

Peristaltic Pump Applications

Reducing maintenance costs for transfer and metering applications

By: Chris Pasquali, CEO Factory Direct Pipeline Products, Inc.

Our previous article "[Characteristics of Industrial Peristaltic Pumps](#)" described modern hose pump design. This article describes the multitude of applications benefiting from the unique and sealless design of peristaltic pumps.

Peristaltic pumps are used in lieu of air-operated diaphragm (AOD), progressing cavity (PC), gear and rotary lobe style pumps for the following types of applications:

Shear and emulsion sensitive fluids

Characteristics of some fluids are negatively affected due to agitation and mixing; examples include paints might be thinned, cornstarch thickened and egg whites separated from yolks. "Gentle pumping" improves process and product consistency.

Slurries, sludge's and viscous fluids

Semi liquid mixtures and viscous fluids are less "flowable" and often contain particulate. Pumps that withstand the potential for abrasive wear as well as handling the suction and discharge requirements for such applications improve reliability and reduce maintenance.

Contamination

As containment of the pumped fluid protects employees and the work environment, likewise isolation of the pumped fluid from the environment contributes to product purity. Peristaltic pumps eliminate a leakage path, reducing potential of contamination either way.

Suction lift, self-priming and dry running

These process characteristics relate directly to efficiency and reliability. Compared to other pump styles, peristaltic hose pumps perform the best for each of these common inlet conditions.



The most common denominator for all peristaltic pump applications is reduced operational costs due to a combination of less maintenance (parts & labor), increased reliability and improved product quality. Other pumps leak, clog and corrode due to designs having seals, valves, diaphragms and rotors.

Technological advancements in peristaltic hose design have increased the application range of modern peristaltic hose pumps. Innovative materials and complex multilayered hose designs have increased the restitutive ability of peristaltic pump hoses. Since the main wear component is the hose, maximizing the number of compressions between replacements corresponds directly to cost effectiveness.

Following are examples of applications within the chemical processing industry (CPI), water and waste treatment (WWT) and food manufacturing industries which highlight the advantages of the peristaltic hose pump design.

It is easy being "green"!

The chemical processing industry as relates to pumping applications often involves non-water based fluids in which the process or personnel benefit from being isolated from the material pumped. Peristaltic pump applications in the CPI are often additive in nature, transferring or dispensing fluid between locations.



One such application is the transfer of paint and dye. These materials are often shear sensitive and viscous, so the gentle pumping action involving only the compression of a hose with smooth interior finish supports efficient transfer with the suction lift and discharge pressure typically required.

Potential for cross contamination is eliminated by swapping hoses for different colors rather than using expensive solvents that ultimately become a hazardous fluid to recycle or dispose.

The reversible nature of peristaltic hose pumps enables transfer to and from an applicator, reducing the number of pumps required.



Water and waste treatment (WWT) applications involve dispensing chemicals and moving gritty sludge.

Reliably dosing chemicals to purify, control foaming and promote flocculation benefit from the sealless peristaltic hose pump design. In addition to being hazardous to personnel and the environment, some of these chemicals are shear sensitive, losing their flocculation efficiency when over-agitated.

Typical WWT Chemicals

Chemical	Purpose
Sodium Hypochlorite	Disinfection & odor removal
Aluminum Sulfate	Coagulation (flocculation) of suspended impurities
Sodium Aluminate	Removal of excess fluoride
Aluminum Hydroxide	pH adjustment
Potassium Hydroxide	

It is common to replace AOD pumps due to sticky polymers clogging check valves, high pressure related stalling and cold weather icing of input air because peristaltic pumps have no valves, can output higher pressures and are unaffected by cold weather. Get rid of the AOD's and reduce your air compressor requirements!

It is important to transfer abrasive flocculants, sludge and gritty scum for further processing and

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disposal with a sealless design that is capable of sufficient suction and pressure to move these semi liquid materials without leakage.

Food & Beverage Manufacturing



Considering the effort required to make a nice "from scratch" meal at home, imagine the throughput and automation required for mass production of food. Whether it is a vitamin supplement, loaf of bread or your favorite snack, peristaltic hose pumps are used to dose, mix and transfer ingredients due to their accuracy and ease of clean-up.

There are no check valves or anything else in contact with the fluid except the hoses, which are available in several FDA and EC certified materials.

