BMG

BELTING

# FABRIC REINFORCED CONVEYOR BELTING

## Technical Guide


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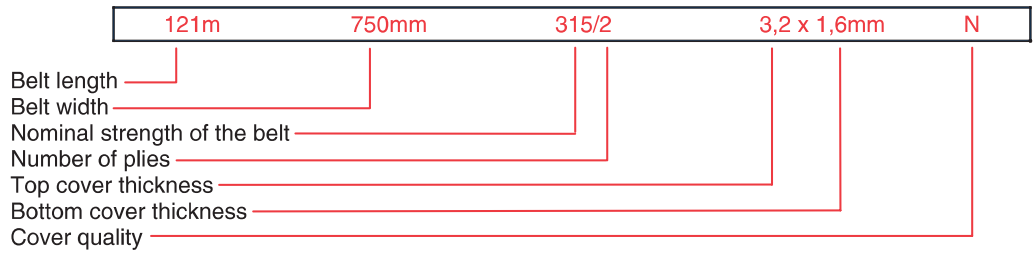
SANS ISO 9001:2008

# CONVEYOR BELTING DESIGNATION

Textile conveyor belting is designed (and if desired, also marked) according to the internationally defined standards. In addition, special type and quality definitions by the manufacturers are possible.
Example:




## Belt Length

The belt length is usually stated in metres (m), either as an open length or as an endless length. An open belt length means the circumference of an installation plus the extra length for splicing. The endless belt length is the inner circumference of the spliced belt.

- Permitted tolerances on standard belt lengths (according to SABS).

| | | | | | |
|---|---|---|---|---|---|
| Open Length of Belting | + | 2% | or | - | 0.5% |
| Endless Length of Belting | +/- | 0.5% | | | |

## Belt Width

Belt widths are stated in millimetres (mm) sometimes in metres (m) and preferred widths are specified in international standards.

- Standard Stock widths in mm (Underlined widths indicate standard stock widths)

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 150, | 200, | 250, | 300, | 350, | 450, | 500, | 600, | 750, | 900, | 1050, | 1200, | 1350, | 1500, | 1650, | 1800, | 2100 |

- Permitted tolerances on standard belt widths (according to SABS).

| | | | |
|---|---|---|---|
| Belt width of less than | 600mm | +/- | 7.5mm |
| Belt width of at least | 600mm | +/- | 1.5% |

## Basic Carcass Material

Most belt carcasses are of a mixed construction, made with the synthetic yarns being Polyester and Nylon (EP).

## Nominal Belt Strength (Class)

This figure states the minimum breaking strength, or class of the conveyor belt, related to the belt width as a unit of measurement.

| | | | | | | |
|---|---|---|---|---|---|---|
| 200 | 250 | 315 | 400 | 500 | 630 | 800N/mm |

## Number of Plies

The number of plies completes the figure for the nominal strength.

- Standard values for the nominal strength of the fabric

| | | | | | | |
|---|---|---|---|---|---|---|
| 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| | 500 | | | 630 | N/mm | |

The nominal strength of the belt carcass is indicated by the strength of each ply multiplied by the number of plies and rounded off upwards to the next nominal belt strength.

## Covers

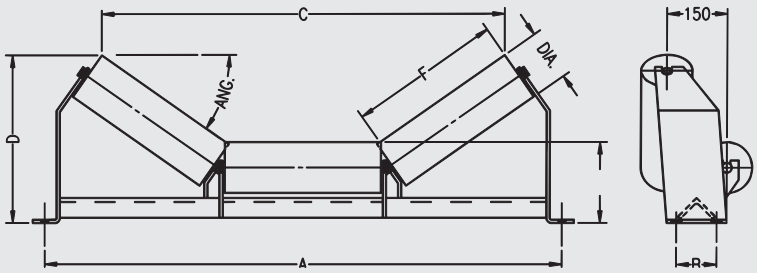
The thickness of both top and bottom cover is stated in millimetres (mm), with the total belt thickness being the sum of the thickness of both covers and that of the carcass.

