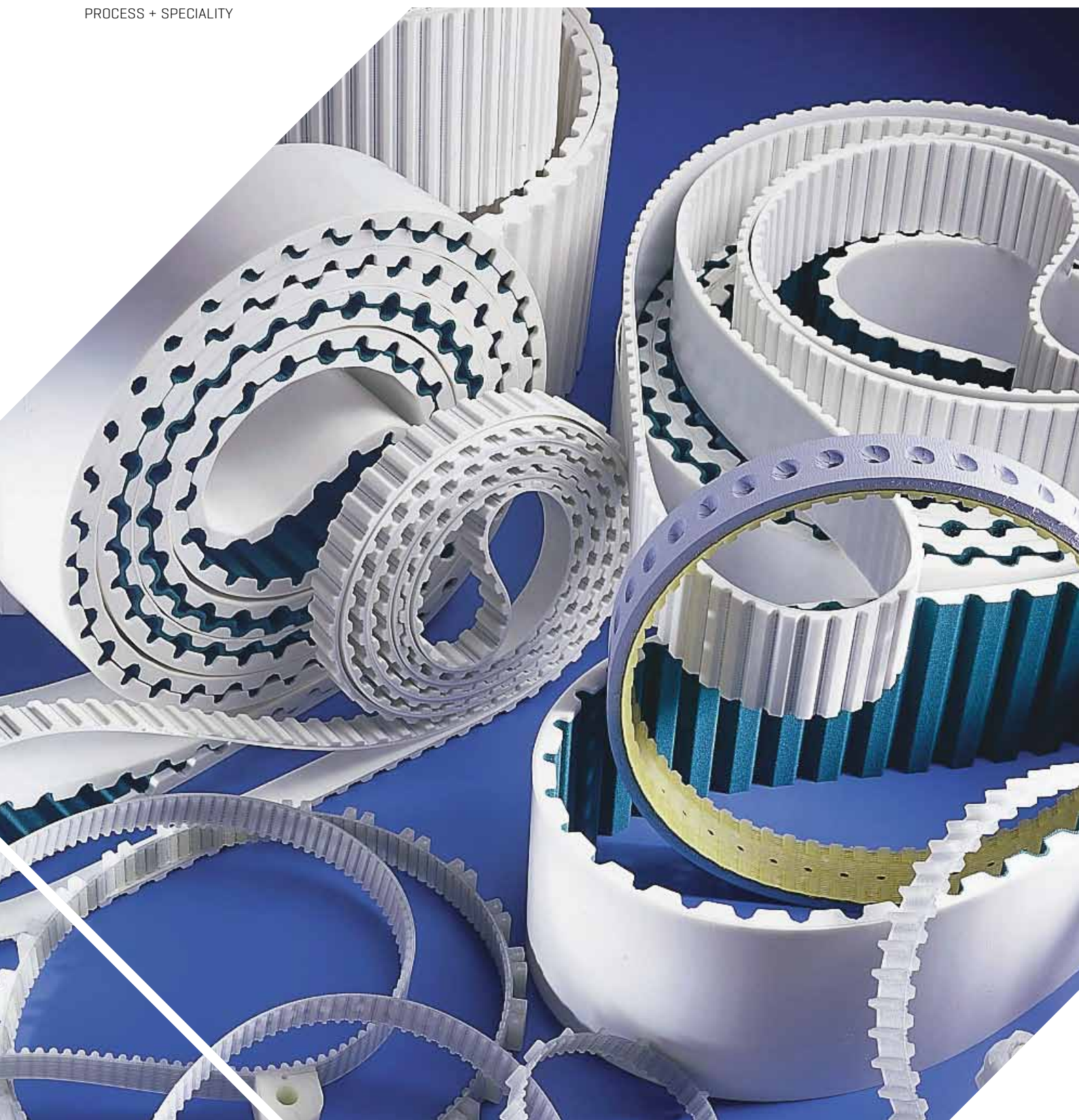


PROCESS + SPECIALITY



## POLYURETHANE BELT PROGRAM

PRODUCT AND TECHNICAL INFORMATION



## Company Profile

Gates is a multinational, leading manufacturer of technological forward-looking power transmission and conveyor belts made out of highly abrasion-resistant polyurethane used in various industries and applications.

Gates Polyurethane Timing Belts provide long-lasting, energy-efficient solutions for power transmission and linear applications. Available are open ended and truly endless belts with different sizes, designs and tooth shapes for various applications.

For processes requiring a specific belt design, contact Gates. Gates offers a variety of customized polyurethane belts to meet the most challenging requirements.

## Our Service

With production and distribution partners worldwide Gates offers global service to solve your challenges. As a total integrated facility, Gates combines in-house extrusion, Molding as well as fabrication capabilities.

## Our Quality

Specialization, research and quality control are the basis of Gates success. Gates keeps investing in quality, research and development in order to meet its customer's current and future demands.

Our continuous development of our products and plants guarantees highest quality according to ISO 9001, ISO 14001 and ISO 18001.

## REACH - Registration, Evaluation, Authorization of Chemical substances

Gates takes its responsibility for human health and the environment very seriously and complies with the requirements laid down in the REACH regulation. All substances in our belts requiring registration will be duly registered in the central database run by the European Chemicals Agency (ECHA).

## CONTENT

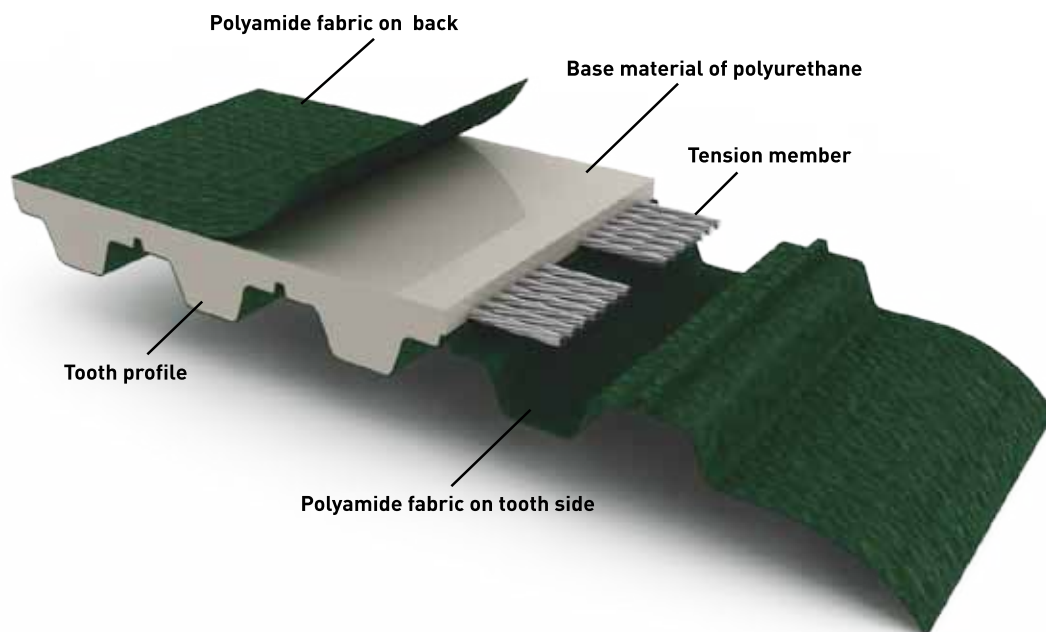
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## POLYURETHANE BELT PROGRAM



## POLYURETHANE BELTS

*Our product quality is highlighted in the details. — Narrow tolerances and perfect tooth engagement are guaranteed.*





Gates Polyurethane Timing Belts are made out of high quality, abrasion-resistant polyurethane in combination with high strength steel or aramid cords. Nearly every extruded belt type can be additionally customized by adding coatings and profiles or special machining.

#### ATTRIBUTES

- › Low-maintenance polyurethane construction
  - › High tensile strength
  - › Abrasion and UV resistant
  - › Low pre-tension
  - › Excellent durability vs. moisture
  - › Temperature resistant from - 5° C up to + 70° C
- Extended service temperature range is available on request

#### CHEMICAL ATTRIBUTES

- › Non-aging
- › High chemical resistance
- › High durability vs. detergent
- › Excellent durability vs. oil and fat
- › Conditionally permanent vs. acids and bases

#### TECHNICAL DATA-COEFFICIENT OF FRICTION

|                |     |          |     |      |            |
|----------------|-----|----------|-----|------|------------|
| › Polyurethane | vs. | Steel    | dry | 0.5  | up to 0.7  |
| › Polyurethane | vs. | Aluminum | dry | 0.5  | up to 0.6  |
| › Polyurethane | vs. | UHMWPE   | dry | 0.2  | up to 0.4  |
| › Polyamide    | vs. | Steel    | dry | 0.2  | up to 0.4  |
| › Polyamide    | vs. | UHMWPE   | dry | 0.1  | up to 0.3  |
| › ECO fabric   | vs. | Steel    | dry | 0.1  | up to 0.3  |
| › ECO fabric   | vs. | PE-UHMW  | dry | 0.05 | up to 0.15 |



## TOOTH PROFILES

### IMPERIAL TOOTH PROFILE



- PITCH: XL / L / H / XH
- Attributes: > Low tooth profiles with large surface area
- Applications: > Sliding conveyor applications

### T TOOTH PROFILE



- PITCH: T2.5 / T5 / T10 / T20
- Attributes: > Developed to enable higher load carrying  
> Capacity combined with low backlash
- Applications: > Sliding conveyor applications

### AT TOOTH PROFILE



- PITCH: AT5 / AT10 / AT20
- Attributes: > Developed to enable higher load carrying  
> Capacity combined with low backlash
- Applications: > Linear positioning  
> Power transmission

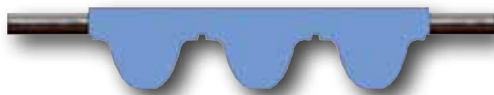
### HTD® TOOTH PROFILE



- PITCH: HTD®5 / HTD®8 / HTD®14
- Attributes: > Higher tooth meshing  
> Equal tension distribution and load transmission  
> Reduced wear and noise characteristics
- Applications: > Linear / rotary positioning  
> Power transmission

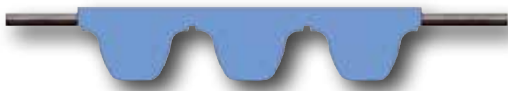


## HPL® TOOTH PROFILE



- PITCH: HPL®14
- Attributes:
- › High-performance synchronous belt
  - › PolyChain® 14M tooth shape
  - › Higher carrying capacity due to PCGT14 pulley
- Applications:
- › Linear positioning
  - › Lifting

## STD TOOTH PROFILE



- PITCH: STD5 / STD8
- Attributes:
- › Reduced wear and noise characteristics
- Applications:
- › Linear positioning
  - › Power transmission

## FLAT BELTS



- PITCH: BFL20 / BFL32 / BFL38 / BFL48
- Attributes:
- › Easy belt guiding
  - › Small pulley diameters
- Applications:
- › Lifting

## WIDE BELTS



- PITCH: WT10 / WH / GMT3™
- Attributes:
- › Widths up to 900mm (36 Inch) available
  - › Alternative to plastic modular chains and flat belting
- Applications:
- › Synchronous conveying
  - › Food industry applications

## LINEAR BELTS

## TIMING BELTS

### TIMING BELTS

### SELF TRACKING

### FLAT BELTS

### WIDE BELTS

### ENDLESS BELTS

### FINISHING

### INFORMATION

Gates Linear Timing belts are manufactured in different sizes, constructions and tooth shapes. The wide range of various constructions offers the exact solution for quite every application. Linear belts are available in different types, such as roll stock, open ended (long length), pre-punched or endless, thermal welded belts.

Gates linear belts are designed to ensure high class performance for both, power transmission and linear applications. And they are suitable for a broad range of demands, speeds and applications.

#### ATTRIBUTES

- › Thermoplastic polyurethane construction
- › High tensile strength and stiffness
- › Parallel cord construction for uniform tensioning
- › Smooth, low-noise operation
- › Temperature range from - 5° C up to + 70° C
- › Extended service temperature range is available on request
- › FDA Approval for:  
XL / L / H / T5 / T10 / AT10 / WT10 / WH / BFL20-Aramid / BFL20-RKV / BFL32-Aramid / BFL32-RKV
- › EU Food Approval for:  
T5 / AT5 / T10 / AT10 / GMT3™ / WT10 / WH / WR10

#### APPLICATIONS

- › Conveying- and handling equipment
- › Linear applications
- › Synchronous conveying applications
- › Automatic assembly machines
- › Door drives
- › Textile industry

#### PROCESSING OPTIONS

- › Backings *Further information on page 124*
- › Profile *Further information on page 138*
- › Special processing *Further information on page 146*



|                     | TENSION MEMBER             |                          |                        |                                      |                     |                        |             |                         | POLYURETHANE  |               |                            |                               |                               |              | FABRIC BACKINGS |                                   |                             |                                    |                                  |           |      |
|---------------------|----------------------------|--------------------------|------------------------|--------------------------------------|---------------------|------------------------|-------------|-------------------------|---------------|---------------|----------------------------|-------------------------------|-------------------------------|--------------|-----------------|-----------------------------------|-----------------------------|------------------------------------|----------------------------------|-----------|------|
| LINEAR TIMING BELTS | Steel-Standard             | Steel-High Flexible (HF) | Steel-Reinforced (RSL) | Steel-Reinforced High Flexible (RHF) | Steel-Basic (BASIC) | Stainless Steel-(NIRO) | Aramid-(KV) | Aramid-Reinforced (RKV) | R1-92 Shore A | R2-85 Shore A | R4-94 Shore A / Antistatic | EU85-85 Shore A / EU-Approval | EU92-92 Shore A / EU-Approval | FDA-Approval | ECO Fabric      | NT-Polyamide Fabric on Tooth Side | NB-Polyamide Fabric on Back | NTB-Polyamide Fabric on both Sides | ATB-Antistatic Fabric both Sides | High Back | Page |
|                     | METRIC TIMING BELTS        |                          |                        |                                      |                     |                        |             |                         |               |               |                            |                               |                               |              |                 |                                   |                             |                                    |                                  |           |      |
| T5                  | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            | ●               | ●                                 | ●                           | ●                                  | ●                                | ●         | 10   |
| T10                 | ●                          | ●                        |                        |                                      |                     |                        | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            | ●               | ●                                 | ●                           | ●                                  | ●                                | ●         | 12   |
| T20                 | ●                          | ●                        |                        |                                      |                     | ●                      | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            | ●               | ●                                 | ●                           | ●                                  | ●                                | ●         | 14   |
| AT5                 | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            | ●               | ●                                 | ●                           | ●                                  | ●                                | ●         | 16   |
| ATL5                |                            |                          | ●                      |                                      |                     |                        |             |                         | ●             | ●             |                            |                               |                               |              |                 | ●                                 | ●                           | ●                                  | ●                                | ●         | 18   |
| AT10                | ●                          | ●                        |                        |                                      |                     | ●                      | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            | ●               | ●                                 | ●                           | ●                                  | ●                                | ●         | 20   |
| ATL10               |                            |                          | ●                      | ●                                    |                     |                        |             | ●                       | ●             | ●             | ●                          | ●                             | ●                             | ●            | ●               | ●                                 | ●                           | ●                                  | ●                                | ●         | 22   |
| AT20                | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            | ●               | ●                                 | ●                           | ●                                  | ●                                | ●         | 24   |
| ATL20               |                            |                          | ●                      |                                      |                     |                        |             |                         | ●             | ●             | ●                          |                               |                               |              | ●               | ●                                 | ●                           | ●                                  | ●                                | ●         | 26   |
| HTD®5               | ●                          |                          |                        |                                      | ●                   |                        | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            |                 | ●                                 | ●                           | ●                                  | ●                                | ●         | 28   |
| HTD®8               | ●                          | ●                        |                        |                                      |                     | ●                      | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            |                 | ●                                 | ●                           | ●                                  | ●                                | ●         | 30   |
| HTD®L8              |                            |                          | ●                      | ●                                    |                     |                        |             | ●                       | ●             | ●             | ●                          | ●                             | ●                             | ●            |                 | ●                                 | ●                           | ●                                  | ●                                | ●         | 32   |
| HTD®14              | ●                          | ●                        |                        |                                      |                     |                        |             | ●                       | ●             | ●             | ●                          | ●                             | ●                             | ●            |                 | ●                                 | ●                           | ●                                  | ●                                | ●         | 34   |
| HTD®L14             |                            |                          | ●                      |                                      |                     |                        |             |                         | ●             | ●             | ●                          |                               |                               |              |                 | ●                                 | ●                           | ●                                  | ●                                | ●         | 36   |
| STD5                | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             |                            | ●                             | ●                             | ●            |                 | ●                                 | ●                           | ●                                  | ●                                | ●         | 38   |
| STD8                | ●                          | ●                        |                        |                                      |                     | ●                      | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            |                 | ●                                 | ●                           | ●                                  | ●                                | ●         | 40   |
| HPL®14-RSL          |                            |                          | ●                      |                                      |                     |                        |             |                         | ●             | ●             | ●                          |                               |                               |              |                 | ●                                 | ●                           | ●                                  | ●                                | ●         | 42   |
| T5-ATB              | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             | ●                          |                               |                               |              |                 |                                   |                             |                                    | ●                                |           | 44   |
| WR10                | ●                          | ●                        |                        |                                      |                     |                        | ●           |                         | ●             | ●             | ●                          | ●                             |                               |              |                 |                                   | ●                           |                                    |                                  |           | 46   |
|                     | IMPERIAL TIMING BELTS      |                          |                        |                                      |                     |                        |             |                         |               |               |                            |                               |                               |              |                 |                                   |                             |                                    |                                  |           |      |
| XL                  | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            | ●               | ●                                 | ●                           | ●                                  | ●                                | ●         | 48   |
| L                   | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             |                            |                               |                               | ●            |                 | ●                                 | ●                           | ●                                  | ●                                |           | 50   |
| H                   | ●                          | ●                        |                        |                                      |                     |                        | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            | ●               | ●                                 | ●                           | ●                                  | ●                                | ●         | 52   |
| XH                  | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             |                            |                               |                               | ●            |                 | ●                                 | ●                           | ●                                  | ●                                |           | 54   |
|                     | SELF TRACKING TIMING BELTS |                          |                        |                                      |                     |                        |             |                         |               |               |                            |                               |                               |              |                 |                                   |                             |                                    |                                  |           |      |
| T5V                 | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            |                 | ●                                 | ●                           | ●                                  | ●                                | ●         | 60   |
| AT5V                | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             |                            |                               |                               |              |                 |                                   | ●                           |                                    |                                  |           | 62   |
| ATL5V               | ●                          |                          |                        |                                      |                     |                        |             |                         | ●             | ●             |                            |                               |                               |              |                 |                                   | ●                           |                                    |                                  |           | 64   |
| T10VS               | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             |                            |                               |                               | ●            |                 |                                   | ●                           |                                    |                                  |           | 66   |
| T10V                | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             |                            |                               |                               | ●            |                 |                                   | ●                           |                                    |                                  |           | 68   |
| AT10V               | ●                          | ●                        |                        |                                      |                     | ●                      | ●           |                         | ●             | ●             | ●                          | ●                             | ●                             | ●            |                 | ●                                 | ●                           | ●                                  | ●                                |           | 70   |
| HV                  | ●                          |                          |                        |                                      |                     |                        | ●           |                         | ●             | ●             |                            |                               |                               | ●            |                 |                                   | ●                           |                                    |                                  |           | 72   |

● STANDARD  
● ON REQUEST

Specifications can change without prior notice.  
Please contact our Applications Engineering for specific „minus“ and length tolerances.  
For further configurations please contact our Application Consulting.  
Please find used abbreviations on page 162.

## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

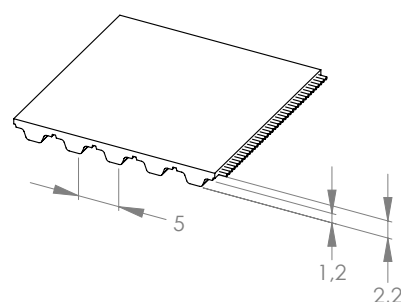
FINISHING

INFORMATION



|                                                       |                               |
|-------------------------------------------------------|-------------------------------|
| Pitch                                                 | 5 mm                          |
| Standard Color                                        | White                         |
| Standard Roll Length ( $\pm 1\%$ )                    | 100 m                         |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width | $\pm 0.5$ mm<br>$\pm 0.75$ mm |
| Sitting Lanes<br>Standard<br>Optional                 | 25 mm<br>10 mm / 16 mm        |
| Minimum Welded Belt Length                            | 480 mm                        |
| Minimum Number<br>of Pulley Teeth $z_{\min}$          | 10                            |
| Minimum Pulley Diameter                               | 15.91 mm                      |
| Minimum<br>Back Bend Diameter                         | 30 mm                         |
| FDA/EU Approval                                       | Yes (Aramid Cord)             |

# T5



| Standard Width (mm)                                | 10     | 16      | 25      | 32      | 50      | 75      | 100     |
|----------------------------------------------------|--------|---------|---------|---------|---------|---------|---------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |        |         |         |         |         |         |         |
| Steel                                              | 1 250  | 2 000   | 3 375   | 4 250   | 6 875   | 10 375  | 13 875  |
| Aramid                                             | 3 162  | 5 245   | 8 370   | 10 800  | 17 050  | 25 730  | 34 410  |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |        |         |         |         |         |         |         |
| Steel                                              | 311    | 498     | 840     | 1 058   | 1 711   | 2 582   | 3 453   |
| Aramid                                             | 346    | 574     | 916     | 1 181   | 1 865   | 2 814   | 3 764   |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |        |         |         |         |         |         |         |
| Steel                                              | 156    | 249     | 420     | 529     | 856     | 1 291   | 1 727   |
| Aramid                                             | 259    | 430     | 687     | 886     | 1 399   | 2 111   | 2 823   |
| Allowable Effective Force $F_{eall}$ (N)           |        |         |         |         |         |         |         |
| (Minimum 15 teeth are in mesh)                     | 356    | 570     | 890     | 1 139   | 1 780   | 2 670   | 3 560   |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |        |         |         |         |         |         |         |
| Steel                                              | 0.0022 |         |         |         |         |         |         |
| Aramid                                             | 0.0020 |         |         |         |         |         |         |
| Specific Belt Stiffness $c_{sp}$ (N)               |        |         |         |         |         |         |         |
| Steel                                              | 77 778 | 124 444 | 210 000 | 264 444 | 427 778 | 645 556 | 863 333 |
| Aramid                                             | 86 464 | 143 428 | 228 875 | 295 334 | 466 227 | 703 579 | 940 931 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

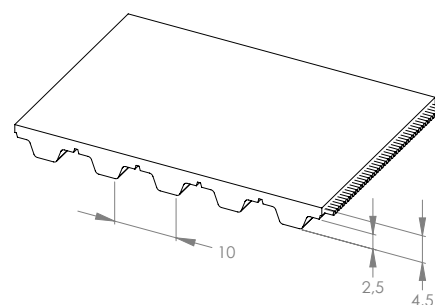
FINISHING

INFORMATION



|                                           |                                          |
|-------------------------------------------|------------------------------------------|
| Pitch                                     | 10 mm                                    |
| Standard Color                            | White                                    |
| Standard Roll Length ( $\pm 1\%$ )        | 100 m                                    |
| Width Tolerance                           |                                          |
| up to 50 mm Width                         | $\pm 0.5$ mm                             |
| > 50 mm Width                             | $\pm 0.75$ mm                            |
| Sitting Lanes                             |                                          |
| Standard                                  | 25 mm                                    |
| Optional                                  | 10 mm / 16 mm                            |
| Minimum Welded Belt Length                |                                          |
| up to 100 mm Width                        | 480 mm                                   |
| > 100 mm Width                            | 960 mm                                   |
| Minimum Number of Pulley Teeth $z_{\min}$ | 14 (Steel/Aramid)<br>12 (HF)             |
| Minimum Pulley Diameter                   | 44,56 mm (Steel/Aramid)<br>38,20 mm (HF) |
| Minimum Back Bend Diameter                | 80 mm (Steel/Aramid)<br>60 mm (HF)       |
| FDA/EU Approval                           | Yes (Aramid Cord)                        |

# T10



| Standard Width (mm)                                | 12      | 16      | 25      | 32      | 40      | 50        | 75        | 100       | 150       |
|----------------------------------------------------|---------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |         |         |         |           |           |           |           |
| Steel                                              | 2 940   | 4 200   | 7 140   | 9 240   | 11 340  | 14 700    | 22 260    | 29 820    | 44 940    |
| Aramid                                             | 3 601   | 4 980   | 8 085   | 10 500  | 13 259  | 16 709    | 25 333    | 33 957    | 51 205    |
| HF                                                 | 4 340   | 6 200   | 10 540  | 13 640  | 16 740  | 21 700    | 32 860    | 44 020    | 66 340    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |         |         |         |         |           |           |           |           |
| Steel                                              | 786     | 1 123   | 1 909   | 2 470   | 3 031   | 3 929     | 5 950     | 7 971     | 12 012    |
| Aramid                                             | 474     | 655     | 1 064   | 1 381   | 1 744   | 2 198     | 3 332     | 4 467     | 6 736     |
| HF                                                 | 964     | 1 376   | 2 340   | 3 028   | 3 716   | 4 818     | 7 295     | 9 773     | 14 728    |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |         |         |         |           |           |           |           |
| Steel                                              | 393     | 561     | 954     | 1 235   | 1 516   | 1 965     | 2 975     | 3 985     | 6 006     |
| Aramid                                             | 355     | 491     | 798     | 1 036   | 1 308   | 1 648     | 2 499     | 3 350     | 5 052     |
| HF                                                 | 482     | 688     | 1 170   | 1 514   | 1 858   | 2 409     | 3 648     | 4 886     | 7 364     |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |         |         |         |           |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 811     | 1 082   | 1 690   | 2 163   | 2 704   | 3 380     | 5 070     | 6 760     | 10 140    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |         |         |         |         |           |           |           |           |
| Steel                                              | 0.0044  |         |         |         |         |           |           |           |           |
| Aramid                                             | 0.0036  |         |         |         |         |           |           |           |           |
| HF                                                 | 0.0047  |         |         |         |         |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |         |         |         |           |           |           |           |
| Steel                                              | 196 463 | 280 662 | 477 125 | 617 456 | 757 787 | 982 316   | 1 487 507 | 1 992 699 | 3 003 081 |
| Aramid                                             | 118 403 | 163 779 | 265 875 | 345 283 | 436 035 | 549 475   | 833 075   | 1 116 675 | 1 683 875 |
| HF                                                 | 240 882 | 344 118 | 585 000 | 757 059 | 929 118 | 1 204 412 | 1 823 824 | 2 443 235 | 3 682 059 |

## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

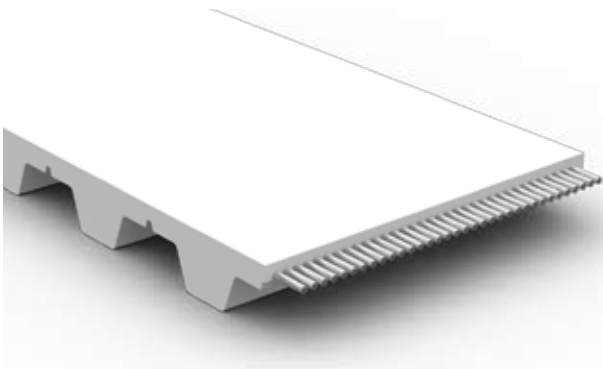
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

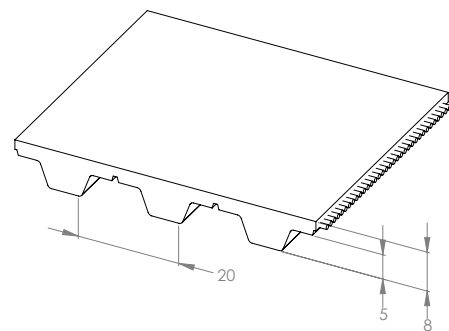
FINISHING

INFORMATION



|                                          |                                                           |
|------------------------------------------|-----------------------------------------------------------|
| Pitch                                    | 20 mm                                                     |
| Standard Color                           | White                                                     |
| Standard Roll Length ( $\pm 1\%$ )       | 50 m                                                      |
| Width Tolerance                          | $\pm 1.0$ mm                                              |
| Sitting Lanes                            |                                                           |
| Standard                                 | 25 mm                                                     |
| Optional                                 | 16 mm                                                     |
| Minimum Welded Belt Length               | 1 000 mm                                                  |
| Minimum Number of Pulley Teeth $z_{min}$ | 15 (Steel/Aramid)<br>20 (Niro)<br>12 (HF)                 |
| Minimum Pulley Diameter                  | 95,5 mm (Steel/Aramid)<br>127,4 mm (Niro)<br>76,4 mm (HF) |
| Minimum Back Bend Diameter               | 120 mm (Steel/Aramid)<br>160 mm (Niro)<br>100 mm (HF)     |
| FDA/EU Approval                          | No                                                        |

# T20



| Standard Width (mm)                                | 25      | 32        | 50        | 75        | 100       | 150       |
|----------------------------------------------------|---------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |           |           |           |           |           |
| Steel                                              | 14 250  | 18 050    | 29 450    | 44 650    | 59 850    | 90 250    |
| Aramid                                             | 16 185  | 21 019    | 33 449    | 50 713    | 67 977    | 102 505   |
| Niro                                               | 10 688  | 13 538    | 22 088    | 33 488    | 44 888    | 67 688    |
| HF                                                 | 12 975  | 16 435    | 26 815    | 40 655    | 54 495    | 82 175    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |           |           |           |           |           |
| Steel                                              | 3 741   | 4 739     | 7 731     | 11 722    | 15 712    | 23 693    |
| Aramid                                             | 1 750   | 2 273     | 3 617     | 5 483     | 7 350     | 11 083    |
| Niro                                               | 2 806   | 3 554     | 5 799     | 8 791     | 11 784    | 17 770    |
| HF                                                 | 3 456   | 4 378     | 7 142     | 10 829    | 14 515    | 21 888    |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |           |           |           |           |           |
| Steel                                              | 1 871   | 2 369     | 3 866     | 5 861     | 7 856     | 11 847    |
| Aramid                                             | 1 313   | 1 705     | 2 713     | 4 113     | 5 513     | 8 313     |
| Niro                                               | 1 403   | 1 777     | 2 899     | 4 396     | 5 892     | 8 885     |
| HF                                                 | 1 728   | 2 189     | 3 571     | 5 414     | 7 258     | 10 944    |
| Allowable Effective Force $F_{eall}$ (N)           |         |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 3 160   | 4 045     | 6 320     | 9 480     | 12 640    | 18 960    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |           |           |           |           |           |
| Steel                                              |         |           | 0.0075    |           |           |           |
| Aramid                                             |         |           | 0.0059    |           |           |           |
| Niro                                               |         |           | 0.0074    |           |           |           |
| HF                                                 |         |           | 0.0072    |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |           |           |           |           |           |
| Steel                                              | 935 250 | 1 184 650 | 1 932 850 | 2 930 450 | 3 928 050 | 5 923 250 |
| Aramid                                             | 437 500 | 568 167   | 904 167   | 1 370 833 | 1 837 500 | 2 770 833 |
| Niro                                               | 701 438 | 888 488   | 1 449 638 | 2 197 838 | 2 946 038 | 4 442 438 |
| HF                                                 | 864 000 | 1 094 400 | 1 785 600 | 2 707 200 | 3 628 800 | 5 472 000 |



## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

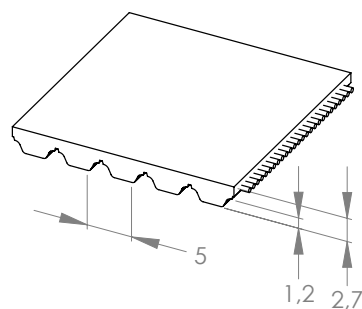
FINISHING

INFORMATION



|                                                       |                               |
|-------------------------------------------------------|-------------------------------|
| Pitch                                                 | 5 mm                          |
| Standard Color                                        | White                         |
| Standard Roll Length ( $\pm 1\%$ )                    | 100 m                         |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width | $\pm 0.5$ mm<br>$\pm 0.75$ mm |
| Sitting Lanes<br>Standard<br>Optional                 | 25 mm<br>10 mm / 16 mm        |
| Minimum Welded Belt Length                            | 480 mm                        |
| Minimum Number<br>of Pulley Teeth $z_{\min}$          | 15                            |
| Minimum Pulley Diameter                               | 23.87 mm                      |
| Minimum<br>Back Bend Diameter                         | 60 mm                         |
| FDA/EU Approval                                       | Yes (Aramid Cord)             |

# AT5



| Standard Width (mm)                                | 10      | 16      | 25      | 32      | 50      | 75        | 100       |
|----------------------------------------------------|---------|---------|---------|---------|---------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |         |         |         |           |           |
| Steel                                              | 2 565   | 4 275   | 7 125   | 9 120   | 14 535  | 21 945    | 29 355    |
| Aramid                                             | 3 140   | 5 224   | 8 350   | 10 782  | 17 034  | 25 718    | 34 402    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |         |         |         |         |           |           |
| Steel                                              | 634     | 1 056   | 1 761   | 2 253   | 3 591   | 5 422     | 7 253     |
| Aramid                                             | 455     | 757     | 1 210   | 1 562   | 2 468   | 3 727     | 4 985     |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |         |         |         |           |           |
| Steel                                              | 317     | 528     | 880     | 1 127   | 1 796   | 2 711     | 3 627     |
| Aramid                                             | 341     | 568     | 908     | 1 172   | 1 851   | 2 795     | 3 739     |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |         |         |         |           |           |
| (Minimum 15 teeth are in mesh)                     | 516     | 826     | 1 290   | 1 651   | 2 580   | 3 870     | 5 160     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |         |         |         |         |           |           |
| Steel                                              | 0.0033  |         |         |         |         |           |           |
| Aramid                                             | 0.0027  |         |         |         |         |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |         |         |         |           |           |
| Steel                                              | 158 445 | 264 075 | 440 125 | 563 360 | 897 855 | 1 355 585 | 1 813 315 |
| Aramid                                             | 113 740 | 189 244 | 302 500 | 390 588 | 617 100 | 931 700   | 1 246 300 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## LINEAR BELTS

## METRIC TIMING BELTS

### TIMING BELTS

### SELF TRACKING

### FLAT BELTS

### WIDE BELTS

### ENDLESS BELTS

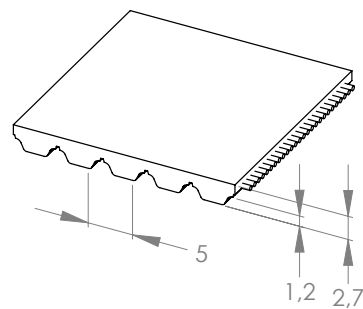
### FINISHING

### INFORMATION



|                                           |               |
|-------------------------------------------|---------------|
| Pitch                                     | 5 mm          |
| Standard Color                            | White         |
| Standard Roll Length ( $\pm 1\%$ )        | 100 m         |
| Width Tolerance                           |               |
| up to 50 mm Width                         | $\pm 0.5$ mm  |
| > 50 mm Width                             | $\pm 0.75$ mm |
| Sitting Lanes                             |               |
| Standard                                  | 25 mm         |
| Optional                                  | 10 mm / 16 mm |
| Minimum Welded Belt Length                | No Welding    |
| Minimum Number of Pulley Teeth $z_{\min}$ | 15            |
| Minimum Pulley Diameter                   | 23.87 mm      |
| Minimum Back Bend Diameter                | 60 mm         |
| FDA/EU Approval                           | No            |

# ATL5



| Standard Width (mm)                              | 10      | 16      | 25      | 32      | 50        | 75        | 100       | 150       |
|--------------------------------------------------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |         |         |         |         |           |           |           |           |
| Steel                                            | 3 720   | 6 200   | 10 540  | 13 640  | 21 700    | 32 860    | 44 020    | 66 340    |
| Allowable Belt Force $F_{Iall}$ (N) Open Ended   |         |         |         |         |           |           |           |           |
| Steel                                            | 826     | 1 376   | 2 340   | 3 028   | 4 818     | 7 295     | 9 773     | 14 728    |
| Allowable Effective Force $F_{eall}$ (N)         |         |         |         |         |           |           |           |           |
| (Minimum 15 teeth are in mesh)                   | 516     | 826     | 1 290   | 1 651   | 2 580     | 3 870     | 5 160     | 7 740     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |         |         |         |         |           |           |           |           |
| Steel                                            | 0.0028  |         |         |         |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |         |         |         |           |           |           |           |
| Steel                                            | 206 471 | 344 118 | 585 000 | 757 059 | 1 204 412 | 1 823 824 | 2 443 235 | 3 682 059 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## LINEAR BELTS

