36         | 109 | 172,25         | 173,53         |
| 23 | 35,40          | 36,62          | 52 | 81,55          | 82,78          | 81  | 127,70         | 128,95         | 110 | 173,85         | 175,12         |
| 24 | 37,00          | 38,21          | 53 | 83,10          | 84,38          | 82  | 129,30         | 130,54         | 111 | 175,45         | 176,71         |
| 25 | 38,60          | 39,80          | 54 | 84,70          | 85,97          | 83  | 130,90         | 132,14         | 112 | 177,05         | 178,30         |
| 26 | 40,20          | 41,39          | 55 | 86,30          | 87,54          | 84  | 132,45         | 133,73         | 113 | 178,65         | 179,84         |
| 27 | 41,80          | 42,98          | 56 | 87,90          | 89,15          | 85  | 134,05         | 135,32         | 114 | 180,25         | 181,49         |
| 28 | 43,35          | 44,58          | 57 | 89,50          | 90,74          | 86  | 135,65         | 136,91         | 115 | 181,85         | 183,08         |
| 29 | 44,95          | 46,17          | 58 | 91,10          | 92,34          | 87  | 137,25         | 138,50         | 116 | 183,45         | 184,67         |
| 30 | 46,55          | 47,76          | 59 | 92,65          | 93,93          | 88  | 138,85         | 140,10         | 117 | 185,00         | 186,26         |
| 31 | 48,15          | 49,35          | 60 | 94,25          | 95,52          | 89  | 140,45         | 141,69         | 118 | 186,60         | 187,86         |
| 32 | 49,70          | 50,94          | 61 | 95,85          | 97,11          | 90  | 142,05         | 143,28         | 119 | 188,20         | 189,45         |
| 33 | 51,30          | 52,54          | 62 | 97,45          | 98,70          | 91  | 143,60         | 144,87         | 120 | 189,80         | 191,04         |
| 34 | 52,85          | 54,13          | 63 | 99,05          | 100,30         | 92  | 145,20         | 146,46         |     |                |                |
| 35 | 54,45          | 55,72          | 64 | 100,65         | 101,89         | 93  | 146,80         | 148,06         |     |                |                |
| 36 | 56,05          | 57,31          | 65 | 102,25         | 103,48         | 94  | 148,40         | 149,65         |     |                |                |
| 37 | 57,65          | 58,90          | 66 | 103,80         | 105,07         | 95  | 150,00         | 151,24         |     |                |                |
| 38 | 59,25          | 60,50          | 67 | 105,40         | 106,66         | 96  | 151,60         | 152,83         |     |                |                |
| 39 | 60,85          | 62,09          | 68 | 107,00         | 108,26         | 97  | 153,15         | 154,42         |     |                |                |
| 40 | 62,45          | 63,66          | 69 | 108,60         | 109,85         | 98  | 154,75         | 156,02         |     |                |                |
| 41 | 64,00          | 65,27          | 70 | 110,20         | 111,44         | 99  | 156,35         | 157,61         |     |                |                |
| 42 | 65,60          | 66,86          | 71 | 111,80         | 113,03         | 100 | 157,95         | 159,20         |     |                |                |
| 43 | 67,30          | 68,46          | 72 | 113,35         | 114,62         | 101 | 159,55         | 160,79         |     |                |                |



## AT10



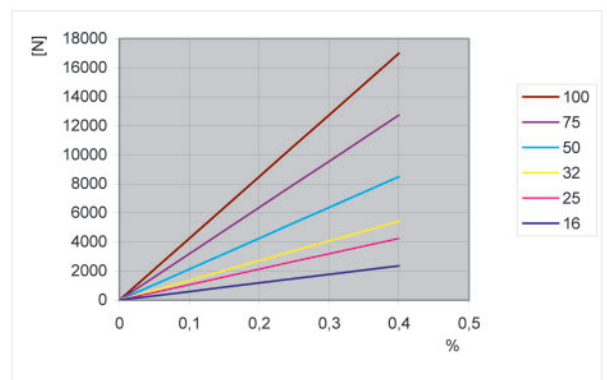
### Belt characteristics

- Polyurethane timing belt with steel tension cords.
  - Metric pitch 10 mm
  - Tooth profile and dimension are optimised to guarantee uniform load distribution and minimum deformation under load.
  - High resistance and low stretch steel cords to guarantee high stability and low elongation
  - Reduced polygonal effect with reduced drive vibration.
  - Particularly suitable for linear drives and medium power transmission applications with high axial and angular positioning accuracy.
- Width tolerance:  $\pm 0,5$  [mm]
  - Length tolerance:  $\pm 0,5$  [mm/m]
  - Thickness tolerance:  $\pm 0,3$  [mm]

## Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 16                      | 2360                                                     | 1180                                                     | 9500                                          | 590000                                       | 0,09             |
| 25                      | 4248                                                     | 2124                                                     | 17100                                         | 1062000                                      | 0,15             |
| 32                      | 5428                                                     | 2714                                                     | 21850                                         | 1357000                                      | 0,19             |
| 50                      | 8496                                                     | 4248                                                     | 34200                                         | 2124000                                      | 0,30             |
| 75                      | 12744                                                    | 6372                                                     | 51300                                         | 3186000                                      | 0,44             |
| 100                     | 16992                                                    | 8496                                                     | 68400                                         | 4248000                                      | 0,59             |

### Load / Elongation [ % ]

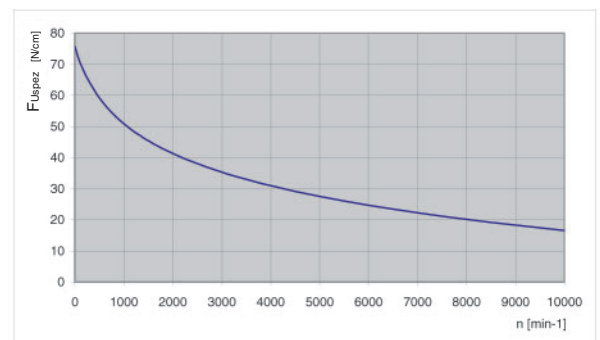


Other widths are available on request.

## Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 75,70                 | 800  | 53,70                 | 1900 | 42,02                 | 4500  | 29,13                 |
| 20  | 74,59                 | 900  | 52,21                 | 2000 | 41,28                 | 5000  | 27,50                 |
| 40  | 73,55                 | 1000 | 50,85                 | 2200 | 39,89                 | 5500  | 26,01                 |
| 60  | 72,57                 | 1100 | 49,59                 | 2400 | 38,62                 | 6000  | 24,65                 |
| 80  | 71,65                 | 1200 | 48,43                 | 2600 | 37,44                 | 6500  | 23,40                 |
| 100 | 70,78                 | 1300 | 47,34                 | 2800 | 36,33                 | 7000  | 22,23                 |
| 200 | 67,13                 | 1400 | 46,32                 | 3000 | 35,30                 | 7500  | 21,14                 |
| 300 | 64,18                 | 1440 | 45,93                 | 3200 | 34,33                 | 8000  | 20,12                 |
| 400 | 61,53                 | 1500 | 45,36                 | 3400 | 33,41                 | 8500  | 19,15                 |
| 500 | 59,21                 | 1600 | 44,46                 | 3600 | 32,55                 | 9000  | 18,24                 |
| 600 | 57,16                 | 1700 | 43,60                 | 3800 | 31,72                 | 9500  | 17,38                 |
| 700 | 55,34                 | 1800 | 42,79                 | 4000 | 30,94                 | 10000 | 16,56                 |

### Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

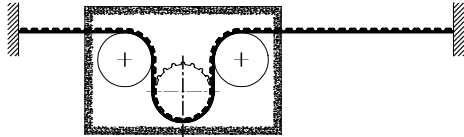
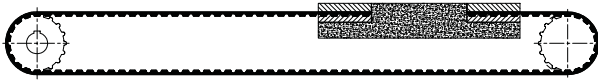
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

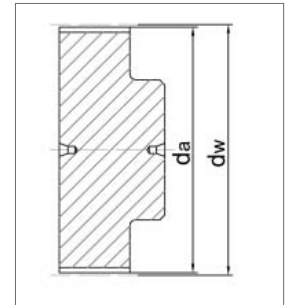
- Timing pulley  $z_{\min} = 15$
- Idler running on belt teeth  $d_{\min} = 50 \text{ mm}$

Drive with reverse bending

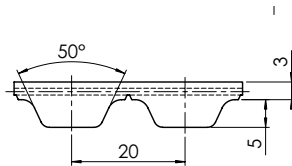
- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 120 \text{ mm}$

## Timing pulleys

| z  | da     | dw     | z  | da     | dw     | z   | da     | dw     | z   | da     | dw     |
|----|--------|--------|----|--------|--------|-----|--------|--------|-----|--------|--------|
| 18 | 55,45  | 57,29  | 47 | 147,75 | 149,60 | 76  | 240,05 | 241,94 | 105 | 332,35 | 334,21 |
| 19 | 58,60  | 60,48  | 48 | 150,95 | 152,78 | 77  | 243,25 | 245,09 | 106 | 335,55 | 337,40 |
| 20 | 61,80  | 63,66  | 49 | 154,10 | 155,97 | 78  | 246,40 | 248,24 | 107 | 338,75 | 340,58 |
| 21 | 65,00  | 66,84  | 50 | 157,30 | 159,15 | 79  | 249,60 | 251,46 | 108 | 341,90 | 343,76 |
| 22 | 68,15  | 70,03  | 51 | 160,50 | 162,33 | 80  | 252,80 | 254,64 | 109 | 345,10 | 346,95 |
| 23 | 71,35  | 73,20  | 52 | 163,65 | 165,52 | 81  | 255,95 | 257,82 | 110 | 348,30 | 350,13 |
| 24 | 74,55  | 76,39  | 53 | 166,85 | 168,70 | 82  | 259,15 | 261,00 | 111 | 351,45 | 353,31 |
| 25 | 77,70  | 79,58  | 54 | 170,05 | 171,88 | 83  | 262,30 | 264,19 | 112 | 354,65 | 356,50 |
| 26 | 80,90  | 82,76  | 55 | 173,20 | 175,06 | 84  | 265,50 | 267,37 | 113 | 357,80 | 359,68 |
| 27 | 84,10  | 85,95  | 56 | 176,40 | 178,25 | 85  | 268,70 | 270,52 | 114 | 361,00 | 362,86 |
| 28 | 87,25  | 89,12  | 57 | 179,60 | 181,43 | 86  | 271,90 | 273,74 | 115 | 364,19 | 366,04 |
| 29 | 90,45  | 92,21  | 58 | 182,75 | 184,61 | 87  | 275,05 | 276,92 | 116 | 367,39 | 369,23 |
| 30 | 93,65  | 95,49  | 59 | 185,95 | 187,80 | 88  | 278,25 | 280,10 | 117 | 370,56 | 372,41 |
| 31 | 96,80  | 98,67  | 60 | 189,10 | 190,98 | 89  | 281,45 | 283,28 | 118 | 373,74 | 375,59 |
| 32 | 100,00 | 101,86 | 61 | 192,30 | 194,16 | 90  | 284,60 | 286,47 | 119 | 376,93 | 378,78 |
| 33 | 103,20 | 105,04 | 62 | 195,50 | 197,35 | 91  | 287,80 | 289,65 | 120 | 380,11 | 381,96 |
| 34 | 106,40 | 108,19 | 63 | 198,65 | 200,53 | 92  | 291,00 | 292,84 |     |        |        |
| 35 | 109,55 | 111,41 | 64 | 201,85 | 203,71 | 93  | 294,20 | 296,02 |     |        |        |
| 36 | 112,75 | 114,59 | 65 | 205,05 | 206,90 | 94  | 297,35 | 299,20 |     |        |        |
| 37 | 115,90 | 117,77 | 66 | 208,20 | 210,08 | 95  | 300,55 | 302,39 |     |        |        |
| 38 | 119,10 | 120,95 | 67 | 211,40 | 213,26 | 96  | 303,70 | 305,57 |     |        |        |
| 39 | 122,30 | 124,14 | 68 | 214,60 | 216,44 | 97  | 306,90 | 308,75 |     |        |        |
| 40 | 125,45 | 127,32 | 69 | 217,75 | 219,63 | 98  | 310,10 | 311,93 |     |        |        |
| 41 | 128,65 | 130,50 | 70 | 220,95 | 222,81 | 99  | 313,25 | 315,12 |     |        |        |
| 42 | 131,85 | 133,69 | 71 | 224,15 | 225,99 | 100 | 316,45 | 318,30 |     |        |        |
| 43 | 135,00 | 136,87 | 72 | 227,30 | 229,18 | 101 | 319,65 | 321,48 |     |        |        |
| 44 | 138,20 | 140,05 | 73 | 230,50 | 232,33 | 102 | 322,80 | 324,66 |     |        |        |
| 45 | 141,40 | 143,24 | 74 | 233,70 | 235,54 | 103 | 326,00 | 327,85 |     |        |        |
| 46 | 144,55 | 146,42 | 75 | 236,90 | 238,72 | 104 | 329,20 | 331,03 |     |        |        |



## AT20



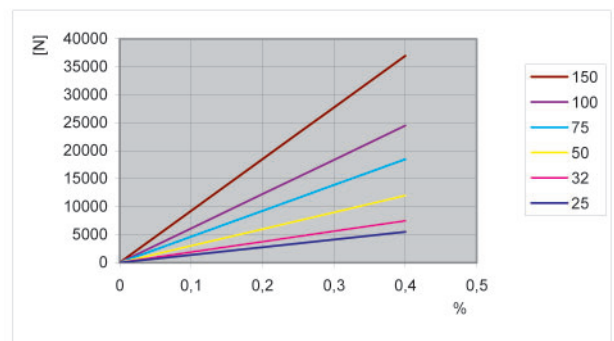
### Belt characteristics

- Polyurethane timing belt with steel tension cords.
  - Metric pitch 20 mm
  - Tooth profile and dimension are optimised to guarantee uniform load distribution and minimum deformation under load.
  - High resistance and low stretch steel cords to guarantee high stability and low elongation
  - Reduced polygonal effect with reduced drive vibration.
  - Particularly suitable for linear drives and heavy power transmission applications with high axial and angular positioning accuracy.
- Width tolerance:  $\pm 1,0$  [mm]
  - Length tolerance:  $\pm 0,5$  [mm/m]
  - Thickness tolerance:  $\pm 0,4$  [mm]

### Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 25                      | 5500                                                     | 2750                                                     | 19030                                         | 1375000                                      | 0,24             |
| 32                      | 7500                                                     | 3750                                                     | 25950                                         | 1875000                                      | 0,31             |
| 50                      | 12000                                                    | 6000                                                     | 41520                                         | 3000000                                      | 0,48             |
| 75                      | 18500                                                    | 9250                                                     | 64010                                         | 4625000                                      | 0,73             |
| 100                     | 24500                                                    | 12250                                                    | 84770                                         | 6125000                                      | 0,97             |
| 150                     | 37000                                                    | 18500                                                    | 128020                                        | 9250000                                      | 1,45             |

### Load / Elongation [ % ]

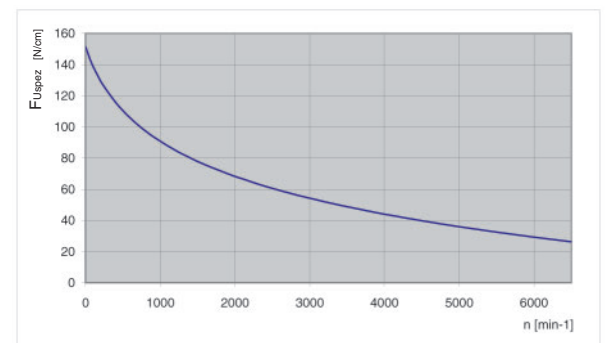


Other widths are available on request.

### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|
| 0   | 151,40                | 800  | 97,44                 | 1900 | 69,96                 | 4500 | 39,72                 |
| 20  | 148,56                | 900  | 93,93                 | 2000 | 68,22                 | 5000 | 35,90                 |
| 40  | 145,89                | 1000 | 90,73                 | 2200 | 64,97                 | 5500 | 32,42                 |
| 60  | 143,38                | 1100 | 87,77                 | 2400 | 61,98                 | 6000 | 29,23                 |
| 80  | 141,01                | 1200 | 85,02                 | 2600 | 59,20                 | 6500 | 26,29                 |
| 100 | 138,78                | 1300 | 82,47                 | 2800 | 56,62                 |      |                       |
| 200 | 129,43                | 1400 | 80,07                 | 3000 | 54,20                 |      |                       |
| 300 | 122,28                | 1440 | 79,16                 | 3200 | 51,92                 |      |                       |
| 400 | 115,96                | 1500 | 77,82                 | 3400 | 49,77                 |      |                       |
| 500 | 110,45                | 1600 | 75,70                 | 3600 | 47,74                 |      |                       |
| 600 | 105,61                | 1700 | 73,69                 | 3800 | 45,80                 |      |                       |
| 700 | 101,31                | 1800 | 71,77                 | 4000 | 43,96                 |      |                       |

### Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

= max. no of teeth in mesh to be considered for the calculation of the drive

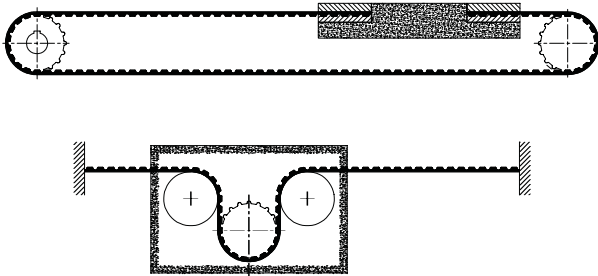
= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm



## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

- Timing pulley  $z_{\min} = 18$
- Idler running on belt teeth  $d_{\min} = 120 \text{ mm}$

Drive with reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 180 \text{ mm}$

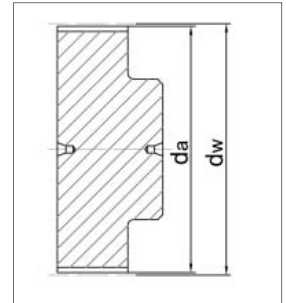
## Timing pulleys

| z  | da     | dw     |
|----|--------|--------|
| 18 | 111,75 | 114,59 |
| 19 | 118,10 | 120,95 |
| 20 | 124,50 | 127,32 |
| 21 | 130,75 | 133,69 |
| 22 | 137,20 | 140,05 |
| 23 | 143,55 | 146,42 |
| 24 | 149,95 | 152,78 |
| 25 | 156,30 | 159,15 |
| 26 | 162,65 | 165,52 |
| 27 | 169,05 | 171,88 |
| 28 | 175,40 | 178,25 |
| 29 | 181,75 | 184,62 |
| 30 | 188,15 | 190,99 |
| 31 | 194,50 | 197,35 |
| 32 | 200,85 | 203,72 |
| 33 | 207,20 | 210,09 |
| 34 | 213,60 | 216,44 |
| 35 | 219,95 | 222,81 |
| 36 | 226,35 | 229,18 |
| 37 | 232,70 | 235,54 |
| 38 | 239,05 | 241,91 |
| 39 | 245,45 | 248,27 |
| 40 | 251,80 | 254,64 |
| 41 | 258,15 | 261,01 |
| 42 | 264,50 | 267,37 |
| 43 | 270,90 | 273,74 |
| 44 | 277,25 | 280,10 |
| 45 | 283,60 | 286,47 |
| 46 | 290,00 | 292,84 |

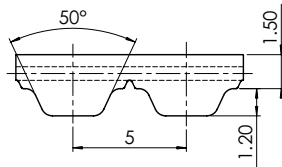
| z  | da     | dw     |
|----|--------|--------|
| 47 | 296,35 | 299,21 |
| 48 | 302,70 | 305,58 |
| 49 | 309,10 | 311,93 |
| 50 | 315,45 | 318,30 |
| 51 | 321,80 | 324,67 |
| 52 | 328,20 | 331,03 |
| 53 | 334,55 | 337,40 |
| 54 | 340,90 | 343,76 |
| 55 | 347,30 | 350,13 |
| 56 | 353,65 | 356,50 |
| 57 | 360,00 | 362,86 |
| 58 | 366,40 | 369,23 |
| 59 | 372,75 | 375,59 |
| 60 | 379,10 | 381,96 |
| 61 | 385,45 | 388,33 |
| 62 | 391,85 | 394,69 |
| 63 | 398,20 | 401,06 |
| 64 | 404,55 | 407,43 |
| 65 | 410,95 | 413,79 |
| 66 | 417,30 | 420,16 |
| 67 | 423,65 | 426,52 |
| 68 | 430,05 | 432,89 |
| 69 | 436,40 | 439,26 |
| 70 | 442,80 | 445,63 |
| 71 | 449,15 | 451,99 |
| 72 | 455,50 | 458,36 |
| 73 | 461,85 | 464,73 |
| 74 | 468,25 | 471,08 |
| 75 | 474,60 | 477,45 |

| z   | da     | dw     |
|-----|--------|--------|
| 76  | 480,95 | 483,82 |
| 77  | 487,35 | 490,19 |
| 78  | 493,70 | 496,56 |
| 79  | 500,05 | 502,91 |
| 80  | 506,45 | 509,28 |
| 81  | 512,80 | 515,65 |
| 82  | 519,15 | 522,02 |
| 83  | 525,55 | 528,39 |
| 84  | 531,90 | 534,74 |
| 85  | 538,25 | 541,11 |
| 86  | 544,60 | 547,48 |
| 87  | 551,00 | 553,85 |
| 88  | 557,35 | 560,22 |
| 89  | 563,70 | 566,57 |
| 90  | 570,10 | 572,94 |
| 91  | 576,45 | 579,31 |
| 92  | 582,85 | 585,67 |
| 93  | 589,20 | 592,04 |
| 94  | 595,55 | 598,40 |
| 95  | 601,90 | 604,77 |
| 96  | 608,30 | 611,14 |
| 97  | 614,65 | 617,50 |
| 98  | 621,00 | 623,87 |
| 99  | 627,35 | 630,24 |
| 100 | 633,75 | 636,60 |
| 101 | 640,10 | 642,97 |
| 102 | 646,50 | 649,34 |
| 103 | 652,85 | 655,71 |
| 104 | 659,20 | 662,06 |

| z   | da     | dw     |
|-----|--------|--------|
| 105 | 665,60 | 668,43 |
| 106 | 671,95 | 674,80 |
| 107 | 678,30 | 681,17 |
| 108 | 684,70 | 687,54 |
| 109 | 691,05 | 693,89 |
| 110 | 697,40 | 700,26 |
| 111 | 703,80 | 706,63 |
| 112 | 710,15 | 712,99 |
| 113 | 716,50 | 719,36 |
| 114 | 722,90 | 725,72 |
| 115 | 729,24 | 732,09 |
| 116 | 735,61 | 738,46 |
| 117 | 741,96 | 744,83 |
| 118 | 748,34 | 751,19 |
| 119 | 754,70 | 757,56 |
| 120 | 761,07 | 763,93 |



## ATL5



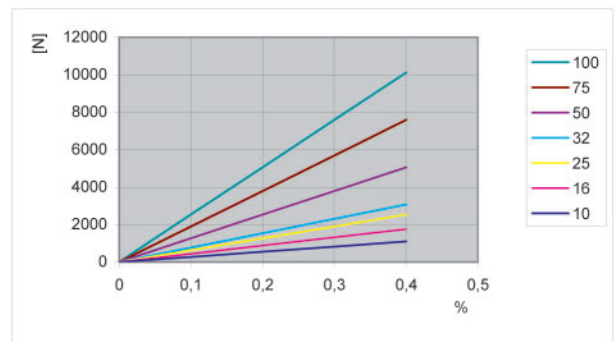
### Belt characteristics

- High performance polyurethane timing belt with HPL steel tension cords.
- Metric pitch 5,0 mm
- Specially designed for linear drives
- Tension cords with increased allowable tensile load compared to standard for lower elongation.
- Produced with special pretension and pitch tolerance to guarantee high positioning precision in linear drives.
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 10                      | 1100                                                     | 4000                                          | 275000                                       | 0,04             |
| 16                      | 1760                                                     | 6400                                          | 440000                                       | 0,06             |
| 25                      | 2530                                                     | 9200                                          | 632500                                       | 0,10             |
| 32                      | 3080                                                     | 11200                                         | 770000                                       | 0,12             |
| 50                      | 5060                                                     | 18400                                         | 1265000                                      | 0,19             |
| 75                      | 7590                                                     | 27600                                         | 1897500                                      | 0,29             |
| 100                     | 10120                                                    | 36800                                         | 2530000                                      | 0,38             |

Load / Elongation [ % ]

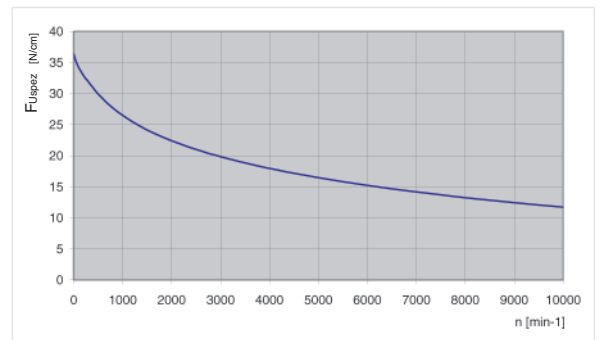


Other widths are available on request.

### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 36,40                 | 800  | 27,69                 | 1900 | 22,73                 | 4500  | 17,18                 |
| 20  | 35,88                 | 900  | 27,06                 | 2000 | 22,42                 | 5000  | 16,47                 |
| 40  | 35,40                 | 1000 | 26,49                 | 2200 | 21,82                 | 5500  | 15,83                 |
| 60  | 34,97                 | 1100 | 25,96                 | 2400 | 21,28                 | 6000  | 15,24                 |
| 80  | 34,59                 | 1200 | 25,47                 | 2600 | 20,77                 | 6500  | 14,69                 |
| 100 | 34,24                 | 1300 | 25,01                 | 2800 | 20,29                 | 7000  | 14,18                 |
| 200 | 32,92                 | 1400 | 24,57                 | 3000 | 19,85                 | 7500  | 13,71                 |
| 300 | 31,92                 | 1440 | 24,41                 | 3200 | 19,43                 | 8000  | 13,26                 |
| 400 | 30,89                 | 1500 | 24,16                 | 3400 | 19,03                 | 8500  | 12,85                 |
| 500 | 29,95                 | 1600 | 23,78                 | 3600 | 18,66                 | 9000  | 12,45                 |
| 600 | 29,12                 | 1700 | 23,41                 | 3800 | 18,30                 | 9500  | 12,07                 |
| 700 | 28,37                 | 1800 | 23,07                 | 4000 | 17,96                 | 10000 | 11,72                 |

Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_U$  transmissible by the belt in the drive is calculated by:

$$F_U [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_U$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

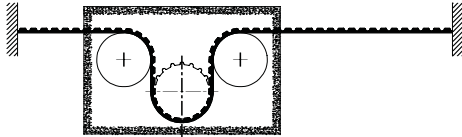
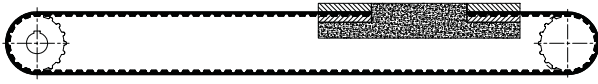
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

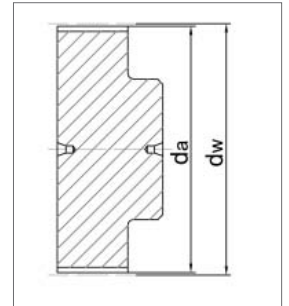
- Timing pulley  $z_{\min} = 25$
- Idler running on belt teeth  $d_{\min} = 40 \text{ mm}$

Drive with reverse bending

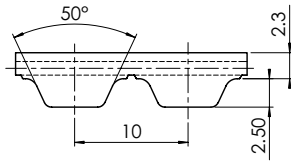
- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 60 \text{ mm}$

## Timing pulleys

| z  | d <sub>a</sub> | d <sub>w</sub> | z  | d <sub>a</sub> | d <sub>w</sub> | z   | d <sub>a</sub> | d <sub>w</sub> | z   | d <sub>a</sub> | d <sub>w</sub> |
|----|----------------|----------------|----|----------------|----------------|-----|----------------|----------------|-----|----------------|----------------|
| 15 | 22,65          | 23,88          | 44 | 68,80          | 70,05          | 73  | 114,95         | 116,22         | 102 | 161,15         | 162,38         |
| 16 | 24,20          | 25,47          | 45 | 70,40          | 71,64          | 74  | 116,55         | 117,81         | 103 | 162,70         | 163,97         |
| 17 | 25,80          | 27,06          | 46 | 72,00          | 73,23          | 75  | 118,15         | 119,40         | 104 | 164,30         | 165,57         |
| 18 | 27,40          | 28,65          | 47 | 73,55          | 74,82          | 76  | 119,75         | 120,99         | 105 | 165,90         | 167,16         |
| 19 | 29,00          | 30,25          | 48 | 75,15          | 76,42          | 77  | 121,35         | 122,58         | 106 | 167,50         | 168,75         |
| 20 | 30,60          | 31,83          | 49 | 76,75          | 78,01          | 78  | 122,90         | 124,18         | 107 | 169,10         | 170,34         |
| 21 | 32,20          | 33,43          | 50 | 78,35          | 79,60          | 79  | 124,50         | 125,77         | 108 | 170,70         | 171,94         |
| 22 | 33,80          | 35,02          | 51 | 79,95          | 81,19          | 80  | 126,10         | 127,36         | 109 | 172,25         | 173,53         |
| 23 | 35,40          | 36,62          | 52 | 81,55          | 82,78          | 81  | 127,70         | 128,95         | 110 | 173,85         | 175,12         |
| 24 | 37,00          | 38,21          | 53 | 83,10          | 84,38          | 82  | 129,30         | 130,54         | 111 | 175,45         | 176,71         |
| 25 | 38,60          | 39,80          | 54 | 84,70          | 85,97          | 83  | 130,90         | 132,14         | 112 | 177,05         | 178,30         |
| 26 | 40,20          | 41,39          | 55 | 86,30          | 87,54          | 84  | 132,45         | 133,73         | 113 | 178,65         | 179,84         |
| 27 | 41,80          | 42,98          | 56 | 87,90          | 89,15          | 85  | 134,05         | 135,32         | 114 | 180,25         | 181,49         |
| 28 | 43,35          | 44,58          | 57 | 89,50          | 90,74          | 86  | 135,65         | 136,91         | 115 | 181,85         | 183,08         |
| 29 | 44,95          | 46,17          | 58 | 91,10          | 92,34          | 87  | 137,25         | 138,50         | 116 | 183,45         | 184,67         |
| 30 | 46,55          | 47,76          | 59 | 92,65          | 93,93          | 88  | 138,85         | 140,10         | 117 | 185,00         | 186,26         |
| 31 | 48,15          | 49,35          | 60 | 94,25          | 95,52          | 89  | 140,45         | 141,69         | 118 | 186,60         | 187,86         |
| 32 | 49,70          | 50,94          | 61 | 95,85          | 97,11          | 90  | 142,05         | 143,28         | 119 | 188,20         | 189,45         |
| 33 | 51,30          | 52,54          | 62 | 97,45          | 98,70          | 91  | 143,60         | 144,87         | 120 | 189,80         | 191,04         |
| 34 | 52,85          | 54,13          | 63 | 99,05          | 100,30         | 92  | 145,20         | 146,46         |     |                |                |
| 35 | 54,45          | 55,72          | 64 | 100,65         | 101,89         | 93  | 146,80         | 148,06         |     |                |                |
| 36 | 56,05          | 57,31          | 65 | 102,25         | 103,48         | 94  | 148,40         | 149,65         |     |                |                |
| 37 | 57,65          | 58,90          | 66 | 103,80         | 105,07         | 95  | 150,00         | 151,24         |     |                |                |
| 38 | 59,25          | 60,50          | 67 | 105,40         | 106,66         | 96  | 151,60         | 152,83         |     |                |                |
| 39 | 60,85          | 62,09          | 68 | 107,00         | 108,26         | 97  | 153,15         | 154,42         |     |                |                |
| 40 | 62,45          | 63,66          | 69 | 108,60         | 109,85         | 98  | 154,75         | 156,02         |     |                |                |
| 41 | 64,00          | 65,27          | 70 | 110,20         | 111,44         | 99  | 156,35         | 157,61         |     |                |                |
| 42 | 65,60          | 66,86          | 71 | 111,80         | 113,03         | 100 | 157,95         | 159,20         |     |                |                |
| 43 | 67,30          | 68,46          | 72 | 113,35         | 114,62         | 101 | 159,55         | 160,79         |     |                |                |



## ATL10



### Belt characteristics

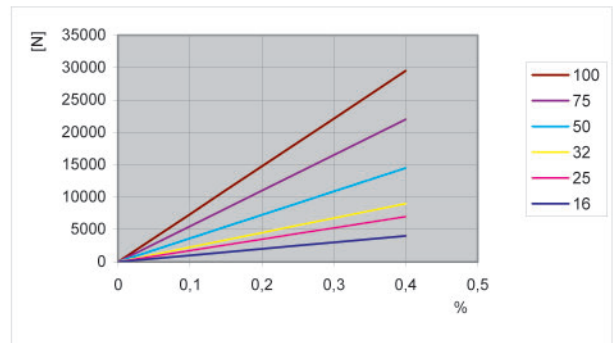
- High performance polyurethane timing belt with HPL steel tension cords.
- Metric pitch 10 mm
- Specially designed for linear drives
- Tension cords with increased allowable tensile load compared to standard for lower elongation.
- Produced with special pretension and pitch tolerance to guarantee high positioning precision in linear drives.
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 16                      | 4000                                                     | 13840                                         | 1000000                                      | 0,11             |
| 25                      | 7000                                                     | 24220                                         | 1750000                                      | 0,17             |
| 32                      | 9000                                                     | 31140                                         | 2250000                                      | 0,22             |
| 50                      | 14500                                                    | 50170                                         | 3625000                                      | 0,35             |
| 75                      | 22000                                                    | 76120                                         | 5500000                                      | 0,52             |
| 100                     | 29500                                                    | 102070                                        | 7375000                                      | 0,69             |

Other widths are available on request.

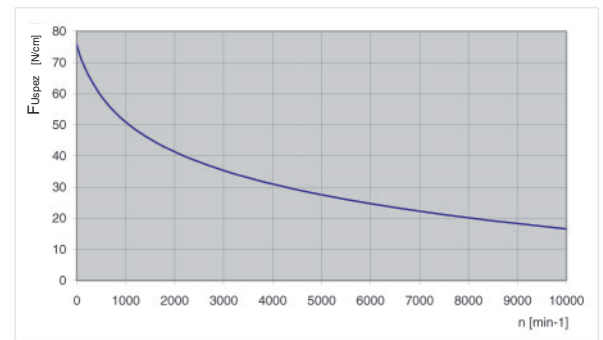
### Load / Elongation [ % ]



### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 75,70                 | 800  | 53,70                 | 1900 | 42,02                 | 4500  | 29,13                 |
| 20  | 74,59                 | 900  | 52,21                 | 2000 | 41,28                 | 5000  | 27,50                 |
| 40  | 73,55                 | 1000 | 50,85                 | 2200 | 39,89                 | 5500  | 26,01                 |
| 60  | 72,57                 | 1100 | 49,59                 | 2400 | 38,62                 | 6000  | 24,65                 |
| 80  | 71,65                 | 1200 | 48,43                 | 2600 | 37,44                 | 6500  | 23,40                 |
| 100 | 70,78                 | 1300 | 47,34                 | 2800 | 36,33                 | 7000  | 22,23                 |
| 200 | 67,13                 | 1400 | 46,32                 | 3000 | 35,30                 | 7500  | 21,14                 |
| 300 | 64,18                 | 1440 | 45,93                 | 3200 | 34,33                 | 8000  | 20,12                 |
| 400 | 61,53                 | 1500 | 45,36                 | 3400 | 33,41                 | 8500  | 19,15                 |
| 500 | 59,21                 | 1600 | 44,46                 | 3600 | 32,55                 | 9000  | 18,24                 |
| 600 | 57,16                 | 1700 | 43,60                 | 3800 | 31,72                 | 9500  | 17,38                 |
| 700 | 55,34                 | 1800 | 42,79                 | 4000 | 30,94                 | 10000 | 16,56                 |

### Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

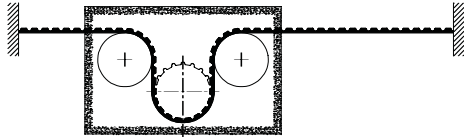
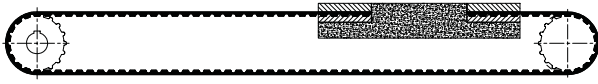
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

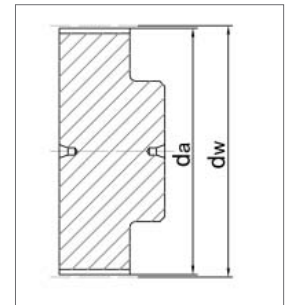
- Timing pulley  $z_{\min} = 25$
- Idler running on belt teeth  $d_{\min} = 80 \text{ mm}$

Drive with reverse bending

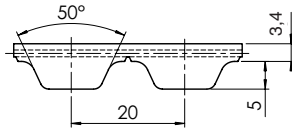
- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 150 \text{ mm}$

## Timing pulleys

| z  | d <sub>a</sub> | d <sub>w</sub> | z  | d <sub>a</sub> | d <sub>w</sub> | z   | d <sub>a</sub> | d <sub>w</sub> | z   | d <sub>a</sub> | d <sub>w</sub> |
|----|----------------|----------------|----|----------------|----------------|-----|----------------|----------------|-----|----------------|----------------|
| 18 | 55,45          | 57,29          | 47 | 147,75         | 149,60         | 76  | 240,05         | 241,94         | 105 | 332,35         | 334,21         |
| 19 | 58,60          | 60,48          | 48 | 150,95         | 152,78         | 77  | 243,25         | 245,09         | 106 | 335,55         | 337,40         |
| 20 | 61,80          | 63,66          | 49 | 154,10         | 155,97         | 78  | 246,40         | 248,24         | 107 | 338,75         | 340,58         |
| 21 | 65,00          | 66,84          | 50 | 157,30         | 159,15         | 79  | 249,60         | 251,46         | 108 | 341,90         | 343,76         |
| 22 | 68,15          | 70,03          | 51 | 160,50         | 162,33         | 80  | 252,80         | 254,64         | 109 | 345,10         | 346,95         |
| 23 | 71,35          | 73,20          | 52 | 163,65         | 165,52         | 81  | 255,95         | 257,82         | 110 | 348,30         | 350,13         |
| 24 | 74,55          | 76,39          | 53 | 166,85         | 168,70         | 82  | 259,15         | 261,00         | 111 | 351,45         | 353,31         |
| 25 | 77,70          | 79,58          | 54 | 170,05         | 171,88         | 83  | 262,30         | 264,19         | 112 | 354,65         | 356,50         |
| 26 | 80,90          | 82,76          | 55 | 173,20         | 175,06         | 84  | 265,50         | 267,37         | 113 | 357,80         | 359,68         |
| 27 | 84,10          | 85,95          | 56 | 176,40         | 178,25         | 85  | 268,70         | 270,52         | 114 | 361,00         | 362,86         |
| 28 | 87,25          | 89,12          | 57 | 179,60         | 181,43         | 86  | 271,90         | 273,74         | 115 | 364,19         | 366,04         |
| 29 | 90,45          | 92,21          | 58 | 182,75         | 184,61         | 87  | 275,05         | 276,92         | 116 | 367,39         | 369,23         |
| 30 | 93,65          | 95,49          | 59 | 185,95         | 187,80         | 88  | 278,25         | 280,10         | 117 | 370,56         | 372,41         |
| 31 | 96,80          | 98,67          | 60 | 189,10         | 190,98         | 89  | 281,45         | 283,28         | 118 | 373,74         | 375,59         |
| 32 | 100,00         | 101,86         | 61 | 192,30         | 194,16         | 90  | 284,60         | 286,47         | 119 | 376,93         | 378,78         |
| 33 | 103,20         | 105,04         | 62 | 195,50         | 197,35         | 91  | 287,80         | 289,65         | 120 | 380,11         | 381,96         |
| 34 | 106,40         | 108,19         | 63 | 198,65         | 200,53         | 92  | 291,00         | 292,84         |     |                |                |
| 35 | 109,55         | 111,41         | 64 | 201,85         | 203,71         | 93  | 294,20         | 296,02         |     |                |                |
| 36 | 112,75         | 114,59         | 65 | 205,05         | 206,90         | 94  | 297,35         | 299,20         |     |                |                |
| 37 | 115,90         | 117,77         | 66 | 208,20         | 210,08         | 95  | 300,55         | 302,39         |     |                |                |
| 38 | 119,10         | 120,95         | 67 | 211,40         | 213,26         | 96  | 303,70         | 305,57         |     |                |                |
| 39 | 122,30         | 124,14         | 68 | 214,60         | 216,44         | 97  | 306,90         | 308,75         |     |                |                |
| 40 | 125,45         | 127,32         | 69 | 217,75         | 219,63         | 98  | 310,10         | 311,93         |     |                |                |
| 41 | 128,65         | 130,50         | 70 | 220,95         | 222,81         | 99  | 313,25         | 315,12         |     |                |                |
| 42 | 131,85         | 133,69         | 71 | 224,15         | 225,99         | 100 | 316,45         | 318,30         |     |                |                |
| 43 | 135,00         | 136,87         | 72 | 227,30         | 229,18         | 101 | 319,65         | 321,48         |     |                |                |
| 44 | 138,20         | 140,05         | 73 | 230,50         | 232,33         | 102 | 322,80         | 324,66         |     |                |                |
| 45 | 141,40         | 143,24         | 74 | 233,70         | 235,54         | 103 | 326,00         | 327,85         |     |                |                |
| 46 | 144,55         | 146,42         | 75 | 236,90         | 238,72         | 104 | 329,20         | 331,03         |     |                |                |



## ATL20



### Belt characteristics

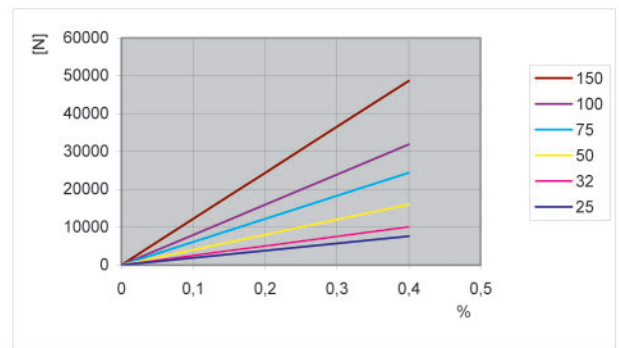
- High performance polyurethane timing belt with HPL steel tension cords.
- Metric pitch 20 mm
- Specially designed for linear drives
- Tension cords with increased allowable tensile load compared to standard for lower elongation.
- Produced with special pretension and pitch tolerance to guarantee high positioning precision in linear drives.
- Width tolerance:  $\pm 1,0$  [mm]
- Thickness tolerance:  $\pm 0,4$  [mm]

### Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 25                      | 7600                                                     | 29700                                         | 1890000                                      | 0,28             |
| 32                      | 10100                                                    | 39600                                         | 2520000                                      | 0,36             |
| 50                      | 16000                                                    | 62700                                         | 3990000                                      | 0,56             |
| 75                      | 24400                                                    | 95700                                         | 6090000                                      | 0,84             |
| 100                     | 31900                                                    | 125400                                        | 7980000                                      | 1,12             |
| 150                     | 48700                                                    | 191400                                        | 12180000                                     | 1,68             |

Other widths are available on request.

