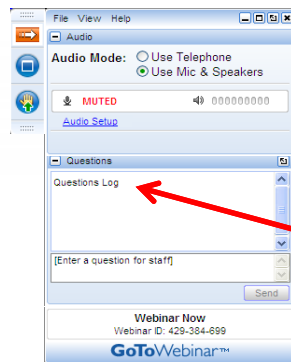


Sponsor eShowcase: Peristaltic or Diaphragm Metering Pump – How to Choose?



Thursday, August 27th, 2015
1:00 - 1:45 pm ET

How to Participate Today



- **Audio Modes**
 - Listen using Mic & Speakers
 - Or, select "Use Telephone" and dial the conference (please remember long distance phone charges apply).
- **Submit your questions using the Questions pane.**
- **A recording will be available for replay shortly after this webcast.**



FLEX-PRO
Peristaltic Metering Pumps

ProSeries-M
by Blue-White Ind.

CHEM-PRO
Diaphragm Metering Pumps

Presented by:



Bill McDowell
Sales Engineer

Peristaltic or Diaphragm metering pump
how to choose?



This section provides a comparison between peristaltic and diaphragm metering pumps. It features the logos for FLEX-PRO (Peristaltic Metering Pumps), ProSeries-M (by Blue-White Ind.), and CHEM-PRO (Diaphragm Metering Pumps). The central text asks "Peristaltic or Diaphragm metering pump how to choose?". A circular portrait of Bill McDowell, Sales Engineer, is shown to the right. Below the text, two pumps are displayed: a large ProSeries-M M-3 peristaltic pump on the left and a smaller ProSeries-M MC-2 diaphragm pump on the right.

FLEX-PRO. Mbofpq̂ iŕ ālōāf meo^dj = **CHEM-PRO.**

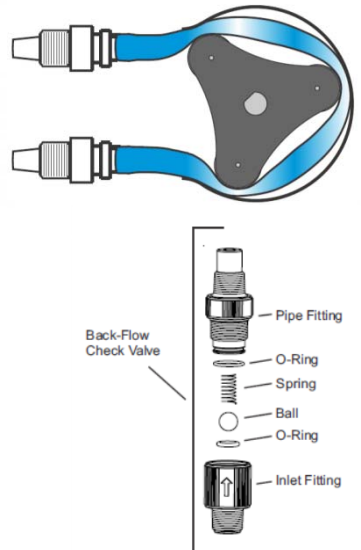
- Reliability of the system
- Total cost of ownership
- Performance issues

ProSeries
by Blue-White Ind.

FLEX-PRO. Mbofpq̂ iŕ ālōāf meo^dj = **CHEM-PRO.**

PERISTALTIC PUMP COMPONENTS

- Pump tubing
- Connection fittings
- Suction piping (tubing)
- Discharge piping (tubing)
- Back-flow check valve



The diagram shows a blue peristaltic pump tubing assembly with two connection fittings. Below it is a detailed cross-sectional view of a back-flow check valve, which includes a pipe fitting, an O-ring, a spring, a ball, another O-ring, and an inlet fitting.

ProSeries
by Blue-White Ind.

FLEX-PRO. Mbofpq i f a l o a f meo^dj = **CHEM-PRO.**

DIAPHRAGM PUMP COMPONENTS

- Pump head
- Valves
 - O-rings
 - Check Balls
 - Housings
- Connection fittings
- Suction piping (tubing)
- Discharge piping (tubing)
- Back-flow check valve
- Foot Valve & Strainer

The diagram shows an exploded view of the pump assembly. On the left, a vertical column of parts includes the pump head, various O-rings, check balls, and housings. On the right, three sub-assemblies are detailed: 1) Back-Flow Check Valve, showing a pipe fitting, O-ring, spring, ball, and inlet fitting. 2) Suction Tubing, showing a ceramic weight. 3) Foot Valve Strainer Assembly, showing a connection fitting, O-ring, ball, O-ring, filter body, and filter.

ProSeries
by Blue-White Ind.

