

## Five ways to cut pump maintenance





Bredel is the world's largest manufacturer of hose pumps. With over 50 years' experience in the manufacture of hose pumps, there are over 100,000 Bredel pumps working worldwide to improve customer processes, while reducing operating costs.



- 1 Seal-less, valve-less design lowers total cost of ownership
- 2 Increased process uptime with precision machined hose elements
- 3 Long service intervals
- 4 Direct-coupled drive and maximum flexibility
- 5 Lower maintenance costs through more flow per revolution

**APEX™ hose pumps are ideal for aggressive and abrasive applications up to 8 bar (116 psi)**

The APEX pump from Bredel has set the standard for lowering acquisition, operating and maintenance costs for low to medium pressure applications. APEX is designed for dosing, metering and transfer duties from 2.8 L/hr (0.012 USGPM) to 6,200 L/hr (27.3 USGPM) at pressures up to 8 bar (116 psi).

The higher flow per revolution means APEX pumps can be run at lower speeds, increasing hose life and reducing wear. With no costly wear components such as seals, valves, membranes or rotors to maintain, APEX is ideal for handling abrasive slurries and aggressive chemicals.

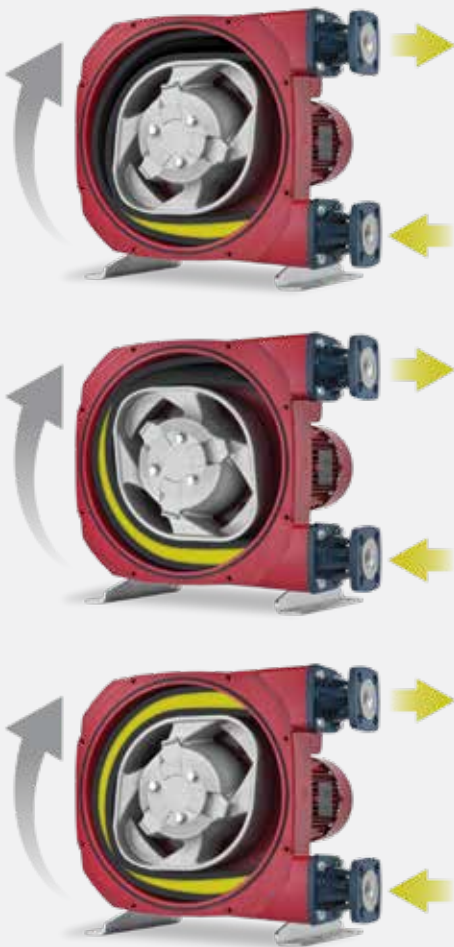
The precision machined hose element and optimised hose compression ensures accurate and repeatable performance. A choice of hose materials ensures compatibility with a wide range of fluids including aggressive chemicals, abrasive slurries and fluids with high solids content.

Compared with other pump types, APEX uptime periods are significantly longer. Maintenance consists of replacing a single hose element, a task that can be performed in minutes.

A robust direct-coupled design fully protects the gearbox; competitively priced against lower-cost, less robust close-coupled hose pumps.



The peristaltic pumping action of APEX works by alternately compressing and relaxing a machined hose between the pump housing and the rotor, ensuring optimal compression. The fluid ahead of the rotor is pushed towards the discharge while the rebounding hose behind the rotor draws more fluid in. There are no seals, seats or valves in the flow path. The fluid contacts only the inner wall of the hose.



Precision machined hose elements, reinforced with layers of braided nylon, ensure perfect compression and maximum hose life. This delivers unrivalled metering accuracy and repeatable in performance for dosing aggressive chemicals or transfer of abrasive slurries, throughout the life of the hose element.



# New APEX™ range: five ways to cut pump maintenance

1

### Seal-less, valve-less design

- Affordable, accurate and reliable
- Engineered for a more competitive price/performance
- Reduced cost of ownership compared to other PD pumps

2

### Increased process uptime

- Precision machined hose elements for accurate, repeatable performance
- Visual verification of correct hose loading
- Optimised hose compression for unmatched flow stability

3

### Long service intervals

- The hose element is the only component to wear
- Hose element can be replaced in-situ quickly and easily in minutes

### APEX28, APEX35

- New connector design without hose clamps enables hose change in minutes
- Now just 8 bolts to change a hose element