## METRIC TIMING BELTS

### TIMING BELTS

### SELF TRACKING

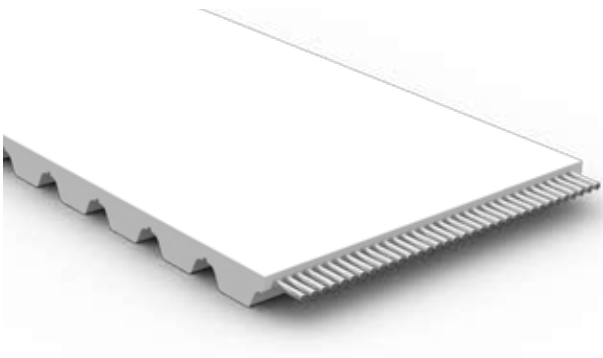
### FLAT BELTS

### WIDE BELTS

### ENDLESS BELTS

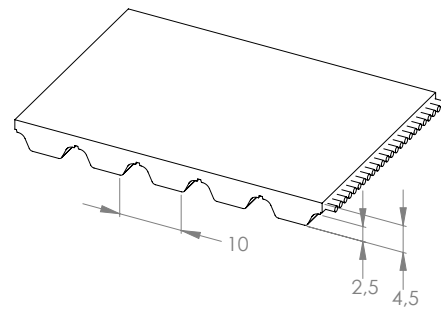
### FINISHING

### INFORMATION



|                                          |                                                         |
|------------------------------------------|---------------------------------------------------------|
| Pitch                                    | 10 mm                                                   |
| Standard Color                           | White                                                   |
| Standard Roll Length ( $\pm 1\%$ )       | 100 m                                                   |
| Width Tolerance                          |                                                         |
| up to 50 mm Width                        | $\pm 0.75$ mm                                           |
| > 50 mm Width                            | $\pm 1.0$ mm                                            |
| Sitting Lanes                            |                                                         |
| Standard                                 | 25 mm                                                   |
| Optional                                 | 16 mm                                                   |
| Minimum Welded Belt Length               |                                                         |
| up to 100 mm Width                       | 480 mm                                                  |
| > 100 mm Width                           | 960 mm                                                  |
| Minimum Number of Pulley Teeth $z_{min}$ | 15 (Steel/Aramid)<br>20 (Niro)<br>12 (HF)               |
| Minimum Pulley Diameter                  | 47.75 mm (Steel/Aramid)<br>63.7 mm (Niro)<br>39 mm (HF) |
| Minimum Back Bend Diameter               | 120 mm (Steel/Aramid)<br>160 mm (Niro)<br>100 mm (HF)   |
| FDA/EU Approval                          | Yes (Aramid Cord)                                       |

# AT10



| Standard Width (mm)                                | 16      | 25      | 32        | 50        | 75        | 100       | 150       |
|----------------------------------------------------|---------|---------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |           |           |           |           |           |
| Steel                                              | 8 550   | 14 250  | 18 050    | 29 450    | 44 650    | 59 850    | 90 250    |
| Aramid                                             | 9 970   | 16 185  | 21 019    | 33 449    | 50 713    | 67 977    | 102 505   |
| Niro                                               | 6 413   | 10 688  | 13 538    | 22 088    | 33 488    | 44 888    | 67 668    |
| HF                                                 | 7 785   | 12 975  | 16 435    | 26 815    | 40 655    | 54 495    | 82 175    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |         |           |           |           |           |           |
| Steel                                              | 2 245   | 3 741   | 4 739     | 7 731     | 11 722    | 15 712    | 23 693    |
| Aramid                                             | 1 078   | 1 750   | 2 273     | 3 617     | 5 483     | 7 350     | 11 083    |
| Niro                                               | 1 683   | 2 806   | 3 554     | 5 799     | 8 791     | 11 784    | 17 770    |
| HF                                                 | 2 074   | 3 456   | 4 378     | 7 142     | 10 829    | 14 515    | 21 888    |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |           |           |           |           |           |
| Steel                                              | 1 122   | 1 871   | 2 369     | 3 866     | 5 861     | 7 856     | 11 847    |
| Aramid                                             | 809     | 1 313   | 1 705     | 2 713     | 4 113     | 5 513     | 8 313     |
| Niro                                               | 842     | 1 403   | 1 777     | 2 899     | 4 396     | 5 892     | 8 885     |
| HF                                                 | 1 037   | 1 728   | 2 189     | 3 571     | 5 414     | 7 258     | 10 944    |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 1 651   | 2 580   | 3 302     | 5 160     | 7 740     | 10 320    | 15 480    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |         |           |           |           |           |           |
| Steel                                              |         |         |           | 0.0057    |           |           |           |
| Aramid                                             |         |         |           | 0.0042    |           |           |           |
| Niro                                               |         |         |           | 0.0057    |           |           |           |
| HF                                                 |         |         |           | 0.0055    |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |           |           |           |           |           |
| Steel                                              | 561 150 | 935 250 | 1 184 650 | 1 932 850 | 2 930 450 | 3 928 050 | 5 923 250 |
| Aramid                                             | 269 500 | 437 500 | 568 167   | 904 167   | 1 370 833 | 1 837 500 | 2 770 833 |
| Niro                                               | 420 863 | 701 438 | 888 488   | 1 449 638 | 2 197 838 | 2 946 038 | 4 442 438 |
| HF                                                 | 518 400 | 864 000 | 1 094 400 | 1 785 600 | 2 707 200 | 3 628 800 | 5 472 000 |

## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

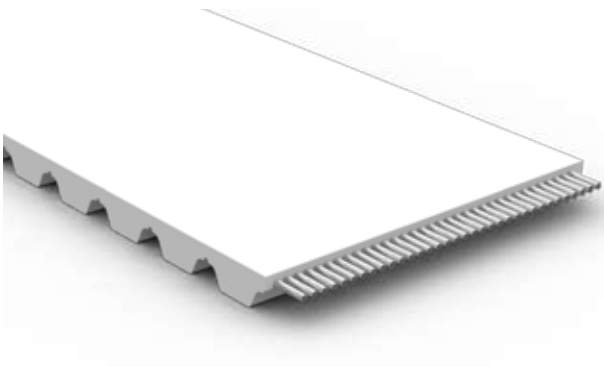
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

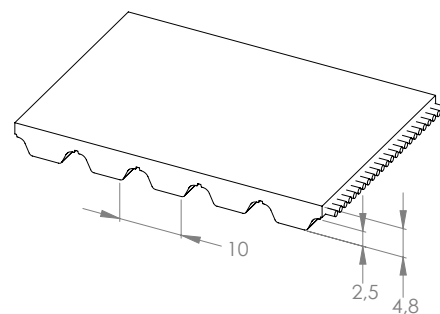
FINISHING

INFORMATION



|                                           |                                          |
|-------------------------------------------|------------------------------------------|
| Pitch                                     | 10 mm                                    |
| Standard Color                            | White                                    |
| Standard Roll Length ( $\pm 1\%$ )        | 100 m                                    |
| Width Tolerance                           |                                          |
| up to 50 mm Width                         | $\pm 1.0$ mm                             |
| > 50 mm Width                             | $\pm 1.5$ mm                             |
| Sitting Lanes                             |                                          |
| Standard                                  | Without Sitting Lanes                    |
| Optional                                  | 25 mm / 32 mm / 50 mm                    |
| Minimum Welded Belt Length                | No Welding                               |
| Minimum Number of Pulley Teeth $z_{\min}$ | 25 (Steel/Aramid)<br>20 (HF)             |
| Minimum Pulley Diameter                   | 79.60 mm (Steel/Aramid)<br>63.66 mm (HF) |
| Minimum Back Bend Diameter                | 150 mm (Steel/Aramid)<br>130 mm (HF)     |
| FDA/EU Approval                           | No                                       |

# ATL10



| Standard Width (mm)                              | 16      | 25        | 32        | 50        | 75        | 100       | 150       |
|--------------------------------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |         |           |           |           |           |           |           |
| Steel                                            | 13 840  | 24 220    | 31 140    | 50 170    | 76 120    | 102 070   | 153 970   |
| Aramid                                           | 13 390  | 21 798    | 28 337    | 45 153    | 68 508    | 91 863    | 138 573   |
| HF                                               | 15 400  | 26 950    | 34 650    | 55 825    | 84 700    | 113 575   | 171 325   |
| Allowable Belt Force $F_{1all}$ (N) Open Ended   |         |           |           |           |           |           |           |
| Steel                                            | 3 349   | 5 860     | 7 534     | 12 139    | 18 417    | 24 696    | 37 253    |
| Aramid                                           | 1 075   | 1 750     | 2 275     | 3 625     | 5 500     | 7 375     | 11 125    |
| HF                                               | 2 902   | 5 079     | 6 530     | 10 521    | 15 963    | 21 404    | 32 288    |
| Allowable Effective Force $F_{eall}$ (N)         |         |           |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                   | 1 651   | 2 580     | 3 302     | 5 160     | 7 740     | 10 320    | 15 480    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |         |           |           |           |           |           |           |
| Steel                                            | 0.0067  |           |           |           |           |           |           |
| Aramid                                           | 0.0041  |           |           |           |           |           |           |
| HF                                               | 0.0072  |           |           |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |           |           |           |           |           |           |
| Steel                                            | 837 143 | 1 465 000 | 1 883 571 | 3 034 643 | 4 604 286 | 6 173 929 | 9 313 214 |
| Aramid                                           | 268 750 | 437 500   | 568 750   | 906 250   | 1 375 000 | 1 843 750 | 2 781 250 |
| HF                                               | 725 571 | 1 269 750 | 1 632 536 | 2 630 196 | 3 990 643 | 5 351 089 | 8 071 982 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION



## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

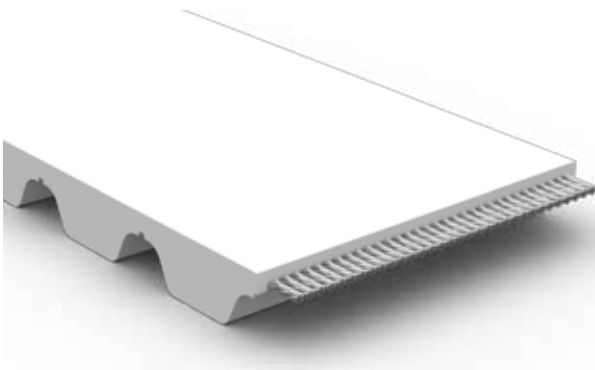
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

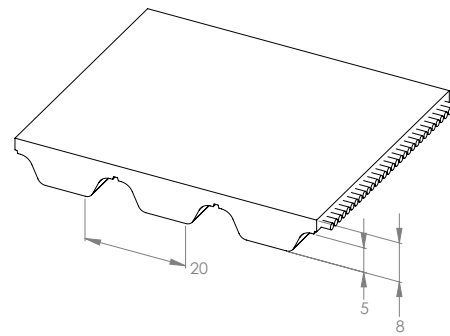
FINISHING

INFORMATION



|                                           |                       |
|-------------------------------------------|-----------------------|
| Pitch                                     | 20 mm                 |
| Standard Color                            | White                 |
| Standard Roll Length ( $\pm 1\%$ )        | 50 m                  |
| Width Tolerance                           |                       |
| up to 50 mm Width                         | $\pm 1.0$ mm          |
| > 50 mm Width                             | $\pm 1.5$ mm          |
| Sitting Lanes                             |                       |
| Standard                                  | Without Sitting Lanes |
| Optional                                  | 25 mm / 32 mm         |
| Minimum Welded Belt Length                | 1.200 mm              |
| Minimum Number of Pulley Teeth $z_{\min}$ | 18                    |
| Minimum Pulley Diameter                   | 115.6 mm              |
| Minimum Back Bend Diameter                | 180 mm                |
| FDA/EU Approval                           | No                    |

# AT20



| Standard Width (mm)                                | 25        | 32        | 50        | 75        | 100       | 150       |
|----------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |           |           |           |           |           |           |
| Steel                                              | 24 220    | 31 140    | 50 170    | 76 120    | 102 070   | 153 970   |
| Aramid                                             | 21 798    | 28 337    | 45 153    | 68 508    | 91 863    | 138 573   |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |           |           |           |           |           |           |
| Steel                                              | 5 860     | 7 534     | 12 139    | 18 417    | 24 696    | 37 253    |
| Aramid                                             | 1 750     | 2 275     | 3 625     | 5 500     | 7 375     | 11 125    |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |           |           |           |           |           |           |
| Steel                                              | 2 930     | 3 767     | 6 069     | 9 209     | 12 348    | 18 626    |
| Aramid                                             | 1 313     | 1 706     | 2 719     | 4 125     | 5 531     | 8 344     |
| Allowable Effective Force $F_{eall}$ (N)           |           |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 5 430     | 6 950     | 10 860    | 16 290    | 21 720    | 32 580    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |           |           |           |           |           |           |
| Steel                                              | 0.0097    |           |           |           |           |           |
| Aramid                                             | 0.0073    |           |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |           |           |           |           |           |           |
| Steel                                              | 1 465 000 | 1 883 571 | 3 034 643 | 4 604 286 | 6 173 929 | 9 313 214 |
| Aramid                                             | 437 500   | 568 750   | 906 250   | 1 375 000 | 1 843 750 | 2 781 250 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

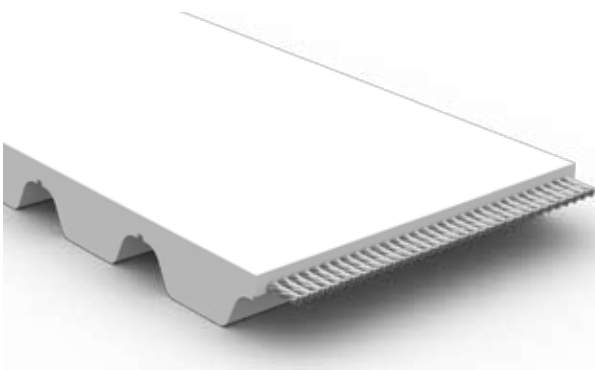
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

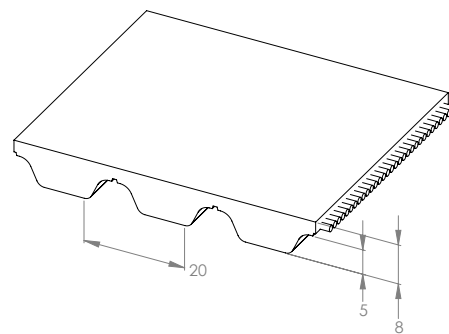
FINISHING

INFORMATION



|                                          |                       |
|------------------------------------------|-----------------------|
| Pitch                                    | 20 mm                 |
| Standard Color                           | White                 |
| Standard Roll Length ( $\pm 1\%$ )       | 50 m                  |
| Width Tolerance                          | $\pm 2.0$ mm          |
| Sitting Lanes                            |                       |
| Standard                                 | Without Sitting Lanes |
| Optional                                 | 50 mm                 |
| Minimum Welded Belt Length               | No Welding            |
| Minimum Number of Pulley Teeth $z_{min}$ | 30                    |
| Minimum Pulley Diameter                  | 190.98 mm             |
| Minimum Back Bend Diameter               | 250 mm                |
| FDA/EU Approval                          | No                    |

# ATL20



| Standard Width (mm)                              | 32        | 50        | 75        | 100       | 150        |
|--------------------------------------------------|-----------|-----------|-----------|-----------|------------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |           |           |           |           |            |
| Steel                                            | 41 600    | 70 400    | 105 600   | 144 000   | 217 600    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended   |           |           |           |           |            |
| Steel                                            | 9 106     | 15 410    | 23 115    | 31 520    | 47 631     |
| Allowable Effective Force $F_{eall}$ (N)         |           |           |           |           |            |
| (Minimum 15 teeth are in mesh)                   | 6 950     | 10 860    | 16 290    | 21 720    | 32 580     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |           |           |           |           |            |
| Steel                                            | 0.0107    |           |           |           |            |
| Specific Belt Stiffness $c_{sp}$ (N)             |           |           |           |           |            |
| Steel                                            | 2 276 477 | 3 852 500 | 5 778 750 | 7 880 114 | 11 907 727 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## LINEAR BELTS

# METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

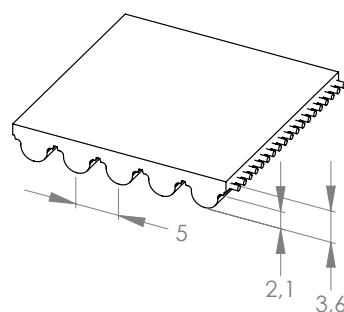
FINISHING

INFORMATION



|                                           |                                                          |
|-------------------------------------------|----------------------------------------------------------|
| Pitch                                     | 5 mm                                                     |
| Standard Color                            | White                                                    |
| Standard Roll Length ( $\pm 1\%$ )        | 100 m                                                    |
| Width Tolerance                           |                                                          |
| up to 50 mm Width                         | $\pm 0.5$ mm                                             |
| > 50 mm Width                             | $\pm 0.75$ mm                                            |
| Sitting Lanes                             | 25 mm                                                    |
| Minimum Welded Belt Length                |                                                          |
| up to 100 mm Width                        | 480 mm                                                   |
| > 100 mm Width                            | 960 mm                                                   |
| Minimum Number of Pulley Teeth $z_{\min}$ | 14 (Steel Classic/Aramid)<br>16 (Steel Basic)            |
| Minimum Pulley Diameter                   | 22.28 mm (Steel Classic/Aramid)<br>25.5 mm (Steel Basic) |
| Minimum Back Bend Diameter                | 60 mm (Steel Classic/Aramid)<br>80 mm (Steel Basic)      |
| FDA/EU Approval                           | No                                                       |

# HTD®5



| Standard Width (mm)                                | 10      | 15      | 20      | 25      | 50        | 100       | 150       |
|----------------------------------------------------|---------|---------|---------|---------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |         |         |           |           |           |
| Steel Classic                                      | 3 720   | 5 580   | 8 060   | 10 540  | 21 700    | 44 020    | 66 340    |
| Aramid                                             | 2 911   | 4 635   | 6 360   | 8 085   | 16 709    | 33 957    | 51 205    |
| Steel Basic                                        | 2 520   | 3 780   | 5 460   | 7 140   | 14 700    | 29 820    | 44 940    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |         |         |         |           | 3 780     |           |
| Steel Classic                                      | 826     | 1 239   | 1 789   | 2 340   | 4 818     | 9 773     | 14 728    |
| Aramid                                             | 383     | 610     | 837     | 1 064   | 2 198     | 4 467     | 6 736     |
| Steel Basic                                        | 674     | 1 010   | 1 459   | 1 909   | 3 929     | 7 971     | 12 012    |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |         |         |           |           |           |
| Steel Classic                                      | 413     | 619     | 895     | 1 170   | 2 409     | 4 886     | 7 364     |
| Aramid                                             | 287     | 457     | 627     | 798     | 1 648     | 3 350     | 5 052     |
| Steel Basic                                        | 337     | 505     | 730     | 954     | 1 965     | 3 985     | 6 006     |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |         |         |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 408     | 612     | 816     | 1 020   | 2 040     | 4 080     | 6 120     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |         |         |         |           |           |           |
| Steel Classic                                      | 0.0049  |         |         |         |           |           |           |
| Aramid                                             | 0.0029  |         |         |         |           |           |           |
| Steel Basic                                        | 0.0044  |         |         |         |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |         |         |           |           |           |
| Steel Classic                                      | 206 471 | 309 706 | 447 353 | 585 000 | 1 204 412 | 2 443 235 | 3 682 059 |
| Aramid                                             | 95 715  | 152 435 | 209 155 | 265 875 | 549 475   | 1 116 675 | 1 683 875 |
| Steel Basic                                        | 168 397 | 252 596 | 364 860 | 477 125 | 982 316   | 1 992 699 | 3 003 081 |

## LINEAR BELTS

# METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

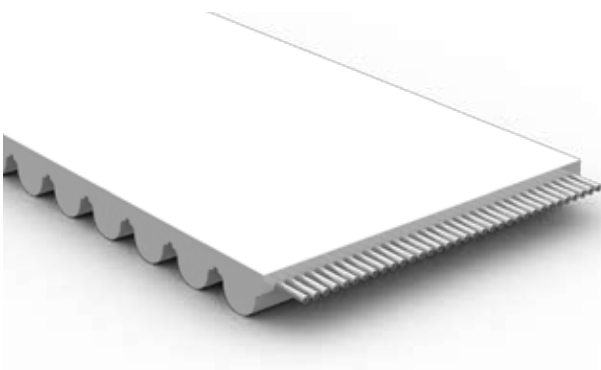
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

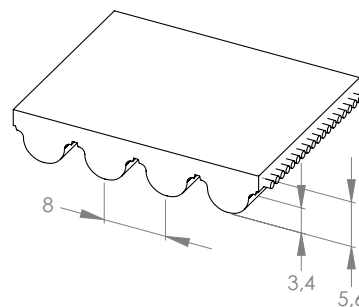
FINISHING

INFORMATION



|                                          |                                                           |
|------------------------------------------|-----------------------------------------------------------|
| Pitch                                    | 8 mm                                                      |
| Standard Color                           | White                                                     |
| Standard Roll Length ( $\pm 1\%$ )       | 100 m                                                     |
| Width Tolerance                          |                                                           |
| up to 50 mm Width                        | $\pm 0,75$ mm                                             |
| > 50 mm Width                            | $\pm 1,0$ mm                                              |
| Sitting Lanes                            |                                                           |
| Standard                                 | 25 mm                                                     |
| Optional                                 | 10 mm / 16 mm                                             |
| Minimum Welded Belt Length               |                                                           |
| up to 100 mm Width                       | 480 mm                                                    |
| > 100 mm Width                           | 960 mm                                                    |
| Minimum Number of Pulley Teeth $z_{min}$ | 20 (Steel/Aramid)<br>25 (Niro)<br>16 (HF)                 |
| Minimum Pulley Diameter                  | 50,93 mm (Steel/Aramid)<br>63,7 mm (Niro)<br>40,8 mm (HF) |
| Minimum Back Bend Diameter               | 120 mm (Steel/Aramid)<br>150 mm (Niro)<br>100 mm (HF)     |
| FDA/EU Approval                          | No                                                        |

# HTD®8



| Standard Width (mm)                                | 10      | 15      | 20      | 25      | 30        | 50        | 85        | 100       | 150       |
|----------------------------------------------------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |         |         |           |           |           |           |           |
| Steel                                              | 4 750   | 7 600   | 10 450  | 14 250  | 17 100    | 29 450    | 50 350    | 59 850    | 90 250    |
| Aramid                                             | 5 827   | 9 279   | 12 732  | 16 185  | 19 638    | 33 449    | 57 619    | 67 977    | 102 505   |
| Niro                                               | 3 563   | 5 700   | 7 838   | 10 688  | 12 825    | 22 088    | 37 763    | 44 888    | 67 688    |
| HF                                                 | 4 325   | 6 920   | 9 515   | 12 975  | 15 570    | 26 815    | 45 845    | 54 495    | 82 175    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |         |         |         |           |           |           |           |           |
| Steel                                              | 1 247   | 1 995   | 2 743   | 3 741   | 4 489     | 7 731     | 13 218    | 15 712    | 23 693    |
| Aramid                                             | 630     | 1003    | 1 377   | 1 750   | 2 123     | 3 617     | 6 230     | 7 350     | 11 083    |
| Niro                                               | 935     | 1 496   | 2 058   | 2 806   | 3 367     | 5 799     | 9 914     | 11 784    | 17 770    |
| HF                                                 | 1 152   | 1 843   | 2 534   | 3 456   | 4 147     | 7 142     | 12 211    | 14 515    | 21 888    |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |         |         |           |           |           |           |           |
| Steel                                              | 624     | 998     | 1 372   | 1 871   | 2 245     | 3 866     | 6 609     | 7 856     | 11 847    |
| Aramid                                             | 473     | 753     | 1 033   | 1 313   | 1 593     | 2 713     | 4 673     | 5 513     | 8 313     |
| Niro                                               | 468     | 748     | 1 029   | 1 403   | 1 683     | 2 899     | 4 957     | 5 892     | 8 885     |
| HF                                                 | 576     | 922     | 1 267   | 1 728   | 2 074     | 3 571     | 6 106     | 7 258     | 10 944    |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |         |         |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 748     | 1 122   | 1 496   | 1 870   | 2 244     | 3 740     | 6 358     | 7 480     | 11 220    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |         |         |         |           |           |           |           |           |
| Steel                                              | 0.0069  |         |         |         |           |           |           |           |           |
| Aramid                                             | 0.0047  |         |         |         |           |           |           |           |           |
| Niro                                               | 0.0068  |         |         |         |           |           |           |           |           |
| HF                                                 | 0.0066  |         |         |         |           |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |         |         |           |           |           |           |           |
| Steel                                              | 311 750 | 498 800 | 685 850 | 935 250 | 1 122 300 | 1 932 850 | 3 304 550 | 3 928 050 | 5 923 250 |
| Aramid                                             | 157 500 | 250 833 | 344 167 | 437 500 | 530 833   | 904 167   | 1 557 500 | 1 837 500 | 2 770 833 |
| Niro                                               | 233 813 | 374 100 | 514 388 | 701 438 | 841 725   | 1 449 638 | 2 478 413 | 2 946 038 | 4 442 438 |
| HF                                                 | 288 000 | 460 800 | 633 600 | 864 000 | 1 036 800 | 1 785 600 | 3 052 800 | 3 628 800 | 5 472 000 |



## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

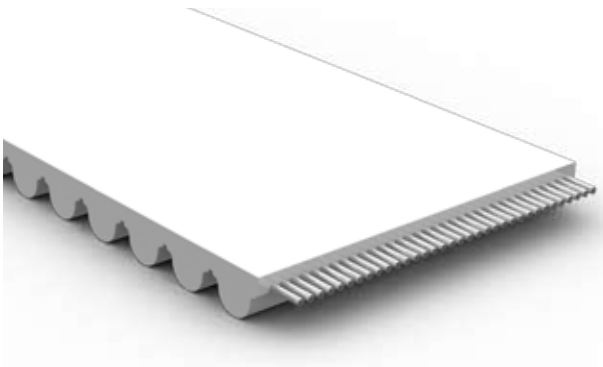
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

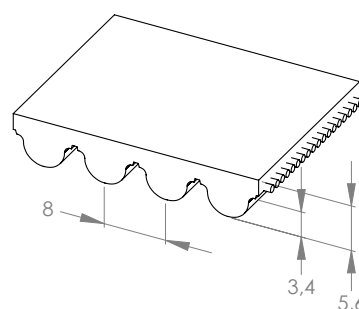
FINISHING

INFORMATION



|                                           |                                          |
|-------------------------------------------|------------------------------------------|
| Pitch                                     | 8 mm                                     |
| Standard Color                            | White                                    |
| Standard Roll Length ( $\pm 1\%$ )        | 100 m                                    |
| Width Tolerance                           |                                          |
| up to 50 mm Width                         | $\pm 1.0$ mm                             |
| > 50 mm Width                             | $\pm 1.5$ mm                             |
| Sitting Lanes                             | Without Sitting Lanes                    |
| Minimum Welded Belt Length                | No Welding                               |
| Minimum Number of Pulley Teeth $z_{\min}$ | 32 (Steel/Aramid)<br>25 (HF)             |
| Minimum Pulley Diameter                   | 81.48 mm (Steel/Aramid)<br>63.66 mm (HF) |
| Minimum Back Bend Diameter                | 150 mm (Steel/Aramid)<br>130 mm (HF)     |
| FDA/EU Approval                           | No                                       |

# HTD® L8



| Standard Width (mm)                              | 20        | 25        | 30        | 50        | 85        | 100       | 150       |
|--------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |           |           |           |           |           |           |           |
| Steel                                            | 19 030    | 24 220    | 29 410    | 50 170    | 86 500    | 102 070   | 153 970   |
| Aramid                                           | 17 127    | 21 798    | 26 469    | 45 153    | 77 850    | 91 863    | 138 573   |
| HF                                               | 21 175    | 26 950    | 32 725    | 55 825    | 96 250    | 113 575   | 171 325   |
| Allowable Belt Force $F_{1all}$ (N) Open Ended   |           |           |           |           |           |           |           |
| Steel                                            | 4 604     | 5 860     | 7 116     | 12 139    | 20 929    | 24 696    | 37 253    |
| Aramid                                           | 1 375     | 1 750     | 2 125     | 3 625     | 6 250     | 7 375     | 11 125    |
| HF                                               | 3 991     | 5 079     | 6 167     | 10 521    | 18 139    | 21 404    | 32 288    |
| Allowable Effective Force $F_{eall}$ (N)         |           |           |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                   | 1 496     | 1 870     | 2 244     | 3 740     | 6 358     | 7 480     | 11 220    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |           |           |           |           |           |           |           |
| Steel                                            | 0.0079    |           |           |           |           |           |           |
| Aramid                                           | 0.0045    |           |           |           |           |           |           |
| HF                                               | 0.0083    |           |           |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |           |           |           |           |           |           |           |
| Steel                                            | 1 151 071 | 1 465 000 | 1 778 929 | 3 034 643 | 5 232 143 | 6 173 929 | 9 313 214 |
| Aramid                                           | 343 750   | 437 500   | 531 250   | 906 250   | 1 562 500 | 1 843 750 | 2 781 250 |
| HF                                               | 997 661   | 1 269 750 | 1 541 839 | 2 630 196 | 4 534 821 | 5 351 089 | 8 071 982 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

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INFORMATION

## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

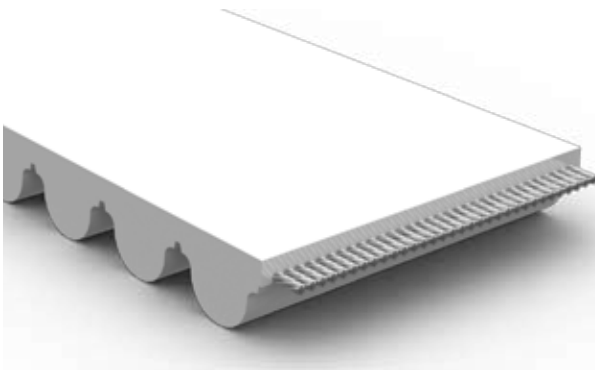
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

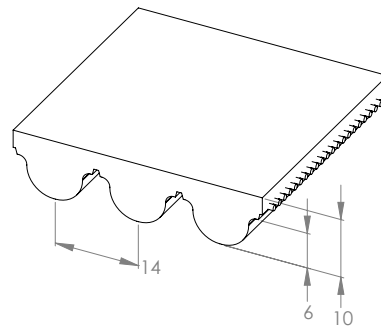
FINISHING

INFORMATION



|                                           |                                           |
|-------------------------------------------|-------------------------------------------|
| Pitch                                     | 14 mm                                     |
| Standard Color                            | White                                     |
| Standard Roll Length ( $\pm 1\%$ )        | 50 m                                      |
| Width Tolerance                           |                                           |
| up to 50 mm Width                         | $\pm 1.0$ mm                              |
| > 50 mm up to 100 mm Width                | $\pm 1.5$ mm                              |
| > 100 mm Width                            | $\pm 2.0$ mm                              |
| Sitting Lanes                             |                                           |
| Standard                                  | 55 mm                                     |
| Optional                                  | 85 mm                                     |
| Minimum Welded Belt Length                | 1.200 mm                                  |
| Minimum Number of Pulley Teeth $z_{\min}$ | 28 (Steel/Aramid)<br>23 (HF)              |
| Minimum Pulley Diameter                   | 124.78 mm (Steel/Aramid)<br>102.5 mm (HF) |
| Minimum Back Bend Diameter                | 200 mm (Steel/Aramid)<br>160 mm (HF)      |
| FDA/EU Approval                           | No                                        |

# HTD®14



| Standard Width (mm)                                | 25        | 40        | 55        | 85        | 115       | 170       |
|----------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |           |           |           |           |           |           |
| Steel                                              | 20 760    | 34 600    | 48 440    | 74 390    | 102 070   | 152 240   |
| Aramid                                             | 18 995    | 31 327    | 43 658    | 68 321    | 92 984    | 138 199   |
| HF                                                 | 23 100    | 38 500    | 53 900    | 82 775    | 113 575   | 169 400   |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |           |           |           |           |           |           |
| Steel                                              | 5 156     | 8 593     | 12 031    | 18 476    | 25 350    | 37 811    |
| Aramid                                             | 1 515     | 2 499     | 3 482     | 5 449     | 7 416     | 11 022    |
| HF                                                 | 4 470     | 7 449     | 10 429    | 16 016    | 21 975    | 32 776    |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |           |           |           |           |           |           |
| Steel                                              | 2 578     | 4 297     | 6 015     | 9 238     | 12 675    | 18 905    |
| Aramid                                             | 1 136     | 1 874     | 2 612     | 4 087     | 5 562     | 8 267     |
| HF                                                 | 2 235     | 3 725     | 5 214     | 8 008     | 10 988    | 16 388    |
| Allowable Effective Force $F_{eall}$ (N)           |           |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 3 430     | 5 488     | 7 546     | 11 662    | 15 778    | 23 324    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |           |           |           |           |           |           |
| Steel                                              | 0.0108    |           |           |           |           |           |
| Aramid                                             | 0.0084    |           |           |           |           |           |
| HF                                                 | 0.0112    |           |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |           |           |           |           |           |           |
| Steel                                              | 1 289 000 | 2 148 333 | 3 007 667 | 4 618 917 | 6 337 583 | 9 452 667 |
| Aramid                                             | 378 750   | 624 627   | 870 504   | 1 362 258 | 1 854 012 | 2 755 561 |
| HF                                                 | 1 117 380 | 1 862 300 | 2 607 220 | 4 003 945 | 5 493 785 | 8 194 120 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## LINEAR BELTS

## METRIC TIMING BELTS

### TIMING BELTS

### SELF TRACKING

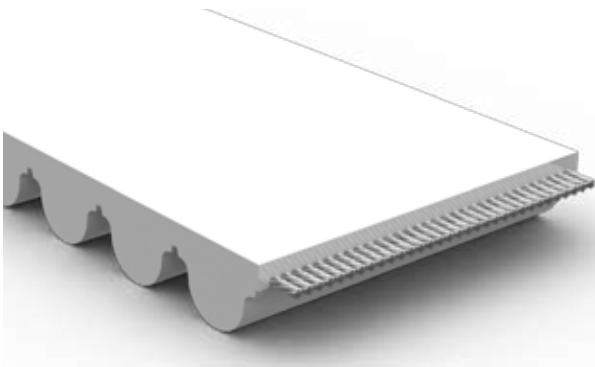
### FLAT BELTS

### WIDE BELTS

### ENDLESS BELTS

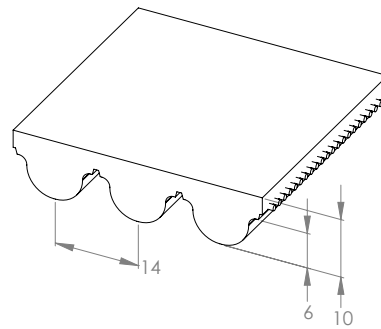
### FINISHING

### INFORMATION



|                                           |                  |
|-------------------------------------------|------------------|
| Pitch                                     | 14 mm            |
| Standard Color                            | White            |
| Standard Roll Length ( $\pm 1\%$ )        | 50 m             |
| Width Tolerance                           |                  |
| up to 55 mm Width                         | $\pm 1.0$ mm     |
| > 55 mm up to 100 mm Width                | $\pm 1.5$ mm     |
| > 100 mm Width                            | $\pm 2.0$ mm     |
| Sitting Lanes                             | No Sitting Lanes |
| Minimum Welded Belt Length                | No Welding       |
| Minimum Number of Pulley Teeth $z_{\min}$ | 36               |
| Minimum Pulley Diameter                   | 160.43 mm        |
| Minimum Back Bend Diameter                | 200 mm           |
| FDA/EU Approval                           | No               |

# HTD® L14



| Standard Width (mm)                              | 55        | 85        | 115       | 170        |
|--------------------------------------------------|-----------|-----------|-----------|------------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |           |           |           |            |
| Steel                                            | 76 800    | 121 600   | 163 200   | 246 400    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended   |           |           |           |            |
| Steel                                            | 16 811    | 26 617    | 35 723    | 53 935     |
| Allowable Effective Force $F_{eall}$ (N)         |           |           |           |            |
| (Minimum 15 teeth are in mesh)                   | 7 546     | 11 662    | 15 778    | 23 324     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |           |           |           |            |
| Steel                                            | 0.0122    |           |           |            |
| Specific Belt Stiffness $c_{sp}$ (N)             |           |           |           |            |
| Steel                                            | 4 202 727 | 6 654 318 | 8 930 795 | 13 483 750 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

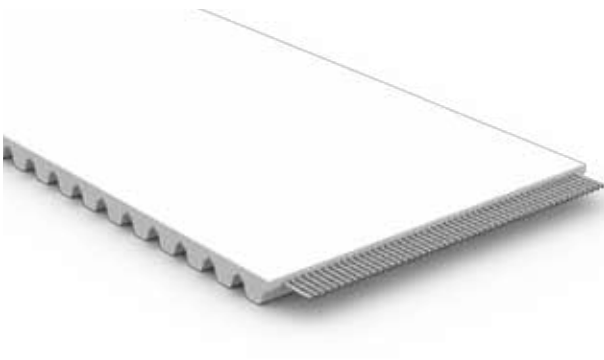
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

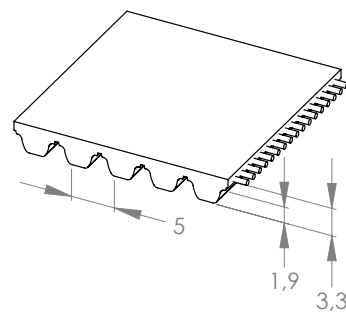
FINISHING

INFORMATION



|                                          |              |
|------------------------------------------|--------------|
| Pitch                                    | 5 mm         |
| Standard Color                           | White        |
| Standard Roll Length ( $\pm 1\%$ )       | 100 m        |
| Width Tolerance                          | $\pm 0.5$ mm |
| Sitting Lanes                            |              |
| Standard                                 | 25 mm        |
| Optional                                 | 10 mm        |
| Minimum Welded Belt Length               | 480 mm       |
| Minimum Number of Pulley Teeth $z_{min}$ | 14           |
| Minimum Pulley Diameter                  | 22.28 mm     |
| Minimum Back Bend Diameter               | 60 mm        |
| FDA/EU Approval                          | No           |