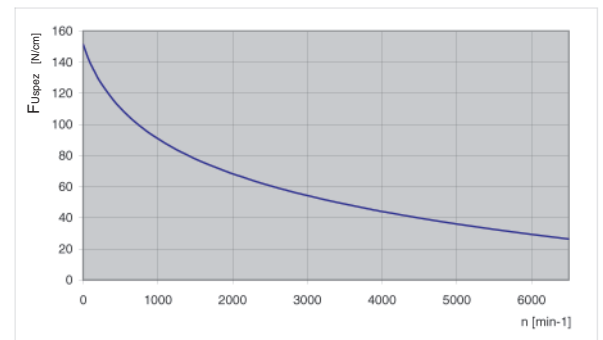
### Load / Elongation [ % ]



### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 151,40                | 800  | 97,44                 | 1900 | 69,96                 | 4500  | 39,72                 |
| 20  | 148,56                | 900  | 93,93                 | 2000 | 68,22                 | 5000  | 35,90                 |
| 40  | 145,89                | 1000 | 90,73                 | 2200 | 64,97                 | 5500  | 32,42                 |
| 60  | 143,38                | 1100 | 87,77                 | 2400 | 61,98                 | 6000  | 29,23                 |
| 80  | 141,01                | 1200 | 85,02                 | 2600 | 59,20                 | 6500  | 26,29                 |
| 100 | 138,78                | 1300 | 82,47                 | 2800 | 56,62                 | 7000  |                       |
| 200 | 129,43                | 1400 | 80,07                 | 3000 | 54,20                 | 7500  |                       |
| 300 | 122,28                | 1440 | 79,16                 | 3200 | 51,92                 | 8000  |                       |
| 400 | 115,96                | 1500 | 77,82                 | 3400 | 49,77                 | 8500  |                       |
| 500 | 110,45                | 1600 | 75,70                 | 3600 | 47,74                 | 9000  |                       |
| 600 | 105,61                | 1700 | 73,69                 | 3800 | 45,80                 | 9500  |                       |
| 700 | 101,31                | 1800 | 71,77                 | 4000 | 43,96                 | 10000 |                       |

### Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_U$  transmissible by the belt in the drive is calculated by:

$$F_U [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_U$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

= max. no of teeth in mesh to be considered for the calculation of the drive

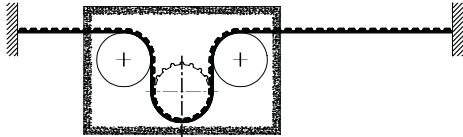
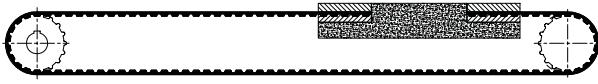
= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm



## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

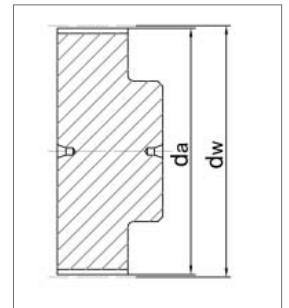
- Timing pulley  $z_{\min} = 25$
- Idler running on belt teeth  $d_{\min} = 160 \text{ mm}$

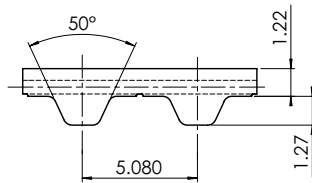
Drive with reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 250 \text{ mm}$

## Timing pulleys

| z  | d <sub>a</sub> | d <sub>w</sub> | z  | d <sub>a</sub> | d <sub>w</sub> | z   | d <sub>a</sub> | d <sub>w</sub> | z   | d <sub>a</sub> | d <sub>w</sub> |
|----|----------------|----------------|----|----------------|----------------|-----|----------------|----------------|-----|----------------|----------------|
| 18 | 111,75         | 114,59         | 47 | 296,35         | 299,21         | 76  | 480,95         | 483,82         | 105 | 665,60         | 668,43         |
| 19 | 118,10         | 120,95         | 48 | 302,70         | 305,58         | 77  | 487,35         | 490,19         | 106 | 671,95         | 674,80         |
| 20 | 124,50         | 127,32         | 49 | 309,10         | 311,93         | 78  | 493,70         | 496,56         | 107 | 678,30         | 681,17         |
| 21 | 130,75         | 133,69         | 50 | 315,45         | 318,30         | 79  | 500,05         | 502,91         | 108 | 684,70         | 687,54         |
| 22 | 137,20         | 140,05         | 51 | 321,80         | 324,67         | 80  | 506,45         | 509,28         | 109 | 691,05         | 693,89         |
| 23 | 143,55         | 146,42         | 52 | 328,20         | 331,03         | 81  | 512,80         | 515,65         | 110 | 697,40         | 700,26         |
| 24 | 149,95         | 152,78         | 53 | 334,55         | 337,40         | 82  | 519,15         | 522,02         | 111 | 703,80         | 706,63         |
| 25 | 156,30         | 159,15         | 54 | 340,90         | 343,76         | 83  | 525,55         | 528,39         | 112 | 710,15         | 712,99         |
| 26 | 162,65         | 165,52         | 55 | 347,30         | 350,13         | 84  | 531,90         | 534,74         | 113 | 716,50         | 719,36         |
| 27 | 169,05         | 171,88         | 56 | 353,65         | 356,50         | 85  | 538,25         | 541,11         | 114 | 722,90         | 725,72         |
| 28 | 175,40         | 178,25         | 57 | 360,00         | 362,86         | 86  | 544,60         | 547,48         | 115 | 729,24         | 732,09         |
| 29 | 181,75         | 184,62         | 58 | 366,40         | 369,23         | 87  | 551,00         | 553,85         | 116 | 735,61         | 738,46         |
| 30 | 188,15         | 190,99         | 59 | 372,75         | 375,59         | 88  | 557,35         | 560,22         | 117 | 741,96         | 744,83         |
| 31 | 194,50         | 197,35         | 60 | 379,10         | 381,96         | 89  | 563,70         | 566,57         | 118 | 748,34         | 751,19         |
| 32 | 200,85         | 203,72         | 61 | 385,45         | 388,33         | 90  | 570,10         | 572,94         | 119 | 754,70         | 757,56         |
| 33 | 207,20         | 210,09         | 62 | 391,85         | 394,69         | 91  | 576,45         | 579,31         | 120 | 761,07         | 763,93         |
| 34 | 213,60         | 216,44         | 63 | 398,20         | 401,06         | 92  | 582,85         | 585,67         |     |                |                |
| 35 | 219,95         | 222,81         | 64 | 404,55         | 407,43         | 93  | 589,20         | 592,04         |     |                |                |
| 36 | 226,35         | 229,18         | 65 | 410,95         | 413,79         | 94  | 595,55         | 598,40         |     |                |                |
| 37 | 232,70         | 235,54         | 66 | 417,30         | 420,16         | 95  | 601,90         | 604,77         |     |                |                |
| 38 | 239,05         | 241,91         | 67 | 423,65         | 426,52         | 96  | 608,30         | 611,14         |     |                |                |
| 39 | 245,45         | 248,27         | 68 | 430,05         | 432,89         | 97  | 614,65         | 617,50         |     |                |                |
| 40 | 251,80         | 254,64         | 69 | 436,40         | 439,26         | 98  | 621,00         | 623,87         |     |                |                |
| 41 | 258,15         | 261,01         | 70 | 442,80         | 445,63         | 99  | 627,35         | 630,24         |     |                |                |
| 42 | 264,50         | 267,37         | 71 | 449,15         | 451,99         | 100 | 633,75         | 636,60         |     |                |                |
| 43 | 270,90         | 273,74         | 72 | 455,50         | 458,36         | 101 | 640,10         | 642,97         |     |                |                |
| 44 | 277,25         | 280,10         | 73 | 461,85         | 464,73         | 102 | 646,50         | 649,34         |     |                |                |
| 45 | 283,60         | 286,47         | 74 | 468,25         | 471,08         | 103 | 652,85         | 655,71         |     |                |                |
| 46 | 290,00         | 292,84         | 75 | 474,60         | 477,45         | 104 | 659,20         | 662,06         |     |                |                |



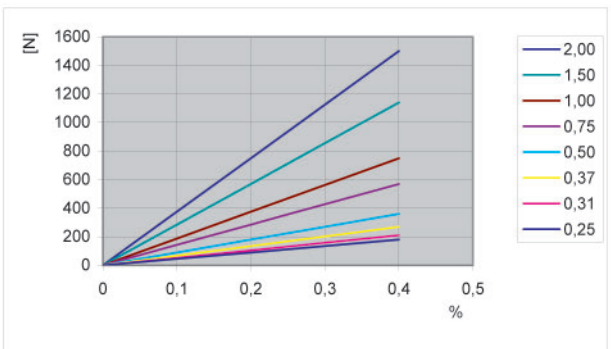

**Belt characteristics**

- Polyurethane timing belt with trapezoidal tooth profile according to DIN/ISO 5296 with steel tension cords.
- Imperial pitch 1/5" = 5,08 mm
- Allow to use small diameter pulley.
- Mainly used in applications where inch pitch is an advantage (USA / UK)
- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

**Technical data**

| Belt width<br>b<br>Code /mm | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-----------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 025 / 6,35                  | 180                                                      | 90                                                       | 750                                           | 45000                                        | 0,015            |
| 031 / 7,94                  | 210                                                      | 105                                                      | 875                                           | 52500                                        | 0,019            |
| 037 / 9,53                  | 270                                                      | 135                                                      | 1125                                          | 67500                                        | 0,023            |
| 050 / 12,7                  | 360                                                      | 180                                                      | 1500                                          | 90000                                        | 0,031            |
| 075 / 19,1                  | 570                                                      | 285                                                      | 2375                                          | 142500                                       | 0,046            |
| 100 / 25,4                  | 750                                                      | 375                                                      | 3125                                          | 187500                                       | 0,061            |
| 150 / 38,1                  | 1140                                                     | 570                                                      | 4750                                          | 285000                                       | 0,092            |
| 200 / 50,8                  | 1500                                                     | 750                                                      | 6250                                          | 375000                                       | 0,122            |

Other widths are available on request.

**Load / Elongation [ % ]**

**Tooth shear strength**

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 25,10                 | 800  | 17,32                 | 1900 | 14,46                 | 4500  | 11,45                 |
| 20  | 24,46                 | 900  | 16,94                 | 2000 | 14,28                 | 5000  | 11,08                 |
| 40  | 23,90                 | 1000 | 16,60                 | 2200 | 13,96                 | 5500  | 10,74                 |
| 60  | 23,42                 | 1100 | 16,29                 | 2400 | 13,66                 | 6000  | 10,43                 |
| 80  | 23,00                 | 1200 | 16,01                 | 2600 | 13,38                 | 6500  | 10,14                 |
| 100 | 22,63                 | 1300 | 15,74                 | 2800 | 13,12                 | 7000  | 9,87                  |
| 200 | 21,24                 | 1400 | 15,49                 | 3000 | 12,88                 | 7500  | 9,63                  |
| 300 | 20,22                 | 1440 | 15,40                 | 3200 | 12,65                 | 8000  | 9,39                  |
| 400 | 19,42                 | 1500 | 15,26                 | 3400 | 12,44                 | 8500  | 9,17                  |
| 500 | 18,77                 | 1600 | 15,04                 | 3600 | 12,24                 | 9000  | 8,97                  |
| 600 | 18,22                 | 1700 | 14,84                 | 3800 | 12,05                 | 9500  | 8,77                  |
| 700 | 17,74                 | 1800 | 14,64                 | 4000 | 11,87                 | 10000 | 8,59                  |

The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

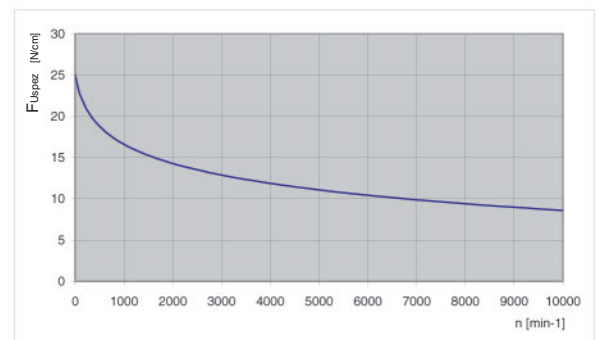
= number of teeth in mesh in the small pulley

= max. no of teeth in mesh to be considered for the calculation of the drive

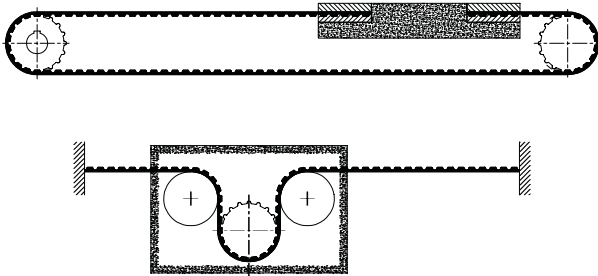
= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

**Tooth shear strenght / rpm**


## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

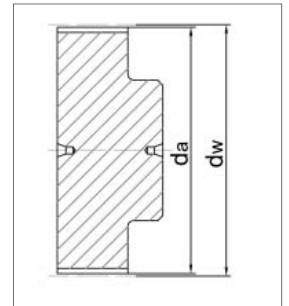
- Timing pulley  $z_{\min} = 10$
- Idler running on belt teeth  $d_{\min} = 30 \text{ mm}$

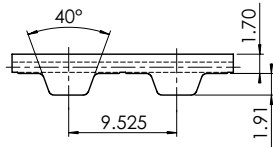
Drive with reverse bending

- Timing pulley  $z_{\min} = 15$
- Idler running on belt back  $d_{\min} = 30 \text{ mm}$

## Timing pulleys

| z  | da    | dw    | z  | da     | dw     | z  | da     | dw     | z   | da     | dw     |
|----|-------|-------|----|--------|--------|----|--------|--------|-----|--------|--------|
| 10 | 15,66 | 16,17 | 39 | 62,55  | 63,06  | 68 | 109,45 | 109,96 | 97  | 156,34 | 156,85 |
| 11 | 17,28 | 17,79 | 40 | 64,17  | 64,68  | 69 | 111,06 | 111,57 | 98  | 157,96 | 158,47 |
| 12 | 18,89 | 19,40 | 41 | 65,79  | 66,30  | 70 | 112,68 | 113,19 | 99  | 159,57 | 160,08 |
| 13 | 20,51 | 21,02 | 42 | 67,40  | 67,91  | 71 | 114,30 | 114,81 | 100 | 161,19 | 161,70 |
| 14 | 22,13 | 22,64 | 43 | 69,02  | 69,53  | 72 | 115,92 | 116,43 | 101 | 162,81 | 163,32 |
| 15 | 23,74 | 24,25 | 44 | 70,64  | 71,15  | 73 | 117,53 | 118,04 | 102 | 164,42 | 164,93 |
| 16 | 25,36 | 25,87 | 45 | 72,26  | 72,77  | 74 | 119,15 | 119,66 | 103 | 166,04 | 166,55 |
| 17 | 26,98 | 27,49 | 46 | 73,87  | 74,38  | 75 | 120,77 | 121,28 | 104 | 167,66 | 168,17 |
| 18 | 28,60 | 29,11 | 47 | 75,49  | 76,00  | 76 | 122,38 | 122,89 | 105 | 169,28 | 169,79 |
| 19 | 30,21 | 30,72 | 48 | 77,11  | 77,62  | 77 | 124,00 | 124,51 | 106 | 170,89 | 171,40 |
| 20 | 31,83 | 32,34 | 49 | 78,72  | 79,23  | 78 | 125,62 | 126,13 | 107 | 172,51 | 173,02 |
| 21 | 33,45 | 33,96 | 50 | 80,34  | 80,85  | 79 | 127,23 | 127,74 | 108 | 174,13 | 174,64 |
| 22 | 35,06 | 35,57 | 51 | 81,96  | 82,47  | 80 | 128,85 | 129,36 | 109 | 175,74 | 176,25 |
| 23 | 36,68 | 37,19 | 52 | 83,57  | 84,08  | 81 | 130,47 | 130,98 | 110 | 177,36 | 177,87 |
| 24 | 38,30 | 38,81 | 53 | 85,19  | 85,70  | 82 | 132,08 | 132,59 | 111 | 178,98 | 179,49 |
| 25 | 39,92 | 40,43 | 54 | 86,81  | 87,32  | 83 | 133,70 | 134,21 | 112 | 180,59 | 181,10 |
| 26 | 41,53 | 42,04 | 55 | 88,42  | 88,93  | 84 | 135,32 | 135,83 | 113 | 182,21 | 182,72 |
| 27 | 43,15 | 43,66 | 56 | 90,04  | 90,55  | 85 | 136,93 | 137,44 | 114 | 183,83 | 184,34 |
| 28 | 44,77 | 45,28 | 57 | 91,66  | 92,17  | 86 | 138,55 | 139,06 | 115 | 185,44 | 185,95 |
| 29 | 46,38 | 46,89 | 58 | 93,28  | 93,79  | 87 | 140,17 | 140,68 | 116 | 187,06 | 187,57 |
| 30 | 48,00 | 48,51 | 59 | 94,89  | 95,40  | 88 | 141,75 | 142,30 | 117 | 188,68 | 189,19 |
| 31 | 49,62 | 50,13 | 60 | 96,51  | 97,02  | 89 | 143,36 | 143,91 | 118 | 190,30 | 190,81 |
| 32 | 51,23 | 51,74 | 61 | 98,13  | 98,64  | 90 | 145,02 | 145,53 | 119 | 191,91 | 192,42 |
| 33 | 52,85 | 53,36 | 62 | 99,74  | 100,25 | 91 | 146,64 | 147,15 | 120 | 193,53 | 194,04 |
| 34 | 54,47 | 54,98 | 63 | 101,36 | 101,87 | 92 | 148,25 | 148,76 |     |        |        |
| 35 | 56,09 | 56,60 | 64 | 102,98 | 103,49 | 93 | 149,87 | 150,38 |     |        |        |
| 36 | 57,70 | 58,21 | 65 | 104,60 | 105,11 | 94 | 151,49 | 152,00 |     |        |        |
| 37 | 59,32 | 59,83 | 66 | 106,21 | 106,72 | 95 | 153,11 | 153,62 |     |        |        |
| 38 | 60,94 | 61,45 | 67 | 107,83 | 108,34 | 96 | 154,72 | 155,23 |     |        |        |





### Belt characteristics

- Polyurethane timing belt with trapezoidal tooth profile according to DIN/ISO 5296 with steel tension cords.
- Imperial pitch 3/8" = 9,525 mm
- Allow to use small diameter pulley.
- Mainly used in applications where inch pitch is an advantage (USA / UK)

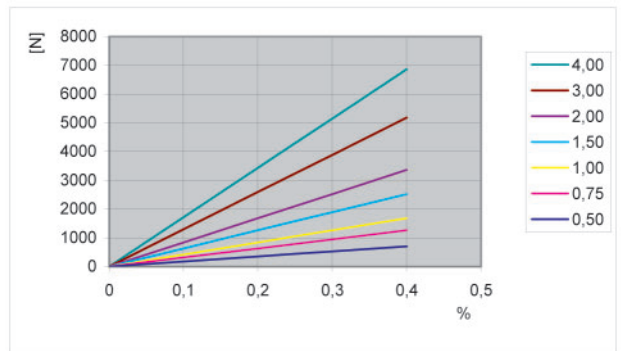
- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width<br>b<br>Code /mm | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-----------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 050 / 12,7                  | 700                                                      | 350                                                      | 2500                                          | 175000                                       | 0,049            |
| 075 / 19,1                  | 1260                                                     | 630                                                      | 4500                                          | 315000                                       | 0,073            |
| 100 / 25,4                  | 1680                                                     | 840                                                      | 6000                                          | 420000                                       | 0,098            |
| 150 / 38,1                  | 2520                                                     | 1260                                                     | 9000                                          | 630000                                       | 0,146            |
| 200 / 50,8                  | 3360                                                     | 1680                                                     | 12000                                         | 840000                                       | 0,195            |
| 300 / 76,2                  | 5180                                                     | 2590                                                     | 18500                                         | 1295000                                      | 0,293            |
| 400 / 101,6                 | 6860                                                     | 3430                                                     | 24500                                         | 1715000                                      | 0,390            |

Other widths are available on request.

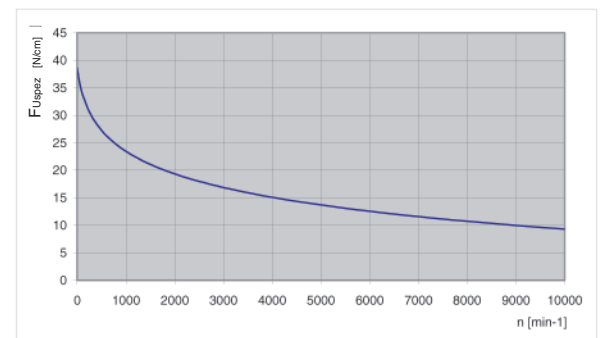
### Load / Elongation [ % ]



### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 38,60                 | 800  | 24,70                 | 1900 | 19,66                 | 4500  | 14,36                 |
| 20  | 37,42                 | 900  | 24,04                 | 2000 | 19,35                 | 5000  | 13,70                 |
| 40  | 36,40                 | 1000 | 23,44                 | 2200 | 18,77                 | 5500  | 13,10                 |
| 60  | 35,51                 | 1100 | 22,89                 | 2400 | 18,24                 | 6000  | 12,55                 |
| 80  | 34,74                 | 1200 | 22,38                 | 2600 | 17,76                 | 6500  | 12,05                 |
| 100 | 34,07                 | 1300 | 21,91                 | 2800 | 17,30                 | 7000  | 11,58                 |
| 200 | 31,59                 | 1400 | 21,48                 | 3000 | 16,88                 | 7500  | 11,14                 |
| 300 | 29,79                 | 1440 | 21,31                 | 3200 | 16,48                 | 8000  | 10,73                 |
| 400 | 28,39                 | 1500 | 21,07                 | 3400 | 16,10                 | 8500  | 10,35                 |
| 500 | 27,25                 | 1600 | 20,69                 | 3600 | 15,75                 | 9000  | 9,98                  |
| 600 | 26,28                 | 1700 | 20,33                 | 3800 | 15,41                 | 9500  | 9,64                  |
| 700 | 25,44                 | 1800 | 19,98                 | 4000 | 15,09                 | 10000 | 9,31                  |

### Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

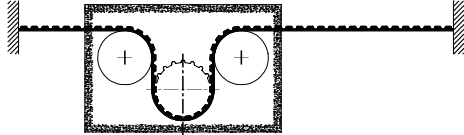
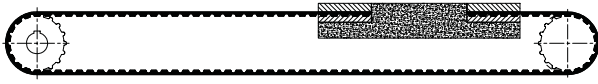
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

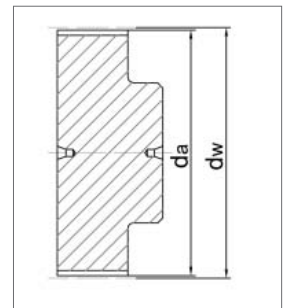
- Timing pulley  $z_{\min} = 15$
- Idler running on belt teeth  $d_{\min} = 60 \text{ mm}$

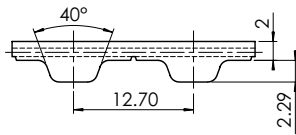
Drive with reverse bending

- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 60 \text{ mm}$

## Timing pulleys

| z  | da     | dw     | z  | da     | dw     | z  | da     | dw     | z   | da     | dw     |
|----|--------|--------|----|--------|--------|----|--------|--------|-----|--------|--------|
| 10 | 29,56  | 30,32  | 39 | 117,47 | 118,24 | 68 | 205,41 | 206,17 | 97  | 293,33 | 294,09 |
| 11 | 32,59  | 33,35  | 40 | 120,52 | 121,27 | 69 | 208,44 | 209,20 | 98  | 296,36 | 297,12 |
| 12 | 35,62  | 36,38  | 41 | 123,55 | 124,30 | 70 | 211,47 | 212,23 | 99  | 299,40 | 300,15 |
| 13 | 38,65  | 39,41  | 42 | 126,58 | 127,33 | 71 | 214,50 | 215,26 | 100 | 302,43 | 303,18 |
| 14 | 41,68  | 42,44  | 43 | 129,61 | 130,36 | 72 | 217,53 | 218,29 | 101 | 305,46 | 306,21 |
| 15 | 44,71  | 45,47  | 44 | 132,64 | 133,39 | 73 | 220,56 | 221,32 | 102 | 308,49 | 309,24 |
| 16 | 47,74  | 48,50  | 45 | 135,67 | 136,44 | 74 | 223,59 | 224,35 | 103 | 311,52 | 312,29 |
| 17 | 50,77  | 51,53  | 46 | 138,70 | 139,47 | 75 | 226,62 | 227,38 | 104 | 314,55 | 315,32 |
| 18 | 53,80  | 54,56  | 47 | 141,73 | 142,50 | 76 | 229,65 | 230,41 | 105 | 317,58 | 318,35 |
| 19 | 56,83  | 57,61  | 48 | 144,76 | 145,53 | 77 | 232,70 | 233,46 | 106 | 320,61 | 321,38 |
| 20 | 59,88  | 60,64  | 49 | 147,80 | 148,56 | 78 | 235,73 | 236,49 | 107 | 323,64 | 324,41 |
| 21 | 62,91  | 63,67  | 50 | 150,83 | 151,59 | 79 | 238,76 | 239,52 | 108 | 326,69 | 327,44 |
| 22 | 65,94  | 66,70  | 51 | 153,86 | 154,62 | 80 | 241,79 | 242,55 | 109 | 329,72 | 330,47 |
| 23 | 68,97  | 69,73  | 52 | 156,89 | 157,65 | 81 | 244,82 | 245,58 | 110 | 332,75 | 333,50 |
| 24 | 72,00  | 72,76  | 53 | 159,92 | 160,68 | 82 | 247,85 | 248,61 | 111 | 335,78 | 336,53 |
| 25 | 75,03  | 75,80  | 54 | 162,95 | 163,71 | 83 | 250,88 | 251,64 | 112 | 338,81 | 339,56 |
| 26 | 78,06  | 78,83  | 55 | 166,00 | 166,76 | 84 | 253,91 | 254,67 | 113 | 341,84 | 342,61 |
| 27 | 81,09  | 81,86  | 56 | 169,03 | 169,79 | 85 | 256,94 | 257,70 | 114 | 344,87 | 345,64 |
| 28 | 84,12  | 84,89  | 57 | 172,06 | 172,82 | 86 | 259,97 | 260,73 | 115 | 347,90 | 348,67 |
| 29 | 87,15  | 87,92  | 58 | 175,09 | 175,85 | 87 | 263,02 | 263,78 | 116 | 350,93 | 351,70 |
| 30 | 90,20  | 90,95  | 59 | 178,12 | 178,88 | 88 | 266,05 | 266,81 | 117 | 353,96 | 354,73 |
| 31 | 93,23  | 93,98  | 60 | 181,15 | 181,91 | 89 | 269,08 | 269,84 | 118 | 357,00 | 357,76 |
| 32 | 96,26  | 97,01  | 61 | 184,18 | 184,94 | 90 | 272,11 | 272,87 | 119 | 360,03 | 360,79 |
| 33 | 99,29  | 100,04 | 62 | 187,21 | 187,97 | 91 | 275,14 | 275,90 | 120 | 363,07 | 363,82 |
| 34 | 102,32 | 103,07 | 63 | 190,24 | 191,00 | 92 | 278,17 | 278,93 |     |        |        |
| 35 | 105,35 | 106,12 | 64 | 193,27 | 194,03 | 93 | 281,20 | 281,96 |     |        |        |
| 36 | 108,38 | 109,15 | 65 | 196,30 | 197,06 | 94 | 284,23 | 285,00 |     |        |        |
| 37 | 111,41 | 112,18 | 66 | 199,33 | 200,11 | 95 | 287,26 | 288,03 |     |        |        |
| 38 | 114,44 | 115,21 | 67 | 202,38 | 203,14 | 96 | 290,30 | 291,06 |     |        |        |





### Belt characteristics

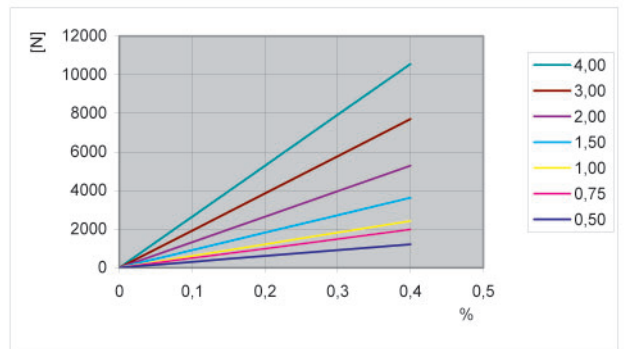
- Polyurethane timing belt with trapezoidal tooth profile according to DIN/ISO 5296 with steel tension cords.
- Imperial pitch 1/2" = 12,7 mm
- Allow to use small diameter pulley.
- Mainly used in applications where inch pitch is an advantage (USA / UK)

- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width<br>b | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-----------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| Code /mm        |                                                          |                                                          |                                               |                                              |                  |
| 050 / 12,7      | 1210                                                     | 605                                                      | 4400                                          | 302500                                       | 0,05             |
| 075 / 19,1      | 1980                                                     | 990                                                      | 7200                                          | 495000                                       | 0,08             |
| 100 / 25,4      | 2420                                                     | 1210                                                     | 8800                                          | 605000                                       | 0,11             |
| 150 / 38,1      | 3630                                                     | 1815                                                     | 13200                                         | 907500                                       | 0,16             |
| 200 / 50,8      | 5280                                                     | 2640                                                     | 19200                                         | 1320000                                      | 0,22             |
| 300 / 76,2      | 7700                                                     | 3850                                                     | 28000                                         | 1925000                                      | 0,32             |
| 400 / 101,6     | 10560                                                    | 5280                                                     | 38400                                         | 2640000                                      | 0,43             |

Load / Elongation [ % ]

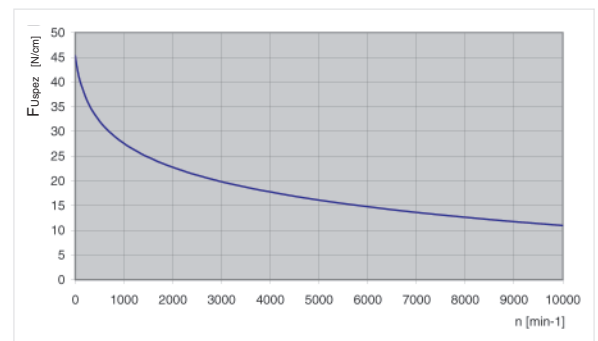


Other widths are available on request.

### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 45,30                 | 800  | 29,04                 | 1900 | 23,11                 | 4500  | 16,88                 |
| 20  | 43,95                 | 900  | 28,26                 | 2000 | 22,74                 | 5000  | 16,11                 |
| 40  | 42,78                 | 1000 | 27,55                 | 2200 | 22,07                 | 5500  | 15,41                 |
| 60  | 41,77                 | 1100 | 26,90                 | 2400 | 21,44                 | 6000  | 14,76                 |
| 80  | 40,88                 | 1200 | 26,31                 | 2600 | 20,87                 | 6500  | 14,17                 |
| 100 | 40,11                 | 1300 | 25,76                 | 2800 | 20,34                 | 7000  | 13,62                 |
| 200 | 37,22                 | 1400 | 25,25                 | 3000 | 19,84                 | 7500  | 13,11                 |
| 300 | 35,07                 | 1440 | 25,05                 | 3200 | 19,37                 | 8000  | 12,63                 |
| 400 | 33,41                 | 1500 | 24,77                 | 3400 | 18,93                 | 8500  | 12,18                 |
| 500 | 32,05                 | 1600 | 24,32                 | 3600 | 18,51                 | 9000  | 11,75                 |
| 600 | 30,90                 | 1700 | 23,89                 | 3800 | 18,12                 | 9500  | 11,35                 |
| 700 | 29,91                 | 1800 | 23,49                 | 4000 | 17,75                 | 10000 | 10,96                 |

Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

= max. no of teeth in mesh to be considered for the calculation of the drive

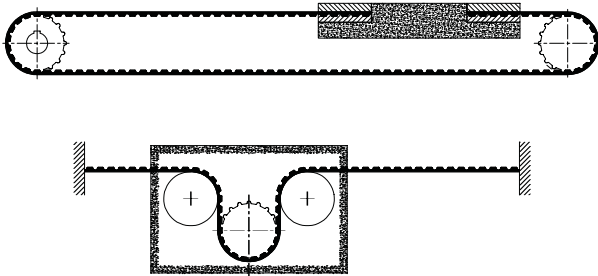
= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm



## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

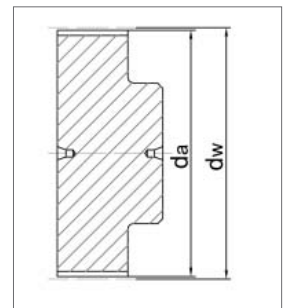
- Timing pulley  $z_{\min} = 14$
- Idler running on belt teeth  $d_{\min} = 60 \text{ mm}$

Drive with reverse bending

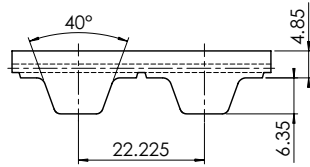
- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 80 \text{ mm}$

## Timing pulleys

| z  | da     | dw     | z  | da     | dw     | z   | da     | dw     | z   | da     | dw     |
|----|--------|--------|----|--------|--------|-----|--------|--------|-----|--------|--------|
| 14 | 55,23  | 56,60  | 43 | 172,46 | 173,82 | 72  | 289,68 | 291,05 | 101 | 406,92 | 408,28 |
| 15 | 59,27  | 60,64  | 44 | 176,50 | 177,86 | 73  | 293,72 | 295,10 | 102 | 410,96 | 412,34 |
| 16 | 63,31  | 64,68  | 45 | 180,54 | 181,90 | 74  | 297,78 | 299,14 | 103 | 415,00 | 416,38 |
| 17 | 67,35  | 68,72  | 46 | 184,58 | 185,96 | 75  | 301,82 | 303,18 | 104 | 419,04 | 420,42 |
| 18 | 71,40  | 72,76  | 47 | 188,62 | 190,00 | 76  | 305,86 | 307,22 | 105 | 423,08 | 424,46 |
| 19 | 75,44  | 76,80  | 48 | 192,67 | 194,04 | 77  | 309,90 | 311,26 | 106 | 427,14 | 428,50 |
| 20 | 79,48  | 80,84  | 49 | 196,71 | 198,08 | 78  | 313,94 | 315,32 | 107 | 431,18 | 432,54 |
| 21 | 83,52  | 84,88  | 50 | 200,75 | 202,13 | 79  | 317,98 | 319,36 | 108 | 435,22 | 436,58 |
| 22 | 87,57  | 88,94  | 51 | 204,80 | 206,17 | 80  | 322,02 | 323,40 | 109 | 439,26 | 440,62 |
| 23 | 91,61  | 92,98  | 52 | 208,84 | 210,21 | 81  | 326,06 | 327,44 | 110 | 443,30 | 444,68 |
| 24 | 95,65  | 97,02  | 53 | 212,88 | 214,25 | 82  | 330,12 | 331,48 | 111 | 447,34 | 448,72 |
| 25 | 99,69  | 101,06 | 54 | 216,92 | 218,29 | 83  | 334,16 | 335,52 | 112 | 451,38 | 452,76 |
| 26 | 103,73 | 105,10 | 55 | 220,96 | 222,33 | 84  | 338,20 | 339,56 | 113 | 455,42 | 456,80 |
| 27 | 107,77 | 109,14 | 56 | 225,00 | 226,37 | 85  | 342,24 | 343,60 | 114 | 459,48 | 460,84 |
| 28 | 111,81 | 113,18 | 57 | 229,04 | 230,41 | 86  | 346,28 | 347,66 | 115 | 463,52 | 464,88 |
| 29 | 115,85 | 117,22 | 58 | 233,10 | 234,47 | 87  | 350,33 | 351,70 | 116 | 467,56 | 468,92 |
| 30 | 119,91 | 121,28 | 59 | 237,14 | 238,51 | 88  | 354,37 | 355,74 | 117 | 471,60 | 472,96 |
| 31 | 123,95 | 125,32 | 60 | 241,18 | 242,55 | 89  | 358,41 | 359,78 | 118 | 475,64 | 477,02 |
| 32 | 127,99 | 129,36 | 61 | 245,22 | 246,59 | 90  | 362,45 | 363,82 | 119 | 479,68 | 481,06 |
| 33 | 132,03 | 133,40 | 62 | 249,26 | 250,63 | 91  | 366,50 | 367,86 | 120 | 483,72 | 485,10 |
| 34 | 136,07 | 137,44 | 63 | 253,30 | 254,67 | 92  | 370,54 | 371,90 |     |        |        |
| 35 | 140,11 | 141,48 | 64 | 257,34 | 258,71 | 93  | 374,58 | 375,94 |     |        |        |
| 36 | 144,15 | 145,52 | 65 | 261,38 | 262,75 | 94  | 378,62 | 380,00 |     |        |        |
| 37 | 148,20 | 149,56 | 66 | 265,44 | 266,81 | 95  | 382,66 | 384,04 |     |        |        |
| 38 | 152,24 | 153,62 | 67 | 269,48 | 270,85 | 96  | 386,70 | 388,08 |     |        |        |
| 39 | 156,28 | 157,66 | 68 | 273,52 | 274,89 | 97  | 390,74 | 392,12 |     |        |        |
| 40 | 160,32 | 161,70 | 69 | 277,56 | 278,93 | 98  | 394,80 | 396,16 |     |        |        |
| 41 | 164,36 | 165,74 | 70 | 281,60 | 282,97 | 99  | 398,84 | 400,20 |     |        |        |
| 42 | 168,42 | 169,78 | 71 | 285,64 | 287,01 | 100 | 402,88 | 404,24 |     |        |        |



## XH



### Belt characteristics

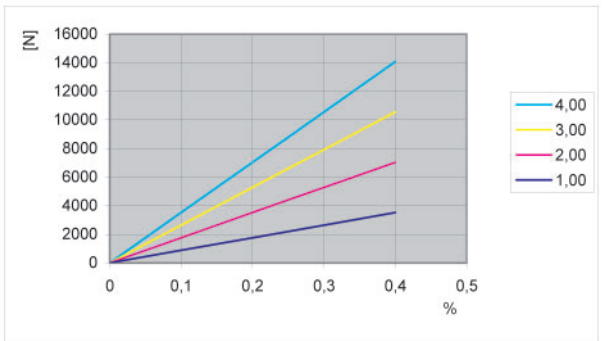
- Polyurethane timing belt with trapezoidal tooth profile according to DIN/ISO 5296 with steel tension cords.
- Imperial pitch  $7/8" = 22,225$  mm
- Mainly used in applications where inch pitch is an advantage (USA / UK)
- Width tolerance:  $\pm 1,0$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,4$  [mm]

### Technical data

| Belt width<br>b<br>Code /mm | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-----------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 100 / 25,4                  | 3520                                                     | 1760                                                     | 15200                                         | 880000                                       | 0,26             |
| 200 / 50,8                  | 7040                                                     | 3520                                                     | 30400                                         | 1760000                                      | 0,54             |
| 300 / 76,2                  | 10560                                                    | 5280                                                     | 45600                                         | 2640000                                      | 0,80             |
| 400 / 101,6                 | 14080                                                    | 7040                                                     | 60800                                         | 3520000                                      | 1,06             |

Other widths are available on request.

