



CHEM-PRO™ C3 Series Diaphragm Metering Pump

Weighing the pros and cons between diaphragm and peristaltic metering pumps.

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Diaphragm pumps vs. Peristaltic metering pumps. What is the best choice for you?

Both styles have distinct advantages and disadvantages over the other. With nearly fifty years (36 me personally) in the industry as a manufacturer of both I would like to share some information with you.

If you are currently using diaphragm pumps in your work and having success the odds are good you are educated on the basics of maintaining your diaphragm pump. I'm also pretty sure the more you learned, the more successful your pumps were... right? Although today's diaphragm pumps are more sophisticated, better valves, diaphragms, drive mechanisms, etc. than years ago; they still require a basic understanding for a successful program. Peristaltic pumps on the other hand are initially simpler to use, and require less experience to operate under adverse conditions. This is where we begin:

Diaphragm metering pumps –

Pros

1. Well maintained a diaphragm metering pump cost you 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 - Poorly maintained, diaphragm metering pump way lose its prime, but seldom leaks, or damages area.

Cons

1. Solution being pumped needs to be clean - 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 (dirty), the pump will first lose its ability to meter accurately, and finally 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 and there is little to no back pressure, and the diaphragm stroke is on full or maximum setting.
4. Difficulty priming when the stroke (feed rate adjustment) is on a low setting. Most diaphragm metering pumps has 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.

In summary (diaphragm metering pump) will require you to be a bit more knowledgeable about

the pump valves, and proper priming and adjustment characteristics. Once you understand the pump and work within its normal limits you will be assured of a successful program.

Peristaltic pumps –

Pros

Are initially easier to use because are more forgiving than diaphragm metering pumps

1. Work well with high levels of particulate in solution (un-Dissolved solids) being pumped. There are no check balls to foul within the pump tube.
2. Feed rates are less affected by pressure, or nature of chemical.
3. Are superior at priming, excellent suction.

Cons

1. Constant squeezing of pump tube weakens (degrades) the tube, and 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), uses more power.
3. When neglected (pump tube not changed), or injection point not serviced, pump tube may leak and could damage the pump, or worse.
4. Pump tubes begin to wear the moment the pump is started, and continue degrading until worn out completely. Most manufactures rate the tubes in hours. Users must be cognizant of total number of hours the pump has operated. This is a common problem with peristaltic pump users, generally operators under estimate how many hours the pump has operated.

Areas concerning both Peristaltic & diaphragm metering pumps

1. Make sure the pump wetted parts are compatible with the chemical you are pumping. Your pump head, valves and diaphragm are commonly referred to as, “wetted end”, need your attention; make sure your wetted end is compatible with the chemical you are pumping. 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.

2. Read the pump curve, the pump output will not be the same at atmospheric pressure, as it will be at 50psig, as the line pressure increases your feed rate will decrease. A pump curve will help you, but remember the pump curves provided are done in all laboratory, pumping pure water. Your solution will have a different viscosity, and specific gravity than water, and will affect your output.

3. It's best if you check your output by measuring from a graduated measuring cup from suction tubing. By doing it this way you will know how your chemical (viscosity, and specific gravity & line pressure) is actually feeding. This is the best way to calibrate your pump.

Summary -

Diaphragm metering pumps excel at pumping clean, aggressive chemicals into high-pressure systems, and require very little maintenance. A variety of wetted parts are available for chemical resistance. Diaphragm pumps, however, 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. Newer peristaltic pump designs are capable of pressures to 100 psig. Pump tube material options, however, can be limited, and chemical resistance can be a factor. In addition, 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.



FLEXFLO A-100N Peristaltic Metering Pump