# STD5



| Standard Width (mm)                                | 10      | 15      | 20      | 25      | 30      | 50        |
|----------------------------------------------------|---------|---------|---------|---------|---------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |         |         |         |           |
| Steel                                              | 3 720   | 5 580   | 8 060   | 10 540  | 12 400  | 21 700    |
| Aramid                                             | 2 911   | 4 635   | 6 360   | 8 085   | 9 810   | 16 709    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |         |         |         |         |           |
| Steel                                              | 826     | 1 239   | 1 789   | 2 340   | 2 753   | 4 818     |
| Aramid                                             | 383     | 610     | 837     | 1 064   | 1 290   | 2 198     |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |         |         |         |           |
| Steel                                              | 413     | 619     | 895     | 1 170   | 1 376   | 2 409     |
| Aramid                                             | 287     | 457     | 627     | 798     | 968     | 1 648     |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |         |         |         |           |
| (Minimum 15 teeth are in mesh)                     | 392     | 588     | 784     | 980     | 1 176   | 1 960     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |         |         |         |         |           |
| Steel                                              | 0.0038  |         |         |         |         |           |
| Aramid                                             | 0.0029  |         |         |         |         |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |         |         |         |           |
| Steel                                              | 206 471 | 309 706 | 447 353 | 585 000 | 688 235 | 1 204 412 |
| Aramid                                             | 95 715  | 152 435 | 209 155 | 265 875 | 322 595 | 549 475   |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION



## LINEAR BELTS

## METRIC TIMING BELTS

### TIMING BELTS

### SELF TRACKING

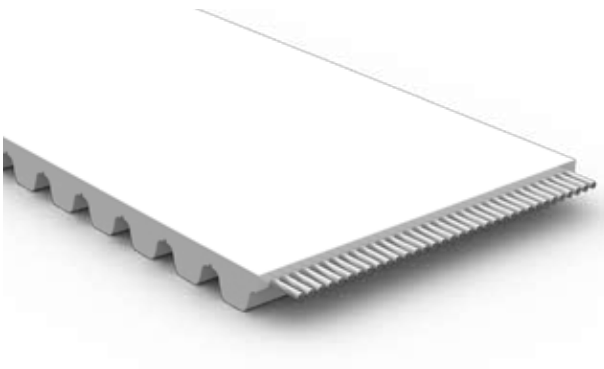
### FLAT BELTS

### WIDE BELTS

### ENDLESS BELTS

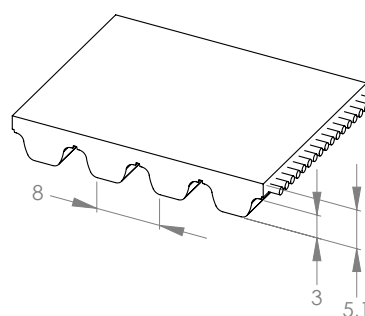
### FINISHING

### INFORMATION



|                                          |                                                            |
|------------------------------------------|------------------------------------------------------------|
| Pitch                                    | 8 mm                                                       |
| Standard Color                           | White                                                      |
| Standard Roll Length ( $\pm 1\%$ )       | 100 m                                                      |
| Width Tolerance                          |                                                            |
| up to 50 mm Width                        | $\pm 0.75$ mm                                              |
| > 50 mm Width                            | $\pm 1.0$ mm                                               |
| Sitting Lanes                            |                                                            |
| Standard                                 | 20 mm / 30 mm                                              |
| Optional                                 | 25 mm                                                      |
| Minimum Welded Belt Length               | 960 mm                                                     |
| Minimum Number of Pulley Teeth $z_{min}$ | 20 (Steel/Aramid)<br>25 (Niro)<br>16 (HF)                  |
| Minimum Pulley Diameter                  | 50.93 mm (Steel/Aramid)<br>81.48 mm (Niro)<br>40.8 mm (HF) |
| Minimum Back Bend Diameter               | 120 mm (Steel/Aramid)<br>150 mm (Niro)<br>100 mm (HF)      |
| FDA/EU Approval                          | No                                                         |

# STD8



| Standard Width (mm)                                | 10      | 15      | 20      | 25      | 30        | 50        | 85        | 100       | 150       |
|----------------------------------------------------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |         |         |           |           |           |           |           |
| Steel                                              | 4 750   | 7 600   | 10 450  | 14 250  | 17 100    | 29 450    | 50 350    | 59 850    | 90 250    |
| Aramid                                             | 5 827   | 9 279   | 12 732  | 16 185  | 19 638    | 33 449    | 57 619    | 67 977    | 102 505   |
| Niro                                               | 3 563   | 5 700   | 7 838   | 10 688  | 12 825    | 22 088    | 37 763    | 44 888    | 67 688    |
| HF                                                 | 4 325   | 6 920   | 9 515   | 12 975  | 15 570    | 26 815    | 45 845    | 54 495    | 82 175    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |         |         |         |           |           |           |           |           |
| Steel                                              | 1 247   | 1 995   | 2 743   | 3 741   | 4 489     | 7 731     | 13 218    | 15 712    | 23 693    |
| Aramid                                             | 630     | 1 003   | 1 377   | 1 750   | 2 123     | 3 617     | 6 230     | 7 350     | 11 083    |
| Niro                                               | 935     | 1 496   | 2 058   | 2 806   | 3 367     | 5 799     | 9 914     | 11 784    | 17 770    |
| HF                                                 | 1 152   | 1 843   | 2 534   | 3 456   | 4 147     | 7 142     | 12 211    | 14 515    | 21 888    |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |         |         |           |           |           |           |           |
| Steel                                              | 624     | 998     | 1 372   | 1 871   | 2 245     | 3 866     | 6 609     | 7 856     | 11 847    |
| Aramid                                             | 473     | 753     | 1 033   | 1 313   | 1 593     | 2 713     | 4 673     | 5 513     | 8 313     |
| Niro                                               | 468     | 748     | 1 029   | 1 403   | 1 683     | 2 899     | 4 957     | 5 892     | 8 885     |
| HF                                                 | 576     | 922     | 1 267   | 1 728   | 2 074     | 3 571     | 6 106     | 7 258     | 10 944    |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |         |         |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 728     | 1 092   | 1 456   | 1 820   | 2 184     | 3 640     | 6 188     | 7 280     | 10 920    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |         |         |         |           |           |           |           |           |
| Steel                                              |         |         |         |         | 0.0058    |           |           |           |           |
| Aramid                                             |         |         |         |         | 0.0043    |           |           |           |           |
| Niro                                               |         |         |         |         | 0.0057    |           |           |           |           |
| HF                                                 |         |         |         |         | 0.0056    |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |         |         |           |           |           |           |           |
| Steel                                              | 311 750 | 498 800 | 685 850 | 935 250 | 1 122 300 | 1 923 850 | 3 304 550 | 3 928 050 | 5 923 250 |
| Aramid                                             | 157 500 | 250 833 | 344 167 | 437 500 | 530 833   | 904 167   | 1 557 500 | 1 837 500 | 2 770 833 |
| Niro                                               | 233 813 | 374 100 | 514 388 | 701 438 | 841 725   | 1 449 638 | 2 478 413 | 2 946 038 | 4 442 438 |
| HF                                                 | 288 000 | 460 800 | 633 600 | 864 000 | 1 036 800 | 1 785 600 | 3 052 800 | 3 628 800 | 5 472 000 |

## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

FLAT BELTS

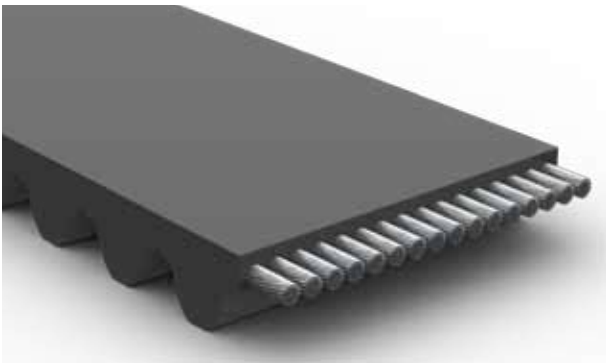
WIDE BELTS

ENDLESS BELTS

FINISHING

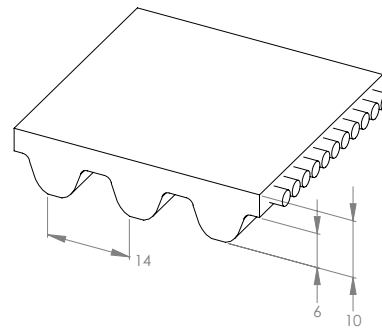
INFORMATION

**Feature:**  
*very strong, long life*



|                                          |                |
|------------------------------------------|----------------|
| Pitch                                    | 14 mm          |
| Standard Color                           | Black          |
| Standard Roll Length ( $\pm 1\%$ )       | 50 m           |
| Width Tolerance                          |                |
| up to 55 mm Width                        | $\pm 1.0$ mm   |
| > 55 mm Width                            | $\pm 1.5$ mm   |
| > 100 mm Width                           | $\pm 2.0$ mm   |
| Sitting Lanes                            |                |
| Standard                                 | 85 mm          |
| Optional                                 | 55 mm / 115 mm |
| Minimum Welded Belt Length               | No Welding     |
| Minimum Number of Pulley Teeth $z_{min}$ | 34             |
| Minimum Pulley Diameter                  | 151 mm         |
| Minimum Back Bend Diameter               | 250 mm         |
| FDA/EU Approval                          | No             |

# HPL®14-RSL



| Standard Width (mm)                              | 55        | 85        | 115        | 170        |
|--------------------------------------------------|-----------|-----------|------------|------------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |           |           |            |            |
| Steel                                            | 97 500    | 157 500   | 217 500    | 315 000    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended   |           |           |            |            |
| Steel                                            | 23 189    | 37 459    | 51 729     | 74 918     |
| Allowable Effective Force $F_{eall}$ (N)         |           |           |            |            |
| (Minimum 15 teeth are in mesh)                   | 8 305     | 12 835    | 17 365     | 25 670     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |           |           |            |            |
| Steel                                            | 0.014     | 0.014     | 0.013      | 0.012      |
| Specific Belt Stiffness $c_{sp}$ (N)             |           |           |            |            |
| Steel                                            | 5 797 187 | 9 364 687 | 12 932 187 | 18 729 375 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## LINEAR BELTS

## METRIC TIMING BELTS

### TIMING BELTS

### SELF TRACKING

### FLAT BELTS

### WIDE BELTS

### ENDLESS BELTS

### FINISHING

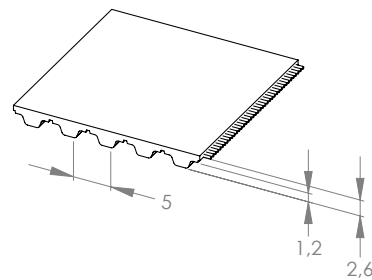
### INFORMATION

**Feature:**  
antistatic, corresponds to:  
IEC DTS 60079- 32, TRBS 2153, CENELEC TR50404



|                                                       |                                                  |
|-------------------------------------------------------|--------------------------------------------------|
| Pitch                                                 | 5 mm                                             |
| Standarddicke                                         | 2.6 mm                                           |
| Standard Color                                        | White                                            |
| Standard Roll Length (± 1%)                           | 100 m                                            |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width | ± 0.5 mm<br>± 0.75 mm                            |
| Sitting Lanes<br>Standard<br>Optional                 | 25 mm<br>10 mm / 16 mm                           |
| Minimum Welded Belt Length                            | 480 mm                                           |
| Minimum Number<br>of Pulley Teeth $z_{min}$           | 10                                               |
| Minimum Pulley Diameter                               | 15.91 mm                                         |
| Minimum<br>Back Bend Diameter                         | 30 mm                                            |
| FDA/EU Approval                                       | No                                               |
| Polyurethane                                          | R1 / 92 Shore A                                  |
| Backing                                               | Antistatic Polyamide Fabric on<br>Tooth and Back |

# T5-ATB



| Standard Width (mm)                                | 10     | 16      | 25      | 32      | 50      | 75      | 100     |
|----------------------------------------------------|--------|---------|---------|---------|---------|---------|---------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |        |         |         |         |         |         |         |
| Steel                                              | 1 250  | 2 000   | 3 375   | 4 250   | 6 875   | 10 375  | 13 875  |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |        |         |         |         |         |         |         |
| Steel                                              | 311    | 498     | 840     | 1 058   | 1 711   | 2 582   | 3 453   |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |        |         |         |         |         |         |         |
| Steel                                              | 156    | 249     | 420     | 529     | 856     | 1 291   | 1 727   |
| Allowable Effective Force $F_{eall}$ (N)           |        |         |         |         |         |         |         |
| (Minimum 15 teeth are in mesh)                     | 356    | 570     | 890     | 1 139   | 1 780   | 2 670   | 3 560   |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |        |         |         |         |         |         |         |
| Steel                                              | 0.0022 |         |         |         |         |         |         |
| Specific Belt Stiffness $c_{sp}$ (N)               |        |         |         |         |         |         |         |
| Steel                                              | 77 778 | 124 444 | 210 000 | 264 444 | 427 778 | 645 556 | 863 333 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## LINEAR BELTS

## METRIC TIMING BELTS

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

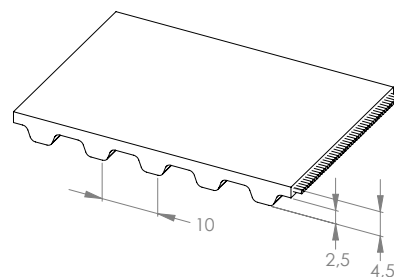
INFORMATION

**Features:**  
*completely sealed, no flights*



|                                          |                                          |
|------------------------------------------|------------------------------------------|
| Pitch                                    | 10 mm                                    |
| Standard Color                           | White                                    |
| Standard Roll Length ( $\pm 1\%$ )       | 100 m                                    |
| Width Tolerance                          |                                          |
| up to 50 mm Width                        | $\pm 0.5$ mm                             |
| > 50 mm Width                            | $\pm 0.75$ mm                            |
| Sitting Lanes                            |                                          |
| Standard                                 | 25 mm                                    |
| Optional                                 | 10 mm / 16 mm                            |
| Minimum Welded Belt Length               | No Welding                               |
| Minimum Number of Pulley Teeth $z_{min}$ | 14 (Steel/Aramid)<br>12 (HF)             |
| Minimum Pulley Diameter                  | 44.56 mm (Steel/Aramid)<br>38.20 mm (HF) |
| Minimum Back Bend Diameter               | 80 mm (Steel/Aramid)<br>60 mm (HF)       |
| FDA/EU Approval                          | No                                       |

# WR10



| Standard Width (mm)                              | 12      | 16      | 25      | 32      | 40      | 50        | 75        | 100       | 150       |
|--------------------------------------------------|---------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |         |         |         |         |         |           |           |           |           |
| Steel                                            | 2 940   | 4 200   | 7 140   | 9 240   | 11 340  | 14 700    | 22 260    | 29 820    | 44 940    |
| Aramid                                           | 3 601   | 4 980   | 8 085   | 10 500  | 13 259  | 16 709    | 25 333    | 33 957    | 51 205    |
| HF                                               | 4 340   | 6 200   | 10 540  | 13 640  | 16 740  | 21 700    | 32 860    | 44 020    | 66 340    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended   |         |         |         |         |         |           |           |           |           |
| Steel                                            | 786     | 1 123   | 1 909   | 2 470   | 3 031   | 3 929     | 5 950     | 7 971     | 12 012    |
| Aramid                                           | 474     | 655     | 1 064   | 1 381   | 1 744   | 2 198     | 3 332     | 4 467     | 6 736     |
| HF                                               | 964     | 1 376   | 2 340   | 3 028   | 3 716   | 4 818     | 7 295     | 9 773     | 14 728    |
| Allowable Effective Force $F_{eall}$ (N)         |         |         |         |         |         |           |           |           |           |
| (Minimum 15 teeth are in mesh)                   | 811     | 1 082   | 1 690   | 2 163   | 2 704   | 3 380     | 5 070     | 6 760     | 10 140    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |         |         |         |         |         |           |           |           |           |
| Steel                                            | 0.0044  |         |         |         |         |           |           |           |           |
| Aramid                                           | 0.0036  |         |         |         |         |           |           |           |           |
| HF                                               | 0.0047  |         |         |         |         |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |         |         |         |         |           |           |           |           |
| Steel                                            | 196 463 | 280 662 | 477 125 | 617 456 | 757 787 | 982 316   | 1 487 507 | 1 992 699 | 3 003 081 |
| Aramid                                           | 118 403 | 163 779 | 265 875 | 345 283 | 436 035 | 549 475   | 833 075   | 1 116 675 | 1 683 875 |
| HF                                               | 240 882 | 344 118 | 585 000 | 757 059 | 929 118 | 1 204 412 | 1 823 824 | 2 443 235 | 3 682 059 |



## LINEAR BELTS

## IMPERIAL TIMING BELTS

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

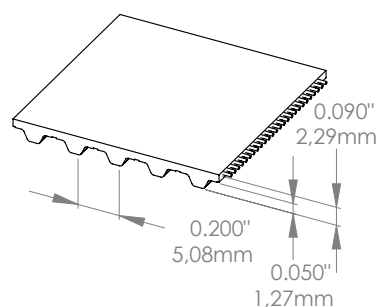
INFORMATION



|                                           |                        |
|-------------------------------------------|------------------------|
| Pitch                                     | 0.200" / 5.08 mm       |
| Standard Color                            | White                  |
| Standard Roll Length ( $\pm 1\%$ )        | 327.8 feet / 100 m     |
| Width Tolerance*                          |                        |
| up to 2" Width                            | $\pm 0.020"$ / 0.51 mm |
| > 2" Width (nur Steel)                    | $\pm 0.030"$ / 0.76 mm |
| Sitting Lanes                             |                        |
| Standard                                  | 0.25" / 6.35 mm        |
| Optional                                  | 1" / 25.4 mm           |
| Minimum Welded Belt Length                | 19.2" / 487.68 mm      |
| Minimum Number of Pulley Teeth $z_{\min}$ | 10                     |
| Minimum Pulley Diameter                   | 0.64" / 16.25 mm       |
| Minimum Back Bend Diameter                | 1.125" / 28.6 mm       |
| FDA-Approval                              | Yes (Aramid Cord)      |

\* With aramid cord only up to 2" width available.

# XL



| Standard Width (Inch)                              | 0.25   | 0.31   | 0.37   | 0.50    | 0.75    | 1       | 2       | 4       |
|----------------------------------------------------|--------|--------|--------|---------|---------|---------|---------|---------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |        |        |        |         |         |         |         |         |
| Steel                                              | 750    | 875    | 1 125  | 1 625   | 2 500   | 3 375   | 6 875   | 13 875  |
| Aramid                                             | 976    | 1 238  | 1 525  | 2 074   | 3 172   | 4 270   | 8 662   | ---- *  |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |        |        |        |         |         |         |         |         |
| Steel                                              | 190    | 221    | 284    | 411     | 632     | 853     | 1 738   | 3 509   |
| Aramid                                             | 213    | 270    | 332    | 452     | 691     | 930     | 1 887   | ---- *  |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |        |        |        |         |         |         |         |         |
| Steel                                              | 95     | 111    | 142    | 205     | 316     | 427     | 869     | 1 754   |
| Aramid                                             | 159    | 202    | 249    | 339     | 518     | 698     | 1 415   | ---- *  |
| Allowable Effective Force $F_{eall}$ (N)           |        |        |        |         |         |         |         |         |
|                                                    | 200    | 248    | 300    | 400     | 600     | 800     | 1 600   | 3 200   |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |        |        |        |         |         |         |         |         |
| Steel                                              | 0.0022 |        |        |         |         |         |         |         |
| Aramid                                             | 0.0019 |        |        |         |         |         |         |         |
| Specific Belt Stiffness $c_{sp}$ (N)               |        |        |        |         |         |         |         |         |
| Steel                                              | 47 413 | 55 316 | 71 120 | 102 729 | 158 044 | 213 360 | 434 622 | 877 147 |
| Aramid                                             | 51 675 | 66 058 | 81 819 | 111 962 | 172 250 | 232 537 | 473 686 | ---- *  |

## LINEAR BELTS

## IMPERIAL TIMING BELTS

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

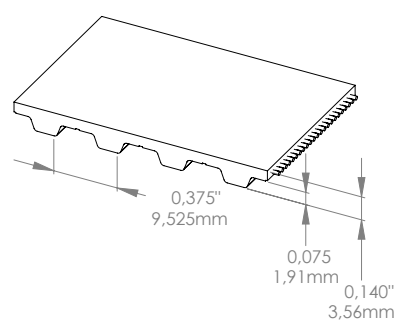
ENDLESS BELTS

FINISHING

INFORMATION



|                                                 |                                                  |
|-------------------------------------------------|--------------------------------------------------|
| Pitch                                           | 0.375" / 9.525 mm                                |
| Standard Color                                  | White                                            |
| Standard Roll Length ( $\pm 1\%$ )              | 200 feet / 61 m                                  |
| Width Tolerance<br>up to 2" Width<br>> 2" Width | $\pm 0.020"$ / 0.51 mm<br>$\pm 0.030"$ / 0.76 mm |
| Sitting Lanes<br>Standard<br>Optional           | 0.25" / 6.35 mm<br>0.50" / 12.7 mm               |
| Minimum Welded Belt Length                      | 19.125" / 485.78 mm                              |
| Minimum Number<br>of Pulley Teeth $z_{\min}$    | 10                                               |
| Minimum Pulley Diameter                         | 1.19" / 30.25 mm                                 |
| Minimum<br>Back Bend Diameter                   | 2.375" / 60.3 mm                                 |
| FDA-Approval                                    | Yes (Aramid Cord)                                |



| Standard Width (Inch)                              | 0.37    | 0.50    | 0.75    | 1       | 1.5     | 2       | 4         |
|----------------------------------------------------|---------|---------|---------|---------|---------|---------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |         |         |         |         |           |
| Steel                                              | 2 280   | 3 135   | 4 845   | 6 555   | 9 975   | 13 395  | 27 075    |
| Aramid                                             | 2 672   | 3 674   | 5 678   | 7 682   | 11 690  | 15 698  | 31 730    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |         |         |         |         |         |           |
| Steel                                              | 574     | 790     | 1 221   | 1 652   | 2 513   | 3 375   | 6 821     |
| Aramid                                             | 428     | 588     | 909     | 1 229   | 1 871   | 2 512   | 5 078     |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |         |         |         |         |           |
| Steel                                              | 287     | 395     | 610     | 826     | 1 257   | 1 687   | 3 411     |
| Aramid                                             | 321     | 441     | 681     | 922     | 1 403   | 1 884   | 3 808     |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |         |         |         |         |           |
|                                                    | 600     | 800     | 1 200   | 1 600   | 2 400   | 3 200   | 6 400     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |         |         |         |         |         |           |
| Steel                                              | 0.0035  |         |         |         |         |         |           |
| Aramid                                             | 0.0030  |         |         |         |         |         |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |         |         |         |         |           |
| Steel                                              | 143 609 | 197 463 | 305 170 | 412 877 | 628 291 | 843 705 | 1 705 362 |
| Aramid                                             | 106 901 | 146 989 | 227 164 | 307 340 | 467 691 | 628 043 | 1 269 448 |

## LINEAR BELTS

## IMPERIAL TIMING BELTS

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

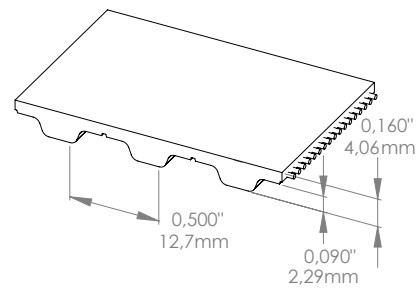
ENDLESS BELTS

FINISHING

INFORMATION



|                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| Pitch                                                      | 0.500" / 12.7 mm                                         |
| Standard Color                                             | White                                                    |
| Standard Roll Length ( $\pm 1\%$ )                         | 327.8 feet / 100 m                                       |
| Width Tolerance<br>up to 2" Width<br>> 2" Width            | $\pm 0.020"$ / 0.51 mm<br>$\pm 0.030"$ / 0.76 mm         |
| Sitting Lanes                                              | 1" / 25.4 mm                                             |
| Minimum Welded Belt Length<br>up to 4" Width<br>> 4" Width | 19" / 482.6 mm<br>38" / 965.2 mm                         |
| Minimum Number<br>of Pulley Teeth $z_{min}$                | 14 (Steel/Aramid)<br>12 (HF)                             |
| Minimum Pulley Diameter                                    | 2.23" / 56.65 mm (Steel/Aramid)<br>1.91" / 48.5 mm (HF)  |
| Minimum<br>Back Bend Diameter                              | 3.125" / 79.4 mm (Steel/Aramid)<br>2.375" / 60.3 mm (HF) |
| FDA-Approval                                               | Yes (Aramid Cord)                                        |



| Standard Width (Inch)                              | 0.50    | 0.75    | 1       | 1.5     | 2         | 3         | 4         | 6         |
|----------------------------------------------------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |         |         |           |           |           |           |
| Steel                                              | 3 360   | 5 040   | 7 140   | 10 920  | 14 700    | 22 260    | 29 820    | 44 940    |
| Aramid                                             | 3 773   | 5 929   | 8 085   | 12 397  | 16 709    | 25 333    | 33 957    | 51 205    |
| HF                                                 | 4 960   | 7 440   | 10 540  | 16 120  | 21 700    | 32 860    | 44 020    | 66 340    |
| Allowable Belt Force $F_{1all}$ (N) Offe           |         |         |         |         |           |           |           |           |
| Steel                                              | 912     | 1 369   | 1 939   | 2 966   | 3 992     | 6 045     | 8 098     | 12 205    |
| Aramid                                             | 504     | 792     | 1 081   | 1 657   | 2 233     | 3 386     | 4 538     | 6 843     |
| HF                                                 | 1 119   | 1 678   | 2 377   | 3 636   | 4 895     | 7 412     | 9 929     | 14 964    |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |         |         |           |           |           |           |
| Steel                                              | 456     | 684     | 970     | 1 483   | 1 996     | 3 023     | 4 049     | 6 102     |
| Aramid                                             | 378     | 594     | 810     | 1 243   | 1 675     | 2 539     | 3 404     | 5 132     |
| HF                                                 | 559     | 839     | 1 189   | 1 818   | 2 447     | 3 706     | 4 965     | 7 482     |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |         |         |           |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 980     | 1 470   | 1 960   | 2 940   | 3 920     | 5 880     | 7 840     | 11 760    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |         |         |         |           |           |           |           |
| Steel                                              | 0.0040  |         |         |         |           |           |           |           |
| Aramid                                             | 0.0032  |         |         |         |           |           |           |           |
| HF                                                 | 0.0043  |         |         |         |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |         |         |           |           |           |           |
| Steel                                              | 228 122 | 342 183 | 484 759 | 741 396 | 998 033   | 1 511 307 | 2 024 582 | 3 051 130 |
| Aramid                                             | 126 060 | 198 095 | 270 129 | 414 198 | 558 267   | 846 404   | 1 134 542 | 1 710 817 |
| HF                                                 | 279 699 | 419 548 | 594 360 | 909 021 | 1 223 682 | 1 853 005 | 2 482 327 | 3 740 972 |

## LINEAR BELTS

## IMPERIAL TIMING BELTS

### TIMING BELTS

### SELF TRACKING

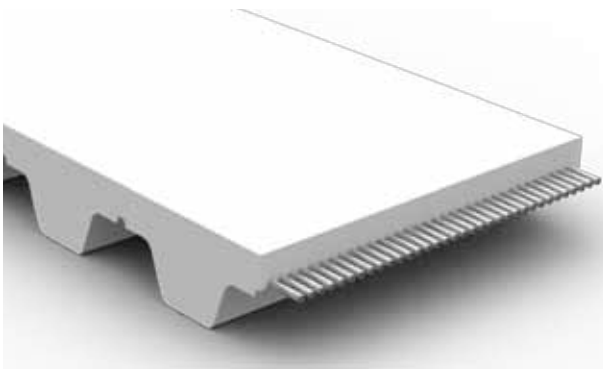
### FLAT BELTS

### WIDE BELTS

### ENDLESS BELTS

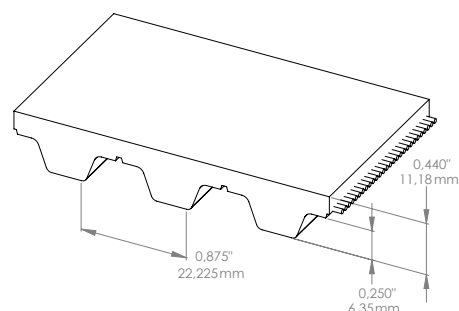
### FINISHING

### INFORMATION



|                                                            |                                   |
|------------------------------------------------------------|-----------------------------------|
| Pitch                                                      | 0.875" / 22.225 mm                |
| Standard Color                                             | White                             |
| Standard Roll Length ( $\pm 1\%$ )                         | 200 feet / 61 m                   |
| Width Tolerance                                            | $\pm 0.040"$ / 1.02 mm            |
| Sitting Lanes                                              | 1" / 25.4 mm                      |
| Minimum Welded Belt Length<br>up to 4" Width<br>> 4" Width | 39.4" / 1 000.76 mm<br>No Welding |
| Minimum Number<br>of Pulley Teeth $z_{\min}$               | 18                                |
| Minimum Pulley Diameter                                    | 5.01" / 127.75 mm                 |
| Minimum<br>Back Bend Diameter                              | 5.875" / 149.2 mm                 |
| FDA-Approval                                               | No                                |

# XH



| Standard Width (Inch)                              | 1       | 1.5       | 2         | 3         | 4         | 6         |
|----------------------------------------------------|---------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |           |           |           |           |           |
| Steel                                              | 14 250  | 21 850    | 29 450    | 44 650    | 59 850    | 90 250    |
| Aramid                                             | 16 185  | 24 817    | 33 449    | 50 713    | 67 977    | 102 505   |
| Allowable Belt Force $F_{1all}$ (N) Offe           |         |           |           |           |           |           |
| Steel                                              | 3 801   | 5 828     | 7 855     | 11 909    | 15 964    | 24 072    |
| Aramid                                             | 1 778   | 2 726     | 3 675     | 5 571     | 7 468     | 11 261    |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |           |           |           |           |           |
| Steel                                              | 1 900   | 2 914     | 3 928     | 5 955     | 7 982     | --- *     |
| Aramid                                             | 1 334   | 2 045     | 2 756     | 4 178     | 5 601     | --- *     |
| Allowable Effective Force $F_{eall}$ (N)           |         |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 3 910   | 5 865     | 7 820     | 11 730    | 15 640    | 23 460    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |           |           |           |           |           |
| Steel                                              | 0.0106  |           |           |           |           |           |
| Aramid                                             | 0.0091  |           |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |           |           |           |           |           |
| Steel                                              | 950 214 | 1 456 995 | 1 963 776 | 2 977 337 | 3 990 899 | 6 018 022 |
| Aramid                                             | 444 500 | 681 567   | 918 633   | 1 392 767 | 1 866 900 | 2 815 167 |

\*Welding only up to 4" width available

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION



## LINEAR BELTS

## SELF TRACKING BELTS





Gates Self Tracking Belts are a composed construction of Gates's standard polyurethane belts and specially designed polyurethane V-Guides, which provide highest flexibility and allow the use of small pulley diameters. Self tracking belts can be manufactured in two different production processes:

- › Fabricated V-Guides can be combined with any belt type and belt width.
- › Integral V-Guides are integrated by co-extrusion in the belt producing process and ensure higher strength and consistency.

#### ATTRIBUTES

- › V-Guides can be added to nearly every belt type.
- › Synchronous operations
- › Operation without flanged pulleys possible
- › Reliable tracking which is not affected by lateral forces
- › Reduction of lateral movement

#### APPLICATIONS

- › Long length conveying
- › Industrial handling
- › General conveying
- › Linear / rotary positioning

#### PROCESSING OPTIONS

- › Backings *Further information on page 124*
- › Profiles *Further information on page 138*
- › Special processing *Further information on page 146*

# FARICATED V-GUIDES

TIMING BELTS

SELF-TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

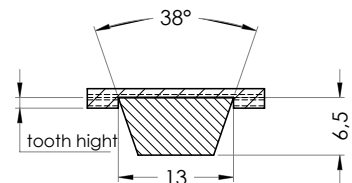
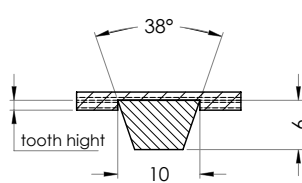
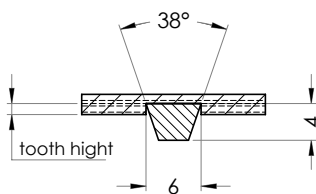
## FOR METRIC TOOTH PITCH BELTS

K6- Section

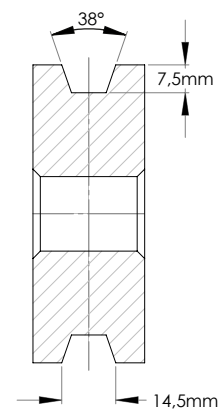
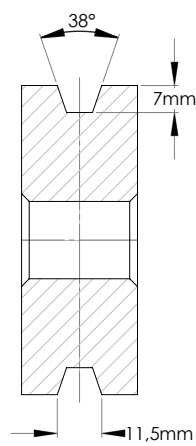
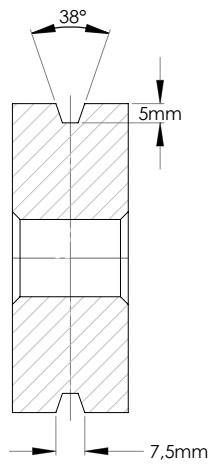
K10- Section

K13- Section

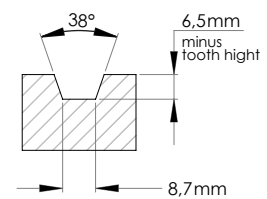
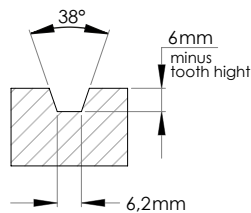
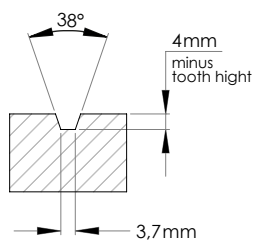
BELT DIMENSIONS



PULLEY DIMENSIONS



SLIDER BED DIMENSIONS

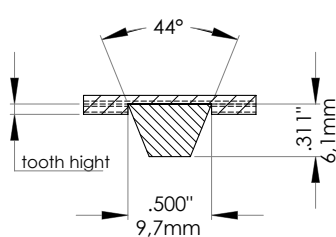
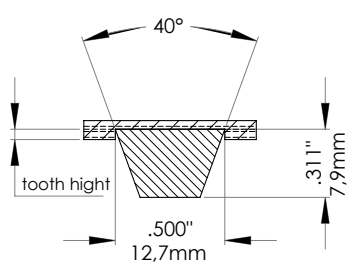


## FOR IMPERIAL TOOTH PITCH BELTS

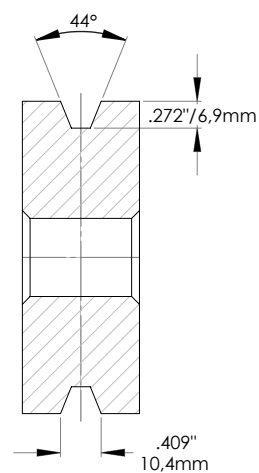
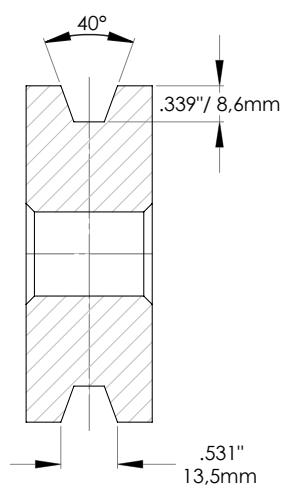
A- Section

O- Section

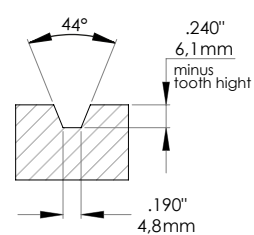
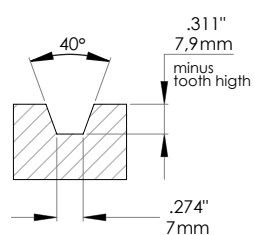
## BELT DIMENSIONS



## PULLEY DIMENSIONS



## SLIDER BED DIMENSIONS



## LINEAR BELTS

## INTEGRAL V-GUIDE

TIMING BELTS

SELF-TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

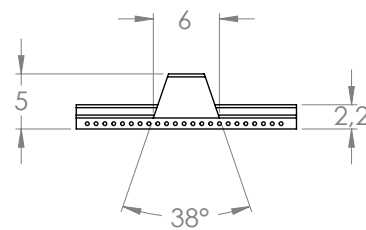
FINISHING

INFORMATION



|                                                       |                               |
|-------------------------------------------------------|-------------------------------|
| Pitch                                                 | 5 mm                          |
| Integral V-Guide                                      | K6                            |
| Standard Color                                        | White                         |
| Standard Roll Length ( $\pm 1\%$ )                    | 100 m                         |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width | $\pm 0.5$ mm<br>$\pm 0.75$ mm |
| Sitting Lanes                                         | 25 mm                         |
| Minimum Welded Belt Length                            | 960 mm                        |
| Minimum Number<br>of Pulley Teeth $z_{\min}$          | 10                            |
| Minimum Pulley Diameter                               | 15.91 mm                      |
| Minimum<br>Back Bend Diameter                         | 30 mm                         |
| FDA/EU Approval                                       | No                            |

