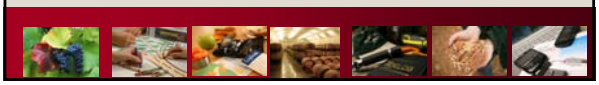
WASHINGTON STATE UNIVERSITY EXTENSION

Lecture 7 – Pumps and Hoses

Gordon Taylor and Carter Clary

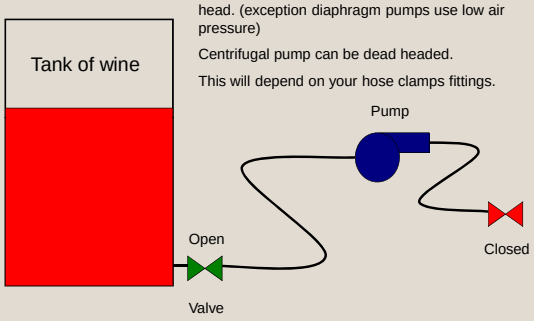


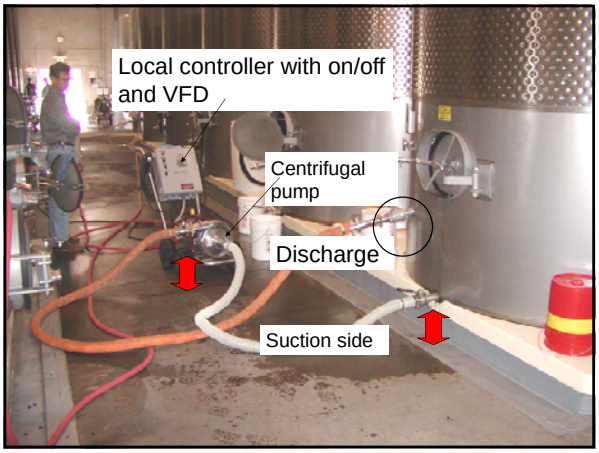
Dead Heading Pumps

Positive Displacement pumps – Don't dead head. (exception diaphragm pumps use low air pressure)

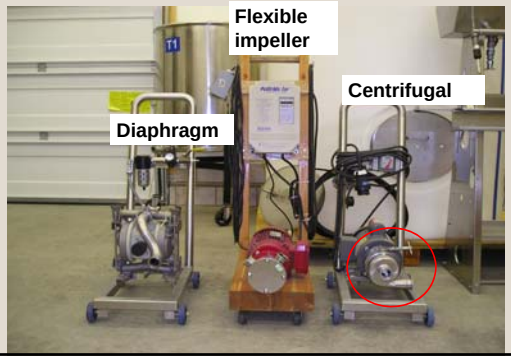
Centrifugal pump can be dead headed.

This will depend on your hose clamps fittings.