### APEX10, APEX15, APEX20

- Easy conversion between three different size hose elements
- Triple the flow without investing in a new pump
- Future-proofing for rising production volumes

4

### Direct-coupled drive and maximum flexibility

- No separate couplings to align or maintain
- Ultra compact design with flexibility to mount standard gear motors
- Rotor supported by own bearings to maximise gearbox life

5

### Lower maintenance costs

- More flow per revolution and long lasting hose elements
- Single component change means fewer spare parts inventory
- Shorter maintenance times compared to other pump types



# Applications



## Water and waste water

Accurate pH control is critical to ensuring consistent water quality. The nature of the chemicals used can cause salt settlement, gassing, abrasive wear and clogging resulting in loss of performance in some pump types. Regular maintenance can be expensive and increase process downtime.

APEX pumps have no moving parts to come into contact with the chemical to be dosed, and has distinct volume strokes, ensuring process accuracy and repeatability. The high flow of the APEX pump means less wear on the precision machined hose element resulting in longer service intervals. Maintenance, when required, is a simple hose change which can be performed in place, taking minutes.

## Industrial and chemical

Maintaining process uptime and process stability when transferring abrasive slurries, high solid fluids and aggressive chemicals is a constant challenge for plant managers. The effects of aggressive fluids on some pumps can necessitate regular maintenance and replacement of components.

APEX pumps have no costly wear components in the flow path. Maintenance intervals are significantly reduced and consists of replacing a single hose element; a task that can be performed quickly and easily in minutes.



## Construction

Consistent volume and flow are critical for maintaining process continuity in the manufacture of building materials. Too soft and the mixture collapses; too hard and it becomes difficult to cut. With no parts in the flow path to clog or wear from the effects of the abrasive clay, APEX pumps ensure maximum process accuracy, repeatability and process uptime.

The direct-coupled design provides the performance, reliability and ease of maintenance benefits of bare-shaft (long-coupled) pumps with the advantages of the compact, close-coupled footprint.

## Paper and pulp

Adding pigment to paper stock requires dosing pigment at very low, precise volumes to ensure consistent shade and end product quality.

The abrasive nature of pigments can cause wear to stators and rotors in some pump types. This leads to a drop in pump performance, the need for regular maintenance and resulting process downtime.

APEX pumps are engineered for maximum uptime and process continuity. Precise and repeatable dosing is afforded by the precision machined hose element. Maintenance intervals are significantly reduced compared to other pump types. The hose element is the only wear part, reducing operating and inventory costs.