# T5V



| Standard Width (mm)                                                        | 25      | 32      | 50      | 100     |
|----------------------------------------------------------------------------|---------|---------|---------|---------|
| Tensile Strength (Average Value) $F_{Break}$ (N)                           |         |         |         |         |
| Steel                                                                      | 3 375   | 4 250   | 6 875   | 13 875  |
| Aramid                                                                     | 8 370   | 10 800  | 17 050  | 34 410  |
| Allowable Belt Force $F_{1all}$ (N) Open Ended                             |         |         |         |         |
| Steel                                                                      | 840     | 1 058   | 1 711   | 3 453   |
| Aramid                                                                     | 916     | 1 181   | 1 865   | 3 764   |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded                         |         |         |         |         |
| Steel                                                                      | 420     | 529     | 856     | 1 727   |
| Aramid                                                                     | 687     | 886     | 1 399   | 2 823   |
| Allowable Effective Force $F_{eall}$ (N)<br>(Minimum 15 teeth are in mesh) |         |         |         |         |
|                                                                            | 676     | 926     | 1 566   | 3 346   |
| Specific Belt Mass $m_{sp}$ (kg/m)                                         |         |         |         |         |
| Steel                                                                      | 0.07    | 0.09    | 0.13    | 0.24    |
| Aramid                                                                     | 0.07    | 0.08    | 0.12    | 0.22    |
| Specific Belt Stiffness $c_{sp}$ (N)                                       |         |         |         |         |
| Steel                                                                      | 210 000 | 264 444 | 427 778 | 863 333 |
| Aramid                                                                     | 228 875 | 295 334 | 466 227 | 940 931 |

TIMING BELTS

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FINISHING

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## LINEAR BELTS

## INTEGRAL V-GUIDE

TIMING BELTS

SELF-TRACKING

FLAT BELTS

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ENDLESS BELTS

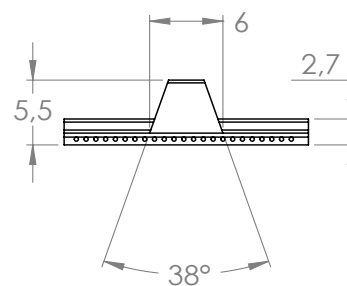
FINISHING

INFORMATION



|                                           |              |
|-------------------------------------------|--------------|
| Pitch                                     | 5 mm         |
| Integral V-Guide                          | K6           |
| Standard Color                            | White        |
| Standard Roll Length ( $\pm 1\%$ )        | 100 m        |
| Width Tolerance                           | $\pm 0.5$ mm |
| Sitting Lanes                             | 25 mm        |
| Minimum Welded Belt Length                | 960 mm       |
| Minimum Number of Pulley Teeth $z_{\min}$ | 15           |
| Minimum Pulley Diameter                   | 23.87 mm     |
| Minimum Back Bend Diameter                | 60 mm        |
| FDA/EU Approval                           | No           |

# AT5V



| Standard Width (mm)                              | 25      | 50      |
|--------------------------------------------------|---------|---------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |         |         |
| Steel                                            | 7 125   | 14 535  |
| Aramid                                           | 8 350   | 17 034  |
| Allowable Belt Force $F_{1all}$ (N) Open Ended   |         |         |
| Steel                                            | 1 761   | 3 591   |
| Aramid                                           | 1 210   | 2 468   |
| Allowable Belt Force $F_{1all}$ (N) Open Ended   |         |         |
| Steel                                            | 880     | 1 796   |
| Aramid                                           | 908     | 1 851   |
| Allowable Effective Force $F_{eall}$ (N)         |         |         |
| (Minimum 15 teeth are in mesh)                   | 980     | 2 270   |
| Specific Belt Mass $m_{sp}$ (kg/m)               |         |         |
| Steel                                            | 0.10    | 0.19    |
| Aramid                                           | 0.09    | 0.15    |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |         |
| Steel                                            | 440 125 | 897 855 |
| Aramid                                           | 302 500 | 617 100 |



## LINEAR BELTS

## INTEGRAL V-GUIDE

TIMING BELTS

SELF-TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

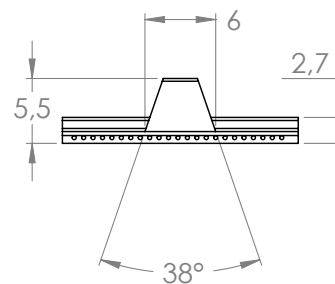
FINISHING

INFORMATION



|                                           |              |
|-------------------------------------------|--------------|
| Pitch                                     | 5 mm         |
| Integral V-Guide                          | K6           |
| Standard Color                            | White        |
| Standard Roll Length ( $\pm 1\%$ )        | 100 m        |
| Width Tolerance                           | $\pm 0.5$ mm |
| Sitting Lanes                             | 25 mm        |
| Minimum Welded Belt Length                | No Welding   |
| Minimum Number of Pulley Teeth $z_{\min}$ | 15           |
| Minimum Pulley Diameter                   | 23.87 mm     |
| Minimum Back Bend Diameter                | 60 mm        |
| FDA/EU Approval                           | No           |

# ATL5V



| Standard Width (mm)                                                        | 25      | 50        |
|----------------------------------------------------------------------------|---------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)                           |         |           |
| Steel                                                                      | 10 540  | 21 700    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended                             |         |           |
| Steel                                                                      | 2 340   | 4 818     |
| Allowable Effective Force $F_{eall}$ (N)<br>(Minimum 15 teeth are in mesh) | 980     | 2 270     |
| Specific Belt Mass $m_{sp}$ (kg/m)                                         |         |           |
| Steel                                                                      | 0.09    | 0.16      |
| Specific Belt Stiffness $c_{sp}$ (N)                                       |         |           |
| Steel                                                                      | 585 000 | 1 204 412 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## LINEAR BELTS

## INTEGRAL V-GUIDE

TIMING BELTS

SELF-TRACKING

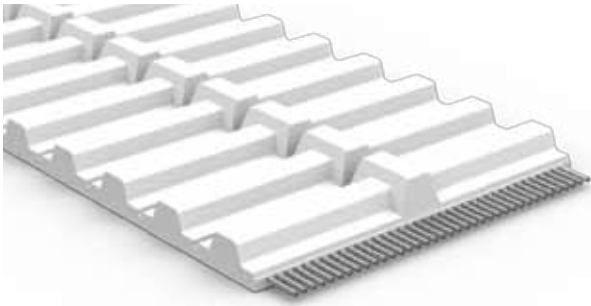
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

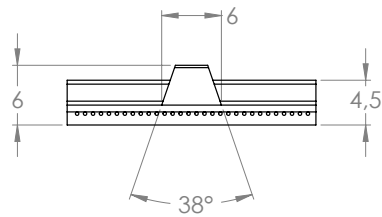
FINISHING

INFORMATION



|                                           |              |
|-------------------------------------------|--------------|
| Pitch                                     | 10 mm        |
| Integral V-Guide                          | K6           |
| Standard Color                            | White        |
| Standard Roll Length ( $\pm 1\%$ )        | 100 m        |
| Width Tolerance                           | $\pm 0.5$ mm |
| Sitting Lanes                             | 25 mm        |
| Minimum Welded Belt Length                | 960 mm       |
| Minimum Number of Pulley Teeth $z_{\min}$ | 14           |
| Minimum Pulley Diameter                   | 44.56 mm     |
| Minimum Back Bend Diameter                | 80 mm        |
| FDA/EU Approval                           | No           |

# T10VS



| Standard Width (mm)                                | 25      | 32      | 50      |
|----------------------------------------------------|---------|---------|---------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |         |
| Steel                                              | 7 140   | 9 240   | 14 700  |
| Aramid                                             | 9 163   | 11 880  | 18 865  |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |         |         |
| Steel                                              | 1 909   | 2 470   | 3 929   |
| Aramid                                             | 1 064   | 1 379   | 2 190   |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |         |
| Steel                                              | 954     | 1 235   | 1 965   |
| Aramid                                             | 798     | 1 034   | 1 642   |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |         |
| (Minimum 15 teeth are in mesh)                     | 1 284   | 1 758   | 2 974   |
| Specific Belt Mass $m_{sp}$ (kg/m)                 |         |         |         |
| Steel                                              | 0.13    | 0.16    | 0.24    |
| Aramid                                             | 0.11    | 0.13    | 0.20    |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |         |
| Steel                                              | 477 125 | 617 456 | 982 316 |
| Aramid                                             | 265 875 | 344 699 | 547 390 |

## LINEAR BELTS

# INTEGRAL V-GUIDE

TIMING BELTS

SELF-TRACKING

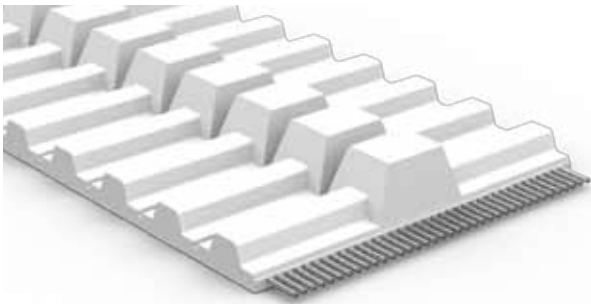
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

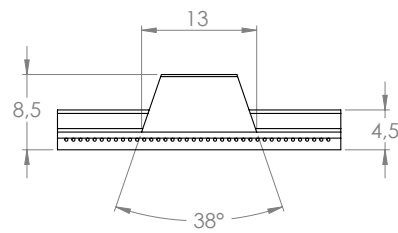
FINISHING

INFORMATION



|                                             |               |
|---------------------------------------------|---------------|
| Pitch                                       | 10 mm         |
| Integral V-Guide                            | K13           |
| Standard Color                              | White         |
| Standard Roll Length ( $\pm 1\%$ )          | 100 m         |
| Width Tolerance<br>up to 50 mm Width        | $\pm 0.5$ mm  |
| > 50 mm Width                               | $\pm 0.75$ mm |
| Sitting Lanes                               | 25 mm         |
| Minimum Welded Belt Length                  | 960 mm        |
| Minimum Number<br>of Pulley Teeth $z_{min}$ | 14            |
| Minimum Pulley Diameter                     | 44.56 mm      |
| Minimum<br>Back Bend Diameter               | 80 mm         |
| FDA/EU Approval                             | No            |

# T10V



| Standard Width (mm)                                | 25      | 32      | 50      | 75        | 100       | 150       |
|----------------------------------------------------|---------|---------|---------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |         |           |           |           |
| Steel                                              | 7 140   | 9 240   | 14 700  | 22 260    | 29 820    | 44 940    |
| Aramid                                             | 9 163   | 11 880  | 18 865  | 28 567    | 38 269    | 57 673    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |         |         |           |           |           |
| Steel                                              | 1 909   | 2 470   | 3 929   | 5 950     | 7 971     | 12 012    |
| Aramid                                             | 1 064   | 1 379   | 2 190   | 3 316     | 4 442     | 6 694     |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |         |           |           |           |
| Steel                                              | 954     | 1 235   | 1 965   | 2 975     | 3 985     | 6 006     |
| Aramid                                             | 798     | 1 0324  | 1 642   | 2 487     | 3 331     | 5 020     |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |         |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 811     | 1 284   | 2 501   | 4 191     | 5 881     | 9 261     |
| Specific Belt Mass $m_{sp}$ (kg/m)                 |         |         |         |           |           |           |
| Steel                                              | 0.18    | 0.21    | 0.29    | 0.40      | 0.50      | 0.72      |
| Aramid                                             | 0.16    | 0.18    | 0.25    | 0.34      | 0.43      | 0.61      |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |         |           |           |           |
| Steel                                              | 477 125 | 617 456 | 982 316 | 1 487 507 | 1 992 699 | 3 003 081 |
| Aramid                                             | 265 875 | 344 699 | 547 390 | 828 904   | 1 110 419 | 1 673 449 |

## LINEAR BELTS

## INTEGRAL V-GUIDE

TIMING BELTS

SELF-TRACKING

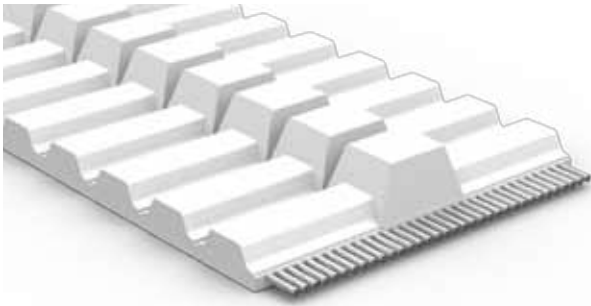
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

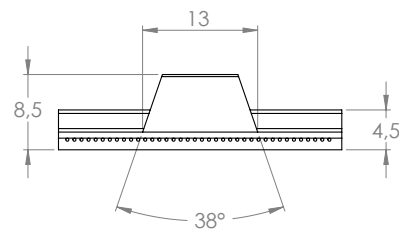
FINISHING

INFORMATION



|                                          |                                                         |
|------------------------------------------|---------------------------------------------------------|
| Pitch                                    | 10 mm                                                   |
| Integral V-Guide                         | K13                                                     |
| Standard Color                           | White                                                   |
| Standard Roll Length ( $\pm 1\%$ )       | 100 m                                                   |
| Width Tolerance                          |                                                         |
| up to 50 mm Width                        | $\pm 0.75$ mm                                           |
| > 50 mm Width                            | $\pm 1.0$ mm                                            |
| Sitting Lanes                            | 25 mm                                                   |
| Minimum Welded Belt Length               | 960 mm                                                  |
| Minimum Number of Pulley Teeth $z_{min}$ | 15 (Steel/Aramid)<br>12 (HF)<br>20 (Niro)               |
| Minimum Pulley Diameter                  | 47.75 mm (Steel/Aramid)<br>39 mm (HF)<br>63.7 mm (Niro) |
| Minimum Back Bend Diameter               | 120 mm (Steel/Aramid)<br>100 mm (HF)<br>160 mm (Niro)   |
| FDA/EU Approval                          | No                                                      |

# AT10V



| Standard Width (mm)                                | 25      | 32        | 50        | 75        |
|----------------------------------------------------|---------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |           |           |           |
| Steel                                              | 14 250  | 18 050    | 29 450    | 44 650    |
| Aramid                                             | 16 185  | 21 019    | 33 449    | 50 713    |
| HF                                                 | 12 975  | 16 435    | 26 815    | 40 655    |
| Niro                                               | 10 688  | 13 538    | 22 088    | 33 488    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |           |           |           |
| Steel                                              | 3 741   | 4 739     | 7 731     | 11 722    |
| Aramid                                             | 1 750   | 2 273     | 3 617     | 5 483     |
| HF                                                 | 3 456   | 4 378     | 7 142     | 10 829    |
| Niro                                               | 2 806   | 3 554     | 5 799     | 8 791     |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |           |           |           |
| Steel                                              | 1 871   | 2 369     | 3 866     | 5 861     |
| Aramid                                             | 1 313   | 1 705     | 2 713     | 4 113     |
| HF                                                 | 1 728   | 2 189     | 3 571     | 5 414     |
| Niro                                               | 1 403   | 1 777     | 2 899     | 4 396     |
| Allowable Effective Force $F_{eall}$ (N)           |         |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 1 238   | 1 961     | 3 818     | 6 398     |
| Specific Belt Mass $m_{sp}$ (kg/m)                 |         |           |           |           |
| Steel                                              | 0.21    | 0.25      | 0.35      | 0.50      |
| Aramid                                             | 0.17    | 0.20      | 0.28      | 0.38      |
| HF                                                 | 0.21    | 0.24      | 0.34      | 0.48      |
| Niro                                               | 0.21    | 0.25      | 0.35      | 0.49      |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |           |           |           |
| Steel                                              | 935 250 | 1 184 650 | 1 932 850 | 2 930 450 |
| Aramid                                             | 437 500 | 568 167   | 904 167   | 1 370 833 |
| HF                                                 | 864 000 | 1 094 400 | 1 785 600 | 2 707 200 |
| Niro                                               | 701 438 | 888 488   | 1 449 639 | 2 197 839 |



## LINEAR BELTS

# INTEGRAL V-GUIDE

TIMING BELTS

SELF-TRACKING

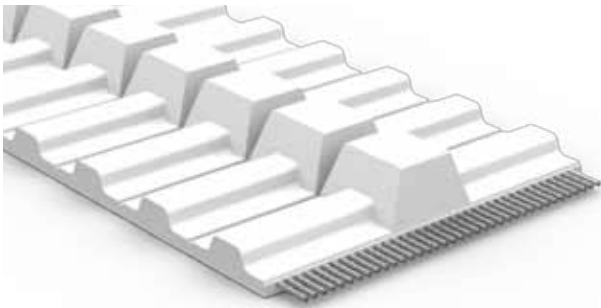
FLAT BELTS

WIDE BELTS

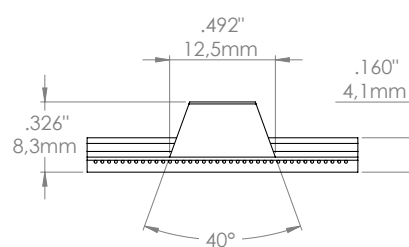
ENDLESS BELTS

FINISHING

INFORMATION



|                                          |                    |
|------------------------------------------|--------------------|
| Pitch                                    | 0.500" / 12.7 mm   |
| Integral V-Guide                         | A- Section         |
| Standard Color                           | White              |
| Standard Roll Length (± 1%)              | 200 feet / 61 m    |
| Width Tolerance                          |                    |
| up to 50 mm Width                        | ± 0.020" / 0.51 mm |
| > 50 mm Width                            | ± 0.030" / 0.76 mm |
| Sitting Lanes                            | 1" / 25.4 mm       |
| Minimum Welded Belt Length               | 36" / 914.4 mm     |
| Minimum Number of Pulley Teeth $z_{min}$ | 14                 |
| Minimum Pulley Diameter                  | 2.23" / 56.65 mm   |
| Minimum Back Bend Diameter               | 3.125" / 79.4 mm   |
| FDA/EU Approval                          | No                 |



| Standard Width (inch)                              | 2       | 3         | 4         | 6         |
|----------------------------------------------------|---------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |           |           |           |
| Steel                                              | 14 700  | 22 260    | 29 820    | 44 940    |
| Aramid                                             | 18 865  | 28 567    | 38 269    | 57 673    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |           |           |           |
| Steel                                              | 3 929   | 5 950     | 7 971     | 12 012    |
| Aramid                                             | 2 127   | 3 221     | 4 315     | 6 503     |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |           |           |           |
| Steel                                              | 1 965   | 2 975     | 3 985     | 6 006     |
| Aramid                                             | 1 595   | 2 416     | 3 236     | 4 877     |
| Allowable Effective Force $F_{eall}$ (N)           |         |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 2 955   | 4 915     | 6 875     | 10 795    |
| Specific Belt Mass $m_{sp}$ (kg/m)                 |         |           |           |           |
| Steel                                              | 0.27    | 0.37      | 0.47      | 0.67      |
| Aramid                                             | 0.23    | 0.31      | 0.39      | 0.56      |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |           |           |           |
| Steel                                              | 982 316 | 1 487 507 | 1 992 699 | 3 003 081 |
| Aramid                                             | 531 750 | 805 221   | 1 078 693 | 1 625 636 |

## GATES BLACK-FLAT — Our Polyurethane Flat Belts are available in various constructions

Gates BLACK-FLAT belts are extruded flat belts made out of high strength Polyurethane. Commonly they are used in lifting and conveying applications. Our BLACK-FLAT belts are typically sold as open ended belts. Usually they are attached at one or both ends in the application with clamping plates or our new FIX-FLAT.

Our flat belts are adapted to a wide range of mechanical requirements. With combinations of different types of polyurethanes and cords we offer a wide variety of belts.

We also have a range of belts specially designed for applications in the food processing industry. These belts have FDA and EU approval.

Our latest development FIX-FLAT, the flat belt clamp, enables the secure clamping of any flat belts at both ends easily, quickly and safely. Patent applied for.

### FEATURES

- › Smooth, vibration free operation
- › High strength combined with low elongation
- › Sealed belt edges result in no cord fraying
- › Easy belt guide with flanged pulleys or guiding rails
- › No re-tensioning required

### TYPICAL APPLICATIONS:

- › Heavy load lifting or lowering
- › Exercise machines
- › Conveying applications
- › Applications with small pulley diameters

### PROCESSING OPTIONS:

- |                      |                                        |
|----------------------|----------------------------------------|
| › Backings           | <i>Further information on page 124</i> |
| › Profiles           | <i>Further information on page 138</i> |
| › Special processing | <i>Further information on page 146</i> |

### CLAMP CONNECTION

- |                  |                                       |
|------------------|---------------------------------------|
| › Clamp FIX-FLAT | <i>Further information on page 84</i> |
|------------------|---------------------------------------|

| FLAT BELTS BACK-FLAT | FABRIC BACKING |                                |                          |                                 |                       | POLYURETHANE  |               |                            |                               |                               | Page         |
|----------------------|----------------|--------------------------------|--------------------------|---------------------------------|-----------------------|---------------|---------------|----------------------------|-------------------------------|-------------------------------|--------------|
|                      | ECO Fabric     | NT-Polyamide Fabric Tooth Side | NB-Polyamide Fabric Back | NTB-Polyamide Fabric Both Sides | ATB-Antistatic Fabric | R1-92 Shore A | R2-85 Shore A | R4-94 Shore A / Antistatic | EU85-85 Shore A / EU Approval | EU92-92 Shore A / EU Approval | FDA Approval |
| BFL20                |                |                                |                          |                                 |                       |               |               |                            |                               |                               |              |
| BFL20                | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 76           |
| BFL20-Aramid         | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 76           |
| BFL20-HF             | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 77           |
| BFL20-RSL            | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 77           |
| BFL20-RKV            | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 78           |
| BFL20-RHF            | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 78           |
| BFL20-Niro           | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 79           |
| BFL32                |                |                                |                          |                                 |                       |               |               |                            |                               |                               |              |
| BFL32                | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 80           |
| BFL32-Aramid         | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 80           |
| BFL32-HF             | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 81           |
| BFL32-RSL            | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 81           |
| BFL32-RKV            | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 82           |
| BFL32-RHF            | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 82           |
| BFL38                |                |                                |                          |                                 |                       |               |               |                            |                               |                               |              |
| BFL38                | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 83           |
| BFL48                |                |                                |                          |                                 |                       |               |               |                            |                               |                               |              |
| BFL48                | ●              | ●                              | ●                        | ●                               | ●                     | ●             | ●             | ●                          | ●                             | ●                             | 83           |

- STANDARD
- ON REQUEST

Specifications can change without prior notice.

Please contact our Applications Engineering for specific „minus“ and length tolerances.

For further configurations please contact our Application Consulting.

Please find used abbreviations on page 162.

## LINEAR BELTS

### FLAT BELTS BLACK-FLAT

#### GATES BFL20 ⇄

|                                                       |                |         |           |           |           |
|-------------------------------------------------------|----------------|---------|-----------|-----------|-----------|
| Belt Thickness                                        | 2 mm           |         |           |           |           |
| Standard Roll Length ( $\pm 1\%$ )                    | 100 m          |         |           |           |           |
| Standard Color                                        | Black          |         |           |           |           |
| Width Tolerance                                       |                |         |           |           |           |
| up to 50 mm Width                                     | $\pm 0.5$ mm   |         |           |           |           |
| > 50 mm Width                                         | $\pm 0.75$ mm  |         |           |           |           |
| Minimum Welded Belt Length                            |                |         |           |           |           |
| up to 100 mm Width                                    | 880 mm         |         |           |           |           |
| > 100 mm Width                                        | 960 mm         |         |           |           |           |
| Minimum Pulley Diameter                               | 45 mm          |         |           |           |           |
| Minimum Back Bend Diameter                            | 67.5 mm        |         |           |           |           |
| Specific Belt Mass $m_{sp}$                           | 0.0030 kg/m/mm |         |           |           |           |
| Standard Width [mm]                                   | 25             | 50      | 75        | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]   | 7140           | 14 700  | 22 260    | 29 820    | 44 940    |
| Allowable Belt Force<br>$F_{1alt}$ [N] Open Ended     | 2 386          | 4 912   | 7 438     | 9 963     | 15 015    |
| Allowable Belt Force<br>$F_{1alt}$ [N] Endless Welded | 1 193          | 2 456   | 3 719     | 4 982     | 7 508     |
| Specific Belt Stiffness $c_{sp}$ [N]                  | 477 125        | 982 316 | 1 487 507 | 1 992 699 | 3 003 081 |

#### GATES BFL20 ⇄ ARAMID

|                                                       |                |         |         |           |           |
|-------------------------------------------------------|----------------|---------|---------|-----------|-----------|
| Belt Thickness                                        | 2 mm           |         |         |           |           |
| Standard Roll Length ( $\pm 1\%$ )                    | 100 m          |         |         |           |           |
| Standard Color                                        | Black          |         |         |           |           |
| Width Tolerance                                       |                |         |         |           |           |
| up to 50 mm Width                                     | $\pm 0.5$ mm   |         |         |           |           |
| > 50 mm Width                                         | $\pm 0.75$ mm  |         |         |           |           |
| Minimum Welded Belt Length                            |                |         |         |           |           |
| up to 100 mm Width                                    | 880 mm         |         |         |           |           |
| > 100 mm Width                                        | 960 mm         |         |         |           |           |
| Minimum Pulley Diameter                               | 45 mm          |         |         |           |           |
| Minimum Back Bend Diameter                            | 67.5 mm        |         |         |           |           |
| Specific Belt Mass $m_{sp}$                           | 0.0023 kg/m/mm |         |         |           |           |
| Standard Width [mm]                                   | 25             | 50      | 75      | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]   | 8 085          | 16 709  | 25 333  | 33 957    | 51 205    |
| Allowable Belt Force<br>$F_{1alt}$ [N] Open Ended     | 1 329          | 2 747   | 4 165   | 5 583     | 8 419     |
| Allowable Belt Force<br>$F_{1alt}$ [N] Endless Welded | 665            | 1 374   | 2 083   | 2 792     | 4 210     |
| Specific Belt Stiffness $c_{sp}$ [N]                  | 265 875        | 549 475 | 833 075 | 1 116 675 | 1 683 875 |

# BFL20

## GATES BFL20 ↔ HF

|                                                                    |                       |           |           |           |           |
|--------------------------------------------------------------------|-----------------------|-----------|-----------|-----------|-----------|
| Belt Thickness                                                     | 2 mm                  |           |           |           |           |
| Standard Roll Length (± 1%)                                        | 100 m                 |           |           |           |           |
| Standard Color                                                     | Black                 |           |           |           |           |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width              | ± 0.5 mm<br>± 0.75 mm |           |           |           |           |
| Minimum Welded Belt Length<br>up to 100 mm Width<br>> 100 mm Width | 880 mm<br>960 mm      |           |           |           |           |
| Minimum Pulley Diameter                                            | 38 mm                 |           |           |           |           |
| Minimum Back Bend Diameter                                         | 57 mm                 |           |           |           |           |
| Specific Belt Mass $m_{sp}$                                        | 0.0033 kg/m/mm        |           |           |           |           |
| Standard Width [mm]                                                | 25                    | 50        | 75        | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]                | 10 540                | 21 700    | 32 860    | 44 020    | 66 340    |
| Allowable Belt Force<br>$F_{1all}$ [N] Open Ended                  | 2 925                 | 6 022     | 9 119     | 12 216    | 18 410    |
| Allowable Belt Force<br>$F_{1all}$ [N] Endless Welded              | 1 463                 | 3 011     | 4 560     | 6 108     | 9 205     |
| Specific Belt Stiffness $c_{sp}$ [N]                               | 585 000               | 1 204 412 | 1 823 824 | 2 443 235 | 3 682 059 |

## GATES BFL20 ↔ RSL

|                                                                    |                       |           |           |           |           |
|--------------------------------------------------------------------|-----------------------|-----------|-----------|-----------|-----------|
| Belt Thickness                                                     | 2 mm                  |           |           |           |           |
| Standard Roll Length (± 1%)                                        | 100 m                 |           |           |           |           |
| Standard Color                                                     | Black                 |           |           |           |           |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width              | ± 0.75 mm<br>± 1.0 mm |           |           |           |           |
| Minimum Welded Belt Length<br>up to 100 mm Width<br>> 100 mm Width | 880 mm<br>960 mm      |           |           |           |           |
| Minimum Pulley Diameter                                            | 48 mm                 |           |           |           |           |
| Minimum Back Bend Diameter                                         | 72 mm                 |           |           |           |           |
| Specific Belt Mass $m_{sp}$                                        | 0.0038 kg/m/mm        |           |           |           |           |
| Standard Width [mm]                                                | 25                    | 50        | 75        | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]                | 14 250                | 29 450    | 44 650    | 59 850    | 90 250    |
| Allowable Belt Force<br>$F_{1all}$ [N] Open Ended                  | 4 676                 | 9 664     | 14 652    | 19 640    | 29 616    |
| Allowable Belt Force<br>$F_{1all}$ [N] Endless Welded              | 2 338                 | 4 832     | 7 326     | 9 820     | 14 808    |
| Specific Belt Stiffness $c_{sp}$ [N]                               | 935 250               | 1 932 850 | 2 930 450 | 3 928 050 | 5 923 250 |

## LINEAR BELTS

### FLAT BELTS BLACK-FLAT

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATIONEN

#### GATES BFL20 ↔ RKV

|                                                       |                |         |           |           |           |
|-------------------------------------------------------|----------------|---------|-----------|-----------|-----------|
| Belt Thickness                                        | 2 mm           |         |           |           |           |
| Standard Roll Length ( $\pm 1\%$ )                    | 100 m          |         |           |           |           |
| Standard Color                                        | Black          |         |           |           |           |
| Width Tolerance                                       |                |         |           |           |           |
| up to 50 mm Width                                     | $\pm 0.75$ mm  |         |           |           |           |
| > 50 mm Width                                         | $\pm 1.0$ mm   |         |           |           |           |
| Minimum Welded Belt Length                            |                |         |           |           |           |
| up to 100 mm Width                                    | 880 mm         |         |           |           |           |
| > 100 mm Width                                        | 960 mm         |         |           |           |           |
| Minimum Pulley Diameter                               | 48 mm          |         |           |           |           |
| Minimum Back Bend Diameter                            | 72 mm          |         |           |           |           |
| Specific Belt Mass $m_{sp}$                           | 0.0022 kg/m/mm |         |           |           |           |
| Standard Width [mm]                                   | 25             | 50      | 75        | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]   | 16 158         | 33 449  | 50 713    | 67 977    | 102 505   |
| Allowable Belt Force<br>$F_{1all}$ [N] Open Ended     | 2 188          | 4 521   | 6 854     | 9 188     | 13 854    |
| Allowable Belt Force<br>$F_{1all}$ [N] Endless Welded | 1 094          | 2 260   | 3 427     | 4 594     | 6 927     |
| Specific Belt Stiffness $c_{sp}$ [N]                  | 437 500        | 904 167 | 1 370 833 | 1 837 500 | 2 770 833 |

#### GATES BFL20 ↔ RHV

|                                                       |                |           |           |           |           |
|-------------------------------------------------------|----------------|-----------|-----------|-----------|-----------|
| Belt Thickness                                        | 2 mm           |           |           |           |           |
| Standard Roll Length ( $\pm 1\%$ )                    | 100 m          |           |           |           |           |
| Standard Color                                        | Black          |           |           |           |           |
| Width Tolerance                                       |                |           |           |           |           |
| up to 50 mm Width                                     | $\pm 0.75$ mm  |           |           |           |           |
| > 50 mm Width                                         | $\pm 1.0$ mm   |           |           |           |           |
| Minimum Welded Belt Length                            |                |           |           |           |           |
| up to 100 mm Width                                    | 880 mm         |           |           |           |           |
| > 100 mm Width                                        | 960 mm         |           |           |           |           |
| Minimum Pulley Diameter                               | 38 mm          |           |           |           |           |
| Minimum Back Bend Diameter                            | 57 mm          |           |           |           |           |
| Specific Belt Mass $m_{sp}$                           | 0.0035 kg/m/mm |           |           |           |           |
| Standard Width [mm]                                   | 25             | 50        | 75        | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]   | 12 975         | 26 815    | 40 655    | 54 495    | 82 175    |
| Allowable Belt Force<br>$F_{1all}$ [N] Open Ended     | 4 320          | 8 928     | 13 536    | 18 144    | 27 360    |
| Allowable Belt Force<br>$F_{1all}$ [N] Endless Welded | 2 160          | 4 464     | 6 768     | 9 072     | 13 680    |
| Specific Belt Stiffness $c_{sp}$ [N]                  | 864 000        | 1 785 600 | 2 707 200 | 3 628 800 | 5 472 000 |

# BFL20

## GATES BFL20 ↔ NIRO

|                                      |                |           |           |           |           |
|--------------------------------------|----------------|-----------|-----------|-----------|-----------|
| Belt Thickness                       | 2 mm           |           |           |           |           |
| Standard Roll Length (± 1%)          | 100 m          |           |           |           |           |
| Standard Color                       | Black          |           |           |           |           |
| Width Tolerance                      | ± 0.75 mm      |           |           |           |           |
| up to 50 mm Width                    | ± 1.0 mm       |           |           |           |           |
| > 50 mm Width                        |                |           |           |           |           |
| Minimum Welded Belt Length           | 880 mm         |           |           |           |           |
| up to 100 mm Width                   | 960 mm         |           |           |           |           |
| > 100 mm Width                       |                |           |           |           |           |
| Minimum Pulley Diameter              | 64 mm          |           |           |           |           |
| Minimum Back Bend Diameter           | 96 mm          |           |           |           |           |
| Specific Belt Mass $m_{sp}$          | 0.0037 kg/m/mm |           |           |           |           |
| Standard Width [mm]                  | 25             | 50        | 75        | 100       | 150       |
| Tensile Strength (Average Value)     |                |           |           |           |           |
| $F_{Break}$ [N]                      | 10 688         | 22 088    | 33 488    | 44 888    | 67 688    |
| Allowable Belt Force                 |                |           |           |           |           |
| $F_{1all}$ [N] Open Ended            | 3 507          | 7 248     | 10 989    | 14 730    | 22 212    |
| Allowable Belt Force                 |                |           |           |           |           |
| $F_{1all}$ [N] Endless Welded        | 1 754          | 3 624     | 5 495     | 7 365     | 11 106    |
| Specific Belt Stiffness $c_{sp}$ [N] | 701 438        | 1 449 639 | 2 197 839 | 2 946 040 | 4 442 441 |

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION



## LINEAR BELTS

# FLAT BELTS BLACK-FLAT

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATIONEN

### GATES BFL32 ⇄

|                                                       |                |         |           |           |           |
|-------------------------------------------------------|----------------|---------|-----------|-----------|-----------|
| Belt Thickness                                        | 3.2 mm         |         |           |           |           |
| Standard Roll Length (± 1%)                           | 100 m          |         |           |           |           |
| Standard Color                                        | Black          |         |           |           |           |
| Width Tolerance                                       |                |         |           |           |           |
| up to 50 mm Width                                     | ± 0.5 mm       |         |           |           |           |
| > 50 mm Width                                         | ± 0.75 mm      |         |           |           |           |
| Minimum Welded Belt Length                            |                |         |           |           |           |
| up to 100 mm Width                                    | 880 mm         |         |           |           |           |
| > 100 mm Width                                        | 960 mm         |         |           |           |           |
| Minimum Pulley Diameter                               | 60 mm          |         |           |           |           |
| Minimum Pack Bend Diameter                            | 120 mm         |         |           |           |           |
| Specific Belt Mass $m_{sp}$                           | 0.0044 kg/m/mm |         |           |           |           |
| Standard Width [mm]                                   | 25             | 50      | 75        | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]   | 7 140          | 14 700  | 22 260    | 29 820    | 44 940    |
| Allowable Belt Force<br>$F_{1alt}$ [N] Open Ended     | 2 386          | 4 912   | 7 438     | 9 963     | 15 015    |
| Allowable Belt Force<br>$F_{1alt}$ [N] Endless Welded | 1 193          | 2 456   | 3 719     | 4 982     | 7 508     |
| Specific Belt Stiffness $c_{sp}$ [N]                  | 477 125        | 982 316 | 1 487 507 | 1 992 699 | 3 003 081 |

### GATES BFL32 ⇄ ARAMID

|                                                       |                |         |         |           |           |
|-------------------------------------------------------|----------------|---------|---------|-----------|-----------|
| Belt Thickness                                        | 3.2 mm         |         |         |           |           |
| Standard Roll Length (± 1%)                           | 100 m          |         |         |           |           |
| Standard Color                                        | Black          |         |         |           |           |
| Width Tolerance                                       |                |         |         |           |           |
| up to 50 mm Width                                     | ± 0.5 mm       |         |         |           |           |
| > 50 mm Width                                         | ± 0.75 mm      |         |         |           |           |
| Minimum Welded Belt Length                            |                |         |         |           |           |
| up to 100 mm Width                                    | 880 mm         |         |         |           |           |
| > 100 mm Width                                        | 960 mm         |         |         |           |           |
| Minimum Pulley Diameter                               | 60 mm          |         |         |           |           |
| Minimum Pack Bend Diameter                            | 120 mm         |         |         |           |           |
| Specific Belt Mass $m_{sp}$                           | 0.0037 kg/m/mm |         |         |           |           |
| Standard Width [mm]                                   | 25             | 50      | 75      | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]   | 8 085          | 16 709  | 25 333  | 33 957    | 51 205    |
| Allowable Belt Force<br>$F_{1alt}$ [N] Open Ended     | 1 329          | 2 747   | 4 165   | 5 583     | 8 419     |
| Allowable Belt Force<br>$F_{1alt}$ [N] Endless Welded | 665            | 1 374   | 2 083   | 2 792     | 4 210     |
| Specific Belt Stiffness $c_{sp}$ [N]                  | 265 875        | 549 475 | 833 075 | 1 116 675 | 1 683 875 |

