

**PUMPS FOR INDUSTRY**

*Watson-Marlow... Innovation in Full Flow*

Industrial  
strength pumps  
with unrivalled  
precision



# Pump perfection

Watson-Marlow is the world's largest manufacturer of peristaltic pumps and tubing. We make nothing else.

We have over 50 years' experience and a worldwide reputation as the leader of our industry in terms of quality as well as quantity.

We offer the widest range of pumps and tubes, capable of handling flows from 0.00015 GPD to 17.6 GPM.

Peristaltic pumps are positive displacement pumps. They use the perfect pumping principle with none of the disadvantages of other pump types, and cost far less in maintenance and interrupted production.

They successfully handle the harshest fluids, stand up to the toughest industrial environment, and pump with extraordinary accuracy and flow control up to 875,000:1 in one pump.

Watson-Marlow 520, left, 620 and 720 pumps cater for the demands of industry, from food production to mining, from the water industry to printing



## What is peristalsis?

Watson-Marlow pumps' low-shear peristaltic action is created by compressing the tube element between rollers. Between roller passes, the element recovers to draw in fluid.

The pump is self-priming and dry-running, with contained flow and no cross-contamination, requiring no seals or valves. No other positive displacement pump offers this separation of pump and fluid. Watson-Marlow pumps outperform other pump types.

## Watson-Marlow Value for life

Value for life is a new way of looking at the cost of ownership of Watson-Marlow pumps compared with other positive displacement pumps. We prove to customers that Watson-Marlow pumps offer the lowest-cost solution over the life of a pump in comparison to competitors.

We engineer our winning performance, we don't just turn up the speed. 60% fewer occlusions than our peristaltic competitors for the same flow means 2½ times the tube life.



- The simplest possible pumping principle: no seals or valves to clog, leak, corrode or replace
- The perfect pump for difficult fluids: caustic, abrasive, viscous, shear-sensitive, gaseous, slurries, suspended solids
- Configured for industrial integration: PLC remote control, analog, SCADA and Profibus network control



## Why Watson-Marlow makes the right pump for you

### World-leading pumps ...

With more than one million pumps in the field, our peristaltic pumps give our customers maximum reliability and minimum downtime.

### ...that eclipse the competition ...

Peristaltic pump usage is growing faster than any other positive displacement pump type because they are simple in essence, but capable of sophisticated control.

- Easy to install, maintain and clean
- Nothing simpler to use
- If you can drive one, you can drive them all
- Upscale from pilot to production
- One-minute maintenance
- Self-priming to 30ft
- Dry running
- Reversible to cut waste
- No metal-to-metal contact
- The duty fluid is contained within a chemically resistant tube: there is no contamination of the pump and no contamination of the fluid
- Accurate and repeatable flow rates  $\pm 0.5\%$
- Designed for continuous duty 24-7
- Valve-free with no backflow or siphoning
- Superb metering: output is proportional to pump speed
- No spares inventory needed



### ...with the key features you need ...

Watson-Marlow cased pumps combine the toughness industry demands with the features vital to today's highly tuned, economic production techniques.

- Speed control range 3,600:1: process flexibility
- Maintenance-free brushless DC motors
  - Up to 100 psi pressure
  - NEMA 4 washdown protection



- Pump drives, pumpheads and tubing all last longer
- There's less downtime, less cleaning, less maintenance
- In the unlikely event of a problem, next-day delivery keeps your production rolling
- Our products are recognized for quality, reliability and performance, backed by a five-year warranty

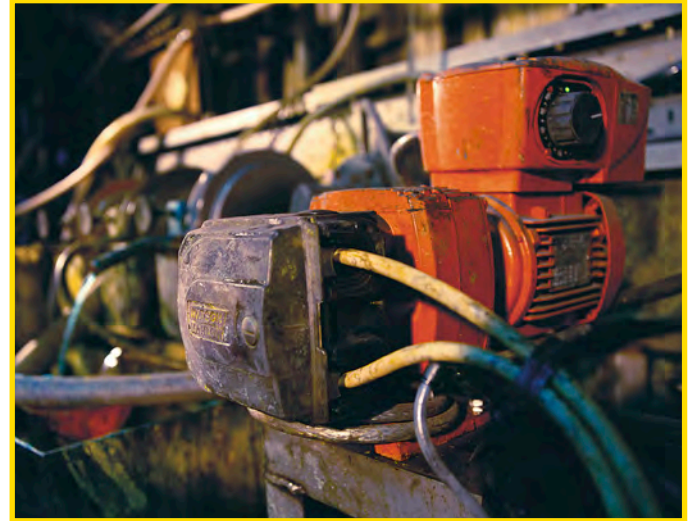
So the best pump really does cost less.  
Call us for the proof. It all adds up to Value for life.

## Five-year warranty

Demonstrating our total confidence in reliability and our commitment to customer satisfaction, Watson-Marlow cased pumps in this brochure carry a five-year warranty against faulty materials and workmanship. It covers everything except misuse of the pump and consumable items. Your production will not stall because of us.



Investment in our low shear pumps at a yeast production facility has increased efficiency



Chemically resistant 500 Series is the perfect solution for pumping corrosive cyanide in gold recovery operation



500 series pumps replaced troublesome diaphragm pumps for coagulant dosing



At a remote water treatment works, chemicals are metered to balance pH levels

## Printing ink feed

Reduced downtime and spares costs meant that a heavy-duty corrugated box manufacturer paid for a new Watson-Marlow 720 series pump in less than a year.

Supplying ink to flexographic presses caused air-operated diaphragm pumps to fail when paper fibers and dried ink particles clogged filters and jammed ball valves. Every jam caused production to be down for 90 minutes, which meant an entire in-line operation was stalled. Production also suffered from continual minor problems.

Watson-Marlow peristaltic pumps have no valves to clog and can handle suspended solids, so no filters are needed. With simple, planned maintenance, a one-minute tube change, production line stoppages is avoided.





## One million pumps keep industry productive

Watson-Marlow pumps save time and money worldwide by successfully handling the toughest applications in a broad range of industries including:

- **Chemical metering and transfer:** corrosive acids and bases
- **Water and waste water treatment:** alum, sodium bisulfite, sulfuric acid, sodium hypochlorite, hydrofluorosilic acid and ferric chloride
- **Paint and pigments:** dispersion mill feed, pigment and latex transfer
- **Pulp and paper:** dyes, brighteners, sizing agents, retention aids and titanium dioxide
- **Mining and mineral separation:** reagents, polymers and flocculants
- **Construction:** cement, brick and roof tile; metering and spraying of colorants, coatings and additives
- **Brewing:** metering and transfer of yeast, flocculants, stabilizers and finings
- **Printing and packaging:** varnishes, inks, coatings and adhesives, with no color cross-contamination or aeration
- **Food and beverage:** Clean-in-place applications, dairy, bakery, flavorings and additives
- **Textiles:** fiber coatings, dyes and acids
- **OEM:** versions available for system suppliers



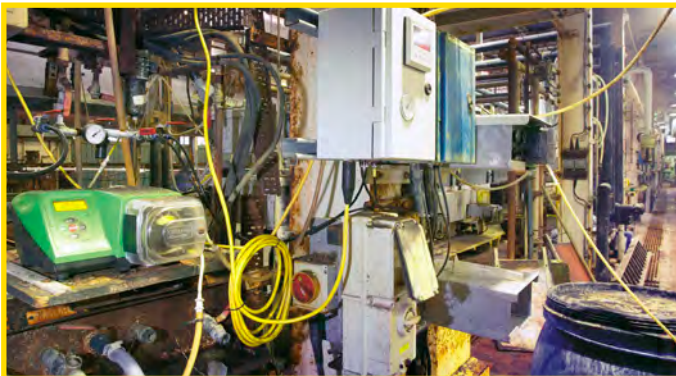
In an aggressive chemical recovery application, the pump paid for itself in less than 12 months



Our 700 series handles abrasive printing ink without wear



Our pumps are impervious to vapor locking in sodium hypochlorite applications



520 pump accurately meters corrosive chemicals in punishing cellulose film manufacturing process



*Watson-Marlow... Innovation in Full Flow*

## Putting diaphragms into the shade

Accurate and repeatable metering of process fluids into dispersion mills is critical in achieving uniformity from one batch of paint pigments to another.