FLEX-PRO. Mbofpq i f a l o a f meo^dj = **CHEM-PRO.**

FOUR PRIMARY VARIABLES

Fluid	System Pressure	Control Capability	Maintenance
Solids	Suction pressure	Variable speed	Service interval
Chemical resistance	Discharge pressure	Stroke length	Life expectancy
Out-gassing / Vapor locking			

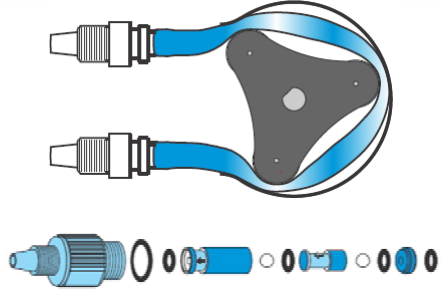
ProSeries
by Blue-White Ind.

FLEX-PRO. Mbofpq if áloá f meo^dj = **CHEM-PRO.**

Fluid

- Solids
- Chemical resistance
- Out-gassing / Vapor locking

SOLIDS AND PARTICULATES	
PERISTALTIC PUMP	DIAPHRAGM
<ul style="list-style-type: none"> No valves to clog Few surfaces 	<ul style="list-style-type: none"> Valves can clog causing pump failure Many small surfaces



ProSeries
by Blue-White Ind.

FLEX-PRO. Mbofpq if áloá f meo^dj = **CHEM-PRO.**

Fluid

- Solids
- Chemical resistance
- Out-gassing / Vapor locking

CHEMICAL RESISTANCE	
PERISTALTIC PUMP	DIAPHRAGM
<ul style="list-style-type: none"> Fewer components to be attacked Limited material options 	<ul style="list-style-type: none"> Many components to be attacked Many material options

ProSeries
by Blue-White Ind.

FLEX-PRO. Mbofpq i f a l o a f m e o ^ d j = **CHEM-PRO.**

Fluid	OUTGASSING / VAPOR LOCKING	
	PERISTALTIC PUMP	DIAPHRAGM
Solids	<ul style="list-style-type: none"> Can pump air - no valve losses to overcome Automatically primes 	<ul style="list-style-type: none"> Head can become vapor locked Difficult to prime
Chemical resistance		
Out-gassing / Vapor locking		

ProSeries
by Blue-White Ind.

FLEX-PRO. Mbofpq i f a l o a f m e o ^ d j = **CHEM-PRO.**

Peristaltic pump cannot vapor lock

THE PINCHING FORCE IS GREATER THAN THE DISCHARGE PRESSURE

GAS ACCUMULATES IN THE PUMP TUBE BECOMING TRAPPED BETWEEN THE PINCHED ROLLERS

THE GAS IS MOVED FORWARD IN THE TUBING BY THE PERISTALTIC ACTION

THE GAS IS DISCHARGED INTO THE PRESSURIZED DISCHARGE LINE

ProSeries
by Blue-White Ind.

FLEX-PRO. Mbof p q i f a l o a f m e o ^ d j = **CHEM-PRO.**

Diaphragm pump can vapor lock

ProSeries
by Blue-White Ind.

FLEX-PRO. Mbof p q i f a l o a f m e o ^ d j = **CHEM-PRO.**

Plumbing design can affect both suction and discharge

ProSeries
by Blue-White Ind.

FLEX-PRO. Mbofpg^i^f^ãlôãf^meo^dj = **CHEM-PRO.**

System Pressure

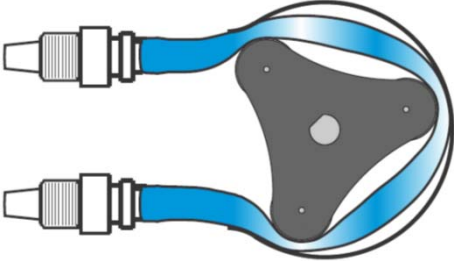
- Suction pressure
- Discharge pressure

SUCTION PRESSURE	
PERISTALTIC PUMP	DIAPHRAGM
<ul style="list-style-type: none"> Suction lift to 30ft of water Output is affected by changes in suction pressure Larger diameter tubes affected more than smaller tubes 	<ul style="list-style-type: none"> Limited suction lift height Can be hard to prime – especially when stroke lengths are short Output is less affected by changes in suction pressure

ProSeries
by Blue-White Ind.

