WATSON MARLOW Bredel PUMPS

NEW

Every peristaltic pump for science

sciQ

From **Watson-Marlow**

sciQ from Watson-Marlow Bredel

The new standard in scientific pumping

With over one million pumps sold, Watson-Marlow Bredel is the world's leading peristaltic pump manufacturer, entrusted with the handling of valuable, difficult and sensitive fluids in research, pilot and production processes everywhere that science is building our future.

science

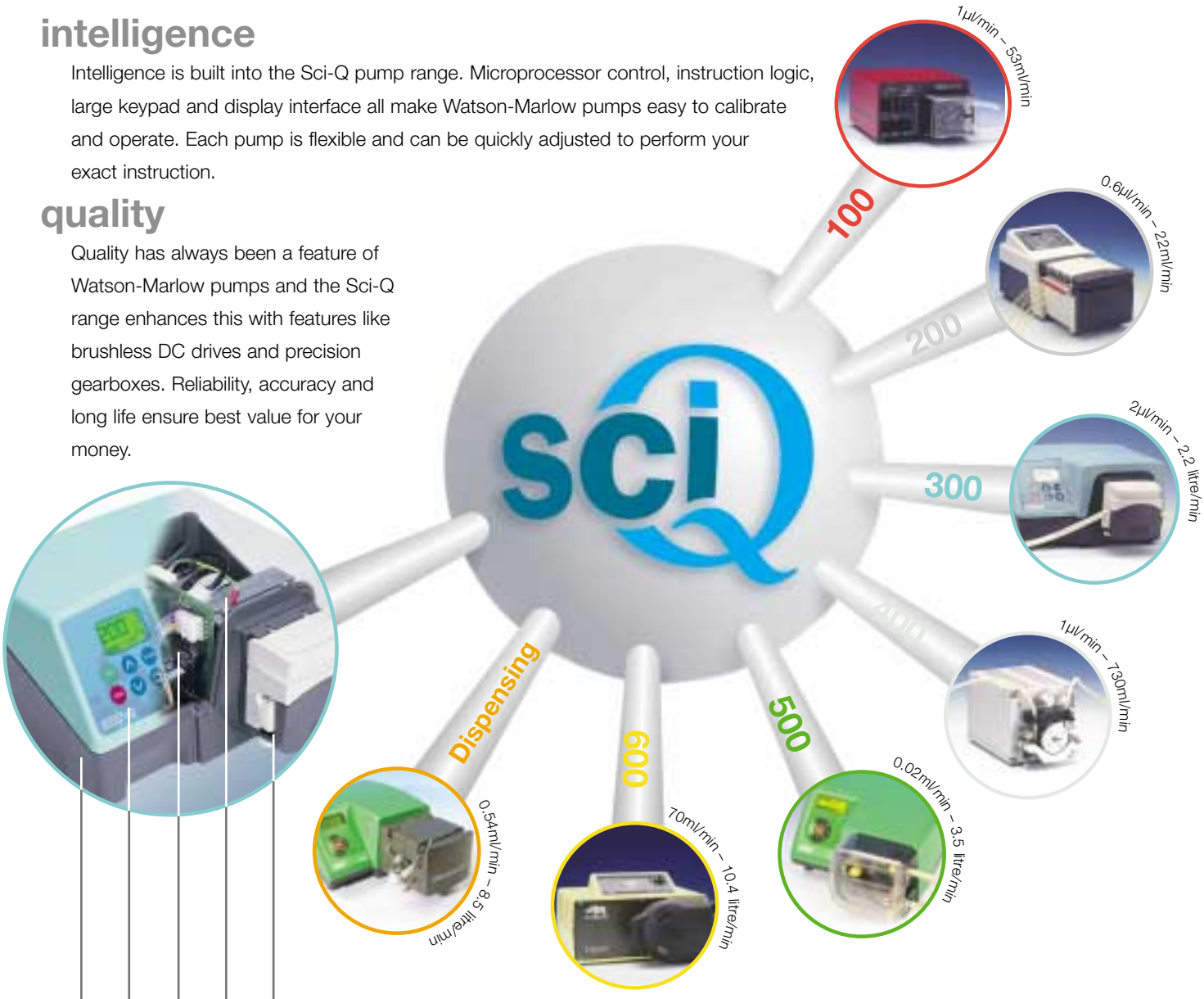
Science and Watson-Marlow pumps lead the way. Sci-Q provides the very latest peristaltic technology in response to customer research, enabling you to match pump, task and budget for precise results without compromise.

intelligence

Intelligence is built into the Sci-Q pump range. Microprocessor control, instruction logic, large keypad and display interface all make Watson-Marlow pumps easy to calibrate and operate. Each pump is flexible and can be quickly adjusted to perform your exact instruction.

quality

Quality has always been a feature of Watson-Marlow pumps and the Sci-Q range enhances this with features like brushless DC drives and precision gearboxes. Reliability, accuracy and long life ensure best value for your money.



Inside the Sci-Q 323

- Five modular pumphead types for single or multi-channel flows from µl/minute to 2.0 litres per minute
- Precision brushless DC motor: servo-quality for precise speed control; zero maintenance
- Full integration with PLC and other equipment; includes digital, analogue and serial RS232 communication
- Easy-use interface: high-visibility display and contoured membrane keypad designed for intuitive operation
- Durable chemical-resistant case, crevice-free for hygiene; distinctive, contemporary and functional

New 520 series

The 520 pumps have raised the standard for scientific, biotech and pharmaceutical pumping. Pump options include the manual control 520S, the 520U with remote auto and analogue control and the 520Du which includes remote digital or RS232 control with full feedback on performance. All 520 pumps have a large digital display and easy-to-use tactile membrane keypad with a keypad lock for process security.