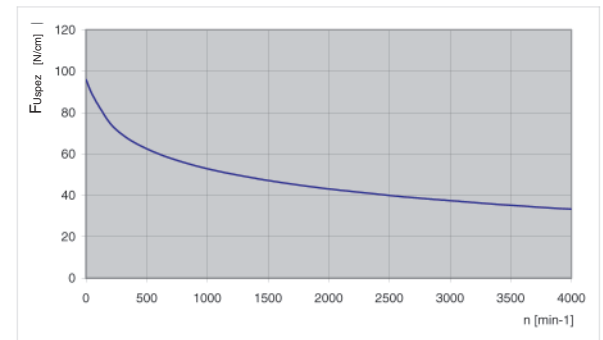
### Load / Elongation [ % ]



### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|
| 0   | 96,00                 | 800  | 55,99                 | 1900 | 43,86                 | 4000 | 33,31                 |
| 20  | 92,98                 | 900  | 54,35                 | 2000 | 43,14                 |      |                       |
| 40  | 90,27                 | 1000 | 52,88                 | 2200 | 41,79                 |      |                       |
| 60  | 87,85                 | 1100 | 51,55                 | 2400 | 40,56                 |      |                       |
| 80  | 85,68                 | 1200 | 50,33                 | 2600 | 39,43                 |      |                       |
| 100 | 83,73                 | 1300 | 49,20                 | 2800 | 38,37                 |      |                       |
| 200 | 74,80                 | 1400 | 48,16                 | 2880 | 37,98                 |      |                       |
| 300 | 69,42                 | 1440 | 47,77                 | 3000 | 37,40                 |      |                       |
| 400 | 65,53                 | 1500 | 47,19                 | 3200 | 36,48                 |      |                       |
| 500 | 62,48                 | 1600 | 46,29                 | 3400 | 35,62                 |      |                       |
| 600 | 59,97                 | 1700 | 45,43                 | 3600 | 34,81                 |      |                       |
| 700 | 57,84                 | 1800 | 44,62                 | 3800 | 34,04                 |      |                       |

### Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_U$  transmissible by the belt in the drive is calculated by:

$$F_U [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_U$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

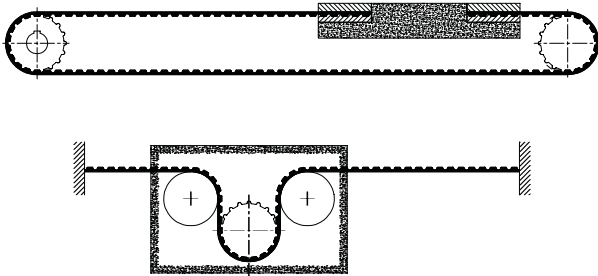
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

- Timing pulley  $z_{\min} = 18$
- Idler running on belt teeth  $d_{\min} = 150 \text{ mm}$

Drive with reverse bending

- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 180 \text{ mm}$

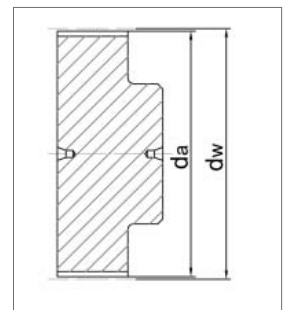
## Timing pulleys

| z  | da     | dw     |
|----|--------|--------|
| 18 | 127,34 | 124,55 |
| 19 | 134,41 | 131,62 |
| 20 | 141,48 | 138,68 |
| 21 | 148,55 | 145,76 |
| 22 | 155,64 | 152,84 |
| 23 | 162,71 | 159,91 |
| 24 | 169,78 | 167,00 |
| 25 | 176,85 | 174,07 |
| 26 | 183,94 | 181,13 |
| 27 | 191,01 | 188,20 |
| 28 | 198,08 | 195,27 |
| 29 | 205,15 | 202,37 |
| 30 | 212,22 | 209,44 |
| 31 | 219,31 | 216,51 |
| 32 | 226,38 | 223,58 |
| 33 | 233,45 | 230,66 |
| 34 | 240,52 | 237,73 |
| 35 | 247,59 | 244,80 |
| 36 | 254,68 | 251,87 |
| 37 | 261,75 | 258,94 |
| 38 | 268,82 | 266,02 |
| 39 | 275,89 | 273,11 |
| 40 | 282,98 | 280,18 |
| 41 | 290,05 | 287,25 |
| 42 | 297,12 | 294,33 |
| 43 | 304,19 | 301,40 |
| 44 | 311,26 | 308,47 |
| 45 | 318,35 | 315,54 |
| 46 | 325,42 | 322,61 |

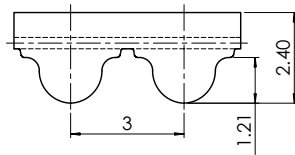
| z  | da     | dw     |
|----|--------|--------|
| 47 | 332,49 | 329,70 |
| 48 | 339,57 | 336,77 |
| 49 | 346,66 | 343,87 |
| 50 | 353,73 | 350,93 |
| 51 | 360,80 | 358,00 |
| 52 | 367,87 | 365,07 |
| 53 | 374,94 | 372,14 |
| 54 | 382,01 | 379,21 |
| 55 | 389,08 | 386,30 |
| 56 | 396,17 | 393,37 |
| 57 | 403,24 | 400,44 |
| 58 | 410,31 | 407,51 |
| 59 | 417,38 | 414,58 |
| 60 | 424,47 | 421,68 |
| 61 | 431,54 | 428,75 |
| 62 | 438,61 | 435,90 |
| 63 | 445,68 | 442,90 |
| 64 | 452,75 | 449,97 |
| 65 | 459,84 | 457,05 |
| 66 | 466,91 | 464,10 |
| 67 | 473,98 | 471,20 |
| 68 | 481,05 | 478,25 |
| 69 | 488,12 | 485,32 |
| 70 | 495,21 | 492,39 |
| 71 | 502,28 | 499,48 |
| 72 | 509,35 | 506,57 |
| 73 | 516,42 | 513,63 |
| 74 | 523,51 | 520,70 |
| 75 | 530,58 | 527,77 |

| z   | da     | dw     |
|-----|--------|--------|
| 76  | 537,65 | 534,84 |
| 77  | 544,72 | 541,93 |
| 78  | 551,79 | 549,00 |
| 79  | 558,88 | 556,07 |
| 80  | 565,95 | 563,15 |
| 81  | 573,02 | 570,22 |
| 82  | 580,09 | 577,29 |
| 83  | 587,18 | 584,36 |
| 84  | 594,25 | 591,43 |
| 85  | 601,32 | 598,60 |
| 86  | 608,39 | 605,61 |
| 87  | 615,46 | 612,68 |
| 88  | 622,55 | 619,75 |
| 89  | 629,62 | 626,82 |
| 90  | 636,69 | 633,89 |
| 91  | 643,76 | 640,96 |
| 92  | 650,85 | 648,04 |
| 93  | 657,92 | 655,11 |
| 94  | 664,99 | 662,18 |
| 95  | 672,06 | 669,25 |
| 96  | 679,13 | 676,33 |
| 97  | 686,22 | 683,40 |
| 98  | 693,29 | 690,47 |
| 99  | 700,36 | 697,55 |
| 100 | 707,43 | 704,62 |
| 101 | 714,50 | 711,70 |
| 102 | 721,59 | 718,77 |
| 103 | 728,66 | 725,85 |
| 104 | 735,73 | 732,92 |

| z   | da     | dw     |
|-----|--------|--------|
| 105 | 742,80 | 740,01 |
| 106 | 749,87 | 747,08 |
| 107 | 756,96 | 754,15 |
| 108 | 764,03 | 761,22 |
| 109 | 771,10 | 768,30 |
| 110 | 778,17 | 775,37 |
| 111 | 785,26 | 782,44 |
| 112 | 792,33 | 789,51 |
| 113 | 799,40 | 796,60 |
| 114 | 806,47 | 803,67 |
| 115 | 813,54 | 810,74 |
| 116 | 820,63 | 817,81 |
| 117 | 827,70 | 824,88 |
| 118 | 834,77 | 831,95 |
| 119 | 841,84 | 839,03 |
| 120 | 848,93 | 846,12 |



## HTD3M



### Belt characteristics

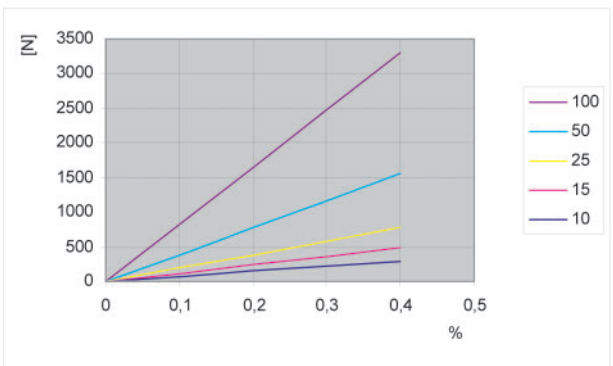
- Polyurethane timing belt with round tooth profile and high tensile load tension cords. Produced according to ISO 13050
- Metric pitch 3 mm
- The round tooth profile allows a uniform load distribution that guarantees high performances, high transmissible torque and precise tooth engagement.
- Widely used in linear positioning, light power transmission applications.
- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 10                      | 300                                                      | 150                                                      | 1250                                          | 75000                                        | 0,02             |
| 15                      | 480                                                      | 240                                                      | 2000                                          | 120000                                       | 0,03             |
| 25                      | 780                                                      | 390                                                      | 3250                                          | 195000                                       | 0,05             |
| 50                      | 1560                                                     | 780                                                      | 6500                                          | 390000                                       | 0,10             |
| 100                     | 3300                                                     | 1650                                                     | 13750                                         | 825000                                       | 0,20             |

Other widths are available on request.

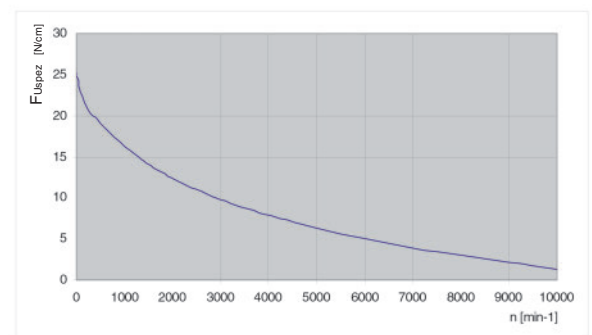
### Load / Elongation [ % ]



### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 25,20                 | 800  | 17,30                 | 1900 | 12,67                 | 4500  | 7,05                  |
| 20  | 24,60                 | 900  | 16,75                 | 2000 | 12,36                 | 5000  | 6,32                  |
| 40  | 24,06                 | 1000 | 16,24                 | 2200 | 11,77                 | 5500  | 5,66                  |
| 60  | 23,57                 | 1100 | 15,75                 | 2400 | 11,22                 | 6000  | 5,04                  |
| 80  | 23,12                 | 1200 | 15,29                 | 2600 | 10,71                 | 6500  | 4,47                  |
| 100 | 22,72                 | 1300 | 14,86                 | 2800 | 10,24                 | 7000  | 3,94                  |
| 200 | 21,22                 | 1400 | 14,45                 | 3000 | 9,79                  | 7500  | 3,44                  |
| 300 | 20,31                 | 1440 | 14,29                 | 3200 | 9,36                  | 8000  | 2,98                  |
| 400 | 19,75                 | 1500 | 14,06                 | 3400 | 8,96                  | 8500  | 2,54                  |
| 500 | 19,14                 | 1600 | 13,69                 | 3600 | 8,57                  | 9000  | 2,12                  |
| 600 | 18,50                 | 1700 | 13,33                 | 3800 | 8,21                  | 9500  | 1,72                  |
| 700 | 17,88                 | 1800 | 12,99                 | 4000 | 7,86                  | 10000 | 1,35                  |

### Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

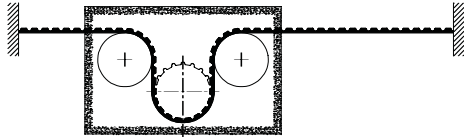
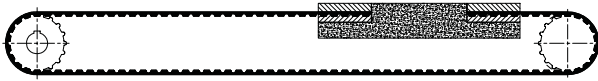
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

- Timing pulley  $z_{min}$  16
- Idler running on belt teeth  $d_{min}$  [mm] 50

Drive with reverse bending

- Timing pulley  $z_{min}$  20
- Idler running on belt back  $d_{min}$  [mm] 50

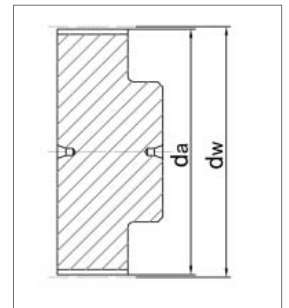
## Timing pulleys

| z  | da    | dw    |
|----|-------|-------|
| 10 | 8,79  | 9,55  |
| 11 | 9,74  | 10,50 |
| 12 | 10,70 | 11,46 |
| 13 | 11,65 | 12,41 |
| 14 | 12,61 | 13,37 |
| 15 | 13,56 | 14,32 |
| 16 | 14,52 | 15,28 |
| 17 | 15,47 | 16,23 |
| 18 | 16,43 | 17,19 |
| 19 | 17,38 | 18,14 |
| 20 | 18,34 | 19,10 |
| 21 | 19,29 | 20,05 |
| 22 | 20,25 | 21,01 |
| 23 | 21,20 | 21,96 |
| 24 | 22,16 | 22,92 |
| 25 | 23,11 | 23,87 |
| 26 | 24,07 | 24,83 |
| 27 | 25,02 | 25,78 |
| 28 | 25,98 | 26,74 |
| 29 | 26,93 | 27,69 |
| 30 | 27,89 | 28,65 |
| 31 | 28,84 | 29,60 |
| 32 | 29,80 | 30,56 |
| 33 | 30,75 | 31,51 |
| 34 | 31,71 | 32,47 |
| 35 | 32,66 | 33,42 |
| 36 | 33,62 | 34,38 |
| 37 | 34,57 | 35,33 |
| 38 | 35,53 | 36,29 |
| 39 | 36,48 | 37,24 |
| 40 | 37,44 | 38,20 |
| 41 | 38,39 | 39,15 |
| 42 | 39,35 | 40,11 |

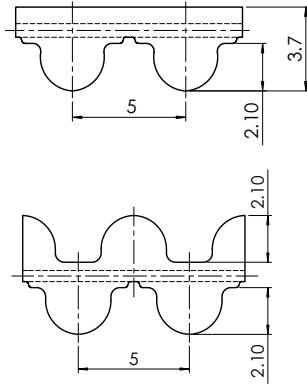
| z  | da    | dw    |
|----|-------|-------|
| 43 | 40,30 | 41,06 |
| 44 | 41,26 | 42,02 |
| 45 | 42,21 | 42,97 |
| 46 | 43,17 | 43,93 |
| 47 | 44,12 | 44,88 |
| 48 | 45,08 | 45,84 |
| 49 | 46,03 | 46,79 |
| 50 | 46,99 | 47,75 |
| 51 | 47,94 | 48,70 |
| 52 | 48,90 | 49,66 |
| 53 | 49,85 | 50,61 |
| 54 | 50,81 | 51,57 |
| 55 | 51,76 | 52,52 |
| 56 | 52,72 | 53,48 |
| 57 | 53,67 | 54,43 |
| 58 | 54,63 | 55,39 |
| 59 | 55,58 | 56,34 |
| 60 | 56,54 | 57,30 |
| 61 | 57,49 | 58,25 |
| 62 | 58,45 | 59,21 |
| 63 | 59,40 | 60,16 |
| 64 | 60,36 | 61,12 |
| 65 | 61,31 | 62,07 |
| 66 | 62,27 | 63,03 |
| 67 | 63,22 | 63,98 |
| 68 | 64,18 | 64,94 |
| 69 | 65,13 | 65,89 |
| 70 | 66,09 | 66,85 |
| 71 | 67,04 | 67,80 |
| 72 | 68,00 | 68,76 |
| 73 | 68,95 | 69,71 |
| 74 | 69,91 | 70,67 |
| 75 | 70,86 | 71,62 |

| z   | da     | dw     |
|-----|--------|--------|
| 76  | 71,82  | 72,58  |
| 77  | 72,77  | 73,53  |
| 78  | 73,73  | 74,49  |
| 79  | 74,68  | 75,44  |
| 80  | 75,64  | 76,40  |
| 81  | 76,59  | 77,35  |
| 82  | 77,55  | 78,31  |
| 83  | 78,50  | 79,26  |
| 84  | 79,46  | 80,22  |
| 85  | 80,41  | 81,17  |
| 86  | 81,37  | 82,13  |
| 87  | 82,32  | 83,08  |
| 88  | 83,28  | 84,04  |
| 89  | 84,23  | 84,99  |
| 90  | 85,19  | 85,95  |
| 91  | 86,14  | 86,90  |
| 92  | 87,10  | 87,86  |
| 93  | 88,05  | 88,81  |
| 94  | 89,01  | 89,77  |
| 95  | 89,96  | 90,72  |
| 96  | 90,92  | 91,68  |
| 97  | 91,87  | 92,63  |
| 98  | 92,83  | 93,59  |
| 99  | 93,78  | 94,54  |
| 100 | 94,74  | 95,50  |
| 101 | 95,69  | 96,45  |
| 102 | 96,65  | 97,41  |
| 103 | 97,60  | 98,36  |
| 104 | 98,56  | 99,32  |
| 105 | 99,51  | 100,27 |
| 106 | 100,47 | 101,23 |
| 107 | 101,42 | 102,18 |
| 108 | 102,38 | 103,14 |

| z   | da     | dw     |
|-----|--------|--------|
| 109 | 103,33 | 104,09 |
| 110 | 104,29 | 105,05 |
| 111 | 105,24 | 106,00 |
| 112 | 106,20 | 106,96 |
| 113 | 107,15 | 107,91 |
| 114 | 108,11 | 108,87 |
| 115 | 109,06 | 109,82 |
| 116 | 110,02 | 110,78 |
| 117 | 110,97 | 111,73 |
| 118 | 111,93 | 112,69 |
| 119 | 112,88 | 113,64 |
| 120 | 113,83 | 114,59 |
| 121 | 114,79 | 115,55 |
| 122 | 115,74 | 116,50 |
| 123 | 116,70 | 117,46 |
| 124 | 117,65 | 118,41 |
| 125 | 118,61 | 119,37 |
| 126 | 119,56 | 120,32 |
| 127 | 120,52 | 121,28 |
| 128 | 121,47 | 122,23 |
| 129 | 122,43 | 123,19 |
| 130 | 123,38 | 124,14 |
| 131 | 124,34 | 125,10 |
| 132 | 125,29 | 126,05 |
| 133 | 126,25 | 127,01 |
| 134 | 127,20 | 127,96 |
| 135 | 128,16 | 128,92 |
| 136 | 129,11 | 129,87 |
| 137 | 130,07 | 130,83 |
| 138 | 131,02 | 131,78 |
| 139 | 131,98 | 132,74 |
| 140 | 132,93 | 133,69 |



## HTD5M



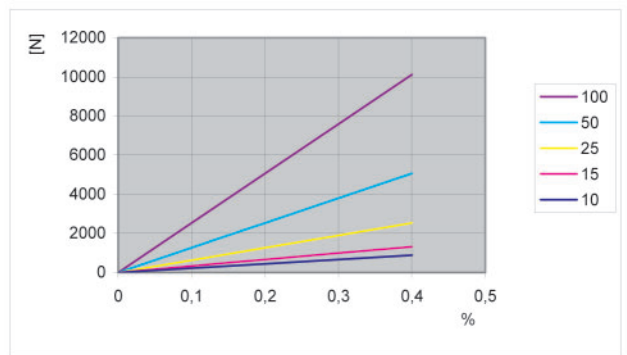
### Belt characteristics

- Polyurethane timing belt with round tooth profile and high tensile load tension cords. Produced according to ISO 13050
- Metric pitch 5 mm
- The round tooth profile allows a uniform load distribution that guarantees high performances, high transmissible torque and precise tooth engagement.
- Widely used in linear positioning, light power transmission applications.
- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 10                      | 880                                                      | 440                                                      | 3200                                          | 220000                                       | 0,05             |
| 15                      | 1320                                                     | 660                                                      | 4800                                          | 330000                                       | 0,07             |
| 25                      | 2530                                                     | 1265                                                     | 9200                                          | 632500                                       | 0,12             |
| 50                      | 5060                                                     | 2530                                                     | 18400                                         | 1265000                                      | 0,24             |
| 100                     | 10120                                                    | 5060                                                     | 36800                                         | 2530000                                      | 0,48             |

### Load / Elongation [ % ]

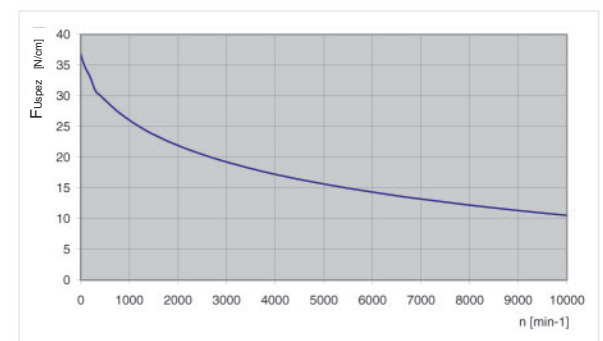


Other widths are available on request.

## Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 36,80                 | 800  | 27,21                 | 1900 | 22,24                 | 4500  | 16,40                 |
| 20  | 36,25                 | 900  | 26,61                 | 2000 | 21,91                 | 5000  | 15,64                 |
| 40  | 35,75                 | 1000 | 26,05                 | 2200 | 21,30                 | 5500  | 14,95                 |
| 60  | 35,30                 | 1100 | 25,52                 | 2400 | 20,72                 | 6000  | 14,32                 |
| 80  | 34,89                 | 1200 | 25,03                 | 2600 | 20,19                 | 6500  | 13,74                 |
| 100 | 34,52                 | 1300 | 24,56                 | 2800 | 19,69                 | 7000  | 13,19                 |
| 200 | 33,13                 | 1400 | 24,13                 | 3000 | 19,23                 | 7500  | 12,68                 |
| 300 | 30,87                 | 1440 | 23,96                 | 3200 | 18,78                 | 8000  | 12,20                 |
| 400 | 30,10                 | 1500 | 23,71                 | 3400 | 18,37                 | 8500  | 11,75                 |
| 500 | 29,31                 | 1600 | 23,32                 | 3600 | 17,97                 | 9000  | 11,33                 |
| 600 | 28,56                 | 1700 | 22,94                 | 3800 | 17,59                 | 9500  | 10,92                 |
| 700 | 27,86                 | 1800 | 22,58                 | 4000 | 17,23                 | 10000 | 10,53                 |

### Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

= max. no of teeth in mesh to be considered for the calculation of the drive

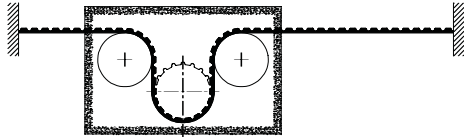
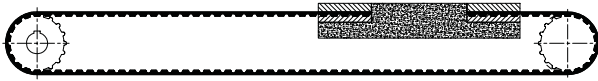
= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm



## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

- Timing pulley  $z_{\min} = 16$
- Idler running on belt teeth  $d_{\min} = 50 \text{ mm}$

Drive with reverse bending

- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 50 \text{ mm}$

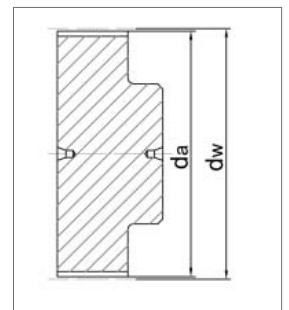
## Timing pulleys

| z  | da    | dw    |
|----|-------|-------|
| 10 | 14,77 | 15,91 |
| 11 | 16,36 | 17,50 |
| 12 | 17,96 | 19,10 |
| 13 | 19,55 | 20,69 |
| 14 | 21,14 | 22,28 |
| 15 | 22,73 | 23,87 |
| 16 | 24,32 | 25,46 |
| 17 | 25,91 | 27,05 |
| 18 | 27,51 | 28,65 |
| 19 | 29,09 | 30,23 |
| 20 | 30,69 | 31,83 |
| 21 | 32,28 | 33,42 |
| 22 | 33,87 | 35,01 |
| 23 | 35,46 | 36,60 |
| 24 | 37,06 | 38,20 |
| 25 | 38,64 | 39,78 |
| 26 | 40,24 | 41,38 |
| 27 | 41,83 | 42,97 |
| 28 | 43,42 | 44,56 |
| 29 | 45,01 | 46,15 |
| 30 | 46,61 | 47,75 |
| 31 | 48,19 | 49,33 |
| 32 | 49,79 | 50,93 |
| 33 | 51,38 | 52,52 |
| 34 | 52,97 | 54,11 |
| 35 | 54,56 | 55,70 |
| 36 | 56,16 | 57,30 |
| 37 | 57,75 | 58,89 |
| 38 | 59,34 | 60,48 |

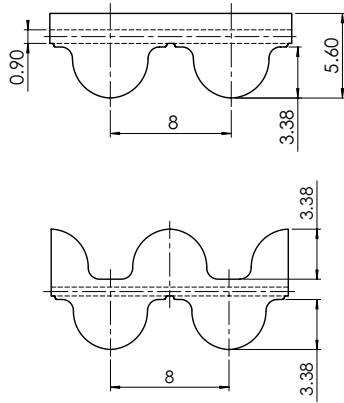
| z  | da     | dw     |
|----|--------|--------|
| 39 | 60,93  | 62,07  |
| 40 | 62,52  | 63,66  |
| 41 | 64,11  | 65,25  |
| 42 | 65,70  | 66,84  |
| 43 | 67,29  | 68,43  |
| 44 | 68,88  | 70,02  |
| 45 | 70,47  | 71,61  |
| 46 | 72,06  | 73,20  |
| 47 | 73,65  | 74,79  |
| 48 | 75,24  | 76,38  |
| 49 | 76,84  | 77,98  |
| 50 | 78,44  | 79,58  |
| 51 | 80,03  | 81,17  |
| 52 | 81,62  | 82,76  |
| 53 | 83,21  | 84,35  |
| 54 | 84,80  | 85,94  |
| 55 | 86,39  | 87,53  |
| 56 | 87,98  | 89,12  |
| 57 | 89,57  | 90,71  |
| 58 | 91,17  | 92,31  |
| 59 | 92,76  | 93,90  |
| 60 | 94,35  | 95,49  |
| 61 | 95,94  | 97,08  |
| 62 | 97,53  | 98,67  |
| 63 | 99,12  | 100,26 |
| 64 | 100,72 | 101,86 |
| 65 | 102,31 | 103,45 |
| 66 | 103,90 | 105,04 |
| 67 | 105,49 | 106,63 |

| z  | da     | dw     |
|----|--------|--------|
| 68 | 107,08 | 108,22 |
| 69 | 108,67 | 109,81 |
| 70 | 110,27 | 111,41 |
| 71 | 111,86 | 113,00 |
| 72 | 113,45 | 114,59 |
| 73 | 115,04 | 116,18 |
| 74 | 116,63 | 117,77 |
| 75 | 118,22 | 119,36 |
| 76 | 119,81 | 120,95 |
| 77 | 121,40 | 122,54 |
| 78 | 122,99 | 124,13 |
| 79 | 124,58 | 125,72 |
| 80 | 126,18 | 127,32 |
| 81 | 127,77 | 128,91 |
| 82 | 129,36 | 130,50 |
| 83 | 130,95 | 132,09 |
| 84 | 132,54 | 133,68 |
| 85 | 134,14 | 135,28 |
| 86 | 135,73 | 136,87 |
| 87 | 137,32 | 138,46 |
| 88 | 138,91 | 140,05 |
| 89 | 140,51 | 141,65 |
| 90 | 142,10 | 143,24 |
| 91 | 143,69 | 144,83 |
| 92 | 145,28 | 146,42 |
| 93 | 146,87 | 148,01 |
| 94 | 148,46 | 149,60 |
| 95 | 150,06 | 151,20 |
| 96 | 151,64 | 152,78 |

| z   | da     | dw     |
|-----|--------|--------|
| 97  | 153,24 | 154,38 |
| 98  | 154,83 | 155,97 |
| 99  | 156,42 | 157,56 |
| 100 | 158,01 | 159,15 |
| 101 | 159,61 | 160,75 |
| 102 | 161,20 | 162,34 |
| 103 | 162,81 | 163,95 |
| 104 | 164,38 | 165,52 |
| 105 | 165,97 | 167,11 |
| 106 | 167,56 | 168,70 |
| 107 | 169,09 | 170,23 |
| 108 | 170,75 | 171,89 |
| 109 | 172,34 | 173,48 |
| 110 | 173,93 | 175,07 |
| 111 | 175,52 | 176,66 |
| 112 | 177,11 | 178,25 |
| 113 | 178,70 | 179,84 |
| 114 | 180,29 | 181,43 |
| 115 | 181,88 | 183,02 |
| 116 | 183,47 | 184,61 |
| 117 | 185,07 | 186,21 |
| 118 | 186,66 | 187,80 |
| 119 | 188,25 | 189,39 |
| 120 | 189,84 | 190,98 |



## HTD8M



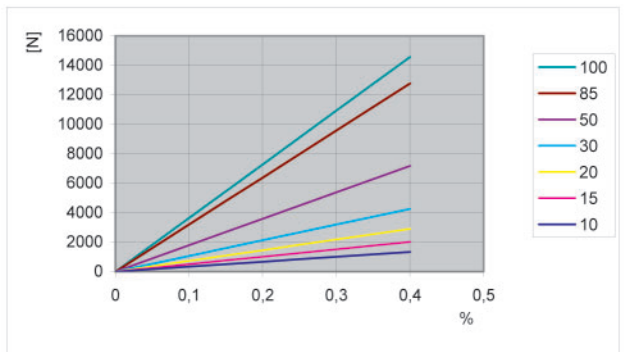
### Belt characteristics

- Polyurethane timing belt with round tooth profile and high tensile load tension cords. Produced according to ISO 13050
- Metric pitch 8 mm
- The round tooth profile allows a uniform load distribution that guarantees high performances, high transmissible torque and precise tooth engagement.
- Widely used in linear positioning, medium power transmission applications.
- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 10                      | 1340                                                     | 670                                                      | 5700                                          | 336000                                       | 0,07             |
| 15                      | 2020                                                     | 1010                                                     | 8550                                          | 504000                                       | 0,10             |
| 20                      | 2910                                                     | 1455                                                     | 12350                                         | 728000                                       | 0,14             |
| 30                      | 4260                                                     | 2130                                                     | 18050                                         | 1064000                                      | 0,21             |
| 50                      | 7170                                                     | 3585                                                     | 30400                                         | 1792000                                      | 0,35             |
| 85                      | 12770                                                    | 6385                                                     | 54150                                         | 3192000                                      | 0,59             |
| 100                     | 14560                                                    | 7280                                                     | 61750                                         | 3640000                                      | 0,69             |

### Load / Elongation [ % ]

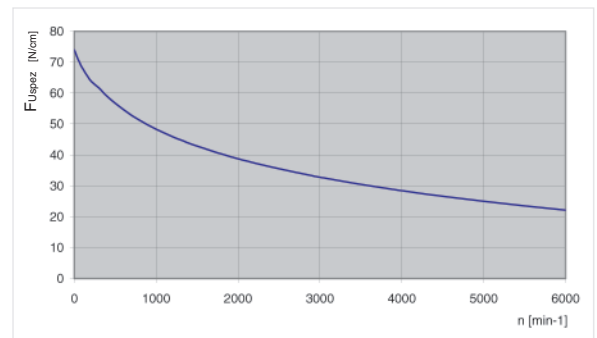


Other widths are available on request.

## Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|
| 0   | 74,00                 | 800  | 51,20                 | 1900 | 39,52                 | 4500 | 26,63                 |
| 20  | 72,62                 | 900  | 49,71                 | 2000 | 38,78                 | 5000 | 25,00                 |
| 40  | 71,34                 | 1000 | 48,35                 | 2200 | 37,39                 | 5500 | 23,51                 |
| 60  | 70,16                 | 1100 | 47,09                 | 2400 | 36,12                 | 6000 | 22,15                 |
| 80  | 69,07                 | 1200 | 45,93                 | 2600 | 34,94                 |      |                       |
| 100 | 68,07                 | 1300 | 44,84                 | 2800 | 33,83                 |      |                       |
| 200 | 64,09                 | 1400 | 43,82                 | 3000 | 32,80                 |      |                       |
| 300 | 61,68                 | 1440 | 43,43                 | 3200 | 31,83                 |      |                       |
| 400 | 59,03                 | 1500 | 42,86                 | 3400 | 30,91                 |      |                       |
| 500 | 56,71                 | 1600 | 41,96                 | 3600 | 30,05                 |      |                       |
| 600 | 54,66                 | 1700 | 41,10                 | 3800 | 29,22                 |      |                       |
| 700 | 52,84                 | 1800 | 40,29                 | 4000 | 28,44                 |      |                       |

### Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

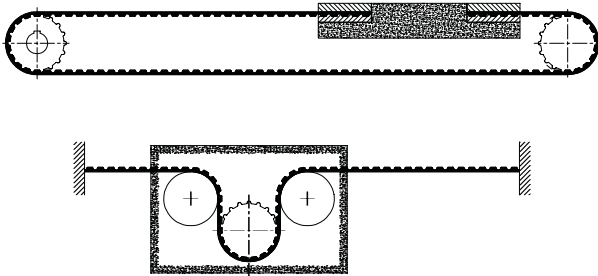
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

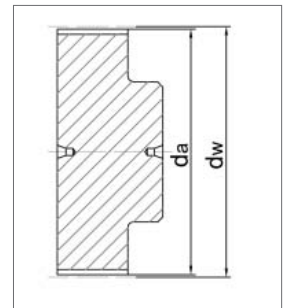
- Timing pulley  $z_{\min} = 18$
- Idler running on belt teeth  $d_{\min} = 50 \text{ mm}$

Drive with reverse bending

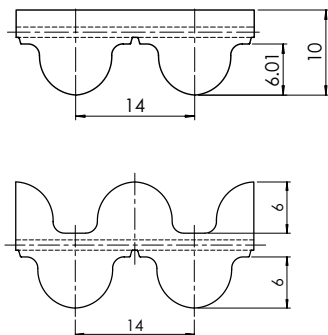
- Timing pulley  $z_{\min} = 18$
- Idler running on belt back  $d_{\min} = 120 \text{ mm}$

## Timing pulleys

| z  | da     | dw     | z  | da     | dw     | z   | da     | dw     | z   | da     | dw     |
|----|--------|--------|----|--------|--------|-----|--------|--------|-----|--------|--------|
| 18 | 44,46  | 45,83  | 47 | 118,31 | 119,68 | 76  | 192,16 | 193,53 | 105 | 266,01 | 267,38 |
| 19 | 47,01  | 48,38  | 48 | 120,86 | 122,23 | 77  | 194,71 | 196,08 | 106 | 268,55 | 269,92 |
| 20 | 49,56  | 50,93  | 49 | 123,40 | 124,77 | 78  | 197,25 | 198,62 | 107 | 271,10 | 272,47 |
| 21 | 52,10  | 53,47  | 50 | 125,95 | 127,32 | 79  | 199,80 | 201,17 | 108 | 273,64 | 275,01 |
| 22 | 54,65  | 56,02  | 51 | 128,50 | 129,87 | 80  | 202,35 | 203,72 | 109 | 276,19 | 277,56 |
| 23 | 57,20  | 58,57  | 52 | 131,05 | 132,41 | 81  | 204,89 | 206,26 | 110 | 278,74 | 280,11 |
| 24 | 59,75  | 61,12  | 53 | 133,59 | 134,96 | 82  | 207,44 | 208,81 | 111 | 281,29 | 282,66 |
| 25 | 62,29  | 63,66  | 54 | 136,14 | 137,51 | 83  | 209,98 | 211,35 | 112 | 283,84 | 285,21 |
| 26 | 64,84  | 66,21  | 55 | 138,68 | 140,05 | 84  | 212,53 | 213,90 | 113 | 286,38 | 287,75 |
| 27 | 67,38  | 68,75  | 56 | 141,23 | 142,60 | 85  | 215,08 | 216,45 | 114 | 288,93 | 290,30 |
| 28 | 70,08  | 71,30  | 57 | 143,78 | 145,15 | 86  | 217,63 | 219,00 | 115 | 291,47 | 292,84 |
| 29 | 72,59  | 73,84  | 58 | 146,32 | 147,69 | 87  | 220,17 | 221,54 | 116 | 294,02 | 295,39 |
| 30 | 75,13  | 76,39  | 59 | 148,87 | 150,24 | 88  | 222,72 | 224,09 | 117 | 296,57 | 297,94 |
| 31 | 77,65  | 78,94  | 60 | 151,42 | 152,79 | 89  | 225,26 | 226,63 | 118 | 299,11 | 300,48 |
| 32 | 80,16  | 81,49  | 61 | 153,96 | 155,33 | 90  | 227,81 | 229,18 | 119 | 301,66 | 303,03 |
| 33 | 82,68  | 84,03  | 62 | 156,52 | 157,89 | 91  | 230,35 | 231,72 | 120 | 304,20 | 305,57 |
| 34 | 85,21  | 86,58  | 63 | 159,06 | 160,43 | 92  | 232,90 | 234,27 |     |        |        |
| 35 | 87,76  | 89,12  | 64 | 161,60 | 162,97 | 93  | 235,45 | 236,82 |     |        |        |
| 36 | 90,30  | 91,67  | 65 | 164,15 | 165,52 | 94  | 238,00 | 239,37 |     |        |        |
| 37 | 92,85  | 94,22  | 66 | 166,69 | 168,06 | 95  | 240,54 | 241,91 |     |        |        |
| 38 | 95,40  | 96,77  | 67 | 169,24 | 170,61 | 96  | 243,09 | 244,46 |     |        |        |
| 39 | 97,94  | 99,31  | 68 | 171,79 | 173,16 | 97  | 245,63 | 247,00 |     |        |        |
| 40 | 100,49 | 101,86 | 69 | 174,33 | 175,70 | 98  | 248,18 | 249,55 |     |        |        |
| 41 | 103,04 | 104,40 | 70 | 176,88 | 178,25 | 99  | 250,73 | 252,10 |     |        |        |
| 42 | 105,58 | 106,95 | 71 | 179,43 | 180,80 | 100 | 253,28 | 254,67 |     |        |        |
| 43 | 108,13 | 109,50 | 72 | 181,98 | 183,35 | 101 | 255,82 | 257,19 |     |        |        |
| 44 | 110,68 | 112,05 | 73 | 184,52 | 185,89 | 102 | 258,37 | 259,74 |     |        |        |
| 45 | 113,22 | 114,59 | 74 | 187,07 | 188,44 | 103 | 260,91 | 262,28 |     |        |        |
| 46 | 115,77 | 117,14 | 75 | 189,61 | 190,98 | 104 | 263,46 | 264,83 |     |        |        |



## HTD14M - HTD14M XHPL



### Belt characteristics

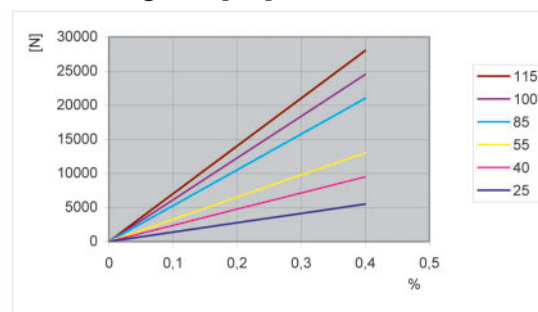
- Polyurethane timing belt with round tooth profile and high tensile load tension cords. Produced according to ISO 13050
- Metric pitch 14 mm
- The round tooth profile, allows a uniform load distribution that guarantees high performances high transmissible torque and precise tooth engagement.
- Widely used in linear positioning, heavy power transmission applications.
- **HTD14M - XHPL is the ideal belt for heavy duty synchronous lifting applications**
- Width tolerance:  $\pm 1,0$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,4$  [mm]

### HTD14M Technical data

| Belt width<br>b<br>[mm] | Allowable tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking load<br>Type M<br>$F_{Br}$<br>[N] | Specific spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|-------------------------------------------------------|-------------------------------------------------------|--------------------------------------------|-------------------------------------------|------------------|
| 40                      | 9500                                                  | 4750                                                  | 32870                                      | 2375000                                   | 0,44             |
| 55                      | 13000                                                 | 6500                                                  | 44980                                      | 3250000                                   | 0,61             |
| 85                      | 21000                                                 | 10500                                                 | 72660                                      | 5250000                                   | 0,94             |
| 115                     | 28000                                                 | 14000                                                 | 96880                                      | 7000000                                   | 1,30             |

Other widths are available on request.

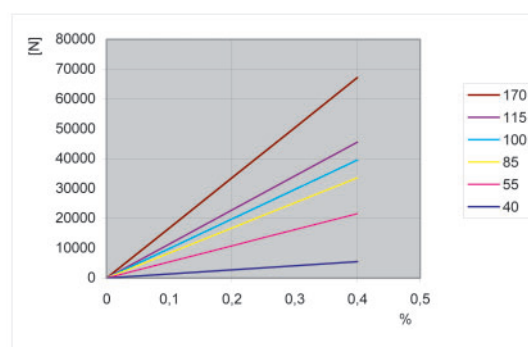
### Load / Elongation [ % ]



### HTD14M XHPL - Technical data

| Belt width<br>b<br>[mm] | Allowable tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Breaking load<br>Type M<br>$F_{Br}$<br>[N] | Specific spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|-------------------------------------------------------|--------------------------------------------|-------------------------------------------|------------------|
| 40                      | 13300                                                 | 58500                                      | 3900000                                   | 0,52             |
| 55                      | 21600                                                 | 81000                                      | 5400000                                   | 0,72             |
| 85                      | 33600                                                 | 126000                                     | 8400000                                   | 1,11             |
| 100                     | 39600                                                 | 148500                                     | 9900000                                   | 1,30             |
| 115                     | 45600                                                 | 171000                                     | 11400000                                  | 1,50             |
| 170                     | 67200                                                 | 252000                                     | 16800000                                  | 2,21             |

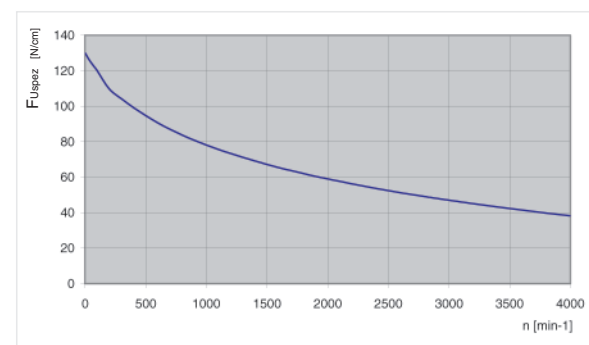
### Load / Elongation [ % ]



### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|
| 0   | 130,00                | 800  | 83,80                 | 1900 | 60,49                 |
| 20  | 127,69                | 900  | 80,85                 | 2000 | 59,01                 |
| 40  | 125,56                | 1000 | 78,14                 | 2200 | 56,23                 |
| 60  | 123,60                | 1100 | 75,63                 | 2400 | 53,68                 |
| 80  | 121,78                | 1200 | 73,31                 | 2600 | 51,30                 |
| 100 | 120,11                | 1300 | 71,14                 | 2800 | 49,09                 |
| 200 | 109,77                | 1400 | 69,11                 | 3000 | 47,01                 |
| 300 | 104,29                | 1440 | 68,33                 | 3200 | 45,06                 |
| 400 | 99,19                 | 1500 | 67,19                 | 3400 | 43,22                 |
| 500 | 94,65                 | 1600 | 65,38                 | 3600 | 41,48                 |
| 600 | 90,64                 | 1700 | 63,67                 | 3800 | 39,82                 |
| 700 | 87,04                 | 1800 | 62,04                 | 4000 | 38,24                 |

### Tooth shear strenght / rpm



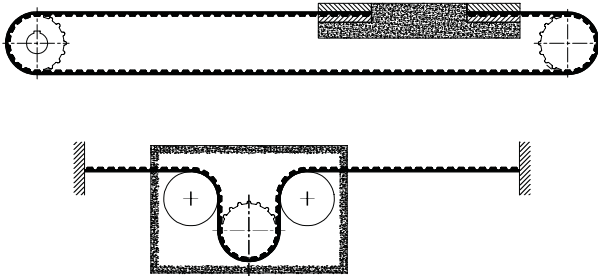
The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm.