FLEX-PRO. Mbofpg^i^f^ãlôãf^meo^dj = **CHEM-PRO.**

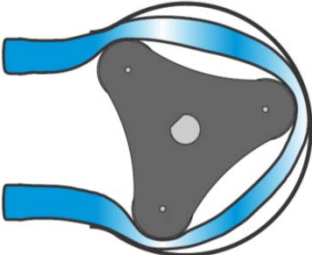
Peristaltic pump output is affected by suction pressure



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FLEX-PRO. Mbofpq̂ iŕ ālōāf meo^dj = **CHEM-PRO.**

Peristaltic pump output is affected by suction pressure

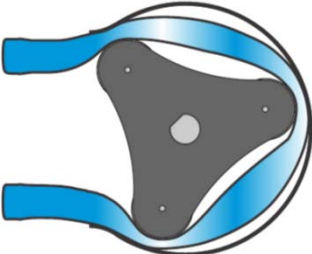


TUBE COLLAPSES DUE TO
NEGATIVE SUCTION PRESSURE
REDUCING PUMP TUBE VOLUME
(CAUSED BY INCREASED SUCTION
LIFT AND/OR INCREASED VISCOSITY)

ProSeries
by Blue-White Ind.

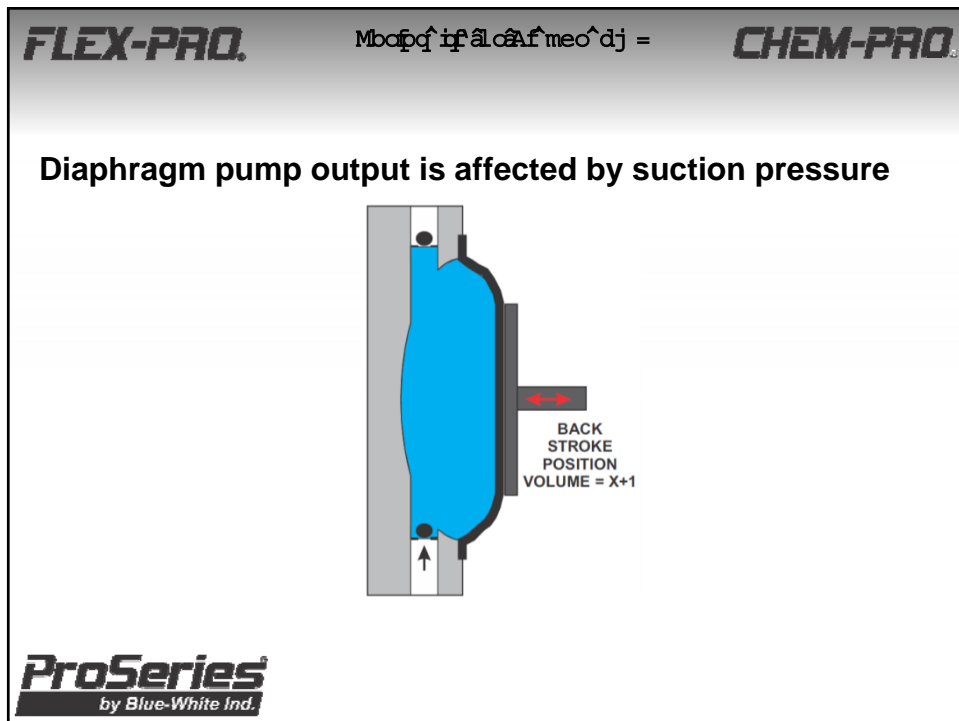
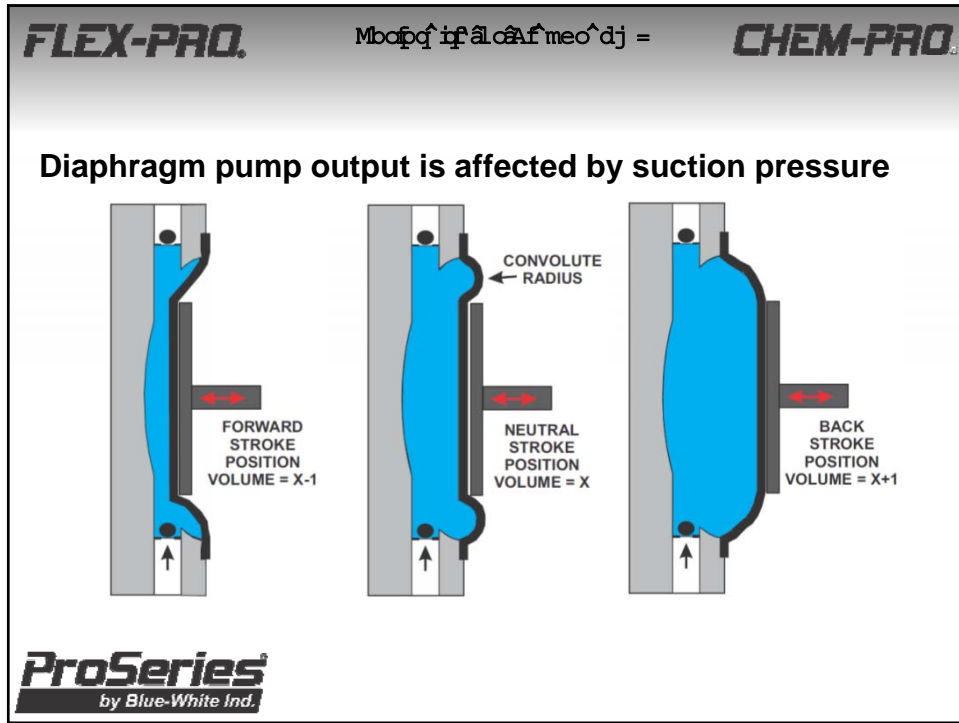
FLEX-PRO. Mbofpq̂ iŕ ālōāf meo^dj = **CHEM-PRO.**

