SCREW CONVEYOR HORSEPOWER

The calculations included in the KWS Screw Conveyor Engineering Guide are for control fed screw conveyors only. The horsepower calculations for screw feeders require additional considerations. Please consult KWS Engineering for screw feeder applications.

Horsepower is defined as the power required to safely and feasibly convey a bulk material a fixed distance in a screw conveyor. The horsepower required to drive a screw conveyor is called Total Shaft Horsepower, or TSHP. TSHP is a function of the characteristics of the bulk material being conveyed and the friction inherent in the screw conveyor. It is very important to design a screw conveyor with sufficient horsepower in order to prevent downtime and loss of production.

Properly defining the bulk material to be conveyed is very important because material characteristics such as bulk density, abrasiveness and flowability all play a role in determining the proper horsepower for a screw conveyor. TSHP is the sum of Friction Horsepower and Material Horsepower divided by the drive efficiency. Friction Horsepower is the horsepower required to turn a screw conveyor when empty. Friction from the bearings, seals and other moving components create resistance. Sufficient horsepower is required to overcome the friction. Material Horsepower is the horsepower required to convey the bulk material the full length of the screw conveyor. The Friction and Material Horsepower calculations are shown below:

Friction HP Calculation:

$$FHP = \frac{DF \times HBF \times L \times S}{1{,}000{,}000}$$

Material HP Calculation:

$$MHP^* = \frac{CFH \times W \times MF \times L}{1{,}000{,}000} \quad OR: \quad MHP = \frac{CP \times MF \times L}{1{,}000{,}000}$$

Total Shaft HP Calculation:

$$TSHP = \frac{FHP + MHP^*}{e}$$

* *If calculated Material Horsepower is less than 5HP it should be corrected for potential overload. Use the Corrected Material HP Chart.*

Equation Nomenclature:

FHP = Friction HP (HP required to drive conveyor empty)
DF = Conveyor Diameter Factor
HBF = Hanger Bearing Factor
L = Conveyor Length (feet)
S = Conveyor Speed (RPM)

MHP = Material HP (HP required to convey bulk material)
CFH = Conveyor Capacity (ft^3/hr)
W = Bulk Density (lbs/ft^3)
MF = Material Factor (From Bulk Material Table)
CP = Capacity (lbs/hr)
TSHP = Total Shaft HP
e = Drive Efficiency (Typical value of 0.88 is used for a shaft mount reducer/motor)

SCREW CONVEYOR HORSEPOWER

The Diameter Factor (DF) is an empirical value determined over many years of testing and represents the frictional resistance of the weight of the screw for various screw diameters.

Diameter Factor Table (DF)	
Dia.	Factor
4	12
6	18
9	31
12	55
14	78
16	106
18	135
20	165
24	235
30	377
36	549

The Hanger Bearing Factor (HBF) is an empirical value determined over many years of testing and represents the frictional resistance of the hanger bearing for various types of hanger bearing materials.

Hanger Bearing Factor Table (HBF)	
Bearing Type	Bearing Factor
Ball, Roller, or none	1.0
Bronze, or Wood	1.7
Plastic, Nylon, UHMW, or Teflon	2.0
Hard Iron, or Stellite	4.4

The Material Factor (MF) is an empirical value determined over many years of testing and represents the frictional resistance of the bulk material being conveyed. Please note that as the bulk density increases, typically the Material Factor increases because denser bulk materials are more difficult to convey. Material Factors for many materials can be found in the Bulk Material Table.

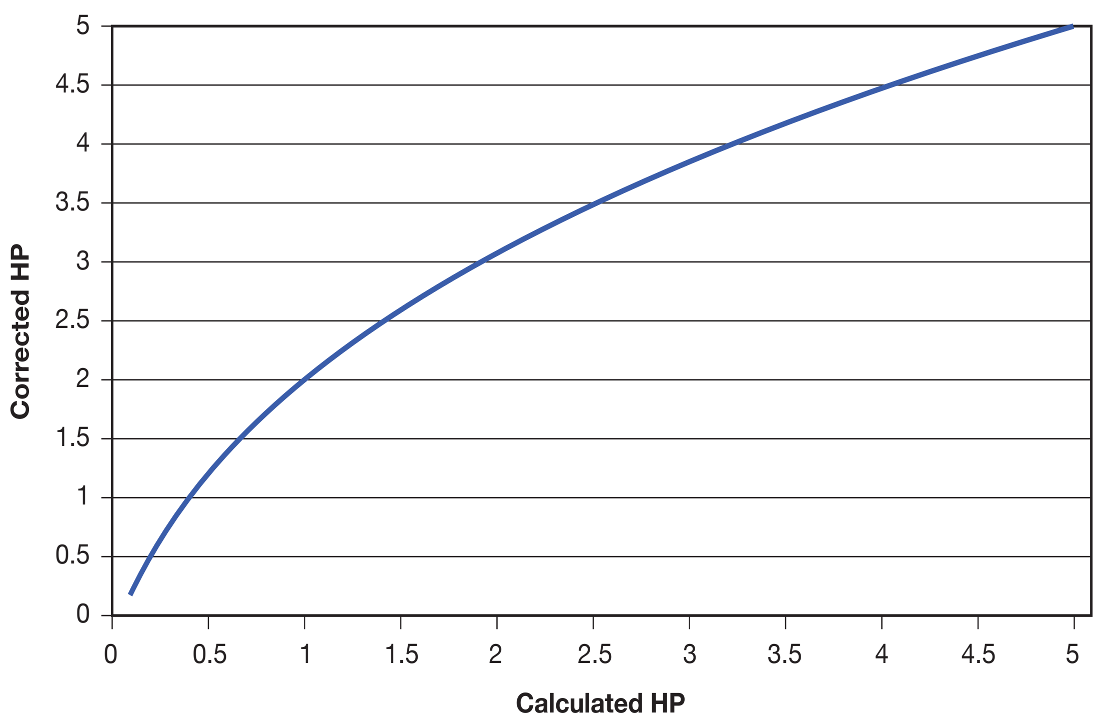
The drive unit for a screw conveyor is typically designed with a gear reducer and motor. The drive unit for a screw conveyor is not 100-percent efficient. There are frictional losses in the gear reducer and belt/chain reduction. Drive efficiency (e) is typically between 85 and 95-percent.