Because of their ability to provide consistent, reproducible flows at low volumes, Watson-Marlow peristaltic pumps were chosen to replace double diaphragm pumps at BASF's Michigan paint mixing plant.

The pumps require minimal set-up time and maintenance. The sealless design eliminates the

need to clean the pumps, thereby avoiding the costs, health risks, and environmental issues associated with cleaning solvents.

"It is essential for color consistency that flow rates to the mills be stable and reproducible," says the production manager. "The double diaphragm pumps we had been using were apt to stall at low flow rates. We no longer have that problem since we installed the Watson-Marlow peristaltic pumps."



# How to pick a

Watson-Marlow's tough industrial cased pumps are a team, and they're on your side. 520, 620 and 720, using continuous tubing or elements, cover flows from 0.00015 GPD to 17.6 GPM, with high accuracy and industrial compatibility.

**The 720 is a powerful pump** which can be fitted with one or two pumpheads: twin channels double the flow for high-flow metering or transfer.

**The versatile, medium-flow 620** is available with two rollers, for maximum throughput, or four rollers, for minimum pulsation. Other pumpheads are available.

**With its eight tubing sizes, the 520** range has a flow ratio of 875,000:1, giving superb control. As well as standard metering duties, the 520 offers specialist pumping such as multi-channel and minimal pulsation.

## No simpler maintenance

Maintenance costs, in cash and downtime, are unavoidable for all pumps – except peristaltic pumps. Stators and rotors wear, valves jam, gas causes breakdowns – every one cutting production. Peristaltic pumps need new tubes at long, predictable intervals. Changing them takes moments – truly, one-minute maintenance.

The same principle applies to 520, 620 and 720 pumpheads:

- 1: Open the tool-unlockable safety guard** (or track); remove the old tube or element, helped by ergonomic features such as the 520's clutched rotor and the 620's retractable rollers
- 2: Put another tube element in place**
- 3: Close the guard;** and (if you have an element model) connect up to your system

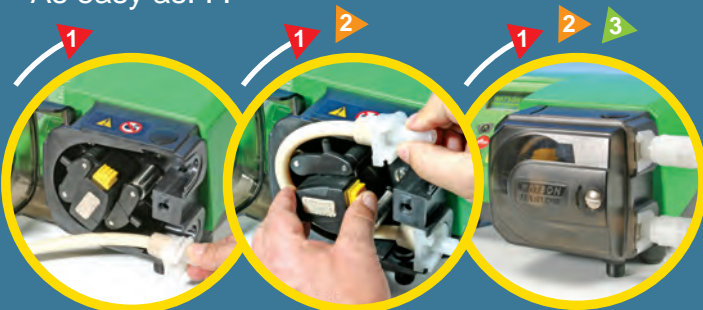
# winner

All share the same technology, human-machine interface, and space-saving design concept. The controls are identical, allowing process scale-up and easy operator training: if you know one pump, you know them all.

- Flow rates to 17.6 GPM
  - Pressures up to 30 psi
  - LoadSure® elements in three materials and four sizes
  - Tubing in six materials and five sizes
- Flow to 4.75 GPM
  - Pressures up to 60 psi
  - LoadSure® elements in three materials and two sizes
  - Tubing in six materials and four sizes
- Flow to 0.92 GPM
  - Three element configurations offer pressure capabilities up to 30 psi, 60 psi, and 100 psi
  - LoadSure® elements in six materials and three sizes
  - Tubing in six materials and eight sizes

## Changing a LoadSure® element

As easy as . . .



## Pick the pump you need

Choosing the perfect pump from our many options is easy. Just answer four questions:

- ① How much fluid?
- ② What pumphead characteristics?
- ③ Which control option?
- ④ Which tubing or element?

### ① HOW MUCH FLUID?

<b>0-17.6 GPM</b> <b>0-66.6 liters/min</b> <b>720</b> <small>page 13</small> The choice for high-flow metering or transfer	<b>0-4.75 GPM</b> <b>0-18 liters/min</b> <b>620</b> <small>page 11</small> High torque means powerful pumping with pressures to 60 psi	<b>0-0.92 GPM</b> <b>0-3.5 liters/min</b> <b>520</b> <small>page 9</small> Element models: three pressure ranges to 100 psi; continuous option
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### ② WHAT PUMPHEAD CHARACTERISTICS?

<b>Continuous tube</b> The right choice where your application requires no joints between source and discharge. The widest range of tubing materials.	<b>LoadSure® element</b> For error-free tube loading and positive system connection Pressures up to 100 psi with the 520, up to 60 psi with the 620 and up to 30 psi with the 720	<b>Special purpose</b> <small>page 14</small> Di: specialist dispensing option. See our datasheets for our wide range of multichannel and ultra low pulse pumpheads
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### ③ WHICH CONTROL OPTION?

<b>720S</b> <b>620S</b> <b>520S</b> <b>pumps</b> Manual keypad control	<b>720U</b> <b>620U</b> <b>520U</b> <b>pumps</b> Manual keypad and remote control	<b>720Du</b> <b>620Du</b> <b>520Du</b> <b>pumps</b> Manual keypad, expanded remote control, RS485	<b>720Bp</b> <b>620Bp</b> <b>520Bp</b> PROFIBUS network control
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### ④ WHICH TUBING OR ELEMENT?

Marprene	STA-PURE PFL	Neoprene	STA-PURE PCS	Pumpsil	Style 400
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Whatever your needs, Watson-Marlow manufacture the industrial pumps of first choice.

**PICK YOUR PUMPHEAD**



# 520

## Pumpheads: choose a 520 for flows up to

Low-flow pumpheads for a wide range of metering applications. Up to 30 psi pumping with continuous tubing or LoadSure® elements and up to 100 psi chemical injection with the 520REH

### LoadSure® pumpheads guarantee correct tube loading



100 psi with the 520REH

Flow rates up to 7 GPH. LoadSure® elements are available in Marprene TH and STA-PURE PCS



60 psi with the 520REM

Flow rates up to 55 GPH. LoadSure® elements are available in Marprene TL, Pumpsil, Neoprene, STA-PURE PFL and Style 400



30 psi with the 520REL

Flow rates up to 24 GPH. LoadSure® elements are available in Marprene TM and STA-PURE PFL and Style 400

### Continuous tubing for clear flow from source to discharge

Choose 520R for 1.6mm thin wall tubing or 520R2 for 2.4mm thick wall tubing



No tube joins, and the widest tube material choice with the 520R and 520R2

#### Pumphead benefits

- Large track diameter and two rollers give long tube life: 2½ times the competition
- Sprung rollers give low-shear pumping
- Tough, chemically resistant construction

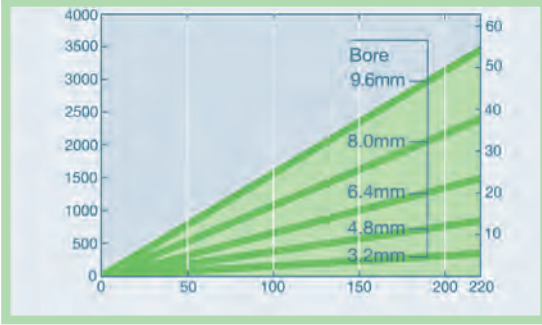
Flow rates up to 55 GPH; pressures up to 30 psi. Continuous tubing in Marprene, Neoprene, Pumpsil, STA-PURE PFL, STA-PURE PCS and Style 400.