Peristaltic pump output is affected by suction pressure



TUBE BALLOONS DUE TO
POSITIVE SUCTION PRESSURE
INCREASING PUMP TUBE VOLUME
(CAUSED BY INCREASED TANK LEVEL
AND/OR REDUCED VISCOSITY)

ProSeries
by Blue-White Ind.



FLEX-PRO. Mbofpg i f a l o a f m e o ^ d j = **CHEM-PRO.**

Diaphragm pump output is affected by suction pressure

CONVOLUTE RADIUS STRETCHES IN DUE TO INCREASING SUCTION VACUUM REDUCING PUMP CHAMBER VOLUME

BACK (SUCTION) STROKE POSITION VOLUME = (X+1) - PRESSURE DEFLECTION

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by Blue-White Ind.

FLEX-PRO. Mbofpg i f a l o a f m e o ^ d j = **CHEM-PRO.**

Diaphragm pump output is affected by suction pressure

BACK STROKE POSITION VOLUME = X+1

ProSeries
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FLEX-PRO. Mbofpg i f a l o a f meo^dj = **CHEM-PRO.**

Diaphragm pump output is affected by suction pressure

CONVOLUTE RADIUS STRETCHES IN DUE TO INCREASING SUCTION VACUUM REDUCING PUMP CHAMBER VOLUME

BACK (SUCTION) STROKE POSITION
VOLUME = (X+1) - PRESSURE DEFLECTION

ProSeries
by Blue-White Ind.

