

Diaphragm Pumps Vs Peristaltic Pumps. What's the best choice for you?

Diaphragm Metering Pumps

This type of metering pump will require you to be a bit more knowledgeable about the pump valves, as well as proper priming and adjustment characteristics. Once you understand the pump and work within its normal limits, you should be assured of a successful program.

Pros

1. A well maintained diaphragm metering pump will cost less to operate over time.
2. Diaphragm metering pumps are more energy efficient, using more motor torque on the foreword (power) stroke, but far less on the back stroke.
3. Overcoming line pressure is easier with properly sized diaphragm metering pumps.
4. Less danger of leakage – if a diaphragm metering pump is poorly maintained, it may lose its prime, but seldom leaks, or damages the surrounding area.

Cons

1. Diaphragm metering pumps operate best when the solution being pumped is clean, free from particulates. The reason; diaphragm metering pumps have check valves in the suction and discharge side of the pump head. If either set of check valves becomes fouled, the pump will not meter accurately, and loss of prime will occur.
2. Difficult to prime against pressure -These pumps Prime best when there is little to no back pressure. Some pumps are fitted with a bleed valve to aid in this challenge.
3. Difficulty priming with dirty check valves - Diaphragm pumps prime best when the valves (check balls) are clean, there is little to no back pressure, and the diaphragm stroke is on full / maximum setting.
4. Difficulty priming when the stroke (feed rate adjustment) is on a low setting. Most diaphragm metering pumps have a diaphragm stroke (feed rate) adjustment, and some also have a motor speed adjustment. Priming is best achieved when the stroke adjustment is above the 60% area. These adjustments can be confusing, try to minimize your variables as much as possible. Avoid adjusting the diaphragm stroke length to low, the pump loses efficiency. Keep your diaphragm stroke above 40% if possible; most pumps are just more efficient with longer stroke lengths.

Peristaltic Metering Pumps

Peristaltic metering pumps are a good choice when pumping dirty fluids that may contain trapped gases or particulate matter, into lower pressure systems. Newer peristaltic pump designs are capable of pressures to 124 psi.

There are more tubing options available for modern peristaltic metering pumps, offering more chemical resistance and longer tube life.

Tube failure has been well addressed with Blue-White's Exclusive, Patented Tube Failure Detection system (U.S. patents 7,001,153 and 7,284,964).

Pros

These pumps are initially easier to begin using than diaphragm metering pumps.

1. They work well with high levels of particulate in the solution being metered (undissolved solids), because there are no check balls to foul.
2. Feed rates are less affected by pressure, or the nature of chemical being metered.
3. Peristaltic pumps have no-hassle priming and excellent suction.

Cons

1. Constant squeezing of pump tube weakens (degrades) the tube over time, and the feed rate is slowly diminished.
2. Squeezing the pump tube requires the drive motor to be under a constant load (similar to a boat motor), so the pump uses more power.
3. When pump tubes not regularly changed, or the injection point not serviced, the pump tube may leak. Pump tubes begin to wear the moment the pump is started, and continue degrading until worn out completely. Most manufacturers rate the tubes in hours. Users must be cognizant of the total number of hours the pump has operated. This is a common problem with peristaltic pump users, generally operators underestimate how many hours the pump has been in operation.

Peristaltic & Diaphragm metering pumps –

1. Diaphragm Pumps - Make sure the pump wetted parts are compatible with the chemical you are pumping. The pump head, valves and diaphragm are commonly referred to as, "wetted end", and they need your attention. Make sure your wetted end is compatible with the chemical you are pumping.
2. With Peristaltic pumps make sure the pump tube, and standard fittings are compatible with your chemical. Manufacturers will list the materials that make up wetted parts. The customer needs to do some basic research on chemical compatibility, no one single material works with everything.
3. Read the pump curve, the pump output will not be the same at atmospheric pressure, as it will be at 50 psi, as line pressure increases your feed rate will decrease. A pump curve will help you, but remember the pump curves provided are done in laboratory testing pumping pure water. Your solution will have a different viscosity, and specific gravity than water. This will affect your output.

Summary –

Diaphragm metering pumps excel at pumping clean, aggressive chemicals into high-pressure systems, and require very little maintenance. A variety of wetted parts materials are available for chemical resistance. However diaphragm pumps can lose their prime, and can be difficult to prime, especially if the fluid is dirty or contains trapped gases.

Peristaltic metering pumps excel at pumping dirty fluids that contain trapped gases or particulate matter into lower pressure systems. Modern peristaltic pump designs are capable of pressures to 124 psi. Peristaltic pumps will require periodic changing of the pump tube.

Research and a good understanding of both the installation requirements, and the pump's operating parameters and maintenance requirements, are vital to choosing the best pump for your application.