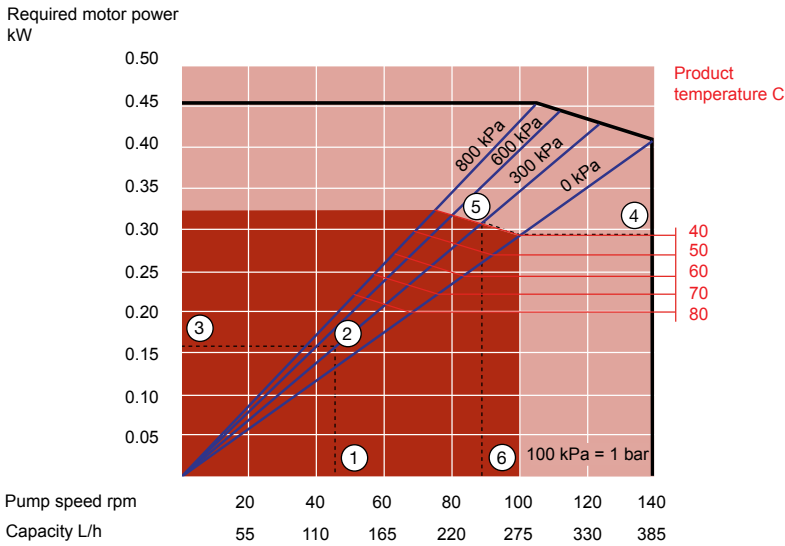


# Technical specifications

## Performance curves

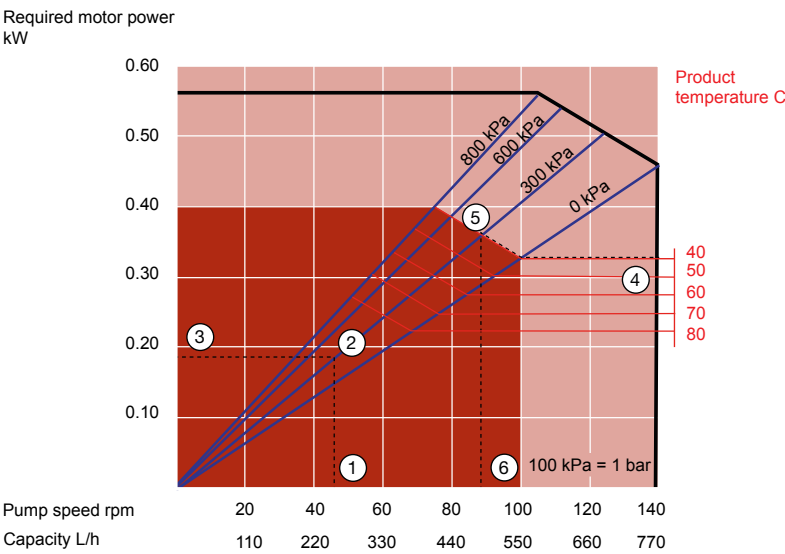
### APEX10

Max flow (intermittent): 390 L/h (1.72 USGPM)  
Max flow (continuous): 280 L/h (1.23 USGPM)  
Capacity: 0.046 L/rev (0.012 USG/rev)  
Inner diameter pump element: 10mm (0.3")  
Lubricant required: 1L (0.264USG)



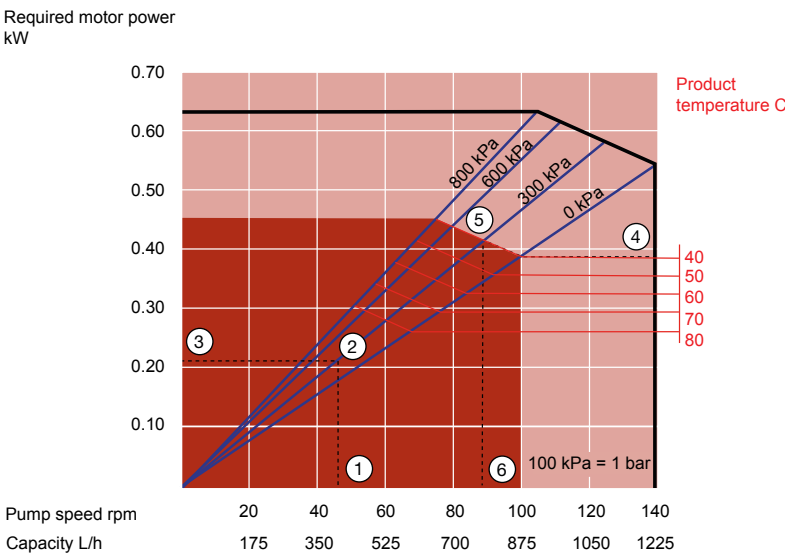
### APEX15

Max flow (intermittent): 770 L/h (3.39 USGPM)  
Max flow (continuous): 550 L/h (2.42 USGPM)  
Capacity: 0.091 Litre/rev (0.024 USG/rev)  
Inner diameter pump element: 15mm (0.59")  
Lubricant required: 1L (0.264USG)



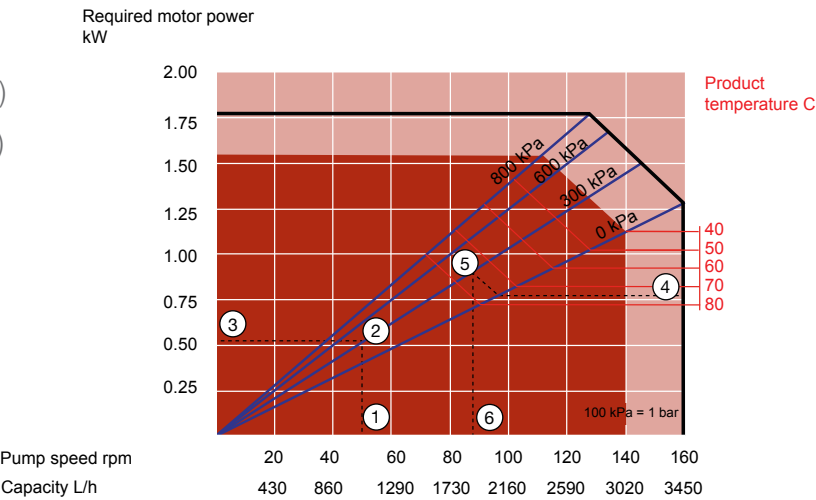
### APEX20

Max flow (intermittent): 1200 L/h (5.28 USGPM)  
Max flow (continuous): 870 L/h (3.83 USGPM)  
Capacity: 0.145 Litre/rev (0.038 USG/rev)  
Inner diameter pump element: 20mm (0.79")  
Lubricant required: 1L (0.264USG)