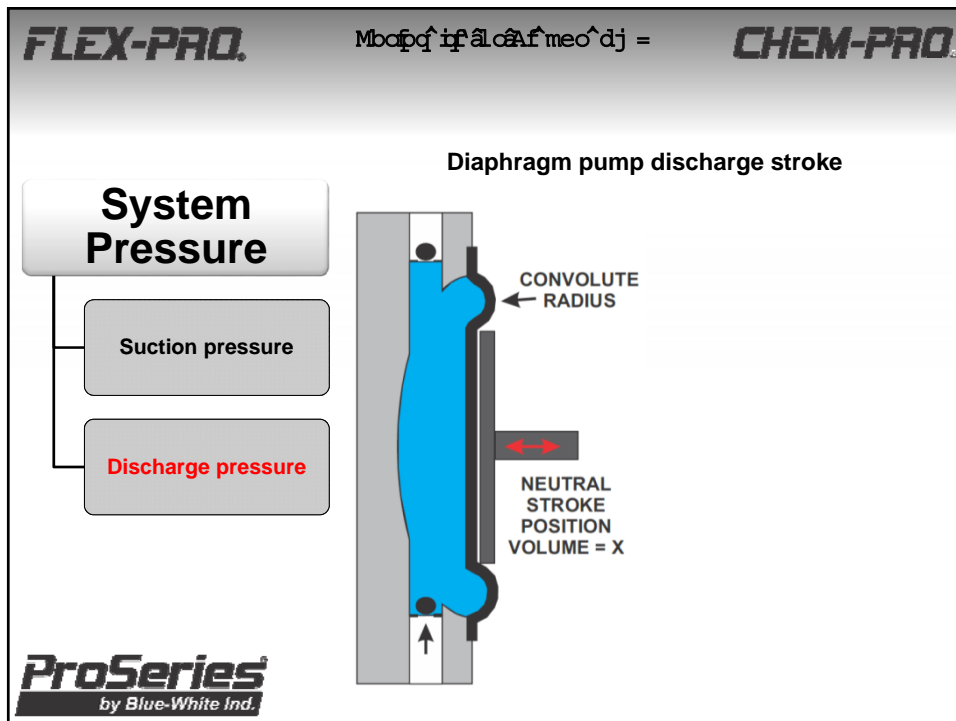
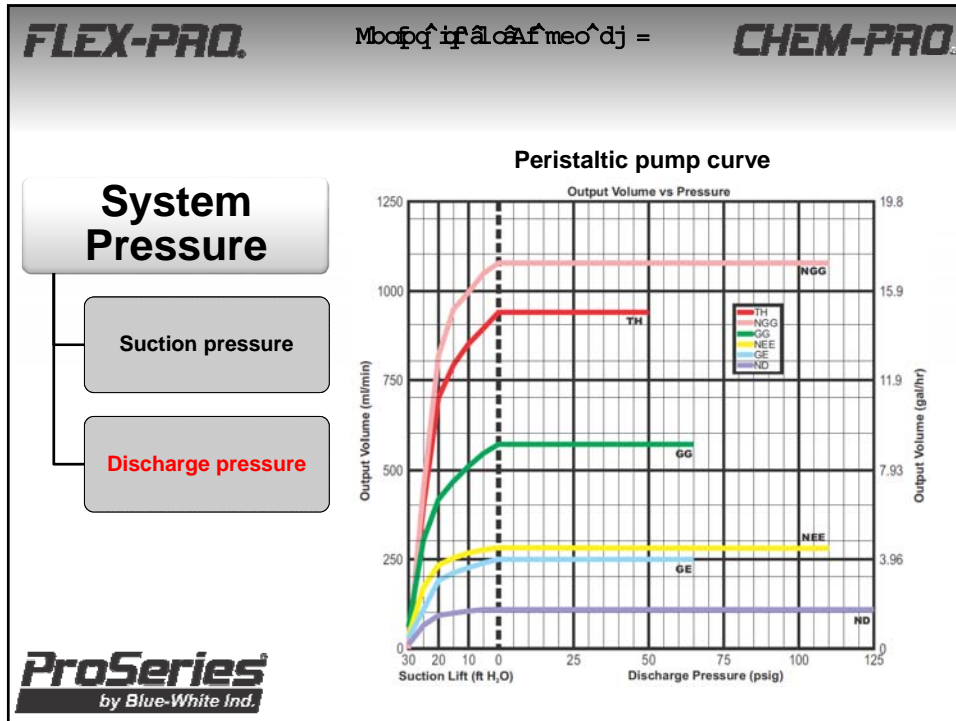
FLEX-PRO. Mbofpg i f a l o a f meo^dj = **CHEM-PRO.**