- Permitted tolerances on cover thickness (according to SABS).

| | | | |
|---|---|---|---|
| Cover thickness of less than | 5mm | - | 0.2mm |
| Cover thickness of at least | 5mm | - | 5% |

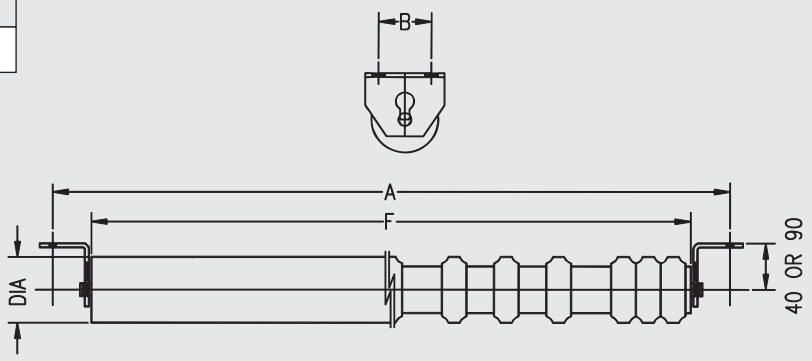
## Troughing Idlers (127 DIA Series 25)

| BW | F | A | Mounting Slot | | 20 | | 35 | | 45 | | Approx. Total Mass |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | B | Size | C | D | C | D | C | D | |
| 400 | 170 | 634 | - | 14x25 | 470 | 258 | 429 | 297 | 392 | 318 | 19 |
| 450 | 190 | 686 | - | 14x25 | 527 | 265 | 482 | 308 | 440 | 333 | 21 |
| 500 | 200 | 736 | - | 14x25 | 556 | 269 | 509 | 314 | 464 | 340 | 22 |
| 600 | 240 | 838 | - | 14x25 | 671 | 282 | 614 | 337 | 561 | 368 | 26 |
| 750 | 290 | 990 | - | 14x25 | 815 | 299 | 746 | 365 | 682 | 403 | 30 |
| 900 | 340 | 1144 | - | 14x25 | 959 | 317 | 878 | 394 | 802 | 439 | 33 |
| 1050 | 390 | 1296 | 100 | 14x25 | 1103 | 334 | 1010 | 423 | 923 | 474 | 38 |
| 1200 | 450 | 1448 | 100 | 14x25 | 1276 | 354 | 1168 | 457 | 1068 | 511 | 42 |
| 1350 | 500 | 1600 | 240 | 18x30 | 1420 | 371 | 1300 | 486 | 1189 | 552 | 55 |
| 1500 | 560 | 1752 | 240 | 18x30 | 1593 | 392 | 1458 | 520 | 1333 | 594 | 60 |
| 1800 | 660 | 2058 | 240 | 18x30 | 1877 | 426 | 1725 | 579 | 1578 | 667 | 68 |




## Return Idlers (127 DIA Series 25)

| BW | F | A | Mounting Slot | | Approx. Total Mass |
|---|---|---|---|---|---|
| | | | B | Size | |
| 400 | 484 | 634 | 100 | 14x25 | 10 |
| 450 | 536 | 686 | 100 | 14x25 | 11 |
| 500 | 586 | 736 | 100 | 14x25 | 12 |
| 600 | 688 | 838 | 100 | 14x25 | 13 |
| 750 | 840 | 990 | 100 | 14x25 | 16 |
| 900 | 994 | 1144 | 100 | 14x25 | 18 |
| 1050 | 1146 | 1296 | 100 | 14x25 | 20 |
| 1200 | 1298 | 1448 | 100 | 14x25 | 23 |
| 1350 | 1450 | 1600 | 100 | 14x25 | 25 |
| 1500 | 1602 | 1752 | 100 | 14x25 | 27 |
| 1800 | 1908 | 2058 | 100 | 14x25 | 33 |



# FABRIC REINFORCED CONVEYOR BELTING

## Conveyor Classes

| Belt Class | Max. Recomm. Operating Tension (kN/m) | 2 Ply | 3 Ply | 4 Ply | 5 Ply |
|---|---|---|---|---|---|
| 200 | 20,0 | 200/2 | - | - | - |
| 250 | 25,0 | 250/2 | - | - | - |
| 315 | 31,5 | 315/2 | 315/3 | - | - |
| 400 | 40,0 | 400/2 | 400/3 | 400/4 | - |
| 500 | 50,0 | - | 500/3 | 500/4 | 500/5 |
| 630 | 63,0 | - | 630/3 | 630/4 | 630/5 |
| 800 | 80,0 | - | 800/3 | 800/4 | 800/5 |