# BFL32

## GATES BFL32 ↔ HF

|                                                                    |                       |           |           |           |           |
|--------------------------------------------------------------------|-----------------------|-----------|-----------|-----------|-----------|
| Belt Thickness                                                     | 3.2 mm                |           |           |           |           |
| Standard Roll Length (± 1%)                                        | 100 m                 |           |           |           |           |
| Standard Color                                                     | Black                 |           |           |           |           |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width              | ± 0.5 mm<br>± 0.75 mm |           |           |           |           |
| Minimum Welded Belt Length<br>up to 100 mm Width<br>> 100 mm Width | 880 mm<br>960 mm      |           |           |           |           |
| Minimum Pulley Diameter                                            | 50 mm                 |           |           |           |           |
| Minimum Pack Bend Diameter                                         | 105 mm                |           |           |           |           |
| Specific Belt Mass $m_{sp}$                                        | 0.0048 kg/m/mm        |           |           |           |           |
| Standard Width [mm]                                                | 25                    | 50        | 75        | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]                | 10 540                | 21 700    | 32 860    | 44 020    | 66 340    |
| Allowable Belt Force<br>$F_{1all}$ [N] Open Ended                  | 2 925                 | 6 022     | 9 119     | 12 216    | 18 410    |
| Allowable Belt Force<br>$F_{1all}$ [N] Endless Welded              | 1 463                 | 3 011     | 4 560     | 6 108     | 9 205     |
| Specific Belt Stiffness $c_{sp}$ [N]                               | 585 000               | 1 204 412 | 1 823 824 | 2 443 235 | 3 682 059 |

## GATES BFL32 ↔ RSL

|                                                                    |                      |           |           |           |           |
|--------------------------------------------------------------------|----------------------|-----------|-----------|-----------|-----------|
| Belt Thickness                                                     | 3.2 mm               |           |           |           |           |
| Standard Roll Length (± 1%)                                        | 100 m                |           |           |           |           |
| Standard Color                                                     | Black                |           |           |           |           |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width              | ± 1.0 mm<br>± 1.5 mm |           |           |           |           |
| Minimum Welded Belt Length<br>up to 100 mm Width<br>> 100 mm Width | 880 mm<br>960 mm     |           |           |           |           |
| Minimum Pulley Diameter                                            | 80 mm                |           |           |           |           |
| Minimum Pack Bend Diameter                                         | 120 mm               |           |           |           |           |
| Specific Belt Mass $m_{sp}$                                        | 0.0062 kg/m/mm       |           |           |           |           |
| Standard Width [mm]                                                | 25                   | 50        | 75        | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]                | 24 220               | 50 170    | 76 120    | 102 070   | 153 970   |
| Allowable Belt Force<br>$F_{1all}$ [N] Open Ended                  | 7 325                | 15 173    | 23 021    | 30 870    | 46 566    |
| Allowable Belt Force<br>$F_{1all}$ [N] Endless Welded              | 3 663                | 7 587     | 11 511    | 15 435    | 23 283    |
| Specific Belt Stiffness $c_{sp}$ [N]                               | 1 465 000            | 3 034 643 | 4 604 286 | 6 173 929 | 9 313 214 |

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# FLAT BELTS BLACK-FLAT

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### GATES BFL32 ⇄ RKV

|                                                       |                |         |           |           |           |
|-------------------------------------------------------|----------------|---------|-----------|-----------|-----------|
| Belt Thickness                                        | 3.2 mm         |         |           |           |           |
| Standard Roll Length ( $\pm 1\%$ )                    | 100 m          |         |           |           |           |
| Standard Color                                        | Black          |         |           |           |           |
| Width Tolerance                                       |                |         |           |           |           |
| up to 50 mm Width                                     | $\pm 1.0$ mm   |         |           |           |           |
| > 50 mm Width                                         | $\pm 1.5$ mm   |         |           |           |           |
| Minimum Welded Belt Length                            |                |         |           |           |           |
| up to 100 mm Width                                    | 880 mm         |         |           |           |           |
| > 100 mm Width                                        | 960 mm         |         |           |           |           |
| Minimum Pulley Diameter                               | 80 mm          |         |           |           |           |
| Minimum Back Bend Diameter                            | 120 mm         |         |           |           |           |
| Specific Belt Mass $m_{sp}$                           | 0.0035 kg/m/mm |         |           |           |           |
| Standard Width [mm]                                   | 25             | 50      | 75        | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]   | 21 798         | 45 153  | 65 508    | 91 863    | 138 573   |
| Allowable Belt Force<br>$F_{1alt}$ [N] Open Ended     | 2 188          | 4 531   | 6 875     | 9 219     | 13 906    |
| Allowable Belt Force<br>$F_{1alt}$ [N] Endless Welded | 1 094          | 2 266   | 3 438     | 4 609     | 6 953     |
| Specific Belt Stiffness $c_{sp}$ [N]                  | 437 500        | 906 250 | 1 375 000 | 1 843 750 | 2 781 250 |

### GATES BFL32 ⇄ RHF

|                                                       |                |           |           |           |           |
|-------------------------------------------------------|----------------|-----------|-----------|-----------|-----------|
| Belt Thickness                                        | 3.2 mm         |           |           |           |           |
| Standard Roll Length ( $\pm 1\%$ )                    | 100 m          |           |           |           |           |
| Standard Color                                        | Black          |           |           |           |           |
| Width Tolerance                                       |                |           |           |           |           |
| up to 50 mm Width                                     | $\pm 1.0$ mm   |           |           |           |           |
| > 50 mm Width                                         | $\pm 1.5$ mm   |           |           |           |           |
| Minimum Welded Belt Length                            |                |           |           |           |           |
| up to 100 mm Width                                    | 880 mm         |           |           |           |           |
| > 100 mm Width                                        | 960 mm         |           |           |           |           |
| Minimum Pulley Diameter                               | 64 mm          |           |           |           |           |
| Minimum Back Bend Diameter                            | 96 mm          |           |           |           |           |
| Specific Belt Mass $m_{sp}$                           | 0.0066 kg/m/mm |           |           |           |           |
| Standard Width [mm]                                   | 25             | 50        | 75        | 100       | 150       |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N]   | 26 950         | 55 825    | 84 700    | 113 575   | 171 325   |
| Allowable Belt Force<br>$F_{1alt}$ [N] Open Ended     | 6 349          | 13 151    | 19 953    | 26 755    | 40 360    |
| Allowable Belt Force<br>$F_{1alt}$ [N] Endless Welded | 3 174          | 6 575     | 9 977     | 13 378    | 20 180    |
| Specific Belt Stiffness $c_{sp}$ [N]                  | 1 269 750      | 2 630 196 | 3 990 643 | 5 351 089 | 8 071 982 |

# BFL32/38/48

## GATES BFL38 ◀▶

|                                                     |                |           |           |           |            |
|-----------------------------------------------------|----------------|-----------|-----------|-----------|------------|
| Belt Thickness                                      | 3.8 mm         |           |           |           |            |
| Standard Roll Length ( $\pm 1\%$ )                  | 50 m           |           |           |           |            |
| Standard Color                                      | Black          |           |           |           |            |
| Width Tolerance                                     | $\pm 2.0$ mm   |           |           |           |            |
| Minimum Welded Belt Length                          | No Welding     |           |           |           |            |
| Minimum Pulley Diameter                             | 160 mm         |           |           |           |            |
| Minimum Back Bend Diameter                          | 160 mm         |           |           |           |            |
| Specific Belt Mass $m_{sp}$                         | 0.0079 kg/m/mm |           |           |           |            |
| Standard Width [mm]                                 | 25             | 50        | 75        | 100       | 150        |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N] | 33 600         | 70 400    | 107 200   | 144 000   | 217 600    |
| Allowable Belt Force<br>$F_{1all}$ [N] Open Ended   | 8 892          | 19 563    | 29 345    | 40 016    | 60 469     |
| Specific Belt Stiffness $c_{sp}$ [N]                | 1 778 498      | 3 912 696 | 5 869 043 | 8 003 241 | 12 093 786 |

## GATES BFL48 ◀▶

|                                                     |                |           |           |            |            |
|-----------------------------------------------------|----------------|-----------|-----------|------------|------------|
| Belt Thickness                                      | 4.8 mm         |           |           |            |            |
| Standard Roll Length (Tolerance $\pm 1\%$ )         | 50 m           |           |           |            |            |
| Standard Color                                      | Black          |           |           |            |            |
| Width Tolerance                                     | $\pm 2.0$ mm   |           |           |            |            |
| Minimum Welded Belt Length                          | No Welding     |           |           |            |            |
| Minimum Pulley Diameter                             | 150 mm         |           |           |            |            |
| Minimum Back Bend Diameter                          | 225 mm         |           |           |            |            |
| Specific Belt Mass $m_{sp}$                         | 0.0108 kg/m/mm |           |           |            |            |
| Standard Width [mm]                                 | 25             | 50        | 75        | 100        | 150        |
| Tensile Strength (Average Value)<br>$F_{Break}$ [N] | 45 000         | 97 500    | 150 000   | 202 500    | 307 500    |
| Allowable Belt Force<br>$F_{1all}$ [N] Open Ended   | 13 378         | 28 986    | 44 594    | 60 201     | 91 417     |
| Specific Belt Stiffness $c_{sp}$ [N]                | 2 675 622      | 5 797 181 | 8 918 740 | 12 040 299 | 18 283 417 |

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### CLAMP CONNECTION FIX-FLAT

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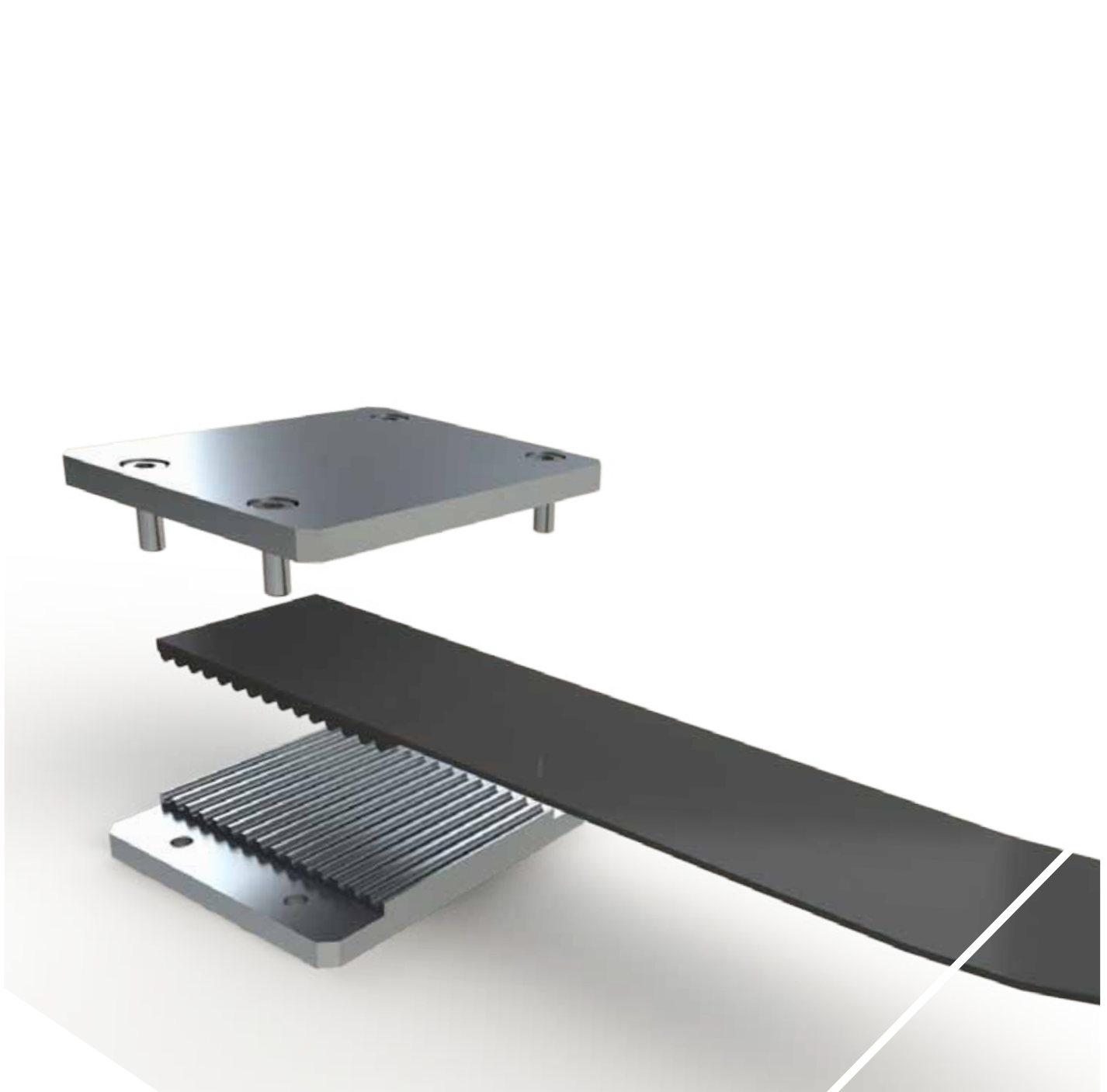
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## **FIX-FLAT — The new Flat Belt Clamp holds all Types of Flat Belts easily and safely!**

With our latest, patent pending process, you can clamp all belts easily, quickly and safely. The FIX-FLAT process is suitable for all BLACK-FLAT belt constructions. More information is available on request!

### FEATURES

- › Suitable for all types of flat belts.
- › Easy
- › Safe
- › Fast

### CONTACT:

- › Phone: +49 (0)6157 9727-0
- › E-Mail: [Info-Pfungstadt@gates.com](mailto:Info-Pfungstadt@gates.com)

## LINEAR BELTS

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Gates Wide Belts are commonly used in applications which require an exact product positioning. A parallel construction of high strength aramid cords ensure even tension and smooth running characteristics. The belt construction of high-strength polyurethane is cut resistant and non-marking. Those belts stand out in addition of easy cleaning and smooth belt drive and are ideal replacement for plastic modular belts and conveyor belts.

### ATTRIBUTES

- › Easy to clean
- › Cut resistant
- › Widths up to 450 mm available
- › Suitable for synchronous conveying applications
- › No cord exposure at the edges of the belt
- › Low-noise, smooth operation
- › FDA approval for: WT10 / WH and GMT3™
- › EU food approval for: GMT3™

### APPLICATIONS

- › Synchronous conveying applications
- › Bulk conveying
- › Food and confectionary conveying
- › Clean room or wash down environments
- › Hygienic applications

### PROCESSING OPTIONS

- › Backings *Further information on page 124*
- › Profiles *Further information on page 138*
- › Special processing *Further information on page 146*

| WIDE BELTS | FABRIC BACKING |                                |                          |                                 | POLYURETHANE  |               |                            |                               |                               | Page |
|------------|----------------|--------------------------------|--------------------------|---------------------------------|---------------|---------------|----------------------------|-------------------------------|-------------------------------|------|
|            | No Fabric      | NT-Polyamide Fabric Tooth Side | NB-Polyamide Fabric Back | NTB-Polyamide Fabric Both Sides | R1-92 Shore A | R2-85 Shore A | R4-94 Shore A / Antistatic | EU85-85 Shore A / EU-Approval | EU92-92 Shore A / EU-Approval |      |
| WH         | ●              | ●                              | ●                        | ●                               | ●             | ●             |                            | ●                             | ●                             | 89   |
| WT10       | ●              | ●                              | ●                        | ●                               | ●             | ●             |                            | ●                             | ●                             | 91   |
| GMT3™      |                |                                |                          |                                 |               | ●             |                            | ●                             | ●                             | 93   |

- STANDARD
- ON REQUEST

Specifications can change without prior notice.

Please contact our Applications Engineering for specific „minus“ and length tolerances.

For further configurations please contact our Application Consulting.

Please find used abbreviations on page 162.



## LINEAR BELTS

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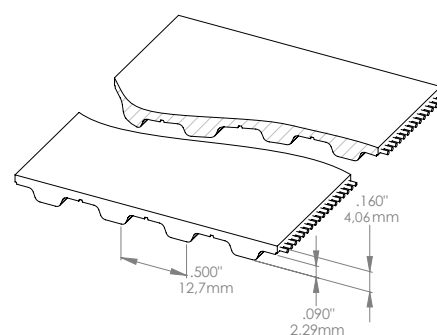
ENDLESS BELTS

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|                                           |                     |
|-------------------------------------------|---------------------|
| Pitch                                     | 0.500" / 12.7 mm    |
| Standard Color                            | CLEAR               |
| Standard Roll Length ( $\pm 1\%$ )        | 200 feet / 61 m     |
| Width Tolerance                           | + 1.0 mm / - 2.0 mm |
| Sitting Lanes                             | 2.5" / 63.5 mm      |
| Minimum Welded Belt Length                | 43.5" / 1 104.9 mm  |
| Minimum Number of Pulley Teeth $z_{\min}$ | 14                  |
| Minimum Pulley Diameter                   | 2.23" / 56.64 mm    |
| Minimum Back Bend Diameter                | 3.12" / 79.24 mm    |
| FDA Approval                              | Yes                 |



| Standard Width (Inch)                              | 6       | 8         | 10        | 12        | 13        | 18        |
|----------------------------------------------------|---------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |           |           |           |           |           |
| Aramid                                             | 21 021  | 28 028    | 35 574    | 42 581    | 46 354    | 64 141    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |           |           |           |           |           |
| Aramid                                             | 3 180   | 4 240     | 5 300     | 6 360     | 6 890     | 9 540     |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |           |           |           |           |           |
| Aramid                                             | 2 385   | 3 180     | 3 975     | 4 770     | 5 168     | 7 155     |
| Allowable Effective Force $F_{eall}$ (N)           |         |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 8 820   | 11 760    | 14 700    | 17 640    | 19 110    | 26 460    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |           |           |           |           |           |
| Aramid                                             | 0.0033  |           |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |           |           |           |           |           |
| Aramid                                             | 795 000 | 1 060 000 | 1 325 000 | 1 590 000 | 1 722 500 | 2 385 000 |

## LINEAR BELTS

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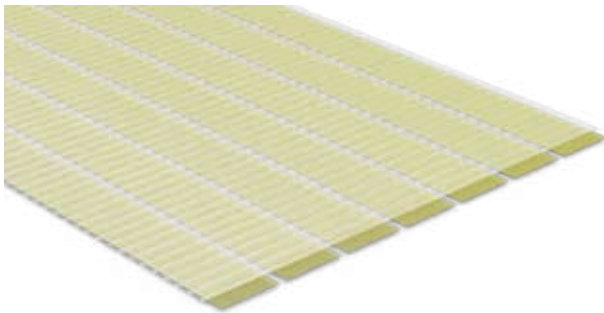
FLAT BELTS

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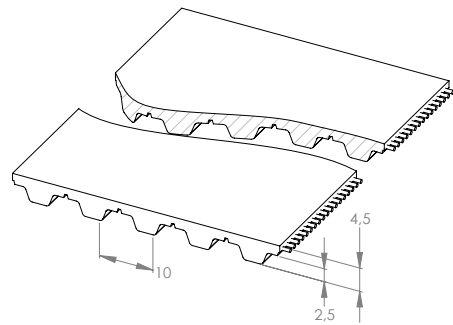
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|                                           |                     |
|-------------------------------------------|---------------------|
| Pitch                                     | 10 mm               |
| Standard Color                            | CLEAR               |
| Standard Roll Length ( $\pm 1\%$ )        | 60 m                |
| Width Tolerance                           | + 1.0 mm / - 2.0 mm |
| Sitting Lanes                             | 64 mm               |
| Minimum Welded Belt Length                | 1 100 mm            |
| Minimum Number of Pulley Teeth $z_{\min}$ | 14                  |
| Minimum Pulley Diameter                   | 44.56 mm            |
| Minimum Back Bend Diameter                | 80 mm               |
| FDA Approval                              | Yes                 |

# WT10



| Standard Width (mm)                                | 150     | 200       | 250       | 300       | 325       | 450       |
|----------------------------------------------------|---------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |           |           |           |           |           |
| Aramid                                             | 21 021  | 28 028    | 35 574    | 42 581    | 46 354    | 64 141    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |           |           |           |           |           |
| Aramid                                             | 3 180   | 4 240     | 5 300     | 6 360     | 6 890     | 9 540     |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |           |           |           |           |           |
| Aramid                                             | 2 385   | 3 180     | 3 975     | 4 770     | 5 168     | 7 155     |
| Allowable Effective Force $F_{eall}$ (N)           |         |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                     | 7 500   | 10 000    | 12 500    | 15 000    | 16 250    | 22 500    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |           |           |           |           |           |
| Aramid                                             | 0.0039  |           |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |           |           |           |           |           |
| Aramid                                             | 795 000 | 1 060 000 | 1 325 000 | 1 590 000 | 1 722 500 | 2 385 000 |

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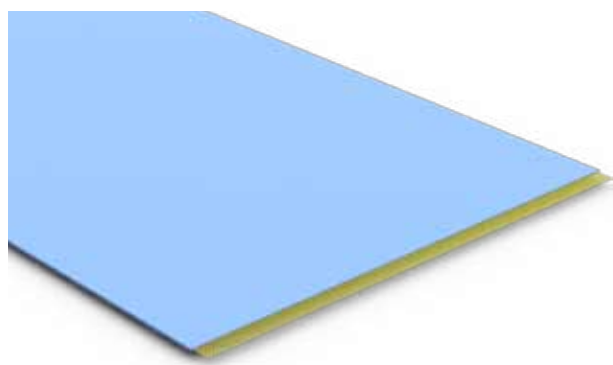
FLAT BELTS

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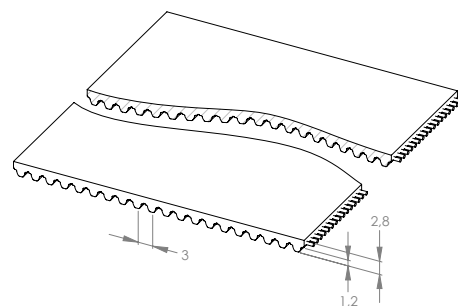
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|                                           |                       |
|-------------------------------------------|-----------------------|
| Pitch                                     | 3 mm                  |
| Standard Color                            | Blue                  |
| Standard Roll Length ( $\pm 1\%$ )        | 60 m                  |
| Width Tolerance                           | + 1.0 mm / - 2.0 mm   |
| Sitting Lanes                             | Without Sitting Lanes |
| Minimum Welded Belt Length                | 1 200 mm              |
| Minimum Number of Pulley Teeth $z_{\min}$ | 19                    |
| Minimum Pulley Diameter                   | 19 mm                 |
| Minimum Back Bend Diameter                | 30 mm                 |
| FDA/EU Approval                           | Yes                   |

# GMT3™



| Standard Width (mm)                                | 50      | 100     | 150     | 200     | 250     | 300     | 450       |
|----------------------------------------------------|---------|---------|---------|---------|---------|---------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N)   |         |         |         |         |         |         |           |
| Aramid                                             | 3 861   | 7 847   | 11 833  | 15 819  | 19 804  | 24 039  | 35 747    |
| Allowable Belt Force $F_{1all}$ (N) Open Ended     |         |         |         |         |         |         |           |
| Aramid                                             | 587     | 1 174   | 1 761   | 2 348   | 2 935   | 3 522   | 5 283     |
| Allowable Belt Force $F_{1all}$ (N) Endless Welded |         |         |         |         |         |         |           |
| Aramid                                             | 440     | 881     | 1 321   | 1 761   | 2 201   | 2 642   | 3 962     |
| Allowable Effective Force $F_{eall}$ (N)           |         |         |         |         |         |         |           |
| (Minimum 15 teeth are in mesh)                     | 700     | 1 400   | 2 100   | 2 800   | 3 500   | 4 200   | 6 300     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)              |         |         |         |         |         |         |           |
| Aramid                                             | 0.0020  |         |         |         |         |         |           |
| Specific Belt Stiffness $c_{sp}$ (N)               |         |         |         |         |         |         |           |
| Aramid                                             | 146 750 | 293 500 | 440 250 | 587 000 | 733 750 | 880 500 | 1 320 750 |

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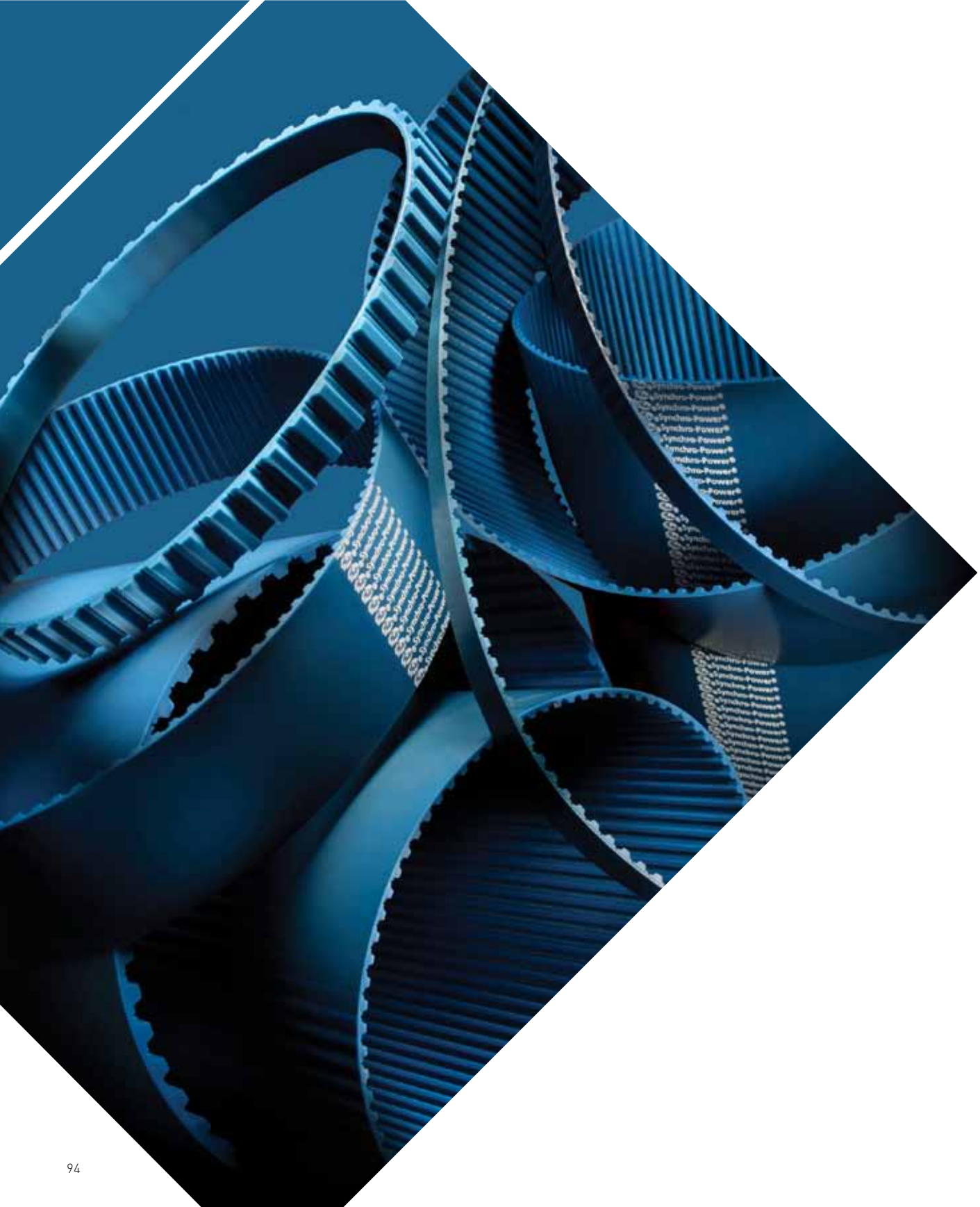
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ENDLESS BELTS

**GATES SYNCHRO-POWER® -  
TRULY ENDLESS (CAST) BELTS**



Certain power transmission and high performance positioning applications require more strength and stiffness than a welded belt can provide. Gates offers two types of truly endless belts to meet these demands.

Gates Synchro-Power® Cast Belts are cast on fixed molds and have continuously wounded steel cords. They are manufactured in various exact sizes, constructions and pitches to fulfill customer requirements.

Cast Belts offer premium capacity for power transmissions and linear applications while fitting a broad range of loads, speeds and applications.

#### ATTRIBUTES

- › Molded, thermo-set polyurethane construction
- › Full load and power transmission based on endless cords
- › Excellent abrasion resistance
- › Smooth, low noise, non-marking operation
- › High tooth strength reduces deforming under load
- › Excellent resistance to chemicals

#### APPLICATIONS

- › Paper processing industry
- › Wood processing industry
- › Glass processing industry
- › Textile industry
- › Packaging machines
- › Exercise equipment

#### PROCESSING OPTIONS

- › Backings *Further information on page 124*
- › Special processing *Further information on page 146*

#### FABRICATION CAPABILITIES

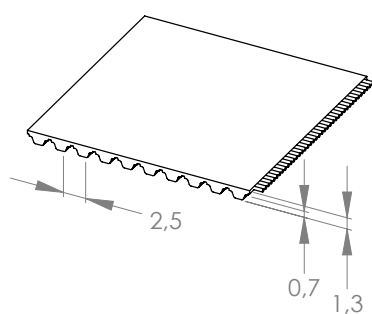
- › Pitches T2,5 / T5 / T10 / DT5 / DT10 / AT5 / AT10
- › Widths 4 mm up to 380 mm
- › Lengths 120 mm up to 2 250 mm
- › Polyurethane 88 Shore A (Standard)
- › Tension members Steel cord (Standard)
- Aramid cord available on request
- › Polyamide fabric Not available

*Further constructions are available on request.*



## ENDLESS BELTS

# GATES SYNCHRO-POWER® - TRULY ENDLESS (CAST) BELTS



|                                          |          |
|------------------------------------------|----------|
| Pitch                                    | 2.5 mm   |
| Standard Color                           | Blue     |
| Width Tolerance complete Sleeve          | ± 3.0 mm |
| Minimum Number of Pulley Teeth $z_{min}$ | 12       |
| Minimum Pulley Diameter                  | 9,55 mm  |
| Minimum Back Bend Diameter               | 20 mm    |
| FDA/EU Approval                          | No       |

| Standard Width (mm)                              | 4   | 6   | 10  | 12    | 16    | 20    | 25    | 32    | 50    |
|--------------------------------------------------|-----|-----|-----|-------|-------|-------|-------|-------|-------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |     |     |     |       |       |       |       |       |       |
| Steel                                            | 330 | 535 | 990 | 1 195 | 1 670 | 2 085 | 2 670 | 3 390 | 5 395 |
| Allowable Belt Force $F_{1all}$ (N)              |     |     |     |       |       |       |       |       |       |
| Steel                                            | 83  | 134 | 248 | 299   | 418   | 521   | 668   | 848   | 1 349 |
| Allowable Effective Force $F_{eall}$ (N)         |     |     |     |       |       |       |       |       |       |
| (Minimum 15 teeth are in mesh)                   | 43  | 65  | 108 | 130   | 173   | 216   | 270   | 346   | 540   |

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# T2.5

| Länge (mm) | Width (mm) | No. of Teeth |
|------------|------------|--------------|
| 120        | 200        | 48           |
| 145        | 200        | 59           |
| 160        | 200        | 64           |
| 177.5      | 200        | 71           |
| 180        | 200        | 72           |
| 200        | 200        | 80           |
| 210        | 200        | 84           |
| 230        | 200        | 92           |
| 245        | 200        | 98           |
| 265        | 200        | 106          |
| 277.5      | 200        | 111          |
| 285        | 200        | 114          |
| 290        | 200        | 116          |
| 305        | 200        | 122          |

| Länge (mm) | Width (mm) | No. of Teeth |
|------------|------------|--------------|
| 317.5      | 200        | 127          |
| 330        | 380        | 132          |
| 342.5      | 200        | 137          |
| 380        | 380        | 152          |
| 420        | 380        | 168          |
| 480        | 380        | 192          |
| 500        | 380        | 200          |
| 540        | 380        | 216          |
| 600        | 380        | 240          |
| 620        | 380        | 248          |
| 650        | 380        | 260          |
| 780        | 380        | 312          |
| 915        | 380        | 366          |
| 950        | 380        | 380          |

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## ENDLESS BELTS

# GATES SYNCHRO-POWER® - TRULY ENDLESS (CAST) BELTS

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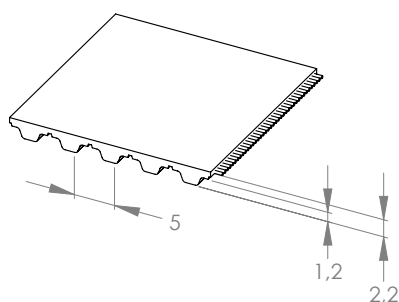
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|                                          |          |
|------------------------------------------|----------|
| Pitch                                    | 5 mm     |
| Standard Color                           | Blue     |
| Width Tolerance complete Sleeve          | ± 3.0 mm |
| Minimum Number of Pulley Teeth $z_{min}$ | 10       |
| Minimum Pulley Diameter                  | 15,91 mm |
| Minimum Back Bend Diameter               | 30 mm    |
| FDA/EU Approval                          | No       |

| Standard Width (mm)                              | 6      | 10     | 12      | 16      | 20      | 25      | 32      | 50      | 75      |
|--------------------------------------------------|--------|--------|---------|---------|---------|---------|---------|---------|---------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |        |        |         |         |         |         |         |         |         |
| Steel                                            | 870    | 1 495  | 1 870   | 2 640   | 3 350   | 4 240   | 5 500   | 8 590   | 13 180  |
| Allowable Belt Force $F_{1all}$ (N)              |        |        |         |         |         |         |         |         |         |
| Steel                                            | 202    | 336    | 403     | 538     | 672     | 840     | 1 075   | 1 680   | 2 520   |
| Allowable Effective Force $F_{eall}$ (N)         |        |        |         |         |         |         |         |         |         |
| (Minimum 15 teeth are in mesh)                   | 214    | 356    | 427     | 570     | 712     | 890     | 1 139   | 1 780   | 2 670   |
| Specific Belt Stiffness $c_{sp}$ (N)             |        |        |         |         |         |         |         |         |         |
| Steel                                            | 50 400 | 84 000 | 100 800 | 134 400 | 168 000 | 210 000 | 268 800 | 420 000 | 630 000 |

# T5

| Länge (mm) | Width (mm) | No. of Teeth |
|------------|------------|--------------|
| 165        | 200        | 33           |
| 185        | 200        | 37           |
| 200        | 200        | 40           |
| 215        | 200        | 43           |
| 220        | 200        | 44           |
| 225        | 200        | 45           |
| 245        | 200        | 49           |
| 250        | 200        | 50           |
| 255        | 200        | 51           |
| 260        | 200        | 52           |
| 270        | 200        | 54           |
| 275        | 200        | 55           |
| 280        | 200        | 56           |
| 295        | 200        | 59           |
| 300        | 200        | 60           |
| 305        | 200        | 61           |
| 320        | 200        | 64           |
| 325        | 380        | 65           |
| 330        | 380        | 66           |
| 340        | 380        | 68           |
| 350        | 380        | 70           |
| 355        | 380        | 71           |
| 365        | 380        | 73           |
| 375        | 380        | 75           |
| 390        | 380        | 78           |

| Länge (mm) | Width (mm) | No. of Teeth |
|------------|------------|--------------|
| 400        | 380        | 80           |
| 410        | 380        | 82           |
| 420        | 380        | 84           |
| 425        | 380        | 85           |
| 430        | 380        | 86           |
| 440        | 380        | 88           |
| 445        | 380        | 89           |
| 450        | 380        | 90           |
| 455        | 380        | 91           |
| 460        | 380        | 92           |
| 475        | 380        | 95           |
| 480        | 380        | 96           |
| 500        | 380        | 100          |
| 510        | 380        | 102          |
| 525        | 380        | 105          |
| 545        | 380        | 109          |
| 550        | 380        | 110          |
| 560        | 380        | 112          |
| 575        | 380        | 115          |
| 590        | 380        | 118          |
| 600        | 380        | 120          |
| 610        | 380        | 122          |
| 620        | 380        | 124          |
| 625        | 380        | 125          |
| 630        | 380        | 126          |

| Länge (mm) | Width (mm) | No. of Teeth |
|------------|------------|--------------|
| 640        | 380        | 128          |
| 650        | 380        | 130          |
| 660        | 380        | 132          |
| 675        | 380        | 135          |
| 690        | 380        | 138          |
| 700        | 380        | 140          |
| 720        | 380        | 144          |
| 725        | 380        | 145          |
| 750        | 380        | 150          |
| 780        | 380        | 156          |
| 800        | 380        | 160          |
| 815        | 380        | 163          |
| 840        | 380        | 168          |
| 850        | 380        | 170          |
| 900        | 380        | 180          |
| 940        | 380        | 188          |
| 990        | 380        | 198          |
| 1 000      | 380        | 200          |
| 1 075      | 380        | 215          |
| 1 100      | 380        | 220          |
| 1 215      | 380        | 243          |
| 1 315      | 380        | 263          |
| 1 350      | 380        | 270          |
| 1 380      | 380        | 276          |
| 1 440      | 380        | 288          |

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## ENDLESS BELTS

# GATES SYNCHRO-POWER® - TRULY ENDLESS (CAST) BELTS

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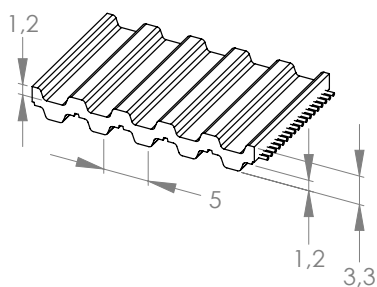
FLAT BELTS