The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

- $F_u$  [N] = peripheral force
- $F_{Uspez}$  [N/cm] = specific load
- $z_e$  = number of teeth in mesh in the small pulley
- $z_{emax}$  = max. no of teeth in mesh to be considered for the calculation of the drive
- $z_{emax}$  = 12 for ELATECH® M
- $z_{emax}$  = 6 for ELATECH® V
- $b$  [cm] = belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

- Timing pulley  $z_{\min} = 28$
- Idler running on belt teeth  $d_{\min} = 120 \text{ mm}$

Drive with reverse bending

- Timing pulley  $z_{\min} = 28$
- Idler running on belt back  $d_{\min} = 180 \text{ mm}$

### HTD14M - XHPL

#### Minimum number of teeth and minimum diameter

Drive without reverse bending

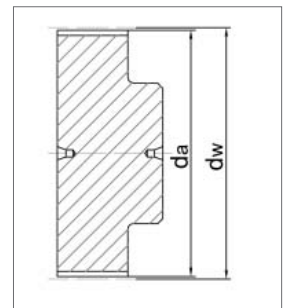
- Timing pulley  $z_{\min} = 34$
- Idler running on belt teeth  $d_{\min} = 140 \text{ mm}$

Drive with reverse bending

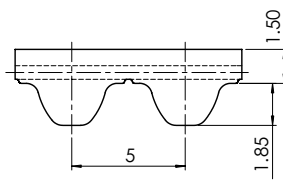
- Timing pulley  $z_{\min} = 34$
- Idler running on belt back  $d_{\min} = 200 \text{ mm}$

## Timing pulleys

| z  | da     | dw     | z  | da     | dw     | z   | da     | dw     | z   | da     | dw     |
|----|--------|--------|----|--------|--------|-----|--------|--------|-----|--------|--------|
| 28 | 122,12 | 124,77 | 57 | 251,22 | 254,01 | 86  | 380,46 | 383,23 | 115 | 509,69 | 512,47 |
| 29 | 126,58 | 129,22 | 58 | 255,68 | 258,46 | 87  | 384,91 | 387,70 | 116 | 514,14 | 516,93 |
| 30 | 130,99 | 133,69 | 59 | 260,14 | 262,91 | 88  | 389,37 | 392,15 | 117 | 518,60 | 521,38 |
| 31 | 135,45 | 138,14 | 60 | 264,60 | 267,38 | 89  | 393,83 | 396,60 | 118 | 523,06 | 525,83 |
| 32 | 139,88 | 142,59 | 61 | 269,04 | 271,83 | 90  | 398,29 | 401,07 | 119 | 527,51 | 530,30 |
| 33 | 144,35 | 147,06 | 62 | 273,50 | 276,28 | 91  | 402,73 | 405,52 | 120 | 531,97 | 534,75 |
| 34 | 148,79 | 151,51 | 63 | 277,96 | 280,75 | 92  | 407,19 | 409,97 |     |        |        |
| 35 | 153,25 | 155,96 | 64 | 282,42 | 285,20 | 93  | 411,65 | 414,44 |     |        |        |
| 36 | 157,68 | 160,41 | 65 | 286,88 | 289,65 | 94  | 416,10 | 418,89 |     |        |        |
| 37 | 162,14 | 164,88 | 66 | 291,32 | 294,11 | 95  | 420,56 | 423,35 |     |        |        |
| 38 | 166,60 | 169,34 | 67 | 295,78 | 298,56 | 96  | 425,02 | 427,80 |     |        |        |
| 39 | 171,02 | 173,79 | 68 | 300,24 | 303,03 | 97  | 429,48 | 432,25 |     |        |        |
| 40 | 175,48 | 178,24 | 69 | 304,70 | 307,48 | 98  | 433,94 | 436,72 |     |        |        |
| 41 | 179,92 | 182,71 | 70 | 309,16 | 311,93 | 99  | 438,38 | 441,17 |     |        |        |
| 42 | 184,37 | 187,16 | 71 | 313,61 | 316,40 | 100 | 442,84 | 445,62 |     |        |        |
| 43 | 188,83 | 191,61 | 72 | 318,07 | 320,85 | 101 | 447,30 | 450,09 |     |        |        |
| 44 | 193,29 | 196,08 | 73 | 322,53 | 325,30 | 102 | 451,76 | 454,54 |     |        |        |
| 45 | 197,75 | 200,53 | 74 | 326,98 | 329,77 | 103 | 456,21 | 459,00 |     |        |        |
| 46 | 202,21 | 204,98 | 75 | 331,44 | 334,22 | 104 | 460,67 | 463,45 |     |        |        |
| 47 | 206,65 | 209,43 | 76 | 335,90 | 338,67 | 105 | 465,13 | 467,90 |     |        |        |
| 48 | 211,11 | 213,90 | 77 | 340,34 | 343,12 | 106 | 469,58 | 472,37 |     |        |        |
| 49 | 215,57 | 218,35 | 78 | 344,80 | 347,59 | 107 | 474,03 | 476,82 |     |        |        |
| 50 | 220,03 | 222,80 | 79 | 349,26 | 352,04 | 108 | 478,49 | 481,28 |     |        |        |
| 51 | 224,49 | 227,27 | 80 | 353,72 | 356,49 | 109 | 482,95 | 485,74 |     |        |        |
| 52 | 228,95 | 231,72 | 81 | 358,17 | 360,96 | 110 | 487,41 | 490,19 |     |        |        |
| 53 | 233,39 | 236,18 | 82 | 362,63 | 365,41 | 111 | 491,87 | 494,64 |     |        |        |
| 54 | 237,85 | 240,64 | 83 | 367,09 | 369,86 | 112 | 496,32 | 499,10 |     |        |        |
| 55 | 242,30 | 245,09 | 84 | 371,54 | 374,33 | 113 | 500,78 | 503,55 |     |        |        |
| 56 | 246,76 | 249,55 | 85 | 376,00 | 378,78 | 114 | 505,23 | 508,02 |     |        |        |



## STD5M



### Belt characteristics

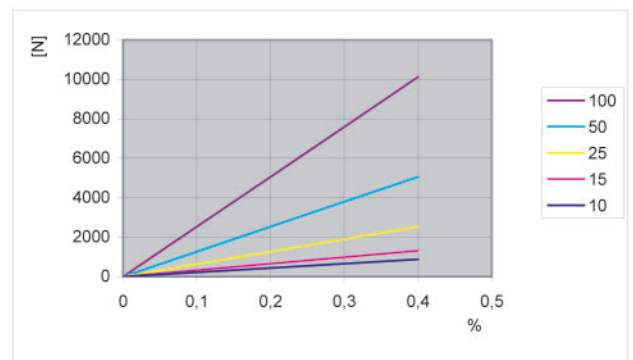
- Polyurethane timing belt with involute tooth, high tensile load steel cords and high torque capacity. Produced according to ISO 13050
- Metric pitch 5 mm
- Low noise generation in high speed drives
- Offers excellent operational reliability in linear positioning and light power transmission applications
- The special profile allows smooth running properties
- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 10                      | 880                                                      | 440                                                      | 3200                                          | 220000                                       | 0,05             |
| 15                      | 1320                                                     | 660                                                      | 4800                                          | 330000                                       | 0,07             |
| 25                      | 2530                                                     | 1265                                                     | 9200                                          | 632500                                       | 0,12             |
| 50                      | 5060                                                     | 2530                                                     | 18400                                         | 1265000                                      | 0,23             |
| 100                     | 10120                                                    | 5060                                                     | 36800                                         | 2530000                                      | 0,46             |

Other widths are available on request.

## Load / Elongation [ % ]



## Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm   | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|-------|-----------------------|
| 0   | 36,90                 | 800  | 27,71                 | 1900 | 22,74                 | 4500  | 16,90                 |
| 20  | 36,35                 | 900  | 27,11                 | 2000 | 22,41                 | 5000  | 16,14                 |
| 40  | 35,85                 | 1000 | 26,55                 | 2200 | 21,80                 | 5500  | 15,45                 |
| 60  | 35,40                 | 1100 | 26,02                 | 2400 | 21,22                 | 6000  | 14,82                 |
| 80  | 34,99                 | 1200 | 25,53                 | 2600 | 20,69                 | 6500  | 14,24                 |
| 100 | 34,62                 | 1300 | 25,06                 | 2800 | 20,19                 | 7000  | 13,69                 |
| 200 | 33,23                 | 1400 | 24,63                 | 3000 | 19,73                 | 7500  | 13,18                 |
| 300 | 31,37                 | 1440 | 24,46                 | 3200 | 19,28                 | 8000  | 12,70                 |
| 400 | 30,60                 | 1500 | 24,21                 | 3400 | 18,87                 | 8500  | 12,25                 |
| 500 | 29,81                 | 1600 | 23,82                 | 3600 | 18,47                 | 9000  | 11,83                 |
| 600 | 29,06                 | 1700 | 23,44                 | 3800 | 18,09                 | 9500  | 11,42                 |
| 700 | 28,36                 | 1800 | 23,08                 | 4000 | 17,73                 | 10000 | 11,03                 |

The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

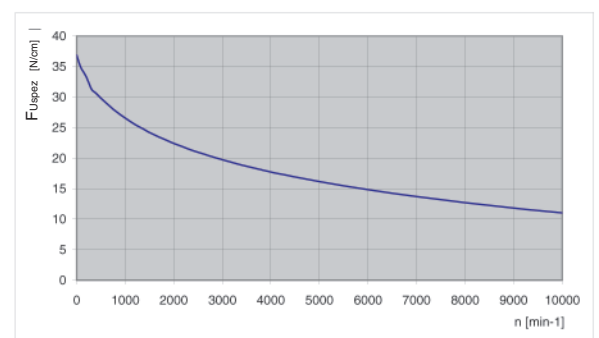
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

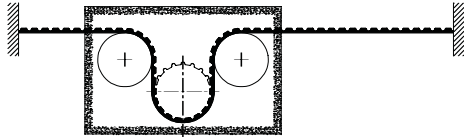
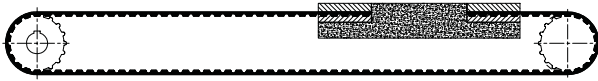
= belt width in cm

## Tooth shear strength / rpm





## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

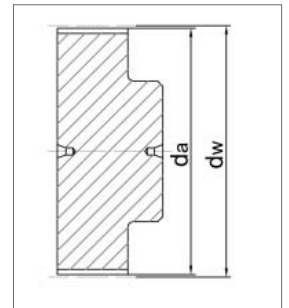
- Timing pulley  $z_{\min} = 16$
- Idler running on belt teeth  $d_{\min} = 50 \text{ mm}$

Drive with reverse bending

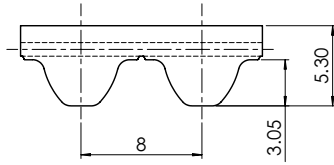
- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 50 \text{ mm}$

## Timing pulleys

| z  | da    | dw    | z  | da     | dw     | z  | da     | dw     | z   | da     | dw     |
|----|-------|-------|----|--------|--------|----|--------|--------|-----|--------|--------|
| 10 | 14,95 | 15,91 | 39 | 61,11  | 62,07  | 68 | 107,27 | 108,23 | 97  | 153,42 | 154,38 |
| 11 | 16,54 | 17,50 | 40 | 62,70  | 63,66  | 69 | 108,86 | 109,82 | 98  | 155,01 | 155,97 |
| 12 | 18,14 | 19,10 | 41 | 64,30  | 65,26  | 70 | 110,45 | 111,41 | 99  | 156,60 | 157,56 |
| 13 | 19,73 | 20,69 | 42 | 65,89  | 66,85  | 71 | 112,04 | 113,00 | 100 | 158,19 | 159,15 |
| 14 | 21,32 | 22,28 | 43 | 67,48  | 68,44  | 72 | 113,63 | 114,59 | 101 | 159,79 | 160,75 |
| 15 | 22,91 | 23,87 | 44 | 69,07  | 70,03  | 73 | 115,23 | 116,19 | 102 | 161,38 | 162,34 |
| 16 | 24,51 | 25,47 | 45 | 70,66  | 71,62  | 74 | 116,82 | 117,78 | 103 | 162,99 | 163,95 |
| 17 | 26,10 | 27,06 | 46 | 72,25  | 73,21  | 75 | 118,41 | 119,37 | 104 | 164,56 | 165,52 |
| 18 | 27,69 | 28,65 | 47 | 73,84  | 74,80  | 76 | 120,00 | 120,96 | 105 | 166,15 | 167,11 |
| 19 | 29,27 | 30,23 | 48 | 75,43  | 76,39  | 77 | 121,59 | 122,55 | 106 | 167,74 | 168,70 |
| 20 | 30,87 | 31,83 | 49 | 77,03  | 77,99  | 78 | 123,18 | 124,14 | 107 | 169,34 | 170,30 |
| 21 | 32,46 | 33,42 | 50 | 78,62  | 79,58  | 79 | 124,77 | 125,73 | 108 | 170,93 | 171,89 |
| 22 | 34,05 | 35,01 | 51 | 80,21  | 81,17  | 80 | 126,36 | 127,32 | 109 | 172,52 | 173,48 |
| 23 | 35,65 | 36,61 | 52 | 81,80  | 82,76  | 81 | 127,95 | 128,91 | 110 | 174,10 | 175,06 |
| 24 | 37,23 | 38,19 | 53 | 83,39  | 84,35  | 82 | 129,54 | 130,50 | 111 | 175,70 | 176,66 |
| 25 | 38,83 | 39,79 | 54 | 84,99  | 85,95  | 83 | 131,14 | 132,10 | 112 | 177,29 | 178,25 |
| 26 | 40,42 | 41,38 | 55 | 86,58  | 87,54  | 84 | 132,73 | 133,69 | 113 | 178,88 | 179,84 |
| 27 | 42,01 | 42,97 | 56 | 88,17  | 89,13  | 85 | 134,32 | 135,28 | 114 | 180,47 | 181,43 |
| 28 | 43,60 | 44,56 | 57 | 89,76  | 90,72  | 86 | 135,91 | 136,87 | 115 | 182,06 | 183,02 |
| 29 | 45,19 | 46,15 | 58 | 91,35  | 92,31  | 87 | 137,51 | 138,47 | 116 | 183,65 | 184,61 |
| 30 | 46,79 | 47,75 | 59 | 92,94  | 93,90  | 88 | 139,09 | 140,05 | 117 | 185,25 | 186,21 |
| 31 | 48,38 | 49,34 | 60 | 94,53  | 95,49  | 89 | 140,69 | 141,65 | 118 | 186,84 | 187,80 |
| 32 | 49,97 | 50,93 | 61 | 96,13  | 97,09  | 90 | 142,28 | 143,24 | 119 | 188,43 | 189,39 |
| 33 | 51,56 | 52,52 | 62 | 97,72  | 98,68  | 91 | 143,87 | 144,83 | 120 | 190,02 | 190,98 |
| 34 | 53,15 | 54,11 | 63 | 99,31  | 100,27 | 92 | 145,46 | 146,42 |     |        |        |
| 35 | 54,75 | 55,71 | 64 | 100,90 | 101,86 | 93 | 147,05 | 148,01 |     |        |        |
| 36 | 56,34 | 57,30 | 65 | 102,49 | 103,45 | 94 | 148,64 | 149,60 |     |        |        |
| 37 | 57,93 | 58,89 | 66 | 104,08 | 105,04 | 95 | 150,24 | 151,20 |     |        |        |
| 38 | 59,52 | 60,48 | 67 | 105,67 | 106,63 | 96 | 151,83 | 152,71 |     |        |        |



## STD8M



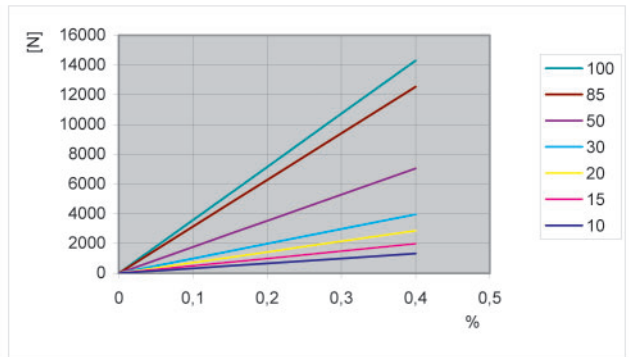
### Belt characteristics

- Polyurethane timing belt with evolvent tooth, high tensile load steel cords and high torque capacity. Produced according to ISO 13050
- Metric pitch 8 mm
- Low noise generation in high speed drives
- Offers excellent operational reliability in linear positioning and medium power transmission applications
- Widely used in automatic doors
- The special profile allows smooth running properties
- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm/m]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|----------------------------------------------|------------------|
| 10                      | 1320                                                     | 660                                                      | 5700                                          | 330000                                       | 0,07             |
| 15                      | 1980                                                     | 990                                                      | 8550                                          | 495000                                       | 0,10             |
| 20                      | 2860                                                     | 1430                                                     | 12350                                         | 715000                                       | 0,13             |
| 30                      | 3960                                                     | 1980                                                     | 17100                                         | 990000                                       | 0,20             |
| 50                      | 7040                                                     | 3520                                                     | 30400                                         | 1760000                                      | 0,33             |
| 85                      | 12540                                                    | 6270                                                     | 54150                                         | 3135000                                      | 0,56             |
| 100                     | 14300                                                    | 7150                                                     | 61750                                         | 3575000                                      | 0,66             |

Load / Elongation [ % ]

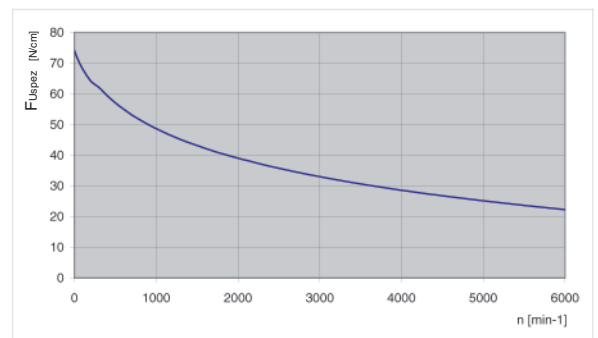


Other widths are available on request.

### Tooth shear strength

| rpm | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] | rpm  | $F_{Uspez}$<br>[N/cm] |
|-----|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|
| 0   | 74,10                 | 800  | 51,53                 | 1900 | 39,76                 | 4500 | 26,79                 |
| 20  | 73,05                 | 900  | 50,03                 | 2000 | 39,02                 | 5000 | 25,14                 |
| 40  | 72,06                 | 1000 | 48,66                 | 2200 | 37,62                 | 5500 | 23,65                 |
| 60  | 71,13                 | 1100 | 47,39                 | 2400 | 36,34                 | 6000 | 22,28                 |
| 80  | 70,26                 | 1200 | 46,22                 | 2600 | 35,15                 |      |                       |
| 100 | 69,43                 | 1300 | 45,12                 | 2800 | 34,04                 |      |                       |
| 200 | 65,98                 | 1400 | 44,10                 | 3000 | 33,00                 |      |                       |
| 300 | 62,11                 | 1440 | 43,70                 | 3200 | 32,02                 |      |                       |
| 400 | 59,43                 | 1500 | 43,13                 | 3400 | 31,10                 |      |                       |
| 500 | 57,08                 | 1600 | 42,22                 | 3600 | 30,23                 |      |                       |
| 600 | 55,02                 | 1700 | 41,36                 | 3800 | 29,40                 |      |                       |
| 700 | 53,18                 | 1800 | 40,54                 | 4000 | 28,61                 |      |                       |

Tooth shear strenght / rpm



The specific load  $F_{Uspez}$  is the maximum load which one single belt tooth 1 cm wide can withstand in all operating conditions. This force is related to the drive rpm. The total load  $F_u$  transmissible by the belt in the drive is calculated by:

$$F_u [N] = F_{Uspez} \cdot z_e \cdot b$$

$F_u$  [N]

$F_{Uspez}$  [N/cm]

$z_e$

$z_{emax}$

$z_{emax}$

$z_{emax}$

$b$  [cm]

= peripheral force

= specific load

= number of teeth in mesh in the small pulley

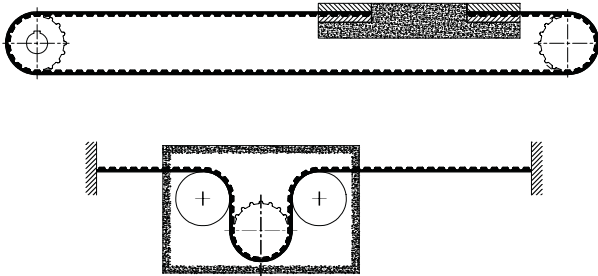
= max. no of teeth in mesh to be considered for the calculation of the drive

= 12 for ELATECH® M

= 6 for ELATECH® V

= belt width in cm

## Flexibility



### Minimum number of teeth and minimum diameter

Drive without reverse bending

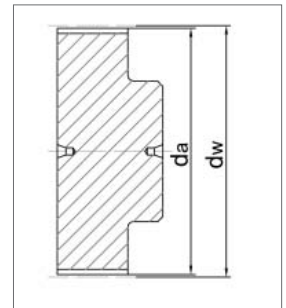
- Timing pulley  $z_{\min} = 18$
- Idler running on belt teeth  $d_{\min} = 50 \text{ mm}$

Drive with reverse bending

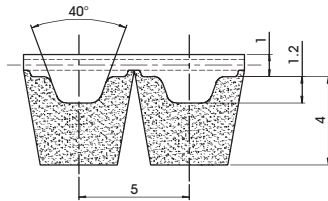
- Timing pulley  $z_{\min} = 18$
- Idler running on belt back  $d_{\min} = 120 \text{ mm}$

## Timing pulleys

| z  | da     | dw     | z  | da     | dw     | z   | da     | dw     | z   | da     | dw     |
|----|--------|--------|----|--------|--------|-----|--------|--------|-----|--------|--------|
| 18 | 44,46  | 45,83  | 47 | 118,31 | 119,68 | 76  | 192,16 | 193,53 | 105 | 266,01 | 267,38 |
| 19 | 47,01  | 48,38  | 48 | 120,86 | 122,23 | 77  | 194,71 | 196,08 | 106 | 268,55 | 269,92 |
| 20 | 49,56  | 50,93  | 49 | 123,40 | 124,77 | 78  | 197,25 | 198,62 | 107 | 271,10 | 272,47 |
| 21 | 52,10  | 53,47  | 50 | 125,95 | 127,32 | 79  | 199,80 | 201,17 | 108 | 273,64 | 275,01 |
| 22 | 54,65  | 56,02  | 51 | 128,50 | 129,87 | 80  | 202,35 | 203,72 | 109 | 276,19 | 277,56 |
| 23 | 57,20  | 58,57  | 52 | 131,04 | 132,41 | 81  | 204,89 | 206,26 | 110 | 278,74 | 280,11 |
| 24 | 59,75  | 61,12  | 53 | 133,59 | 134,96 | 82  | 207,44 | 208,81 | 111 | 281,29 | 282,66 |
| 25 | 62,29  | 63,66  | 54 | 136,14 | 137,51 | 83  | 209,98 | 211,35 | 112 | 283,84 | 285,21 |
| 26 | 64,84  | 66,21  | 55 | 138,68 | 140,05 | 84  | 212,53 | 213,90 | 113 | 286,38 | 287,75 |
| 27 | 67,38  | 68,75  | 56 | 141,23 | 142,60 | 85  | 215,08 | 216,45 | 114 | 288,93 | 290,30 |
| 28 | 69,93  | 71,30  | 57 | 143,78 | 145,15 | 86  | 217,63 | 219,00 | 115 | 291,47 | 292,84 |
| 29 | 72,47  | 73,84  | 58 | 146,32 | 147,69 | 87  | 220,17 | 221,54 | 116 | 294,02 | 295,39 |
| 30 | 75,02  | 76,39  | 59 | 148,87 | 150,24 | 88  | 222,72 | 224,09 | 117 | 296,57 | 297,94 |
| 31 | 77,57  | 78,94  | 60 | 151,42 | 152,79 | 89  | 225,26 | 226,63 | 118 | 299,11 | 300,48 |
| 32 | 80,12  | 81,49  | 61 | 153,96 | 155,33 | 90  | 227,81 | 229,18 | 119 | 301,66 | 303,03 |
| 33 | 82,66  | 84,03  | 62 | 156,52 | 157,89 | 91  | 230,35 | 231,72 | 120 | 304,20 | 305,57 |
| 34 | 85,21  | 86,58  | 63 | 159,06 | 160,43 | 92  | 232,90 | 234,27 |     |        |        |
| 35 | 87,75  | 89,12  | 64 | 161,60 | 162,97 | 93  | 235,45 | 236,82 |     |        |        |
| 36 | 90,30  | 91,67  | 65 | 164,15 | 165,52 | 94  | 238,00 | 239,37 |     |        |        |
| 37 | 92,85  | 94,22  | 66 | 166,69 | 168,06 | 95  | 240,54 | 241,91 |     |        |        |
| 38 | 95,40  | 96,77  | 67 | 169,24 | 170,61 | 96  | 243,09 | 244,46 |     |        |        |
| 39 | 97,94  | 99,31  | 68 | 171,79 | 173,16 | 97  | 245,63 | 247,00 |     |        |        |
| 40 | 100,49 | 101,86 | 69 | 174,33 | 175,70 | 98  | 248,18 | 249,55 |     |        |        |
| 41 | 103,03 | 104,40 | 70 | 176,88 | 178,25 | 99  | 250,73 | 252,10 |     |        |        |
| 42 | 105,58 | 106,95 | 71 | 179,43 | 180,80 | 100 | 253,30 | 254,67 |     |        |        |
| 43 | 108,13 | 109,50 | 72 | 181,98 | 183,35 | 101 | 255,82 | 257,19 |     |        |        |
| 44 | 110,68 | 112,05 | 73 | 184,52 | 185,89 | 102 | 258,37 | 259,74 |     |        |        |
| 45 | 113,22 | 114,59 | 74 | 187,07 | 188,44 | 103 | 260,91 | 262,28 |     |        |        |
| 46 | 115,77 | 117,14 | 75 | 189,61 | 190,98 | 104 | 263,46 | 264,83 |     |        |        |



## TK5 - K6



### Belt characteristics

- Polyurethane self tracking timing belt with steel tension cords
- Profile T5 with central guide - K6 x 4 mm
- Central guide height 4,0 mm
- Allow to use pulleys without flanges
- The central guide is notched in order to maximize belt flexibility
- Ideal for conveying applications where a side load is generated by loading/unloading transferring a product

### Technical data

|                                   |      |      |      |      |
|-----------------------------------|------|------|------|------|
| Belt width [mm]                   | 32   | 50   | 75   | 100  |
| Allowable tensile load type V [N] | 570  | 900  | 1350 | 1800 |
| Weight [kg/m]                     | 0,08 | 0,13 | 0,20 | 0,26 |

### Minimum number of teeth and minimum diameter

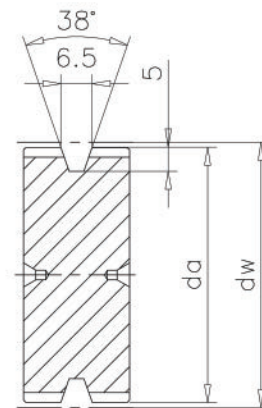
Drive without reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt teeth  $d_{\min} = 60$  mm

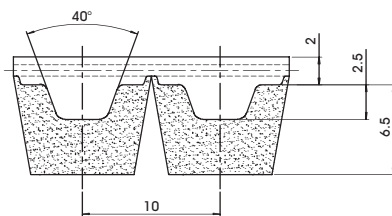
Drive with reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 80$  mm

### Pulley profile



## TK10 - K13



### Belt characteristics

- Polyurethane self track timing belt with steel tension cords
- Profile T10 with central guide - K13 x 6,5
- Central guide height 6,5 mm
- Allow to use pulleys without flanges
- The central guide is notched in order to maximize belt flexibility
- Ideal for conveying applications where a side load is generated by loading/unloading transferring a product

### Technical data

|                                   |      |      |      |      |
|-----------------------------------|------|------|------|------|
| Belt width [mm]                   | 32   | 50   | 75   | 100  |
| Allowable tensile load type V [N] | 1650 | 2660 | 3960 | 5390 |
| Weight [kg/m]                     | 0,22 | 0,30 | 0,41 | 0,53 |

### Minimum number of teeth and minimum diameter

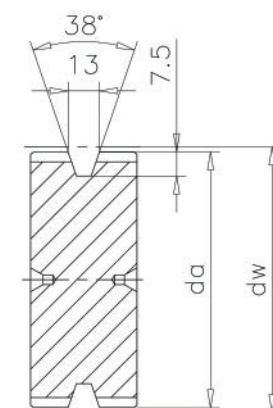
Drive without reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt teeth  $d_{\min} = 80$  mm

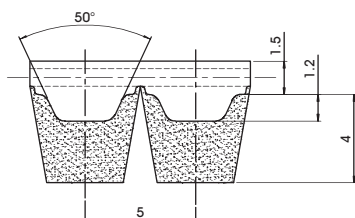
Drive with reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 80$  mm

### Pulley profile



## ATK5 - K6



### Belt characteristics

- Polyurethane self track timing belt with steel tension cords
- Profile AT5 with central guide - K6 x 4 mm
- Central guide height 4,0 mm
- Allow to use pulleys without flanges
- The central guide is notched in order to maximize belt flexibility
- Ideal for conveying applications where a side load is generated by loading/unloading transferring a product

### Technical data

|                                   |      |      |      |      |
|-----------------------------------|------|------|------|------|
| Belt width [mm]                   | 32   | 50   | 75   | 100  |
| Allowable tensile load type V [N] | 1120 | 1750 | 2625 | 3500 |
| Weight [kg/m]                     | 0,11 | 0,19 | 0,29 | 0,38 |

### Minimum number of teeth and minimum diameter

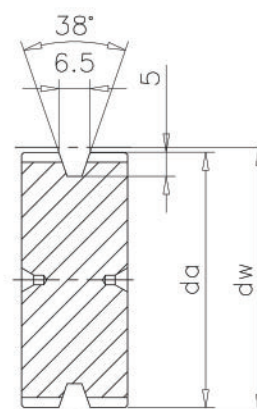
Drive without reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt teeth  $d_{\min} = 60$  mm

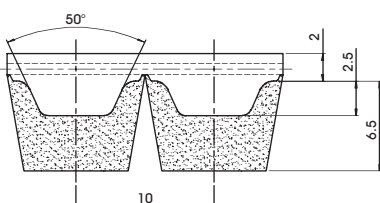
Drive with reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 80$  mm

### Pulley profile



## ATK10 - K13



### Belt characteristics

- Polyurethane self track timing belt with steel tension cords
- Profile AT10 with central guide - K13 x 6,5 mm
- Central guide height 6,5 mm
- Allow to use pulleys without flanges
- The central guide is notched in order to maximize belt flexibility
- Ideal for conveying applications where a side load is generated by loading/unloading transferring a product

### Technical data

|                                   |      |      |      |      |
|-----------------------------------|------|------|------|------|
| Belt width [mm]                   | 32   | 50   | 75   | 100  |
| Allowable tensile load type V [N] | 2450 | 3900 | 5950 | 7850 |
| Weight [kg/m]                     | 0,27 | 0,36 | 0,50 | 0,72 |

### Minimum number of teeth and minimum diameter

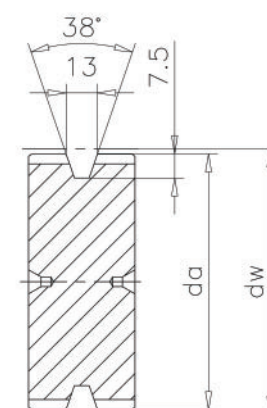
Drive without reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt teeth  $d_{\min} = 80$  mm

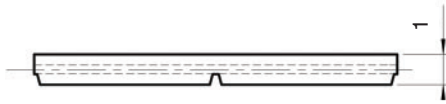
Drive with reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 120$  mm

### Pulley profile



## F1



### Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring<br>rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|-------------------------------------------------|------------------|
| 10                      | 360                                                      | 180                                                      | 1500                                          | 90000                                           | 0,02             |
| 20                      | 750                                                      | 375                                                      | 3125                                          | 187500                                          | 0,04             |
| 30                      | 1200                                                     | 600                                                      | 5000                                          | 300000                                          | 0,05             |
| 40                      | 1500                                                     | 750                                                      | 6250                                          | 375000                                          | 0,08             |
| 50                      | 1800                                                     | 900                                                      | 7500                                          | 450000                                          | 0,09             |

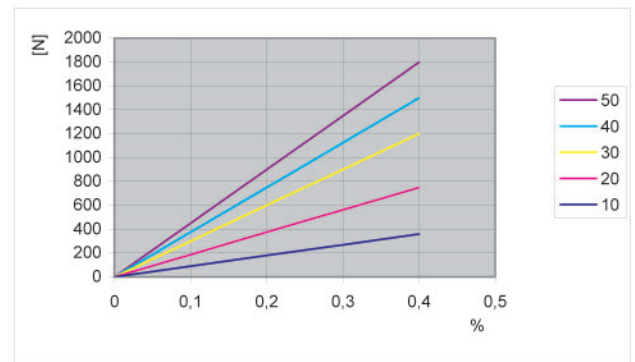
Other widths are available on request.

| Minimum<br>pulley<br>diameter | Drive without<br>reverse bending<br>[mm] | Drive with<br>reverse bending<br>[mm] |
|-------------------------------|------------------------------------------|---------------------------------------|
|                               | 16                                       | 30                                    |

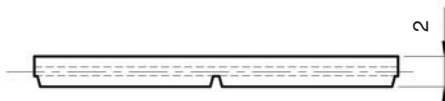
### Belt characteristics

- Polyurethane flat belt with steel tension cords
- It is mainly used in lifting applications where there is no need for synchronization
- Allows the use of small diameter pulleys
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Load / Elongation [ % ]



## F2



### Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring<br>rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|-------------------------------------------------|------------------|
| 10                      | 1320                                                     | 660                                                      | 5700                                          | 330000                                          | 0,03             |
| 15                      | 1980                                                     | 990                                                      | 8550                                          | 495000                                          | 0,05             |
| 25                      | 3080                                                     | 1540                                                     | 13300                                         | 770000                                          | 0,08             |
| 30                      | 3960                                                     | 1980                                                     | 17100                                         | 990000                                          | 0,10             |
| 50                      | 7040                                                     | 3520                                                     | 30400                                         | 1760000                                         | 0,17             |
| 75                      | 10560                                                    | 5280                                                     | 45600                                         | 2640000                                         | 0,25             |
| 100                     | 14300                                                    | 7150                                                     | 61750                                         | 3575000                                         | 0,34             |

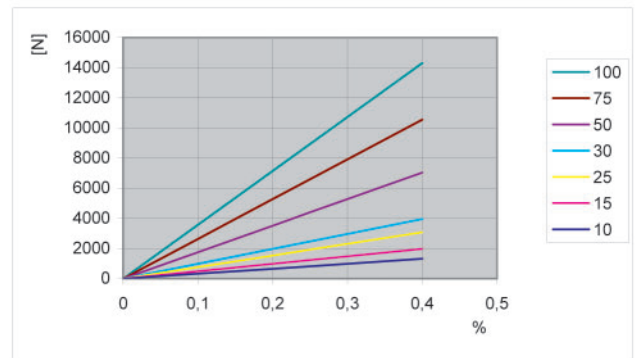
Other widths are available on request.

| Minimum<br>pulley<br>diameter | Drive without<br>reverse bending<br>[mm] | Drive with<br>reverse bending<br>[mm] |
|-------------------------------|------------------------------------------|---------------------------------------|
|                               | 50                                       | 100                                   |

### Belt characteristics

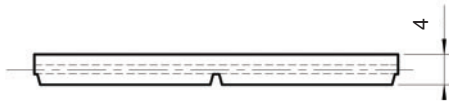
- Polyurethane flat belt with steel tension cords
- It is mainly used in lifting application where there is no need for synchronization
- Allows the use of small diameter pulleys
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Load / Elongation [ % ]





## F4



### Belt characteristics

- Polyurethane flat belt with steel tension cords
- It is mainly used in lifting application where there is no need of synchronization
- Allows the use of small diameter pulleys
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

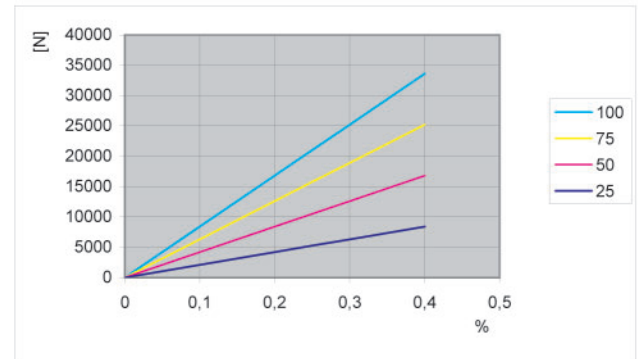
### Technical data

| Belt width<br>b<br>[mm] | Allowable<br>tensile load<br>Type M<br>$F_{Tzul}$<br>[N] | Allowable<br>tensile load<br>Type V<br>$F_{Tzul}$<br>[N] | Breaking<br>load<br>Type M<br>$F_{Br}$<br>[N] | Specific<br>spring<br>rate<br>$C_{spez}$<br>[N] | Weight<br>[kg/m] |
|-------------------------|----------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|-------------------------------------------------|------------------|
| 25                      | 8400                                                     | 4200                                                     | 33000                                         | 2100000                                         | 0,20             |
| 50                      | 16800                                                    | 8400                                                     | 66000                                         | 4200000                                         | 0,40             |
| 75                      | 25200                                                    | 12600                                                    | 99000                                         | 6300000                                         | 0,60             |
| 100                     | 33600                                                    | 16800                                                    | 132000                                        | 8400000                                         | 0,80             |

Other widths are available on request.

| Minimum<br>pulley<br>diameter | Drive without<br>reverse bending<br>[mm] | Drive with<br>reverse bending<br>[mm] |
|-------------------------------|------------------------------------------|---------------------------------------|
|                               | 120                                      | 150                                   |

### Load / Elongation [ % ]



## Clamp plates

Clamp plates may be used as positive attachment of the belt ends in numerous applications in linear drives. Clamp plates must have the correct belt profile, guarantee a uniform clamping force on all the clamped belt surface and must be rigid.

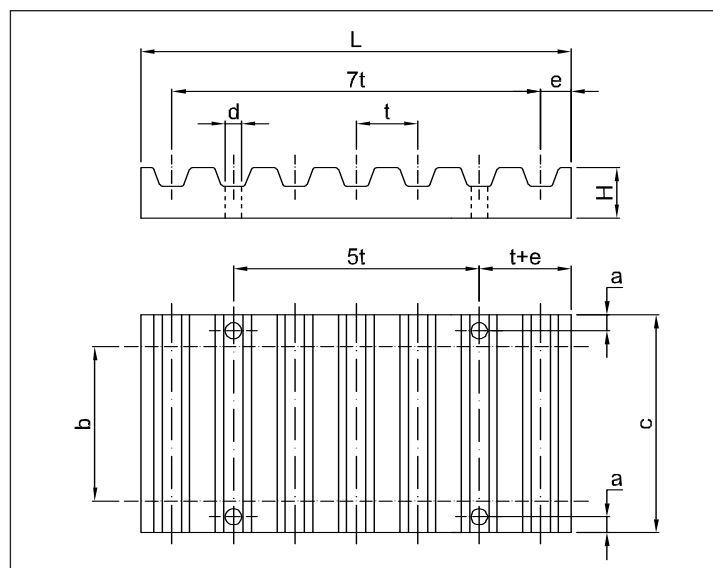
For standard applications a minimum of 7 teeth in clamp is recommended.

For use with timing belts with HPL cords, a minimum of 12 teeth in clamp is recommended.

| Type | a  | d   | e   | L    | H  | Belt width b (mm) |    |    |    |    |    |     |     |
|------|----|-----|-----|------|----|-------------------|----|----|----|----|----|-----|-----|
|      |    |     |     |      |    | 6                 | 10 | 16 | 25 | 32 | 50 | 75  | 100 |
|      |    |     |     |      |    | C                 |    |    |    |    |    |     |     |
| T5   | 6  | 5,5 | 3,2 | 41,8 | 8  | -                 | 29 | 35 | 44 | -  | -  | -   | -   |
| AT5  | 6  | 5,5 | 3,2 | 41,8 | 8  | -                 | 29 | 35 | 44 | -  | -  | -   | -   |
| T10  | 8  | 9   | 5   | 80   | 15 | -                 | -  | 41 | 50 | 57 | 75 | 100 | 125 |
| AT10 | 8  | 9   | 5   | 80   | 15 | -                 | -  | 41 | 50 | 57 | 75 | 100 | 125 |
| T20  | 10 | 11  | 10  | 160  | 20 | -                 | -  | -  | 56 | 63 | 81 | 106 | 132 |
| AT20 | 10 | 11  | 10  | 160  | 20 | -                 | -  | -  | 56 | 63 | 81 | 106 | 132 |

| Type | a  | d   | e   | L     | H  | Belt width b (inch/100) |     |      |     |     |      |     |     |
|------|----|-----|-----|-------|----|-------------------------|-----|------|-----|-----|------|-----|-----|
|      |    |     |     |       |    | 025                     | 031 | 037  | 050 | 075 | 100  | 150 | 200 |
|      |    |     |     |       |    | C                       |     |      |     |     |      |     |     |
| XL   | 6  | 5,5 | 3,5 | 42,5  | 8  | 25,5                    | 27  | 28,5 | -   | -   | -    | -   | -   |
| L    | 8  | 9   | 6   | 76,6  | 15 | -                       | -   | 36   | 39  | 45  | 51,5 | 64  | 77  |
| H    | 10 | 11  | 9   | 106,9 | 22 | -                       | -   | -    | 45  | 51  | 57,5 | 70  | 83  |

| Type | a  | d   | e   | L    | H  | Belt width b (mm) |    |    |    |    |    |    |     |     |
|------|----|-----|-----|------|----|-------------------|----|----|----|----|----|----|-----|-----|
|      |    |     |     |      |    | 15                | 20 | 25 | 30 | 40 | 50 | 55 | 85  | 115 |
|      |    |     |     |      |    | C                 |    |    |    |    |    |    |     |     |
| 5M   | 6  | 5,5 | 3,4 | 41,8 | 8  | 34                | -  | 44 | -  | -  | -  | -  | -   | -   |
| 8M   | 8  | 9   | 5   | 66   | 15 | 40                | 45 | -  | 55 | -  | 75 | -  | 110 | -   |
| 14M  | 10 | 11  | 9   | 116  | 22 | -                 | -  | 56 | -  | 71 | -  | 86 | 116 | 146 |



# Drive calculation

## GUIDELINES

### Pulleys

It is recommended to use pulleys with the maximum diameter allowed by the application in order to maximise the number of teeth in mesh and increase the belt peripheral speed. For applications where high positioning precision is required, it might be useful to use zero backlash pulleys.