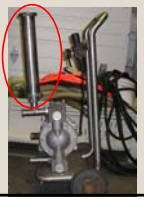


Pumps

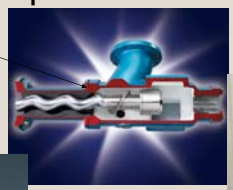


Pumps



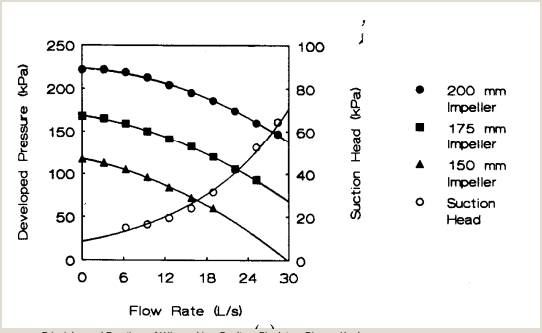



Pumps and Delivery



Gravity Winery

Pump Curve for Centrifugal Pump



Principles and Practices of Winemaking. Boulton, Singleton, Bisson, Kunkee

Classification of Pumps

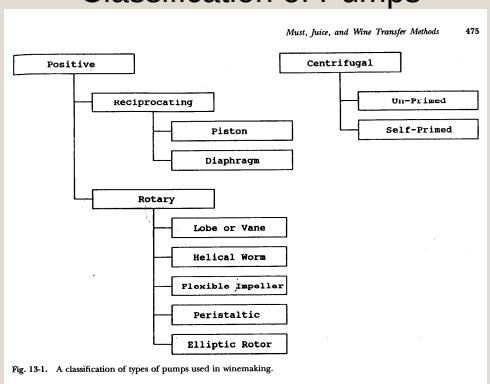
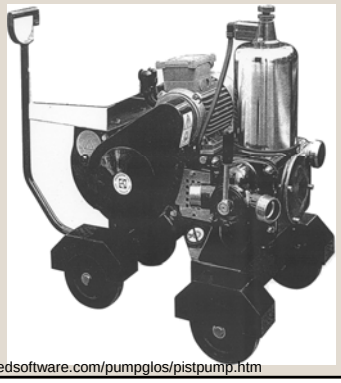


Fig. 13-1. A classification of types of pumps used in winemaking.

Principles and Practices of Winemaking. Boulton, Singleton, Bisson, Kunkee

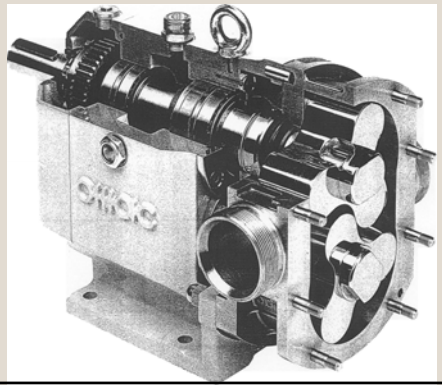
Variety of Pumps

Piston Pump

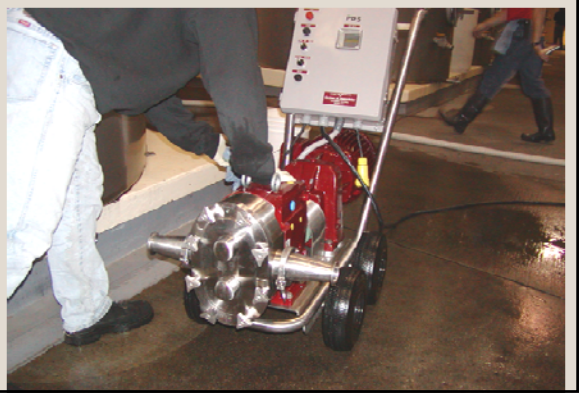


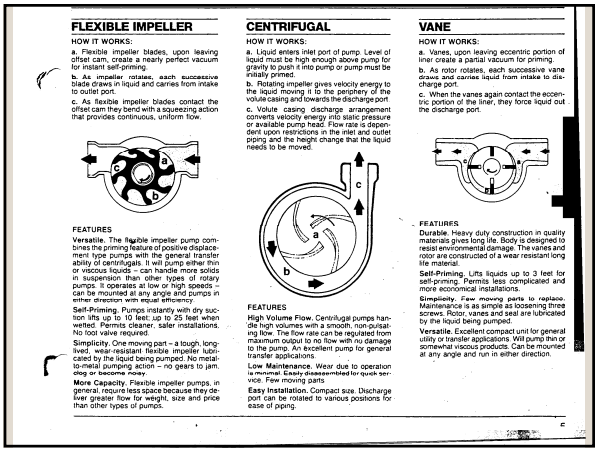
http://www.animatedsoftware.com/pumpglos/pistpump.htm

Tri Lobe Rotor Pump



Waukesha Pump





FLEXIBLE IMPELLER

HOW IT WORKS:

a. Flexible impeller blades, upon leaving offset cam, create a nearly perfect vacuum for instant self-priming.

b. As impeller rotates, each successive blade draws in liquid and carries from intake to outlet port.

c. As flexible impeller blades contact the offset cam they bend with a squeezing action that provides continuous, uniform flow.

FEATURES

Versatile. The flexible impeller pump combines the priming feature of positive displacement type pumps with the general transfer ability of centrifugals. It will pump either thin or viscous liquids – can handle more solids in suspension than other types of rotary pumps. It operates at low or high speeds – can be mounted at any angle and pumps in either direction with equal efficiency.