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|                                          |          |
|------------------------------------------|----------|
| Pitch                                    | 5 mm     |
| Standard Color                           | Blue     |
| Width Tolerance complete Sleeve          | ± 3.0 mm |
| Minimum Number of Pulley Teeth $z_{min}$ | 10       |
| Minimum Pulley Diameter                  | 15.91 mm |
| Minimum Back Bend Diameter               | 15.91 mm |
| FDA/EU Approval                          | No       |

| Standard Width (mm)                              | 6      | 10     | 12      | 16      | 20      | 25      | 32      | 50      | 75      |
|--------------------------------------------------|--------|--------|---------|---------|---------|---------|---------|---------|---------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |        |        |         |         |         |         |         |         |         |
| Steel                                            | 870    | 1 495  | 1 870   | 2 640   | 3 350   | 4 240   | 5 500   | 8 590   | 13 180  |
| Allowable Belt Force $F_{1alt}$ (N)              |        |        |         |         |         |         |         |         |         |
| Steel                                            | 202    | 336    | 403     | 538     | 672     | 840     | 1 075   | 1 680   | 2 520   |
| Allowable Effective Force $F_{eall}$ (N)         |        |        |         |         |         |         |         |         |         |
| (Minimum 15 teeth are in mesh)                   | 214    | 356    | 427     | 570     | 712     | 890     | 1 139   | 1 780   | 2 670   |
| Specific Belt Stiffness $c_{sp}$ (N)             |        |        |         |         |         |         |         |         |         |
| Steel                                            | 50 400 | 84 000 | 100 800 | 134 400 | 168 000 | 210 000 | 268 800 | 420 000 | 630 000 |

# DT5

| Length (mm) | Width (mm) | No of Teeth |
|-------------|------------|-------------|
| 300         | 200        | 60          |
| 400         | 200        | 80          |
| 410         | 380        | 82          |
| 450         | 200        | 90          |
| 460         | 380        | 92          |
| 480         | 380        | 96          |
| 500         | 200        | 100         |
| 515         | 380        | 103         |
| 550         | 200        | 110         |
| 590         | 380        | 118         |
| 600         | 200        | 120         |
| 620         | 380        | 124         |
| 650         | 200        | 130         |
| 700         | 200        | 140         |
| 750         | 380        | 150         |
| 815         | 380        | 163         |
| 900         | 200        | 180         |
| 940         | 380        | 188         |
| 1 100       | 380        | 220         |

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## ENDLESS BELTS

# GATES SYNCHRO-POWER® - TRULY ENDLESS (CAST) BELTS

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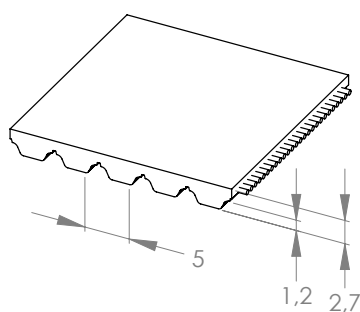
FLAT BELTS

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|                                          |          |
|------------------------------------------|----------|
| Pitch                                    | 5 mm     |
| Standard Color                           | Blue     |
| Width Tolerance complete Sleeve          | ± 3.0 mm |
| Minimum Number of Pulley Teeth $z_{min}$ | 15       |
| Minimum Pulley Diameter                  | 23.87 mm |
| Minimum Back Bend Diameter               | 60 mm    |
| FDA/EU Approval                          | No       |

| Standard Width (mm)                              | 6       | 10      | 12      | 16      | 20      | 25      | 32      | 50      | 75        |
|--------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |         |         |         |         |         |         |         |         |           |
| Steel                                            | 1 410   | 2 865   | 3 720   | 5 110   | 6 560   | 8 300   | 10 785  | 17 090  | 26 200    |
| Allowable Belt Force $F_{1all}$ (N)              |         |         |         |         |         |         |         |         |           |
| Steel                                            | 423     | 704     | 845     | 1 127   | 1 408   | 1 761   | 2 253   | 3 521   | 5 282     |
| Allowable Effective Force $F_{eall}$ (N)         |         |         |         |         |         |         |         |         |           |
| (Minimum 15 teeth are in mesh)                   | 310     | 516     | 619     | 826     | 1 032   | 1 290   | 1 651   | 2 580   | 3 870     |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |         |         |         |         |         |         |         |           |
| Steel                                            | 105 630 | 176 050 | 211 260 | 281 680 | 352 100 | 440 125 | 563 360 | 880 250 | 1 320 375 |

# AT5

| Length (mm) | Width (mm) | No of Teeth |
|-------------|------------|-------------|
| 225         | 200        | 45          |
| 280         | 200        | 56          |
| 300         | 200        | 60          |
| 340         | 380        | 68          |
| 375         | 380        | 75          |
| 390         | 380        | 78          |
| 420         | 380        | 84          |
| 450         | 200        | 90          |
| 455         | 380        | 91          |
| 500         | 380        | 100         |
| 545         | 380        | 109         |
| 600         | 380        | 120         |
| 610         | 380        | 122         |
| 660         | 380        | 132         |
| 710         | 200        | 142         |
| 720         | 380        | 144         |
| 750         | 380        | 150         |
| 780         | 380        | 156         |
| 825         | 380        | 165         |
| 860         | 200        | 172         |
| 975         | 380        | 195         |
| 1 050       | 380        | 210         |
| 1 500       | 380        | 300         |

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## ENDLESS BELTS

# GATES SYNCHRO-POWER® - TRULY ENDLESS (CAST) BELTS

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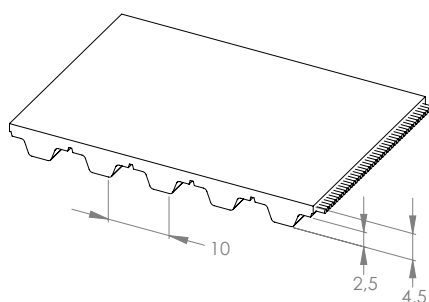
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|                                          |          |
|------------------------------------------|----------|
| Pitch                                    | 10 mm    |
| Standard Color                           | Blue     |
| Width Tolerance complete Sleeve          | ± 3.0 mm |
| Minimum Number of Pulley Teeth $z_{min}$ | 14       |
| Minimum Pulley Diameter                  | 44.56 mm |
| Minimum Back Bend Diameter               | 80 mm    |
| FDA/EU Approval                          | No       |

| Standard Width (mm)                              | 10      | 12      | 16      | 20      | 25      | 32      | 50      | 75        |
|--------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |         |         |         |         |         |         |         |           |
| Steel                                            | 3 350   | 4 195   | 5 910   | 7 585   | 9 700   | 12 580  | 20 190  | 30 710    |
| Allowable Belt Force $F_{tall}$ (N)              |         |         |         |         |         |         |         |           |
| Steel                                            | 763     | 916     | 1 221   | 1 527   | 1 909   | 2 443   | 3 817   | 5 726     |
| Allowable Effective Force $F_{eall}$ (N)         |         |         |         |         |         |         |         |           |
| (Minimum 15 teeth are in mesh)                   | 676     | 811     | 1 082   | 1 352   | 1 690   | 2 163   | 3 380   | 5 070     |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |         |         |         |         |         |         |           |
| Steel                                            | 190 850 | 229 020 | 305 360 | 381 700 | 477 125 | 610 720 | 954 250 | 1 431 375 |

# T10

| Length (mm) | Width (mm) | No. of Teeth |
|-------------|------------|--------------|
| 260         | 200        | 26           |
| 320         | 200        | 32           |
| 370         | 380        | 37           |
| 400         | 380        | 40           |
| 410         | 380        | 41           |
| 440         | 380        | 44           |
| 450         | 380        | 45           |
| 500         | 380        | 50           |
| 530         | 380        | 53           |
| 550         | 200        | 55           |
| 560         | 380        | 56           |
| 600         | 380        | 60           |
| 610         | 380        | 61           |
| 630         | 380        | 63           |
| 650         | 200        | 65           |
| 660         | 380        | 66           |
| 690         | 380        | 69           |
| 700         | 380        | 70           |
| 720         | 380        | 72           |
| 750         | 380        | 75           |
| 780         | 380        | 78           |
| 800         | 380        | 80           |

| Length (mm) | Width (mm) | No. of Teeth |
|-------------|------------|--------------|
| 810         | 380        | 81           |
| 840         | 380        | 84           |
| 850         | 380        | 85           |
| 880         | 380        | 88           |
| 890         | 380        | 89           |
| 900         | 380        | 90           |
| 910         | 380        | 91           |
| 920         | 380        | 92           |
| 950         | 380        | 95           |
| 960         | 380        | 96           |
| 970         | 380        | 97           |
| 980         | 380        | 98           |
| 1 000       | 380        | 100          |
| 1 010       | 380        | 101          |
| 1 050       | 200        | 105          |
| 1 080       | 380        | 108          |
| 1 100       | 380        | 110          |
| 1 140       | 380        | 114          |
| 1 150       | 380        | 115          |
| 1 200       | 200        | 120          |
| 1 210       | 380        | 121          |
| 1 240       | 380        | 124          |

| Length (mm) | Width (mm) | No. of Teeth |
|-------------|------------|--------------|
| 1 250       | 380        | 125          |
| 1 300       | 380        | 130          |
| 1 320       | 380        | 132          |
| 1 350       | 380        | 135          |
| 1 390       | 380        | 139          |
| 1 400       | 380        | 140          |
| 1 420       | 380        | 142          |
| 1 440       | 380        | 144          |
| 1 450       | 380        | 145          |
| 1 460       | 380        | 146          |
| 1 500       | 380        | 150          |
| 1 560       | 380        | 156          |
| 1 600       | 200        | 160          |
| 1 610       | 200        | 161          |
| 1 700       | 200        | 170          |
| 1 750       | 200        | 175          |
| 1 780       | 200        | 178          |
| 1 800       | 200        | 180          |
| 1 880       | 200        | 188          |
| 1 960       | 200        | 196          |
| 2 250       | 200        | 225          |

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# GATES SYNCHRO-POWER® - TRULY ENDLESS (CAST) BELTS

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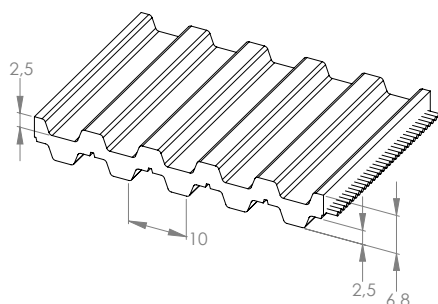
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|                                          |          |
|------------------------------------------|----------|
| Pitch                                    | 10 mm    |
| Standard Color                           | Blue     |
| Width Tolerance complete Sleeve          | ± 3.0 mm |
| Minimum Number of Pulley Teeth $z_{min}$ | 14       |
| Minimum Pulley Diameter                  | 44.56 mm |
| Minimum Back Bend Diameter               | 44.56 mm |
| FDA/EU Approval                          | No       |

| Standard Width (mm)                              | 10      | 12      | 16      | 20      | 25      | 32      | 50      |
|--------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |         |         |         |         |         |         |         |
| Steel                                            | 3 350   | 4 195   | 5 910   | 7 585   | 9 700   | 12 580  | 20 190  |
| Allowable Belt Force $F_{1all}$ (N)              |         |         |         |         |         |         |         |
| Steel                                            | 763     | 916     | 1 221   | 1 527   | 1 909   | 2 443   | 3 817   |
| Allowable Effective Force $F_{eall}$ (N)         |         |         |         |         |         |         |         |
| (Minimum 15 teeth are in mesh)                   | 676     | 811     | 1 082   | 1 352   | 1 690   | 2 163   | 3 380   |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |         |         |         |         |         |         |
| Steel                                            | 190 850 | 229 020 | 305 360 | 381 700 | 477 125 | 610 720 | 954 250 |

# DT10

| Length (mm) | Width (mm) | No of Teeth |
|-------------|------------|-------------|
| 600         | 380        | 60          |
| 630         | 200        | 63          |
| 660         | 200        | 66          |
| 700         | 380        | 70          |
| 750         | 380        | 75          |
| 800         | 380        | 80          |
| 840         | 200        | 84          |
| 900         | 380        | 90          |
| 980         | 200        | 98          |
| 1 000       | 380        | 100         |
| 1 100       | 380        | 110         |
| 1 200       | 380        | 120         |
| 1 210       | 200        | 121         |
| 1 300       | 380        | 130         |
| 1 320       | 200        | 132         |
| 1 420       | 200        | 142         |
| 1 600       | 380        | 160         |
| 1 610       | 200        | 161         |
| 1 700       | 380        | 170         |
| 1 880       | 200        | 188         |

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## ENDLESS BELTS

# GATES SYNCHRO-POWER® - TRULY ENDLESS (CAST) BELTS

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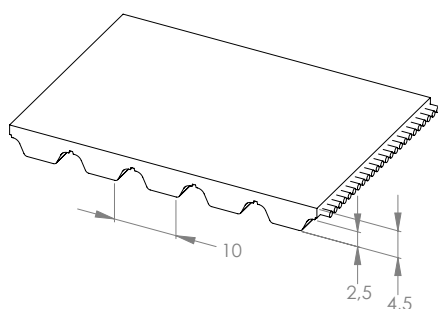
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|                                          |          |
|------------------------------------------|----------|
| Pitch                                    | 10 mm    |
| Standard Color                           | Blue     |
| Width Tolerance complete Sleeve          | ± 3.0 mm |
| Minimum Number of Pulley Teeth $z_{min}$ | 15       |
| Minimum Pulley Diameter                  | 47.75 mm |
| Minimum Back Bend Diameter               | 120 mm   |
| FDA/EU Approval                          | No       |

| Standard Width (mm)                              | 10    | 12    | 16    | 20     | 25     | 32     | 50     | 75     |
|--------------------------------------------------|-------|-------|-------|--------|--------|--------|--------|--------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |       |       |       |        |        |        |        |        |
| Steel                                            | 4 750 | 5 700 | 8 565 | 10 485 | 14 305 | 18 100 | 29 485 | 45 575 |
| Allowable Belt Force $F_{Tall}$ (N)              |       |       |       |        |        |        |        |        |
| Steel                                            | 1 496 | 1 796 | 2 394 | 2 993  | 3 741  | 4 788  | 7 482  | 11 223 |
| Allowable Effective Force $F_{eall}$ (N)         |       |       |       |        |        |        |        |        |
| (Minimum 15 teeth are in mesh)                   | 1 032 | 1 238 | 1 651 | 2 064  | 2 580  | 3 302  | 5 160  | 7 740  |
| Specific Belt Stiffness $c_{sp}$ (N)             |       |       |       |        |        |        |        |        |

# AT10

| Length (mm) | Width (mm) | No. of Teeth |
|-------------|------------|--------------|
| 500         | 380        | 50           |
| 560         | 380        | 56           |
| 610         | 380        | 61           |
| 660         | 380        | 66           |
| 700         | 380        | 70           |
| 730         | 380        | 73           |
| 780         | 380        | 78           |
| 800         | 380        | 80           |
| 840         | 380        | 84           |
| 890         | 380        | 89           |
| 920         | 380        | 92           |
| 960         | 380        | 96           |
| 980         | 380        | 98           |
| 1 010       | 380        | 101          |
| 1 050       | 380        | 105          |
| 1 080       | 380        | 108          |
| 1 100       | 200        | 110          |

| Length (mm) | Width (mm) | No. of Teeth |
|-------------|------------|--------------|
| 1 150       | 380        | 115          |
| 1 200       | 380        | 120          |
| 1 210       | 380        | 121          |
| 1 250       | 380        | 125          |
| 1 280       | 200        | 128          |
| 1 320       | 380        | 132          |
| 1 350       | 200        | 135          |
| 1 360       | 200        | 136          |
| 1 400       | 380        | 140          |
| 1 420       | 200        | 142          |
| 1 480       | 200        | 148          |
| 1 500       | 380        | 150          |
| 1 600       | 200        | 160          |
| 1 700       | 200        | 170          |
| 1 800       | 200        | 180          |
| 1 860       | 200        | 186          |
| 1 940       | 200        | 194          |

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## TRULY ENDLESS FLEX BELTS



Flex Belts are truly endless extruded with helically wound steel cords in different sizes, constructions and pitches.

#### ATTRIBUTES

- › Extruded, thermoplastic polyurethane construction
- › High performance and power transmission based on truly endless cords
- › Synchronous tracking

#### APPLICATIONS

- › Wood processing industry
- › Textile industry
- › Conveying machines
- › Foiling machine
- › Power transmission
- › Highly stressed conveying applications

#### PROCESSING OPTIONS

- › Backings *Further information on page 124*
- › Special processing *Further information on page 146*

#### FABRICATION CAPABILITIES

- › Pitches H / T5 / T10 / T20 / AT5 / AT10 / AT20 / ATL10 / ATL20  
HTD®5 / HTD®8 / HTD®14
- › Widths 10 mm up to 100 mm
- › Lengths 1 550 mm up to 23 500 mm
- › Polyurethane 92 Shore A (standard)
- › Tension members Steel cord (standard)
- › Polyamide Fabric Polyamide fabric on tooth side (NT)

*Further constructions are available on request.*



## ENDLESS BELTS

# H

## TRULY ENDLESS FLEX BELTS

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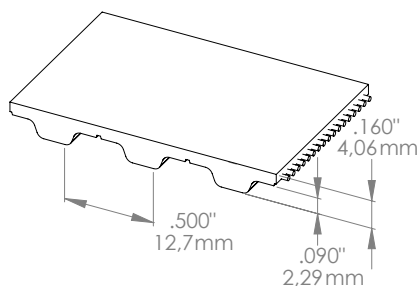
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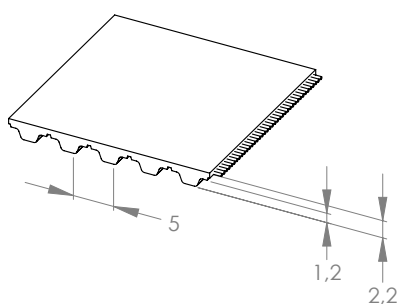
INFORMATION



|                                             |                            |
|---------------------------------------------|----------------------------|
| Pitch                                       | 0.500"                     |
| Standard Color                              | White                      |
| Width Tolerance<br>up to 2" Width           | $\pm 0.020"$ / 0.51 mm     |
| > 2" Width                                  | $\pm 0.030"$ / 0.76 mm     |
| Minimum Number<br>of Pulley Teeth $z_{min}$ | 14                         |
| Minimum Pulley Diameter                     | 2.23" / 56.64 mm           |
| Minimum<br>Back Bend Diameter               | 3.125" / 79.4 mm           |
| Standard Lengths                            | 1 562.1 mm up to 23 495 mm |

| Standard Width (Inch)                            | 0.50    | 0.75    | 1       | 1.5     | 2       | 3         | 4         |
|--------------------------------------------------|---------|---------|---------|---------|---------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |         |         |         |         |         |           |           |
| Steel                                            | 3 360   | 5 040   | 7 140   | 10 920  | 14 700  | 22 260    | 29 820    |
| Allowable Belt Force $F_{1all}$ (N)              |         |         |         |         |         |           |           |
| Steel                                            | 898     | 1 347   | 1 909   | 2 919   | 3 929   | 5 950     | 7 971     |
| Allowable Effective Force $F_{eall}$ (N)         |         |         |         |         |         |           |           |
| (Minimum 15 teeth are in mesh)                   | 980     | 1 470   | 1 960   | 2 940   | 3 920   | 5 880     | 7 840     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |         |         |         |         |         |           |           |
| 0.0039                                           |         |         |         |         |         |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |         |         |         |         |           |           |
| Steel                                            | 224 529 | 336 794 | 477 125 | 729 721 | 982 316 | 1 487 507 | 1 992 699 |

# T5



|                                                       |                               |
|-------------------------------------------------------|-------------------------------|
| Pitch                                                 | 5 mm                          |
| Standard Color                                        | White                         |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width | $\pm 0.5$ mm<br>$\pm 0.75$ mm |
| Minimum Number<br>of Pulley Teeth $z_{min}$           | 10                            |
| Minimum Pulley Diameter                               | 15,91 mm                      |
| Minimum<br>Back Bend Diameter                         | 30 mm                         |
| Standard Lengths                                      | 1 550 mm up to 15 000 mm      |

| Standard Width (mm)                              | 10     | 16      | 25      | 32      | 50      | 75      | 100     |
|--------------------------------------------------|--------|---------|---------|---------|---------|---------|---------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |        |         |         |         |         |         |         |
| Steel                                            | 1 250  | 2 000   | 3 375   | 4 250   | 6 875   | 10 375  | 13 875  |
| Allowable Belt Force $F_{1all}$ (N)              |        |         |         |         |         |         |         |
| Steel                                            | 311    | 498     | 840     | 1 058   | 1 711   | 2 582   | 3 453   |
| Allowable Effective Force $F_{eall}$ (N)         |        |         |         |         |         |         |         |
| (Minimum 15 teeth are in mesh)                   | 356    | 570     | 890     | 1 139   | 1 780   | 2 670   | 3 560   |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |        |         |         |         |         |         |         |
| Steel                                            | 0.0022 |         |         |         |         |         |         |
| Specific Belt Stiffness $c_{sp}$ (N)             |        |         |         |         |         |         |         |
| Steel                                            | 77 778 | 124 444 | 210 000 | 264 444 | 427 778 | 645 556 | 863 333 |

## ENDLESS BELTS

# T10

## TRULY ENDLESS FLEX BELTS

TIMING BELTS

SELF TRACKING

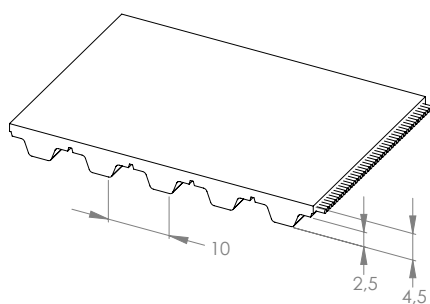
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

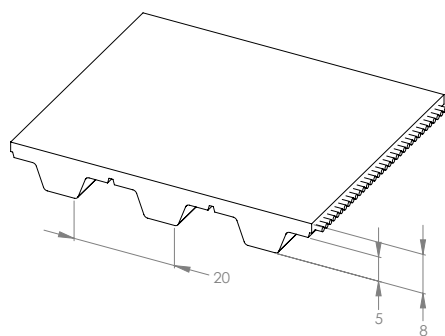
INFORMATION



|                                                       |                               |
|-------------------------------------------------------|-------------------------------|
| Pitch                                                 | 10 mm                         |
| Standard Color                                        | White                         |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width | $\pm 0.5$ mm<br>$\pm 0.75$ mm |
| Minimum Number<br>of Pulley Teeth $z_{min}$           | 14                            |
| Minimum Pulley Diameter                               | 44.56 mm                      |
| Minimum<br>Back Bend Diameter                         | 80 mm                         |
| Standard Lengths                                      | 1 550 mm up to 23 500 mm      |

| Standard Width (mm)                              | 16      | 25      | 32      | 50      | 75        | 100       |
|--------------------------------------------------|---------|---------|---------|---------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |         |         |         |         |           |           |
| Steel                                            | 4 200   | 7 140   | 9 240   | 14 700  | 22 260    | 29 820    |
| Allowable Belt Force $F_{Iall}$ (N)              |         |         |         |         |           |           |
| Steel                                            | 1 123   | 1 909   | 2 470   | 3 929   | 5 950     | 7 971     |
| Allowable Effective Force $F_{eall}$ (N)         |         |         |         |         |           |           |
| (Minimum 15 teeth are in mesh)                   | 1 082   | 1 690   | 2 163   | 3 380   | 5 070     | 6 760     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |         |         |         |         |           |           |
| 0.0043                                           |         |         |         |         |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |         |         |         |           |           |
| Steel                                            | 280 662 | 477 125 | 617 456 | 982 316 | 1 487 507 | 1 992 699 |

# T20



|                                           |                          |
|-------------------------------------------|--------------------------|
| Pitch                                     | 20 mm                    |
| Standard Color                            | White                    |
| Width Tolerance                           | $\pm 1.0$ mm             |
| Minimum Number of Pulley Teeth $z_{\min}$ | 15                       |
| Minimum Pulley Diameter                   | 95.49 mm                 |
| Minimum Back Bend Diameter                | 120 mm                   |
| Standard Lengths                          | 1 550 mm up to 23 500 mm |

| Standard Width (mm)                                     | 32        | 50        | 75        | 100       |
|---------------------------------------------------------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{\text{Break}}$ (N) |           |           |           |           |
| Steel                                                   | 18 050    | 29 450    | 44 650    | 59 850    |
| Allowable Belt Force $F_{\text{Iall}}$ (N)              |           |           |           |           |
| Steel                                                   | 4 739     | 7 731     | 11 722    | 15 712    |
| Allowable Effective Force $F_{\text{eall}}$ (N)         |           |           |           |           |
| (Minimum 15 teeth are in mesh)                          | 4 045     | 6 320     | 9 480     | 12 640    |
| Specific Belt Mass $m_{\text{sp}}$ (kg/m/mm)            |           |           |           |           |
| Steel                                                   | 0.0073    |           |           |           |
| Specific Belt Stiffness $c_{\text{sp}}$ (N)             |           |           |           |           |
| Steel                                                   | 1 184 650 | 1 932 850 | 2 930 450 | 3 928 050 |

## ENDLESS BELTS

# AT5

## TRULY ENDLESS FLEX BELTS

TIMING BELTS

SELF TRACKING

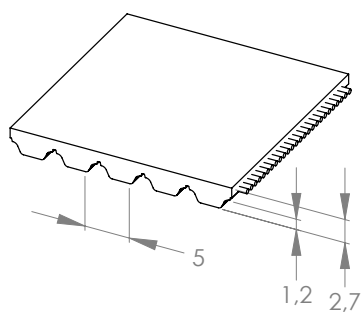
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

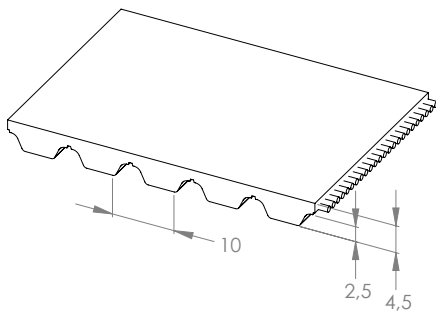
INFORMATION



|                                                       |                               |
|-------------------------------------------------------|-------------------------------|
| Pitch                                                 | 5 mm                          |
| Standard Color                                        | White                         |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width | $\pm 0.5$ mm<br>$\pm 0.75$ mm |
| Minimum Number<br>of Pulley Teeth $z_{min}$           | 15                            |
| Minimum Pulley Diameter                               | 23 87 mm                      |
| Minimum<br>Back Bend Diameter                         | 60 mm                         |
| Standard Lengths                                      | 1 550 mm up to 14 900 mm      |

| Standard Width (mm)                              | 10      | 16      | 25      | 32      | 50      | 75        | 100       |
|--------------------------------------------------|---------|---------|---------|---------|---------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |         |         |         |         |         |           |           |
| Steel                                            | 2 565   | 4 275   | 7 125   | 9 120   | 14 535  | 21 945    | 29 355    |
| Allowable Belt Force $F_{1all}$ (N)              |         |         |         |         |         |           |           |
| Steel                                            | 634     | 1 056   | 1 761   | 2 253   | 3 591   | 5 422     | 7 253     |
| Allowable Effective Force $F_{eall}$ (N)         |         |         |         |         |         |           |           |
| (Minimum 15 teeth are in mesh)                   | 516     | 826     | 1 290   | 1 651   | 2 580   | 3 870     | 5 160     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |         |         |         |         |         |           |           |
| 0.0032                                           |         |         |         |         |         |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |         |         |         |         |           |           |
| Steel                                            | 158 445 | 264 075 | 440 125 | 563 360 | 897 855 | 1 355 585 | 1 813 315 |

# AT10



|                                                       |                               |
|-------------------------------------------------------|-------------------------------|
| Pitch                                                 | 10 mm                         |
| Standard Color                                        | White                         |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width | $\pm 0.75$ mm<br>$\pm 1.0$ mm |
| Minimum Number<br>of Pulley Teeth $z_{\min}$          | 15                            |
| Minimum Pulley Diameter                               | 47.75 mm                      |
| Minimum<br>Back Bend Diameter                         | 120 mm                        |
| Standard Lengths                                      | 1 550 up to 23 500 mm         |

| Standard Width (mm)                                     | 25      | 32        | 50        | 75        | 100       |
|---------------------------------------------------------|---------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{\text{Break}}$ (N) |         |           |           |           |           |
| Steel                                                   | 14 250  | 18 050    | 29 450    | 44 650    | 59 850    |
| Allowable Belt Force $F_{1\text{all}}$ (N)              |         |           |           |           |           |
| Steel                                                   | 3 741   | 4 739     | 7 731     | 11 722    | 15 712    |
| Allowable Effective Force $F_{\text{eall}}$ (N)         |         |           |           |           |           |
| (Minimum 15 teeth are in mesh)                          | 2 580   | 3 302     | 5 160     | 7 740     | 10 320    |
| Specific Belt Mass $m_{\text{sp}}$ (kg/m/mm)            |         |           |           |           |           |
| Steel                                                   | 0.0056  |           |           |           |           |
| Specific Belt Stiffness $c_{\text{sp}}$ (N)             |         |           |           |           |           |
| Steel                                                   | 935 250 | 1 184 650 | 1 932 850 | 2 930 450 | 3 928 050 |

TIMING BELTS

SELF TRACKING

FLST BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## ENDLESS BELTS

# ATL10

## TRULY ENDLESS FLEX BELTS

TIMING BELTS

SELF TRACKING

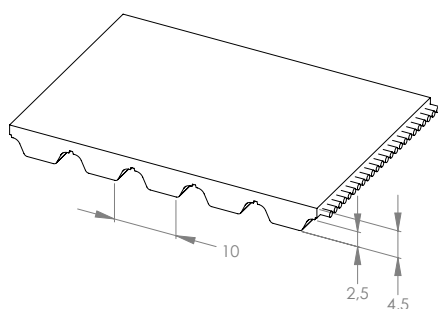
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

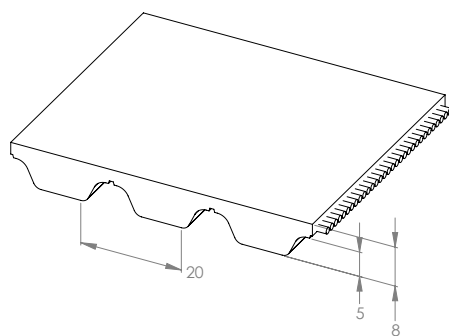
INFORMATION



|                                             |                          |
|---------------------------------------------|--------------------------|
| Pitch                                       | 10 mm                    |
| Standard Color                              | White                    |
| Width Tolerance<br>up to 50 mm Width        | ± 1.0 mm                 |
| > 50 mm Width                               | ± 1.5 mm                 |
| Minimum Number<br>of Pulley Teeth $z_{min}$ | 25                       |
| Minimum Pulley Diameter                     | 79.60 mm                 |
| Minimum<br>Back Bend Diameter               | 150 mm                   |
| Standard Lengths                            | 1 550 mm up to 23 500 mm |

| Standard Width (mm)                              | 10        | 16        | 25        | 32        | 50        |
|--------------------------------------------------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |           |           |           |           |           |
| Steel                                            | 24 220    | 31 140    | 50 170    | 76 120    | 102 070   |
| Allowable Belt Force $F_{Tall}$ (N)              |           |           |           |           |           |
| Steel                                            | 5 860     | 7 534     | 12 139    | 18 417    | 24 696    |
| Allowable Effective Force $F_{eall}$ (N)         |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                   | 2 580     | 3 302     | 5 160     | 7 740     | 10 320    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |           |           |           |           |           |
| 0.0067                                           |           |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |           |           |           |           |           |
| Steel                                            | 1 465 000 | 1 883 571 | 3 034 643 | 4 604 286 | 6 173 929 |

# AT20



|                                                       |                              |
|-------------------------------------------------------|------------------------------|
| Pitch                                                 | 20 mm                        |
| Standard Color                                        | White                        |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width | $\pm 1.0$ mm<br>$\pm 1.5$ mm |
| Minimum Number<br>of Pulley Teeth $z_{min}$           | 18                           |
| Minimum Pulley Diameter                               | 114.59 mm                    |
| Minimum<br>Back Bend Diameter                         | 180 mm                       |
| Standard Lengths                                      | 1 550 mm up to 23 500 mm     |

| Standard Width (mm)                              | 32        | 50        | 75        | 100       |
|--------------------------------------------------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |           |           |           |           |
| Steel                                            | 31 140    | 50 170    | 76 120    | 102 070   |
| Allowable Belt Force $F_{1all}$ (N)              |           |           |           |           |
| Steel                                            | 7 534     | 12 139    | 18 417    | 24 696    |
| Allowable Effective Force $F_{eall}$ (N)         |           |           |           |           |
| (Minimum 15 teeth are in mesh)                   | 6 950     | 10 860    | 16 290    | 21 720    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |           |           |           |           |
| Steel                                            | 0.0099    |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |           |           |           |           |
| Steel                                            | 1 883 571 | 3 034 643 | 4 604 286 | 6 173 929 |



## ENDLESS BELTS

# ATL20

## TRULY ENDLESS FLEX BELTS

TIMING BELTS

SELF TRACKING

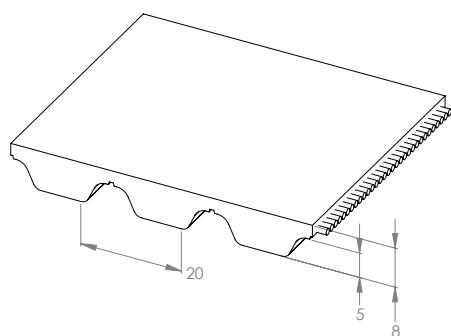
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

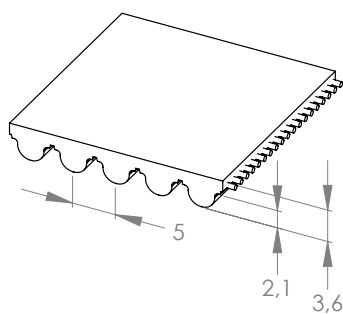
INFORMATION



|                                           |                          |
|-------------------------------------------|--------------------------|
| Pitch                                     | 20 mm                    |
| Standard Color                            | White                    |
| Width Tolerance                           | $\pm 2.0$ mm             |
| Minimum Number of Pulley Teeth $z_{\min}$ | 30                       |
| Minimum Pulley Diameter                   | 190.98 mm                |
| Minimum Back Bend Diameter                | 250 mm                   |
| Standard Lengths                          | 1 550 mm up to 23 500 mm |

| Standard Width (mm)                                     | 32        | 50        | 75        | 100       |
|---------------------------------------------------------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{\text{Break}}$ (N) |           |           |           |           |
| Steel                                                   | 41 600    | 70 400    | 105 600   | 144 000   |
| Allowable Belt Force $F_{\text{tall}}$ (N)              |           |           |           |           |
| Steel                                                   | 9 106     | 15 410    | 23 115    | 31 520    |
| Allowable Effective Force $F_{\text{eall}}$ (N)         |           |           |           |           |
| (Minimum 15 teeth are in mesh)                          | 6 950     | 10 860    | 16 290    | 21 720    |
| Specific Belt Mass $m_{\text{sp}}$ (kg/m/mm)            |           |           |           |           |
|                                                         | 0.0108    |           |           |           |
| Specific Belt Stiffness $c_{\text{sp}}$ (N)             |           |           |           |           |
| Steel                                                   | 2 276 477 | 3 852 500 | 5 778 750 | 7 880 114 |

# HTD®5



|                                                       |                               |
|-------------------------------------------------------|-------------------------------|
| Pitch                                                 | 5 mm                          |
| Standard Color                                        | White                         |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width | $\pm 0.5$ mm<br>$\pm 0.75$ mm |
| Minimum Number<br>of Pulley Teeth $z_{min}$           | 14                            |
| Minimum Pulley Diameter                               | 22.28 mm                      |
| Minimum<br>Back Bend Diameter                         | 60 mm                         |
| Standard Lengths                                      | 1 550 mm up to 14 900 mm      |

| Standard Width (mm)                              | 25      | 50      | 100       |
|--------------------------------------------------|---------|---------|-----------|
| Tensile Strength (Average Value) $F_{break}$ (N) |         |         |           |
| Steel                                            | 7 125   | 14 535  | 29 355    |
| Allowable Belt Force $F_{1all}$ (N)              |         |         |           |
| Steel                                            | 1 761   | 3 591   | 7 253     |
| Allowable Effective Force $F_{eall}$ (N)         |         |         |           |
| (Minimum 15 teeth are in mesh)                   | 1 020   | 2 040   | 4 080     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |         |         |           |
| Steel                                            | 0.0041  |         |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |         |           |
| Steel                                            | 440 125 | 897 855 | 1 813 315 |

## ENDLESS BELTS

# HTD®8

## TRULY ENDLESS FLEX BELTS

TIMING BELTS

SELF TRACKING

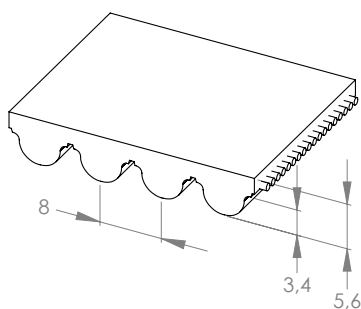
FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

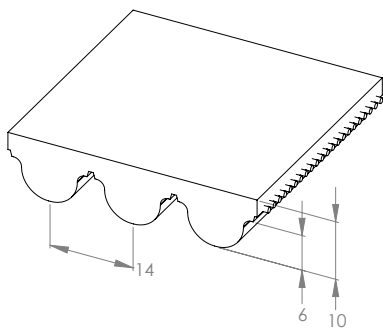
INFORMATION



|                                                       |                               |
|-------------------------------------------------------|-------------------------------|
| Pitch                                                 | 8 mm                          |
| Standard Color                                        | White                         |
| Width Tolerance<br>up to 50 mm Width<br>> 50 mm Width | $\pm 0.75$ mm<br>$\pm 1.0$ mm |
| Minimum Number<br>of Pulley Teeth $z_{min}$           | 20                            |
| Minimum Pulley Diameter                               | 50.93 mm                      |
| Minimum<br>Back Bend Diameter                         | 120 mm                        |
| Standard Lengths                                      | 1 552 mm up to 23 496 mm      |

| Standard Width (mm)                              | 25      | 30        | 50        | 100       |
|--------------------------------------------------|---------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |         |           |           |           |
| Steel                                            | 14 250  | 17 100    | 29 450    | 59 850    |
| Allowable Belt Force $F_{Tall}$ (N)              |         |           |           |           |
| Steel                                            | 3 741   | 4 489     | 7 731     | 15 712    |
| Allowable Effective Force $F_{eall}$ (N)         |         |           |           |           |
| (Minimum 15 teeth are in mesh)                   | 1 870   | 2 244     | 3 740     | 7 480     |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            | 0.0059  |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |         |           |           |           |
| Steel                                            | 935 250 | 1 122 300 | 1 932 850 | 3 928 050 |

# HTD®14



|                                             |                       |
|---------------------------------------------|-----------------------|
| Pitch                                       | 14 mm                 |
| Standard Color                              | White                 |
| Width Tolerance<br>up to 50 mm Width        | ± 1.0 mm              |
| > 50 mm Width                               | ± 1.5 mm              |
| Minimum Number<br>of Pulley Teeth $z_{min}$ | 28                    |
| Minimum Pulley Diameter                     | 124.78 mm             |
| Minimum<br>Back Bend Diameter               | 200 mm                |
| Standard Lengths                            | 1 554 up to 23 492 mm |

| Standard Width (mm)                              | 25        | 40        | 55        | 85        | 100       |
|--------------------------------------------------|-----------|-----------|-----------|-----------|-----------|
| Tensile Strength (Average Value) $F_{Break}$ (N) |           |           |           |           |           |
| Steel                                            | 20 760    | 34 600    | 48 440    | 74 390    | 88 230    |
| Allowable Belt Force $F_{1all}$ (N)              |           |           |           |           |           |
| Steel                                            | 5 156     | 8 593     | 12 031    | 18 476    | 21 913    |
| Allowable Effective Force $F_{eall}$ (N)         |           |           |           |           |           |
| (Minimum 15 teeth are in mesh)                   | 3 430     | 5 488     | 7 546     | 11 662    | 13 720    |
| Specific Belt Mass $m_{sp}$ (kg/m/mm)            |           |           |           |           |           |
| Steel                                            | 0.0107    |           |           |           |           |
| Specific Belt Stiffness $c_{sp}$ (N)             |           |           |           |           |           |
| Steel                                            | 1 289 000 | 2 148 333 | 3 007 667 | 4 618 917 | 5 478 250 |

FINISHING

## COATED BELTS



Most belt types can be modified with a coating to achieve a desired coefficient of friction, abrasion resistance or thickness. Gates offers more than 20 backings in categories such as polyurethane, rubber, foam, PVC and special backings to meet your requirements.