In order to guarantee a reliable drive, it is recommended to use superior quality pulleys

### Machine structure

For a trouble free drive, it is recommended that the structure of application of the timing belt drive, is as rigid as possible. That will guarantee high work repeatability.

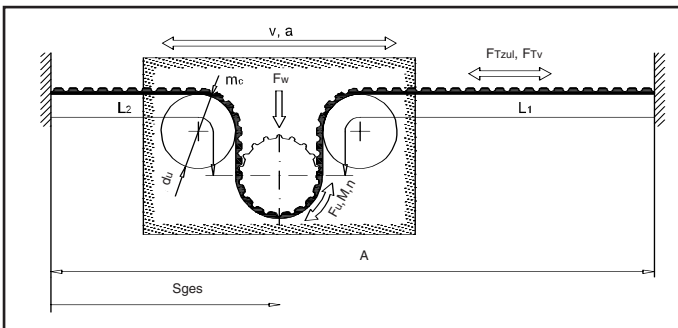
### Clamping plates

In case of use of clamping plates, they must have the belt profile, be rigid and guarantee a uniform clamping force on all the surface. It is recommended to have a minimum of 7 teeth in clamp to guarantee catalogue performances. In case of belts with HPL cords, the recommended number of teeth in clamp is 12.

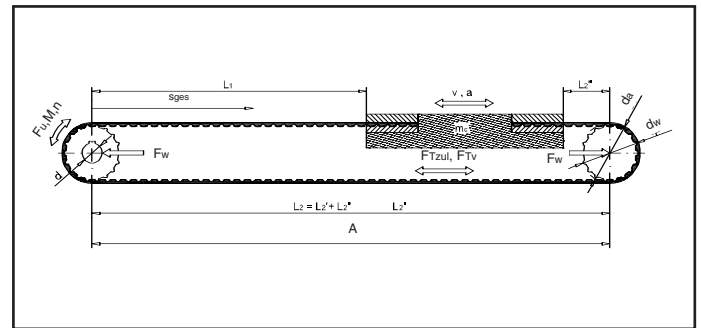
## DEFINITIONS AND TRANSMISSION CYCLE

In most cases linear drives may be taken back to one of the two layouts shown, where a specific system of forces acts.

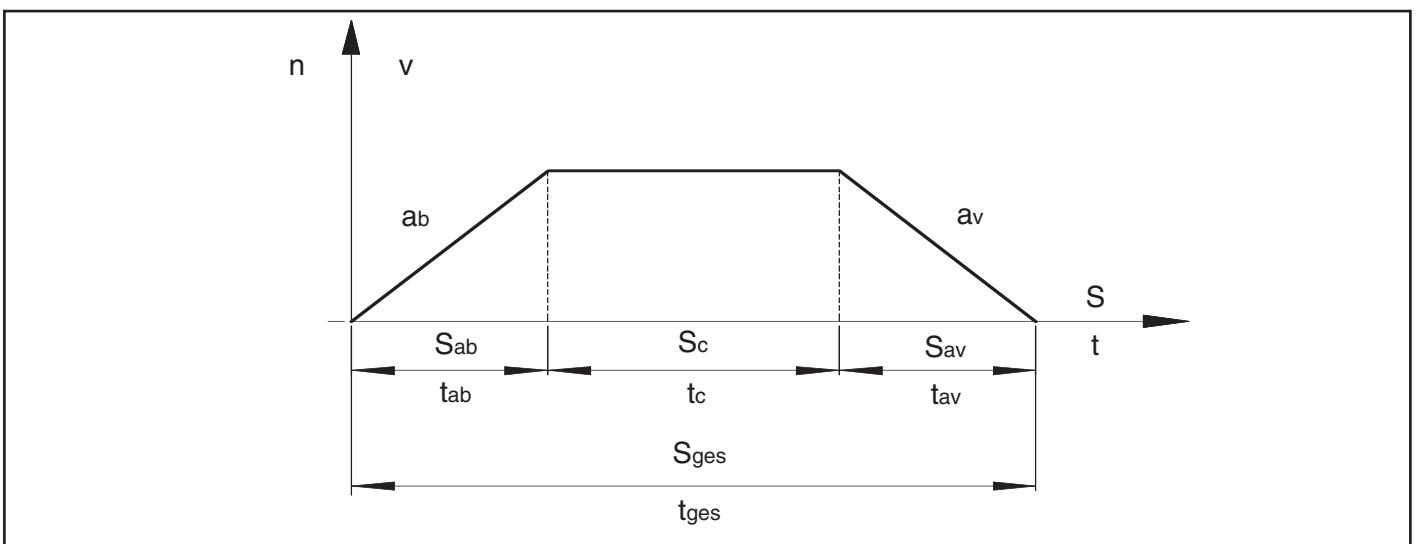
“ OMEGA “ drive



Linear drive



### Transmission cycle (rmp/time)



## Definitions and abbreviations

|             |                     |                                                        |            |                       |                                      |
|-------------|---------------------|--------------------------------------------------------|------------|-----------------------|--------------------------------------|
| $a_b$       | (m/s <sup>2</sup> ) | Acceleration                                           | $M_{av}$   | (Nm)                  | Braking torque                       |
| $a_v$       | (m/s <sup>2</sup> ) | Deceleration                                           | $\rho$     | (kg/dm <sup>3</sup> ) | Specific weight                      |
| $B$         | (mm)                | Pulley width                                           | $m$        | (kg)                  | Total mass                           |
| $b$         | (cm)                | Belt width                                             | $m_R$      | (kg)                  | Mass of belt                         |
| $t$         | (mm)                | Belt pitch                                             | $m_c$      | (kg)                  | Mass of carriage / slide             |
| $C$         | (N/mm)              | Belt modulus / spring rate                             | $m_S$      | (kg)                  | Pulley mass                          |
| $C_{spez}$  | (N)                 | Specific spring rate                                   | $m_{Sred}$ | (kg)                  | Pulley reduced mass                  |
| $A$         | (mm)                | Centre distance                                        | $m_U$      | (kg)                  | Idler mass                           |
| $A_{eff}$   | (mm)                | Effective centre distance                              | $m_{Ured}$ | (kg)                  | Idler reduced mass                   |
| $d$         | (mm)                | Bore diameter                                          | $n$        | (min <sup>-1</sup> )  | Rpm                                  |
| $d_a$       | (mm)                | Outside pulley diameter                                | $n_1$      | (min <sup>-1</sup> )  | Rpm driver pulley                    |
| $d_w$       | (mm)                | Pitch circle diameter                                  | $\Delta n$ | (min <sup>-1</sup> )  | Rpm variation                        |
| $d_U$       | (mm)                | Idler pulley diameter                                  | $c_1$      | -                     | Service factor                       |
| $F_{wdyn}$  | (N)                 | Dynamic shaft load                                     | $P$        | (kW)                  | Power                                |
| $F_{wsta}$  | (N)                 | Static shaft load                                      | $s_{ges}$  | (mm)                  | Total travel                         |
| $F_{Tmax}$  | (N)                 | Maximum span force                                     | $s_{ab}$   | (mm)                  | Travel during acceleration           |
| $F_R$       | (N)                 | Resisting force of friction                            | $s_{av}$   | (mm)                  | Travel during deceleration / braking |
| $F_{Uspez}$ | (N/cm)              | Specific tooth shear strength                          | $s_c$      | (mm)                  | Travel at constant speed             |
| $F_{TV}$    | (N)                 | Pretension force per belt side                         | $t_{ges}$  | (sec <sup>-1</sup> )  | Total time of travel                 |
| $F_{Tzul}$  | (N)                 | Allowable tensile load                                 | $t_{ab}$   | (sec <sup>-1</sup> )  | Acceleration time                    |
| $F_U$       | (N)                 | Peripheral force                                       | $t_{av}$   | (sec <sup>-1</sup> )  | Deceleration time / braking time     |
| $F_H$       | (N)                 | Vertical lifting force                                 | $t_c$      | (sec <sup>-1</sup> )  | Time at constant speed               |
| $F_{ab}$    | (N)                 | Acceleration force                                     | $v$        | (m/s)                 | Peripheral speed                     |
| $F_{av}$    | (N)                 | Deceleration force                                     | $z$        | -                     | No. of teeth of pulley               |
| $g$         | (m/s <sup>2</sup> ) | Acceleration due to gravity (= 9,81 m/s <sup>2</sup> ) | $z_k$      | -                     | No. of teeth of small pulley         |
| $\Delta l$  | (mm)                | Elongation                                             | $z_g$      | -                     | No. of teeth of big pulley           |
| $\Delta s$  | (mm)                | Difference of position due to force                    | $z_R$      | -                     | No. of teeth of belt                 |
| $L_1, L_2$  | (mm)                | Length of tight and slack side                         | $z_e$      | -                     | No. of teeth in mesh                 |
| $L_R$       | (mm)                | Belt length                                            | $i$        | -                     | Drive ratio                          |
| $M$         | (Nm)                | Torque                                                 | $\omega$   | (s <sup>-1</sup> )    | Angular velocity                     |
| $M_{ab}$    | (Nm)                | Torque during acceleration                             | $\mu$      | -                     | Coefficient of friction              |

## Calculation formula

### Torque

$$M = \frac{F_U \cdot d_w}{2000} = \frac{P \cdot 9550}{2000}$$

### Peripheral force

$$F_U = \frac{2000 \cdot M}{d_w} = \frac{P \cdot 1000}{v}$$

### Angular velocity

$$\omega = \frac{\pi \cdot n}{30}$$

### Acceleration time

$$t_{ab} = \frac{v}{a_b} = \sqrt{\frac{2 \cdot s_{ab}}{a_b \cdot 1000}}$$

### Braking time

$$t_{av} = \frac{v}{a_v} = \sqrt{\frac{2 \cdot s_{av}}{a_v \cdot 1000}}$$

### Total time

$$t_{ges} = t_{ab} + t_c + t_{av}$$

### Time at constant speed

$$t_c = \frac{s_c}{v \cdot 1000}$$

### Safety factor

ELATECH® belts do not need any safety factor. However if there are unknown peaks or shock loads or swings in the peripheral force unknown at design time, which therefore can not be included in the calculation parameters, a suitable safety factor should be considered by the designer.

Steady load  $c_1 = 1$

Peak or fluctuating loads:

Light  $c_1 = 1,4$   
Medium  $c_1 = 1,7$   
Heavy  $c_1 = 2,0$

### Power

$$P = \frac{M \cdot n}{9550} = \frac{F_U \cdot v}{1000}$$

### Linear speed

$$v = \frac{d_w \cdot n}{19100} = \frac{n \cdot z \cdot t}{60000}$$

### Rpm

$$n = \frac{19100 \cdot v}{d_w} = \frac{60000 \cdot v}{z \cdot t}$$

### Acceleration travel

$$s_{ab} = \frac{a_b \cdot t_{ab}^2 \cdot 1000}{2} = \frac{v^2 \cdot 1000}{2 \cdot a_b}$$

### Braking travel

$$s_{av} = \frac{a_v \cdot t_{av}^2 \cdot 1000}{2} = \frac{v^2 \cdot 1000}{2 \cdot a_v}$$

### Total travel

$$s_{ges} = s_{ab} + s_c + s_{av}$$

### Travel at constant speed

$$s_c = v \cdot t_c \cdot 1000$$

## Calculation

Linear drives are correctly dimensioned when the total peripheral force, necessary for the requested work, satisfies the 3 technical parameters of the selected belt:

- **tooth shear strength**
- **allowable tensile load**
- **flexibility**

The necessary data for the calculation are: the mass to be moved, the transmission cycle, the drive layout with the related forces, the resisting force of friction.

Friction force is generally determined by the linear bearing manufacturer.

In case of conveying applications, it is resulting from the weight of the conveyed goods and the coefficient of friction between slider bed and belt surface. In case of accumulating conveyors the friction between the conveyed goods and the backside of the belt must be considered additionally.

### Select belts and pulleys

For initial belt profile and pitch selection, use the graphs available in the related catalogue section.

For the choice of the pulleys it is recommended to use pulleys with the largest possible diameter.

That will reduce the belt width and optimise drive performances.

### Calculate total mass in motion (m)

$$m = m_c + m_R + m_{Sred} + m_{Ured}$$

With:

$$m_{Sred} = \frac{m_s}{2} \cdot \left( 1 + \frac{d^2}{d_a^2} \right); \quad \text{inertia of the idler timing pulley}$$

$$m_{Ured} = \frac{m_u}{2} \cdot \left( 1 + \frac{d^2}{d_u^2} \right); \quad \text{inertia of the idler tensioning pulley}$$

### Calculate the necessary total peripheral force $F_U$ and torque $M$

$$F_U = m \cdot a_b + m \cdot g + m \cdot g \cdot \mu$$

$$F_U = F_{ab} + F_H + F_R$$

The load ( $m \cdot g \cdot \sin \alpha$ ) must be considered only in vertical or inclined drives when a mass is lifted against gravity.

$$M = \frac{F_U \cdot d_w}{2000}$$

### Determine the belt width

$$b = \frac{F_U \cdot c_0}{F_{Uspez} \cdot z_e}$$

with  $F_{Uspez}$  depending on the rpm of the small pulley (see technical data on tooth shear strength for the selected belt type).

Note:  $z_{emax} = 12$  for belts ELATECH® M

$z_{emax} = 6$  for belts ELATECH® V

### Determine installation pretension $F_{TV}$

Linear motion drives are correctly tensioned when in the slack side a minimum tension is guaranteed in all working conditions and for every value of  $F_{Tmax}$  (acceleration, deceleration).

It is recommended a pretension of:

$F_{TV} \geq F_U$  for linear drives with ELATECH® M belts

$F_{TV} \geq 0,5 \cdot F_U$  for conveying applications with ELATECH® V belts

### Verify of allowable tensile load

The maximum load on the belt will appear when both the pretension  $F_{TV}$  and the working load  $F_U$  will act at the same time:

$$F_{Tmax} = F_{TV} + F_U$$

The maximum allowable tensile load of the belt  $F_{tzul}$  (see technical tables of corresponding selected belt) must be greater than the maximum working load:

$$F_{Tzul} > F_{Tmax}$$

### Verify flexibility

The diameter of the chosen pulleys, must be greater or equal to the minimum recommended diameter for the specific belt profile chosen (see technical data).



### Calculate shaft load

The shaft load under static conditions is:

$$F_{Wsta} = 2 \cdot F_{TV}$$

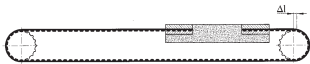
The shaft load under dynamic conditions is:

$$F_{Wdyn} = 2 \cdot F_{TV} + F_U$$

### Calculate necessary static elongation

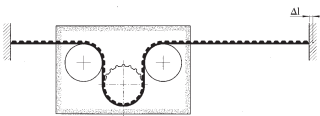
Installation tension generates a belt elongation "Δl" between the shafts (for linear drives) or the clamping plates (for "Omega" drives).

Linear drive



$$\Delta l = \frac{F_{TV} \cdot L_R}{2 \cdot C_{spez}}$$

"Omega" drive



$$\Delta l = \frac{F_{TV} \cdot L_R}{C_{spez}}$$

If the resulting elongation is not acceptable for the application, it is possible to reduce it by increasing the belt width.

### Determine the positioning accuracy

The stiffness coefficient of linear drives depends on the length of slack and tight side in the drive. Every position of the system has its own stiffness coefficient calculated with the formula:

$$C = \frac{L_R}{L_1 \cdot L_2} \cdot C_{spez} \quad L_R = L_1 + L_2$$

For  $C_{spez}$  value see technical data of selected belt type.

Stiffness coefficient will be minimum when slack and tight side will have the same length during the working cycle.

$$C_{min} = \frac{4 \cdot C_{spez}}{L_R}$$

With  $L_R$  equal to the belt length free to elongate (excluding contact length on timing pulleys).

Being  $F_U$  the resulting force on the slide, the positioning deviation generated by belt elongation is:

$$\Delta_s = \frac{F_U}{C}$$

The positioning accuracy is also depending on other parameters and therefore for an accurate calculation, please consult our technical department.

### Installation and drive pretensioning:

In order to pretension a drive is possible to use one of the following methods:

#### 1) Measuring elongation

ELATECH® timing belts with steel cords have a constant elongation to the maximum allowable load  $F_{Tzul}$ . Therefore the correct pretension can be set by measuring the belt elongation with a gauge and using as a reference the graph load/elongation of the selected belt type. This is a simple method but requires a good accessibility of the drive.

#### 2) Using span deflection

The pretension is checked by applying a force in the centre of the span length and measuring the span deflection

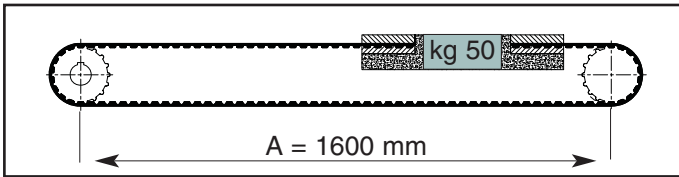
#### 3) Measuring frequency

The tension of the belt is calculated from the natural frequency of vibration of the belt span which is measured by means of a special belt tension meter. This is the most accurate and easiest method.

A suitable belt tension meter is available from ELATECH®

## Calculation example

### Linear positioning drive



### Data

|                                   |                                |
|-----------------------------------|--------------------------------|
| Slide mass                        | $m_c = 50$ [kg]                |
| Center distance                   | $A = 1600$ [mm]                |
| Acceleration                      | $a_b = 20$ [m/s <sup>2</sup> ] |
| Maximum allowable pulley diameter | $d_w = 110$ [mm]               |
| Friction force                    | $F_R = 100$ [N]                |
| Total travel                      | $s_{ges} = 1100$ [mm]          |
| Linear speed                      | $v = 5$ [m/s]                  |
| Shaft diameter                    | $d = 28$ [mm]                  |

### Select belt

From selection graph mass/acceleration of AT belts (preferred for linear positioning because of the higher stiffness) select a 25 AT10 belt with aluminium pulleys  $z = 32$  ( $d_a = 100,00$  mm and  $d_w = 101,86$  mm).

$$Rpm \quad n = \frac{19100 \cdot 5}{101,86} = 937,56$$

### Calculation of total mass in motion

$$L_R = L_1 + L_2 = 1600 \cdot 2 = 3200 \text{ mm}$$

Belt mass  $m_R$ :

$$m_R = 3,2 \cdot 0,15 = 0,48 \text{ kg}$$

Pulley mass  $m_S$ :

$$\frac{(d_a^2 - d^2) \cdot \pi \cdot \rho \cdot B}{4 \cdot 10^6} = \frac{(100^2 - 28^2) \cdot \pi \cdot 2,8 \cdot 30}{4 \cdot 10^6} = 0,61 \text{ kg}$$

Reduced pulley mass  $m_{Sred}$ :

$$\frac{m_S}{2} \cdot \left(1 + \frac{d^2}{d_a^2}\right) = \frac{0,61}{2} \cdot \left(1 + \frac{28^2}{100^2}\right) = 0,33 \text{ kg}$$

$$m = m_c + m_R + m_{Sred} = 50 + 0,48 + 0,33 = 50,81 \text{ kg}$$

### Calculate total peripheral force $F_U$

$$F_U = m \cdot a_b + F_R = 1116,2 \text{ N}$$

$$M = \frac{1116,2 \cdot 101,86}{2000} = 56,85 \text{ Nm}$$

### Check belt width

$$b = \frac{1116,2}{52,21 \cdot 12} = 1,78 \text{ cm} \approx 18 \text{ mm}$$

A belt width 25 mm is selected as next standard width.

### Determine effective installation tension $F_{TV}$

$$F_{TV} > F_U = 1116,2 \text{ N} ; \quad \text{choose } F_{TV} = 1200 \text{ N}$$

### Verify allowable tensile load

$$F_{Tmax} = F_{TV} + F_U = 2316,2 \text{ N}$$

$$F_{Tzul} > F_{Tmax} \quad 3800 \text{ N} > 2316,2 \text{ N}$$

### Determine necessary elongation

$$\Delta l = \frac{1200 \cdot 3200}{2 \cdot 952000} = 2,02 \text{ mm} \approx 0,63 \text{ ‰}$$

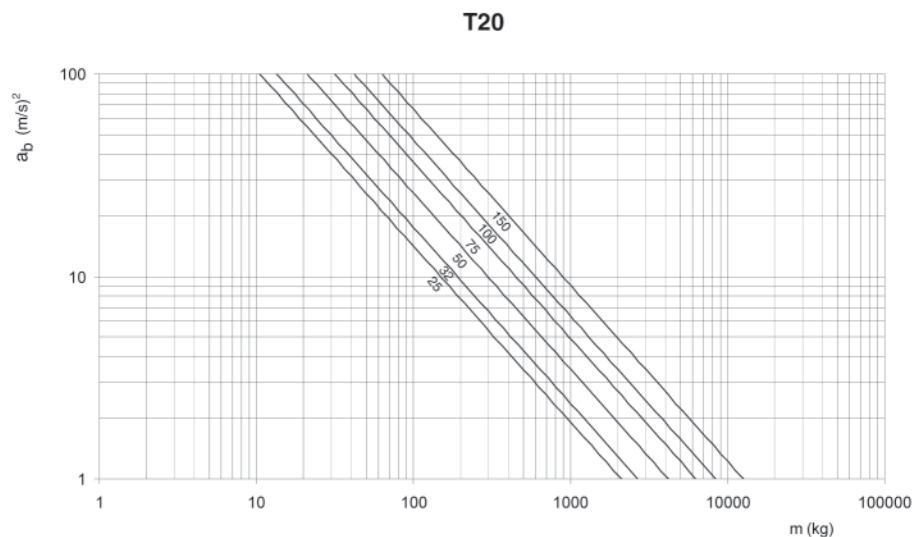
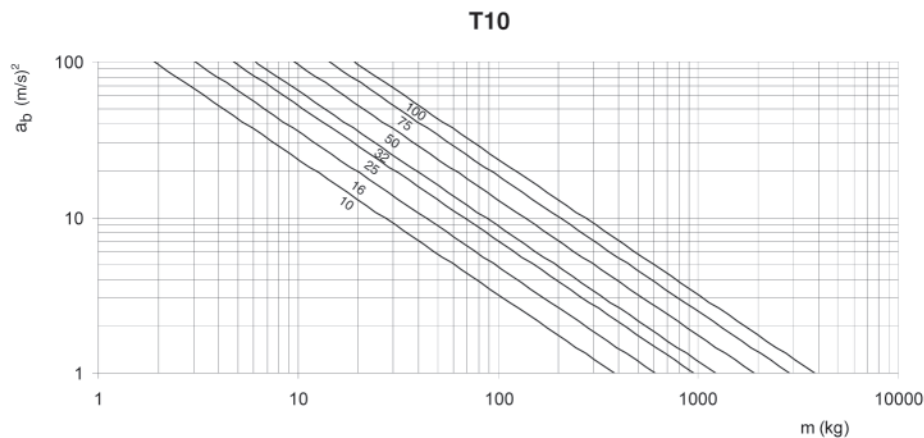
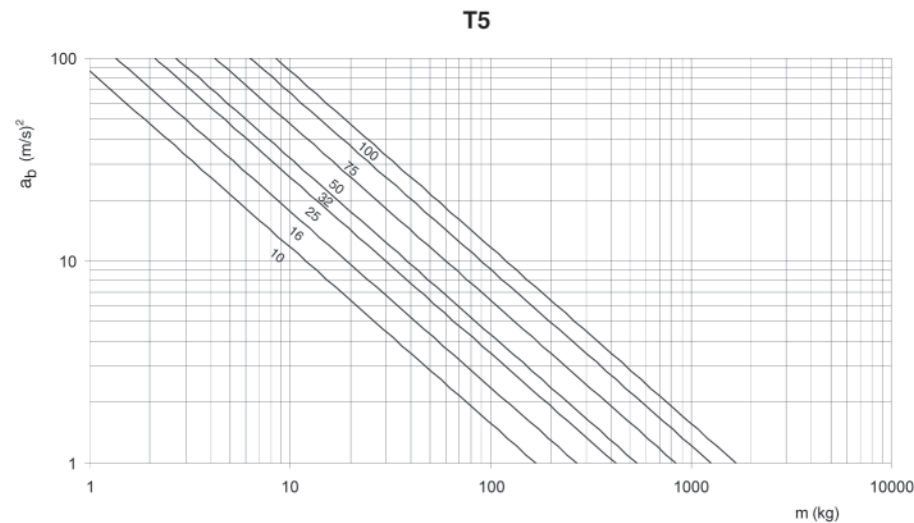
Should the elongation be too high, a larger width must be selected or ATL10 type of the same width can be used.

### Check flexibility

The minimum pulleys diameter are respected.

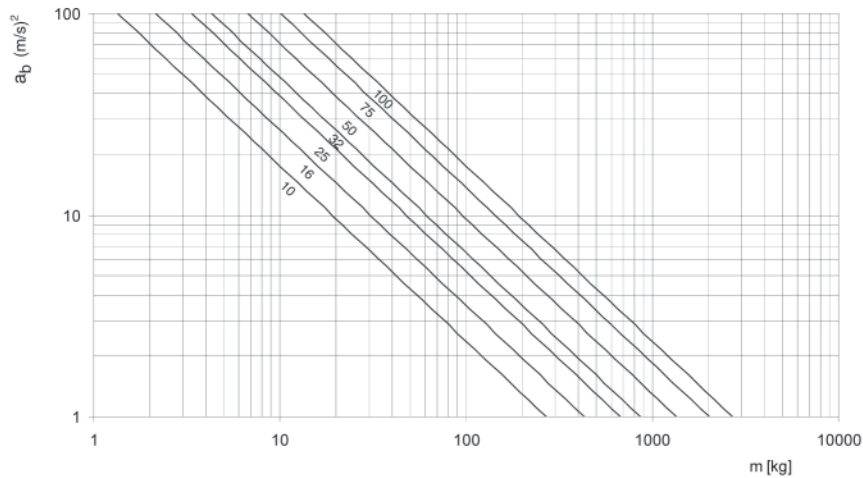
## Selection graphs mass / acceleration

The selection graphs **mass/acceleration**, are a useful aid to the designer for the initial selection of the belt type and width in the linear motion applications. The graphs have been designed considering the maximum speed (rpm) generally used in the applications for every belt profile and pitch and have included a safety factor increasing with the acceleration. Therefore, depending on the specific values of the application, it might be needed to change the belt width upon calculation.

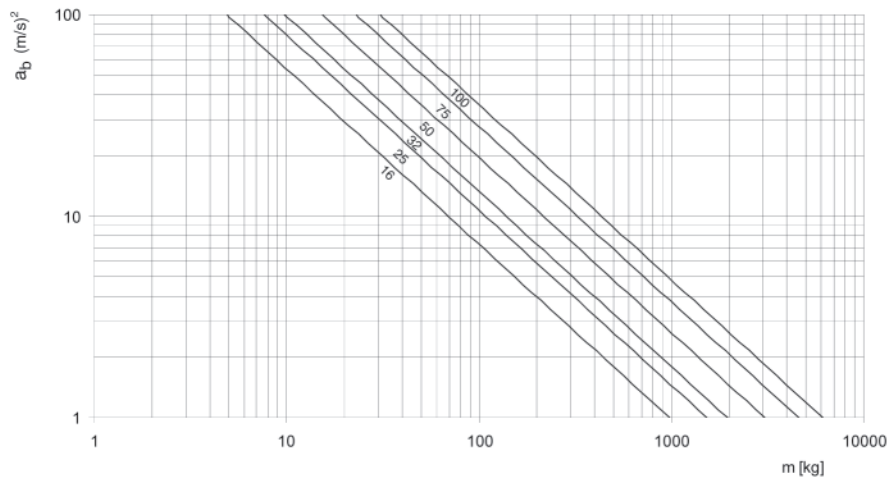


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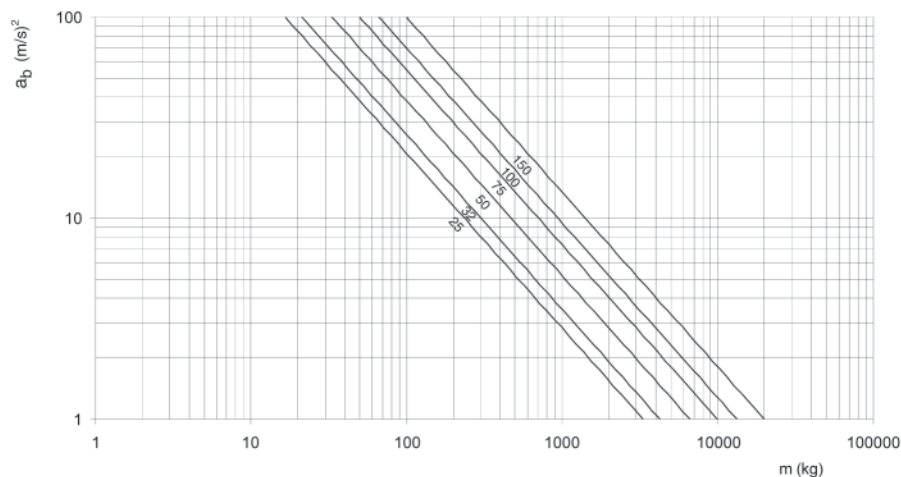
**AT5 - ATL5**



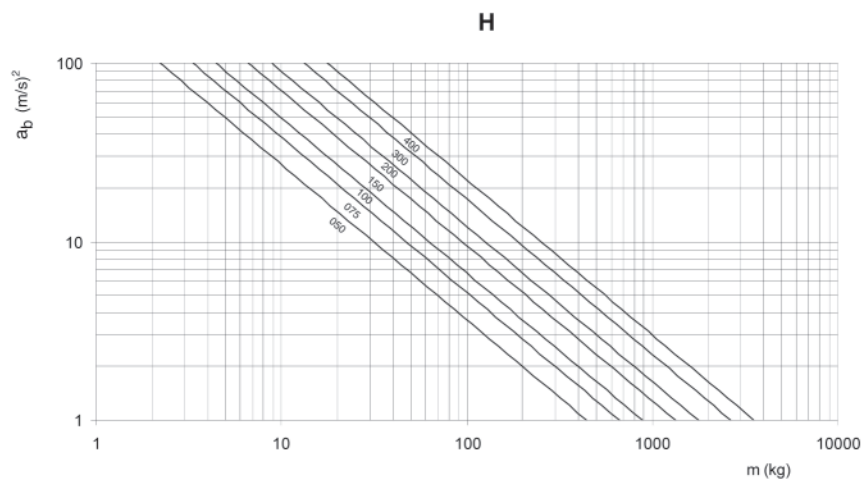
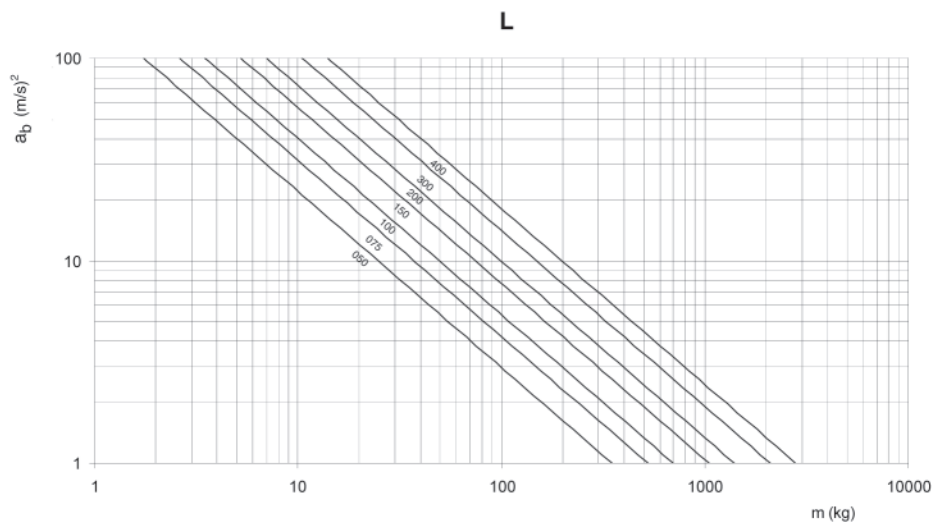
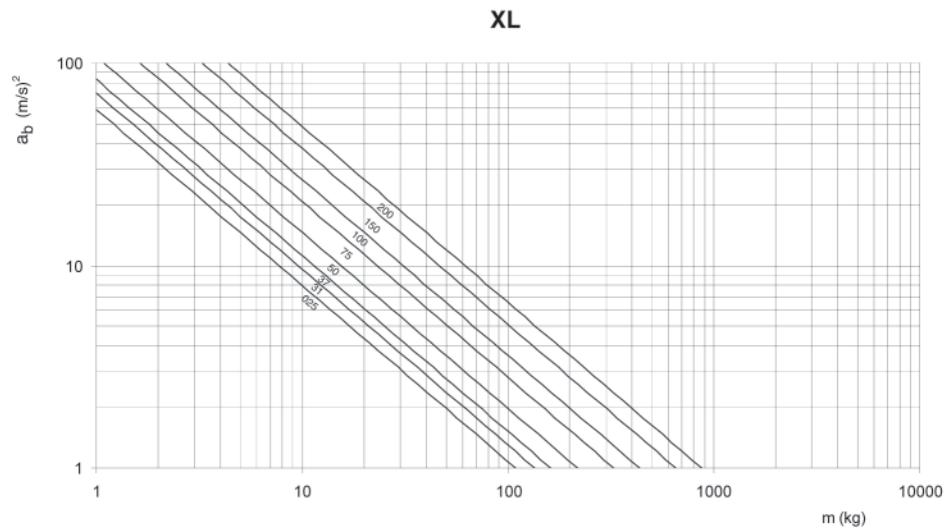
**AT10 - ATL10**



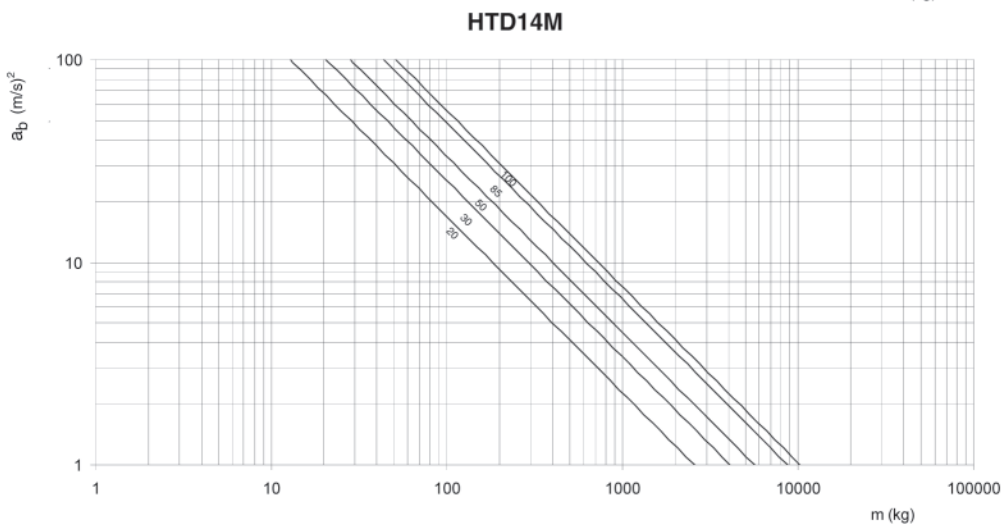
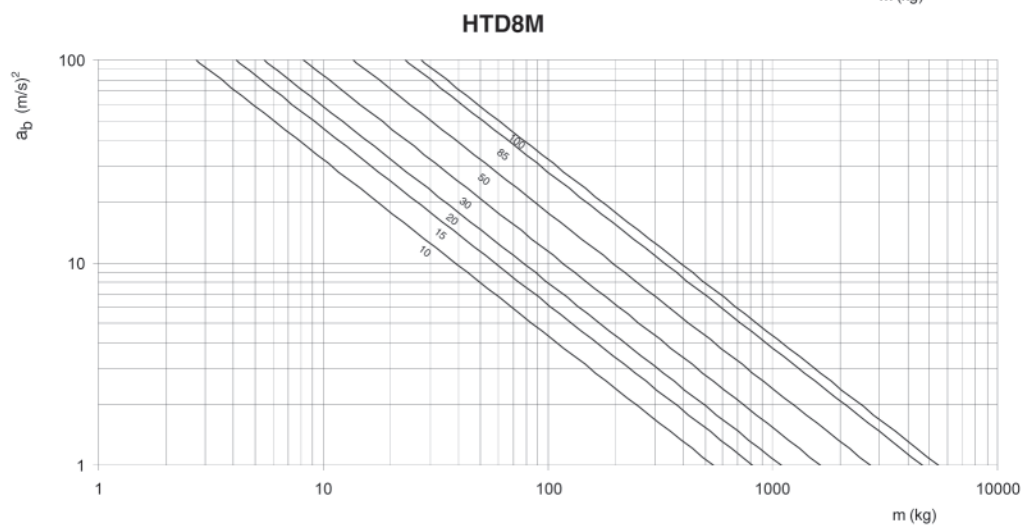
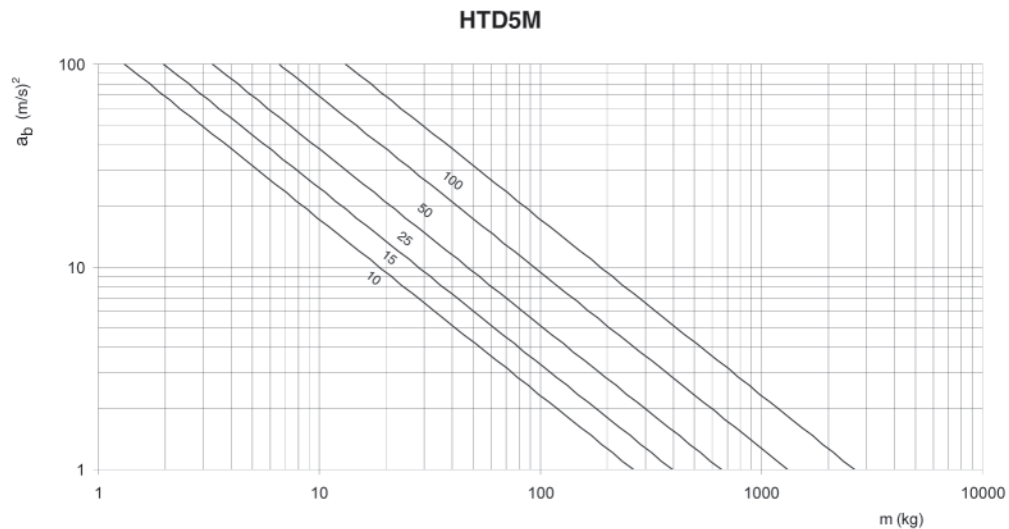
**AT20 - ATL20**



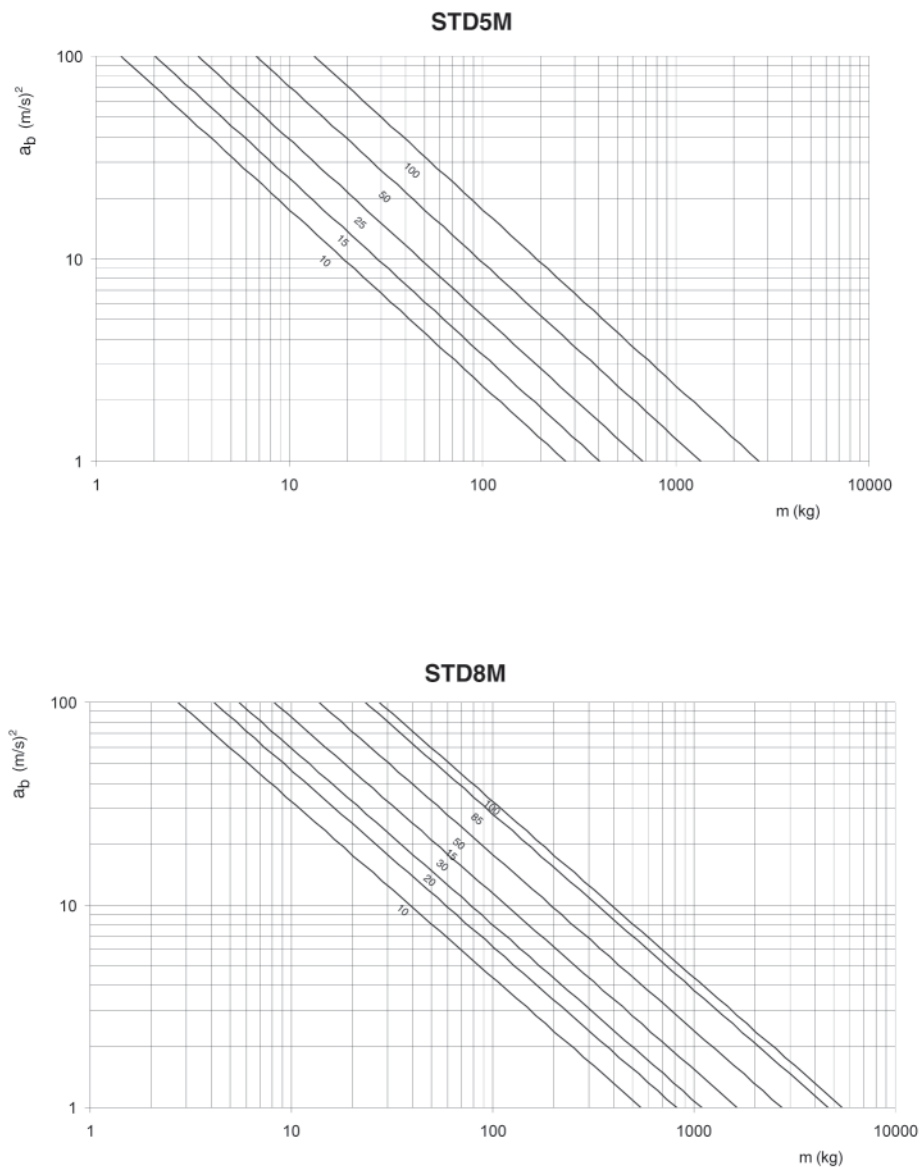
The selection graphs **mass/acceleration**, are a useful aid to the designer for the initial selection of the belt type and width in the linear motion applications. The graphs have been designed considering the maximum speed (rpm) generally used in the applications for every belt profile and pitch and have included a safety factor increasing with the acceleration. Therefore, depending on the specific values of the application, it might be needed to change the belt width upon calculation.