SCREW CONVEYOR HORSEPOWER

Corrected Material Horsepower

The calculated horsepower of a screw conveyor may need to be adjusted so the drive unit will have more horsepower and torque available to overcome an upset condition such as a minor choke in the inlet or a large lump being conveyed. The Corrected Material Horsepower Factor, sometimes called the Overload Factor, is used to increase the Total Shaft Horsepower (TSHP) of a screw conveyor when the calculated Material Horsepower (MHP) is less than 5-HP. Increasing the TSHP allows the screw conveyor to overcome most upset conditions, reducing downtime and loss of production.

Corrected Material HP Chart



SCREW CONVEYOR HORSEPOWER

Conveyors With Special Flights

The procedure for calculating Total Shaft Horsepower (TSHP) for screw conveyors with special flights is identical to that used for standard flights except the Material Horsepower (MHP) must be multiplied by one or more of the Special Flight Factors (SF). Special Flight Factors are used to account for the additional horsepower needed to overcome the resistance of the special flights to the bulk material being conveyed. Special flights are used for chopping up or mixing bulk materials and additional horsepower is required to perform these functions.

Total Shaft Horsepower

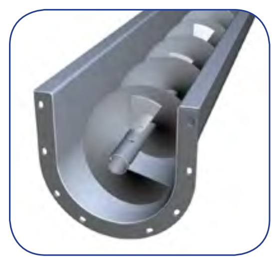
$$TSHP = \frac{FHP + (MHP^{*} \times SF)}{e}$$

** If calculated Material Horsepower is less than 5HP it should be corrected for potential overload. Use the Corrected Material HP Chart.*

Special Flight Factors:

Type	Conveyor Loading		
	15%	30%	45%
Cut flight	1.10	1.15	1.2
Cut & folded flight	X	1.50	1.7
Ribbon flight	1.05	1.14	1.20

Paddles Per Pitch	1	2	3	4
Factor	1.29	1.58	1.87	2.16



Note: Trough loading must not exceed 45-percent when using special flights.

Example

Using the previous example, a screw conveyor is required to transport 10 tons per hour of unslaked lime with a bulk density of 60 lbs. per cubic foot. The unslaked lime also needs to be mixed in transit using cut and folded flights. The conveying distance is 15-feet so short (2/3) pitch screws will be used to ensure proper mixing. The recommended trough loading percentage from the Bulk Material Table is 30A. The Special Flight Factor for cut-and-folded flights at 30-percent trough loading is 1.50.

Type	Conveyor Loading		
	15%	30%	45%
Cut flight	1.10	1.15	1.2
Cut & folded flight	X	1.50	1.7
Ribbon flight	1.05	1.14	1.20

The Material Horsepower (MHP) will be multiplied by 1.50 to account for the additional horsepower needed to overcome the resistance of the special flights to the unslaked lime being conveyed and mixed.

SCREW CONVEYOR TORQUE

Torque is defined as the twisting force exerted by the drive unit on the conveyor screw. Torque is transmitted through the drive shaft of the drive unit to the screw and converted to force to convey the bulk material. Properly selecting screw conveyor components is important to minimizing downtime and maintenance.

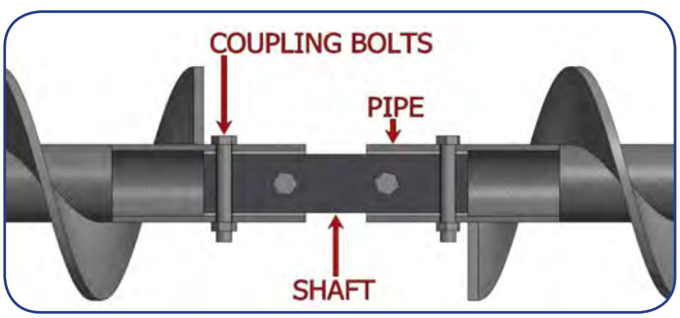
Full Motor Torque is the maximum torque generated by the drive unit. The equation for Full Motor Torque is shown below:

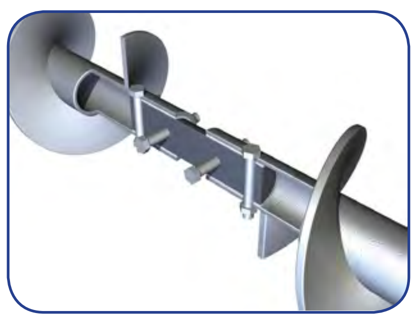
$$Full\ Motor\ Torque = \frac{HP \times 63{,}025}{S}$$

HP = Nameplate Horsepower of the motor on the screw conveyor
S = Conveyor Speed

Torque is measured in inch-lbs. for screw conveyor components. The torque rating of the drive shaft, coupling shafts, coupling bolts and conveyor screw must be able to withstand Full Motor Torque without failing. Every KWS screw conveyor is designed to this criteria with a minimum safety factor of 5 to 1. The motor on the screw conveyor will stall out before there is a mechanical failure of a screw conveyor component.