# 55 GPH, with pressures to 100 psi

520R and 520R2 continuous tube performance

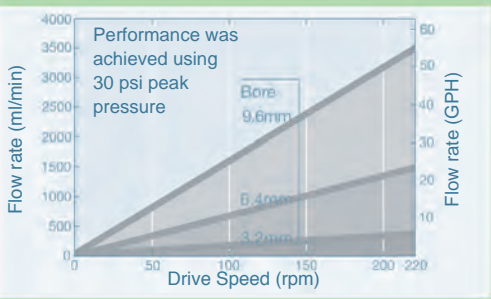


520R & 520R2 pumpheads: flow ranges, 0.1-220 rpm, GPH\*

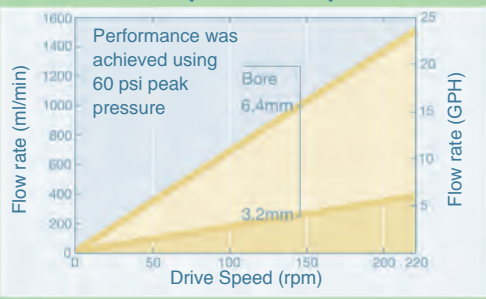
		0.5	0.8	1.6	3.2	4.8	6.4	8.0	9.6
Tube bore, mm		1/50	1/32	1/16	1/8	3/16	1/4	5/16	3/8
Tube bore, inch		1/50	1/32	1/16	1/8	3/16	1/4	5/16	3/8
Tube number		112	13	14	16	25	17	18	193
520R & 520R2 (continuous tubing)	Neoprene STA-PURE PCS STA-PURE PFL PVC, Pumpsil	0.00006 -0.151	0.0002 -0.380	0.0006 -1.537	0.0029 -6.181	0.0063 -13.788	0.0111 -23.772	0.0174 -38.035	0.0254 -55.468
	Marpene 64 shore tubing	0.00006 -0.143	0.0002 -0.365	0.0006 -1.458	0.0027 -5.864	0.006 -13.154	0.0106 -23.772	0.0174 -36.45	0.0238 -52.298
	Style 400				0.0021 -4.437	0.0046 -9.984	0.0081 -17.433		

\*1gal/hr = 63.1ml/min

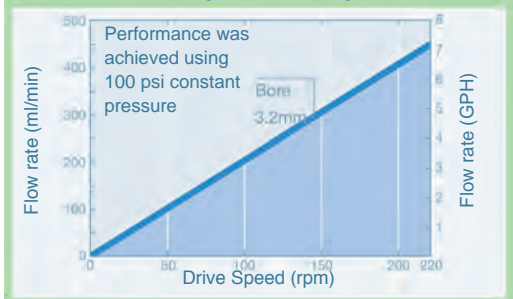
520REL 0-30 psi element performance



520REM 30-60 psi element performance



520REH 60-100 psi element performance



520 LoadSure® element pumpheads: flow ranges, 0.1-220 rpm, GPH\*

		3.2	6.4	9.6
Tube bore, mm		1/8	1/4	3/8
Tube bore, inch		1/8	1/4	3/8
Quick release connectors		1/2"	1/2"	1/2"
520REL (elements to 30 psi)	Neoprene, STA-PURE PCS, Pumpsil, Style 400	0.0029-6.181	0.0111-23.772	0.0254-55.468
	Marpene TL	0.0027-5.864	0.0106-23.772	0.0238-52.298
520REM (elements to 60 psi)	STA-PURE PCS, Style 400	0.0029-6.181	0.0111-23.772	
	Marpene TM	0.0027-5.864	0.0106-23.772	
520REH (elements to 100 psi)	Marpene TH, STA-PURE PCS, Style 400	0.0032-7.132		

\*1gal/hr = 63.1ml/min

**Construction materials:** High-spec engineering plastics and stainless steel defeat chemical attack. There is no known solvent that will attack polyphenylene sulphide (PPS) below 200C (392F). Robust enough for the most arduous environment. No paint or surface treatments. Pumphead track: PPS; guard, inner/outer: polycarbonate; guard seal: Neoprene; rotor hub: stainless steel 316; roller arms, rotor cover: PPS; rollers, main/guide: stainless steel 316; main roller bearings: stainless steel with PTFE seals; drain port and nut: polypropylene; drain plug: Hytrel

**NOW SELECT YOUR DRIVE**

## Water treatment

A water company in Washington State has replaced diaphragm pumps with Watson-Marlow 520DuN/REH to inject sodium hypochlorite into a mains supply at 65 psi, via 60ft carrier water line at 70 psi.

The flow rate varies between 0.29 gal/hr and 2.01 gal/hr. The pump is in the open air, under a shelter. It endures ambient temperatures of 19°F to 90°F. Initially set up to operate manually, it is now analogue-controlled.

During testing after installation, water company engineers confirmed that the pump would hold its pressure at up to 95 psi, well above the pressure actually required. They found the pump easy to install, and were delighted with the quick-connect element connectors.



# 620

## Pumpheads: choose a 620 for flows up to 4.8

Mid-flow pumpheads for metering or transfer. The 620 is available with continuous tubing for pumping up to 30 psi. For guaranteed loading and pumping to 60 psi, LoadSure® pumpheads are available in two or four-roller versions.

### LoadSure® pumpheads guarantee correct tube loading



Maximum throughput and longer tube life with the 620RE's two rollers



Highest accuracy and minimal pulsation with the 620RE4's four rollers

Flow rates up to 4.76 GPM, pressures up to 60 psi. LoadSure® elements are available in Marprene™ 60 psi, Pumpsil and Neoprene 30 psi. Industrial Cam-and-Groove connectors allow universal drop-in fitting.

Flow rates up to 3.43 gal/min, pressures up to 60 psi. LoadSure® elements are available in Marprene™ 60 psi, Pumpsil and Neoprene 30 psi. Industrial Cam-and-Groove connectors allow universal drop-in fitting.

#### Pumphead benefits

- Tough, chemically resistant construction
- Large track diameter and two rollers for long tube life: up to 2½ times the competition
- Sprung rollers give low-shear pumping

### Continuous tubing for joint-free flow from source to discharge

No tube joins, and the widest tube material choice with the 620R

Flow rates to 3.43 gal/min. Pressures to 30 psi.

Employs tube clamps to secure the tubing.