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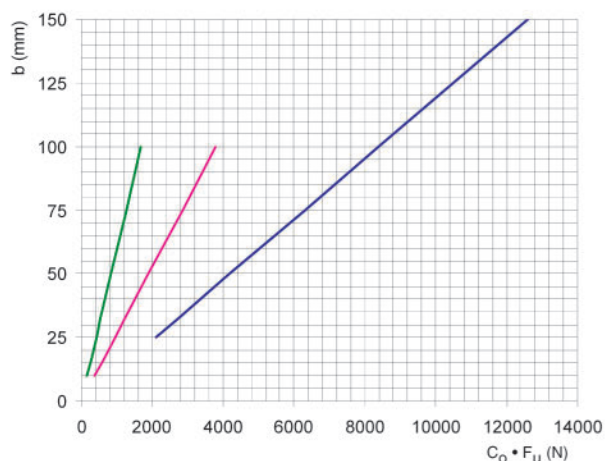
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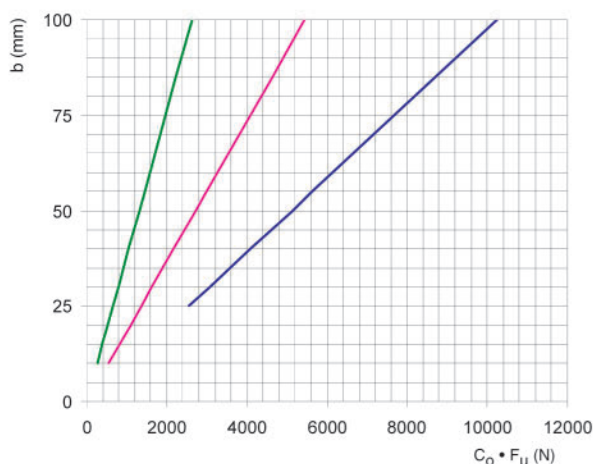
## Selection graphs corrected peripheral force / belt width

Profile T

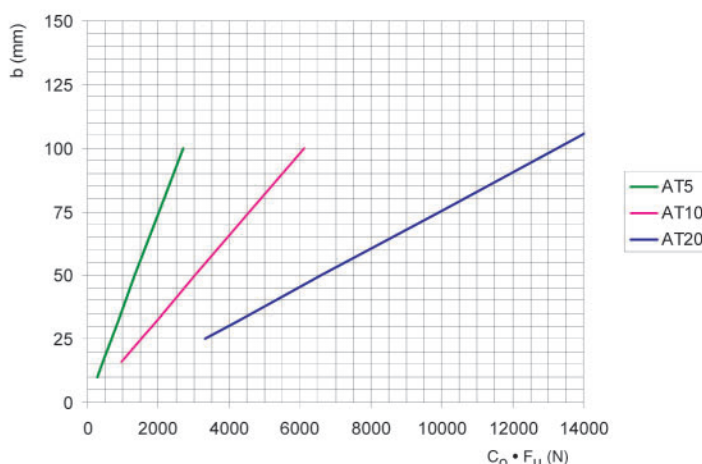


The selection graphs **corrected peripheral force / belt width** provide a quick indication on the belt width needed for each belt profile when a specific corrected load is applied. The graphs have been designed considering the maximum speed (rpm) generally used in the applications for every belt profile and pitch. No safety factor is included as usually depending on acceleration. Therefore, depending on the specific values of the application, it might be needed to change the belt width upon calculation.

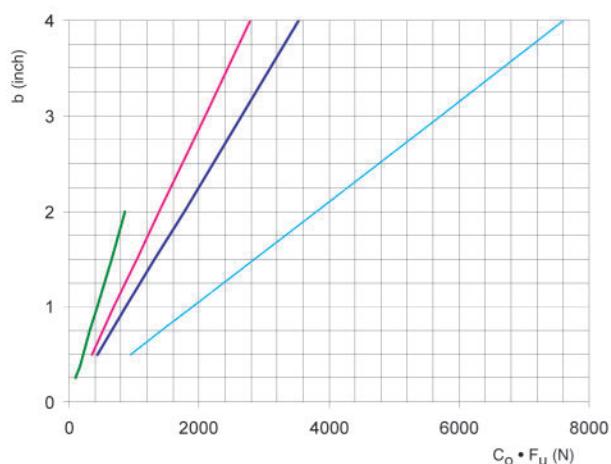
HTD profile



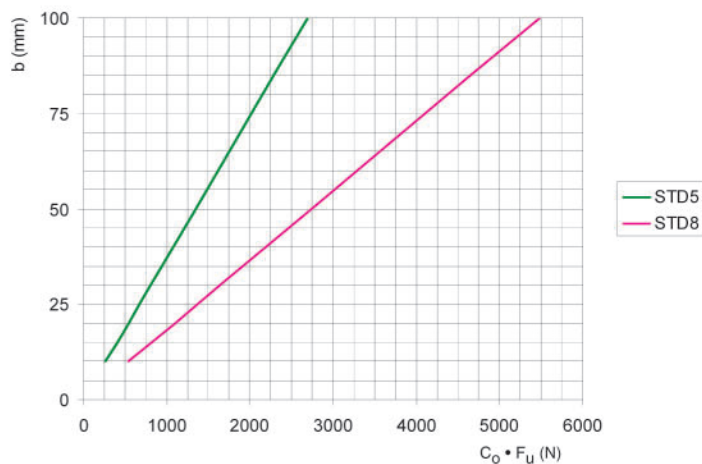
AT profile



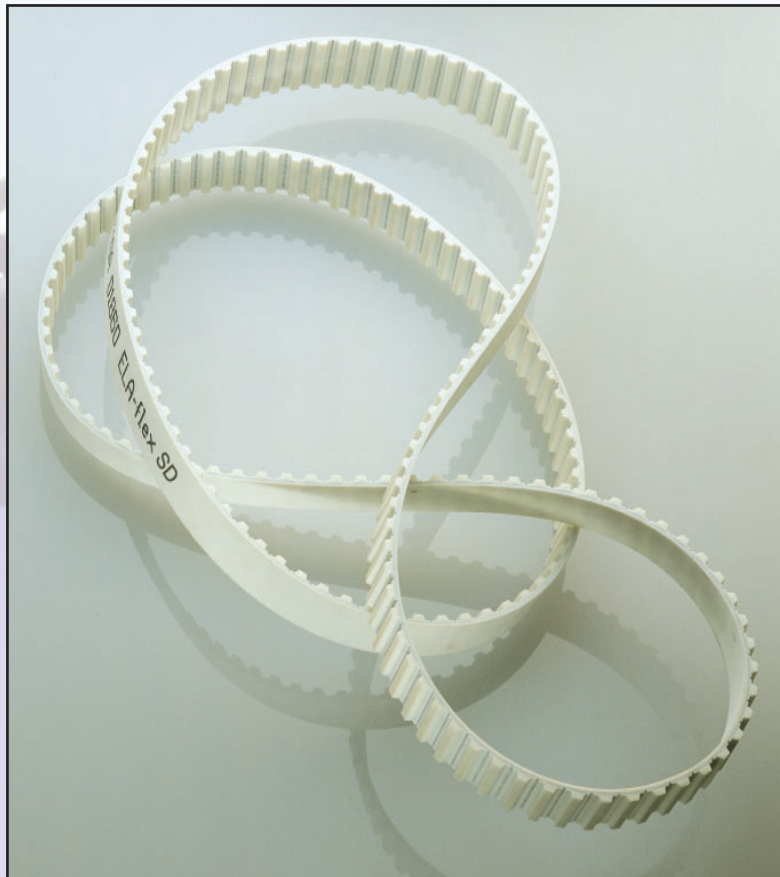
Inches profile



STD profile

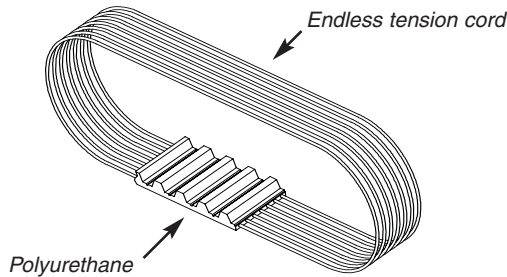


# ELA-flex SD™ timing belts



## ELA-flex SD™ Synchro Drive timing belts

ELA-flex SD™ timing belts are manufactured with truly endless high tension strenght steel tension cords and high wear, abrasion and tear resistance polyurethane.



Having no splice or welding, the belts have no weak cross section. ELA-flex SD™ timing belts are therefore ideal for high speed power transmission and high load conveying applications.

The unique high tech manufacturing process designed by our research and development allows the production of every belt length, tooth by tooth from a minimum of 1500 mm to a maximum of 22000 mm to permit the best flexibility in application.

### Lenght tolerances

| Belt lenght [mm] | Lenght tolerance [mm] (+/-) | Belt lenght [mm] | Lenght tolerance [mm] (+/-) |
|------------------|-----------------------------|------------------|-----------------------------|
| 1700             | 1,13                        | 4500             | 2,32                        |
| 1900             | 1,22                        | 4750             | 2,40                        |
| 2120             | 1,30                        | 5000             | 2,52                        |
| 2240             | 1,35                        | 5300             | 2,64                        |
| 2360             | 1,44                        | 5600             | 2,72                        |
| 2500             | 1,49                        | 6000             | 2,92                        |
| 2650             | 1,57                        | 6300             | 3,04                        |
| 2800             | 1,61                        | 6700             | 3,19                        |
| 3000             | 1,70                        | 7100             | 3,35                        |
| 3550             | 1,91                        | 7500             | 3,51                        |
| 3750             | 2,03                        | 8000             | 3,70                        |
| 4000             | 2,11                        | 9000             | 4,09                        |
| 4250             | 2,24                        | more             | on request                  |

### Double sided timing belts

On demand it is possible to supply ELA-flex SD™ as double sided belts. Please ask for the minimum quantity.

### Special cords

In order to solve any design need, ELA-flex SD™ belts may be produced with special cords:

|               |                                                  |
|---------------|--------------------------------------------------|
| <b>HPL</b>    | high performance                                 |
| <b>HFE</b>    | high Flexibility                                 |
| <b>INOX</b>   | stainless steel for high aggressive environments |
| <b>ARAMID</b> | low weight, non magnetic                         |

### Antistatic belts

On request it is possible to deliver ELA-flex SD™ belts with anti-static properties by using a specific electrically conductive coating or a special compound. A minimum quantity is applied.

### Product certification

On request, it is possible to deliver belts according to 94/9/CE

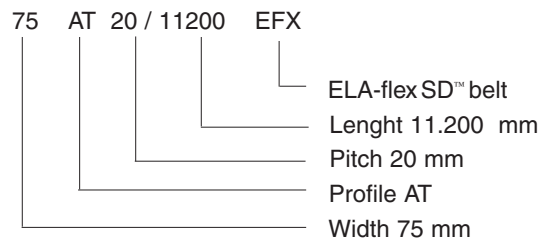
ATEX  II 2G/22D.

### Thickness and width tolerance

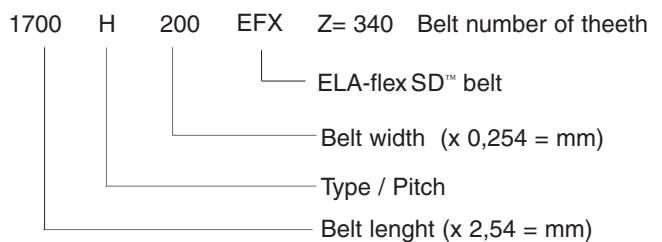
ELA-flex SD™ belts are ground on the back as a standard and are manufactured at precise width (see technical tables). For special application needs, special thickness and width tolerances can be produced.

### Belt designation

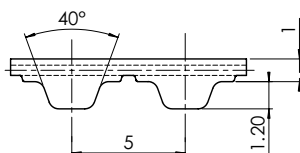
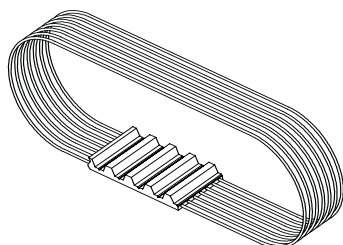
#### Metric pitch



#### Inch pitch



## T5 ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with steel tension cords according to DIN 7721 T1
  - Metric pitch 5 mm
  - Ideal for drives where high belt flexibility is requested
  - Allows to use small diameter pulleys
  - Transmissible power up to 5 kW
  - Rpm up to 10.000 [1/min]
- Maximum width: 150 mm
  - Width tolerance:  $\pm 0,5$  [mm]
  - Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width [mm]            | 10   | 16   | 25   | 32   | 50   | 75   | 100  | 150  |
|----------------------------|------|------|------|------|------|------|------|------|
| Allowable tensile load [N] | 337  | 540  | 843  | 1080 | 1687 | 2531 | 3375 | 5062 |
| Weight [kg/m]              | 0,02 | 0,03 | 0,05 | 0,07 | 0,11 | 0,16 | 0,21 | 0,32 |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 1,966                         | 0,000                       | 1200                        | 1,252                         | 1,573                       | 3400                        | 0,972                         | 3,462                       |
| 20                          | 1,915                         | 0,040                       | 1300                        | 1,231                         | 1,676                       | 3600                        | 0,957                         | 3,609                       |
| 40                          | 1,872                         | 0,078                       | 1400                        | 1,211                         | 1,776                       | 3800                        | 0,942                         | 3,749                       |
| 60                          | 1,834                         | 0,115                       | 1440                        | 1,204                         | 1,815                       | 4000                        | 0,928                         | 3,886                       |
| 80                          | 1,802                         | 0,151                       | 1500                        | 1,194                         | 1,875                       | 4500                        | 0,895                         | 4,218                       |
| 100                         | 1,773                         | 0,186                       | 1600                        | 1,176                         | 1,971                       | 5000                        | 0,866                         | 4,533                       |
| 200                         | 1,663                         | 0,348                       | 1700                        | 1,160                         | 2,065                       | 5500                        | 0,840                         | 4,835                       |
| 300                         | 1,583                         | 0,497                       | 1800                        | 1,145                         | 2,158                       | 6000                        | 0,815                         | 5,120                       |
| 400                         | 1,520                         | 0,637                       | 1900                        | 1,131                         | 2,250                       | 6500                        | 0,793                         | 5,395                       |
| 500                         | 1,468                         | 0,769                       | 2000                        | 1,116                         | 2,338                       | 7000                        | 0,772                         | 5,658                       |
| 600                         | 1,425                         | 0,895                       | 2200                        | 1,091                         | 2,513                       | 7500                        | 0,753                         | 5,912                       |
| 700                         | 1,388                         | 1,017                       | 2400                        | 1,068                         | 2,684                       | 8000                        | 0,735                         | 6,153                       |
| 800                         | 1,354                         | 1,135                       | 2600                        | 1,046                         | 2,847                       | 8500                        | 0,717                         | 6,382                       |
| 900                         | 1,325                         | 1,249                       | 2800                        | 1,026                         | 3,007                       | 9000                        | 0,701                         | 6,607                       |
| 1000                        | 1,299                         | 1,360                       | 3000                        | 1,007                         | 3,162                       | 9500                        | 0,686                         | 6,824                       |
| 1100                        | 1,274                         | 1,467                       | 3200                        | 0,989                         | 3,314                       | 10000                       | 0,672                         | 7,033                       |

The total power “P” and the total torque “M” transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k}{180} \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

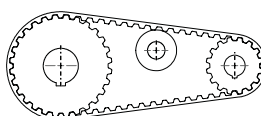
A = centre distance [mm]

### Flexibility

#### Minimum number of teeth and minimum diameter

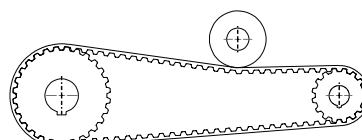
Drive without reverse bending

- Timing pulley  $z_{\min} = 10$
- Idler running on belt teeth  $d_{\min} = 30$  mm

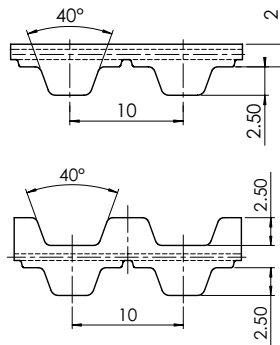
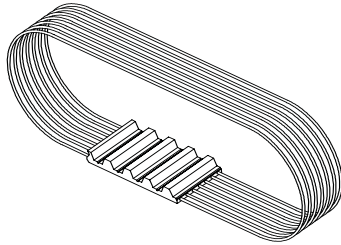


Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 15$
- Idler running on belt back  $d_{\min} = 30$  mm



## T10 ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with steel tension cords according to DIN 7721 T1
  - Metric pitch 10 mm
  - Ideal for drives where high belt flexibility is requested
  - Allows to use small diameter pulleys
  - Transmissible power up to 30 kW
  - Rpm up to 10.000 [1/min]
- Maximum width: 150 mm
  - Width tolerance:  $\pm 0,5$  [mm]
  - Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width [mm]            | 10   | 16   | 25   | 32   | 50   | 75   | 100  | 150   |
|----------------------------|------|------|------|------|------|------|------|-------|
| Allowable tensile load [N] | 1000 | 1600 | 2400 | 3100 | 4800 | 7200 | 9600 | 14300 |
| Weight [kg/m]              | 0,05 | 0,07 | 0,12 | 0,15 | 0,23 | 0,35 | 0,46 | 0,69  |

Other widths are available on request

## Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 8,244                         | 0,000                       | 1200                        | 4,808                         | 6,042                       | 3400                        | 3,460                         | 12,318                      |
| 20                          | 8,009                         | 0,168                       | 1300                        | 4,708                         | 6,409                       | 3600                        | 3,385                         | 12,761                      |
| 40                          | 7,805                         | 0,327                       | 1400                        | 4,614                         | 6,764                       | 3800                        | 3,312                         | 13,179                      |
| 60                          | 7,627                         | 0,479                       | 1440                        | 4,577                         | 6,902                       | 4000                        | 3,245                         | 13,592                      |
| 80                          | 7,472                         | 0,626                       | 1500                        | 4,526                         | 7,109                       | 4500                        | 3,088                         | 14,549                      |
| 100                         | 7,339                         | 0,768                       | 1600                        | 4,444                         | 7,445                       | 5000                        | 2,946                         | 15,424                      |
| 200                         | 6,804                         | 1,425                       | 1700                        | 4,366                         | 7,771                       | 5500                        | 2,817                         | 16,224                      |
| 300                         | 6,411                         | 2,014                       | 1800                        | 4,292                         | 8,090                       | 6000                        | 2,701                         | 16,969                      |
| 400                         | 6,105                         | 2,557                       | 1900                        | 4,222                         | 8,401                       | 6500                        | 2,593                         | 17,646                      |
| 500                         | 5,857                         | 3,066                       | 2000                        | 4,157                         | 8,706                       | 7000                        | 2,492                         | 18,269                      |
| 600                         | 5,648                         | 3,549                       | 2200                        | 4,033                         | 9,291                       | 7500                        | 2,398                         | 18,836                      |
| 700                         | 5,467                         | 4,007                       | 2400                        | 3,920                         | 9,851                       | 8000                        | 2,311                         | 19,359                      |
| 800                         | 5,306                         | 4,445                       | 2600                        | 3,815                         | 10,386                      | 8500                        | 2,228                         | 19,832                      |
| 900                         | 5,163                         | 4,866                       | 2800                        | 3,718                         | 10,901                      | 9000                        | 2,150                         | 20,264                      |
| 1000                        | 5,034                         | 5,271                       | 3000                        | 3,626                         | 11,389                      | 9500                        | 2,077                         | 20,661                      |
| 1100                        | 4,916                         | 5,663                       | 3200                        | 3,541                         | 11,866                      | 10000                       | 2,007                         | 21,015                      |

The total power “P” and the total torque “M” transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]}{180}$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

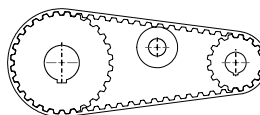
A = centre distance [mm]

## Flexibility

### Minimum number of teeth and minimum diameter

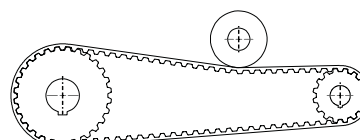
Drive without reverse bending

- Timing pulley  $z_{\min} = 12$
- Idler running on belt teeth  $d_{\min} = 60$  mm



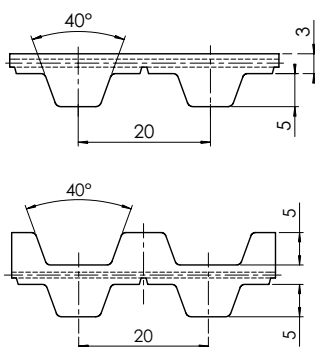
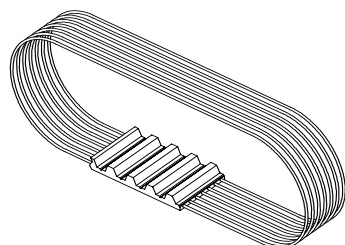
Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 60$  mm





## T20 ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with steel tension cords according to DIN 7721 T1
- Metric pitch 20 mm
- Ideal for drives where high belt flexibility is requested
- Transmissible power up to 100 kW
- Rpm up to 6.000 [1/min]
- Maximum width: 150 mm
- Width tolerance:  $\pm 1,0$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width [mm]            | 25   | 32   | 50   | 75    | 100   | 150   |
|----------------------------|------|------|------|-------|-------|-------|
| Allowable tensile load [N] | 4000 | 5100 | 7900 | 11900 | 15800 | 23700 |
| Weight [kg/m]              | 0,18 | 0,23 | 0,37 | 0,55  | 0,73  | 1,1   |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 33,263                        | 0,000                       | 1200                        | 17,542                        | 22,042                      | 3400                        | 11,510                        | 40,978                      |
| 20                          | 32,181                        | 0,674                       | 1300                        | 17,093                        | 23,268                      | 3600                        | 11,173                        | 42,117                      |
| 40                          | 31,242                        | 1,309                       | 1400                        | 16,673                        | 24,442                      | 3800                        | 10,851                        | 43,178                      |
| 60                          | 30,424                        | 1,911                       | 1440                        | 16,511                        | 24,896                      | 4000                        | 10,546                        | 44,170                      |
| 80                          | 29,714                        | 2,489                       | 1500                        | 16,278                        | 25,568                      | 4500                        | 9,842                         | 46,377                      |
| 100                         | 29,097                        | 3,047                       | 1600                        | 15,909                        | 26,654                      | 5000                        | 9,209                         | 48,213                      |
| 200                         | 26,579                        | 5,566                       | 1700                        | 15,562                        | 27,702                      | 5500                        | 8,639                         | 49,753                      |
| 300                         | 24,777                        | 7,783                       | 1800                        | 15,234                        | 28,714                      | 6000                        | 8,114                         | 50,976                      |
| 400                         | 23,393                        | 9,798                       | 1900                        | 14,922                        | 29,689                      | 6500                        | 7,630                         | 51,931                      |
| 500                         | 22,269                        | 11,659                      | 2000                        | 14,623                        | 30,624                      | 7000                        |                               |                             |
| 600                         | 21,320                        | 13,395                      | 2200                        | 14,069                        | 32,411                      | 7500                        |                               |                             |
| 700                         | 20,502                        | 15,028                      | 2400                        | 13,563                        | 34,086                      | 8000                        |                               |                             |
| 800                         | 19,783                        | 16,572                      | 2600                        | 13,092                        | 35,643                      | 8500                        |                               |                             |
| 900                         | 19,140                        | 18,038                      | 2800                        | 12,659                        | 37,116                      | 9000                        |                               |                             |
| 1000                        | 18,561                        | 19,435                      | 3000                        | 12,252                        | 38,487                      | 9500                        |                               |                             |
| 1100                        | 18,029                        | 20,766                      | 3200                        | 11,870                        | 39,773                      | 10000                       |                               |                             |

The total power "P" and the total torque "M" transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k}{180} \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

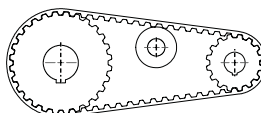
A = centre distance [mm]

### Flexibility

#### Minimum number of teeth and minimum diameter

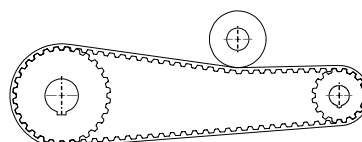
Drive without reverse bending

- Timing pulley  $z_{\min} = 15$
- Idler running on belt teeth  $d_{\min} = 120$  mm

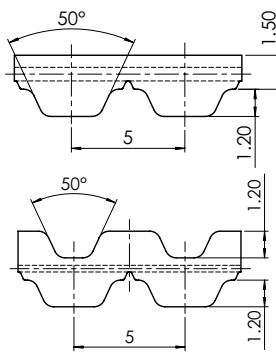
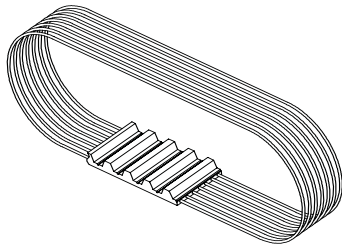


Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 120$  mm



## AT5 ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with steel tension cords. Metric pitch 5 mm
- Tooth profile and dimension are optimised to guarantee uniform load distribution and minimum deformation under load
- High resistance and low stretch steel cords to guarantee high stability and low elongation
- Reduced polygonal effect with reduced drive vibration and noise
- Transmissible power up to 15 kW
- Rpm up to 10.000 [1/min]
- Maximum width: 150 mm
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Technical data

| Belt width [mm]            | 10   | 16   | 25   | 32   | 50   | 75   | 100  | 150   |
|----------------------------|------|------|------|------|------|------|------|-------|
| Allowable tensile load [N] | 1000 | 1600 | 2400 | 3100 | 4800 | 7200 | 9600 | 14300 |
| Weight [kg/m]              | 0,03 | 0,05 | 0,08 | 0,11 | 0,17 | 0,25 | 0,33 | 0,50  |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 2,897                         | 0,000                       | 1200                        | 2,027                         | 2,547                       | 3400                        | 1,514                         | 5,391                       |
| 20                          | 2,855                         | 0,060                       | 1300                        | 1,990                         | 2,709                       | 3600                        | 1,485                         | 5,598                       |
| 40                          | 2,817                         | 0,118                       | 1400                        | 1,955                         | 2,866                       | 3800                        | 1,456                         | 5,795                       |
| 60                          | 2,783                         | 0,175                       | 1440                        | 1,942                         | 2,929                       | 4000                        | 1,429                         | 5,986                       |
| 80                          | 2,753                         | 0,231                       | 1500                        | 1,923                         | 3,020                       | 4500                        | 1,367                         | 6,442                       |
| 100                         | 2,725                         | 0,285                       | 1600                        | 1,892                         | 3,170                       | 5000                        | 1,311                         | 6,862                       |
| 200                         | 2,620                         | 0,549                       | 1700                        | 1,863                         | 3,316                       | 5500                        | 1,260                         | 7,255                       |
| 300                         | 2,540                         | 0,798                       | 1800                        | 1,836                         | 3,460                       | 6000                        | 1,213                         | 7,619                       |
| 400                         | 2,458                         | 1,030                       | 1900                        | 1,809                         | 3,599                       | 6500                        | 1,169                         | 7,957                       |
| 500                         | 2,383                         | 1,248                       | 2000                        | 1,784                         | 3,736                       | 7000                        | 1,128                         | 8,271                       |
| 600                         | 2,317                         | 1,456                       | 2200                        | 1,736                         | 4,000                       | 7500                        | 1,091                         | 8,568                       |
| 700                         | 2,258                         | 1,655                       | 2400                        | 1,693                         | 4,256                       | 8000                        | 1,055                         | 8,839                       |
| 800                         | 2,204                         | 1,846                       | 2600                        | 1,653                         | 4,500                       | 8500                        | 1,023                         | 9,101                       |
| 900                         | 2,153                         | 2,029                       | 2800                        | 1,615                         | 4,734                       | 9000                        | 0,991                         | 9,337                       |
| 1000                        | 2,108                         | 2,207                       | 3000                        | 1,580                         | 4,962                       | 9500                        | 0,961                         | 9,555                       |
| 1100                        | 2,066                         | 2,379                       | 3200                        | 1,546                         | 5,181                       | 10000                       | 0,933                         | 9,766                       |

The total power “P” and the total torque “M” transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]}{180}$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

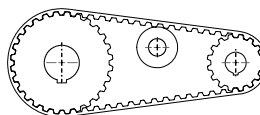
A = centre distance [mm]

### Flexibility

#### Minimum number of teeth and minimum diameter

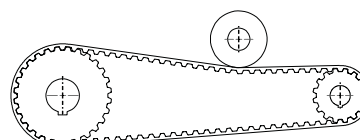
Drive without reverse bending

- Timing pulley  $z_{\min} = 15$
- Idler running on belt teeth  $d_{\min} = 30$  mm



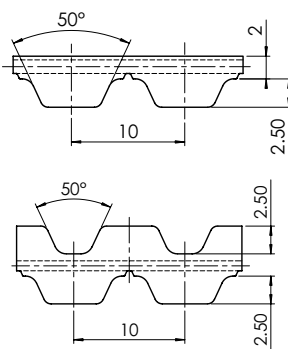
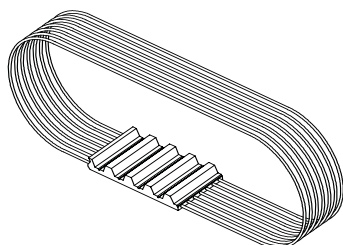
Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 60$  mm





## AT10 ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with steel tension cords. Metric pitch 10 mm
- Tooth profile and dimension are optimised to guarantee uniform load distribution and minimum deformation under load
- High resistance and low stretch steel cords to guarantee high stability and low elongation
- Reduced polygonal effect with reduced drive vibration and noise
- Transmissible power up to 70 kW
- Rpm up to 10.000 [1/min]
- Maximum width: 150 mm
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Technical data

| Belt width [mm]            | 16   | 25   | 32   | 50   | 75    | 100   | 150   |
|----------------------------|------|------|------|------|-------|-------|-------|
| Allowable tensile load [N] | 2600 | 4000 | 5100 | 7900 | 11900 | 15800 | 23700 |
| Weight [kg/m]              | 0,09 | 0,14 | 0,18 | 0,29 | 0,43  | 0,57  | 0,86  |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 12,048                        | 0,000                       | 1200                        | 7,708                         | 9,685                       | 3400                        | 5,317                         | 18,931                      |
| 20                          | 11,871                        | 0,249                       | 1300                        | 7,534                         | 10,256                      | 3600                        | 5,180                         | 19,529                      |
| 40                          | 11,706                        | 0,490                       | 1400                        | 7,372                         | 10,807                      | 3800                        | 5,048                         | 20,088                      |
| 60                          | 11,550                        | 0,726                       | 1440                        | 7,310                         | 11,022                      | 4000                        | 4,924                         | 20,625                      |
| 80                          | 11,403                        | 0,955                       | 1500                        | 7,219                         | 11,339                      | 4500                        | 4,636                         | 21,846                      |
| 100                         | 11,265                        | 1,180                       | 1600                        | 7,076                         | 11,855                      | 5000                        | 4,377                         | 22,915                      |
| 200                         | 10,684                        | 2,238                       | 1700                        | 6,939                         | 12,352                      | 5500                        | 4,140                         | 23,841                      |
| 300                         | 10,215                        | 3,209                       | 1800                        | 6,810                         | 12,836                      | 6000                        | 3,923                         | 24,648                      |
| 400                         | 9,793                         | 4,102                       | 1900                        | 6,688                         | 13,305                      | 6500                        | 3,724                         | 25,348                      |
| 500                         | 9,424                         | 4,934                       | 2000                        | 6,570                         | 13,759                      | 7000                        | 3,538                         | 25,933                      |
| 600                         | 9,097                         | 5,716                       | 2200                        | 6,349                         | 14,625                      | 7500                        | 3,365                         | 26,423                      |
| 700                         | 8,808                         | 6,456                       | 2400                        | 6,147                         | 15,447                      | 8000                        | 3,202                         | 26,825                      |
| 800                         | 8,547                         | 7,159                       | 2600                        | 5,959                         | 16,223                      | 8500                        | 3,048                         | 27,127                      |
| 900                         | 8,309                         | 7,831                       | 2800                        | 5,782                         | 16,953                      | 9000                        | 2,903                         | 27,358                      |
| 1000                        | 8,093                         | 8,474                       | 3000                        | 5,618                         | 17,649                      | 9500                        | 2,766                         | 27,516                      |
| 1100                        | 7,893                         | 9,091                       | 3200                        | 5,464                         | 18,308                      | 10000                       | 2,636                         | 27,598                      |

The total power “P” and the total torque “M” transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k}{180} \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

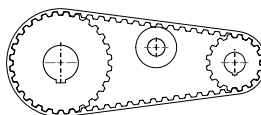
A = centre distance [mm]

### Flexibility

#### Minimum number of teeth and minimum diameter

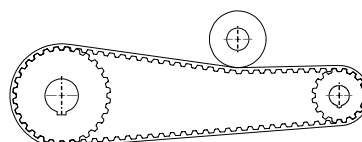
Drive without reverse bending

- Timing pulley  $z_{\min} = 15$
- Idler running on belt teeth  $d_{\min} = 50$  mm

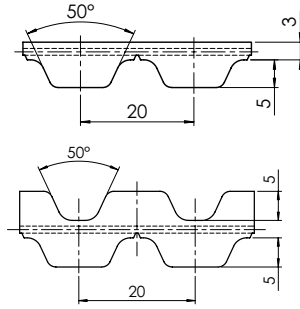
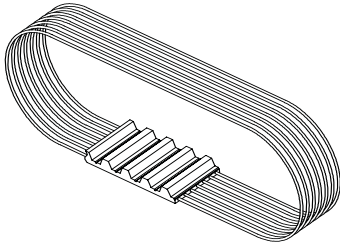


Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 120$  mm



## AT20 ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with steel tension cords. Metric pitch 10 mm
- Tooth profile and dimension are optimised to guarantee uniform load distribution and minimum deformation under load
- High resistance and low stretch steel cords to guarantee high stability and low elongation
- Reduced polygonal effect with reduced drive vibration and noise
- Transmissible power up to 200 kW
- Rpm up to 6.000 [1/min]
- Maximum width: 150 mm
- Width tolerance:  $\pm 1,0$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Technical data

| Belt width [mm]            | 25   | 32   | 50    | 75    | 100   | 150   |
|----------------------------|------|------|-------|-------|-------|-------|
| Allowable tensile load [N] | 6700 | 8600 | 13400 | 20100 | 26800 | 40200 |
| Weight [kg/m]              | 0,24 | 0,31 | 0,48  | 0,73  | 0,97  | 1,45  |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>isp</sub><br>[Ncm/cm] | P <sub>sp</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|------------------------------|---------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 48,192                       | 0,000                     | 1200                        | 27,063                        | 34,006                      | 3400                        | 15,842                        | 56,402                      |
| 20                          | 47,288                       | 0,990                     | 1300                        | 26,251                        | 35,734                      | 3600                        | 15,196                        | 57,284                      |
| 40                          | 46,438                       | 1,945                     | 1400                        | 25,487                        | 37,363                      | 3800                        | 14,579                        | 58,009                      |
| 60                          | 45,639                       | 2,867                     | 1440                        | 25,197                        | 37,994                      | 4000                        | 13,993                        | 58,609                      |
| 80                          | 44,885                       | 3,760                     | 1500                        | 24,771                        | 38,907                      | 4500                        | 12,643                        | 59,576                      |
| 100                         | 44,175                       | 4,626                     | 1600                        | 24,096                        | 40,370                      | 5000                        | 11,427                        | 59,829                      |
| 200                         | 41,199                       | 8,628                     | 1700                        | 23,456                        | 41,755                      | 5500                        | 10,320                        | 59,432                      |
| 300                         | 38,923                       | 12,227                    | 1800                        | 22,845                        | 43,059                      | 6000                        | 9,304                         | 58,456                      |
| 400                         | 36,911                       | 15,460                    | 1900                        | 22,269                        | 44,305                      | 6500                        |                               |                             |
| 500                         | 35,157                       | 18,407                    | 2000                        | 21,715                        | 45,477                      | 7000                        |                               |                             |
| 600                         | 33,617                       | 21,120                    | 2200                        | 20,681                        | 47,641                      | 7500                        |                               |                             |
| 700                         | 32,248                       | 23,637                    | 2400                        | 19,729                        | 49,580                      | 8000                        |                               |                             |
| 800                         | 31,016                       | 25,982                    | 2600                        | 18,844                        | 51,303                      | 8500                        |                               |                             |
| 900                         | 29,899                       | 28,177                    | 2800                        | 18,023                        | 52,841                      | 9000                        |                               |                             |
| 1000                        | 28,880                       | 30,241                    | 3000                        | 17,252                        | 54,196                      | 9500                        |                               |                             |
| 1100                        | 27,938                       | 32,180                    | 3200                        | 16,527                        | 55,377                      | 10000                       |                               |                             |

The total power “P” and the total torque “M” transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]}{180}$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

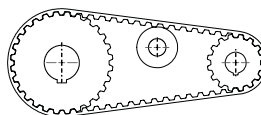
A = centre distance [mm]

### Flexibility

#### Minimum number of teeth and minimum diameter

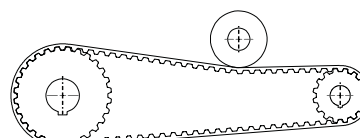
Drive without reverse bending

- Timing pulley  $z_{\min} = 18$
- Idler running on belt teeth  $d_{\min} = 120$  mm

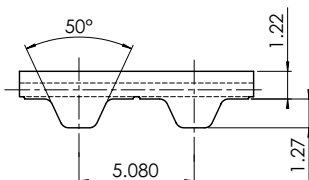
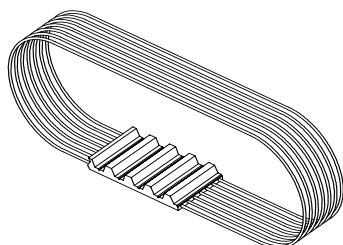


Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 180$  mm



## XL ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with steel tension cords and trapezoidal tooth profile according to DIN/ISO 5296.
- Imperial pitch 1/5" = 5,08 mm
- Allow to use small diameter pulley
- Mainly used in applications where inch pitch is an advantage
- Transmissible power up to 5 kW
- Rpm up to 10.000 [1/min]
- Maximum width: 150 mm
- Width tolerance: ±0,5 [mm]
- Thickness tolerance: ±0,2 [mm]

## Technical data

| Belt width [inch]          | 0,25  | 0,31  | 0,37  | 0,50  | 0,75  | 1,00  | 1,50  | 2,00  | 4,00  |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Allowable tensile load [N] | 220   | 280   | 330   | 440   | 650   | 870   | 1300  | 1720  | 3440  |
| Weight [kg/m]              | 0,016 | 0,020 | 0,024 | 0,033 | 0,049 | 0,065 | 0,098 | 0,130 | 0,260 |

Other widths are available on request

## Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 2,029                         | 0,000                       | 1200                        | 1,294                         | 1,626                       | 3400                        | 1,006                         | 3,581                       |
| 20                          | 1,978                         | 0,041                       | 1300                        | 1,273                         | 1,732                       | 3600                        | 0,990                         | 3,730                       |
| 40                          | 1,932                         | 0,081                       | 1400                        | 1,252                         | 1,836                       | 3800                        | 0,974                         | 3,877                       |
| 60                          | 1,894                         | 0,119                       | 1440                        | 1,245                         | 1,877                       | 4000                        | 0,960                         | 4,020                       |
| 80                          | 1,860                         | 0,156                       | 1500                        | 1,234                         | 1,938                       | 4500                        | 0,926                         | 4,362                       |
| 100                         | 1,830                         | 0,192                       | 1600                        | 1,216                         | 2,037                       | 5000                        | 0,896                         | 4,690                       |
| 200                         | 1,717                         | 0,360                       | 1700                        | 1,200                         | 2,136                       | 5500                        | 0,868                         | 5,001                       |
| 300                         | 1,635                         | 0,514                       | 1800                        | 1,184                         | 2,231                       | 6000                        | 0,843                         | 5,298                       |
| 400                         | 1,570                         | 0,658                       | 1900                        | 1,169                         | 2,326                       | 6500                        | 0,820                         | 5,580                       |
| 500                         | 1,518                         | 0,795                       | 2000                        | 1,155                         | 2,418                       | 7000                        | 0,798                         | 5,849                       |
| 600                         | 1,473                         | 0,926                       | 2200                        | 1,129                         | 2,600                       | 7500                        | 0,779                         | 6,115                       |
| 700                         | 1,434                         | 1,051                       | 2400                        | 1,104                         | 2,776                       | 8000                        | 0,759                         | 6,360                       |
| 800                         | 1,400                         | 1,173                       | 2600                        | 1,082                         | 2,945                       | 8500                        | 0,741                         | 6,599                       |
| 900                         | 1,370                         | 1,291                       | 2800                        | 1,061                         | 3,110                       | 9000                        | 0,725                         | 6,835                       |
| 1000                        | 1,342                         | 1,405                       | 3000                        | 1,041                         | 3,271                       | 9500                        | 0,709                         | 7,053                       |
| 1100                        | 1,317                         | 1,517                       | 3200                        | 1,023                         | 3,427                       | 10000                       | 0,695                         | 7,272                       |