## Approx. Carcass Thickness (mm)

| Belt Class | 2 Ply | 3 Ply | 4 Ply | 5 Ply |
|---|---|---|---|---|
| 200 | 2.6 | - | - | - |
| 250 | 2.7 | - | - | - |
| 315 | 2.8 | 3.5 | - | - |
| 400 | 3.0 | 3.8 | 5.0 | - |
| 500 | - | 4.2 | 5.2 | 5.9 |
| 630 | - | 5.2 | 5.8 | 6.6 |
| 800 | - | 6.0 | 6.9 | 7.3 |

## Approx. Carcass Mass ($kg/m^2$)

| Belt Class | 2 Ply | 3 Ply | 4 Ply | 5 Ply |
|---|---|---|---|---|
| 200 | 3.0 | - | - | - |
| 250 | 3.1 | - | - | - |
| 315 | 3.4 | 4.0 | - | - |
| 400 | 3.7 | 4.4 | 6.0 | - |
| 500 | - | 4.8 | 6.4 | 7.5 |
| 630 | - | 5.2 | 6.8 | 8.0 |
| 800 | - | 6.4 | 7.2 | 8.5 |

## Cover Thickness (mm)

| Cover Thickness |
|---|
| 1.5 |
| 2.0 |
| 2.5 |
| 3.0 |
| 4.0 |
| 5.0 |
| 6.0 |
| 8.0 |
| 10.0 |
| 12.0 |

## Cover Grades & Mass per mm of thickness ($kg/m^2$)

| Cover Grade | Mass($kg/m^2$) |
|---|---|
| N | 1.14 |
| M | 1.10 |
| H.R | 1.17 |
| O.R | 1.41 |

Figures stated in these tables may vary to those measured in the finished product

# FABRIC REINFORCED CONVEYOR BELTING

## Recommended Minimum Pulley Diameters

| Belt Class | Pulley Type | 2 Ply | 3 Ply | 4 Ply | 5 Ply |
|---|---|---|---|---|---|
| 200 | A | 315 | - | - | - |
| | B | 250 | - | - | - |
| | C | 200 | - | - | - |
| 250 | A | 315 | - | - | - |
| | B | 250 | - | - | - |
| | C | 200 | - | - | - |
| 315 | A | 315 | 400 | - | - |
| | B | 250 | 315 | - | - |
| | C | 200 | 250 | - | - |
| 400 | A | 400 | 500 | 630 | - |
| | B | 315 | 400 | 500 | - |
| | C | 250 | 315 | 400 | - |
| 500 | A | - | 500 | 630 | 630 |
| | B | - | 400 | 500 | 500 |
| | C | - | 315 | 400 | 400 |
| 630 | A | - | 630 | 630 | 800 |
| | B | - | 500 | 500 | 630 |
| | C | - | 400 | 400 | 500 |
| 800 | A | - | 800 | 800 | 800 |
| | B | - | 630 | 630 | 630 |
| | C | - | 500 | 500 | 500 |

Pulley Types:

| | | |
|---|---|---|
| A | High tension pulleys wrap exceeding 45° | eg. Head, drive, tripper |
| B | Low tension pulleys wrap exceeding 45° | eg. Tail, take-up, take-up bend |
| C | Low tension pulleys wrap up to 45° | eg. Low tension snub or bend |

## Maximum Number of Plies Recommended for Correct Empty Belt Troughing

| Belt Class | Belt Width (mm) | | | | | | | | Troughing Angle |
|---|---|---|---|---|---|---|---|---|---|
| | 450 | 600 | 750 | 900 | 1050 | 1200 | 1350 | 1500 | |
| 200 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 20° |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 35° |
| 250 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 20° |
| | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 35° |
| 315 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 20° |
| | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 35° |
| 400 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 20° |
| | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 35° |
| 500 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 20° |
| | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 35° |
| 630 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 20° |
| | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 35° |
| 800 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 20° |
| | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 35° |

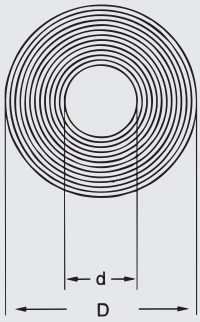
## Information on SABS

SANS 1173 was first published in August 1977, and was written to give South African manufacturers a guideline to minimum acceptable requirements for "General purpose textile-reinforced conveyor belting"

There have been revisions to the standard. The first revision in 1979, the second in January 2000, and the latest in 2005. These revisions have brought the standards requirements more in line with internationally recognized standards, such as DIN 22 101 and BS490.