All backings can be modified mechanically on request. Gates customizes belts especially according to your requirements.

#### PROCESSING OPTIONS

- › Grinding
- › Milling
- › Sandwich Belts
- › Grooves
- › Holes

*Further information on page 146*

#### ATTRIBUTES

- › Low vibration and quiet operation
- › Reduced noise characteristics
- › Adaption of friction

#### APPLICATIONS

- › Metal stamping industry
- › Feeding and pulling applications
- › Paper handling
- › Glass conveying
- › Food industry
- › Cardboard conveying

#### FABRICATION CAPABILITIES

- |                                    |               |
|------------------------------------|---------------|
| › Minimum width                    | 10 mm         |
| › Maximum width                    | 450 mm        |
| › Minimum length                   | 480 mm        |
| › Maximum length / welding process | No limitation |
| › Maximum length / gluing process  | No limitation |

*Further information regarding backings, thicknesses or special dimensions is available on request.*

## POLYURETHANE (PU) BACKINGS

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

Polyurethane is the most abrasion-proof, resilient and durable backing. Polyurethane backings are available in different thicknesses and hardnesses and are applied by welding process on to the belt.

### ATTRIBUTES

- › Excellent friction
- › Good abrasion resistance
- › Good durability vs. chemicals
- › Excellent durability vs. oil and fat
- › Available with FDA / EU food approval

### APPLICATIONS

- › Stone processing industry
- › Wood processing industry
- › Glass processing industry
- › Card sheet processing industry
- › Cardboard transport
- › Packaging industry
- › Feeding and pulling applications
- › Ascending conveyor

| Material | Color | Hardness                 | Material Thickness | Minimum Ø / Ø Factor | Approval | Backing                                                                               |
|----------|-------|--------------------------|--------------------|----------------------|----------|---------------------------------------------------------------------------------------|
| PU       | CLEAR | 75 Shore A               | 2 mm / 3 mm *      | x 30                 |          | 75 Shore A Polyurethane Clear                                                         |
|          |       |                          |                    |                      |          |    |
| PU       | CLEAR | 85 Shore A               | 2 mm / 3 mm *      | x 30                 | FDA / EU | 85 Shore A Polyurethane Clear                                                         |
|          |       |                          |                    |                      |          |   |
| PU       | CLEAR | 92 Shore A               | 2 mm *             | x 30                 |          | 92 Shore A Polyurethane Clear                                                         |
|          |       |                          |                    |                      |          |  |
| PU       | CLEAR | 75 Shore A               | 5 mm               | Ø 120 mm             |          | Glass Backing                                                                         |
|          |       |                          |                    |                      |          |  |
| PU       | CLEAR | 85 Shore A               | 3 mm               | Ø 90 mm              |          | Ridge Top                                                                             |
|          |       |                          |                    |                      |          |  |
| PU       | CLEAR | 85 Shore A               | 1 mm / 2 mm *      | x 30                 |          | HV Foil                                                                               |
|          |       |                          |                    |                      |          |  |
| PU       | CLEAR | 85 Shore A<br>92 Shore A | 2.7 mm             | Ø 75 mm              |          | Fine Glass Backing                                                                    |
|          |       |                          |                    |                      |          |  |

\* Several layers can be welded together or grinded for other thicknesses.



## FINISHING

## RUBBER BACKINGS

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

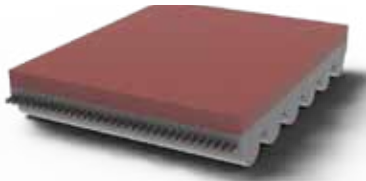
Rubber backings are commonly used in industries such as wood processing, glass processing and ceramics industry based on their high coefficient of friction and temperature resistance as well as good abrasion resistance. Rubber backings are applied by adhesive bonding.

### ATTRIBUTES

- › Excellent friction
- › Good abrasion resistance
- › Good durability vs. temperature and resistance to atmospheric conditions
- › Flexibility at low temperatures
- › Available with FDA Approval

### APPLICATIONS

- › Wood processing industry
- › Metal stamping industry
- › Paper processing industry
- › Textile processing industry
- › Packaging industry
- › Feeding and pulling applications
- › Pharmaceutical / cosmetic industry

| Material       | Color  | Hardness   | Material Thickness   | Minimum Ø / Ø Factor | Approval | Backing                                                                                                     |
|----------------|--------|------------|----------------------|----------------------|----------|-------------------------------------------------------------------------------------------------------------|
| NATURAL RUBBER | RED    | 38 Shore A | 1,6 mm up to 10 mm * | x 20                 |          | Linatex®<br>             |
| NATURAL RUBBER | WHITE  | 38 Shore A | 3 mm / 5 mm / 8 mm * | x 20                 | FDA      | Linaplus FG™<br>        |
| NATURAL RUBBER | BEIGE  | 40 Shore A | 3 mm / 6 mm *        | x 20                 |          | Tan Natural Rubber<br> |
| NATURAL RUBBER | BLACK  | 65 Shore A | 3 mm / 5 mm / 6 mm * | x 25                 |          | Nitrile Rubber<br>     |
| NATURAL RUBBER | ORANGE | 55 Shore A | 3 mm / 8 mm *        | x 20                 |          | Linatril®<br>          |
| NATURAL RUBBER | YELLOW | 38 Shore A | 2 mm / 4 mm *        | x 20                 |          | RP400<br>              |

\* Several layers can be glued together or grinded for other thicknesses.

## FOAM BACKINGS

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INFORMATION

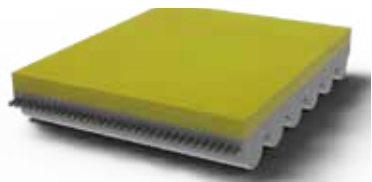
Foam backings are commonly used in glass, paper, textile and wood processing industries due to their flexibility. Foam backings are applied by adhesive bonding.

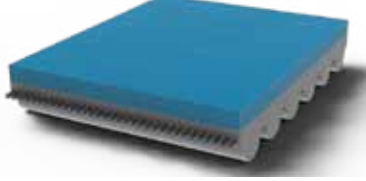
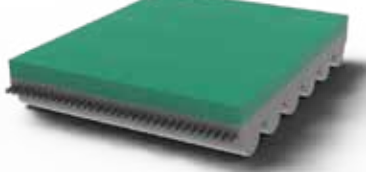
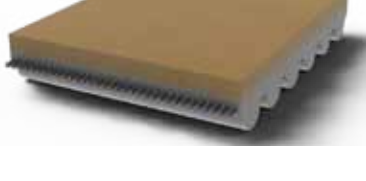
## ATTRIBUTES

- › Excellent compressibility
- › Good abrasion resistance
- › Excellent coefficient of friction
- › Good durability vs. chemicals
- › Good durability vs. oil and fat

## APPLICATIONS

- › Paper processing industry
- › Foil processing industry
- › Wood processing industry
- › Glass processing industry
- › Labeling machines
- › Feeding and pulling applications
- › Vacuum applications
- › Cleaning / bottling applications

| Material            | Color  | Hardness / Density    | Material Thickness | Minimum Ø / Ø Factor | ATTRIBUTES | Backing                                                                                                  |
|---------------------|--------|-----------------------|--------------------|----------------------|------------|----------------------------------------------------------------------------------------------------------|
| POLYURETHANE        | YELLOW | 55 Shore A            | 2 mm up to 8 mm *  | x 30                 |            | HD Yellow<br>       |
| FOAMED POLYURETHANE | YELLOW | 160 kg/m <sup>3</sup> | 12 mm *            | x 15                 |            | Sylomer® Yellow<br> |

| Material                  | Color          | Hardness / Density         | Material Thickness     | Minimum Ø /<br>Ø Factor | Attributes    | Backing                                                                                                 |
|---------------------------|----------------|----------------------------|------------------------|-------------------------|---------------|---------------------------------------------------------------------------------------------------------|
| FOAMED POLYURETHANE       | BLUE           | 220 kg/m <sup>3</sup>      | 12 mm / 25 mm *        | x 15                    |               | Sylomer® Blue<br>    |
| FOAMED POLYURETHANE       | GREEN          | 300 kg / m                 | 6 mm up to 25 mm *     | x 15                    |               | Sylomer® Green<br>  |
| FOAMED POLYURETHANE       | BROWN          | 400 kg / m                 | 6 mm / 12 mm / 25 mm * | x 15                    |               | Sylomer® Brown<br> |
| FOAMED POLYURETHANE       | RED            | 500 kg / m                 | 6 mm / 12 mm / 25 mm * | x 15                    |               | Sylomer® red<br>   |
| CELLULAR RUBBER           | BLACK          | 150- 200 kg/m <sup>3</sup> | 3 mm / 5 mm / 10 mm *  | x 15                    |               | Neoprene<br>       |
| NATURAL POLYURETHANE FOAM | BEIGE / YELLOW | 400 kg/m <sup>3</sup>      | 3 mm up to 8 mm *      | x 15                    | High Flexible | Natural<br>        |

\* Several layers can be glued together or grinded for other thicknesses.

## POLYVENYLCHLORID (PVC) BACKINGS

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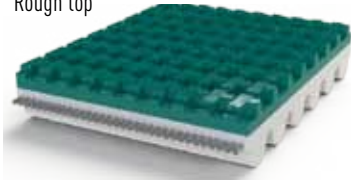
Due to various backing characteristics, Polyvinylchlorid (PVC) backings are commonly used in glass processing, wood processing, ceramic and packaging industries. Various FDA/EU approvals for different PVC backings allow applications in sectors such as food and where good hygiene is required. PVC backings are applied by adhesive bonding.

## ATTRIBUTES

- › Good durability vs. acids and chemicals
- › Good resistance to atmospheric conditions
- › Very adhesive
- › Available with FDA/EU approval
- › Available with various surface textures such as rough top and saw tooth

## APPLICATIONS

- › Wood processing industry
- › Glass processing industry
- › Stone processing industry
- › Paper processing industry
- › Labeling industry
- › Packaging industry
- › Pharmaceutical / cosmetic industry

| Material | Color | Hardness   | Material Thickness | Minimum Ø / Ø Factor | Approval | Backing                                                                                                         |
|----------|-------|------------|--------------------|----------------------|----------|-----------------------------------------------------------------------------------------------------------------|
| PVC      | GREEN | 46 Shore A | 4,8 mm             | 90 mm                |          | Rough top<br>              |
| PVC      | WHITE | 65 Shore A | 1,2 mm             | 25 mm                | FDA / EU | Small Pebble Structure<br> |

| Material | Color | Hardness   | Material Thickness | Minimum Ø / Ø Factor | Approval | Backing                                                                                                           |
|----------|-------|------------|--------------------|----------------------|----------|-------------------------------------------------------------------------------------------------------------------|
| PVC      | WHITE | 35 Shore A | 6 mm               | 40 mm                | FDA/EU   | <p>Large Pebble Structure</p>  |
| PVC      | WHITE | 70 Shore A | 4,5 mm             | 90 mm                | FDA      | <p>PVC Herringbone</p>        |
| PVC      | WHITE | 40 Shore A | 2,5 mm             | 90 mm                | FDA/EU   | <p>PVC Saw Tooth</p>         |
| PVC      | WHITE | 65 Shore A | 0,7 mm             | 50 mm                | FDA      | <p>PVC Waffle Structure</p>  |
| PVC      | BLUE  | 60 Shore A | 1 mm / 2 mm        | 40 mm                |          | <p>PVC Blue</p>              |
| PVC      | WHITE | 65 Shore A | 2 mm               | 40 mm                | FDA EU   | <p>PVC White</p>             |

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## SPECIAL BACKINGS - SPECIAL FABRIC

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In addition to our standard backing types, we offer special backings, such as Novo Fleece and Chrome Leather. Both backings are applied by adhesive bonding.

## NOVO FLEECE

- › Material: Polyester
- › Color: Anthracite
- › Hardness: Incapable of measurement
- › Material Thickness: 1,2 mm
- › Mindestdurchmesser: Ø 25 mm
- › Attributes: Suited for high temperature ranges  
Good durability vs. oil and fat
- › Applications: General conveying applications, glass processing



## CHROME LEATHER

- › Material: Leather
- › Color: Grey
- › Hardness: 65 Shore A
- › Material Thickness: 2 mm / 3 mm
- › Mindestdurchmesser: Ø 90 mm
- › Attributes: Excellent coefficient of friction  
Good abrasion resistance  
Excellent oil resistance
- › Applications: General conveying applications



## POLYAMIDE FABRIC

Polyamide fabric on tooth and/or back reduces the coefficient of friction and provides smooth and enhanced operation characteristics for custom designed applications. Polyamide fabric is added to the belt during the extrusion process.

## ATTRIBUTES

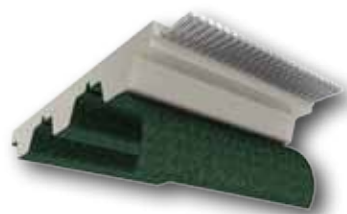
- › low coefficient of friction
- › High wear resistance
- › Good sliding attributes
- › Low noise operation
- › Good durability vs. oil and fat

## APPLICATIONS

- › Accumulating conveyor
- › Sliding applications

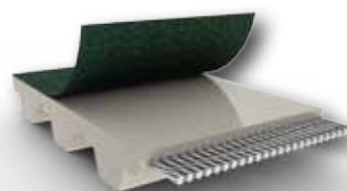
#### POLYAMIDE FABRIC ON TOOTH SIDE

- › Code: NT / Nylon® Tooth
- › Color: Green



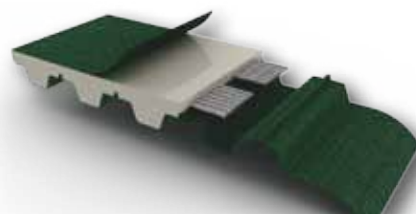
#### POLYAMIDE FABRIC ON BACK

- › Code: NB / Nylon® Back
- › Color: Green



#### POLYAMIDE FABRIC ON TOOTH AND BACK

- › Code: NTB / Nylon® Tooth and Back
- › Color: Green



#### SPECIAL FABRIC

ECO Fabric offers both, antistatic features as well as an extremely low coefficient of friction. Depending on its application area ECO also provides an extended service life in comparison to the standard polyamide fabric. The special antistatic fabric is available for standard pitches such as T5 / T10 / AT5 / AT10.

#### ECO FABRIC ON TOOTH AND BACK

- › Color: Anthracite



*Further backings, thicknesses and special dimensions are available on request.*



## OVERVIEW BACKINGS

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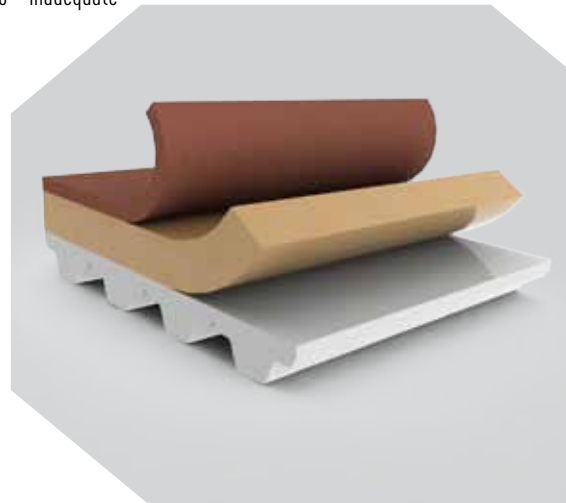
INFORMATION

| Backing                       | Code      | Hardness (Shore A)<br>Density (kg/m <sup>3</sup> ) | Material<br>Thickness (mm) | Abrasion<br>Resistance | Oil<br>Resistance | Attributes |
|-------------------------------|-----------|----------------------------------------------------|----------------------------|------------------------|-------------------|------------|
| Polyurethane (PU)             |           |                                                    |                            |                        |                   |            |
| Polyurethane 75 Shore A       | U32 / U33 | 75 Shore A                                         | 2 / 3                      | 1                      | 1                 | FDA / EU   |
| Polyurethane 85 Shore A       | U22 / U23 | 85 Shore A                                         | 2 / 3                      | 1                      | 1                 |            |
| Polyurethane 92 Shore A       | U12       | 92 Shore A                                         | 2                          | 1                      | 1                 |            |
| Glass Backing                 | G32       | 75 Shore A                                         | 5                          | 1                      | 1                 |            |
| Ridge Top                     | G21       | 85 Shore A                                         | 3                          | 1                      | 1                 |            |
| HV Foil                       | U41 / U42 | 85 Shore A                                         | 1 / 2                      | 1                      | 1                 |            |
| Fine Glass Backing 85 Shore A | G53       | 85 Shore A                                         | 2.7                        | 1                      | 1                 |            |
| Fine Glass Backing 92 Shore A | G52       | 92 Shore A                                         | 2.7                        | 1                      | 1                 |            |
| Rubber                        |           |                                                    |                            |                        |                   |            |
| Linatex®                      | L         | 38 Shore A                                         | 1.6 up to 10               | 2                      | 4                 | FDA        |
| Linaplus FG™                  | LP        | 38 Shore A                                         | 3 / 5 / 8                  | 2                      | 4                 |            |
| Tan Natural Rubber            | LT        | 40 Shore A                                         | 3 / 6                      | 2                      | 4                 |            |
| Nitrile Rubber                | LB        | 65 Shore A                                         | 3 / 5 / 6                  | 2                      | 1                 |            |
| Linatril®                     | NL        | 55 Shore A                                         | 3 / 8                      | 2                      | 2                 |            |
| RP400 / Racloprema            | RP2 / RP4 | 38 Shore A                                         | 2 / 4                      | 1                      | 2                 |            |
| Schaum                        |           |                                                    |                            |                        |                   |            |
| HD Yellow                     | FUY       | 55 Shore A                                         | 2 up to 8                  | 3                      | 1                 |            |
| Sylomer® Yellow               | FY        | 160 kg/m <sup>3</sup>                              | 12                         | 4                      | 1                 |            |
| Sylomer® Blue                 | FB        | 220 kg/m <sup>3</sup>                              | 12 / 25                    | 4                      | 1                 |            |
| Sylomer® Green                | FG        | 300 kg/m <sup>3</sup>                              | 6 / 12 / 25                | 3                      | 1                 |            |
| Sylomer® Brown                | FN        | 400 kg/m <sup>3</sup>                              | 6 / 12 / 25                | 3                      | 1                 |            |
| Sylomer® Red                  | FR        | 500 kg/m <sup>3</sup>                              | 6 / 12 / 25                | 3                      | 1                 |            |
| Neoprene                      | NF        | 150-200 kg/m <sup>3</sup>                          | 3 / 5 / 10                 | 4                      | 3                 |            |
| Natural                       | FC        | 400 kg/m <sup>3</sup>                              | 3 up to 8                  | 3                      | 1                 |            |

| Backing                           | Code          | Hardness (Shore A)<br>Density (kg/m³) | Material<br>Thickness (mm) | Abriebfestigkeit* | Ölbeständigkeit* | Sonsige<br>ATTRIBUTES |
|-----------------------------------|---------------|---------------------------------------|----------------------------|-------------------|------------------|-----------------------|
| PVC                               |               |                                       |                            |                   |                  |                       |
| Rough Top                         | RT            | 46 Shore A                            | 4.8                        | 3                 | 4                |                       |
| Small Pebble                      | SPT           | 65 Shore A                            | 1.2                        | 3                 | 4                | FDA / EU              |
| Large Pebble                      | LPT           | 35 Shore A                            | 6                          | 3                 | 4                | FDA / EU              |
| PVC Herringbone                   | PH            | 70 Shore A                            | 4.5                        | 3                 | 4                | FDA                   |
| PVC Saw Tooth                     | ST            | 40 Shore A                            | 2.5                        | 2                 | 3                | FDA / EU              |
| PVC Waffle Structure              | PTW           | 65 Shore A                            | 0.7                        | 2                 | 3                | FDA                   |
| PVC Blue                          | PB            | 60 Shore A                            | 1 / 2                      | 3                 | 4                |                       |
| PVC White                         | PW            | 65 Shore A                            | 2                          | 3                 | 4                | FDA / EU              |
| Special Backings                  |               |                                       |                            |                   |                  |                       |
| Novo Fleece                       | NV            | Not specified                         | 1.2                        | 3                 | 2                |                       |
| Chrome Leather                    | Not specified | 65 Shore A                            | 2 / 3                      | 2                 | 1                |                       |
| Polyamide Fabric                  |               |                                       |                            |                   |                  |                       |
| Polyamide Fabric Tooth Side       | NT            | Not specified                         | Not specified              | 2                 | 1                |                       |
| Polyamid Fabric Back              | NB            | Not specified                         | Not specified              | 2                 | 1                |                       |
| Polyamid Fabric<br>Tooth and Back | NTB           | Not specified                         | Not specified              | 2                 | 1                |                       |
| ECO Fabric<br>Tooth and Back      | ECO           | Not specified                         | Not specified              | 1                 | 1                | Antistatic            |

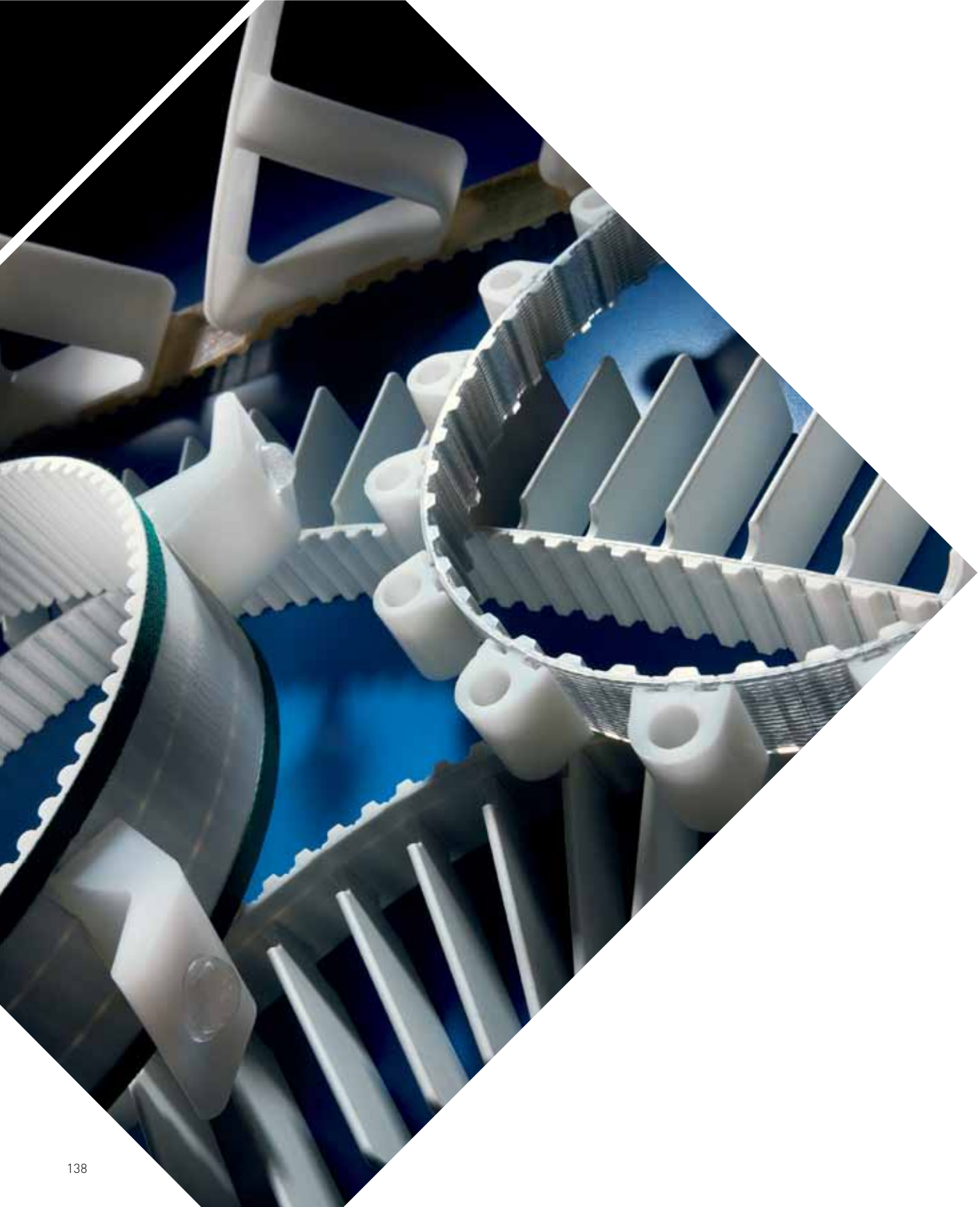
Stave for abrasion resistance / oil resistance:

1 – very good   2 – good   3 – satisfactory   4 – adequate   5 – poor   6 – inadequate



FINISHING

## PROFILED BELTS





Gates Timing Belts can be customized with welded profiles to meet specific application requirements. The molded profiles are made of tough polyurethane and become an integral part of the belt through thermal bonding. Profiles can be manufactured in nearly any shape and construction.

Our timing belts with welded profiles are optimal for applications in packaging, general conveying and other automation equipment applications.

Choose from over 2 000 existing profiles available from Gates's extensive mold inventory.

#### ATTRIBUTES

- › Available for all standard pitches
- › Non-marking, durable design
- › Over 2 000 existing shapes and constructions
- › Widths up to 18" / 450 mm available
- › Thermal bonding process fuses belt and profile together

#### APPLICATIONS

- › Pushing applications
- › General conveying applications
- › Glass conveying
- › Food conveying
- › Hygienic industry
- › Textile industry
- › Wood processing industry
- › Synchronous conveying applications

#### FABRICATION CAPABILITIES

- |                  |              |
|------------------|--------------|
| › Minimum length | 500 mm       |
| › Maximum length | 25 000 mm    |
| › Maximum width  | 450 mm / 18" |

*Special dimensions and tolerances are available on request.*

## PROFILED BELTS-DESIGN RECOMMENDATIONS

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Over 2.000 profile designs are already available from Gates extensive mold inventory. Our application engineers will help you to design new, custom built profiles which will fit your application.

Ultimate performance can be achieved by following the design guidelines outlined below:

### 1. PROFILE SPACING

It is recommended that the profile spacing "A" correspond with the pitch of the belt. This allows the best spacing tolerances, and minimizes the effects of the belt's overall length tolerance on the profile spacing. Profiles can be spaced on non-Pitch increments. However, if non-Pitch spacing is used, the cumulative tolerance of the belt length must be considered.

**Please add the Profile Spacing Tolerance of  $\pm 0.2\text{ mm}$  to calculate the profile spacing „A“ as follows:**

*Example*

*Profile Spacing Tolerance for pitch type T10:  $\pm 0.54\text{ mm}$*

*Profile Spacing "A" (notional value):  $1\,000\text{ mm}$*

*Resultant positional tolerance:  $1\,000\text{ mm} \pm 0.74\text{ mm}$  for pitch type T10*

**Tighter tolerances for profile spacing are available. Please contact Gates applications engineering for detailed information.**

| Pitch Tolerance for all Belt Types |                                            |
|------------------------------------|--------------------------------------------|
| T / HTD® / STD / Imperial Pitches  | $\pm 0.54\text{ mm per m}$                 |
| AT Pitches                         | $+ 0.27\text{ mm} / -0.54\text{ mm per m}$ |

### 2. PROFILE DIMENSIONS

The most important considerations while dimensioning a profile are the size of the base of the profile ("foot" of the profile) and the position of the profile on the belt. The profile thickness can affect the flexibility of the belt, and can determine the minimum allowable pulley diameter. The flexibility of the belt can be maximized, however, by positioning the profile directly over the tooth of the belt. As the thickness of the foot of the profile increases, the minimum pulley diameter in the system must be increased according to the table below:

| Tolerances                                                                                                 |                                                                        |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Profile Width<br>Profile Length                                                                            | $\pm 0.25\text{ mm} / \pm 0.01''$<br>$\pm 0.25\text{ mm} / \pm 0.01''$ |
| The height tolerance of a profile in consequence of the fusion of the profile and belt at the welding area | $+ 0.25\text{ mm} / -0.5\text{ mm}$<br>$+ 0.01'' / -0.02''$            |

Minimum Number of Teeth of Pulley for Profiles located over Tooth

| Profile Foot Thickness (Inch) | 1/16 | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 | 5/8 | 3/4 |
|-------------------------------|------|-----|------|-----|------|-----|------|-----|-----|-----|
| Profile Foot Thickness (mm)   | 2    | 3   | 5    | 6   | 8    | 10  | 11   | 13  | 16  | 19  |
| XL                            | 10   | 10  | 18   | 25  | 40   | 50  | 60   | 100 | --- | --- |
| L                             | 12   | 12  | 12   | 18  | 30   | 40  | 50   | 60  | 100 | --- |
| H / H-HF                      | 14   | 14  | 14   | 14  | 18   | 25  | 35   | 45  | 80  | 100 |
| XH                            | 18   | 18  | 18   | 18  | 18   | 18  | 18   | 20  | 35  | 50  |
| T5                            | 12   | 12  | 18   | 25  | 40   | 50  | 60   | 100 | --- | --- |
| AT5 / ATL5                    | 15   | 15  | 18   | 25  | 40   | 50  | 60   | 100 | --- | --- |
| T10 / T10-HF                  | 14   | 14  | 16   | 16  | 18   | 25  | 35   | 45  | 80  | 100 |
| AT10                          | 15   | 15  | 18   | 18  | 22   | 25  | 35   | 45  | 80  | 100 |
| ATL10 / ATL10-HF              | 25   | 25  | 25   | 25  | 25   | 25  | 35   | 45  | 80  | 100 |
| T20 / AT20                    | 18   | 18  | 18   | 18  | 18   | 18  | 18   | 20  | 35  | 50  |
| ATL20                         | 30   | 30  | 30   | 30  | 30   | 30  | 30   | 30  | 35  | 50  |
| HTD®5 / STD5                  | 14   | 14  | 16   | 25  | 40   | 50  | 60   | 100 | --- | --- |
| HTD®8 / STD8                  | 20   | 20  | 20   | 24  | 30   | 40  | 50   | 60  | 100 | --- |
| HTD®14                        | 28   | 28  | 28   | 28  | 28   | 28  | 30   | 30  | 50  | 72  |
| HTD®L14                       | 43   | 43  | 43   | 43  | 43   | 43  | 43   | 43  | 50  | 72  |

Minimum Number of Teeth of Pulley for Profiles not located over Tooth

| Profile Foot Thickness (Inch) | 1/16 | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 | 5/8 | 3/4 |
|-------------------------------|------|-----|------|-----|------|-----|------|-----|-----|-----|
| Profile Foot Thickness (mm)   | 2    | 3   | 5    | 6   | 8    | 10  | 11   | 13  | 16  | 19  |
| XL                            | 12   | 30  | 45   | 50  | 60   | 100 | ---  | --- | --- | --- |
| L                             | 12   | 20  | 40   | 45  | 55   | 60  | 70   | 80  | 100 | --- |
| H / H-HF                      | 14   | 14  | 25   | 30  | 45   | 50  | 55   | 65  | 80  | 100 |
| XH                            | 18   | 18  | 20   | 30  | 40   | 45  | 50   | 54  | 58  | 60  |
| T5                            | 12   | 30  | 45   | 50  | 60   | 100 | ---  | --- | --- | --- |
| AT5 / ATL5                    | 15   | 30  | 45   | 50  | 60   | 100 | ---  | --- | --- | --- |
| T10 / T10-HF / AT10           | 18   | 20  | 30   | 40  | 45   | 50  | 55   | 65  | 80  | 100 |
| ATL10 / ATL10-HF              | 25   | 25  | 30   | 40  | 45   | 50  | 55   | 65  | 80  | 100 |
| T20 / AT20                    | 18   | 18  | 20   | 30  | 40   | 45  | 50   | 54  | 58  | 60  |
| ATL20                         | 30   | 30  | 30   | 30  | 40   | 45  | 50   | 54  | 58  | 60  |
| HTD®5 / STD5                  | 18   | 30  | 45   | 50  | 60   | 100 | ---  | --- | --- | --- |
| HTD®8 / STD8                  | 20   | 20  | 40   | 45  | 55   | 60  | 70   | 80  | 100 | --- |
| HTD®14                        | 28   | 28  | 30   | 42  | 58   | 64  | 72   | 78  | 82  | 86  |
| HTD®L14                       | 43   | 43  | 43   | 43  | 58   | 64  | 72   | 78  | 82  | 86  |

\* not available

## PROFILED BELTS-DESIGN RECOMMENDATIONS

TIMING BELTS

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FLAT BELTS

WIDE BELTS

ENDLESS BELTS

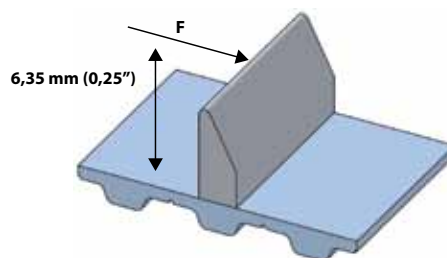
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### 3. PROFILE STRENGTH

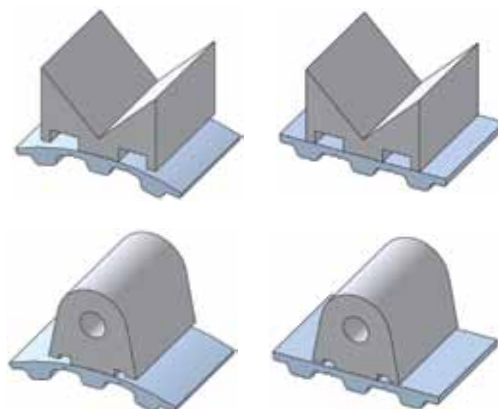
The strength, and therefore the capacity of the profile depends primarily on the size of the welded profile foot.

The strength of the profile is affected by the type and direction of the force applied to it. Under high loads, the failure mode will normally be either bending or distortion of the profile and belt, or in some cases, the polyurethane may actually tear. The strength of the profile is approximately 6 N/mm<sup>2</sup> according to the drawing opposite.



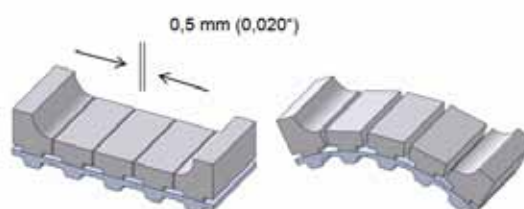
### 4. WIDE BASE PROFILES OR PROFILES WITH RELIEF

For profiles requiring a wide base, such as pushers, one foot should be left unwelded. This allows for flexing around the pulley yet it remains rigid when loaded.