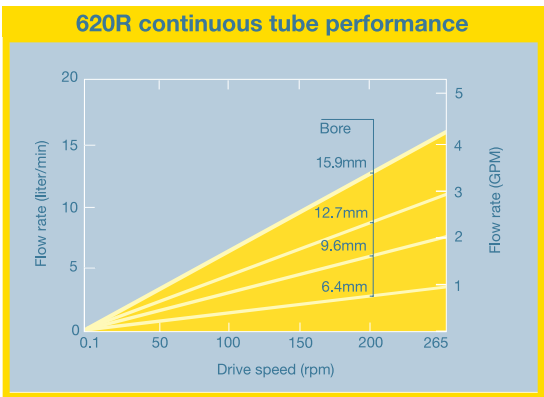
Continuous tubing in Marprene™ TL, Neoprene, Pumpsil, STA-PURE PFL, STA-PURE PCS and Style 400



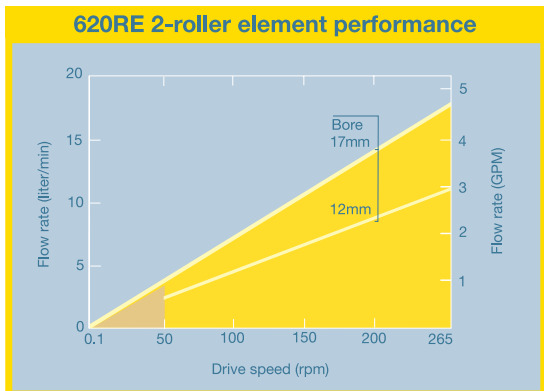
**True versatility:** switch from continuous tubing to elements in moments



# GPM with pressures to 60 psi



620R continuous tubing, two rollers pumpheads: flow ranges, 0.1-265 rpm								
	GPM	liters/min	GPM	liters/min	GPM	liters/min	GPM	liters/min
Tube bore mm	6.4	6.4	9.6	9.6	12.7	12.7	15.9	15.9
Tube bore in	1/4	1/4	3/8	3/8	1/2	1/2	3/4	3/4
Tube number	17	17	193	193	88	88	189	189
Marprene	0.0003-0.9	0.001-3.4	0.001-1.7	0.003-6.6	0.001-2.9	0.004-11	0.003-3.2	0.01-12
Pumpsil	0.0003-0.8	0.001-3.2	0.001-1.9	0.003-7.2	0.001-2.9	0.004-11	0.003-4.0	0.01-15
STA-PURE PCS Neoprene Style 400	0.0003-0.8	0.001-3.2	0.001-1.7	0.003-6.6	0.001-2.9	0.004-11	0.003-4.2	0.01-16



Note: beige portion of graphs refers to limit of 30 psi below 50 rpm

	620 pumpheads: flow ranges, 0.1-265 rpm							
	620RE two rollers pumpheads				620RE4 four rollers pumpheads			
	GPM	liters/min	GPM	liters/min	GPM	liters/min	GPM	liters/min
Element bore, mm	12.0	12.0	17.0	17.0	12.0	12.0	17.0	17.0
Element bore, inch	15/32	15/32	11/16	11/16	15/32	15/32	11/16	11/16
Cam and Groove connector size, inch	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Marprene TL (elements to 30 psi)	0.001-2.6	0.004-9.8	0.003-4.8	0.01-18	0.001-2.2	0.003-8.3	0.001-3.2	0.005-12
Marprene TM (elements to 60 psi)	0.001-2.6	0.004-9.8	0.003-4.2	0.01-16	0.001-2.2	0.003-8.3	0.001-2.9	0.004-11
Pumpsil (elements to 30 psi)	0.001-2.6	0.004-10	0.003-4.2	0.01-16	0.001-2.3	0.003-8.7	0.001-2.9	0.004-11
STA-PURE PCS, Neoprene, Style 400 (elements to 60 psi)	0.001-2.9	0.004-11	0.003-4.8	0.01-18	0.001-2.4	0.003-9.0	0.003-3.4	0.01-13

**Construction materials:** 620 pumpheads are designed for ultimate impact and corrosion resistance. Pumphead track: powder-coated aluminum- LM24; guard, inner/outer: Grilamid TR55/polyurethane PBA; rotor hub, roller arms: Fortron 1140L4 (PPS); rotor cover: Dupont Hytrel G5544; rollers, main/guide: stainless steel 303/Nylatron; main roller bearings: carbon steel; tube clamp sets: polypropylene

**NOW SELECT YOUR DRIVE**

## Pulp & Paper

Precise, consistent, repeatable flow rates and minimal maintenance are the primary reasons why Boise Cascade switched from diaphragm pumps to Watson-Marlow peristaltic pumps for dye addition.

Overall shade losses at the Oxford Speciality Papers Division were costing as much as 60 tons of off-quality paper a month. In addition, stripping, cleaning and repair of the diaphragm pumps were causing excessive downtime and lost productivity.

Since installing the Watson-Marlow pumps, losses due to color irregularities have been negligible and productivity has increased substantially. Maintenance now consists of only scheduled tubing changeovers which take only minutes.



# 720

## Pumpheads: choose a 720 for flows to 17.6

High-flow pumpheads for metering or transfer applications. The 720 delivers a lot for its size.

Five sizes of continuous tubing and elements in four sizes give optimum performance over a wide flow range.

Extension pumpheads double the available flow to 17.6 gal/min. Pressures up to 30 psi.

### LoadSure® pumpheads ensure correct tube loading



30 psi pressures with the 720RE

LoadSure® elements are available in Marprene TL, Pumpsil and Neoprene. Industrial Cam-and-Groove connectors allow universal drop-in fitting

### Continuous tubing for joint-free flow from source to discharge



No tube joins, and the widest tube material choice with the 720R

Employs tube clamps to secure the tubing. Continuous tubing in Marprene TL, Neoprene, Pumpsil, STA-PURE Series PCS and Style 400

#### Pumphead benefits

- Four driven rollers and sprung track for long tube life and low pulsation
- Tough, chemically resistant powder coating inside and out





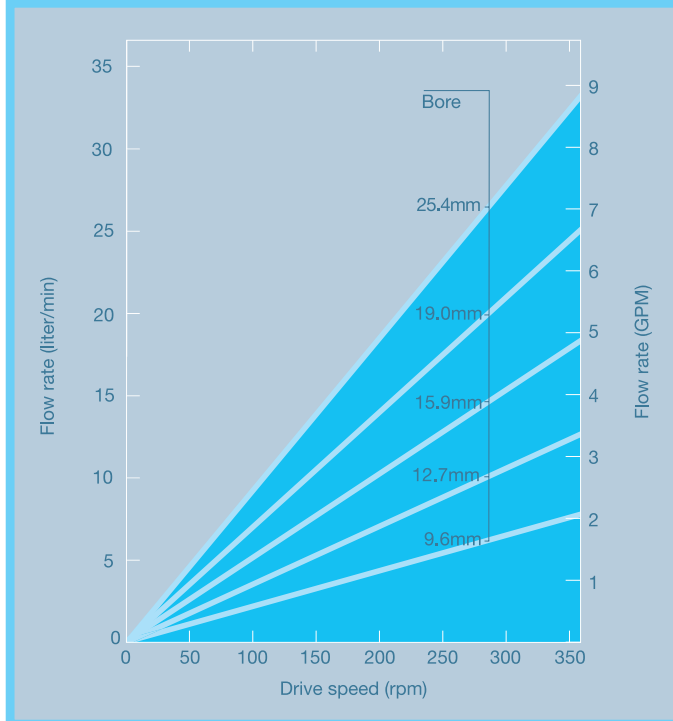
# GPM with pressures to 30 psi

## 720 pumpheads: flow ranges, 0.1-360rpm

	720R continuous tubing					720RE elements			
	9.6	12.7	15.9	19	25.4	12.7	15.9	19	25.4
Tube or element bore, mm	9.6	12.7	15.9	19	25.4	12.7	15.9	19	25.4
Tube or element bore, inch	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Tube number	193	88	189	191	92	-	-	-	-
Cam and groove connector size, inch	-	-	-	-	-	1	1	1	1
GPM	0.0005-1.8	0.001-3.5	0.001-4.8	0.002-6.6	0.003-8.8	0.001-3.5	0.001-4.8	0.002-6.6	0.003-8.8
liters/min	0.002-6.9	0.004-13.2	0.005-18.3	0.007-25.2	0.009-33.3	0.004-13.2	0.005-18.3	0.007-25.2	0.009-33.3

Flow listed is per channel. Double your flow by adding a 720RX or 720REX extension pumphead as shown below.