Our belting is manufactured and tested in strict accordance to the requirements of SANS 1173.

# USEFUL CALCULATIONS




Calculation Method of Finished Belt Length

$$L = \frac{(D+d)\ \pi}{2}\ N$$

L : Finished Belt Length
d : Dia. of Core
D : Dia. of Rolled Belt.
N : No. of Times Rolled
t : Belt Thickness

Method of Calculating the Dia. of Rolled Belt.

$$D = \sqrt{\frac{4}{\pi}\ t \cdot L + d^{\ 2}}$$

| Belt Thickness | Dia. of Core |
|---|---|
| 6.0 ~ 10.0mm | 0.18m |
| 10.5 ~ 20.0mm | 0.30m |
| 20.5 ~ 25.0mm | 0.40m |

| Length (m) | Belt Thickness (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 20 | 0.47 | 0.49 | 0.52 | 0.54 | 0.56 | 0.59 | 0.61 | 0.63 | 0.65 | 0.67 |
| 30 | 0.53 | 0.56 | 0.60 | 0.63 | 0.66 | 0.69 | 0.71 | 0.74 | 0.77 | 0.79 |
| 40 | 0.59 | 0.63 | 0.67 | 0.70 | 0.74 | 0.77 | 0.81 | 0.84 | 0.87 | 0.90 |
| 50 | 0.64 | 0.69 | 0.73 | 0.77 | 0.81 | 0.85 | 0.89 | 0.92 | 0.96 | 0.99 |
| 60 | 0.69 | 0.74 | 0.79 | 0.84 | 0.88 | 0.92 | 0.96 | 1.00 | 1.04 | 1.08 |
| 70 | 0.73 | 0.79 | 0.84 | 0.90 | 0.94 | 0.99 | 1.03 | 1.08 | 1.12 | 1.16 |
| 80 | 0.77 | 0.84 | 0.90 | 0.95 | 1.00 | 1.05 | 1.10 | 1.14 | 1.19 | 1.23 |
| 90 | 0.81 | 0.88 | 0.94 | 1.00 | 1.06 | 1.11 | 1.16 | 1.21 | 1.26 | 1.30 |
| 100 | 0.85 | 0.92 | 0.99 | 1.05 | 1.11 | 1.17 | 1.22 | 1.27 | 1.32 | 1.37 |
| 120 | 0.92 | 1.00 | 1.08 | 1.14 | 1.21 | 1.27 | 1.33 | 1.39 | 1.44 | 1.49 |
| 140 | 0.99 | 1.08 | 1.16 | 1.23 | 1.30 | 1.37 | 1.43 | 1.49 | 1.55 | 1.61 |
| 160 | 1.05 | 1.14 | 1.23 | 1.31 | 1.39 | 1.46 | 1.52 | 1.59 | 1.65 | 1.71 |
| 180 | 1.11 | 1.21 | 1.30 | 1.39 | 1.47 | 1.54 | 1.61 | 1.68 | 1.75 | 1.81 |
| 200 | 1.17 | 1.27 | 1.37 | 1.46 | 1.54 | 1.62 | 1.70 | 1.77 | 1.84 | 1.91 |
| 220 | 1.22 | 1.33 | 1.43 | 1.52 | 1.61 | 1.70 | 1.78 | 1.86 | 1.93 | 2.00 |
| 240 | 1.27 | 1.39 | 1.49 | 1.59 | 1.68 | 1.77 | 1.86 | 1.94 | 2.01 | 2.09 |
| 260 | 1.32 | 1.44 | 1.55 | 1.65 | 1.75 | 1.84 | 1.93 | 2.01 | 2.09 | 2.17 |
| 280 | 1.37 | 1.49 | 1.61 | 1.71 | 1.81 | 1.91 | 2.00 | 2.09 | 2.17 | 2.25 |
| 300 | 1.41 | 1.54 | 1.66 | 1.77 | 1.88 | 1.97 | 2.07 | 2.16 | 2.25 | 2.33 |