520U/R

520U/R auto/analogue, maual control variable speed pump

- Flow rates from 4 microlitres/min up to 2.4 litre/min
- Manual control with flow calibration and MemoDose for accurate single shot dispensing
- Analogue input, 0-10V / 4-20mA software configurable and calibrated, 0-10V analogue or 0-1258Hz speed indication output
- Inputs: run/stop, direction, leak detected, auto/manual toggle, MemoDose remote footswitch, all accepting 5VTTL or 24V industrial logic
- Outputs: four status outputs, 5V TTL or 24V industrial logic, user set-up for run/stop, direction, auto/manual status and choice of alarm conditions

520S/R

520S/R manual control variable speed pump

If you require only manual control, please order a 520S/R pump.

505Du/R

520Du/R digital/analogue/manual control variable speed pump

- RS232 network control for connectivity by PC or PLC
- Manual control with flow calibration and MemoDose for accurate single shot dispensing
- Analogue input, 0-10V / 4-20mA software configurable and calibrated, 0-10V analogue or 0-1258Hz speed indication output. Plus speed scaling from keypad or a second input
- Inputs: run/stop, direction, leak detected, auto/manual toggle, MemoDose remote foot switch, all accepting 5VTTL or 24V industrial logic
- Outputs: four status outputs, 5V TTL or 24V industrial logic, user set-up for run/stop, direction, auto/manual status and choice of alarm conditions

The 520S/R, 520U/R and 520Du/R are fitted as standard with the 520R pumphead which uses 1.6mm wall thickness tubing and features a large swept volume and sprung rollers for high accuracy, gentle pumping of shear sensitive fluids. A brushless DC motor provides a massive speed control ratio of 2,200:1 and set speed accuracy to 0.1%. Pumps combine extraordinary levels of functionality with on-screen menus, large high visibility displays and easy-to-use tactile membrane keypads.

520 drives also accept 313/314 flip-top pumpheads which can be extended for up to six channels of flow, as well as the 505L low-pulse and 505CA microlitre flow, multi-channel pumpheads. For high pressure applications or for pumping viscous materials, tubing with a 2.4mm wall thickness can be used. The 520R2 pumphead or 313D2 and 314D2 pumpheads should be chosen for 2.4mm wall thickness tubing.

The **520R2 pumphead can also be fitted to achieve a higher maximum flow rate of 3.5 litre/min** using the largest 9.6mm bore tubing which has 2.4mm wall thickness. Ordering codes for pumps fitted with the 520R2 are given on page18. 2.4mm wall thickness tubing ordering information is also shown.

Tubing for 520S/R, 520U/R and 520Du/R pumps							
Bore	**0.5mm**	**0.8mm**	**1.6mm**	**3.2mm**	**4.8mm**	**6.4mm**	**8.0mm**
Bioprene	903.0005.016	903.0008.016	903.0016.016	903.0032.016	903.0048.016	903.0064.016	903.0080.016
Marprene	902.0005.016	902.0008.016	902.0016.016	902.0032.016	902.0048.016	902.0064.016	902.0080.016
Sta-Pure	960.0005.016	960.0008.016	960.0016.016	960.0032.016	960.0048.016	960.0064.016	960.0080.016
Platinum silicone	913.A005.016	913.A008.016	913.A016.016	913.A032.016	913.A048.016	913.A064.016	913.A080.016
Neoprene		920.0008.016	920.0016.016	920.0032.016	920.0048.016	920.0064.016	920.0080.016
PVC			950.0016.016	950.0032.016	950.0048.016	950.0064.016	950.0080.016
Chem-Sure			965.0016.016	965.0032.016	965.0048.016	965.0064.016	965.0080.016

2.4mm wall tubing for 520S/R2, 520U/R2 and 520Du/R2 pumps						
Tube bore	**1.6mm**	**3.2mm**	**4.8mm**	**6.4mm**	**8.0mm**	**9.6mm**
Bioprene	903.0016.024	903.0032.024	903.0048.024	903.0064.024	903.0080.024	903.0096.024
Marprene	902.0016.024	902.0032.024	902.0048.024	902.0064.024	902.0080.024	902.0096.024
Platinum silicone	913.A016.024	913.A032.024	913.A048.024	913.A064.024	913.A080.024	913.A096.024

520S/R, 520U/R and 520Du/R specifications					
Maximum speed	220rpm	Weight	9.6kg	Standards	EN60529, (IP31) CE C ETL US
Control ratio	2,200:1	Dimensions	H158 x W276 x L385mm		

Ordering information		Product code	Product code
Speed range	**Supply**	**520S/R**	**520S/R2**
0.1 to 220rpm	100-120V/220-240V 50/60Hz 1ph 100VA	050.7131.100	050.7131.2L0
		520U/R	**520U/R2**
0.1 to 220rpm	100-120V/220-240V 50/60Hz 1ph 100VA	050.7141.100	050.7141.2L0
		520Du/R	**520Du/R2**
0.1 to 220rpm	100-120V/220-240V 50/60Hz 1ph 100VA	050.7151.100	050.7151.2L0

*Replace last **0** with **A, E** or **U** for **American, European** or **UK** mains lead

A range of IP66 pumps are also available for high pressure wash down areas.