### 720 performance graph



**Construction materials:** All 720 pumpheads are designed for strength and durability. Pumphead track: aluminum; drive shaft: stainless steel 440C; rotor end plates: aluminum; cradle assembly, track: aluminum; central shaft: EN24 steel; rollers: MOS2 filled Nylon 6 (Nylatron); springs, spindles: stainless steel; coating: Alocrom pre-treatment with polyester powder coating

**NOW SELECT YOUR DRIVE**

## Abrasive slurry

With 50% solids, the oxide-water mix that a major roof tile manufacturer uses to color his products is highly abrasive.

The plant engineer tried piston pumps, but abandoned them when the slurry was effectively being de-watered: the pumps pumped the water, but left the solids to clog the cylinders. He tried centrifugal pumps, but poor flow control led to inconsistent coloring.

The plant was then converted over to Watson-Marlow 720 pumps. The slurry remained uniform and could be applied in precise quantities. Since the fluid is contained within the tube, the pump cannot clog. In addition, the pump is small enough to be conveniently set up in various parts of the factory, and its impervious casing protects the pump in a washdown environment.



## A family of pumps that perfectly fit all production line needs

The new generation of Watson-Marlow peristaltic pumps offers a complete range to suit industrial and process application needs

- Efficient and reliable through a clean and brushless DC motor consuming up to 36% less power with minimal maintenance
- Tough, powder-coated housing and NEMA 4X water-tight enclosure: perfect for industrial environments and wash-down
- Speed controls up to 3600:1 and eight tubing sizes give metering capability of 875,000:1. Comprehensive calibration and precise speed adjustment ensure metering accuracy

- Comprehensive functionality and control. Manual control for plug-and-go; auto control for straightforward set-up of analogue remote control; digital control using RS485
- Pump scaling has never been easier. The 520, 620 and 720 pumps have the same footprint: they are interchangeable on the line. Similar keypad layout and menu options. No further operator training is required; use one pump, use them all
- Value for life: the tube is the only consumable; unbeatable tube life; no installation; minimal maintenance; and a five-year warranty



## Drop-in diaphragm or lobe pump replacement

- Tubing is the only consumable. No valves, seals, ball checks, or rotors to clean, unclog, or replace
- Simple and easy installation
- Variable speed control with an unrivaled 0.1 rpm resolution for precise metering is built right in. No separate panels or ancillaries required.
- Minimal maintenance means less downtime, less downtime means more productivity. A cost effective solution for production
- Efficient motors means less power consumption





# control needs: 520, 620 and 720

## DuN: the ultimate pump for production process

520DuN, 620DuN and 720DuN offer full industrial connectivity and process control through PC, PLC or other plant controller. 16-key numeric keypad makes manual control truly simple, too: just type in the flow rate or speed you need

- Digital network control with RS485
- Comprehensive calibration with a choice of flow units
- PIN-secure process protection with two PIN levels
- Twin analogue inputs for scaled flow adjustment
- Full remote control
- Analogue speed feedback



## Bp: PROFIBUS DP pumps

- Fast communication for all pump functions
- No additional gateways or I/O converters required reducing cable needs and costs
- Predictive maintenance



## UN with analogue and remote control

520UN, 620UN and 720UN offer keypad and remote control with analogue speed inputs and status outputs. The drives are configurable in software, and password-protected

- Analogue speed control
- Industrial logic remote control
- Analogue speed feedback



## SN with manual control

520SN, 620SN and 720SN are plug-and-play pumps: Just plug in and switch on. They offer low cost of ownership, simple, accurate metering and one-key keypad access to all major controls



- Manual control: 9-key display pad
- Calibration to display flow rate
- MemoDose for easy one-shot dispensing

## Printing ink feed

Reduced downtime and spares costs meant that a heavy-duty corrugated box manufacturer paid for their new Watson-Marlow 720 series pumps in less than a year.

Supplying ink to flexographic presses caused air-operated diaphragm pumps to fail when paper fibers and dried ink particles clogged filters and jammed ball valves. Every jam costs 90 minutes of production, with an entire in-line operation stalled. Production also suffered from continual minor problems.

Watson-Marlow peristaltic pumps have no valves to clog and can handle suspended solids, so they need no filters. A one-minute tube change at extended intervals avoids production line stoppages.



Feature	Bp	520DuN 620DuN 720DuN	520UN 620UN 720UN	520SN 620SN 720SN
<b>Manual control</b>				
Run/stop; speed adjustment; forward/reverse; max key for rapid priming and purging; auto-restart; keypad lock, flow calibration in metric units	•	•	•	•
Choice of flow rate display; metric and imperial units	•	•		
Numeric keypad for entry of speed, flow or PIN	•	•		
Cumulative flow display	•	720		
<b>Remote control</b>				
Run/stop direction change; auto/manual mode; leak detector input (via contact closure or 5V TTL to 24V industrial logic)		•	•	
Remote switch operation of MemoDose		•	•	
<b>Analog speed control</b>				
Software programmable inputs; 0-10V, 1-5V or 4-20mA		•	•	
Second analog or keypad key scaling		•		
<b>Digital network control</b>				
Full RS485 network connectivity for process control through PC or PLC		•		
PROFIBUS DP network communication	•			
<b>Process security</b>				
Keypad lock	•	•	•	•
Basic security code to protect setup	•		•	
PIN-secure process protection: two-level PIN access	•	•		
<b>Pump status outputs</b>				
Analog frequency output of pump speed		•	•	
Four 24V change-over relay pump status outputs		•	•	
4-20mA pump speed feedback		•		
<b>MemoDose</b>				
Accurate, easy, single-shot dispensing		•	•	•
<b>Calibration</b>				
Simple calibration to display the flow rate as well as the rotation speed	•		•	•
Comprehensive calibration for precise metering. Choice of flow units	•	•		

Sophisticated, but simplicity itself to set-up



## Specifications

	Width	Depth	Height	Weight
520, drive only	276mm 10 <sup>7</sup> / <sub>16</sub> in	322mm 12 <sup>3</sup> / <sub>16</sub> in	158mm 6 <sup>1</sup> / <sub>4</sub> in	10.7kg 23lb 10oz
520 with 520R pumphead	276mm 10 <sup>7</sup> / <sub>16</sub> in	407mm 16in	158mm 6 <sup>1</sup> / <sub>4</sub> in	11.5kg 25lb 5oz
620, drive only	280mm 11in	328mm 12 <sup>7</sup> / <sub>16</sub> in	05mm 12in	17.4kg 38lb 6oz
620 with 620R pumphead	280mm 11in	448mm 17 <sup>5</sup> / <sub>16</sub> in	305mm 12in	20.5kg 45lb 3oz
720, drive only	280mm 11in	328mm 12 <sup>7</sup> / <sub>16</sub> in	305mm 12in	18.5kg 40lb 13oz
720 with 720R pumphead	280mm 11in	508mm 20in	305mm 12in	25.0kg 55lb 2oz



We have the technology

# Robust and resilient

Advanced technology and design underlie Watson-Marlow industrial pumps' long life of quality service.