Maximum torque ratings for each screw conveyor component are shown in the Torque Tables. Maximum torque ratings are based on a safe stress value for the specific material of construction. The screw conveyor components will have an infinite life under normal operating conditions.



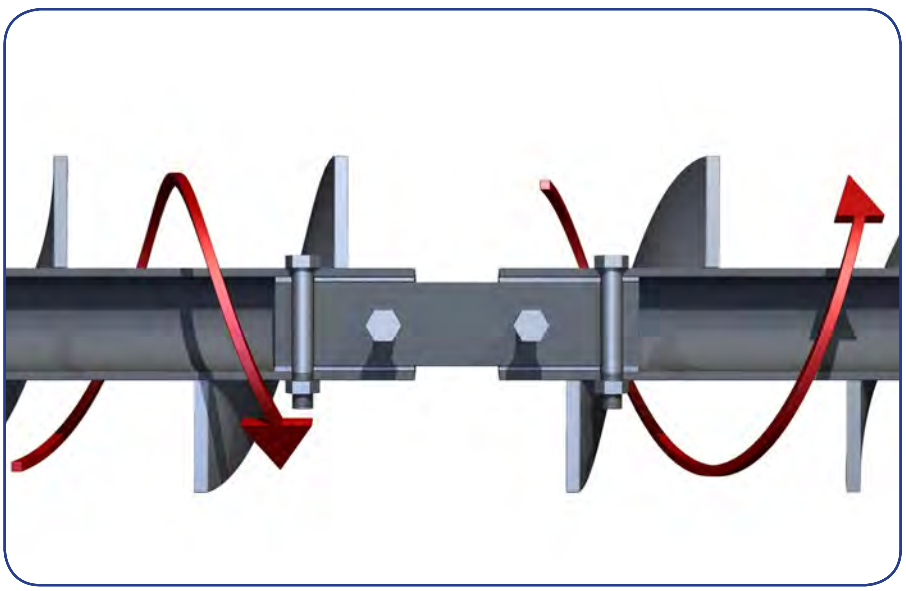


Standard Screw Construction (by Shaft Size)								
Shaft Diameter (In.)	1	1-1/2	2	2-7/16	3	3-7/16	3-15/16	4-7/16
Nominal Pipe Size	1-1/4	2	2-1/2	3	3-1/2	4	5	6
Coupling Bolt Dia. (In.)	3/8	1/2	5/8	5/8	3/4	7/8	1-1/8	1-1/4

SCREW CONVEYOR TORQUE

Torque Table – Carbon Steel

Shaft Dia.	Carbon Steel Torque Values							
	Shaft		Coupling Bolts (2-Bolt)		Pipe – Schedule 40			
	C-1045		Grade 5		A-53			
	Torsion		Bolts in Shear		Pipe in Shear		Pipe in Bearing	
	Safe Stress	Torque Rating	Safe Stress	Torque Rating	Safe Stress	Torque Rating	Safe Stress	Torque Rating
	PSI	In-Lbs	PSI	In-Lbs	PSI	In-Lbs	PSI	In-Lbs
1	8,750	1,000	15,500	3,400	6,700	3,100	6,700	2,200
1-1/2	8,750	3,800	15,500	9,100	6,700	7,600	6,700	5,600
2	8,750	9,500	15,500	19,000	6,700	14,200	6,700	8,900
2-7/16	8,750	18,700	15,500	23,000	6,700	23,000	6,700	13,200
3	8,750	35,400	15,500	41,000	6,700	31,900	6,700	17.500
3-7/16	8,750	53,000	15,500	64,000	6,700	42,700	6,700	24,700
3-15/16	8,750	76,400	15,500	121,300	6,700	72,600	6,700	58,200
4-7/16	8,750	110,200	15,500	168,800	6,700	112,900	6,700	101,300