Dispensing

323Dz/D

323Dz/D general purpose benchtop dispenser

- Dispenses 100ml in 3 seconds
- Accurate to within ± 1%
- Menu driven calibration procedure with mid-batch re-calibration
- Dispensing by key press or an additional footswitch/handswitch
- Fitted with 313D three roller pumphead with flip-top design, ensuring easy cleaning and ultra-fast set up
- Also accepts 314D four roller pumphead for greater accuracy and low pulsation
- Extension pumpheads can be fitted for up to six channels of flow

323Dz/D extends the laboratory range with a unique dispensing unit that combines accuracy and versatility. Designed for precise dispensing up to 2.0 litre/minute without the need for stored programs or printed records. The new 323Dz/D general purpose dispensing pump incorporates zero-maintenance brushless DC motors that are dust and contaminant-free. It is simple to use and benefits from a microprocessor control that delivers a dosing accuracy of ±1.0%. Additional features include soft-start "ramp", which reduces splashes and frothing, and a "suck-back" facility eliminates drips at the end of each dose.

Digital speed control from 3rpm to 400rpm and instantly reversible. Switchable between 100-120V and 220-240V. 313D and 314D pumpheads accept five bore sizes of tubing. For use with 2.4mm wall thickness tubing, use 313D2 and 314D2 pumpheads (these cannot be extended). The maximum speed a 314D pumphead can be run is 300rpm.

323Dz/D flow rate and dose ranges (ml/min)						
Pump	**Speed range**	**1.6mm**	**3.2mm**	**4.8mm**	**6.4mm**	**8.0mm**
323Dz/D	2.0 - 400rpm	0.54-110	2.0-400	4.4-880	54-1400	75-2000
Minimum recommended dose (ml)						
		1.4	5.0	11.0	18.0	25.0

Dose size and approximate dose time - using 323Dz/D at 400rpm					
	10ml	**25ml**	**50ml**	**100ml**	**250ml**
Recommended tube bore					
High accuracy ± 1%	1.6mm	3.2mm	4.8mm	6.4mm	8.0mm
Seconds	*5.6*	*3.8*	*3.4*	*3.0*	*7.5*
Recommended tube bore					
Normal	3.2mm	4.8mm	8.0mm	6.4mm	8.0mm
Seconds	*1.5*	*1.7*	*1.5*	*3.0*	*7.5*

Ordering information for 323Dz/D dispenser				
Pump	**Pumphead fitted**	**Speed range**	**Supply**	**Product code**
323Dz/D	313D three-roller pumphead	3.0 to 400rpm	100-120/220-240V 50/60Hz 1ph 100VA	030.3184.3D0*

*Replace last **0** with **A, E** or **U** for **American, European** or **UK** mains lead

323Dz/D specifications	
Weight	4.7kg
Dimensions	H125 x W230 x L225mm
Control ratio	133:1
Standards	EN60529(IP31) **CE**

520Di/L

NEW 520Di/L high accuracy dispenser

- Accurately dispenses to +/- 0.5 percent using 505L pumphead for minimal pulsation
- Dial-up flow rates from 43 microlitres/min to 4.4 litre/min*
- Calibration by weight or by volume
- "Suck-back" facility eliminates drips at dose end
- Two models for IP31 or IP66 NEMA 4X protection
- Dosing triggered by keypad or additional footswitch, handswitch or proximity switch
- Data logging via printer or PC terminal
- On-the-fly calibration without disturbing batch dispensing

The new 520Di/L pump combines extraordinary levels of functionality with an on-screen menu, easy-to-use tactile membrane keypad and an alphanumeric display in English, German, French, Spanish and Italian. Up to 50 individual dispensing programs including all dose parameters and calibration, can be stored in the memory with full file name. Brushless DC motor with 3,500:1 speed control. IP31 pump has full RS232 control via serial communications and the IP66 model has full RS485 control.

A simple security protection code protects set functions and a comprehensive security protection can be incorporated to protect dispensing parameters and calibration values.

The 505L pumphead has low inertia stainless steel rollers and twin offset tracks to provide smooth flows using double tube elements, or two individual tubes up to 9.6mm bore with 2.4mm wall thickness. A 505LX extension pumphead can be fitted to provide one additional channel of flow through a double tube element, or four separate channels of flow via individual tubes.

520Di/L recommended dose sizes (ml)							
Maximum speed	**Tube bore**	**1.6mm**	**3.2mm**	**4.8mm**	**6.4mm**	**8.0mm**	**9.6mm**
350rpm	**Minimum dose**	4ml	13ml	25ml	40ml	50ml	70ml
	Maximum dose	20ml	65ml	125ml	200ml	250ml	360ml

520Di/L flow rates (ml/min)							
Tube bore	**1.6mm**	**3.2mm**	**4.8mm**	**6.4mm**	**8.0mm**	**9.6mm**	**9.6mm***
0.1 to 350rpm	0.04-150	0.23-800	0.42-1500	0.70-2500	0.90-3200	1.3-3800	1.3-4400

*To obtain the highest flow rate of 4.4 litres/min you should use a high-flow Double-Y tube element, product code 913.AH96.K24 together with the 505L tube clamp MN0857T

520Di/L ordering information		
Speed range	**Supply**	**Product code**
0.1 to 350rpm	100-120V/220-240V 50/60Hz 1ph 100VA	050.7171.5L0*

*Replace last **0** with **A, E** or **U** for **American, European** or **UK** mains lead