Our admirable reliability record is maintained by features such as brushless DC motors, a toughened LCD screen and a tough membrane keypad. The chemical resistance of the whole range outlasts our competition; the powder-coated casings outperform stainless steel when exposed to aggressive fluids such as ferric chloride or sodium hypochlorite.

## Profibus cased pumps

No point-to-point wiring and a simple 9-pin PROFIBUS connector means real-time, two way communication for pump control and status feedback, including a full range of diagnostic information. The 520, 620 and 720 series pumps run from the same GSD file which enables true process scaling. Pumps communicate at the full PROFIBUS bus speed range, automatically detecting and adjusting to fit your network..

## Speed scaling

Programmable twin analog inputs allow flow pacing to be coupled with downstream quality feedback. The second input over-rides the main speed control, making stroke adjustment on a diaphragm pump redundant. Drop-in diaphragm pump replacement could not be simpler.

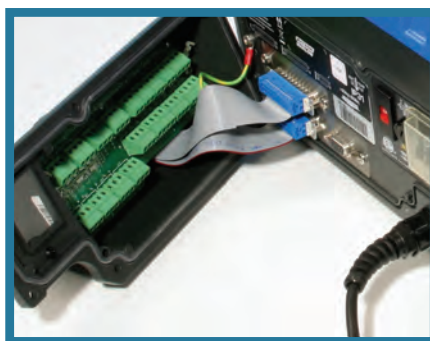
## Accuracy

Class-leading flow control up to 3,600:1 and simple, accurate configuration mean that your flow will match your needs precisely. Couple that with tube bores from 0.5mm to 25.4mm and you have a range of unbeaten versatility.



## Easy wiring

Wiring-up all the cased pumps in this brochure is standard and easy. The watertight module at the rear of the pump has four watertight glands providing ample access for whatever control system connections you require. Inside: no soldering, no D-connectors, no fiddling - just large, clearly marked screw terminals. With clear instructions in product documentation, you will be up and running in minutes.



## RS485

Full industrial-standard connectivity with RS485 and easy-wire relays for permanent connection to control systems including PC, PLC and SCADA.

## NEMA 4X protection

All pumps meet the criteria for IP66 and NEMA 4X classification: they are secure against high-pressure washdown. NEMA 2 wipe-down models are also available in the 520 and 620 series.



## Status outputs

Four configurable relay outputs. Monitor Run/Stop; Rotation direction; Auto/Manual operation; general fault alarm; automatic shut-down if the guard is opened; leak-detected shutdown.

## Operator safety

Operator safety comes first, with sturdy metal or impact-resistant guards and drain ports for safe disposal of spillages. Tool lockable or electronic guard switches are standard on all pumps. Optional leak detection is available for all models.



**NOW SELECT YOUR TUBE**

<b>Control range</b>	520N: 0.1-220 rpm; 620N: 0.1-265 rpm; 720N: 0.1-360rpm
<b>Voltage/frequency</b>	Filtered 100-120V/200-240V 50/60Hz 1ph ±10% of nominal voltage. A well regulated electrical mains supply is required along with cable connections conforming to the best practice of noise immunity
<b>Maximum voltage fluctuation</b>	
<b>Installation category (overvoltage)</b>	II
<b>Power consumption</b>	520N: 135VA; 620N: 250VA; 720N: 350VA
<b>Full load current</b>	520N: <0.6A at 230V; <1.25A at 115V; 620N: <1.1A at 230V; <2.2A at 115V; 720N: <1.5A at 230V; <3.0A at 115V
<b>Eprom version</b>	Accessible through pump software

<b>Enclosure rating</b>	IP66 to BS EN 60529; Equivalent to NEMA 4X to NEMA 250* (indoor use). Suitable for heavy industrial, process and harsh environments. The drive uses a Gore membrane vent to equalize the pressure inside the enclosure and to prevent ingress of water and corrosive vapors.
<b>Operating temperature</b>	5C to 40C, 41F to 104F
<b>Storage temperature</b>	520N: -40C to 70C, -40F to 158F; 620N, 720N: -25C to 65C, -13F to 149F
<b>Maximum altitude</b>	2,000m, 6,560ft
<b>Humidity (condensing)</b>	10% - 100% RH
<b>Noise</b>	520, 620 <70dB(A) at 1m, 720 <85dB(A) at 1m

# Close-coupled pumps

Watson-Marlow pumps can also be supplied with standard industrial motor gearbox configurations. Close-coupled pumps satisfy a host of industrial pumping duties in harsh atmospheres including explosion-proof. Same great Watson-Marlow performance with off-the-shelf constant or variable speed drive options.



## 521

- Flow to 1.16 GPM
- Pressures up to 100 psi
- Elements in 6 materials and 3 sizes
- Continuous tubing in 8 materials and sizes



## 621

- Flow to 4.75 GPM
- Two or four roller versions
- Pressures up to 60 psi

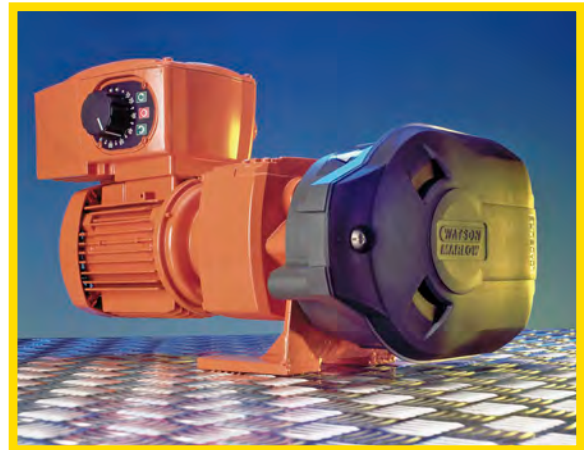


## 701

- Flow to 8.8 GPM, 1 channel
- Flow to 17.6 GPM, 2 channels
- Pressures up to 30 psi

## Varmeca Drive

The Varmeca drive brings 10:1 speed control, constant torque output and total reliability to the industrial environment. With no external wiring and resin-shrouded electronics, humidity and vibration are no threat. Inverter and motor are UL Approved and sealed to NEMA 4X. Control could not be simpler, with local forward/stop/reverse switching and a large speed control knob calibrated in percentage of maximum speed. The drive offers 230V and 460V three phase power options, plus 115V and 230V single-phase.



NOW SELECT  
YOUR TUBE

## Mining

Used throughout the mining and mineral-processing world, Watson-Marlow peristaltic pumps are the solution to many of the rigorous metering challenges found in the mining industry including: reagent feed, shear sensitive polymer metering for flocculation, abrasive lime slurries for pH control, or corrosive cyanide for gold recovery. With a wide variety of drive configurations available, including integral NEMA 4X washdown, TEFC and explosion proof, Watson-Marlow offers the flexibility to meet the requirement of any mining application. By changing either the bore diameter of the tube or the rpm of the rotor, the rate of reagent feed will vary proportionally. And, each unit can be interfaced to any digital or analog process control signal.





At the centre of all Watson-Marlow pumps is a range of abrasion-resistant tubes and elements available in chemically stable materials including Marprene, Style 400, STA-PURE PCS, STA-PURE PFL, Pumpsil and Neoprene.

## Choosing the best tubing for your application

Selecting the right tubing is as important as the choice of pump. The best way to select a tube material is to check the fluid to be pumped against those listed in our chemical compatibility guide, via the website or request a printed copy of the guide.

- For maximum tube life use a large bore tube at low speed.
- For maximum flow rate use the largest bore size tube at maximum speed.
- For maximum accuracy use a small bore size tube at high speed.

