Calculations for Screw conveyors

Calculations for screw conveyors

Screw conveyor speed in m per sec

$$v = \frac{\text{Screw diameter (in meters)} \times 3{,}14 \times \text{Rotations per minute}}{60}$$

v	=	speed in m per sec

Calculations for screw conveyors

Capacity in m² per hour (Q)

$$Q\ (m^3/h) = 47{,}1 \times (D^2 - d^2) \times s \times n \times i$$

Capacity in kg per hour (Q)

$$Q\ (kg/h) = 47{,}1 \times (D^2 - d^2) \times s \times n \times i \times sg$$

D	=	screw outside diameter in meter
d	=	screw inner diameter in meter
s	=	pitch in meter
n	=	rotations per minute
sg	=	specific weight of the material (kg/m³)
i	=	degree of trough filling (eg. 30%: i=0,3)

Calculations for screw conveyors

Power in Kw (P)

$$P = \frac{Q \times L \times K}{3600 \times 102}$$

P	=	power in Kw
Q	=	capacity in 1000 kg per hour
L	=	conveyor screw length (m)
K	=	friction coefficient

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Specific weights

The following specific weights (sw) are frequently used for calculations in conjunction with elevators, screw conveyors, and chain conveyors.

Specific weight (in g/cm3)					
product	sw				
aloin	1,700	earth	1,600	peat	0,410
aluminum	2,800	egg powder	0,250	peat mulch	0,230
amaril	4,000			pit coal	0,860
anthracite	1,700	fish meal	0,900	potatoes, in bulk	0,800
asbestos	2,800	flax seed	0,720	pulp	1,100
ash	0,900	flower, loose	0,500		
		fly ash	1,000	resin	1,070
baking powder	0,900			rye, in bulk	0,780
barley, in bulk	0,690	gaged mortar	1,900		
basalt	3,000	grain	0,750	salt	1,100
bauxite	2,550	granite	2,800	sand	1,600
bitumen	1,500	graphite	2,300	sandstone	2,500
blast furnace slag	2,800			sawdust	0,600
boiler slag	1,000	hard rock	2,700	shale	2,800
brick	1,500	hay	0,120	shingle	1,650
broken stone	1,700	hemp fibers	1,500	soda, heavy	0,900
bronze	8,800	hops	0,560	straw	0,045
brown coal	0,780			sugar	1,600
buckwheat, in bulk	0,810	kitchen salt	2,160		
				talc	2,700
cement	1,600	lime, caustic	1,300	turnips, in bulk	0,650
cement root	2,100	lime mortars	1,700		
chalk	2,600	lime stone	2,800	wheat, in bulk	0,800
charcoal	0,400	lime, slaked	1,400	wool	1,320
clay	1,600	linseed, broken	0,500		
clinkers	2,000	loam	1,600		
coffee, green	0,510				
cokes	0,600	marble	2,700		
concrete	2,400				
cork	0,350	oats, in bulk	0,500		
corn	0,750	ore, crude	2,200		
cottonseeds	0,400	ore, fine	2,800		
domestic waste	0,700				

The above-mentioned specific weights are measured in dry condition.

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