"Double-Y" tubing elements for 520Di/L dispenser						
Tube bore	**1.6mm**	**3.2mm**	**4.8mm**	**6.4mm**	**8.0mm**	**9.6mm**
Bioprene	903.E016.K24	903.E032.K24	903.E048.K24	903.E064.K24	903.E080.K24	903.E096.K24
Marprene	902.E016.K24	902.E032.K24	902.E048.K24	902.E064.K24	902.E080.K24	902.E096.K24
Platinum silicone	913.E016.K24	913.E032.K24	913.E048.K24	913.E064.K24	913.E080.K24	913.E096.K24
Sta-Pure	960.E016.K24	960.E032.K24	960.E048.K24	960.E064.K24	960.E080.K24	913.AH96.K24

2.4mm wall transfer tubing for 520Di/L dispenser						
Tube bore	**1.6mm**	**3.2mm**	**4.8mm**	**6.4mm**	**8.0mm**	**9.6mm**
Bioprene	903.0016.024	903.0032.024	903.0048.024	903.0064.024	903.0080.024	903.0096.024
Marprene	902.0016.024	902.0032.024	902.0048.024	902.0064.024	902.0080.024	902.0096.024
Platinum silicone	913.A016.024	913.A032.024	913.A048.024	913.A064.024	913.A080.024	913.A096.024

520Di/L specifications	
Weight	15kg
Dimensions	H158 x W276 X L395mm
Standards	EN60529 (IP31) CE

624Di/L

624Di/L high-accuracy high-flow dispenser

- Fitted with high-accuracy twin-channel 605L pumphead
- Dial-up flow rates, menu driven for simple operation
- Calibration by weight or volume
- Store up to 26 dispensing programs
- Manual and RS232,TTL or analogue auto control
- Maximum flow rate 8.5 litre/min

Twin tubes on the 605L pumphead split and recombine the flow out of phase to virtually eliminate pulsation and more than double dosing accuracy. Accepts three sizes of double-Y tube elements. Sta-Pure tubing will give the highest accuracy, followed by silicone. Sta-Pure, Marprene and Bioprene will all give extremely long life. For two-channel dosing, two separate tubes can be fitted into the 605L pumphead, each producing half the listed flow rate.

Network any combination of up to sixteen 624Di/L pumps for computer control of all functions. Analogue control up to 30V or 32mA through rear panel, of speed, and switched or TTL control of direction and stop/start. Keypad lock prevents tampering or accidental changes, auto restart for mains failure recovery, adjustable speed ramp reduces splashes or frothing, suck back facility eliminates drips at dose end. Dose triggered by front panel or remote switch. Selectable dual voltage operation.
Two-year comprehensive warranty. IP55 washdown protection.

624Di/L recommended dose sizes (ml)				
Maximum speed	**Tube bore**	**8.0mm**	**12.0mm**	**16.0mm**
200rpm	**Minimum dose**	60ml	100ml	150ml
	Maximum dose	300ml	500ml	750ml
624Di/L flow rates (litre/min)				
Speed range	**Tube bore**	**8.0mm**	**12.0mm**	**16.0mm**
4.0 to 200rpm		0.07-3.5	0.13-6.5	0.17-8.5

624Di/L ordering information		
Speed range	**Supply**	**Product code**
4.0 to 200rpm	100-120V/220-240V 50/60Hz 1ph 300VA	060.2204.5L0
* Replace last **0** with **A, E** or **U** for **American, European** or **UK** mains lead		

Double-Y tubing elements for 624Di/L dispenser			
Tube bore	**8.0mm**	**12.0mm**	**16.0mm**
Marprene	902.E080.K40	902.E120.K40	902.E160.040
Platinum silicone	913.AE80.K40	913.A12E.K40	913.A16E.040
Sta-Pure	960.E080.K40	960.E120.K40	960.E160.040
Chem-Sure	965.E080.K40	965.E120.K40	965.E160.040

Transfer tubing for 624Di/L dispenser			
Tube bore	**8.0mm**	**12.0mm**	**16.0mm**
Bioprene	903.0080.040	903.0120.040	903.0160.040
Marprene	902.0080.040	902.0120.040	902.0160.040
Platinum silicone	913.A080.040	913.A120.040	913.A160.040

624Di/L specifications	
Weight	40kg
Dimensions	H260 x W420 x L510mm
Menu languages	English, French
Standards	EN60529 (IP55) CE

Filling needles

Filling stand

Footswitch

Handswitch

Dispensing accessories

Watson-Marlow dispensing accessories can tailor-make a complete dispensing system for any individual application.

Two sets of stainless steel filling needles are available with two alternative stainless steel filling stands which accept a variety of bottle sizes and come complete with a holder for the filling needles. Pumping can be activated by a proximity sensor available for either of the filling stands and automatically triggers a fill when a bottle is in place.

Footswitches and handswitches for the 323Dz/D, 520Di/L and 624Di/L are also available.

If you are not using a filling stand, you may choose to use one of the hand held lances specifically designed for our dispensing system filling needles. Each lance has a built-in switch.