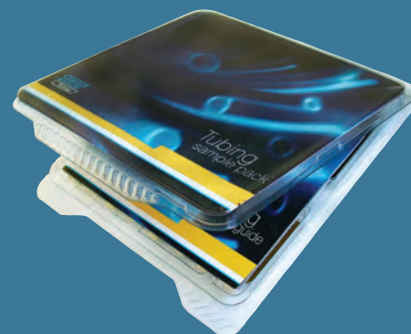
Suction lift depends on the tube restituting fully before the advance of the next roller. If this does not occur, the flow rate will be reduced. For maximum suction lift, use the smallest practicable bore size of tubing and run the pump at the slowest speed.

	Marprene	STA-PURE PCS	STA-PURE PFL	Pumpsil	Neoprene	Style 400
Up to 10,000 hours pumping life	•	•	•			•
Wide chemical resistance	•		•			•
High pressure capability 100 psi	•	•	•			•
Additional abrasion resistance					•	
High dispensing accuracy		•	•			•
Low gas permeability	•					•
LaserTraceability				•		
Meets or exceeds USP Class VI requirements		•	•	•		

## Tubing immersion samples

A tubing sample pack is available which contains the full range of materials for chemical compatibility testing. For critical application, we recommend that customers carry out an immersion test using the duty fluid and the intended tubing material. A short length of tube is immersed in the duty fluid for a period of 48 hours and then examined for signs of swelling, embrittlement or deterioration.

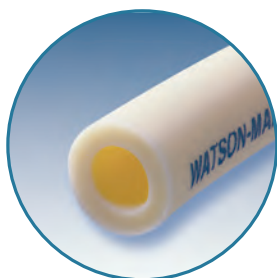
To request a tube sample pack please contact your local representative



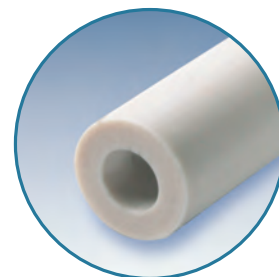
# Choosing the PERFECT tube for all of your applications

Watson-Marlow is the only peristaltic pump manufacturer in the world to manufacture its own tubing, optimizing our tubing tolerances and formulation to deliver the best process pump performance. In a peristaltic pump, the tubing largely dictates pump and system performance: Its restitution creates suction, its strength resists pressure, its flex resistance determines pumping life, its bore defines the flow rate, its wall thickness controls pumping efficiency and its purity protects your product from contamination. Watson-Marlow offers tubing in eight materials and over 40 sizes, giving an extraordinary range of chemical and application capability.

**Marprene** is our high-performance general-purpose tube. This thermoplastic elastomer provides chemical compatibility, long pumping life and pressure handling. Marprene® is ideal for general-purpose pumping or food handling and is highly resistant to oxidizing agents such as ozone, peroxides and sodium hypochlorite. Meets FDA requirements 21 CFR 177.2600 and USDA standards for food handling. Working temperature range 41F to 176F. Autoclavable.



**GORE High Resilience Tubing Style 400** is an expanded PTFE and Viton fluoroelastomer and enables the benefits of peristaltic pumps to be introduced to a wide range of applications for pumping concentrated acids like sulphuric and nitric acid, as well as aromatic hydrocarbons like toluene and xylene. Style 400 tubing offers tube life more than 50 times that of extruded Viton or Fluorel tube and can be used for pumping up to 60 psi. The elastomer used in this tubing is Viton GF-600S, a peroxide-cured fluoroelastomer based on DuPont's advanced polymer architecture.



## Secure linking up

Watson-Marlow tubing elements for 520, 620 and 720 pumps link to the rest of your system using secure instant connectors: industrial-standard Cam-and-Groove connectors for 620 and 720, left; and quick-release push-fit connectors for 520 pumps, above. Both guarantee a secure seal and immediate release when required.



## GORE STA-PURE Series PCS

has a unique composite construction of silicone in a PTFE lattice giving it superior burst resistance up to 100 psi and 18 times longer life than silicone tubing.

It produces virtually no spalling, is USP Class VI approved and is classified as non-toxic. Working temperature range 32F to 176F. Opaque white. Autoclavable, SIP and CIP compatible.



**GORE STA-PURE Series PFL** is effectively pumpable PTFE – a high performance composite of PTFE and a high-grade fluoroelastomer – offering extraordinary chemical resistance, long life and very high burst pressures.

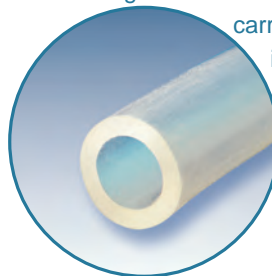
STA-PURE PFL is USP Class VI and food grade approved, making it suitable for foods and pharmaceuticals as well as aggressive chemicals.



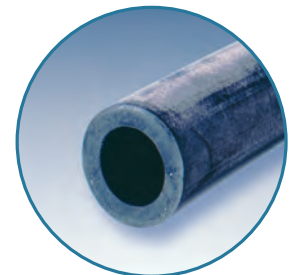
## Pumpsil platinum-cured silicone

tubing is manufactured by Watson-Marlow in our own silicone-dedicated ISO1644-1 class 7 (class J/10,000) cleanroom. Developed specifically for biopharmaceutical application, Pumpsil carries full biopharmaceutical certification USP Class VI and ISO10993 and complies with FDA 21CFR177.2600 for food contact. Pumpsil is entirely free of 2,4 DCBA and other leachables associated with peroxide-cured silicone and is post-cured to remove linear and cyclic siloxanes, cytotoxic materials which can leach out of other manufacturers' non-post-cured platinum-cured tubing. Pumpsil® has an ultra-smooth bore to control protein

binding and bacterial growth, making it ideal for production applications where there is long-term contact with the process fluid. Our LaserTraceability™ provides an ink-free, indelibly etched record of part number, lot number and use-by date right on the tubing. This means that lot traceability is carried through from box to bag to the tube itself. Working temperature range: 68F to 176F. Translucent. Autoclavable.



**Neoprene** offers excellent performance with abrasive slurries and sustained pressure applications. Good suction and pressure capabilities. Working temperature range 32F to 176F. Black.



## Pipework and accessories

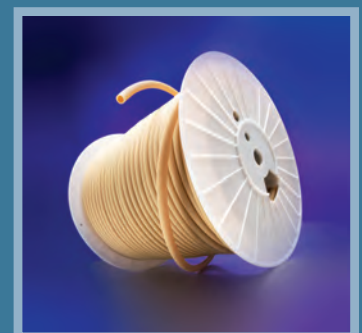
A range of interface pipework is available for our LoadSure™ element pumps with industrial valved or non-valved connectors. Leak detection sensors are also available for most of our pump range.

## Make reel savings

Many of our tubes are available on bulk reels as well as in the standard shorter lengths - up to 500 ft at a time, depending on the bore size.

Bulk buying gives important benefits in convenience and huge cost savings. Further discounts are available on orders for multiple reels.

Ask for our reel leaflet for further details on the tube material of your choice.



**100**

Small, simple and precise pumps for biopharm and science. Manual or auto control, single or multi-channel.

- Flows up to 190ml/min from new 114 flip-top pumphead
- Exceptional speed control
- Minimal key presses, intuitive operation



30 psi

120U/DV



120S/DM3



**200**

Near pulseless, multi-channel cassette pumps with up to 32 channels.

- Flow rates from 0.0001 GPD to 8.38 GPD per channel
- Precise flow control for each individual channel
- Manual, auto and digital TTL control



30 psi

205S/CA



205U/CA



**300**

Single or multi-channel benchtop pumps with manual, remote, analog, RS232 control and accurate dispensing.