Mmm...Donuts!

A scrambled egg is a rheopectic non-Newtonian fluid that affects the texture of pasta dough and other dough-based products such as cereal, piecrust, fruitcake and donuts. The slow and gentle transfer of egg whites and yolks supports an elastic, soft and resistant product. Peristaltic hose pumps are also used for metering yeast and sugar solutions to donut machines.



Beneficial for your application?

- Ease of maintenance
- Self-priming
- Dry running
- Elimination of check valves
- Elimination of seals
- The ability to handle entrained air and particulate
- Gentle pumping motion

It is desirable to keep some ingredients whole, such as nuts and fruit pieces found in fruitcake dough.

Likewise, cream, milk and yogurt are also shear sensitive, benefitting from the gentle pumping action of a peristaltic hose pump. Ingredients such as vitamins have a tendency

towards crystallization and are abrasive in nature. Since the rotary pumping mechanism of a peristaltic hose pump is external to the material pumped, there is less contamination and leakage potential. Dry cavity roller style peristaltic hose pumps have a light food-grade grease applied externally to the hose whereas the shoe style peristaltic pumps require glycerin or glycol reservoir for hose lubrication.

A "MUST" have Pump!

Peristaltic hose pumps are used by wineries for transferring must (whole, destemmed or pressed grapes), lees (residual yeast) and wine. Their gentle pumping action decreases oxidation, shaking, emulsion and deformation of grapes/seeds. They are also used for tank transfers (settling and blending of wines) and barrel racking (transferring wine from aging barrels to tanks for bottling). Unlike flexible impeller pumps which are easily damaged when operated dry, peristaltic hose pumps can vacuum out a sump or vessel quickly.



Solving Problems

Having a flow range from 18 GPH to over 200 GPM and capable of a discharge pressure over 200 PSI, modern peristaltic hose pumps truly solve common problems due to their simplistic, easy-to-clean and maintain design.

Visit our website and use our peristaltic pump inquiry form which prompts you for all of the required information for us to provide a detailed proposal for your specific application.

Chris Pasquali has been trained by Wanner Engineering Inc, having provided sales and engineering support since 1991.

FLUID INFORMATION

Fluid To Be Pumped:

Fluid Temperature: Fahrenheit Celsius

Viscosity: CPS

Specific Gravity:

Desired flow rate and pressure: GPM

at PSI

Describe the inlet condition:

(SELECT):

DESCRIBE ANY SOLIDS

FLUID COMPATIBILITY

CHECK ALL OF THE COMPATIBLE MATERIALS:

Hose Material of Construction:

- | | |
|--|-----------------------------------|
| <input type="checkbox"/> Natural Rubber | <input type="checkbox"/> EPDM |
| <input type="checkbox"/> Hypalon | <input type="checkbox"/> Neoprene |
| <input type="checkbox"/> Oil-rated Nitrile | <input type="checkbox"/> Silicone |
| <input type="checkbox"/> PharMed | <input type="checkbox"/> Varprene |

Connection Type and Material:

- | |
|---|
| <input type="checkbox"/> Hose Barb-Brass |
| <input type="checkbox"/> Hose Barb-Steel |
| <input type="checkbox"/> Hose Barb-316SS |
| <input type="checkbox"/> Hose Barb-PTFE |
| <input type="checkbox"/> ANSI Flange-Steel |
| <input type="checkbox"/> ANSI Flange-316SS |
| <input type="checkbox"/> ANSI Flange-PVC |
| <input type="checkbox"/> ANSI Flange-Nylon |
| <input type="checkbox"/> NPT Threaded-Brass |
| <input type="checkbox"/> NPT Threaded-Steel |
| <input type="checkbox"/> NPT Threaded-316SS |
| <input type="checkbox"/> NPT Threaded-PVC |
| <input type="checkbox"/> NPT Threaded-Polypropylene |
| <input type="checkbox"/> NPT Threaded-Nylon |
| <input type="checkbox"/> NPT Threaded-PTFE |
| <input type="checkbox"/> Tri-Clamp-316SS |

SYSTEM INFORMATION

(SELECT DRIVE OPTION):

(SELECT A MOTOR OPTION):

Describe the existing pump or other pumps you are co

Describe any problems you experience

Provide a detailed application overview here

Submit