### 5. SEGMENTED PROFILES

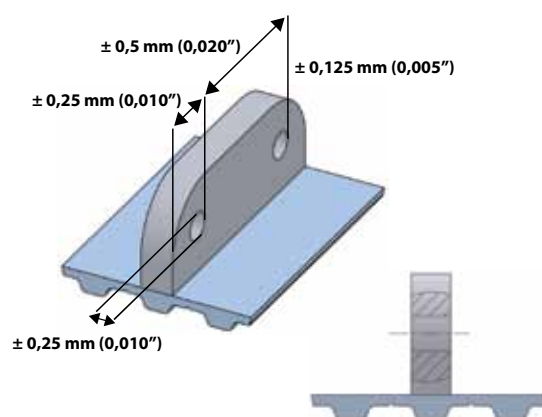
If large profiles are required as carriers, then it is necessary, that they are either segmented or slotted.



## 6. PROFILES WITH HOLES

Profiles with holes for securing paddles or other attachments can be produced. Holes are either drilled before bonding, or are molded into the profile depending upon the volume and requirements of the application. Tolerances of the hole placement depends upon whether the holes are drilled or molded.

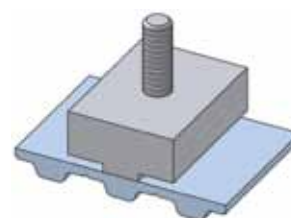
The tolerance of the hole from the belt surface is subject to the bonding process of the profile foot and the belt surface. Generally, tolerances are as shown on the right-hand side



## 7. PROFILES WITH INSERTS

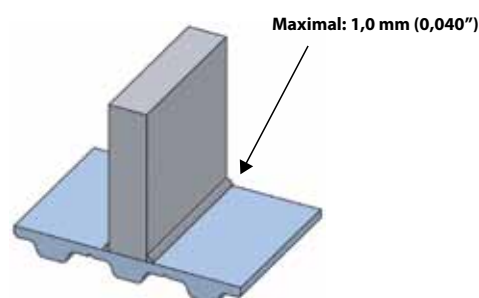
Profiles can be molded with metallic inserts. These are particularly useful in some applications to replace roller chains with attachments.

The actual inserts can either be manufactured by Gates or provided by the customer.



## 8. FLASH BEAD

The welding process can cause a weld bead of polyurethane between belt back and the lower profile edge. This can be removed on customer request.





## PROFILED BELTS-DESIGN RECOMMENDATIONS

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FLAT BELTS

WIDE BELTS

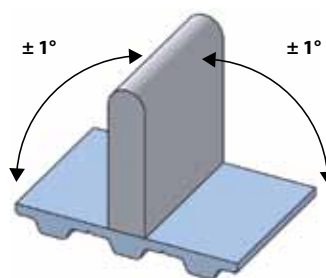
ENDLESS BELTS

FINISHING

INFORMATION

## 9. PERPENDICULARITY

All profiles are perpendicular to  $\pm 1^\circ$ .



## 10. ORDERING

When ordering a profiled belt, it is advisable to submit a drawing of the profiled belt. For your convenience standard drawing forms are available from our Applications Engineering Department. Once a design is finalized, Gates will submit the drawing to the customer for approval. This custom belt drawing number should be used for future ordering.

## PROFILE SELECTOR

Our online Profile Selector Tool allows you to:

- › Find the right profile for your application
- › Download of drawings for each selection
- › Review minimum pulley recommendations
- › Go to our website: [www.gatesmectrol.com](http://www.gatesmectrol.com)
- › On the right hand side you will find the item *Tool Set*
- › Click on *Profiles Selector 2* to start the application

*Please contact our Applications Engineering group for special profile shapes, dimensions or tolerances.*



### Profile Search By Shape and Features

| Geometric Shape:                         |                                  | Features:                                            |  |
|------------------------------------------|----------------------------------|------------------------------------------------------|--|
| <input type="radio"/> All                | <input type="radio"/> Pentagon   | <input type="radio"/> All                            |  |
| <input type="radio"/> Round Top          | <input type="radio"/> Cylinder   | <input type="radio"/> Holes, Vertical                |  |
| <input type="radio"/> Standard Rectangle | <input type="radio"/> Half-round | <input type="radio"/> Holes, along belt              |  |
| <input type="radio"/> Other Rectangular  | <input type="radio"/> T shape    | <input type="radio"/> Holes, across belt width       |  |
| <input type="radio"/> Trapezoid          | <input type="radio"/> U Shape    | <input type="radio"/> Support Leg – Back only        |  |
| <input type="radio"/> Triangle           | <input type="radio"/> V shape    | <input type="radio"/> Support leg – Front and Back   |  |
| <input type="radio"/> Others             |                                  | <input type="radio"/> Metal Threaded Insert – Male   |  |
|                                          |                                  | <input type="radio"/> Metal Threaded Insert – Female |  |

**Profile Dimensions :** ☒ Metric (mm) ☐ Imperial (inches)

Length : Min.  Max.

Height : Min.  Max.

Thickness : Min.  Max.

Weld Foot : Min.  Max.  Reset

[View Matching Profiles](#)

**1418**  
Results

[Profile Home](#)

[Gates Mectrol](#)

developed by [NauTech IT Solutions, LLC](#)

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

## FINISHING

## SPECIAL PROCESSING

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

Gates offers further finishings for belts to achieve a variety of application requirements. From grinded edges or surfaces to tight tolerances, punching or machining holes and slots to CNC machining of three dimensional contours - Gates provides for all needs customized solutions.

### Milling

|                |           |
|----------------|-----------|
| Minimum Length | 500 mm    |
| Maximum Length | 30.000 mm |
| Minimum Width  | 10 mm     |
| Maximum Width  | 450 mm    |

### Punching

|                       |           |
|-----------------------|-----------|
| Minimum Length        | 500 mm    |
| Maximum Length        | 30.000 mm |
| Minimum Width         | 10 mm     |
| Maximum Width         | 450 mm    |
| Minimum Hole Diameter | 1,0 mm    |
| Maximum Hole Diameter | 10 mm     |

### Grinding

|                |               |
|----------------|---------------|
| Minimum Length | 480 mm        |
| Maximum Length | No Limitation |
| Minimum Width  | 10 mm         |
| Maximum Width  | 450 mm        |

### Removing individual teeth

For precise positioning of deats

### Slotting

The flexibility can be increased by cross grooving thick coatings

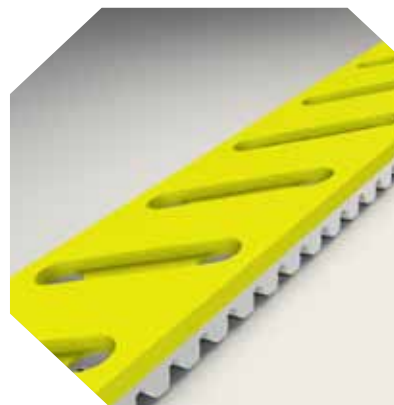
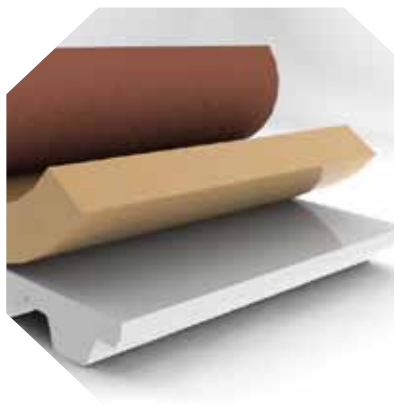
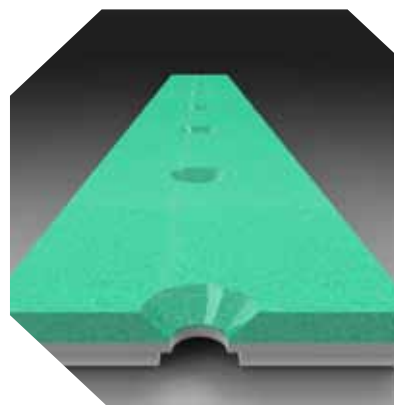
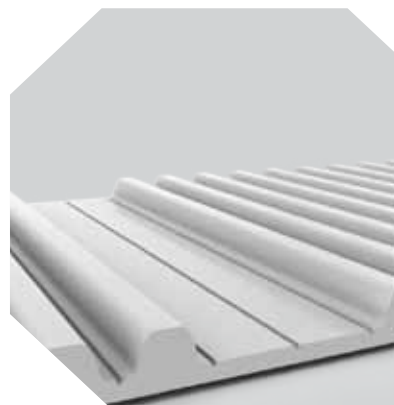
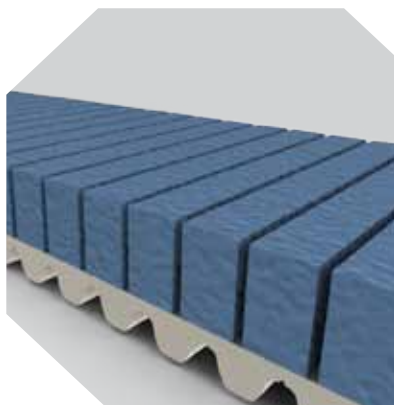
*Our Applications Engineering Department will help you with your custom requirements.*

### ADVANTAGES

- › Unlimited adaptability for nearly all dimensions, contours and configurations
- › Combination of flexible base belt manufacturing and additional fabrication in one hand.

### EXAMPLE OF USE

- › Vacuum conveying belts for pulling applications



TIMING BELTS

SELF TRACKING

FLAT BELTS

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INFORMATION

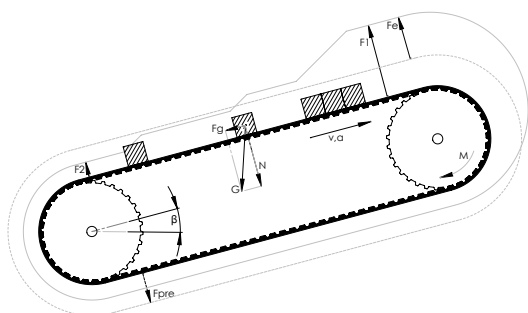
## 1. ABBREVIATIONS

Please consider the following abbreviations and symbols for calculation basis:

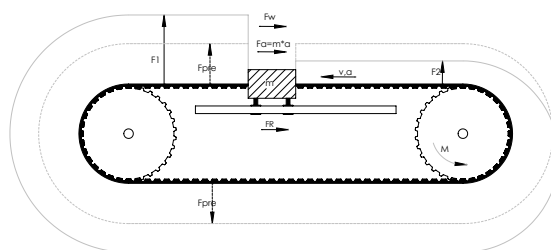
|                  |                                                   |              |                                                               |
|------------------|---------------------------------------------------|--------------|---------------------------------------------------------------|
| $a$              | Acceleration [m/s <sup>2</sup> ]                  | $g$          | Gravitational Acceleration [m/s <sup>2</sup> ]                |
| $A_v$            | Vacuum Area [m <sup>2</sup> ]                     | $L$          | Timing Belt Length [mm]                                       |
| $\beta$          | Angle of Inclination [°]                          | $l$          | Gauge Length during Frequency measurement [mm]                |
| $c_R$            | Overall Stiffness [N]                             | $L1$         | Tight Side Length [mm]                                        |
| $c_{sp}$         | Belt Stiffness [N]                                | $L2$         | Slack Side Length [mm]                                        |
| $d$              | Diameter                                          | $M$          | Torque                                                        |
| $\Delta x$       | Elongation [mm]                                   | $m$          | Mass [kg]                                                     |
| $\Delta x_{Pos}$ | Positional Deviation [mm]                         | $m_a$        | Mass of accumulated Good [kg]                                 |
| $f$              | Frequency [Hz]                                    | $m_e$        | Mass of Counter Weight [kg]                                   |
| $F_1$            | Tight Side Belt Force [N]                         | $m_F$        | Mass of Transported Goods [kg]                                |
| $F_{1all}$       | Allowable Belt Force [N]                          | $\mu$        | Coefficient of Friction between Belt and Support              |
| $F_{1max}$       | Maximum occurring Belt Force [N]                  | $\mu_a$      | Coefficient of Friction between Belt and transported Material |
| $F_{2opt}$       | Optimal Slack Side Force [N]                      | $n$          | Revolutions per minute [1/min]                                |
| $F_a$            | Acceleration Force [N]                            | $p$          | Vacuum [N/m <sup>2</sup> ]                                    |
| $F_{Break}$      | Ultimate Tensile Strength [N]                     | $P_{Motor}$  | Motor Power on Output Shaft [kW]                              |
| $F_e$            | Effective Force [N]                               | $r_{pulley}$ | Radius of Driver Pulley [mm]                                  |
| $F_{eall}$       | Allowable Effective Force [N]                     | $Si_{Break}$ | Safety Factor on Breaking Force                               |
| $F_{eallapp}$    | Maximum Allowable Effective Force Application [N] | $Si_{F1}$    | Safety Factor on allowable Belt Force                         |
| $F_f$            | Friction Force [N]                                | $Si_{Fe}$    | Safety Factor on Allowable Effective Force                    |
| $F_{Fa}$         | Friction Force during accumulation [N]            | $t_m$        | Tooth in mesh Factor                                          |
| $F_{Fv}$         | Friction Force due to Vacuum [N]                  | $T_{Motor}$  | Torque of Output Shaft [Nm]                                   |
| $F_g$            | Gravitational Force [N]                           | $t_v$        | Speed Factor                                                  |
| $F_{pre}$        | Force for Pre-tensioning [N]                      | $v$          | Speed [m/sec]                                                 |
| $F_{Stress}$     | Load Factor                                       | $z_m$        | Teeth in mesh                                                 |
| $F_w$            | Externally applied working load [N]               |              |                                                               |

## 2. FORCES / FORCES FOR TIMING BELT DRIVES

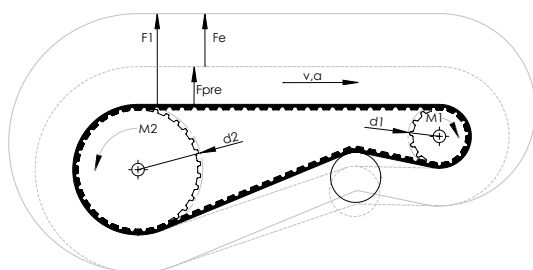
### a. Conveying Applications



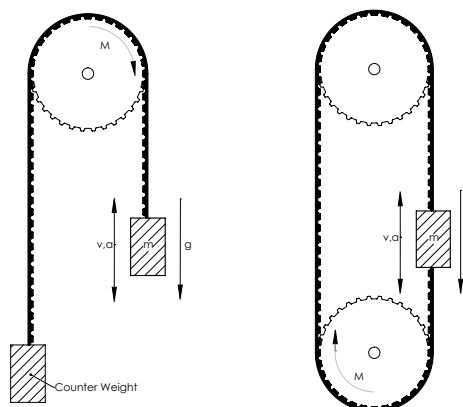
### b. Linear Positioning



### c. Closed Power Transmission Drives



### d. Lifting Applications



## 3. BASICS

### a. Load Factor $F_{\text{Stress}}$

If no real-life testing results are available for the design of timing belt applications we recommend a load factor for calculating the effective force  $F_e$ , associated forces for pre-tensioning  $F_{\text{pre}}$  and tight side belt force  $F_1$ .

Negative effects on the timing belt service life such as shocks are avoided through the Load Factor. The following list is provided as a guide for establishing a suitable factor:

| Load                | Load Factor | Examples                                                                                                                                                |
|---------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Uniform             | 1,2 ... 1,5 | Conveyor for light goods, vial filling systems, medical devices, gauges, light wood processing machines, light bearing technology, linear motion slides |
| Weak impact load    | 1,5 ... 1,8 | Wood processing machines, bearing technology, rack feeders, lathes, washing machines, mixing machines, vibration testing machines                       |
| Average impact load | 1,8 ... 2,2 | Hoisting devices, textile machines, extruders, paper handling                                                                                           |
| Heavy impact load   | 2,2 ... 2,5 | Brickworks, molding press, coining machines, hammer mills                                                                                               |

**b. Tooth in mesh Factor  $t_m$  / Speed Factor  $t_v$**

The factors listed below are required to correct the Allowable Effective Force:

table 1

| Tooth in mesh Factor $t_m$ |                      |
|----------------------------|----------------------|
| No. of Teeth in mesh       | Tooth in mesh Factor |
| $z_m$                      | $t_m$                |
| 3                          | 0.39                 |
| 4                          | 0.5                  |
| 5                          | 0.59                 |
| 6                          | 0.67                 |
| 7                          | 0.74                 |
| 8                          | 0.8                  |
| 9                          | 0.85                 |
| 10                         | 0.89                 |
| 11                         | 0.92                 |
| 12                         | 0.95                 |
| 13                         | 0.97                 |
| 14                         | 0.99                 |
| 15                         | 1                    |

table 2

| Speed Factor $t_v$ |        |
|--------------------|--------|
| Speed              | Factor |
| m/s                | $t_v$  |
| 0                  | 1      |
| 1                  | 0.99   |
| 2                  | 0.98   |
| 3                  | 0.97   |
| 4                  | 0.95   |
| 5                  | 0.93   |
| 6                  | 0.9    |
| 7                  | 0.87   |
| 8                  | 0.84   |
| 9                  | 0.81   |
| 10                 | 0.77   |

**c. Braking / Emergency Shutdown**

For the following calculations the review of the peripheral forces occur due to normal braking maneuvers and especially emergency operations are of highest interest.

If the forces during these operation are bigger than the tangential forces based on lateral movement, further calculation of the force for pre-tensioning and the allowable belt force are needed on the basis of higher loads.

#### 4. CALCULATION OF CONVEYING APPLICATIONS

##### a. Calculation of Effective Force $F_e$

The effective force  $F_e$  at the driver pulley is derived from the sum of all individual forces resisting the belt motion. The individual loads contributing to the effective force must be identified and calculated based on the loading conditions and drive configurations. To determine the Effective Force please use the method for conveying as follows:

$$F_e = \sum F_{\text{Resistance}} \times F_{\text{Stress}}$$

##### i. Friction Force $F_F$

The friction force between the timing belt and the slider bed due to weight of the conveyed good vertically to the direction of conveyance.

$$F_F = \mu \times g \times m_F \times \cos\beta$$

##### ii. Friction Force during accumulation $F_{Fa}$

The friction force between the timing belt, slider bed and the conveyed Material due to the mass component of the accumulated Material vertically to the direction of conveyance.

$$F_{Fa} = (\mu + \mu_a) \times g \times m_a \times \cos\beta$$

##### iii. Friction Force due to Vacuum $F_{FV}$

The friction force between the timing belt and the slider bed due to the vacuum for fixation of conveyed goods

$$F_{FV} = \mu \times p \times A_V$$

##### iv. Gravitational Force $F_G$

Force due to the mass component of the conveyed good parallel to the direction of conveyance.

$$F_G = m_F \times g \times \sin\beta$$

##### v. Acceleration Force $F_a$

Force to accelerate the mass of the conveyed good.

$$F_a = m_F \times a$$

##### vi. Further Forces

Motion resistance on the basis of belt mass, idler or similar are normally insignificant, but may have a decisive influence on the total value of the effective force and therewith on the belt load as well. The importance of mentioned influences has to be estimated throughout the calculations – in extreme cases the component forces must be calculated and considered.



**b. Calculation of Force for Pre-tensioning  $F_{pre}$** **i. Real calculated Pre-tension**

For trouble-free operation, it is necessary that the slack side does not fall below a certain tension. The pre-tension prevents jumping of the pulley teeth during belt operation. In order to collect the pre-tension, the optimal slack side force has to be ascertained as follows:

$$F_{2opt} = (0,1 \dots 0,3) \times F_U$$

Higher values are recommended for longer belt lengths.

Assuming an optimal slack side force the force for pre-tensioning is calculated considering the tight side length  $L_1$  and the total timing belt length  $L$  as follows:

$$F_{pre} = F_{2opt} + F_e \times \frac{L_1}{L}$$

**ii. Minimum Factor for Pre-tensioning**

In most cases the selection of the belt type and its width is not carried out by existing applied loads, but on the geometry of the transported material. In most cases the result of this choice is an oversized belt drive the required pre-tension can hardly be determined based on calculation bases. For proper operation the Factor for pre-tensioning should be set as follows:

$$F_{pre} = 0,3 \times F_{1all}$$

**c. Calculation of Tight Side Belt Force  $F_1$** 

In the worst case the tight side belt force results as follows (conveyor moving at full load):

$$F_1 = F_e + F_{pre}$$

**d. Belt Selection**

To select the matching application for the belt type and width by using the values determined above ( $F_e$  and  $F_1$ ) have to be compared with the valid data from our catalogue. After the first selection, the resulting pulley teeth have to be detected. The determined number of teeth and the angle of contact are the basis for the number of teeth which are constantly engaged to the pulley and which can be used for power transmissions.

The allowable effective force  $F_{eall}$  for the number of teeth smaller than 15 has to be rectified with the help of a tooth in mesh factor  $t_m$  which can be taken from *table 1*. The same method is allowed for conveying velocity. The needed speed factor  $t_v$  for speed can be taken from *table 2*. The outcome is a maximum allowable effective Force Application as follows:

$$F_{eallapp} = F_{eall} \times t_m \times t_v$$

$F_{eallapp}$  and  $F_{1all}$  should be larger than the actual prevailing forces in the application.

$$F_{eallapp} > F_e$$

$$F_{1all} > F_1$$

**c. Calculation of Safety Factor SF**

- i. Safety factor on allowable effective force  $SF_{Fe}$   

$$SF_{Fe} = F_{eallapp} / F_e$$
- ii. Safety factor on allowable belt force  $SF_1$   

$$SF_1 = F_{1all} / F_1$$
- iii. Safety factor on ultimate tensile strength  $SF_{Break}$   

$$SF_{Break} = F_{Break} / F_1$$

## 5. CALCULATION OF LINEAR APPLICATIONS

**a. Calculation of Effective Force  $F_e$**

The effective force  $F_e$  at the driver pulley is derived from the sum of all individual forces resisting the belt motion. The individual loads contributing to the effective force must be identified and calculated based on the loading conditions and drive configurations. To determine the effective force please use the method for conveying as follows:

$$F_e = \sum F_{Resistance} \times F_{Stress}$$

- i. Friction Force  $F_F$   
 The friction force between the conveyed material and the storing vertically to the direction of conveyance.  

$$F_F = \mu \times g \times m \times \cos\beta$$
- ii. Gravitational Load  $F_G$   
 Force due to mass component parallel to the direction of conveyance.  

$$F_G = m \times g \times \sin\beta$$
- iii. Acceleration Force  $F_a$   
 Force to accelerate the mass of the moved goods.  

$$F_a = m \times a$$

## iv. Further Forces

Motion resistance due to belt mass, idler or similar are normally insignificant, but may have a decisive influence on the total value of the effective force  $F_e$  and therewith on the belt load as well. The importance of mentioned influences has to be estimated throughout the calculations – in extreme cases the component forces must be calculated and considered.

b. Calculation of Force for Pre-tensioning  $F_{pre}$ 

For trouble-free operation, it is necessary that the slack side does not fall below a certain tension. The pre-tension prevents jumping of the pulley teeth during belt operation. In order to collect the pre-tension, the optimal slack side force has to be ascertained as follows:

$$F_{2opt} = (0,1 \dots 0,3) \times F_e$$

Higher values are recommended for longer belt lengths.

Assuming an optimal slack side force, the force for pre-tensioning is calculated considering the tight side length  $L_1$  and the total timing belt length  $L$  as follows:

$$F_{pre} = F_{2opt} + F_e \times \frac{L_1}{L}$$

c. Calculation of Tight Side Belt Force  $F_1$ 

In the worst case the tight side belt force results as follows (application moving at full load):

$$F_1 = F_e + F_{pre}$$

## d. Belt Selection

To select the matching application for the belt type and width by using the values determined above ( $F_e$  and  $F_1$ ) have to be compared with the valid data from our catalog. After the first selection, the resulting pulley teeth have to be detected. The determined number of teeth and the angle of contact are the basis for the number of teeth which are constantly engaged to the pulley and which can be used for power transmissions. The allowable effective force  $F_{eall}$  for the number of teeth smaller than 15 has to be rectified with the help of a tooth in mesh factor  $t_m$  which can be taken from **table 1**. The same method is allowed for conveying velocity. The needed speed factor  $t_v$  for speed can be taken from **table 2**. The outcome is a maximum allowable effective force application as follows:

$$F_{eallapp} = F_{eall} \times t_m \times t_v$$

$F_{eallapp}$  and  $F_1$  should be larger than the actual prevailing forces in the application.

$$F_{EallAn} > F_U$$

$$F_{1all} > F_1$$

#### e. Calculation of Safety Factor SF

- i. Safety factor on allowable effective force  $SF_{Fe}$   

$$SF_{Fe} = F_{eallapp} / F_e$$
- ii. Safety factor on allowable belt force  $SF_1$   

$$SF_1 = F_{1all} / F_1$$
- iii. Safety factor on ultimate tensile strength  $SF_{Break}$   

$$SF_{Break} = F_{Break} / F_1$$

#### f. Clamp Plates

The clamp plates should be accomplished that at least 8 teeth per belt end can be clamped. During the assembling process please consider to equally clamp the belt – the belt height has to be reduced by at least 0,2 - 0,3 mm.

### 6. CALCULATION OF CLOSED POWER TRANSMISSION DRIVES

Closed power transmission drives should be always realized as truly endless cast or flex belts. The use of endless welded timing belts is not recommended.

#### a. Calculation of Effective Force $F_e$

The Effective Force  $F_e$  can be calculated with the existing movement resistance as follows:

$$F_e = \sum F_{Resistance} \times F_{Stress} \quad \text{Quod vide} \rightarrow \text{conveying applications}$$

Furthermore the effective force can also be calculated with the existing driving power as follows:

$$F_e = (T_{Motor} \times 1000) / r_{pulley}$$

or

$$F_e = (19100 \times P_{Motor} \times 500) / (n \times r_{pulley})$$

#### b. Calculation of Force for Pre-tensioning $F_{pre}$

For trouble-free operation, it is necessary that the slack side does not fall below a certain tension. The pre-tension prevents jumping of the pulley teeth during belt operation. In order to collect the pre-tension, the optimal slack side force has to be ascertained as follows:

$$F_{2opt} = (0,1 \dots 0,3) \times F_e$$

Higher values are recommended for longer belt lengths.

Assuming an optimal slack side force, the force for pre-tensioning is calculated considering the tight side length  $L_1$  and the total timing belt length  $L$  as follows:

$$F_{pre} = F_{2opt} + F_e \times \frac{L_1}{L}$$

**c. Calculation of Tight Side Belt Force  $F_1$** 

In the worst case the tight side belt force  $F_1$  results as follows (application moving at full load):

$$F_1 = F_e + F_{pre}$$

**d. Belt Selection**

To select the matching application for the belt type and width by using the values determined above ( $F_e$  and  $F_1$ ) have to be compared with the valid data from our catalog. After the first selection, the resulting pulley teeth have to be detected. The determined number of teeth and the angle of contact are the basis for the number of teeth which are constantly engaged to the pulley and which can be used for power transmissions. The allowable effective force  $F_{eall}$  for the number of teeth smaller than 15 has to be rectified with the help of a tooth in mesh factor  $t_m$  which can be taken from **table 1**. The same method is allowed for conveying velocity. The needed speed factor  $t_v$  for speed can be taken from **table 2**. The outcome is a maximum allowable effective force application as follows:

$$F_{eallapp} = F_{eall} \times t_m \times t_v$$

$F_{eallapp}$  and  $F_{1all}$  should be larger than the actual prevailing forces in the application.

$$F_{eallapp} > F_e$$

$$F_{1all} > F_1$$

**e. Calculation of Safety Factor  $SF_i$** 

- i. Safety factor on allowable effective force  $SF_{Fe}$   

$$SF_{Fe} = F_{eallapp} / F_e$$
- ii. Safety factor on allowable belt force  $SF_1$   

$$SF_1 = F_{1all} / F_1$$
- iii. Safety factor on ultimate tensile strength  $SF_{Break}$   

$$SF_{Break} = F_{Break} / F_1$$

## 7. CALCULATION OF LIFTING APPLICATIONS WITHOUT COUNTER WEIGHT, TWO SHAFTS

### a. Calculation of Effective Force $F_e$

The effective force at the driver pulley is derived from the sum of all individual forces resisting the belt motion. The individual loads contributing to the effective force must be identified and calculated based on the loading conditions and drive configurations. To determine the effective force  $F_e$  please use the method for conveying as follows:

$$F_e = \sum F_{\text{Resistance}} \times F_{\text{Stress}}$$

#### i. Friction Force $F_F$

The friction force between the moved mass and its bearings.

$$F_F = \mu \times g \times m \times \cos\beta$$

#### ii. Gravitational Load $F_G$

Force due to mass component parallel to the direction of conveyance.

$$F_G = m \times g \times \sin\beta$$

#### iii. Acceleration force $F_a$

Force to accelerate the mass.

$$F_a = m \times a$$

#### iv. Further Forces

Motion resistance due to belt mass, idler or similar are normally insignificant, but may have a decisive influence on the total value of the effective force  $F_e$  and therewith on the belt load as well. The importance of mentioned influences has to be estimated throughout the calculations – in extreme cases the component forces must be calculated and considered.

### b. Calculation of Factor for Pre-tensioning $F_{\text{pre}}$

For trouble-free operation, it is necessary that the slack side does not fall below a certain tension. The pre-tension prevents jumping of the pulley teeth during belt operation. In order to collect the pre-tension, the optimal slack side force has to be ascertained as follows:

$$F_{2\text{opt}} = (0,1 \dots 0,3) \times F_U$$

Higher values are recommended for longer belt lengths.

Assuming an optimal slack side force, the force for pre-tensioning is calculated considering the tight side length  $L_1$  and the total timing belt length  $L$  as follows:

$$F_V = F_{2\text{opt}} + F_U \times \frac{L_1}{L}$$

**c. Calculation of Tight Side Belt Force  $F_1$** 

In the worst case the Tight Side Belt Force results as follows (Conveyor moving at full load):

$$F_1 = F_e + F_{pre}$$

**d. Belt Selection**

To select the matching application for the belt type and width by using the values determined above ( $F_e$  and  $F_1$ ) have to be compared with the valid data from our catalogue. After the first selection, the resulting pulley teeth have to be detected. The determined number of teeth and the angle of contact are the basis for the number of teeth which are constantly engaged to the pulley and which can be used for power transmissions. The allowable effective force  $F_{eall}$  for the number of teeth smaller than 15 has to be rectified with the help of a tooth in mesh factor  $t_m$  which can be taken from **table 1**. The same method is allowed for conveying velocity. The needed speed factor  $t_v$  for speed can be taken from **table 2**. The outcome is a maximum allowable effective force application as follows:

$$F_{eallapp} = F_{eall} \times t_m \times t_v$$

$F_{eallapp}$  and  $F_{1all}$  should be larger than the actual prevailing forces in the application.

$$F_{eallapp} > F_e$$

$$F_{1all} > F_1$$

**e. Calculation of Safety Factor SF**

- i. Safety factor on allowable effective force  $SF_{Fe}$

$$SF_{Fe} = F_{eallapp} / F_e$$

- ii. Safety factor on allowable belt force  $SF_1$

$$SF_1 = F_{1all} / F_1$$

- iii. Safety factor on ultimate tensile strength  $SF_{Break}$

$$SF_{Break} = F_{Break} / F_1$$

## 8. CALCULATION OF LIFTING APPLICATIONS, WITH COUNTER WEIGHT, 1 SHAFT

### a. Calculation of Effective Force $F_e$

The effective force  $F_e$  at the driver pulley is derived from the sum of all individual forces resisting the belt motion. The individual loads contributing to the effective force must be identified and calculated based on the loading conditions and drive configurations. To determine the effective force please use the method for conveying as follows:

i.  $F_e = m \times (g + a) - m_e \times (g - a)$

### ii. Further Forces

Motion resistance due to belt mass, idler or similar are normally insignificant, but may have a decisive influence on the total value of the effective force  $F_e$  and therewith on the belt load as well. The importance of mentioned influences has to be estimated throughout the calculations – in extreme cases the component forces must be calculated and considered.

### b. Calculation of Factor for Pre-tensioning $F_{pre}$

Not available for lifting applications with counter weight and one pulley.

### c. Calculation of Tight Side Belt Force $F_1$

In the worst case the tight side belt force results as follows (conveyor moving at full load):

$$F_{1max} = m_{max} \times (a + g)$$

### d. Belt Selection

To select the matching application for the belt type and width by using the values determined above ( $F_e$  and  $F_1$ ) have to be compared with the valid data from our catalog. After the first selection, the resulting pulley teeth have to be detected. The determined number of teeth and the angle of contact are the basis for the number of teeth which are constantly engaged to the pulley and which can be used for power transmissions. The allowable effective force  $F_{eall}$  for the number of teeth smaller than 15 has to be rectified with the help of a tooth in mesh factor  $t_m$  which can be taken from **table 1**. The same method is allowed for conveying velocity. The needed speed factor  $t_v$  for speed can be taken from **table 2**. The outcome is a maximum allowable effective force application as follows:

$$F_{eallapp} = F_{eall} \times t_m \times t_v$$

$F_{eallapp}$  and  $F_{1all}$  should be larger than the actual prevailing forces in the application.

$$F_{eallapp} > F_e$$

$$F_{1all} > F_{1max}$$



**e. Calculation of Safety Factor SF**

- i. Safety factor on allowable effective force  $SF_{Fe}$   

$$SF_{Fe} = F_{eallapp} / F_e$$
- ii. Safety factor on allowable belt force  $SF_1$   

$$SF_1 = F_{1all} / F_1$$
- iii. Safety factor on ultimate tensile strength  $SF_{Break}$   

$$SF_{Break} = F_{Break} / F_1$$

**9. ELONGATION / POSITIONING ERROR IN TIMING BELT DRIVES****a. Elongation  $\Delta x$** 

The static elongation based on an applied force such as the pre-tension results as follows:

$$\Delta x = \frac{F \times L}{c_{Sp}}$$

**b. Positioning Error  $\Delta x_{Pos}$** 

The positioning error mainly depends on the total stiffness  $c_R$  of the slack and tight side.

$$c_R = c_{Sp} \times \frac{L}{L_1 \times L_2}$$

Note that  $c_R$  is at its minimum when the tight and slack sides are equal.

Determine the positioning error  $\Delta x_{Pos}$  due to belt elongation caused by e.g. the effective force  $F_e$ :

$$\Delta x_{Pos} = \frac{F}{c_R}$$

## 10. TIMING BELT CONSTRUCTION

### a. Pre-tensioning $F_{pre}$

For proper adjustment of pre-tensioning  $F_{pre}$  Gates recommends the Sonic Tension Meter 507 C which directly specifies the pre-tension in Newton.

When using prior tension meters the conversion of the pre-tension is required. The conversion results as follows:

$$f = \sqrt{\frac{F_{pre}}{4 \times m \times l^2}}$$

### b. Assembling Instructions

The timing belt should be placed around the pulleys without any tension. Using the tensioning device, apply the calculated pre-tension to the belt. After applying the pre-tension, lock all adjustable shafts into place. If the shafts are fixed, the timing belt has to be assembled together with the pulleys.

## ABBREVIATIONS

TIMING BELTS

SELF TRACKING

FLAT BELTS

WIDE BELTS

ENDLESS BELTS

FINISHING

INFORMATION

The specifications listed are based on Gates experience. However, our specifications and data do NOT cover all possible belt drive conditions. It is the responsibility of the belt drive system designer to ensure Gates belts are appropriate for a given system and application. The provided data is representative of our in-house experience and does not necessarily match product performance in industrial use. Gates cannot assume any liability concerning the suitability and process ability of our products. We also cannot assume liability for process results, damages or consequential damages associated with the use of our products.

Do not use Gates belts in applications that depend solely upon the belt to raise/lower, support or sustain a mass without an independent safety backup system. Gates products are not suitable for applications in aircraft.

All information contained are subject to change without notice.

## ABBREVIATIONS

| Polyurethane |                                    | Belt Types |                                   |
|--------------|------------------------------------|------------|-----------------------------------|
| R1           | 92 Shore A                         | R          | Roll stock                        |
| R2           | 85 Shore A                         | G          | Open ended                        |
| FDA          | 85 Shore A / FDA approval          | P          | Punched only belts                |
| R3           | 90 Shore A / STAND cast belts      | E          | Endless welded belts              |
| R4           | 94 Shore A / antistatic features   | S          | Gates Synchro Power® (Cast) Belts |
| EUF85        | 85 Shore A / suitable for food use | F          | Truly Endless Flex Belts          |
| EUF92        | 92 Shore A / suitable for food use |            |                                   |

| Pitches and Cord Types |                          | Polyamide and Special Fabrics |                                         |
|------------------------|--------------------------|-------------------------------|-----------------------------------------|
| SL                     | Steel cord               | NB                            | Polyamide fabric on back                |
| L                      | Reinforced cord          | NT                            | Polyamide fabric on tooth side          |
| HF                     | High flexible steel cord | NTB                           | Polyamide fabric on tooth and back      |
| NIRO                   | Stainless steel cord     | ECO                           | Antistatic ECO fabric on tooth and back |
| KV                     | Aramide cord             | ATB                           | Antistatic fabric on tooth and back     |
| DT                     | Double sided cast belts  |                               |                                         |

| Approvals |                                                                                                                                                                                                                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FDA       | Approval by the U.S. Food and Drug Administration according to regulation no. 177.2600-Rubber Articles for repeated use                                                                                                                                                                     |
| EU        | EU approval for materials made of polyurethane, which are used for food applications according to the following EU regulations and guidelines: VO (EG) No. 1935 / 2004 § 4, EG Regulation 2002 / 72 / EG-completion 2007 / 19 / EG, Regulation 82 / 711 / EWG and Regulation 85 / 572 / EWG |

| Backings and Fabrications  |                                                                  |
|----------------------------|------------------------------------------------------------------|
| HB                         | High Back Backing / backing hardness depends on on belt hardness |
| Min. pulley diameter in mm | Pulley diameter factor x material thickness                      |

## NOTES

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TIMING BELT

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FLAT BELTS

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## POWERING PROGRESS™

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