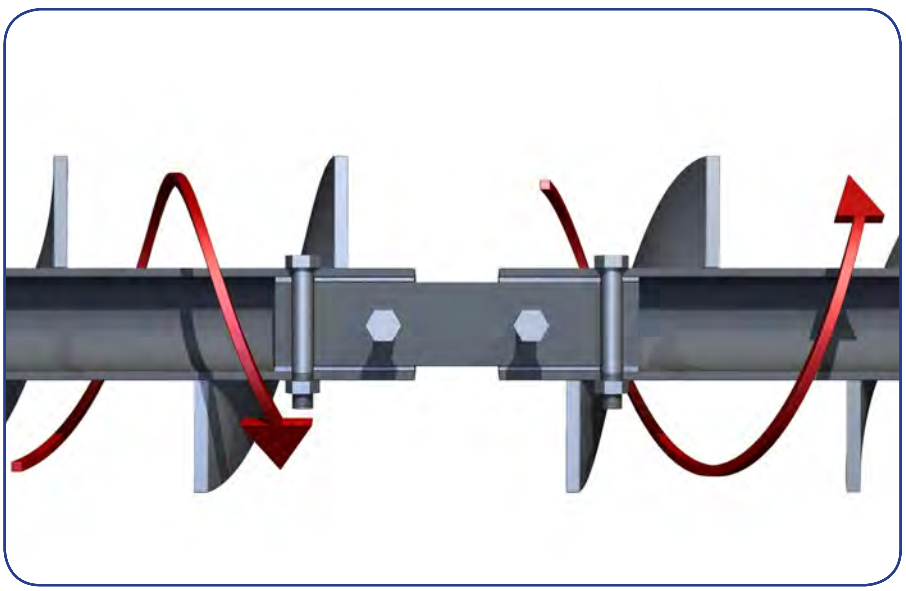


Torque On Shaft, Coupling Bolts and Pipe

SCREW CONVEYOR TORQUE

Torque Table – Stainless Steel

Shaft Dia.	Stainless Steel Torque Values							
	Shaft		Coupling Bolts (2-Bolt)		Pipe – Schedule 40			
	304 & 316		18-8		A-312			
	Torsion		Bolts in Shear		Pipe in Shear		Pipe in Bearing	
	Safe Stress	Torque Rating	Safe Stress	Torque Rating	Safe Stress	Torque Rating	Safe Stress	Torque Rating
	PSI	In-Lbs	PSI	In-Lbs	PSI	In-Lbs	PSI	In-Lbs
1	6,000	700	6,000	1,300	6,000	2,800	6,000	1,900
1-1/2	6,000	2,600	6,000	3,500	6,000	6,800	6,000	5,000
2	6,000	6,500	6,000	7,300	6,000	12,700	6,000	7,900
2-7/16	6,000	12,800	6,000	8,900	6,000	20,600	6,000	11,800
3	6,000	24,300	6,000	15,900	6,000	28,600	6,000	15,700
3-7/16	6,000	36,400	6,000	24,800	6,000	38,300	6,000	22,100
3-15/16	6,000	52,400	6,000	46,900	6,000	65,000	6,000	52,100
4-7/16	6,000	75,600	6,000	65,300	6,000	101,100	6,000	90,700



Torque On Shaft, Coupling Bolts and Pipe

SCREW CONVEYOR EXAMPLE

There are many different factors to consider when designing a screw conveyor. The purpose of this example is to provide a step-by-step process that a KWS engineer would follow when designing a screw conveyor. It is important for the person designing the screw conveyor to understand how each factor affects the final screw conveyor design.

The following information will be used for the example –

- Bulk Material: Corn Meal
- Capacity: 25,600 lbs/hr
- Screw Conveyor Length: 16-feet, 0-inches from centerline of inlet to centerline of discharge
- Screw Conveyor Degree of Incline: 0° Horizontal

The screw conveyor for the example is control fed at the inlet by another screw conveyor.

SCREW CONVEYOR EXAMPLE - STEP 1: ESTABLISH CHARACTERISTICS OF BULK MATERIAL

The first step is to look up corn meal in the Bulk Material Table and write down the following information –

Bulk Material: Corn Meal

Maximum Particle Size: minus 1/8-inch and smaller

Bulk Density: 32 to 40 lbs/ft^3

Trough Loading: 30A (30-percent)

HP Factor: 0.5

Component Series: A1-A2

Abrasiveness: I

Corrosiveness: I

Flowability: III

Note – For the example, the additional characteristics provided in the "Note" column of the bulk material will not be considered in order to simplify the solution. Please refer to the Bulk Material Factors section for more detailed information.

SCREW CONVEYOR EXAMPLE

SCREW CONVEYOR EXAMPLE - STEP 2:
DETERMINE CONVEYOR SIZE AND SPEED BASED ON CAPACITY

Information Given for Example:

– Bulk Material: Corn Meal
– Capacity: 25,600 lbs per hour
– Length: 16’-0” from centerline of inlet to centerline of discharge
– Conveyor Type: Horizontal

Information Provided from Bulk Material Table:

Bulk Material	Maximum Particle Size (in.)	Bulk Density (lbs/ft³)	% Loading	HP Factor	Component Series	Abrasiveness	Corrosiveness	Flowability
Corn Meal	-1/8	32-40	30A	0.5	A1-A2	I	I	III

Now that the characteristics of the bulk material to be conveyed have been determined, the next step is to calculate the capacity in cubic feet per hour. Always use the lowest bulk density when calculating capacity in order to get the highest potential volumetric capacity.

The recommended trough loading percentage according to the Bulk Material Table is 30A, or 30-percent.

Fill in the blanks and calculate the Capacity:

$$\textit{Capacity } (ft^3/hr) = \frac{\textit{Capacity } (lbs/hr)}{\textit{Bulk Density } (lbs/ft^3)} = \frac{25{,}600 \ lbs/hr}{32 \ lbs/ft^3} = \underline{800} \ ft^3/hr$$

Using standard full pitch, fill in the blank to calculate the Selection Capacity:

$$SC = CFH \times CF = \underline{800} \ ft^3/hr \ \times \ \underline{1} \ = \ \underline{800} \ ft^3/hr$$

Nomenclature:

SC = Selection Capacity (ft³/hr)
CFH = Required Capacity in Cubic Feet Per Hour (ft³/hr)
CF = Capacity Factor