The total power "P" and the total torque "M" transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k}{180} \cdot \arccos \left[ \frac{t \cdot (Z_g - Z_k)}{2 \cdot \pi \cdot A} \right]$$

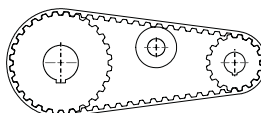
- P = power in Kw  
 M = torque in Nm  
 P<sub>spez</sub> = specific power  
 M<sub>spez</sub> = specific torque  
 Z<sub>e</sub> = number of teeth in mesh of the small pulley  
 Z<sub>emax</sub> = 12  
 Z<sub>k</sub> = number of teeth of the small pulley  
 b = belt width in cm  
 A = centre distance [mm]

## Flexibility

### Minimum number of teeth and minimum diameter

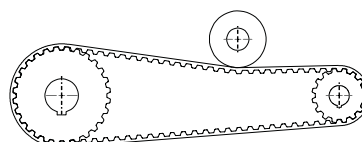
Drive without reverse bending

- Timing pulley  $Z_{\min} = 10$
- Idler running on belt teeth  $d_{\min} = 30 \text{ mm}$

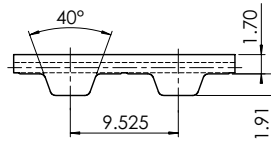
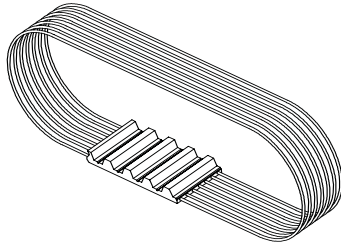


Drive with reverse bending and double sided belt

- Timing pulley  $Z_{\min} = 15$
- Idler running on belt back  $d_{\min} = 30 \text{ mm}$



## L ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with steel tension cords and trapezoidal tooth profile according to DIN/ISO 5296.
- Imperial pitch 3/8" = 9,525 mm
- Mainly used in applications where inch pitch is an advantage
- Transmissible power up to 20 kW
- Rpm up to 10.000 [1/min]
- Maximum width: 150 mm
- Width tolerance: ±0,5 [mm]
- Thickness tolerance: ±0,2 [mm]

## Technical data

| Belt width [inch]          | 0,50 | 0,75 | 1,00 | 1,50 | 2,00 | 3,00 | 4,00 | 6,00  |
|----------------------------|------|------|------|------|------|------|------|-------|
| Allowable tensile load [N] | 1220 | 1820 | 2430 | 3640 | 4850 | 7260 | 9680 | 14520 |
| Weight [kg/m]              | 0,05 | 0,08 | 0,10 | 0,15 | 0,20 | 0,30 | 0,40 | 0,60  |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 5,852                         | 0,000                       | 1200                        | 3,393                         | 4,263                       | 3400                        | 2,441                         | 8,689                       |
| 20                          | 5,673                         | 0,119                       | 1300                        | 3,321                         | 4,521                       | 3600                        | 2,388                         | 9,000                       |
| 40                          | 5,518                         | 0,231                       | 1400                        | 3,256                         | 4,774                       | 3800                        | 2,336                         | 9,295                       |
| 60                          | 5,383                         | 0,338                       | 1440                        | 3,230                         | 4,871                       | 4000                        | 2,288                         | 9,581                       |
| 80                          | 5,266                         | 0,441                       | 1500                        | 3,194                         | 5,017                       | 4500                        | 2,177                         | 10,258                      |
| 100                         | 5,165                         | 0,541                       | 1600                        | 3,137                         | 5,255                       | 5000                        | 2,077                         | 10,874                      |
| 200                         | 4,789                         | 1,003                       | 1700                        | 3,082                         | 5,486                       | 5500                        | 1,986                         | 11,437                      |
| 300                         | 4,516                         | 1,419                       | 1800                        | 3,029                         | 5,709                       | 6000                        | 1,903                         | 11,953                      |
| 400                         | 4,304                         | 1,803                       | 1900                        | 2,980                         | 5,930                       | 6500                        | 1,827                         | 12,433                      |
| 500                         | 4,131                         | 2,163                       | 2000                        | 2,933                         | 6,143                       | 7000                        | 1,755                         | 12,867                      |
| 600                         | 3,984                         | 2,503                       | 2200                        | 2,845                         | 6,555                       | 7500                        | 1,689                         | 13,263                      |
| 700                         | 3,857                         | 2,827                       | 2400                        | 2,765                         | 6,949                       | 8000                        | 1,627                         | 13,626                      |
| 800                         | 3,744                         | 3,137                       | 2600                        | 2,692                         | 7,330                       | 8500                        | 1,569                         | 13,965                      |
| 900                         | 3,644                         | 3,434                       | 2800                        | 2,623                         | 7,689                       | 9000                        | 1,513                         | 14,258                      |
| 1000                        | 3,553                         | 3,721                       | 3000                        | 2,559                         | 8,039                       | 9500                        | 1,461                         | 14,537                      |
| 1100                        | 3,470                         | 3,997                       | 3200                        | 2,498                         | 8,371                       | 10000                       | 1,411                         | 14,779                      |

The total power "P" and the total torque "M" transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k}{180} \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

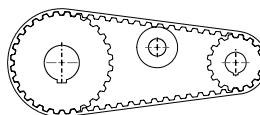
A = centre distance [mm]

## Flexibility

### Minimum number of teeth and minimum diameter

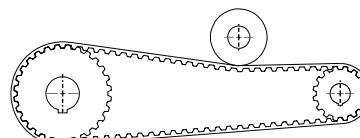
Drive without reverse bending

- Timing pulley  $z_{\min} = 15$
- Idler running on belt teeth  $d_{\min} = 60 \text{ mm}$

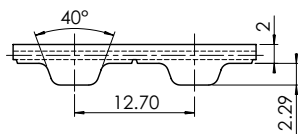
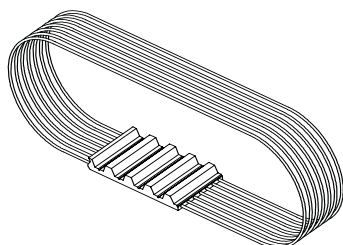


Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 60 \text{ mm}$



## H ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with steel tension cords and trapezoidal tooth profile according to DIN/ISO 5296.
- Imperial pitch 1/2" = 12,7 mm
- Allow to use small diameter pulley
- Mainly used in applications where inch pitch is an advantage
- Transmissible power up to 30 kW
- Rpm up to 10.000 [1/min]
- Maximum width: 150 mm
- Width tolerance: ±0,5 [mm]
- Thickness tolerance: ±0,2 [mm]

## Technical data

| Belt width [inch]          | 0,50  | 0,75  | 1,00  | 1,50  | 2,00  | 3,00  | 4,00  | 6,00  |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Allowable tensile load [N] | 1220  | 1820  | 2430  | 3640  | 4850  | 7260  | 9680  | 14520 |
| Weight [kg/m]              | 0,056 | 0,084 | 0,113 | 0,169 | 0,225 | 0,338 | 0,450 | 0,675 |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 9,156                         | 0,000                       | 1200                        | 5,318                         | 6,682                       | 3400                        | 3,826                         | 13,622                      |
| 20                          | 8,883                         | 0,186                       | 1300                        | 5,207                         | 7,088                       | 3600                        | 3,741                         | 14,104                      |
| 40                          | 8,647                         | 0,362                       | 1400                        | 5,104                         | 7,482                       | 3800                        | 3,663                         | 14,573                      |
| 60                          | 8,443                         | 0,530                       | 1440                        | 5,063                         | 7,635                       | 4000                        | 3,588                         | 15,027                      |
| 80                          | 8,263                         | 0,692                       | 1500                        | 5,007                         | 7,864                       | 4500                        | 3,412                         | 16,077                      |
| 100                         | 8,107                         | 0,849                       | 1600                        | 4,916                         | 8,236                       | 5000                        | 3,256                         | 17,049                      |
| 200                         | 7,523                         | 1,576                       | 1700                        | 4,829                         | 8,596                       | 5500                        | 3,115                         | 17,939                      |
| 300                         | 7,089                         | 2,227                       | 1800                        | 4,748                         | 8,949                       | 6000                        | 2,983                         | 18,744                      |
| 400                         | 6,753                         | 2,829                       | 1900                        | 4,671                         | 9,293                       | 6500                        | 2,864                         | 19,494                      |
| 500                         | 6,478                         | 3,392                       | 2000                        | 4,596                         | 9,626                       | 7000                        | 2,753                         | 20,179                      |
| 600                         | 6,246                         | 3,924                       | 2200                        | 4,461                         | 10,277                      | 7500                        | 2,650                         | 20,811                      |
| 700                         | 6,046                         | 4,431                       | 2400                        | 4,334                         | 10,891                      | 8000                        | 2,553                         | 21,385                      |
| 800                         | 5,870                         | 4,917                       | 2600                        | 4,218                         | 11,485                      | 8500                        | 2,462                         | 21,912                      |
| 900                         | 5,712                         | 5,383                       | 2800                        | 4,111                         | 12,054                      | 9000                        | 2,375                         | 22,382                      |
| 1000                        | 5,569                         | 5,831                       | 3000                        | 4,010                         | 12,597                      | 9500                        | 2,294                         | 22,821                      |
| 1100                        | 5,437                         | 6,263                       | 3200                        | 3,915                         | 13,119                      | 10000                       | 2,215                         | 23,197                      |

The total power "P" and the total torque "M" transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k}{180} \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

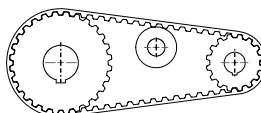
A = centre distance [mm]

### Flexibility

#### Minimum number of teeth and minimum diameter

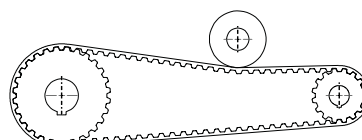
Drive without reverse bending

- Timing pulley  $z_{\min} = 14$
- Idler running on belt teeth  $d_{\min} = 60 \text{ mm}$

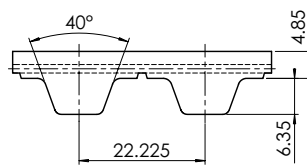
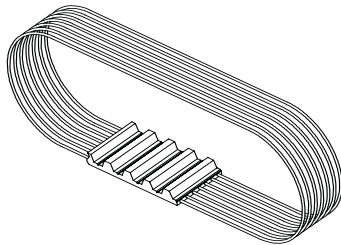


Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 80 \text{ mm}$



## XH ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with steel tension cords and trapezoidal tooth profile according to DIN/ISO 5296.
- Imperial pitch 7/8" = 22,225 mm
- Mainly used in applications where inch pitch is an advantage
- Transmissible power up to 100 kW
- Rpm up to 5.000 [1/min]
- Maximum width: 150 mm
- Width tolerance: ±1,0 [mm]
- Thickness tolerance: ±0,2 [mm]

## Technical data

| Belt width [inch]          | 1,00 | 2,00 | 3,00  | 4,00  | 6,00  |
|----------------------------|------|------|-------|-------|-------|
| Allowable tensile load [N] | 4010 | 8010 | 12010 | 16010 | 24010 |
| Weight [kg/m]              | 0,27 | 0,53 | 0,80  | 1,06  | 1,59  |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 33,957                        | 0,000                       | 1200                        | 17,802                        | 22,369                      | 3400                        | 12,904                        | 43,237                      |
| 20                          | 32,889                        | 0,689                       | 1300                        | 17,405                        | 23,692                      | 3600                        | 12,599                        | 44,855                      |
| 40                          | 31,932                        | 1,337                       | 1400                        | 17,037                        | 24,975                      | 3800                        | 12,312                        | 46,411                      |
| 60                          | 31,074                        | 1,952                       | 1440                        | 16,897                        | 25,477                      | 4000                        | 12,040                        | 47,907                      |
| 80                          | 30,306                        | 2,539                       | 1500                        | 16,693                        | 26,220                      | 4500                        | 11,782                        | 49,347                      |
| 100                         | 29,618                        | 3,101                       | 1600                        | 16,372                        | 27,430                      | 5000                        |                               |                             |
| 200                         | 26,460                        | 5,541                       | 1700                        | 16,070                        | 28,606                      | 5500                        |                               |                             |
| 300                         | 24,554                        | 7,713                       | 1800                        | 15,785                        | 29,752                      | 6000                        |                               |                             |
| 400                         | 23,178                        | 9,708                       | 1900                        | 15,515                        | 30,867                      | 6500                        |                               |                             |
| 500                         | 22,100                        | 11,571                      | 2000                        | 15,259                        | 31,955                      | 7000                        |                               |                             |
| 600                         | 21,213                        | 13,327                      | 2200                        | 14,782                        | 34,053                      | 7500                        |                               |                             |
| 700                         | 20,459                        | 14,996                      | 2400                        | 14,347                        | 36,054                      | 8000                        |                               |                             |
| 800                         | 19,804                        | 16,590                      | 2600                        | 13,946                        | 37,967                      | 8500                        |                               |                             |
| 900                         | 19,224                        | 18,117                      | 2800                        | 13,574                        | 39,798                      | 9000                        |                               |                             |
| 1000                        | 18,704                        | 19,586                      | 3000                        | 13,433                        | 40,509                      | 9500                        |                               |                             |
| 1100                        | 18,233                        | 21,001                      | 3200                        | 13,228                        | 41,553                      | 10000                       |                               |                             |

The total power "P" and the total torque "M" transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k}{180} \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

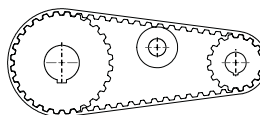
A = centre distance [mm]

## Flexibility

### Minimum number of teeth and minimum diameter

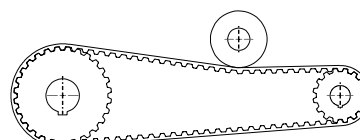
Drive without reverse bending

- Timing pulley  $z_{\min} = 18$
- Idler running on belt teeth  $d_{\min} = 150 \text{ mm}$



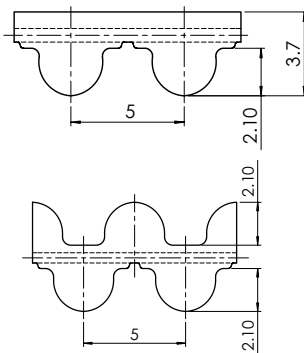
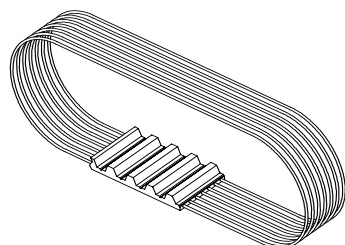
Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 180 \text{ mm}$





## HTD5M ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with round tooth profile and steel tension cords. Produced according to ISO 13050
- Metric pitch 5 mm
- The round tooth profile allows a uniform load distribution that guarantees high performance, high transmissible torque and precise tooth engagement
- Transmissible power up to 6 kW
- Rpm up to 10.000 [1/min]
- Maximum width: 150 mm
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width [mm]            | 10   | 15   | 25   | 50   | 100  | 150   |
|----------------------------|------|------|------|------|------|-------|
| Allowable tensile load [N] | 1000 | 1500 | 2400 | 4800 | 9600 | 14300 |
| Weight [kg/m]              | 0,05 | 0,07 | 0,11 | 0,23 | 0,46 | 0,68  |

Other widths are available on request

## Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 2,928                         | 0,000                       | 1200                        | 1,992                         | 2,503                       | 3400                        | 1,461                         | 5,203                       |
| 20                          | 2,885                         | 0,060                       | 1300                        | 1,955                         | 2,661                       | 3600                        | 1,430                         | 5,390                       |
| 40                          | 2,845                         | 0,119                       | 1400                        | 1,920                         | 2,814                       | 3800                        | 1,400                         | 5,570                       |
| 60                          | 2,809                         | 0,176                       | 1440                        | 1,906                         | 2,875                       | 4000                        | 1,371                         | 5,743                       |
| 80                          | 2,776                         | 0,233                       | 1500                        | 1,887                         | 2,964                       | 4500                        | 1,305                         | 6,148                       |
| 100                         | 2,747                         | 0,288                       | 1600                        | 1,855                         | 3,109                       | 5000                        | 1,245                         | 6,517                       |
| 200                         | 2,637                         | 0,552                       | 1700                        | 1,826                         | 3,250                       | 5500                        | 1,190                         | 6,854                       |
| 300                         | 2,457                         | 0,772                       | 1800                        | 1,797                         | 3,387                       | 6000                        | 1,140                         | 7,161                       |
| 400                         | 2,395                         | 1,003                       | 1900                        | 1,770                         | 3,521                       | 6500                        | 1,093                         | 7,440                       |
| 500                         | 2,333                         | 1,221                       | 2000                        | 1,744                         | 3,652                       | 7000                        | 1,050                         | 7,695                       |
| 600                         | 2,273                         | 1,428                       | 2200                        | 1,695                         | 3,904                       | 7500                        | 1,009                         | 7,926                       |
| 700                         | 2,217                         | 1,625                       | 2400                        | 1,649                         | 4,145                       | 8000                        | 0,971                         | 8,135                       |
| 800                         | 2,166                         | 1,814                       | 2600                        | 1,607                         | 4,375                       | 8500                        | 0,935                         | 8,324                       |
| 900                         | 2,118                         | 1,996                       | 2800                        | 1,567                         | 4,595                       | 9000                        | 0,901                         | 8,493                       |
| 1000                        | 2,073                         | 2,170                       | 3000                        | 1,530                         | 4,806                       | 9500                        | 0,869                         | 8,644                       |
| 1100                        | 2,031                         | 2,339                       | 3200                        | 1,495                         | 5,009                       | 10000                       | 0,838                         | 8,778                       |

The total power "P" and the total torque "M" transmitted by the belt, are calculated with the following formulas:

$$P [\text{Kw}] = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M [\text{Nm}] = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k}{180} \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

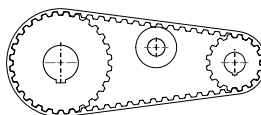
A = centre distance [mm]

## Flexibility

### Minimum number of teeth and minimum diameter

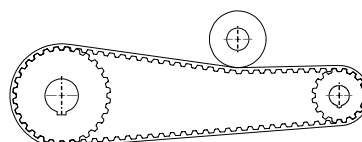
Drive without reverse bending

- Timing pulley  $z_{\min} = 16$
- Idler running on belt teeth  $d_{\min} = 50$  mm



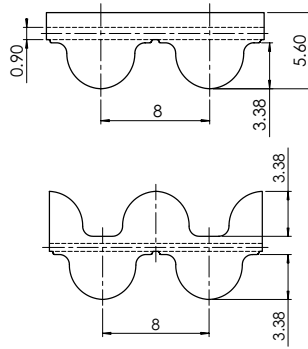
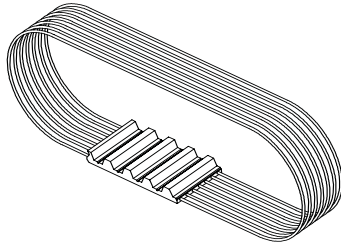
Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 50$  mm





## HTD8M ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with round tooth profile and steel tension cords. Produced according to ISO 13050
- Metric pitch 8 mm
- The round tooth profile, allows a uniform load distribution that guarantees high performance, high transmissible torque and precise tooth engagement
- Transmissible power up to 80 kW
- Rpm up to 10.000 [1/min]
- Maximum width: 150 mm
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width [mm]            | 10   | 15   | 20   | 30   | 50   | 85    | 100   | 150   |
|----------------------------|------|------|------|------|------|-------|-------|-------|
| Allowable tensile load [N] | 1600 | 2400 | 3200 | 4800 | 7900 | 13400 | 15800 | 23700 |
| Weight [kg/m]              | 0,07 | 0,10 | 0,13 | 0,20 | 0,33 | 0,56  | 0,66  | 1,00  |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 9,422                         | 0,000                       | 1200                        | 5,848                         | 7,348                       | 3400                        | 3,936                         | 14,013                      |
| 20                          | 9,246                         | 0,194                       | 1300                        | 5,709                         | 7,772                       | 3600                        | 3,826                         | 14,421                      |
| 40                          | 9,083                         | 0,380                       | 1400                        | 5,580                         | 8,180                       | 3800                        | 3,721                         | 14,805                      |
| 60                          | 8,933                         | 0,561                       | 1440                        | 5,530                         | 8,338                       | 4000                        | 3,621                         | 15,166                      |
| 80                          | 8,794                         | 0,737                       | 1500                        | 5,458                         | 8,572                       | 4500                        | 3,390                         | 15,975                      |
| 100                         | 8,666                         | 0,907                       | 1600                        | 5,343                         | 8,951                       | 5000                        | 3,183                         | 16,663                      |
| 200                         | 8,160                         | 1,709                       | 1700                        | 5,233                         | 9,316                       | 5500                        | 2,994                         | 17,241                      |
| 300                         | 7,853                         | 2,467                       | 1800                        | 5,130                         | 9,669                       | 6000                        | 2,821                         | 17,720                      |
| 400                         | 7,516                         | 3,148                       | 1900                        | 5,031                         | 10,010                      | 6500                        |                               |                             |
| 500                         | 7,220                         | 3,780                       | 2000                        | 4,937                         | 10,340                      | 7000                        |                               |                             |
| 600                         | 6,959                         | 4,372                       | 2200                        | 4,761                         | 10,968                      | 7500                        |                               |                             |
| 700                         | 6,728                         | 4,931                       | 2400                        | 4,599                         | 11,557                      | 8000                        |                               |                             |
| 800                         | 6,519                         | 5,461                       | 2600                        | 4,448                         | 12,110                      | 8500                        |                               |                             |
| 900                         | 6,330                         | 5,965                       | 2800                        | 4,308                         | 12,630                      | 9000                        |                               |                             |
| 1000                        | 6,156                         | 6,446                       | 3000                        | 4,176                         | 13,119                      | 9500                        |                               |                             |
| 1100                        | 5,996                         | 6,907                       | 3200                        | 4,053                         | 13,580                      | 10000                       |                               |                             |

The total power "P" and the total torque "M" transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k}{180} \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

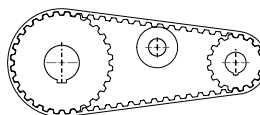
A = centre distance [mm]

## Flexibility

### Minimum number of teeth and minimum diameter

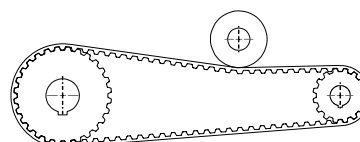
Drive without reverse bending

- Timing pulley  $z_{\min} = 18$
- Idler running on belt teeth  $d_{\min} = 50$  mm

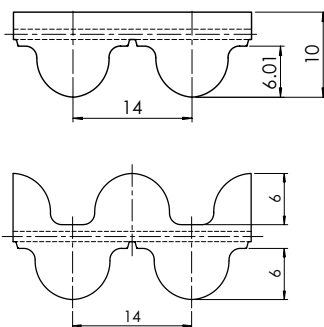
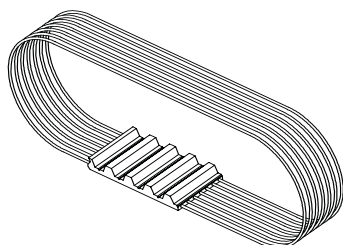


Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 18$
- Idler running on belt back  $d_{\min} = 120$  mm



## HTD14M ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with round tooth profile and steel tension cords. Produced according to ISO 13050
- Metric pitch 14 mm
- The round tooth profile, allows a uniform load distribution that guarantees high performance, high transmissible torque and precise tooth engagement
- Transmissible power up to 200 kW
- Rpm up to 6.000 [1/min]
- Maximum width: 150 mm
- Width tolerance:  $\pm 1,0$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width [mm]            | 40    | 55    | 85    | 115   | 150   |
|----------------------------|-------|-------|-------|-------|-------|
| Allowable tensile load [N] | 10800 | 14800 | 22800 | 30900 | 41000 |
| Weight [kg/m]              | 0,42  | 0,57  | 0,89  | 1,24  | 1,7   |

Other widths are available on request

## Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 28,966                        | 0,000                       | 1200                        | 16,335                        | 20,526                      | 3400                        | 9,630                         | 34,286                      |
| 20                          | 28,452                        | 0,596                       | 1300                        | 15,852                        | 21,578                      | 3600                        | 9,242                         | 34,837                      |
| 40                          | 27,978                        | 1,172                       | 1400                        | 15,398                        | 22,573                      | 3800                        | 8,872                         | 35,303                      |
| 60                          | 27,540                        | 1,730                       | 1440                        | 15,225                        | 22,957                      | 4000                        | 8,521                         | 35,688                      |
| 80                          | 27,136                        | 2,273                       | 1500                        | 14,972                        | 23,516                      | 4500                        |                               |                             |
| 100                         | 26,762                        | 2,802                       | 1600                        | 14,569                        | 24,408                      | 5000                        |                               |                             |
| 200                         | 24,458                        | 5,122                       | 1700                        | 14,187                        | 25,254                      | 5500                        |                               |                             |
| 300                         | 23,239                        | 7,300                       | 1800                        | 13,824                        | 26,056                      | 6000                        |                               |                             |
| 400                         | 22,100                        | 9,257                       | 1900                        | 13,478                        | 26,816                      | 6500                        |                               |                             |
| 500                         | 21,091                        | 11,042                      | 2000                        | 13,148                        | 27,536                      | 7000                        |                               |                             |
| 600                         | 20,195                        | 12,688                      | 2200                        | 12,530                        | 28,865                      | 7500                        |                               |                             |
| 700                         | 19,394                        | 14,216                      | 2400                        | 11,960                        | 30,056                      | 8000                        |                               |                             |
| 800                         | 18,672                        | 15,641                      | 2600                        | 11,431                        | 31,121                      | 8500                        |                               |                             |
| 900                         | 18,014                        | 16,976                      | 2800                        | 10,938                        | 32,069                      | 9000                        |                               |                             |
| 1000                        | 17,410                        | 18,230                      | 3000                        | 10,476                        | 32,908                      | 9500                        |                               |                             |
| 1100                        | 16,853                        | 19,411                      | 3200                        | 10,041                        | 33,645                      | 10000                       |                               |                             |

The total power "P" and the total torque "M" transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k}{180} \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

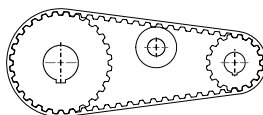
A = centre distance [mm]

## Flexibility

### Minimum number of teeth and minimum diameter

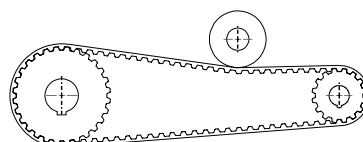
Drive without reverse bending

- Timing pulley  $z_{\min} = 28$
- Idler running on belt teeth  $d_{\min} = 120$  mm

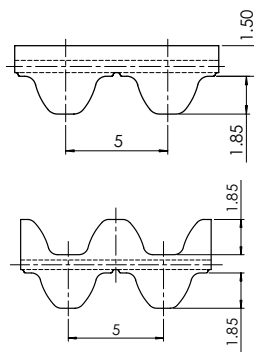
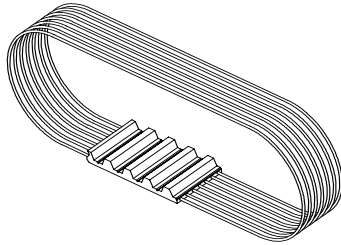


Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 28$
- Idler running on belt back  $d_{\min} = 180$  mm



## STD5M ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with high tensile load steel cords and high torque capacity - produced according to ISO 13050
- Metric pitch 5 mm
- Low noise generation in high speed drives
- Offer excellent operational reliability
- The special profile allows smooth running properties
- Transmissible power up to 6 Kw
- Rpm up to 10.000 [1/min]
- Maximum width: 150 mm
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Technical data

| Belt width [mm]            | 10    | 15    | 25    | 50    | 100   | 150   |
|----------------------------|-------|-------|-------|-------|-------|-------|
| Allowable tensile load [N] | 1000  | 1500  | 2400  | 4800  | 9600  | 14300 |
| Weight [kg/m]              | 0,046 | 0,068 | 0,114 | 0,228 | 0,456 | 0,684 |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 2,936                         | 0,000                       | 1200                        | 2,031                         | 2,553                       | 3400                        | 1,501                         | 5,345                       |
| 20                          | 2,892                         | 0,061                       | 1300                        | 1,995                         | 2,715                       | 3600                        | 1,470                         | 5,540                       |
| 40                          | 2,853                         | 0,119                       | 1400                        | 1,960                         | 2,873                       | 3800                        | 1,440                         | 5,728                       |
| 60                          | 2,817                         | 0,177                       | 1440                        | 1,946                         | 2,935                       | 4000                        | 1,411                         | 5,910                       |
| 80                          | 2,784                         | 0,233                       | 1500                        | 1,927                         | 3,026                       | 4500                        | 1,345                         | 6,336                       |
| 100                         | 2,755                         | 0,288                       | 1600                        | 1,895                         | 3,175                       | 5000                        | 1,285                         | 6,726                       |
| 200                         | 2,645                         | 0,554                       | 1700                        | 1,865                         | 3,321                       | 5500                        | 1,230                         | 7,083                       |
| 300                         | 2,497                         | 0,784                       | 1800                        | 1,837                         | 3,462                       | 6000                        | 1,180                         | 7,411                       |
| 400                         | 2,435                         | 1,020                       | 1900                        | 1,810                         | 3,600                       | 6500                        | 1,133                         | 7,711                       |
| 500                         | 2,372                         | 1,242                       | 2000                        | 1,784                         | 3,735                       | 7000                        | 1,090                         | 7,987                       |
| 600                         | 2,313                         | 1,453                       | 2200                        | 1,734                         | 3,996                       | 7500                        | 1,049                         | 8,238                       |
| 700                         | 2,257                         | 1,654                       | 2400                        | 1,689                         | 4,245                       | 8000                        | 1,011                         | 8,469                       |
| 800                         | 2,205                         | 1,847                       | 2600                        | 1,647                         | 4,483                       | 8500                        | 0,975                         | 8,678                       |
| 900                         | 2,157                         | 2,033                       | 2800                        | 1,607                         | 4,712                       | 9000                        | 0,941                         | 8,868                       |
| 1000                        | 2,113                         | 2,212                       | 3000                        | 1,570                         | 4,931                       | 9500                        | 0,909                         | 9,040                       |
| 1100                        | 2,071                         | 2,385                       | 3200                        | 1,535                         | 5,142                       | 10000                       | 0,878                         | 9,195                       |

The total power "P" and the total torque "M" transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]}{180}$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

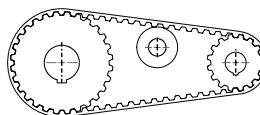
A = centre distance [mm]

### Flexibility

#### Minimum number of teeth and minimum diameter

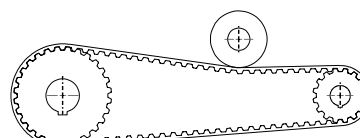
Drive without reverse bending

- Timing pulley  $z_{\min} = 16$
- Idler running on belt teeth  $d_{\min} = 50$  mm

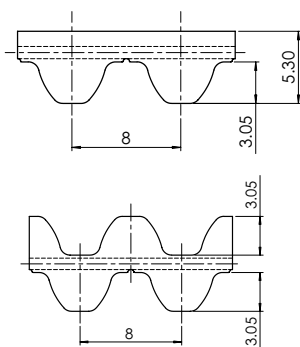
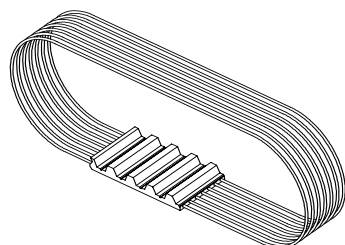


Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 20$
- Idler running on belt back  $d_{\min} = 50$  mm



## STD8M ELA-flex SD™



### Belt characteristics

- Truly endless polyurethane timing belt with high tensile load steel cords and high torque capacity - produced according to ISO 13050
  - Metric pitch 8 mm
  - Low noise generation in high speed drives
  - Offer excellent operational reliability
  - The special profile allows smooth running properties
  - Transmissible power up to 80 Kw
  - Rpm up to 10.000 [1/min]
- Maximum width: 150 mm
  - Width tolerance:  $\pm 0,5$  [mm]
  - Thickness tolerance:  $\pm 0,2$  [mm]

## Technical data

| Belt width [mm]            | 10   | 15   | 20   | 30   | 50   | 85    | 100   | 150   |
|----------------------------|------|------|------|------|------|-------|-------|-------|
| Allowable tensile load [N] | 1600 | 2400 | 3200 | 4800 | 7900 | 13400 | 15800 | 23700 |
| Weight [kg/m]              | 0,07 | 0,10 | 0,13 | 0,20 | 0,33 | 0,56  | 0,66  | 1,00  |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 9,435                         | 0,000                       | 1200                        | 5,885                         | 7,394                       | 3400                        | 3,960                         | 14,098                      |
| 20                          | 9,301                         | 0,195                       | 1300                        | 5,745                         | 7,821                       | 3600                        | 3,849                         | 14,508                      |
| 40                          | 9,176                         | 0,384                       | 1400                        | 5,615                         | 8,231                       | 3800                        | 3,743                         | 14,894                      |
| 60                          | 9,057                         | 0,569                       | 1440                        | 5,565                         | 8,391                       | 4000                        | 3,643                         | 15,257                      |
| 80                          | 8,946                         | 0,749                       | 1500                        | 5,492                         | 8,626                       | 4500                        | 3,410                         | 16,070                      |
| 100                         | 8,841                         | 0,926                       | 1600                        | 5,376                         | 9,007                       | 5000                        | 3,201                         | 16,762                      |
| 200                         | 8,401                         | 1,759                       | 1700                        | 5,266                         | 9,374                       | 5500                        | 3,011                         | 17,343                      |
| 300                         | 7,908                         | 2,484                       | 1800                        | 5,162                         | 9,729                       | 6000                        | 2,837                         | 17,824                      |
| 400                         | 7,567                         | 3,169                       | 1900                        | 5,063                         | 10,072                      | 6500                        |                               |                             |
| 500                         | 7,268                         | 3,805                       | 2000                        | 4,968                         | 10,404                      | 7000                        |                               |                             |
| 600                         | 7,005                         | 4,401                       | 2200                        | 4,790                         | 11,035                      | 7500                        |                               |                             |
| 700                         | 6,772                         | 4,963                       | 2400                        | 4,627                         | 11,628                      | 8000                        |                               |                             |
| 800                         | 6,561                         | 5,496                       | 2600                        | 4,475                         | 12,184                      | 8500                        |                               |                             |
| 900                         | 6,370                         | 6,003                       | 2800                        | 4,334                         | 12,707                      | 9000                        |                               |                             |
| 1000                        | 6,195                         | 6,487                       | 3000                        | 4,202                         | 13,199                      | 9500                        |                               |                             |
| 1100                        | 6,034                         | 6,950                       | 3200                        | 4,077                         | 13,662                      | 10000                       |                               |                             |

The total power "P" and the total torque "M" transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]}{180}$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

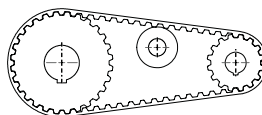
A = centre distance [mm]

### Flexibility

#### Minimum number of teeth and minimum diameter

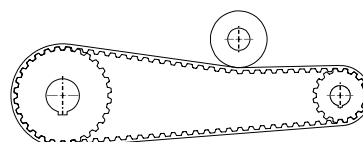
Drive without reverse bending

- Timing pulley  $z_{\min} = 18$
- Idler running on belt teeth  $d_{\min} = 50$  mm

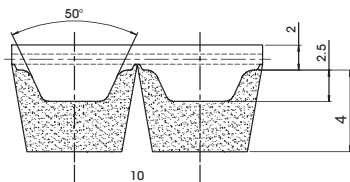
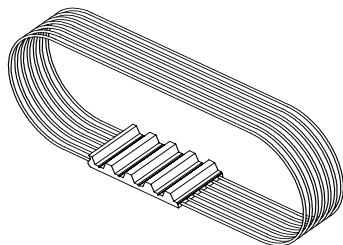


Drive with reverse bending and double sided belt

- Timing pulley  $z_{\min} = 18$
- Idler running on belt back  $d_{\min} = 120$  mm



## ATK10 - K6 ELA-flex SD™



### Belt characteristics

- Polyurethane self track timing belt with steel tension cords
- Profile AT10 with central guide
- Central guide height 4 mm
- Allow to use pulleys without flanges
- The central guide is notched in order to maximize belt flexibility
- Ideal for conveying applications where a side load is generated by loading/unloading transferring a product

### Technical data

|                                   |      |      |
|-----------------------------------|------|------|
| Belt width [mm]                   | 32   | 50   |
| Allowable tensile load type V [N] | 5100 | 7900 |
| Weight [kg]                       | 0,27 | 0,36 |

Other widths are available on request

### Tooth shear strength

| rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] | rpm<br>[min <sup>-1</sup> ] | M <sub>spez</sub><br>[Ncm/cm] | P <sub>spez</sub><br>[W/cm] |
|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|
| 0                           | 12,048                        | 0,000                       | 1200                        | 7,708                         | 9,685                       | 3400                        | 5,317                         | 18,931                      |
| 20                          | 11,871                        | 0,249                       | 1300                        | 7,534                         | 10,256                      | 3600                        | 5,180                         | 19,529                      |
| 40                          | 11,706                        | 0,490                       | 1400                        | 7,372                         | 10,807                      | 3800                        | 5,048                         | 20,088                      |
| 60                          | 11,550                        | 0,726                       | 1440                        | 7,310                         | 11,022                      | 4000                        | 4,924                         | 20,625                      |
| 80                          | 11,403                        | 0,955                       | 1500                        | 7,219                         | 11,339                      | 4500                        | 4,636                         | 21,846                      |
| 100                         | 11,265                        | 1,180                       | 1600                        | 7,076                         | 11,855                      | 5000                        | 4,377                         | 22,915                      |
| 200                         | 10,684                        | 2,238                       | 1700                        | 6,939                         | 12,352                      | 5500                        | 4,140                         | 23,841                      |
| 300                         | 10,215                        | 3,209                       | 1800                        | 6,810                         | 12,836                      | 6000                        | 3,923                         | 24,648                      |
| 400                         | 9,793                         | 4,102                       | 1900                        | 6,688                         | 13,305                      | 6500                        | 3,724                         | 25,348                      |
| 500                         | 9,424                         | 4,934                       | 2000                        | 6,570                         | 13,759                      | 7000                        | 3,538                         | 25,933                      |
| 600                         | 9,097                         | 5,716                       | 2200                        | 6,349                         | 14,625                      | 7500                        | 3,365                         | 26,423                      |
| 700                         | 8,808                         | 6,456                       | 2400                        | 6,147                         | 15,447                      | 8000                        | 3,202                         | 26,825                      |
| 800                         | 8,547                         | 7,159                       | 2600                        | 5,959                         | 16,223                      | 8500                        | 3,048                         | 27,127                      |
| 900                         | 8,309                         | 7,831                       | 2800                        | 5,782                         | 16,953                      | 9000                        | 2,903                         | 27,358                      |
| 1000                        | 8,093                         | 8,474                       | 3000                        | 5,618                         | 17,649                      | 9500                        | 2,766                         | 27,516                      |
| 1100                        | 7,893                         | 9,091                       | 3200                        | 5,464                         | 18,308                      | 10000                       | 2,636                         | 27,598                      |

The total power "P" and the total torque "M" transmitted by the belt, are calculated with the following formulas:

$$P \text{ [Kw]} = P_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 1000$$

$$M \text{ [Nm]} = M_{\text{spez}} \cdot Z_e \cdot Z_k \cdot b / 100$$

$$Z_e = \frac{Z_k \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]}{180}$$

P = power in Kw

M = torque in Nm

P<sub>spez</sub> = specific power

M<sub>spez</sub> = specific torque

Z<sub>e</sub> = number of teeth in mesh of the small pulley

Z<sub>emax</sub> = 12

Z<sub>k</sub> = number of teeth of the small pulley

b = belt width in cm

A = centre distance [mm]

### Flexibility

#### Minimum number of teeth and minimum diameter

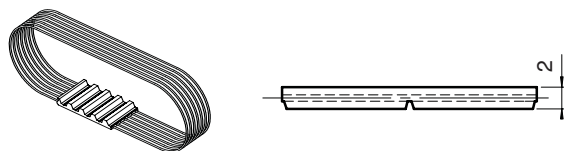
Drive without reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt teeth  $d_{\min} = 80 \text{ mm}$

Drive with reverse bending

- Timing pulley  $z_{\min} = 25$
- Idler running on belt back  $d_{\min} = 120 \text{ mm}$

## F2



### Belt characteristics

- Polyurethane flat belt with steel tension cords
- It is mainly used in lifting application where there is no need for synchronization
- Allows the use of small diameter pulleys
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Technical data

|                            |       |      |      |      |      |
|----------------------------|-------|------|------|------|------|
| Belt width [mm]            | 25    | 32   | 50   | 75   | 100  |
| Allowable tensile load [N] | 1800  | 2320 | 3860 | 5900 | 7900 |
| Weight [kg/m]              | 0,007 | 0,1  | 0,16 | 0,24 | 0,3  |

Other widths are available on request

### Flexibility

#### Minimum pulley diameter

Minimum pulley diameter  $d_{\min} = 50$  mm

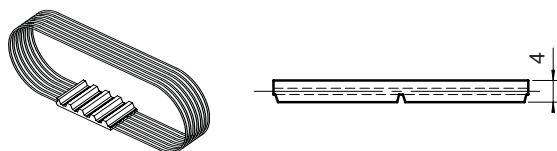
Drive without reverse bending

- Idler running inside belt  $d_{\min} = 50$  mm

Drive with reverse bending

- Idler running on belt back  $d_{\min} = 100$  mm

## F4



### Belt characteristics

- Polyurethane flat belt with steel tension cords
- It is mainly used in lifting application where there is no need of synchronization
- Allows the use of small diameter pulleys
- Width tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

### Technical data

|                            |      |      |       |       |
|----------------------------|------|------|-------|-------|
| Belt width [mm]            | 25   | 50   | 75    | 100   |
| Allowable tensile load [N] | 4200 | 8400 | 12600 | 16800 |
| Weight [kg/m]              | 0,2  | 0,4  | 0,6   | 0,8   |

Other widths are available on request.