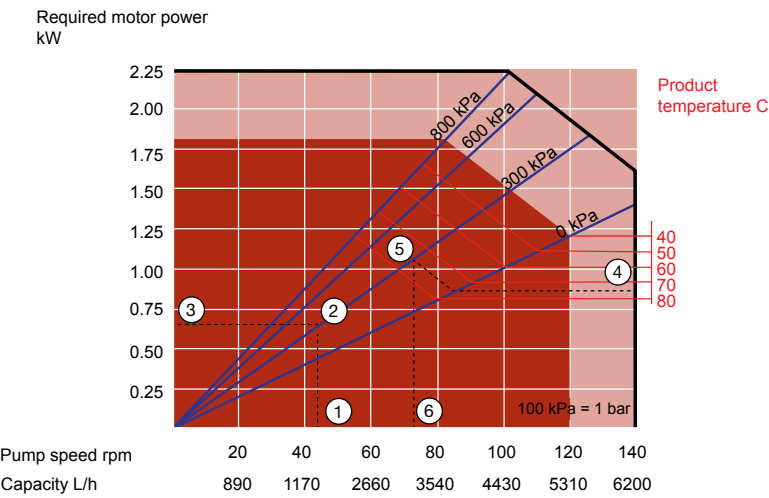
### APEX28

Max flow (intermittent): 3,450 L/h (15.2 USGPM)  
Max flow (continuous): 3,020 L/h (13.3 USGPM)  
Capacity: 0.36 L/rev (0.095 USG/rev)  
Inner diameter pump element: 28mm (1.10")  
Lubricant required: 2L (0.528USG)



### APEX35

Max flow (intermittent): 6,200 L/h (27.3 USGPM)  
Max flow (continuous): 5,310 L/h (23.4 USGPM)  
Capacity: 0.74 L/rev (0.195 USG/rev)  
Inner diameter pump element: 35mm (1.38")  
Lubricant required: 4L (1.06USG)



Continuous duty  
Intermittent Duty\*

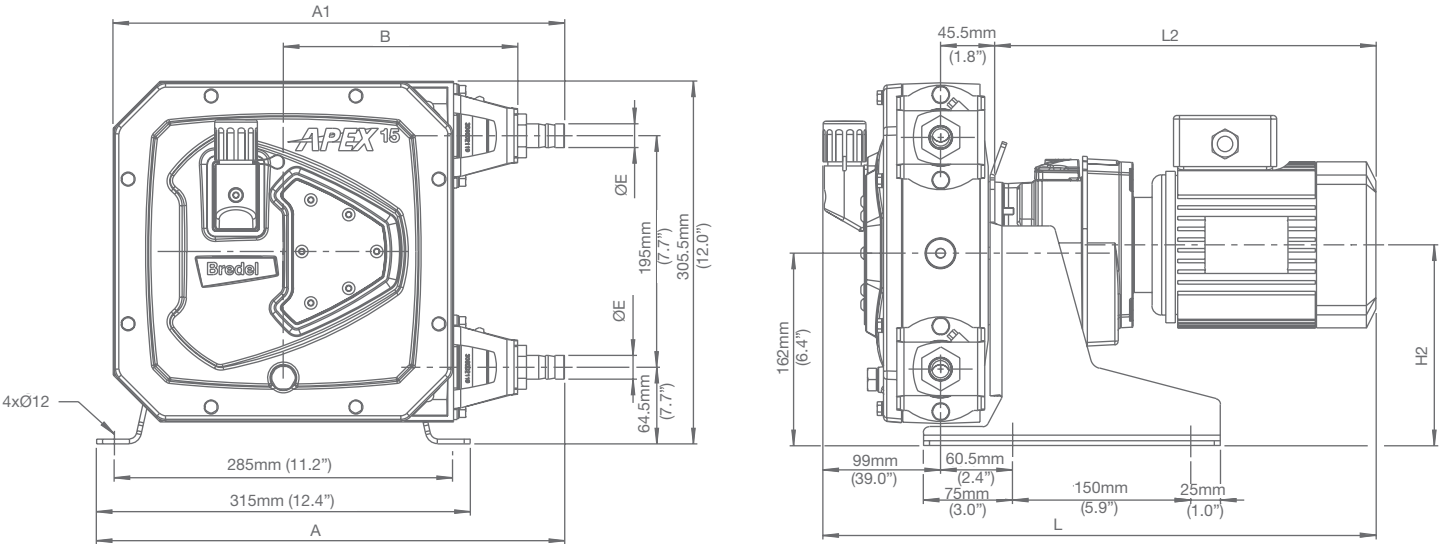
\*Maximum 3 hours operation followed by minimum 1 hour stop