Accessory	Description	Product code
Accessories for 520Di/L dispensers		
520AF	Footswitch for 323Dz and 520Di	059.3002.000
520AH	Handswitch for 323Dz and 520Di	059.3022.000
520AL	Dispensing lance	059.5052.000
520AV	Proximity switch	059.5072.000
505AS	Filling stand	059.5001.000
505AFN	Filling needle set	059.5101.000
	Filling needle 1.6mm bore	059.5100.016
	Filling needle 3.2mm bore	059.5100.032
	Filling needle 4.8mm bore	059.5100.048
	Filling needle 6.4mm bore	059.5100.064
	Filling needle 8.0mm bore	059.5100.080

Accessories for 520Di/L dispensers		
520AN	Network kit for 520Di (including software & cables)	059.3102.000
505LTC	Tube clamps set for 505L pumphead	059.4001.000

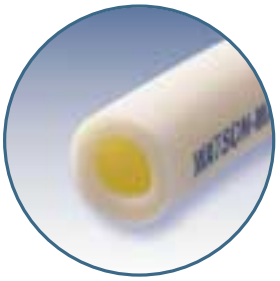
Accessories for 624Di/L dispensers		
624AF	Footswitch for 624Di Mk3	069.5231.000
624AN	Network kit for 624Di Mk3 (including software & cables)	069.3311.000
624AP	Printer and cable for 624Di Mk3, UK plug	069.3301.000
624AL	Dispensing lance Mk3	069.5251.000
624AV	Proximity switch for 624Di Mk3	069.5271.000
625LTC	Tube clamp set for 625L pumphead	069.4001.000
624AS	Filling stand	069.5001.000
624AFN	Filling needle set	069.5101.000
	Filling needle 8.0mm bore	069.5100.080
	Filling needle 12.0mm bore	069.5100.120
	Filling needle 16.0mm bore	069.5100.160

Tube selection guide

Choosing the best tube

Watson-Marlow tubing is available in seven materials and over forty sizes, giving an extraordinary range of chemical and application capability. Watson-Marlow pumps are designed for Watson-Marlow tubing tolerances and performance, and no other tubing will provide comparable results.

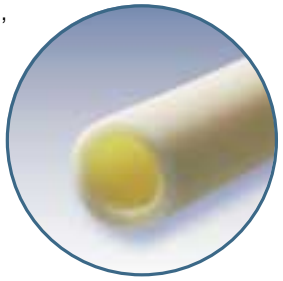
The tubing largely dictates pump performance: Its restitution creates suction, its strength resists pressure, its flex resistance determines pumping life, its bore defines the flow rate, and its wall thickness controls pumping efficiency.

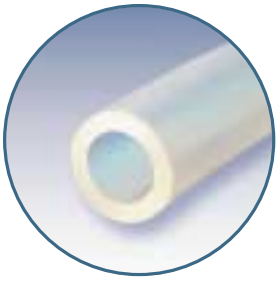


Marprene is Watson-Marlow's exclusive thermoplastic elastomer.

Always our first recommendation. Marprene is the longest life tubing with a wide chemical compatibility, and is highly resistant to oxidising agents such as ozone and peroxides and sodium hypochlorite. Marprene is beige in colour, opaque to both visible and ultra-violet light with low permeability to gases such as oxygen, carbon dioxide and nitrogen, and meets USDA standards for food handling. Working temperature range 5C to 80C. Autoclavable.

Bioprene has the same long life as Marprene but complies with USP Class VI, FDA requirements 21 CFR 177.2600 and NSF and USDA standards for food handling. It has a wide chemical compatibility, and can handle repeated autoclaving. Bioprene can be sterilised by ethylene oxide or gamma irradiation. Working temperature range 5C to 80C. Beige. Available in 15 metre packs only.





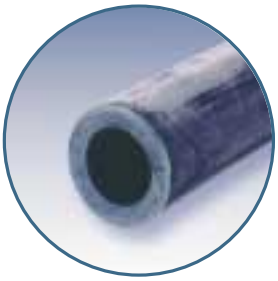
Silicone is the standard laboratory tubing used for small bore sizes up to 9.6mm. Food and medical quality, meets USP and NSF Class VI standards and autoclavable.

Watson-Marlow manufactures a specially developed **platinum-cured silicone tubing, Pumpsil** for additional protection from contamination during the pumping process. Platinum-cured tubing produces a smoother surface, less protein binding offers high levels of purity. It is ideal for medical devices, chemical analysis and pharmaceutical production applications, particularly where there is long term contact with the process fluid. Working temperature range -20C to 80C. High permeability to oxygen. Translucent. Autoclavable.

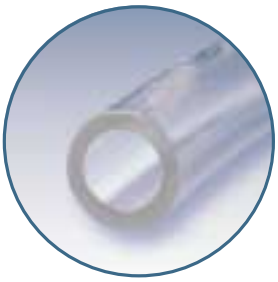
LaserTraceability coding produces an indelible print which uses no ink and has no effect on tube performance. It means that, for the first time, lot traceability is carried through from box to bag to the tube itself.

Sta-Pure has a unique composite construction of silicone in a PTFE lattice giving it superior burst resistance up to 7 bar (100psi) 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 0C to 80C. Opaque white. Autoclavable, SIP and CIP compatible.

Chem-Sure 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. Chem-Sure is USP Class VI and food grade approved making it suitable for foods and pharmaceuticals as well as aggressive chemicals.



Neoprene offers excellent performance with abrasive slurries and sustained pressure applications. Good suction and pressure capabilities. Food quality. Working temperature range 0C to 80C. Black.



PVC has a high Shore hardness giving excellent pressure and suction performance and low gas permeability. FDA approved for use with food and is NSF listed. Working temperature range 20C to 60C. Glass clear.

The best way to select a tube is to first decide which materials are chemically suitable, and then choose the one which best meets the physical demands of the application.