### Flexibility

#### Minimum pulley diameter

Minimum pulley diameter  $d_{\min} = 120$  mm

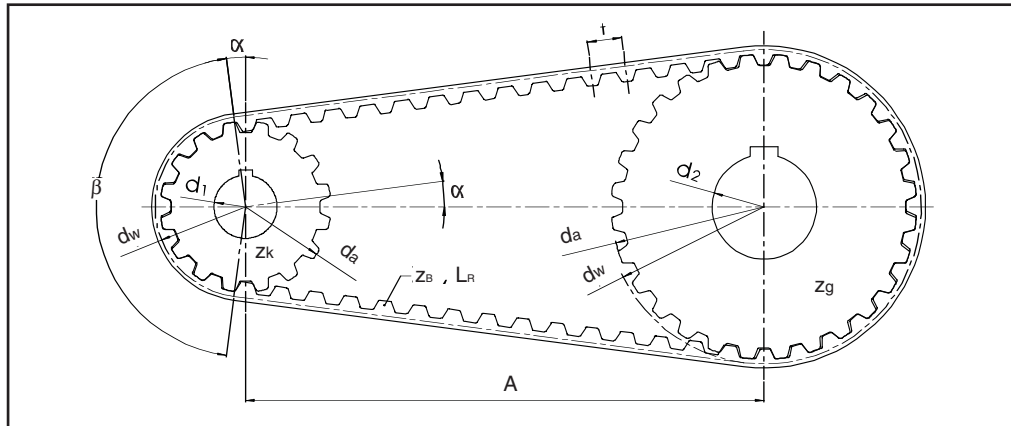
Drive without reverse bending

- Idler running inside belt  $d_{\min} = 120$  mm

Drive with reverse bending

- Idler running on belt back  $d_{\min} = 150$  mm

# Drive calculation



## Definitions

|                   |      |                                    |                 |                       |                                                 |
|-------------------|------|------------------------------------|-----------------|-----------------------|-------------------------------------------------|
| b                 | (cm) | Belt width                         | F <sub>U</sub>  | (N)                   | Peripheral force                                |
| L <sub>R</sub>    | (mm) | Belt length                        | M               | (Nm)                  | Torque                                          |
| z <sub>R</sub>    | -    | Number of teeth of the belt        | P               | (kW)                  | Power                                           |
| B                 | (mm) | Pulley width                       | t <sub>ab</sub> | (s)                   | Acceleration time                               |
| A                 | (mm) | Center distance                    | t <sub>av</sub> | (s)                   | Deceleration time                               |
| A <sub>eff</sub>  | (mm) | Effective center distance          | v               | (m/s)                 | Peripheral speed                                |
| d                 | (mm) | Pulley bore diameter               | z <sub>e</sub>  | -                     | N. of teeth in mesh                             |
| d <sub>a</sub>    | (mm) | Pulley outside diameter            | z <sub>k</sub>  | -                     | Number of teeth of the small pulley             |
| d <sub>ak</sub>   | (mm) | Small pulley outside diameter      | z <sub>g</sub>  | -                     | Number of teeth of the large pulley             |
| d <sub>ag</sub>   | (mm) | Large pulley outside diameter      | i               | -                     | Drive ratio ( n <sub>1</sub> : n <sub>2</sub> ) |
| d <sub>w</sub>    | (mm) | Pulley pitch diameter              | ρ               | (kg/dm <sup>3</sup> ) | Specific weight                                 |
| d <sub>wk</sub>   | (mm) | Small pulley pitch circle diameter | J               | (kgm <sup>2</sup> )   | Moment of inertia                               |
| d <sub>wg</sub>   | (mm) | Large pulley pitch circle diameter | t               | (mm)                  | Pitch                                           |
| F <sub>Wsta</sub> | (N)  | Static Shafts load                 | n               | (min <sup>-1</sup> )  | Rpm                                             |
| F <sub>TV</sub>   | (N)  | Pretension force per belt side     | n <sub>1</sub>  | (min <sup>-1</sup> )  | Rpm of driver pulley                            |
| F <sub>Tzul</sub> | (N)  | Allowable tensile load             | ω               | (s <sup>-1</sup> )    | Angular speed                                   |
|                   |      |                                    | β               | (°)                   | Wrap angle                                      |

## Calculation formula

|                                                                  |                                                      |                                                       |
|------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------|
| Power                                                            | Peripheral force                                     | Torque                                                |
| $P = \frac{M \cdot n}{9550}$                                     | $F_u = \frac{19100 \cdot P \cdot 10^3}{n \cdot d_w}$ | $M = \frac{F_u \cdot d_w}{2000}$                      |
| $P = \frac{F_u \cdot d_w \cdot n}{19100 \cdot 10^3}$             | $F_u = \frac{2000 \cdot M}{d_w}$                     | $M = \frac{P \cdot 9550}{n}$                          |
| Angular speed                                                    | peripheral speed                                     | Acceleration torque                                   |
| $\omega = \frac{\pi \cdot n}{30}$                                | $v = \frac{d_w \cdot n}{19100}$                      | $M_{ab} = \frac{J \cdot \Delta n}{9,55 \cdot t_{ab}}$ |
| Moment of inertia                                                | rpm                                                  |                                                       |
| $J = 98,2 \cdot 10^{-15} \cdot B \cdot \rho \cdot (d_a^4 - d^4)$ | $n = \frac{19100 \cdot v}{d_w}$                      |                                                       |



## Safety factors

Belt selection is made according to a constant working load. In case of peak loads and vibrations a safety factor  $c_1$  must be considered.

Transmission with steady load  $c_1 = 1,0$

Transmission with peak or fluctuating loads:

|        |             |
|--------|-------------|
| Light  | $c_1 = 1,4$ |
| Medium | $c_1 = 1,7$ |
| Heavy  | $c_1 = 2,0$ |

For speed up driver factor  $c_2$  must be considered:

|                                          |             |
|------------------------------------------|-------------|
| $i = \text{from } 0,66 \text{ to } 1$    | $c_2 = 1,1$ |
| $i = \text{from } 0,40 \text{ to } 0,66$ | $c_2 = 1,2$ |
| $i < 0,40$                               | $c_2 = 1,3$ |

The resulting total safety factor is:

$$c_0 = c_1 \cdot c_2$$

## Drive calculation

The necessary data for drive calculation are:

|                                  |          |                      |
|----------------------------------|----------|----------------------|
| • Power to be transmitted        | $P$      | [kW]                 |
| • Driver rpm                     | $n_1$    | [min <sup>-1</sup> ] |
| • Motor starting torque          | $M_{ab}$ | [Nm]                 |
| • Required center distance       | $A$      | [mm]                 |
| • Maximum driver pulley diameter | $d_{w1}$ | [mm]                 |

## Select type of belt

For the initial drive selection, use the selection graphs illustrated in the relative ELA-flex SD™ catalogue section. For initial pulley choice, it is recommended to use the driver pulley with maximum diameter allowable in the application.

## Calculate drive ratio

$$i = \frac{n_{\text{driver}}}{n_{\text{driven}}}$$

## Calculate belt length

Belt length for drive with ratio  $i \neq 1$

$$L_R \approx \frac{t}{2} \cdot (z_g + z_k) + 2A + \frac{1}{4A} \cdot \left[ \frac{(z_g - z_k) \cdot t}{\pi} \right]^2$$

and more precisely:

$$L_R = 2A \cdot \sin \frac{\beta}{2} + \frac{t}{2} \cdot \left[ z_g + z_k + \left( 1 - \frac{\beta}{180} \right) \cdot (z_g - z_k) \right]$$

Belt length for drive with ratio  $i = 1$

$$L_R = 2 \cdot A + \pi \cdot d_w = 2 \cdot A + z \cdot t$$

## Calculate teeth in mesh

$$z_e = \frac{\beta}{360} \cdot z_k$$

with  $\beta [^\circ] =$  wrap angle

$$\beta = 2 \cdot \arccos \left[ \frac{t \cdot (z_g - z_k)}{2 \cdot \pi \cdot A} \right]$$

## Determine belt width

$$b = \frac{P \cdot 1000 \cdot c_0}{z_k \cdot z_e \cdot P_{\text{spez}}} \quad b = \frac{100 \cdot M \cdot c_0}{z_k \cdot z_e \cdot M_{\text{spez}}}$$

## Verify allowable tensile load

The allowable tensile load of the belt must be higher than the total corrected peripheral force.

$$F_{Tzul} > c_0 \cdot F_U \quad \text{with} \quad F_U = \frac{2000 \cdot M}{d_w}$$

## Calculate shaft load

$$F_{Wsta} = 2 \cdot F_{TV} \cdot \cos \beta$$

$$F_{Wsta} = 2 \cdot F_{TV} \quad (\text{for } i = 1)$$

## Determine installation tension

A drive is correctly tensioned when the belt slack side is tensioned in all working conditions. It is also important to use the minimum necessary tension to minimize shaft loads. Belt tension is dependent also on belt length  $L_R$  and its number of teeth  $Z_R$ . According to belt number of teeth, following tension is suggested:

### 2 shafts drive

|                  |                    |
|------------------|--------------------|
| $Z_R < 75$       | $F_{TV} = 1/3 F_U$ |
| $75 < Z_R < 150$ | $F_{TV} = 1/2 F_U$ |
| $Z_R > 150$      | $F_{TV} = 2/3 F_U$ |

### More than 2 shafts drive

$$F_{TV} > F_U$$

In order to ensure the correct drive installation tension, it is recommended to use the special belt tension meter available from ELATECH®.

## Calculation example

|                                              |            |
|----------------------------------------------|------------|
| - Power to be transmitted                    | 20 Kw      |
| - Driver rpm $n_1$                           | 1500 1/min |
| - Driven rpm $n_2$                           | 1500 1/min |
| - Motor torque M                             | 250 Nm     |
| - Required center distance A                 | 1800 mm    |
| - Max allowable driver pulley diameter $d_w$ | 150 mm     |
| - Safety factor $c_1$                        | 1,4        |

### Calculate drive ratio

$$\frac{n_1}{n_2} = 1$$

### Select belt type and pitch

From HTD selection graphs and the corrected power of 28 Kw, a 8M pitch is chosen.

### Calculate pulley diameter

From the maximum allowable pulleys diameter, the drive ratio and the type of belt selected, the number of teeth of the driver and driven pulley is calculated.

$$z = \frac{150 \cdot \pi}{8} = 58,9 - \text{select } z = 56 \text{ with } d_w = 142,60 \text{ mm}$$

The maximum allowable diameter is chosen to minimize belt width.

$$z_1 = 56$$

$$z_2 = 56$$

### Calculate belt length

$$L_R = 2 \cdot A + \pi \cdot d_w = 2 \cdot A + z \cdot t$$

$$L_R = 2 \cdot 1800 + 56 \cdot 8 = 4048 \text{ mm}$$

### Calculate teeth in mesh

Being the drive ratio 1, the pulleys have 28 teeth in mesh.

$$z_e = 28$$

### Calculate belt width

$$b = \frac{1000 \cdot 20 \cdot 1,4}{56 \cdot 12 \cdot 8,572} = 4,86 \text{ cm} = 48,6 \text{ mm}$$

A belt width of 50 mm is selected .

The belt width is verified according to the peak torque (starting torque) for  $n = 0$  with  $1,4 \times 250 \text{ Nm}$  as start up torque

$$b = \frac{10 \cdot 250 \cdot 1,4}{56 \cdot 12 \cdot 9,422} = 5,53 \text{ cm} = 55 \text{ mm}$$

The next belt width 85 mm is chosen.

### Verify allowable tensile load

$$F_U = \frac{2000 \cdot 350}{142,6} = 4908,83 \text{ N}$$

### Determine installation tension according to belt number of teeth

$$z_R = \frac{4048}{8} = 506 \text{ teeth}$$

The installation tension per belt side  $F_{TV}$  is therefore:

$$F_{TV} = \frac{2}{3} \cdot F_U = 3272,55 \text{ N with } z_R = 506 > 150$$

From the technical data for ELA-flex SD™ belts HTD 8M, the maximum allowable tensile load for belt width 85 mm is: 13400 N.

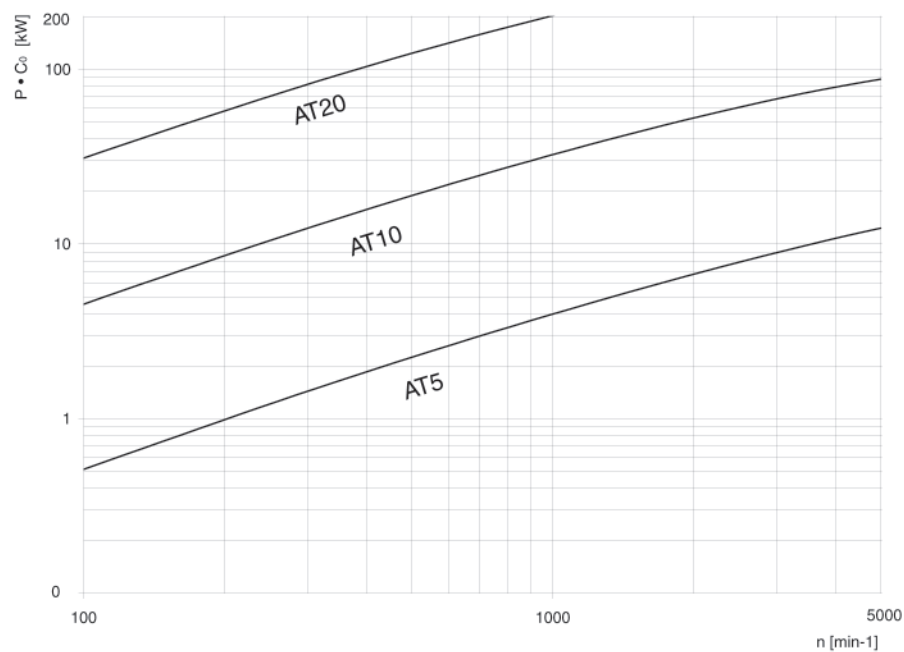
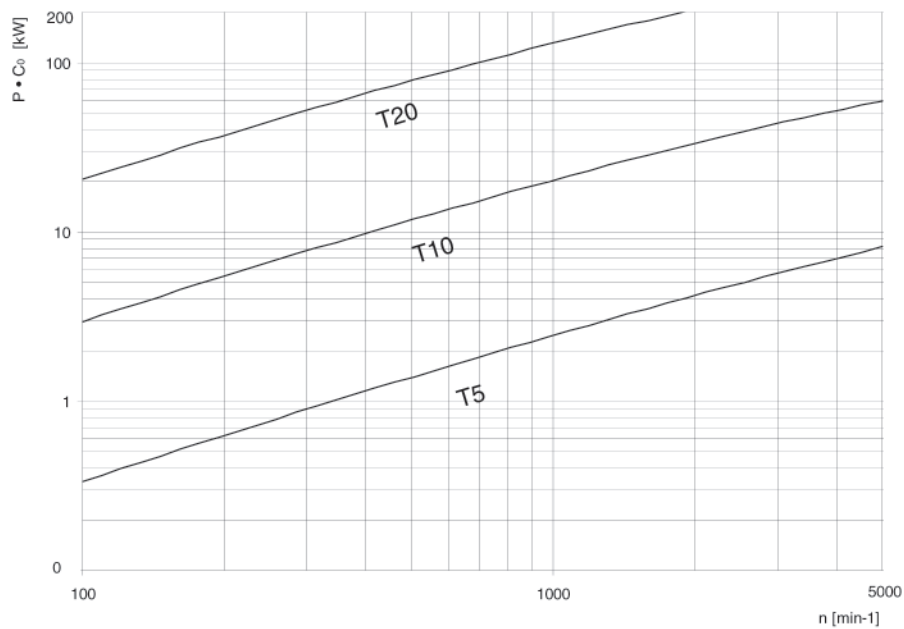
$$F_{Tzul} = 13400 \text{ N} > F_{TV} + F_U = 3272,55 + 4908,83 = 8181,38 \text{ N}$$

### Verify flexibility

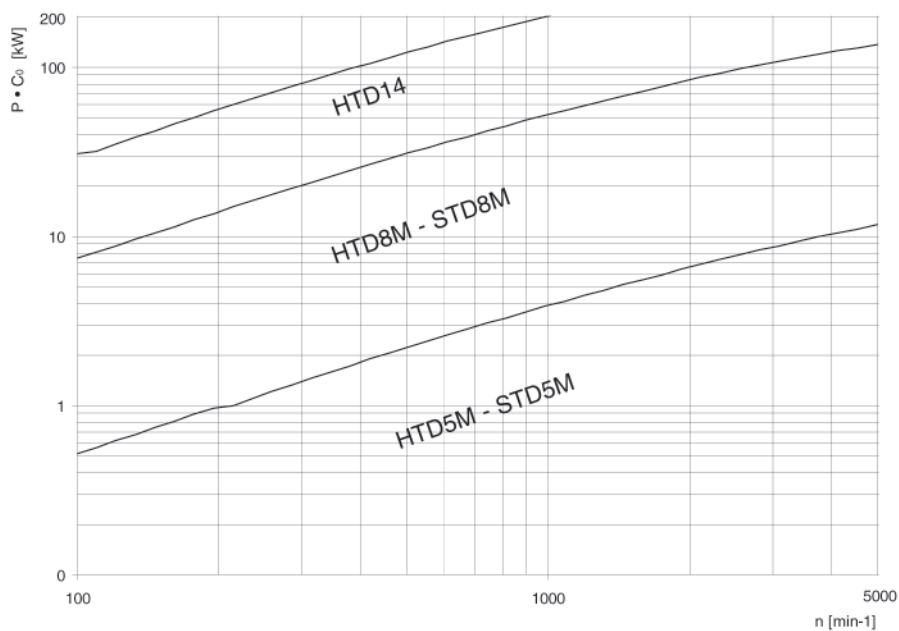
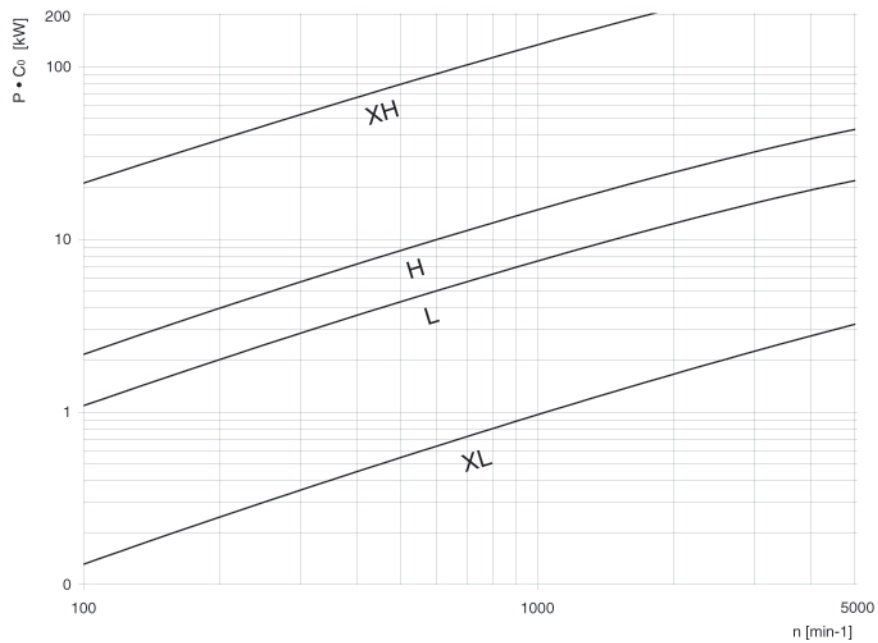
The minimum pulley diameters are respected.

## Selection graphs

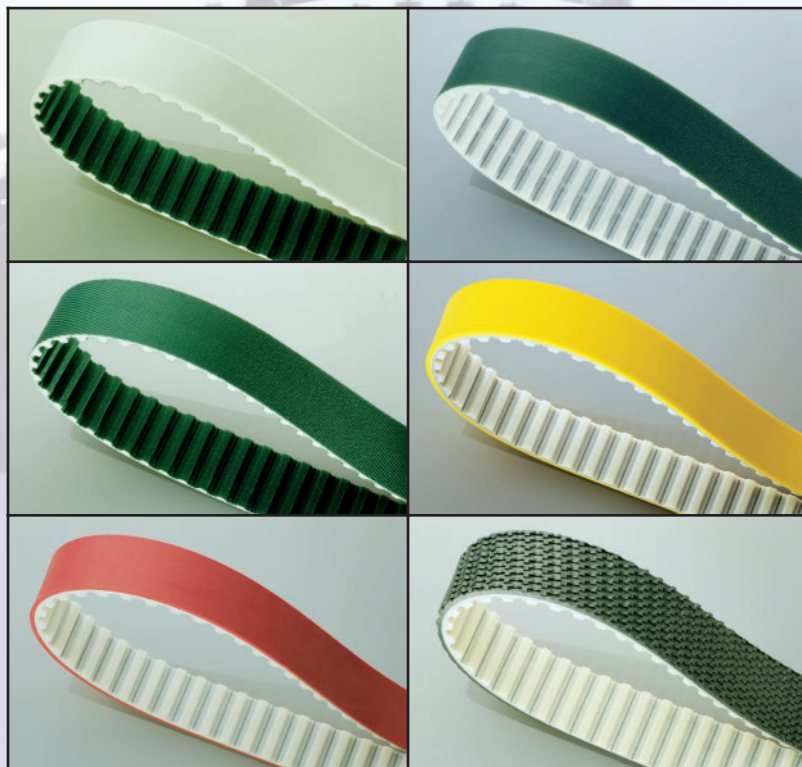
The selection graphs enable to select the most suitable timing belt pitch, for each belt profile, for the power to be transmitted. The rpm on the horizontal axis refers to the small pulley. The corrected power (safety factor x nominal power) is read on the vertical axis.



The selection graphs enable to select the most suitable timing belt pitch, for each belt profile, for the power to be transmitted. The rpm on the horizontal axis refers to the small pulley. The corrected power (safety factor x nominal power) is read on the vertical axis.



# Polyurethane belts for conveying applications



# Polyurethane belts for conveying applications

The unique chemical and mechanical characteristics of ELATECH® belts together with the possibility of a wide variety of backings in different materials make ELATECH® belts ideal for all conveying applications where synchronization is required. The engineer designer has unlimited possibilities to make unique designs.

## Minimum pulley diameter

The recommended pulley diameter shown for each type of backing, are valid for application with speed up to 1m/s and temperature of 20° C. When smaller pulley diameter are needed please consult with Elatech technical department.

## Drive with reverse bending

Elatech polyurethane timing belts are suitable for drives with reverse bending. Tension should be adjusted, depending on backing hardness.

## Temperature

Hot items may be conveyed when a correct backing is selected. In such a case, ensure that the belt toothed structure does not over come 80° C.

## Polyamide fabric backings

The special polyamide fabric backings allow a reduction of the friction coefficient and when applied on teeth, decrease noise in high speed drives. They are very useful in applications with sliding surfaces or product accumulation.

## Coefficient of friction

- Polyurethane on steel  $\mu = 0,7$
- Polyamide on steel  $\mu = 0,35$

PAZ: Polyamide backing on tooth side  
Reduces coefficient of friction and allows a smoother tooth engagement.

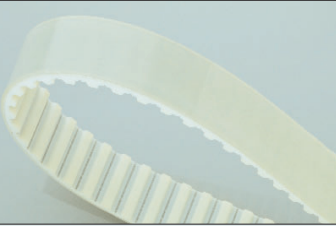
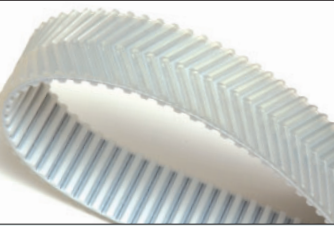
PAR: Polyamide backing on back side  
Reduces coefficient of friction.

PAZ-PAR: Polyamide backing on both tooth and back side

|  | PAZ                                                                                 | PAR                                                                                  | PAZ-PAR                                                                               |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                                                                     |  |  |  |
|                                                                                     | Tooth facing fabric                                                                 | Nylon fabric on the belt back                                                        | Nylon fabric on tooth facing and on belt back                                         |
| Material                                                                            | Polyamide                                                                           | Polyamide                                                                            | Polyamide                                                                             |
| Color                                                                               | Green                                                                               | Green                                                                                | Green                                                                                 |
| Mechanical characteristics                                                          | Low coefficient of friction                                                         | Low coefficient of friction                                                          | Low coefficient of friction                                                           |
| Chemical properties                                                                 | Moderate resistance to oils and greases                                             | Moderate resistance to oils and greases                                              | Moderate resistance to oils and greases                                               |

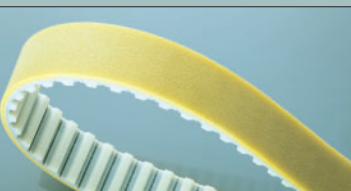
### Polyurethane film backing (foil)

Among all synthetic materials and rubber compounds, polyurethane is the material which offers the best resistance to abrasion. Polyurethane films of different thickness and different shore hardness, applied on ELATECH® belts, are an ideal solution in many applications in the wood processing, ceramic and glass industry. On request it is possible to supply polyurethane backings FDA approved.

|  | PUR 85                                                                            | PUR 70                                                                             | PUR 85 FISHBONE                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                   |  |  |  |
| Material                                                                          | TPU                                                                               | TPU                                                                                | TPU                                                                                 |
| Color                                                                             | Trasparent                                                                        | Trasparent                                                                         | Trasparent                                                                          |
| Hardness                                                                          | 85 Sh A                                                                           | 70 Sh A                                                                            | 80 Sh A                                                                             |
| Standard thickness (mm)                                                           | 2                                                                                 | 2 - 3 - 4 - 5                                                                      | 5                                                                                   |
| Minimum pulley diameter (mm)                                                      | 80                                                                                | 60 - 80 - 80 - 80                                                                  | 120                                                                                 |
| Max working temperature (°C)                                                      | 85                                                                                | 80                                                                                 | 80                                                                                  |
| Mechanical characteristics                                                        | High coefficient of friction, high abrasion and wear resistance                   | High coefficient of friction, high abrasion and wear resistance                    | High coefficient of friction, high abrasion and wear resistance                     |
| Chemical properties                                                               | Good resistance to oils and greases                                               | Good resistance to oils and greases                                                | Good resistance to oils and greases                                                 |

### Polyurethane foam backings

Polyurethane foams are easily compressible according to the cellular structure of the material. Due to this main characteristic, common applications are: labelling equipment, light and/or fragile materials conveying, glass and paper industry, vacuum conveyors.

|  | PU YELLOW                                                                           | CELLOFLEX                                                                            |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                                                     |  |  |
| Material                                                                            | Polyurethane                                                                        | Polyurethane foam                                                                    |
| Color                                                                               | Yellow                                                                              | Beige                                                                                |
| Hardness                                                                            | 55 Sh A                                                                             | -                                                                                    |
| Standard thickness (mm)                                                             | 2 - 3 - 4 - 5                                                                       | 2 - 4 - 6 - 8 - 10                                                                   |
| Minimum pulley diameter (mm)                                                        | 60 - 60 - 80 - 100                                                                  | 40 - 40 - 60 - 80 - 100                                                              |
| Max working temperature (°C)                                                        | 60                                                                                  | 80                                                                                   |
| Mechanical characteristics                                                          | Good wear resistance                                                                | High flexibility and high coefficient of friction                                    |
| Chemical properties                                                                 | Moderate resistance to oils and greases                                             | Moderate resistance to oils and greases                                              |



## PVC backings

PVC has a high coefficient of friction and a good resistance to acids. Due to its versatility, it is used in many applications in the paper, glass, ceramic industry, labelling and packing equipment. FDA quality allows the application in food industry processes.

|  | SUPERGRIP                                                                         | FISHBONE                                                                           | PVC BLUE/WHITE                                                                      |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                   |  |  |  |
| Material                                                                          | PVC                                                                               | PVC                                                                                | PVC                                                                                 |
| Color                                                                             | Green / Blue                                                                      | White                                                                              | Blue / White                                                                        |
| Hardness                                                                          | ca. 30 Sh A                                                                       | 40 Sh A                                                                            | ca. 40 Sh A                                                                         |
| Standard thickness (mm)                                                           | 4                                                                                 | ca. 4                                                                              | 1 - 2 - 3                                                                           |
| Minimum pulley diameter (mm)                                                      | 60                                                                                | 60                                                                                 | 30 - 40 - 50                                                                        |
| Max working temperature (°C)                                                      | 60                                                                                | 80                                                                                 | 80                                                                                  |
| Mechanical characteristics                                                        | High coefficient of friction                                                      | Good wear resistance, high coefficient of friction                                 | Good wear resistance, high coefficient of friction                                  |
| Chemical properties                                                               | Good resistance to oils and greases                                               | FDA approved, good resistance to oils and greases                                  | Good resistance to oils and greases. White type is FDA approved.                    |

## Rubber backing

Many different rubber backings in both synthetic and natural rubber are available. Due to rubber high friction coefficient and high temperature resistance, ELATECH® polyurethane belt with rubber backing are used in many different conveying application: paper industry, ceramic industry, wood processing industry, glass industry, labelling and packaging machines.

|  | LINATEX                                                                           | POROL                                                                              | ISOGUM                                                                                                                    |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
|                                                                                   |  |  |                                        |
| Material                                                                          | Natural rubber                                                                    | Cellular rubber                                                                    | Natural rubber                                                                                                            |
| Color                                                                             | Red                                                                               | Black                                                                              | Red                                                                                                                       |
| Hardness (Sh A) - Density (g/dm <sup>3</sup> )                                    | ca. 38 Sh A                                                                       | ca. 190 g/dm <sup>3</sup>                                                          | ca. 40 Sh A                                                                                                               |
| Standard thickness (mm)                                                           | 1,6 - 2,4 - 3,2 - 4,8 - 6,4 - 10                                                  | ca. 4                                                                              | 2 - 3 - 4 - 6 - 10 - 12                                                                                                   |
| Minimum pulley diameter (mm)                                                      | 30 - 30 - 40 - 40 - 40 - 60                                                       | 40                                                                                 | 30 - 30 - 30 - 40 - 80 - 100                                                                                              |
| Max working temperature (°C)                                                      | 60                                                                                | 60                                                                                 | 60                                                                                                                        |
| Mechanical characteristics                                                        | Hight coefficient of friction, very good resistance to cut and tear               | Good wear and tear resistance, high coefficient of friction                        | Truly endless backing which guarantee long belt life. Hight coefficient of friction, very good resistance to cut and tear |
| Chemical properties                                                               | Good resistance to oils                                                           | Good resistance to non aggressive oils                                             | Good resistance to oils                                                                                                   |

## Speciality

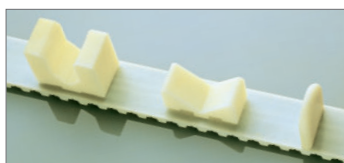
|  | TECNOGUM                                                                            | SYLOMER                                                                              | VITON                                                                                 |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                                                                     |  |  |  |
| Material                                                                            | Termoplastic rubber compound                                                        | PUR                                                                                  | Fluoroelastomer                                                                       |
| Color                                                                               | Red                                                                                 | Blue - Green - Brown                                                                 | Black                                                                                 |
| Hardness (Sh A) - Density (g/dm <sup>3</sup> )                                      | ca. 60 Sh A                                                                         | 220 - 300 - 400                                                                      | ca. 75 Sh A                                                                           |
| Standard thickness (mm)                                                             | 2 - 3 - 4 - 6                                                                       | 3 → 25                                                                               | 2 - 4 - 5 - 6                                                                         |
| Minimum pulley diameter (mm)                                                        | 30 - 40 - 50 - 60                                                                   | 80 → 120                                                                             | 80 - 100 - 110 - 120                                                                  |
| Max working temperature (°C)                                                        | 80                                                                                  | 70                                                                                   | 250                                                                                   |
| Mechanical characteristics                                                          | Hight coefficient of friction, very good resistance to cut and tear weldable        | Good wear resistance, high coefficient of friction                                   | High temperature resistance                                                           |
| Chemical properties                                                                 | Very good resistance to oils                                                        | Resistance to some oils and greases                                                  | Good resistance to oils and greases.                                                  |

More types of backing are available. Please consult with our technical department.

# ELATECH® polyurethane belts with profiles

It is possible to attach profiles on all ELATECH® and ELA-flex SD™ polyurethane belts for conveying, handling and positioning applications.

## Characteristics and guidelines



### Pitch

It is recommended to choose the pitch of the profile corresponding to the belt profile or multiple. This allows to minimize the effects of the belt overall length tolerance on profile spacing.

### Position

Profiles position may be over the tooth or not over the tooth. Belt Flexibility is maximised when the profiles are applied over the tooth.

Fig. 1

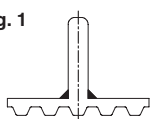
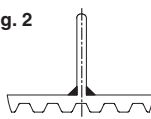
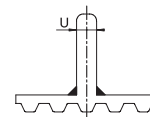
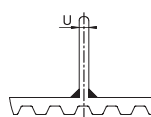


Fig. 2



### Arc of contact

It is to be noted that the belt's arc of contact may be restricted by the jointed profile. It is therefore recommended to select profiles with the minimum allowable thickness "U".



### Tolerances

The tolerance of position of the profiles is +/- 0,5 mm. During the welding process a bead of polyurethane of about 0,5-1 mm develops at the meeting point between the profile and the belt. Should it be necessary for the application, it is possible to remove it with a mechanical machining.

| Belt type | Profile thickness "U" (mm) |    |    |    |    |    |    |    |    |    |    |     |                                              |     |    |    |     |     |     |     |     |     |     |     |
|-----------|----------------------------|----|----|----|----|----|----|----|----|----|----|-----|----------------------------------------------|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
|           | 2                          | 3  | 5  | 6  | 8  | 10 | 12 | 14 | 16 | 20 | 25 | 30  | Recommended minimum pulley number of teeth z |     |    |    |     |     |     |     |     |     |     |     |
| T5        | 14                         | 20 | 14 | 30 | 20 | 45 | 25 | 50 | 40 | 60 | 60 | 100 | 80                                           | 100 |    |    |     |     |     |     |     |     |     |     |
| T10       | 16                         | 20 | 16 | 20 | 16 | 30 | 16 | 40 | 20 | 50 | 25 | 50  | 35                                           | 60  | 50 | 70 | 80  | 80  | 100 | 100 | 120 | 120 |     |     |
| T20       | 20                         | 20 | 18 | 20 | 18 | 25 | 18 | 40 | 18 | 50 | 20 | 50  | 25                                           | 50  | 30 | 60 | 40  | 60  | 50  | 60  | 70  | 80  |     |     |
| AT5       | 12                         | 20 | 12 | 30 | 20 | 45 | 25 | 50 | 40 | 60 | 60 | 100 | 80                                           | 100 |    |    |     |     |     |     |     |     |     |     |
| AT10      | 18                         | 20 | 18 | 20 | 18 | 30 | 18 | 40 | 20 | 50 | 25 | 50  | 35                                           | 60  | 50 | 70 | 80  | 80  | 100 | 100 | 120 | 120 |     |     |
| AT20      | 20                         | 20 | 20 | 20 | 20 | 25 | 20 | 40 | 20 | 50 | 20 | 50  | 25                                           | 50  | 30 | 60 | 40  | 50  | 50  | 60  | 70  | 80  | 100 | 100 |
| XL        | 10                         | 20 | 10 | 30 | 20 | 45 | 25 | 50 | 40 | 60 | 50 | 100 | 60                                           | 100 |    |    |     |     |     |     |     |     |     |     |
| L         | 12                         | 16 | 12 | 20 | 12 | 40 | 20 | 50 | 30 | 60 | 40 | 60  | 50                                           | 70  | 60 | 80 | 100 | 100 |     |     |     |     |     |     |
| H         | 14                         | 16 | 14 | 16 | 14 | 25 | 14 | 30 | 20 | 50 | 25 | 50  | 40                                           | 60  | 50 | 70 | 80  | 80  | 100 | 100 | 120 | 120 |     |     |
| XH        | 18                         | 18 | 18 | 20 | 18 | 20 | 18 | 30 | 18 | 40 | 20 | 50  | 20                                           | 50  | 25 | 55 | 35  | 60  | 50  | 60  | 70  | 80  |     |     |
| HTD5M     | 12                         | 20 | 12 | 30 | 20 | 45 | 25 | 50 | 40 | 60 | 60 | 100 | 80                                           | 100 |    |    |     |     |     |     |     |     |     |     |
| HTD8M     | 18                         | 18 | 18 | 18 | 18 | 24 | 18 | 32 | 18 | 40 | 20 | 40  | 28                                           | 48  | 40 | 56 | 64  | 64  | 80  | 80  | 100 | 100 |     |     |
| HTD14M    | 28                         | 28 | 28 | 28 | 28 | 28 | 28 | 40 | 28 | 50 | 28 | 50  | 28                                           | 50  | 30 | 60 | 40  | 50  | 50  | 60  | 100 | 100 | 110 | 110 |
| STD5M     | 12                         | 20 | 12 | 30 | 20 | 45 | 25 | 50 | 40 | 60 | 60 | 100 | 80                                           | 100 |    |    |     |     |     |     |     |     |     |     |
| STD8M     | 18                         | 18 | 18 | 18 | 18 | 24 | 18 | 32 | 18 | 40 | 20 | 40  | 28                                           | 48  | 40 | 56 | 64  | 64  | 80  | 80  | 100 | 100 |     |     |

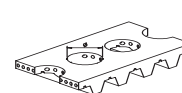
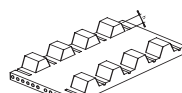
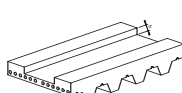
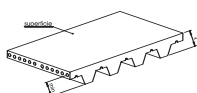
Maximum number of teeth when the profile is welded on tooth gap (fig. 2)  
Maximum number of teeth when the profile is welded on tooth (fig. 1)

## Ordering

When ordering it is necessary to indicate: type of belt (width, profile, pitch, length), the belt length in number of teeth, the belt and profile drawing with the number and the pitch of the requested profiles

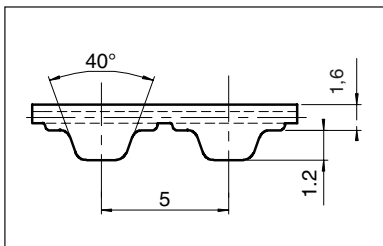
## Special execution

On demand it is possible to produce special belts with special machining both on the teeth and on the back of the belt.



# TT5 Polyurethane timing belts

ELATECH® manufactures special TT5 belts which have been expressly designed for application in circular knitting machines drives.



## Belt characteristics

- Trapezoidal tooth profile according to DIN 7721 T1
- Metric pitch 5 mm
- Standard colour: blue with kevlar cords, white with steel cords, other colours available on request
- Width tolerance:  $\pm 0,5$  [mm]
- Length tolerance:  $\pm 0,5$  [mm]
- Thickness tolerance:  $\pm 0,2$  [mm]

ELATECH® belts TT5 are available in the following executions:

## ELATECH® - V

- A special slicing and welding process offers superior traction load resistance.
- They are available both with steel and aramid cords.
- Special colours available on demand.
- Available in any length tooth by tooth.

## ELA-flex SD™ truly endless

- ELA-flex SD™ TT5 have no splice and welding and therefore offer best traction resistance load.
- They are available both with steel and aramid cords.
- Special colours available on demand.
- Available in all lengths tooth by tooth up to a length of 13500 mm.

# Troubleshooting

| DAMAGE                          | CAUSE                                                                                                                                                                                                                    | REMEDY                                                                                                                                                                                                                                                                 |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Belt tooth jumping              | Over load (shock on the machine)<br>Overload due to machine accident<br>Shortage of teeth in mesh<br>Lack of initial tension<br>Pulley diameter too small<br>Moment of inertia for start and stop is not considered      | Increase belt size/modify design<br>Prevent reoccur of the accident<br>Increase teeth in mesh by using an idler<br>Correct initial tension<br>Change design<br>Change design                                                                                           |
| Abnormal noise level            | Bad pulley alignment<br>Incorrect pulley tooth shape<br>Belt wider than pulley diameter<br>Over load<br>Belt over-tension                                                                                                | Adjust alignment<br>Change pulley<br>Change design<br>Change design<br>Correct initial tension                                                                                                                                                                         |
| Belt side abrasion              | Bad pulley alignment<br>Poor flange shape<br>Pulley flange roughness                                                                                                                                                     | Adjust alignment<br>Correct flange bending or change flange<br>Change flange to an appropriate one                                                                                                                                                                     |
| Belt tooth abrasion             | Presence of particles between belt and pulley<br>Over load<br>Over tension<br>Belt tooth jumping due to lack of initial tension                                                                                          | Improve environment or apply a protective cover<br>Change design (increase belt size)<br>Correct initial tension<br>Correct initial tension                                                                                                                            |
| Belt tooth bottom abrasion      | Bad pulley profile<br>Over tension                                                                                                                                                                                       | Use correct pulley<br>Correct initial tension                                                                                                                                                                                                                          |
| Belt back abrasion              | Contact with undesired element (i.e. machine frame)                                                                                                                                                                      | Eliminate contact                                                                                                                                                                                                                                                      |
| Belt back cracking              | Running under too low temperature<br>Pulleys too small                                                                                                                                                                   | Increase environment temperature or ask for special compound<br>Observe minimum pulley diameter recommendations                                                                                                                                                        |
| Belt breakage                   | Over load (shock on the machine)<br>Undesired particles in mesh<br>Tension member corrosion<br>Belt run off over pulley flange<br>Not enough belt teeth in clamping plate<br>Clamping plate screws tightened incorrectly | Increase belt size/modify design<br>Improve environment or apply a protective cover<br>Improve environment or use aramid/stainless steel cords<br>Adjust alignment and change pulley flange<br>Use larger clamping plate<br>Apply optimum torque to clamp plate screws |
| Tension member partial tear     | Presence of undesired particles in mesh<br>Improper installation<br>Belt folded or twisted<br>Fatigue on side due to bad alignment                                                                                       | Improve environment or apply a protective cover<br>Pay care when installing<br>Pay care in handling<br>Correct alignment                                                                                                                                               |
| Back covering abnormal abrasion | Aggressive environment                                                                                                                                                                                                   | Change belt back cover or improve environment conditions                                                                                                                                                                                                               |
| Pulley tooth abrasion           | Presence of undesired particles in mesh<br>Over load<br>Belt over tension<br>Pulley material not adequate (too soft)                                                                                                     | Improve environment or apply a protective cover<br>Change design<br>Correct initial tension<br>Change pulley material or adopt surface treatment                                                                                                                       |

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