- How to use the curves**
1. Flow required indicates pump speed
  2. Calculated discharge pressure
  3. Net motor power required
  4. Product temperature
  5. Calculated discharge pressure
  6. Maximum recommended pump speed

Hose construction

Dimensions

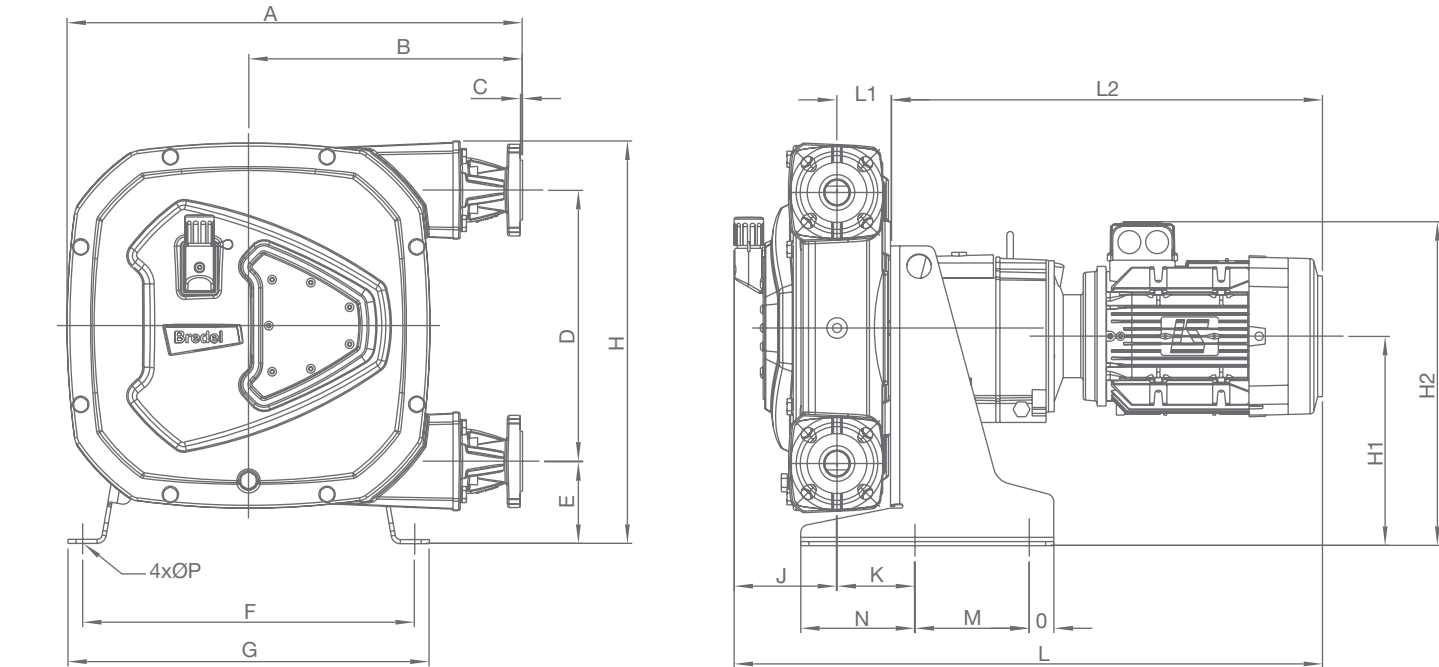
APEX10/15/20



	A	A1	B	E	H2max	Lmax	L2max
APEX10 (mm)	388.5	374.5	197.5	Ø16	170	545.5	401
APEX10 (inches)	15.3	17.7	7.8	1/2" NPT	6.7	18.7	14.5
APEX15/20 (mm)	394.5	380.5	197.5	Ø20	170	545.5	401
APEX15/20 (inches)	15.5	15	7.8	3/4" NPT	6.7	18.7	14.5