- Flow rates from 0.001 GPH to 31.7 GPH
- High visibility digital display with membrane keypad
- Single channel or up to ten separate channels
- Zero maintenance brushless DC motors



30 psi

323E, S and U/D



323Du/D



**400**

Ultra-compact scientific pumps for low flow single or multi-channel applications.

- Flow rates from 0.0001 GPH to 9.67 GPH
- Precision multi-roller pumpheads for accurate flows
- Configured with either single or multi channel pumphead
- Digital and analog process signal control



30 psi

403U/R1 and 403U/UL2



403U/VM2 and VM4



**500**

Superb range of NEMA2 and NEMA4 rated pumps for science and industry as well as fixed and variable speed close-coupled pumps.

- Flow rates from 0.00006 GPH to 76 GPH
- Manual, analog and digital RS232/RS485 control
- Explosion Proof rated, 3 phase and pneumatic drives
- Seven pumpheads and including low-pulse high accuracy 505L element pumphead
- Dosing and dispensing pump for ±0.5% accuracy



100 psi

520S, U and Du/R



520 sanitary LoadSure



**600**

NEMA4 mid-flow process pumps with full clean-in-place and steam-in-place capability.

- Flow rates from 0.0003 GPM to 4.8 GPM
- Manual, auto and digital control
- Close coupled pumps for the three phase operation including pneumatic and Explosion Proof options
- One minute maintenance LoadSure® elements



60 psi

620UN/R



620 sanitary LoadSure



**700**

Industrial cased and baseplate mounted pumps for use with continuous tubing or new LoadSure® elements. 3 phase motors, explosion proof rated drives or pneumatic.

- Flow rates from 0.001 GPM to 17.6 GPM
- Single or twin channel operation
- Driven roller pumphead extends tube life
- LoadSure® elements ensure correct tube loading
- Fixed or variable speed drives



30 psi

720Du, U and S/R



720Du, U and S/RE



**800**

High-flow hygienic pumping using USP Class VI Bioprene tubing or STA-PURE tubing.

- Flow rates up to 35 GPM
- Full Clean-In-Place and Steam-In-Place capability
- Extensive motor/gearbox control options



100 psi

825



840



**SPX**

High flow high-pressure industrial pumps with unique patented direct coupled design. Duplex and CIP models available.

- Flow rates from 0.01 GPM to 400 GPM
- Reinforced hoses enable pressures up to 232 psi
- Fixed and mechanically or electronically variable speed drives including explosion proof versions



232 psi

SPX10 and 15



SPX25 and 32



**OEM**

A wide range of instrument quality and industrial OEM pumpheads for fitting to users own drives, or with faceplate-mounted motor options.

- Flow rates from 0.01µl/min to 300 GPM
- Single and multi-channel pumpheads
- Synchronous, DC, induction, shaded-pole or stepper motors
- Optional Eurocard pcb enables full controllability



30 psi

100



NEW 114



**Flexicon**

Tabletop, semi-automatic, fully automatic and OEM aseptic filling solutions including bottle handling, stoppering and crimp capping.

- 0.5ml to 5 liter/minute fills
- Handle up to 75 vials/minute
- 0.5% fill accuracy
- Easy product changeover and no cleaning validation



PF6

PF6



FC10/FC32



**MasoSine**

No shear, high suction lift sinusoidal pumps. Pulsation-free and extremely low maintenance.

- Pressures up to 200 psi
- Flow rates to 400 gpm
- Handle high viscosity products without cavitation
- 3A certified and CIPable



200 psi

MR



EcoSine



**Tubing Hoses**

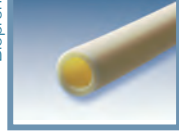
Extensive range of tubing ensures chemical compatibility. USP Class VI and FDA approvals. Precision machined, re-enforced hoses provide flow stability and excellent suction performance.

- Twelve tubing materials in bore sizes 0.13mm to 25.4mm
- New materials include ADCF and weldable PureWeld for biopharm, and chemical resistant Style 400
- Four hose materials including Natural Rubber, Nitrile NBR, Hypalon and EPDM from 10mm to 100mm

Marprene



Bioprene



# Watson-Marlow pumps bring you

- Accurate and repeatable flow rates
- Contamination free pumping - ideal for shear-sensitive fluids, viscous sludges or slurries, and aggressive acids and caustics
- Easy to install, operate and maintain
- Virtually maintenance-free
- No expensive seals, valves, diaphragms or rotors to leak, clog or corrode
- Designed for continuous duty - 24 hours/7 days
- Pumps act as their own check-valves
- Self-priming up to 30 feet and dry running
- Reversible flow direction

120F/R



120U/D1



323Dz/D



405U/R1



405U/L



520 industrial LoadSure



520UN/R2



521F/R2



521DF/RLA



520D/L



620 industrial LoadSure



620D/L



621F/R



621V/RE



621P/RE



701F/R



701PB/R



701D/RE



SPX DuCoNite



SPX40 - SPX100



SPX DUPLEX



300



400



500



520F



600



700



FF15



FF20



FF30



FFC50



FMB2-10



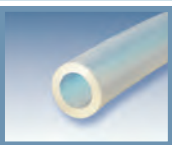
SPS



MasoSine custom solution



Pumpsil (silicone)



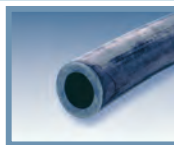
STA-PURE Series PCS



PureWeld



Neoprene



Style 400



STA-PURE Series PFL



Hoses



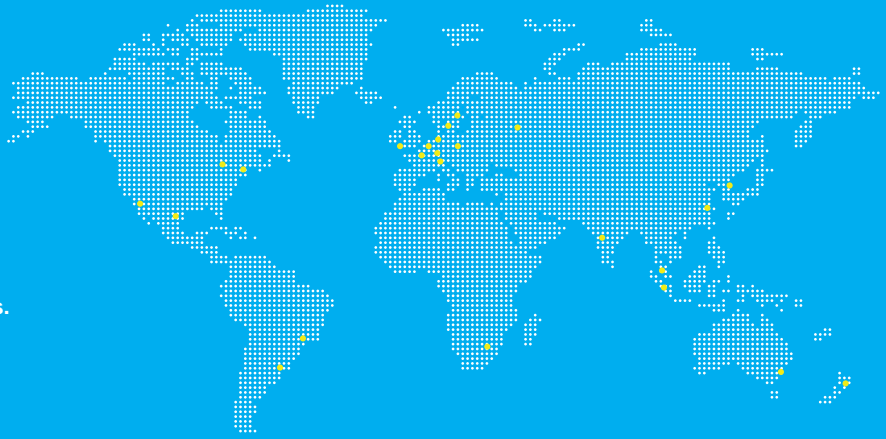




Watson-Marlow Pumps Group

Watson-Marlow Pumps Group has six world-class factories supported by direct sales operations in 24 countries and distributors in more than 50 countries. For contact details visit our website:

[www.wmpg.com](http://www.wmpg.com)



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**Watson-Marlow   Bredel   Alitea   Flexicon   MasoSine**



### Watson-Marlow online

Our engineers around the world can help you choose the perfect pump and tubing for your needs.

More information? Our brochures are on our website - [www.wmpg.com](http://www.wmpg.com)

**support@wmpg.us**

*Watson-Marlow...Innovation in Full Flow*

#### Watson-Marlow Pumps Group

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Lake Forest, CA 92630  
Tel: 855-567-9674

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