Normally, use the longest tube life material, which will usually be Bioprene or Marprene if they are chemically and physically suitable. Otherwise, silicone tubing is most often chosen for sizes up to 9.6mm (3/8"), and Neoprene tubing for bore sizes of 12.7mm (1/2") or more.

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

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

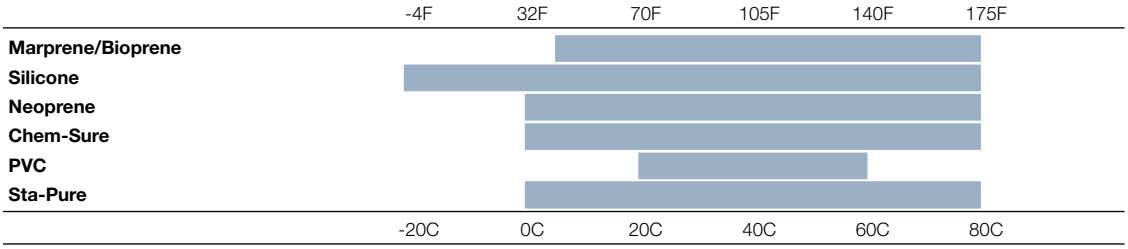
Checking your choice with an immersion test

Always conduct an immersion test before choosing a tube material for critical applications. Immerse a short length of the tubing or a disk of rubber sample (always available from Watson-Marlow or its distributors) in a closed container of the fluid for 48 hours, and then examine for signs of attack, swelling, embrittlement or other deterioration.

Physical compatibility

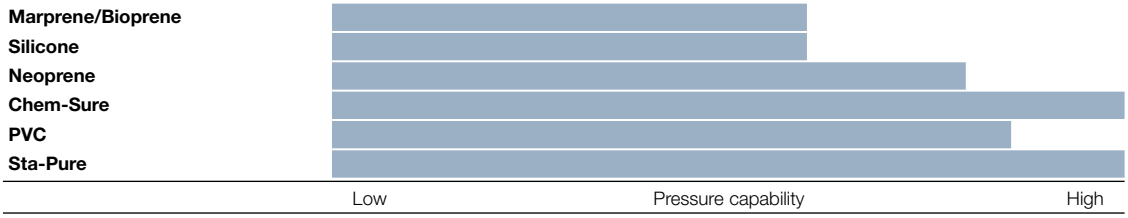
Temperature

The chart shows the temperature range of each tubing type when suction and delivery pressures are negligible. Operating temperatures of Bioprene, Marprene, Chem-Sure, Sta-Pure and silicone tubing are limited to 80C, but all may be autoclaved up to 135C.



Pressure

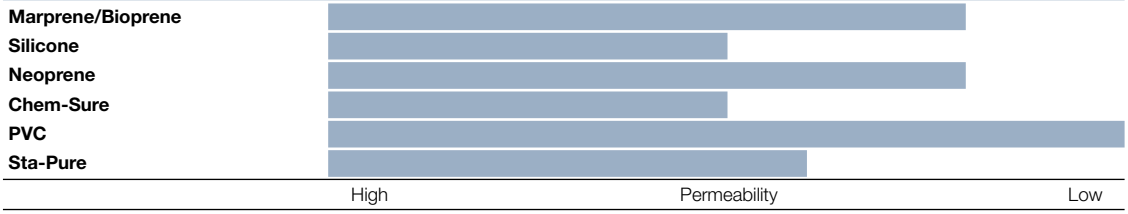
Choose the smallest bore size of tubing which will give the required flow rate.



