SELECT THE RIGHT PUMP

2900 MacArthur Blvd. Northbrook, IL. USA 60062 **WWW.SERFILCO.COM** (800) 323 - 5431

PROBLEMS CAN ABOUND, SUCH AS:

1. Chemicals may range in pH from 1 - 14.
2. Hot chemicals can cause suction cavitation that can reduce efficiency and cause noise, impeller wear and seal damage.
3. Cooling chemicals may produce crystalline formations which can abrade moving parts.
4. Liquids having an elevated specific gravity (above 1.0) will require a corresponding increase in pump motor horsepower.
5. Motors often operate in hot, unvented areas, requiring proper enclosure selection.

MATERIAL COMPATIBILITY

Materials must be compatible with the chemicals to be pumped. Most plating solutions and many chemicals are corrosive, so pump materials must resist chemical attack.

Corrosion-resistant chlorinated polyvinyl chloride (CPVC) pumps are made in many sizes to handle a variety of pressure ranges and flow rates. CPVC withstands temperatures to 200°F and somewhat higher at low pressures.

Polypropylene is suitable, but not as versatile as CPVC. Polyethylene, PVDF, Ryton®, Noryl® and Teflon® are also available for specific solutions. Corrosion-resistant alloys are also available. Material used for seals and gaskets must be considered.

WHAT SPEED AND HP?

Centrifugal pumps are available with various motor speeds, such as 1725 or 3450 RPM. The lower speed pump has half the flow, one-fourth the pressure and requires one-eighth the horsepower of the higher RPM model.

Pump ratings are based on moving liquid with a specific gravity of 1.0. For fluids with a specific gravity greater that 1.0, the required pump/motor horsepower of a direct drive pump can be determined by identifying the desired flow/pressure point on a performance curve and multiplying the indicated horsepower by the specific gravity of the fluid.

Many magnetic-coupled pumps are built with magnets capable of handling fluids with a specific gravity greater than 1.0. Care must be taken not to select a pump whose rating isn't adequate to handle the specific gravity of the fluid or the pump will lose synchronization and fail to pump. On some magnetic coupled pumps, the impeller can be trimmed to pump higher specific gravity liquids. In any match-up of the pump and motor, make sure the piping is adequate. Piping too narrow can starve the pump and ruin efficiency.

The Ten Commandments of Pumping

1. Always read operating instructions.
2. Strain foreign objects from the pump.
3. Use siphon breakers on suction and discharge piping.
4. Provide proper electrical power with proper overload protection.
5. Never starve the pump; use oversize suction piping for distance, elevated temperatures, vaporization or high atmospheric elevations.
6. Carefully choose materials that contact the liquid.
7. Determine flow, pressure and size of pump required. Match the HP of drive motor to the specific gravity of the liquid being pumped.
8. Install a valve on a centrifugal pump discharge to prevent overloading the motor, or use a non-overloading motor for the entire performance range.
9. Keep adequate spare parts on hand.
10. Install standby pumps when uninterrupted pumping is mandatory.

PUMP SELECTION

Pump sizing is largely determining the desired pressure and flow rate. Most pumps are of horizontal design. They are available as direct driven or as magnetic coupled seal-less, in many flow rate/pressure combinations. Which to choose? It depends on use conditions.

A direct drive pump requires careful seal selection to minimize wear and failure. Mechanical seals provide precision fit, are self-adjusting and are available water or product flushed. A closed-loop, double water flushed seal system also can be used when an external source of water is not available, or if the seal is to be self-contained.

Vertical pumps must have their drive motors mounted at the tank, which may cause a space problem. Fumes and mist from the plating bath can be a problem, too, so protect the motor if necessary. Vertical pumps are often used to pump waste solution from sumps.

Drum pumps are narrow enough to self-prime liquids through the bung opening. To add chemical for pH control or to add brightener, use a diaphragm or piston type metering pump. Such pumps could be operated on timers or amp-hour meters.