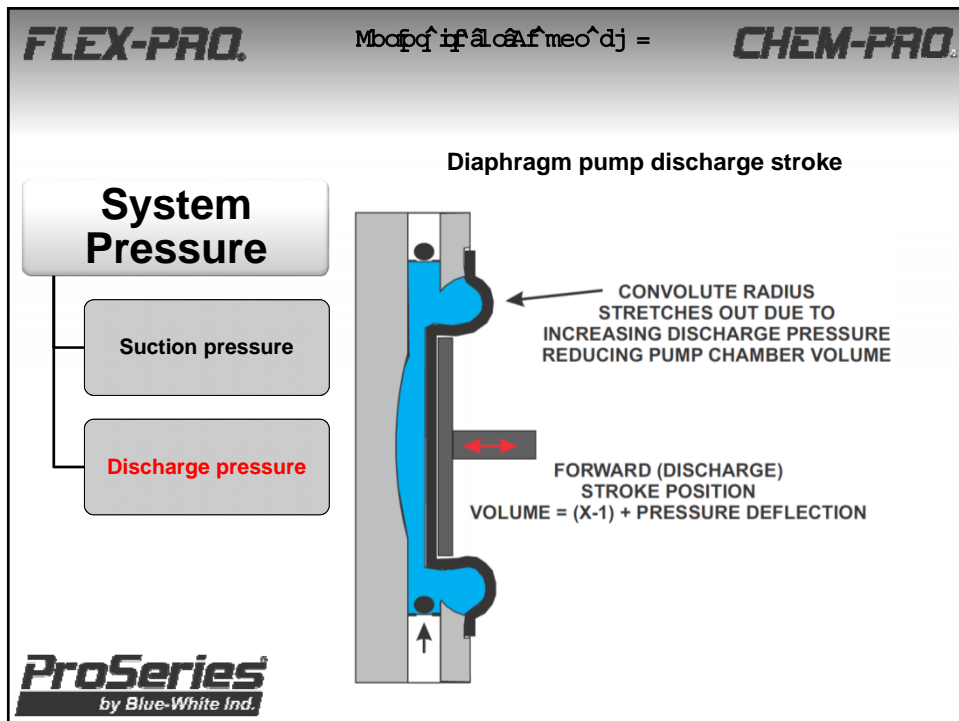
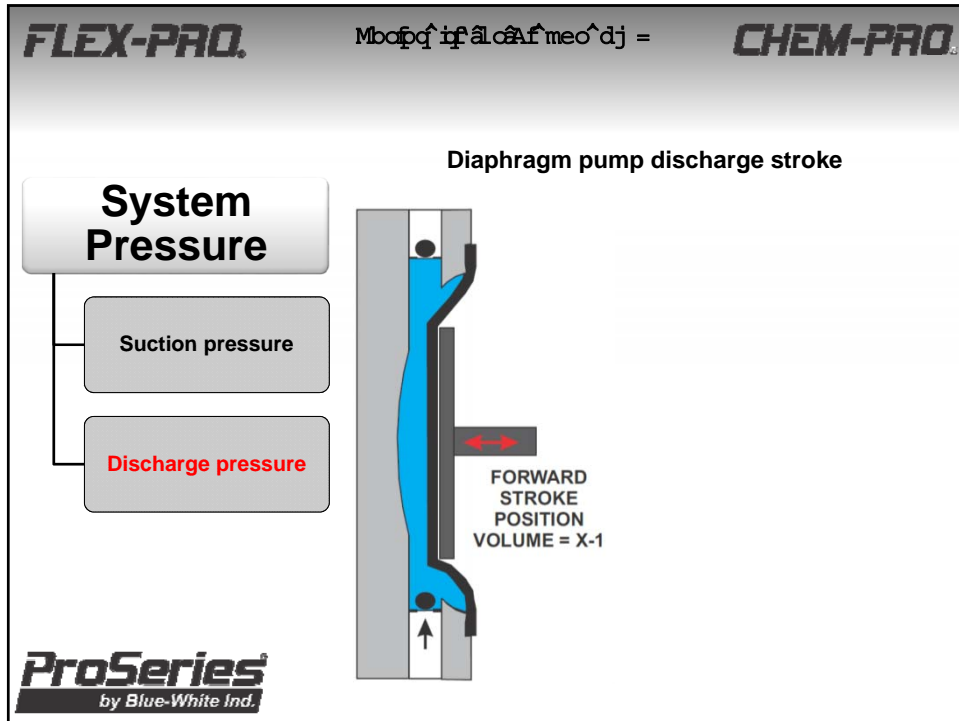
System Pressure