The Selection Capacity will be used to select the proper screw conveyor diameter and speed from the Capacity Table. Using the Recommended Trough % Loading and calculated Selection Capacity, select the proper conveyor diameter. The Selection Capacity must be less than the maximum capacity given in the Capacity Table. Fill in the blanks below based on your previous calculations:

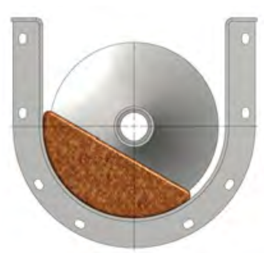
Conveyor Diameter: 12” Capacity at Max RPM: 1,161 Capacity at 1 RPM: 12.9

SCREW CONVEYOR EXAMPLE

SCREW CONVEYOR EXAMPLE - STEP 2:
DETERMINE CONVEYOR SIZE AND SPEED BASED ON CAPACITY (CONTINUED)

The Actual Conveyor Speed is calculated by dividing the Selection Capacity by the Capacity at 1-RPM. Fill in the blanks below:

$$\textit{Actual Conveyor Speed } (S) = \frac{SC\ (ft^3/hr)}{\text{Capacity at 1 RPM}} = \frac{800\ ft^3/hr}{12.9\ ft^3/hr \text{ at 1 RPM}} = \underline{62}\ RPM$$

Capacity Table				
Trough Loading	Screw Dia. (in.)	Max. RPM *	Capacity in ft³/hr	
			At Max. RPM	At 1 RPM
	4	139	57	0.4
	6	120	179	1.5
	9	100	545	5.5
	12	90	1,161	12.9
	14	85	1,768	20.8
	16	80	2,496	31.2
	18	75	3,375	45.0
	20	70	4,375	62.5
	24	65	7,085	109.0
	30	60	12,798	213.3
30% A	36	50	18,440	368.8

SCREW CONVEYOR EXAMPLE - STEP 3:
CALCULATE HORSEPOWER REQUIREMENTS

Information Given for Example:

- Bulk Material: Corn Meal
- Capacity (CP): 25,600 lbs/hr
- Length (L): 16'-0" from centerline of inlet to centerline of discharge
- Conveyor Type: Horizontal

Information Provided from Bulk Material Table:

Bulk Material	Maximum Particle Size (in.)	Bulk Density (lbs/ft³)	% Loading	HP Factor	Component Series	Abrasiveness	Corrosiveness	Flowability
Corn Meal	-1/8	32-40	30A	0.5	A1-A2	I	I	III

SCREW CONVEYOR EXAMPLE

SCREW CONVEYOR EXAMPLE - STEP 3:
CALCULATE HORSEPOWER REQUIREMENTS (CONTINUED)

Calculating Horsepower

Friction Horsepower

A 12-inch diameter screw conveyor was selected in Step 2 of the example. The Diameter Factor (DF) selected from the Diameter Factor Chart (HP Section) is 55 for a 12-inch diameter screw conveyor.

Diameter Factor Chart (DF)							
Dia.	Factor	Dia.	Factor	Dia.	Factor	Dia.	Factor
4	12	12	55	18	135	30	377
6	18	14	78	20	165	36	549
9	31	16	106	24	235		

Since the bulk material to be conveyed is corn meal, a wood hanger bearing is selected for the application. The Hanger Bearing Factor (HBF) selected from the Hanger Bearing Factor Chart (HP Section) is 1.7 for a wood hanger bearing.

Hanger Bearing Factor Chart (HBF)		
Bearing Type	Bearing Factor	Bearing* Class
Ball, Roller, or none	1.0	2
Bronze, or Wood	1.7	2
Plastic, Nylon, UHMW, or Teflon	2.0	3
Hard Iron, or Stellite	4.4	4

The screw conveyor speed calculated in Step 2 is 62-rpm.
Fill in the blanks and calculate the Friction Horsepower (FHP):

$$FHP = \frac{DF \times HBF \times L \times S}{1{,}000{,}000} = \frac{55 \times 1.7 \times 16 \times 62}{1{,}000{,}000} = 0.09\text{HP}$$

Nomenclature:

DF = Conveyor Diameter Factor HBF = Hanger Bearing Factor
L = Conveyor Length (ft) S = Conveyor Speed

Material Horsepower

The capacity (CP) given in the example is 25,600 lbs. per hour. Please note: Do not use Selection Capacity (SC) to calculate horsepower. The screw conveyor length is 16-feet.
The Material Factor (MF) or HP Factor for corn meal is 0.5 from the Bulk Material Table.

$$MHP^{*} = \frac{CP \times MF \times L}{1{,}000{,}000} = \frac{25{,}600 \times 0.5 \times 16}{1{,}000{,}000} = 0.21\text{HP}$$

Nomenclature:

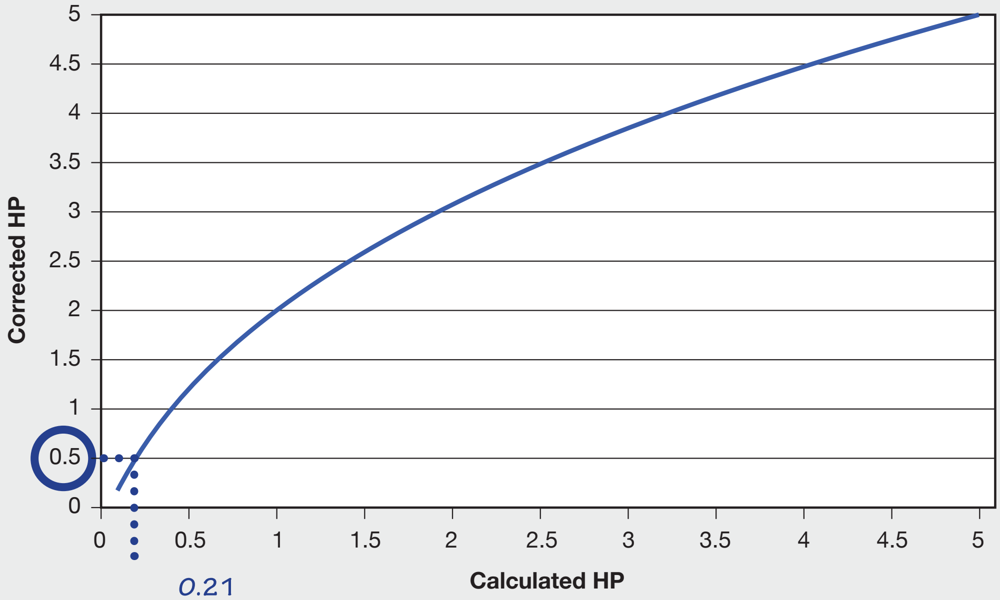
MF = Material Factor CP = Capacity (lbs/hr)

The calculated Material Horsepower (MHP) is 0.21-HP and must be corrected since it is less than 5-HP. Using the Corrected Material HP Chart below, locate 0.21-HP on the horizontal axis of the chart, draw a line vertically until it intersects the curved line, then move horizontally to determine the Corrected Material Horsepower of 0.5-HP.

SCREW CONVEYOR EXAMPLE

SCREW CONVEYOR EXAMPLE - STEP 3:
CALCULATE HORSEPOWER REQUIREMENTS (CONTINUED)

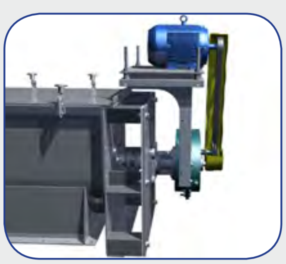
Corrected Material HP Chart



Fill in the blanks and calculate Total Shaft Horsepower (TSHP) by summing the Friction Horsepower (FHP) and the Corrected Material Horsepower (MHP) as follows:

$$TSHP = \frac{FHP + MHP^*}{e} = \frac{0.09 + 0.50}{0.88} = 0.67\ \text{HP}$$

Drive efficiency (e) for a typical screw conveyor drive unit with shaft-mounted reducer and V-belt drive is 88-percent, or 0.88.



Total Shaft Horsepower (TSHP) is typically rounded up to the next commonly available motor size. The most commonly available motor size for the example would be 1-HP. The drive unit selected for the example is 1-HP at 60-rpm. The speed of the drive unit is typically rounded to the closest 5-rpm increment.

SCREW CONVEYOR EXAMPLE

SCREW CONVEYOR EXAMPLE - STEP 4:
CALCULATE TORQUE REQUIREMENTS

Information Given for Example:

- Bulk Material: Corn Meal
- Capacity: 25,600 lbs/hr
- Length: 16'-0" from centerline of inlet to centerline of discharge
- Conveyor Type: Horizontal

Information Provided from Bulk Material Table:

Bulk Material	Maximum Particle Size (in.)	Bulk Density (lbs/ft^3)	% Loading	HP Factor	Component Series	Abrasiveness	Corrosiveness	Flowability
Corn Meal	-1/8	32-40	30A	0.5	A1-A2	I	I	III

Calculating Full Motor Torque

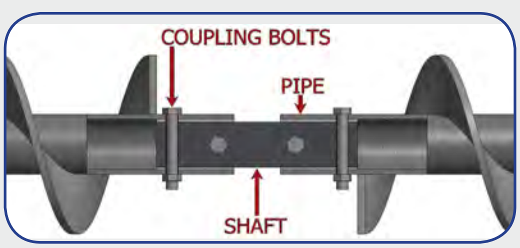
A 1-HP at 60-rpm drive unit was selected for the example screw conveyor. Full Motor Torque is calculated with the following equation below:

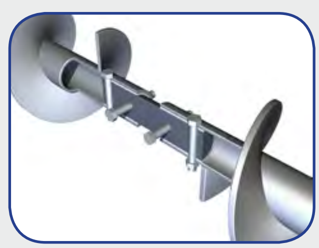
$$\text{Full Motor Torque} = \frac{HP \times 63{,}025}{S} = \frac{1 \times 63{,}025}{60} = 1{,}050 \text{ inch-lbs.}$$

HP = Nameplate Horsepower of the motor on the screw conveyor
S = Screw Conveyor Speed.

The torque rating of the drive shaft, coupling shafts, coupling bolts and conveyor screw must be greater than Full Motor Torque for proper design.

A 12-inch diameter screw conveyor was selected for the example. The minimum standard shaft size for a 12-inch diameter screw conveyor is 2-inch diameter. The corresponding pipe size is 2-1/2-inch schedule 40 pipe with 5/8-inch diameter coupling bolts. The materials of construction of the screw conveyor is carbon steel.