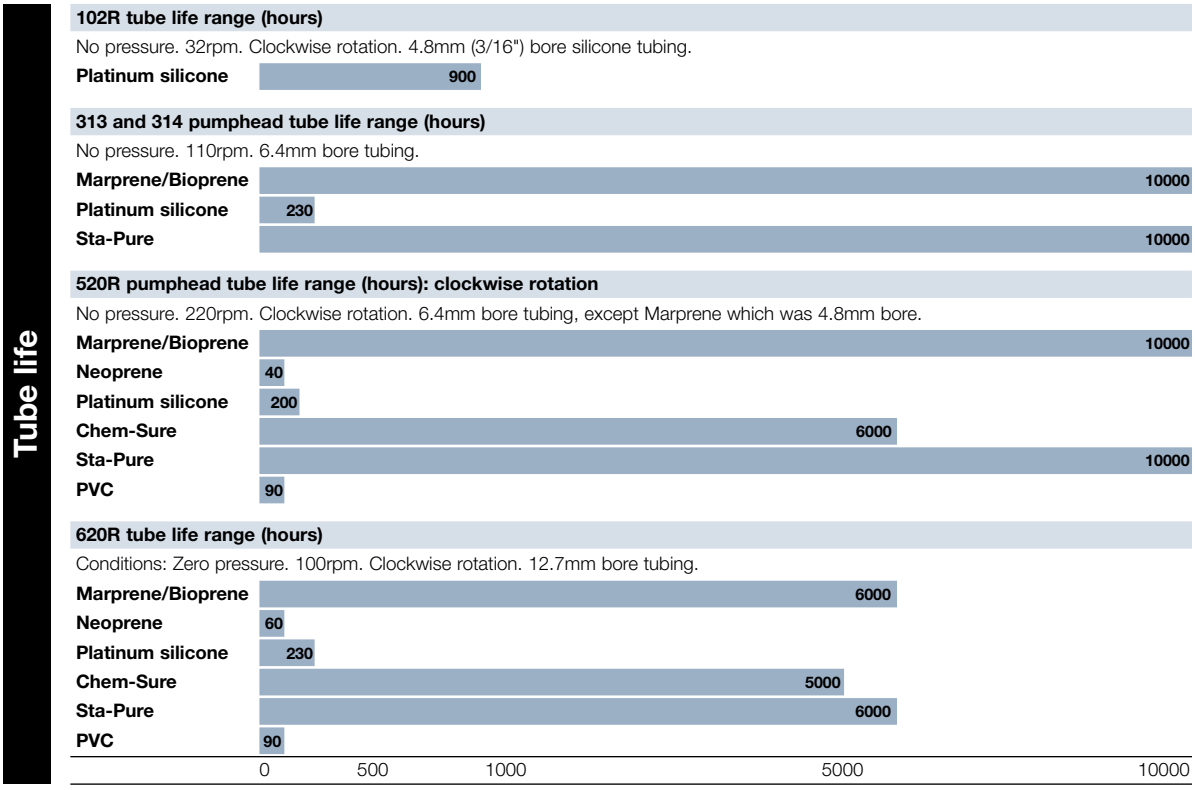
Suction

As with pressure, choose the smallest bore of tube which will produce the required flow rate. Equally important, however, is the restitutional power of the tubing material:

Permeability



Tube life



Viscosity

The flow rates given in this catalogue are valid for fluids with viscosities in the range 1 to 100 centipoise. Increased fluid viscosity will result in decreased flow rate. Choose a tubing with as large a wall thickness as possible, which could, for instance, mean using a 600 series pump which user greater wall thickness tubing, rather than a 500 series pump. Following this guidance will allow fluids with viscosities up to 2500 centipoise to be satisfactorily handled.

Contact Watson-Marlow or its local distributor for advice on specific applications.

Watson-Marlow Bredel 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

100

Low flow single channel pumps. Fixed and manual/auto control variable speed.

- Flow rates from 1µl/min to 53ml/min
- Rapid and simple tube loading
- Manual, auto and digital TTL control

2 years warranty

2 bar

101F/R

101U/R

200

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

- Flow rates from 0.6µl/min to 22ml/min per channel
- Precise flow control for each individual channel
- Manual, auto and digital TTL control

2 years warranty

2 bar

205S/CA

205U/CA

300

NEW

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

- Flow rates from 2µl/min to 3 litre/min
- High visibility digital display with membrane keypad
- Single channel or up to ten separate channels
- Zero maintenance brushless DC motors
- New 323Dz general purpose dispensing pump

2 years warranty

2 bar

323E/D

323S/D

400

NEW

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

- Flow rates from 1µl to 610 ml/min
- Precision multi-roller pumpheads for accurate flows
- Single channel 102R pumphead for use with Silicone or Marprene tubing
- Digital and analogue process signal control

2 years warranty

2 bar

401U/D1

401U/DM3

500

NEW

Superb range of IP31 and IP66 rated pumps for science and industry as well as fixed and variable speed close-coupled pumps.

- Flow rates from 10 µl/min to 4.4 litre/min
- Manual, analogue and digital RS232/RS485 control
- ATEX rated, three phase and pneumatic drives
- Seven pumpheads options including low-pulse high accuracy 505L
- Dosing and dispensing pump for +/- 0.5% accuracy

3 years warranty

2 bar

520S/R

520U/R

600

IP55 mid-flow process pumps with full clean-in-place and steam-in-place capability.

- Flow rates from 50ml/min to 18.3 litre/min
- Manual, auto and digital control
- Close coupled pumps for the three phase operation including pneumatic and ATEX options
- One minute maintenance LoadSure elements

2 years warranty

4 bar

623S/R

624S/RE

700

Industrial cased and baseplate mounted pumps for use with continuous tubing or new LoadSure elements. Three phase motors, ATEX rated drives or pneumatic.

- Flow rates from 1.6 litre/min to 2,000 litre/ hour
- Single or twin channel operation
- Driven roller pumphead extends tube life
- LoadSure elements ensure correct tube loading every time
- Fixed or variable speed drives

2 years warranty

2 bar

704U/R and 704S/R

704U/RE and 704S/RE

800

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

- Flow rates 2 litre/min to 8,000 litre/hour
- Full Clean-In-Place and Steam-In-Place capability
- Extensive motor/gearbox control options

2 years warranty

7 bar

825

840

SPX

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

- Flow rates to 0.3 litre/min 80 cubic metres/hour
- Reinforced hoses enable pressures up to 16 bar
- Fixed and mechanically or electronically variable speed drives including ATEX versions

2 years warranty

16 bar

SP10 and 15

SP25

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 33 litre/min
- Single and multi-channel pumpheads
- Synchronous, DC, induction, shaded-pole or stepper motors
- Optional Eurocard pcb enables full controllability

1 year warranty

2 bar

100

300

Tubing Hoses

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

- Twelve tubing materials in bore sizes 0.13mm to 25.4mm
- Autoclavable Marprene, Bioprene, STA-PURE, Chem-Sure and Pumpsil Silicone (platinum-cured) with LaserTraceability
- Four hose materials including Natural Rubber, Nitrile NBR, Hypalon and EPDM from 10mm to 100mm

Marprene

Bioprene

- Designed for continuous duty - 24 hours/7 days
- Pumps act as their own check-valves
- Self-priming up to 9 metres (30 feet) and dry running
- Reversible flow direction