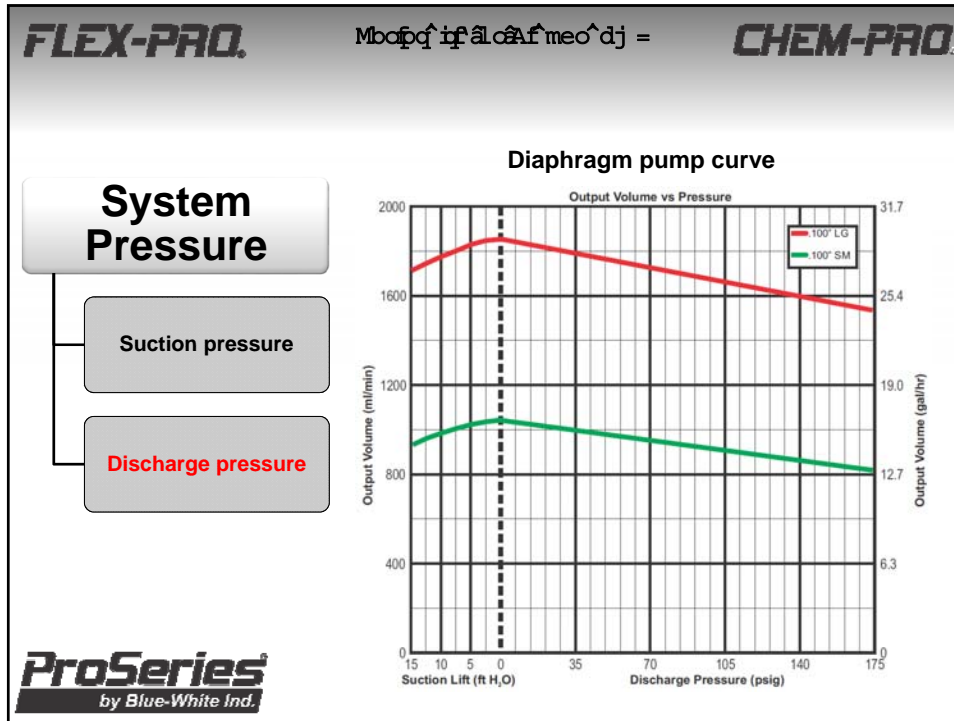
- Suction pressure
- Discharge pressure

DISCHARGE PRESSURE	
PERISTALTIC PUMP	DIAPHRAGM
<ul style="list-style-type: none"> Output is not affected by changes in the discharge pressure Pump tubing life is reduced as the discharge pressure increases Limited to pressures less than 125 psi (tubing style) Easily primes against maximum pressure Can pump into a vacuum (cannot syphon) 	<ul style="list-style-type: none"> Output is affected by changes in the discharge pressure Can pump into high pressures without severe wear issues Can pump against very high pressures over 1,000 psi Hard to prime against pressure Must pump into positive pressure to prevent syphoning (pressurized valve required)

ProSeries
by Blue-White Ind.







FLEX-PRO. Mboofq if alca f meo^dj = **CHEM-PRO.**

Control Capability

- Variable Speed**
- Stroke Length

CONTROL CAPABILITY	
PERISTALTIC PUMP	DIAPHRAGM
<ul style="list-style-type: none"> Motor speed adjustment results in near continuous output Can be pulsed on/off by timers for batch type injection No stroke length adjustment – so motor speed turn-down is important – but... Tubing size can be easily changed to vary the volume per revolution 	<ul style="list-style-type: none"> Motor speed adjustment results in greater time between chemical injection strokes Can be pulsed on/off by timers for batch type injection Stroke length can be adjusted to change the volume per stroke Difficult to change the diaphragm size.

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FLEX-PRO. *Mbafpq if alcaF meo^dj =* **CHEM-PRO.**

Control Capability

- Variable Speed
- Stroke Length

Variable Speed Peristaltic Pump

Near continuous injection even at very low motor speed

Variable Frequency & Stroke Diaphragm Pump

Long stroke and low frequency result in intermittent chemical injection.

Variable Frequency & Stroke Diaphragm Pump

High frequency results in better dispersion but shorter stroke lengths.

ProSeries
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FLEX-PRO. *Mbafpq if alcaF meo^dj =* **CHEM-PRO.**

SYSTEM PARAMETERS

Control Capability

- Variable Speed
- Stroke Length

Diaphragm stroke length adjustment

Loss Motion stroke

SPRINGS ARE USED TO PULL THE DIAPHRAGM BACK FOR THE SUCTION STROKE

GEAR MOTOR

STROKE LENGTH IS CONTROLLED BY LIMITING THE BACKSTROKE

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by Blue-White Ind.

