

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:

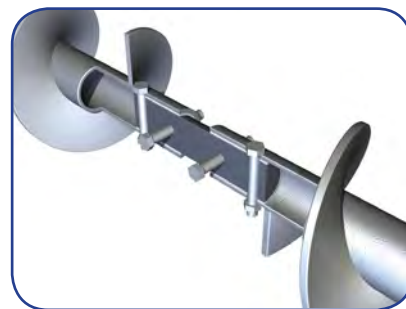
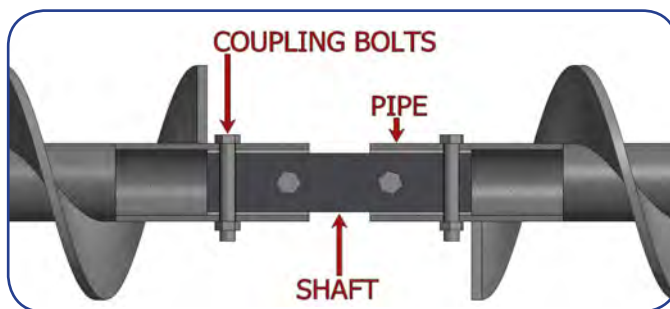
$$\text{Full Motor Torque} = \frac{HP \times 63,025}{S}$$

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.



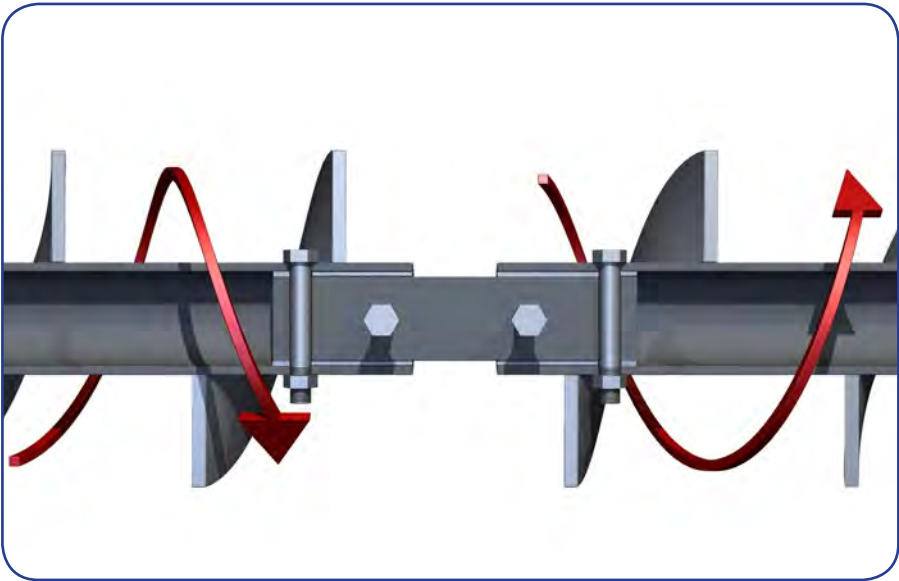
Standard Screw Construction (by Shaft Size)								
Shaft Diameter (In.)	1	1-1/2	2	2-7/16	3	3-7/16	3-15/16	4-7/16
Nominal Pipe Size	1-1/4	2	2-1/2	3	3-1/2	4	5	6
Coupling Bolt Dia. (In.)	3/8	1/2	5/8	5/8	3/4	7/8	1-1/8	1-1/4



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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

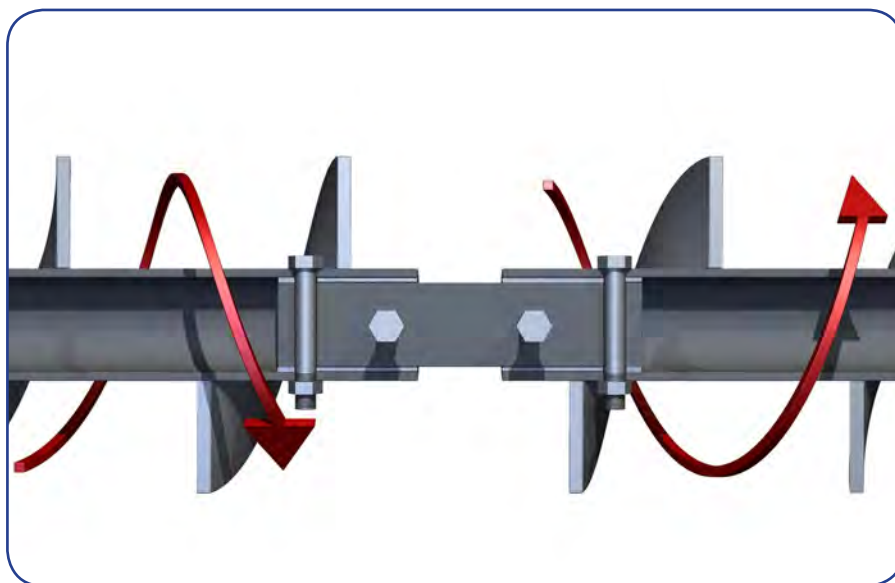


Torque On Shaft, Coupling Bolts and Pipe

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