Standard Screw Construction (by Shaft Size)								
Shaft Diameter (In.)	1	1-1/2	2	2-7/16	3	3-7/16	3-15/16	4-7/16
Nominal Pipe Size	1-1/4	2	2-1/2	3	3-1/2	4	5	6
Coupling Bolt Dia. (In.)	3/8	1/2	5/8	5/8	3/4	7/8	1-1/8	1-1/4

SCREW CONVEYOR EXAMPLE

SCREW CONVEYOR EXAMPLE - STEP 4:
CALCULATE TORQUE REQUIREMENTS (CONTINUED)

Maximum torque ratings for each screw conveyor component are shown in the Torque Tables below. Maximum torque ratings are based on a safe stress value for the specific material of construction. The screw conveyor components will have an infinite life under normal operating conditions.

Shaft Dia.	Carbon Steel Torque Values							
	Shaft		Coupling Bolts (2-Bolt)		Pipe – Schedule 40			
	C-1045		Grade 5		A-53			
	Shaft in Torsion		Bolts in Shear		Pipe in Shear		Pipe in Bearing	
	Safe Stress	Torque Rating	Safe Stress	Torque Rating	Safe Stress	Torque Rating	Safe Stress	Torque Rating
	PSI	In-Lbs	PSI	In-Lbs	PSI	In-Lbs	PSI	In-Lbs
1	8,750	1,000	15,500	3,400	6,700	3,100	6,700	2,200
1-1/2	8,750	3,800	15,500	9,100	6,700	7,600	6,700	5,600
2	8,750	9,500	15,500	19,000	6,700	14,200	6,700	8,900
2-7/16	8,750	18,700	15,500	23,000	6,700	23,000	6,700	13,200
3	8,750	35,400	15,500	41,000	6,700	31,900	6,700	17.500
3-7/16	8,750	53,000	15,500	64,000	6,700	42,700	6,700	24,700
3-15/16	8,750	76,400	15,500	121,300	6,700	72,600	6,700	58,200
4-7/16	8,750	110,200	15,500	168,800	6,700	112,900	6,700	101,300

The torque rating of the screw conveyor components from the Torque Tables:

Drive and Coupling Shafts = 9,500 inch-lbs.
Coupling Bolts = 19,000 inch-lbs.
Pipe in Shear = 14,200 inch-lbs.
Pipe in Bearing = 8,900 inch-lbs.

The torque rating of each screw conveyor component is much higher than the Full Motor Torque generated by the drive unit. The screw conveyor in the example is designed properly and will function many years with minimal maintenance or downtime.

SCREW CONVEYOR EXAMPLE

SCREW CONVEYOR EXAMPLE - STEP 5:
COMPONENT SERIES SELECTION

Information Given for Example:

- Bulk Material: Corn Meal
- Capacity: 25,600 lbs/hr
- Length: 16'-0" from centerline of inlet to centerline of discharge
- Conveyor Type: Horizontal

Information Provided from Bulk Material Table:

Bulk Material	Maximum Particle Size (in.)	Bulk Density (lbs/ft^3)	% Loading	HP Factor	Component Series	Abrasiveness	Corrosiveness	Flowability
Corn Meal	-1/8	32-40	30A	0.5	A1-A2	I	I	III

The recommended Component Series for corn meal is A as listed in the Bulk Material Table. Corn meal is a light, non-abrasive and free-flowing bulk material.

The 12-inch diameter by 16-feet long screw conveyor for the example is constructed from carbon steel with the following construction as selected from the Component Series Table:

Screw Dia.	Shaft Dia.	Cover Thickness	Series A		
			Screw Number		Trough Thickness (Min.)
			Helicoid	Sectional	
4	1"	14 Ga.	4H206	N/A	14 Ga.
6	1-1/2"	14 Ga.	6H304*	6S309	14 Ga.
9	1-1/2 " 2"	14 Ga.	9H306* 9H406*	9S309 9S409	14 Ga.
12	2" 2-7/16" 3"	14 Ga.	12H408* 12H508* 12H614*	12S409 12S509 12S612	12 Ga.
14	2-7/16" 3"	14 Ga.	14H508* 14H614*	14S509 14S609	12 Ga.
16	3"	14 Ga.	16H610*	16S612	12 Ga.
18	3" 3-7/16"	12 Ga.	N/A	18S612 18S712	10 Ga.
20	3" 3-7/16"	12 Ga.	N/A	20S612 20S712	3/16"
24	3-7/16"	12 Ga.	N/A	24S712	3/16"
30	3-15/16"	10 Ga.	N/A	30S816	3/8"
36	4-7/16"	3/16"	N/A	36S916	3/8"

Screw: 12H408 helicoid screws with 1/8-inch nominal flight thickness and 2-inch shaft diameter
Trough: TUA1212 angle flange trough with 12-gauge trough thickness
Cover: COV1214UFL flanged cover with 14-gauge cover thickness

SCREW CONVEYOR EXAMPLE

SCREW CONVEYOR EXAMPLE - STEP 5:
COMPONENT SERIES SELECTION (CONTINUED)