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Control Capability

- Variable Speed
- Stroke Length**

Diaphragm stroke length adjustment

Non Loss Motion stroke

THE DIAPHRAGM IS CONNECTED DIRECTLY TO THE MOTOR SHAFT RESULTING IN A POSITIVE PULL BACK STROKE

GEAR MOTOR

STROKE LENGTH IS CONTROLLED BY ADJUSTING OFF-SET CAMS

ProSeries
by Blue-White Ind.

FLEX-PRO. *Mbafpq if alca f meo^dj =* **CHEM-PRO.**

Control Capability

- Variable Speed
- Stroke Length**

Variable Frequency & Stroke Diaphragm Pump

Injection Point Gaps in the injected chemical.

Long stroke and low frequency result in intermittent chemical injection.

Variable Frequency & Stroke Diaphragm Pump

Better chemical dispersion but short stroke length.

High frequency results in better dispersion but shorter stroke lengths.

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FLEX-PRO.
CHEM-PRO.

Maintenance

- Service Interval
- Life Expectancy

MAINTENANCE	
PERISTALTIC PUMP	DIAPHRAGM
<ul style="list-style-type: none"> Few wear components Changing the tube and wiping out the head is the only maintenance, about five minutes Pump tubing life is typically predictable, from 2 weeks to 2 years Replacement tubes are inexpensive 	<ul style="list-style-type: none"> Many wear components Valves and diaphragms must be periodically cleaned or replaced, about one hour Valve life, failure is unpredictable Pump head & valve rebuild kits can be expensive

ProSeries
by Blue-White Ind.

FLEX-PRO.
CHEM-PRO.

Variable	Peristaltic	Diaphragm
FLUID		
Solids	<ul style="list-style-type: none"> No valves to clog Few surfaces 	<ul style="list-style-type: none"> Valves can clog causing failure Many small surfaces
Chemical resistance	<ul style="list-style-type: none"> Fewer components to be attacked Limited tube material options 	<ul style="list-style-type: none"> Many components to be attacked Many component material options
Out-gassing / Vapor Locking	<ul style="list-style-type: none"> Can pump air, no valves to overcome Automatically primes 	<ul style="list-style-type: none"> Head can become vapor locked Difficult to prime
PRESSURE		
Suction pressure	<ul style="list-style-type: none"> Suction lift to 30 feet of water Output is affected by suction psi Larger diameter tubes affected more 	<ul style="list-style-type: none"> Limited suction lift height Hard to prime if negative pressure Output is less affected by suction psi
Discharge pressure	<ul style="list-style-type: none"> Output is not affected by discharge psi Tube life reduces as pressure increases Discharge pressure limited – 125 psi Easily primes against max psi Can pump into a vacuum (cannot syphon) 	<ul style="list-style-type: none"> Output is affected by discharge psi Can pump against high pressure with little wear Discharge pressures to over 1,000 psi Hard to prime against pressure Must pump into positive psi to prevent syphoning
CONTROL		
Variable Speed	<ul style="list-style-type: none"> Motor speed adjust - near continuous output No stroke adjustment – motor turndown is important Tubing size can be easily changed in the field 	<ul style="list-style-type: none"> Motor speed adjust results in intermittent output Stroke length adjustable to change volume per stroke Difficult to change the diaphragm size in the field
Stroke Length	<ul style="list-style-type: none"> The stroke length cannot be changed 	<ul style="list-style-type: none"> Reduced stroke length increases priming and vapor locking problems
MAINTENANCE		
Service Interval	<ul style="list-style-type: none"> Predictable service required at regular intervals Changing tubes is quick and inexpensive 	<ul style="list-style-type: none"> Unpredictable periodic service is required Rebuilding pump heads and valves is time consuming and expensive
Life expectancy	<ul style="list-style-type: none"> Few components to wear 	<ul style="list-style-type: none"> Many wear components

ProSeries
by Blue-White Ind.

FLEX-PRO. Mbofpq̂ ip̂ ãlôãr̂ meô dĵ = **CHEM-PRO.**

Qê khâVl rỗ

For additional information please contact....

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ProSeries
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