



TECHNICAL DATA

FORMULAS

<p>Belt Length</p> <p>When pulleys are approximately the same size:</p> $L = \frac{D + d}{2} \times 3.1416 + 2C$ <p>When one pulley is much larger than other (at least 3 or more times larger)</p> $L = \frac{D + d}{2} \times 3.1416 + 2C + \frac{(D - d)^2}{4C}$	<p>Belt Speed in feet per minute</p> $S = D \times \text{RPM} \times .2618 \times 1.021$	<p>Maximum Product Weight on Belt at any one time</p> <p>When load is known per square foot: $P + G_1 \times C$ (in feet) x W (in feet)</p> <p>When load is known by lbs. per hour:</p> $P = \frac{G_2}{S \times 60 \text{ (minutes)}} \times C \text{ (in feet)}$
<p>Horsepower to Drive a Conveyor Belt</p> <p>For Level conveyors:</p> $\text{HP} = \frac{F \times S \times (P + M)}{33,000}$ <p>For Inclined conveyors</p> $\text{HP} = \frac{(P \times B) + (P + M) \times F \times S}{33,000}$	<p>Effective Tension</p> <p>(pull needed to move belt and load horizontally)</p> $E = F \times (P + M)$ <p>Slack Side Tension</p> <p>(addition tension required to prevent slippage on pulley drive)</p> $E_1 = E \times K$	<p>Tight Side Tension</p> <p>(total tension to move belt and load horizontally)</p> $E_2 = E + E_1$ <p>Operating Tension</p> <p>(determines working strength of belt to handle job on per inch width basis)</p> $T = \frac{E_2}{W}$

Calculating length of a roll of belting —

Add together the diameter of the roll and the diameter of the hole in inches and divide the result by 2. Multiply by 3.14 and by the number of coils in the roll. This gives the length in inches. Divide by 12 and you will have the approximate number of feet in the roll.

KEY TO SYMBOLS

B – Sine of angle of incline	F – Coefficient of friction (see Table #1 below)	M – Belt Weight (overall length, not c/c)
C – Center to center distance (in inches)	G₁ – Load per sq. or cu. ft. (in lbs.)	P – Product weight (in lbs.)
D – Diameter drive pulley (in inches)	G₂ – Load per Hour (in lbs.)	RPM – Revolutions per minute
d – diameter tail pulley (in inches)	HP – Horsepower	S – Speed feet per minute
E – Effective Tension (in lbs.)	K – Drive factor (table #2 below)	T – Operating tension PIW (in lbs.)
E₁ – Slack side tension (lbs.)	L – Belt length (in inches)	W – Belt width (in inches)
E₂ – Tight side tension (lbs.)		

TABLE #1 – COEFFICIENT OF FRICTION
(belt to slider bed or rollers)

Belt	Steel or Aluminum	Metal Rollers
FS pulley side	.30 to .35	.10 to .15
Bare Duck or BB side	.20 to .25	.10 to .15
Cover on pulley side	.50 to .55	.10 to .15

TABLE #2 – DRIVE FACTOR K

Screw Belt Wrap on Drive Pulley	Gravity or Take-up		Weighted Take-up	
	Bare	Lagged	Bare	Lagged
180°	1.6	1.0	.84	.50
220°	1.2	.6	.62	.35
240°	1.0	.5	.54	.30

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