Self-Priming. Pumps instantly with dry suction lifts up to 10 feet; up to 25 feet when wetted. Permits cleaner, safer installations. No foot valve required.

Simplicity. One moving part – a tough, long-lived, wear-resistant flexible impeller lubricated by the liquid being pumped. No metal-to-metal pumping action – no gears to jam, clog or become noisy.

More Capacity. Flexible impeller pumps, in general, require less space because they deliver greater flow for weight, size and price than other types of pumps.

CENTRIFUGAL

HOW IT WORKS:

a. Liquid enters inlet port of pump. Level of liquid must be high enough above pump for gravity to push it into pump or pump must be initially primed.

b. Rotating impeller gives velocity energy to the liquid moving it to the periphery of the volute casing and towards the discharge port.

c. Volute casing discharge arrangement converts velocity energy into static pressure or available pump head. Flow rate is dependent upon restrictions in the inlet and outlet piping and the height change that the liquid needs to be moved.

FEATURES

High Volume Flow. Centrifugal pumps handle high volumes with a smooth, non-pulsating flow. The flow rate can be regulated from maximum output to no flow with no damage to the pump. An excellent pump for general transfer applications.

Low Maintenance. Wear due to operation is minimal. Easily disassembled for quick service. Few moving parts.

Easy Installation. Compact size. Discharge port can be rotated to various positions for ease of piping.

VANE

HOW IT WORKS:

a. Vanes, upon leaving eccentric portion of liner create a partial vacuum for priming.

b. As rotor rotates, each successive vane draws and carries liquid from intake to discharge port.

c. When the vanes again contact the eccentric portion of the liner, they force liquid out the discharge port.

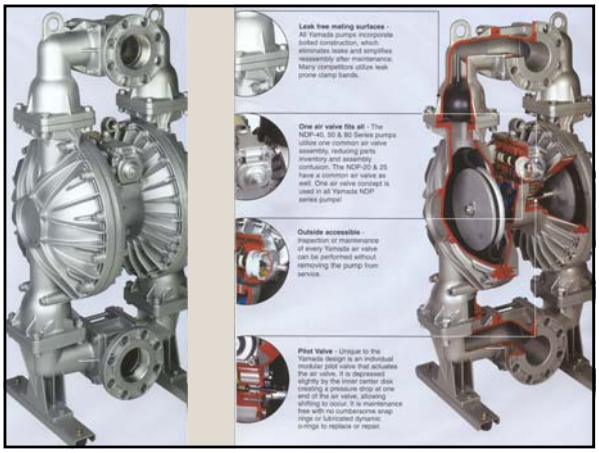
FEATURES

Durable. Heavy duty construction in quality materials gives long life. Body is designed to resist environmental damage. The vanes and rotor are constructed of a wear resistant long life material.

Self-Priming. Lifts liquids up to 3 feet for self-priming. Permits less complicated and more economical installations.

Simplicity. Few moving parts to replace. Maintenance is as simple as loosening three screws. Rotor, vanes and seal are lubricated by the liquid being pumped.

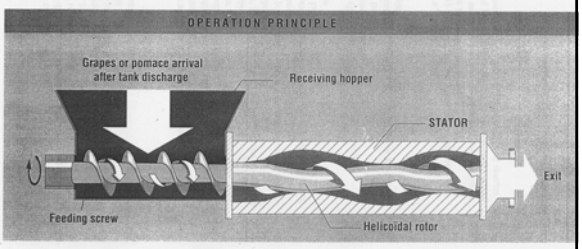
Versatile. Excellent compact unit for general utility or transfer applications. Will pump thin or somewhat viscous products. Can be mounted at any angle and run in either direction.



Diaphragm Pump

Centrifugal Pumps

AN EFFECTIVE AND GENTLE OPERATION



Progressive Cavity Pump

Hoses

More Hoses

Hose Considerations

- Pressure
- Temperature
- Durability
- Application (wine or must)
- Cost
- Weight

Fittings & Hoses

- Tri-Clover, DIN, BMT, Cam-Lock, NPT.
- Food Grade Only, Dairy (sanitary) vs. Wire Wound.
- Hose Size 0.5 to 4 inch and up to 6 inch


Commercial Hose Ends for Food Grade Hose

Hose Ends