

Advantage of Belt Driven Pump in Slurry Application

SHROFF® PROCESS PUMPS *Pumping Innovation!*

- No need to change Pump / Motor when there is slight change or increase in Head-Capacity requirements. This can be done easily by varying only the Pulley ratio.
- Pump & Motor do not get damaged when line is choked or Pump is clogged especially in slurry / high sp. gravity liquid applications.
- Very common and easy to install
- Larger pulleys prevent slippage better
- To prevent slippage:
 - Motors ½ Hp or less, use at least a 2” diameter pulley
 - Motors larger than ½ Hp, use a 3” diameter pulley
- Most popular drive used with electric motors
- Advantages:
 - Motor may be mounted on or close to machine
 - Less tension is needed on the belt
 - Belt stays on pulley better
- Very common on cooling fans and squirrel-cage blowers
- Three sizes:
 - FHP:
 - suited for pulleys 2½” and less in diameter, on motors of less than 1 Hp
 - Thinner & more flexible than other V-belts
 - A-Section:
 - Heavier and can be used on small pulleys
 - More slippage than the thinner belt
 - Stiffness of belt prevents it from following curvature of pulleys
 - Designed for pulleys 3” in diameter or larger, on motors from ¾ Hp to 5 Hp
 - B-Section:
 - Designed for use on motors of 3 Hp or larger, with a motor pulley 5½” or larger in diameter

Webbed Multi-V-Belt

- Made up of two or more V-belts webbed together
- Main Advantages:
 - Elimination of slippage
 - Belt turnover

- Standard V-pulley:
 - Used when only one speed is needed
- V-step pulley:
 - Used for machine driven variable speeds
- Adjustable V-pulley:
 - Also for variable speeds
 - Diameter may be increased or decreased to adjust speed to desired rpm

Determining Length of a V-belt

- Mounted Motor:
 - Loop a piece of string around and in grooves of pulleys
 - Pull tight
 - Tie knots in the ends
 - Cut string
 - Measure length
 - Gives inside length of belt needed
- Unmounted Motor:
 - 4 X diameter of largest pulley = _____
 - 1.6 X diameter of motor pulley = _____
 - 1.6 X diameter of machine pulley = _____
 - Total Length = _____
 - **Example:** (motor pulley= 3", machine pulley= 6")
 - 4 X 6 = 24.0 inches
 - 1.6 X 3 = 4.8 inches
 - 1.6 X 6 = 9.6 inches
 - Closest standard length belt to the measurement should be purchased

Determining Pulley Size

• Working speed of machine: determined by size of machine pulley in relation to size of motor drive pulley

• Rule of Thumb:

–To increase speed of machine: reduce size of pulley on machine or place a larger pulley on motor shaft

–To decrease speed of machine: place a smaller pulley on motor shaft or a larger pulley on machine shaft

• Pulley Size Formula:

–RPM of motor X Diameter of motor pulley = RPM of machine X Diameter of machine pulley

–Example 1: (Machine Pulley)

•1/3 Hp electric motor

- Operates at 1750 rpm
- Need a pulley to turn a fan at 875 rpm
- What size pulley is needed on the fan if a 2" pulley is on the motor?
- $1750 \times 2 = 875 \times D$
- $(1750 \times 2) \div 875 = D$
- $3500 \div 875 = 4$ " pulley
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- RPM of motor X Diameter of motor pulley = RPM of machine X Diameter of machine pulley
- **Example 1:** (Machine Pulley)
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- **Example 2:** (Machine Pulley)
- 1/3 Hp electric motor
- Operates at 1750 rpm
- Need a pulley to turn a compressor at 3500 rpm
- What size pulley is needed on the compressor if a 4" pulley is on the electric motor?
- $1750 \times 4 = 3500 \times D$
- $(1750 \times 4) \div 3500 = D$
- $7000 \div 3500 = 2$ " pulley

Courtesy:

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Manufacturers of [Rubber Lined](#) & Chemical Process Pumps

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