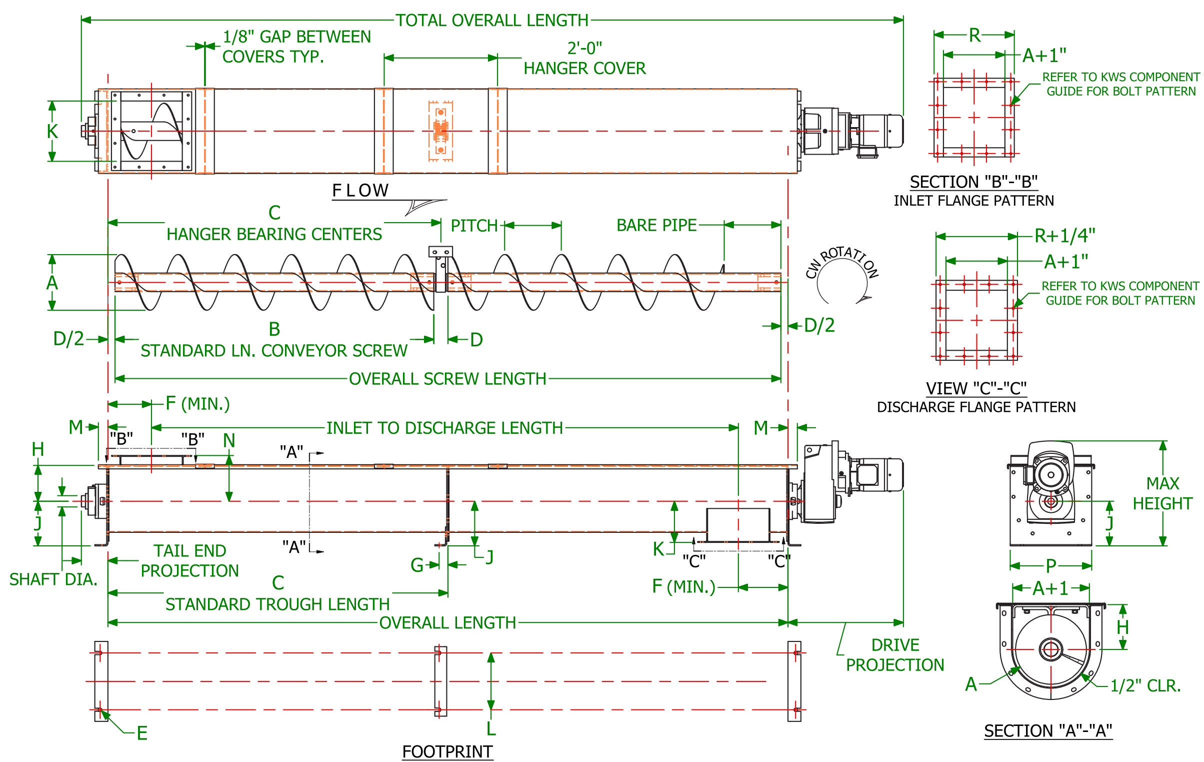
The recommended Bearing Material Series is 1-2 as listed in the Bulk Material Table.

The 12-inch diameter by 16-feet long screw conveyor for the example can utilize several different hanger bearing materials as selected from the Component Series Table:

Series	Bearing Material
1	Nylatron, Plastech, UHMW, Wood, Ball
2	Plastech, Gatke, Ball
3	Bronze, Hard Iron
4	Hard Iron, Hardsurface, Stellite, Ceramic

Based on a Bearing Material Series of 1-2, the hanger bearings can be Nylatron, Plastech, UHMW, Wood, Gatke or ball bearing. We are selecting wood for the example because wood hanger bearings are very cost-effective and durable.

DIMENSIONAL LAYOUT OF CONVEYOR



A Screw Dia.	Shaft Dia.	B	C	D	E Bolts	F (Min.)	G	H	J	K	L	M	N	P	R
4	1	9' - 10-1/2"	10	1-1/2	3/8	4-1/2	1	3-5/8	4-5/8	3-3/4	5-3/4	1-7/16	4-7/8	7-3/4	7-1/2
6	1-1/2	9' - 10"	10	2	3/8	6	1	4-1/2	5-5/8	5	8-1/8	1-1/2	6	9-3/4	10
9	1-1/2 2	9' - 10"	10	2	1/2	8	1-1/2	6-1/8	7-7/8	7-1/8	9-3/8	1-5/8	7-5/8	13-3/4	13
12	2 2-7/16 3	11' - 10" 11' - 9" 11' - 9"	12	2 3 3	5/8	10-1/2	1-5/8	7-3/4	9-5/8	8-7/8	12-1/4	2	9-3/4	17-1/4	17
14	2-7/16 3	11' - 9"	12	3	5/8	11-1/2	1-5/8	9-1/4	10-7/8	10-1/8	13-1/2	2	11-1/4	19-1/4	19
16	3	11' - 9"	12	3	5/8	13-1/2	2	10-5/8	12	11-1/8	14-7/8	2-1/2	12-5/8	21-1/1	21
18	3 3-7/16	11' - 9" 11' - 8"	12	3 4	5/8	14-1/2	2	12-1/8	13-3/8	12-3/8	16	2-1/2	14-5/8	24-1/4	24
20	3 3-7/16	11' - 9" 11' - 8"	12	3 4	3/4	15-1/2	2-1/4	13-1/2	15	13-3/8	19-1/4	2-1/2	16	26-1/4	26
24	3-7/16	11' - 8"	12	4	3/4	17-1/2	2-1/4	16-1/2	18-1/8	15-3/8	20	2-1/2	19	30-1/4	30
30	3-15/16	11' - 8"	12	4	3/4	20-1/2	2-1/2	19-1/2	21-1/2	18-3/8	30	3	22-1/2	38	36
36	4-7/16	11' - 7"	12	5	3/4	23-1/2	2-1/2	22-1/2	24	21-3/8	36	3	25-1/2	44	43

Notes

Notes

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