Connector sizes	MNPT	EN DIN	JIS
APEX10	0.5"	10mm	10mm
APEX15	0.75"	20mm	20mm
APEX20	0.75"	20mm	20mm

APEX28/35



	A	B	C	D	E	F	G	H	H1	H2max	J	K	Lmax	L1	L2max	M	N	O	ØP
APEX28 (mm)	481	297	2.5	264	98	338	370	415	221	359	124	82.5	714	63	528	152	121	27	12
APEX28 (inch)	18.9	11.7	0.1	10.4	3.9	13.3	14.6	16.3	8.7	14.1	4.9	3.2	28.1	2.5	20.8	6.0	4.8	1.1	0.5
APEX35 (mm)	557	335	2.5	330	100	406	442	490	255	373	126	95	734	66	528	140	140	30	12
APEX35 (inch)	21.9	13.2	0.1	13.0	3.9	16.0	17.4	19.3	10.0	14.7	5.0	3.7	28.9	2.6	20.8	5.5	5.5	1.2	0.5

Connector sizes	ASME B16.5, 150# (ANSI)	EN 1092-1, PN40 (DIN)	JIS B2220, 10/16/20 kgf/cm <sup>2</sup>
APEX28	DN 1"	DN 25	25mm
APEX35	DN 1.5"	DN 32	32mm

The essential component of high-performance hose pumps is a hose that is constructed of layers of rubber reinforced by winding several layers of nylon cords. The inner and outer layers are extruded. The inner layer is available in a range of rubber compounds. After the hose is constructed, it is then machined. Machining is the final step in hose manufacture and is critical to insure that exact tolerances are held.

Precision hose ensure

- Tight tolerances for low stress on bearings
- Perfect compression for long life
- Consistent capacity independent of varying suction and discharge conditions



- 1 Inner layer in various types of rubber
- 2 Reinforced with layers of nylon
- 3 Outer layer precision-machined
- 4 Rough outer surface before machining

Hose options



NATURAL RUBBER (NR)

Outstanding abrasion resistance. Generally resistant to diluted acids and alcohols.  
Max. fluid temp 80C (176F)  
Min. fluid temp -20C (-4F)



BUNA N (NBR)

Resistant to oils, greases, alkalis and detergents.  
Max. fluid temp 80C (176F)  
Min. fluid temp -10C (14F)



EPDM

Excellent chemical resistance, especially to ketones, alcohols and concentrated acids.  
Max. fluid temp 90C (194F)  
Min. fluid temp -10C (14F)



CSM

Outstanding chemical resistance to highly concentrated acids and bases.  
Max. fluid temp 80C (176F)  
Min. fluid temp -10C (14F)  
(Call for availability on APEX28/35)



NBR for food

Suitable for a wide range of food products. Resistant to various cleaning chemicals. Meets EC 1935/2004.  
Max. fluid temp 80C (176F)  
Min. fluid temp -10C (14F)



F-NBR

Meets FDA21CFR177.2600, EC 1935/2004 and BfR XX1. Category 4 safe for food contact.  
Max. fluid temp 80C (176F)  
Min. fluid temp -10C (14F)  
(Call for availability on APEX28/35)

Accessories



- 1. High level float switch**  
When connected to a motor controller, the high level sensor can trigger a pump shutdown in the event of a hose element failure.
- 2. Variable Frequency Drive**  
Variable Frequency Drives are used to reduce energy consumption and for improved process control/flexibility. They can be used for local control or by 4-20 mA / 0-10 V remote control.
- 3. Revolution counter**  
A sensor for precise monitoring of the pump speed allowing to schedule maintenance and to achieve additional process data



Fluid Technology Group

## INDUSTRIAL SOLUTIONS



### Watson-Marlow Fluid Technology Group

Watson-Marlow Fluid Technology Group supports its customers locally through an extensive global network of direct sales operations and distributors

[wmftg.com/global](http://wmftg.com/global)



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