Calculation of belt length

Working out the correct belt length
Use a string or steel tape to make measurements after reducing take-up (if installed) to the minimum. Distance between pulleys should remain fixed. To obtain good driving strength and good belt life, the belt pretension should be 1 to 8%, based on hardness and length of the belt. To verify pretension on an installed belt, apply two marks with a pen separated by 10 inches (or 100 mm) on the belt when it is free from tension. The increase of space between the marks after mounting the belt in tenths of an inch (or mm) provides a measure of the pretension in percent.

Calculation of belt length

Calculation formula

\[
L_{f1} = dw \times \pi + 2 \times A
\]

\[
dw = \text{effective diameter (position of the neutral axis of belt)}
\]

\[
A = \text{center distance}
\]

\[
\text{for round belts:}
\]

\[
dw = \text{bottom of groove} + \text{diameter of belt}
\]

The recommended pretension has to be considered in addition!

Calculation formula

\[
L_{f2} = b1w + b2w + 2 \times A
\]

\[
b1w = \pi \times r1w \times b_1
\]

\[
b2w = \pi \times r2w \times b_2
\]

\[
w = \text{radian measure at effective radius}
\]

\[
w = \text{center distance}
\]

\[
A = \text{radius at bottom of groove + half belt diameter}
\]

The recommended pretension has to be considered in addition!

Calculation formula

Lineshaft Conveyor Belts (semi-crossed)

\[
L_{f3} = [(D1 + d) + (D2 + d)] \times \pi / 2 + 2 \times \sqrt{(D1+d)^2 / 4 + e^2}
\]

D1 : pulley diameter at bottom of groove
D2 : inner diameter of diabolo roller
d : diameter of belt
e : center distance

The recommended pretension has to be considered in addition!

Quick reference for V-Belts

<table>
<thead>
<tr>
<th>Profile according to DIN 2215</th>
<th>6</th>
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<tbody>
<tr>
<td>Profile according to ISO 4184</td>
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<td>Upper width b (mm)</td>
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<td>Height h (mm)</td>
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<td>Lower width u (mm)</td>
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