Code descriptions eg: 101**U**/**R** = Manual/auto control variable speed with single channel pumphead

Drive	
F	Fixed speed
S	Manual control variable speed
U	Manual/auto control variable speed
Du	Digital/analogue control variable speed
Dz	Dispenser
Di	Precision dispenser, RS232 control
VI	Varmeca controlled
FX	Fixed speed duplex drive
DF	ATEX EExd T4 fixed speed
P	Pneumatic
DVB	ATEX Exd T4, mechanical variable speed
PB	Pneumatic, baseplate mounted

SN/UN/DuN (N) denotes IP66 protection

Pumphead	
R	Single channel pumphead
R2	Single channel pumphead for 2.4mm wall tubing
RE	Single channel pumphead for LoadSure elements
CA	High precision multi-channel cassette pumphead
D1	Single channel, four roller pumphead
D	Single channel, three or four roller, 'flip-top' pumphead
DM2-3	Three channel pumphead for three bridge manifold tubing
R1	Single channel, four roller pumphead
L2	Two channel, four roller pumphead
L	Precision 'low pulse' pumphead
VM2-4	Precision low flow multi-channel pumphead for two bridge manifold tubing

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WATSON MARLOW Bredel PUMPS

Value for life

HBO156 issue 5

Pump Series — Flow Rates

100	Low flow single channel pumps. Fixed and manual/auto control variable speed.	1µl/min - 53ml/min	101F/R
200	Near pulseless, multi-channel pumps with up to 32 channels.	0.6µl/min - 22ml/min	205S/CA
300	Single or multi-channel benchtop pumps with manual, remote, analogue, RS232 control and accurate dispensing.	2µl/min - 3 litre/min	323E/D
400	Ultra-compact scientific pumps for low flow single or multi-channel applications.	1µl/min - 610ml/min	401U/D1
500	**NEW** Superb range of IP31 and IP66 rated pumps for science and industry as well as fixed and variable speed close-coupled pumps.	10µl/min - 4.4 litre/min	505S/R
600	**NEW** IP66 mid-flow process pumps with full clean-in-place and steam-in-place capability	50ml/min - 18.3 litre/min	620S/R
700	Industrial cased and baseplate mounted pumps for use with continuous tubing or new LoadSure elements. Three phase motors, ATEX rated drives or pneumatic.	1.6 litre/min - 2,000 litre/hr	704U/R and 704S/R
800	High-flow hygienic pumping using USP Class VI Bioprene tubing or STA-PURE tubing.	2 litre/min - 8,000 litre/hr	825
SPX	High-flow high-pressure industrial pumps with unique patented direct coupled design. Duplex and CIP models available.	0.3 litre/min - 80m^3/hr	SPX40
OEM	A wide range of instrument quality and industrial OEM pumpheads for fitting to users own drives, or with faceplate-mounted motor options.	0.01µl/min - 33 litre/min	100
Tubing Hoses	Extensive range of tubing ensures chemical compatibility. USP Class VI and FDA approvals. Precision machined, re-inforced hoses provide flow stability and excellent suction performance.		Tubing

- Twelve tubing materials in bore sizes 0.13mm to 25.4mm
- Autoclavable Marprene, Bioprene, STA-PURE, CHEM-SURE and Pumpsil Silicone (platinum-cured) with LaserTraceability
- Four hose materials including Natural Rubber, Nitrile NBR, Hypalon and EPDM from 10mm to 100mm

Put a peristaltic in your process — Improve your performance












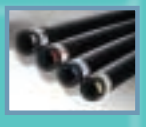

Profile of flow rate against time

The flow rate of all peristaltic pump tubing will reduce over time, with the majority of the change occurring in the first hours and days of use, after which the flow rate will stabilise. Maximum accuracy of metering and dosing will be obtained during this period of stability. Where precise flow rates are required, it is recommended that the flow rate is calibrated after at least a one hour running-in period.

Flow rates

All flow rates given in this catalogue were obtained pumping water at 20C (68F) with zero suction and delivery heads. PVC tubing was used to obtain the 200 series flow rates, Marprene or Bioprene tubing to obtain the 600 series flow rates. All other flow rates were obtained using silicone tubing.

Operating and storage temperatures

Unless otherwise stated, all pumps listed in this catalogue may be operated at ambient temperatures between 5C and 40C (41F and 104F). They may be stored at temperatures between -40C and 70C (-40F and 158F), but allow time for acclimatisation before operating.

Standards

CE Meets all relevant directives

EN601010 is the European Norm standard dealing with "Safety requirements for electrical equipment for measurement, control and laboratory use".

EN60529 is the European Norm standard dealing with the "Classification of degrees of protection provided by enclosures for rotating machines". Equivalents are BS 4999: Part 105, IEN 60 034: Part 5, and DIN VDE 0530: Part 5. IP numbers (such as IP34, IP42, IP55) indicate the degree of ingress protection of the product, with the first digit indicating protection against the ingress of objects, and the second digit indicating the degree of protection against the ingress of water.

Spare parts availability

Watson-Marlow's policy is to provide spare parts for all products for a minimum of seven years from discontinuation. The ability to implement this policy is not entirely within Watson-Marlow's control and cannot be guaranteed, but every effort will be made to honour this policy.

LLOYD'S REGISTER QUALITY ASSURANCE ISO 14001 — UKAS ENVIRONMENTAL MANAGEMENT 001

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