



VERDERFLEX®

VERDERFLEX PERISTALTIC PUMPS

Verderflex® Economy Tube Pumps

Any questions? You may still have questions and/or comments after reading this brochure. Please feel free to contact us on +44 (0)1924 221 020. You can also respond via email to info@verderflex.com. For more information about Verderflex please visit our website www.verderflex.com



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VERDER
passion for pumps

Verderflex Economy Peristaltic tube pumps

The Verderflex Economy range of peristaltic tube pumps are a simple to use, 'no frills' range of cased drive tube pumps. Ideal for benchtop use in laboratories and process environments, this compact range provides accurate flow and consistent dosing up to 8,000 ml/min (127 US GPH).



The Verderflex Economy range is available with a large selection of tubing types and sizes for transferring, dosing and metering harsh, abrasive, shear sensitive or highly viscous fluids. The pumped product is totally and hygienically contained within the sterilisable tubing and does not come into contact with any other moving parts of the pump, making this an ideal pump for laboratory conditions.

Every Verderflex Economy pump consists of a proven Verderflex pump head design, mounted on a case which houses the motor and controls. Each Verderflex Economy pump is simple to operate via a manual variable speed control with fast prime switch* for immediate, accurate dosing. All Verderflex Economy pumps are also reversible to help clear blockages.

The heavy duty EV8000 is designed for continuous 24hr use and includes a push button digital potentiometer for increased pump speed control.

Features and Advantages

- Flow rates from a few ml/min up to 8,000 ml/min (127 US GPH)
- Fast Prime switch
- Variable speed control
- IP30 Chemical resistant Epoxy polyester coating
- Gentle pumping action, ideal for shear sensitive fluids
- Highly accurate dosing with no product slip
- Zero contamination - the fluid is hygienically contained within the tubing of the pump
- Self priming
- Dry running
- Reversible
- Ideal for dosing harsh, aggressive, or viscous products
- Quick and easy tube change

* except ev8000

PERISTALTIC PUMPS

Peristaltic pumps provide excellent problem solving pumping solutions especially when the product is abrasive, corrosive, shear sensitive or viscous.

With the following features and benefits it's no wonder that peristaltic pumps are one of the fastest growing pump types in the world.

Seal-less design

Only the sterilisable tube comes into contact with the fluid.

Low maintenance costs

The only consumable part is the relatively low cost tube.

Dry running

Can run dry without any additional lubrication.

Self priming

The pumps are capable of self-priming and can handle products that are likely to "air" or "gas".

Gentle pumping action

The gentle pumping action means that peristaltic pumps are ideal for shear sensitive products such as cells.

Suction lift

The pumps also have high suction capabilities of up to 8m (26ft) of water.

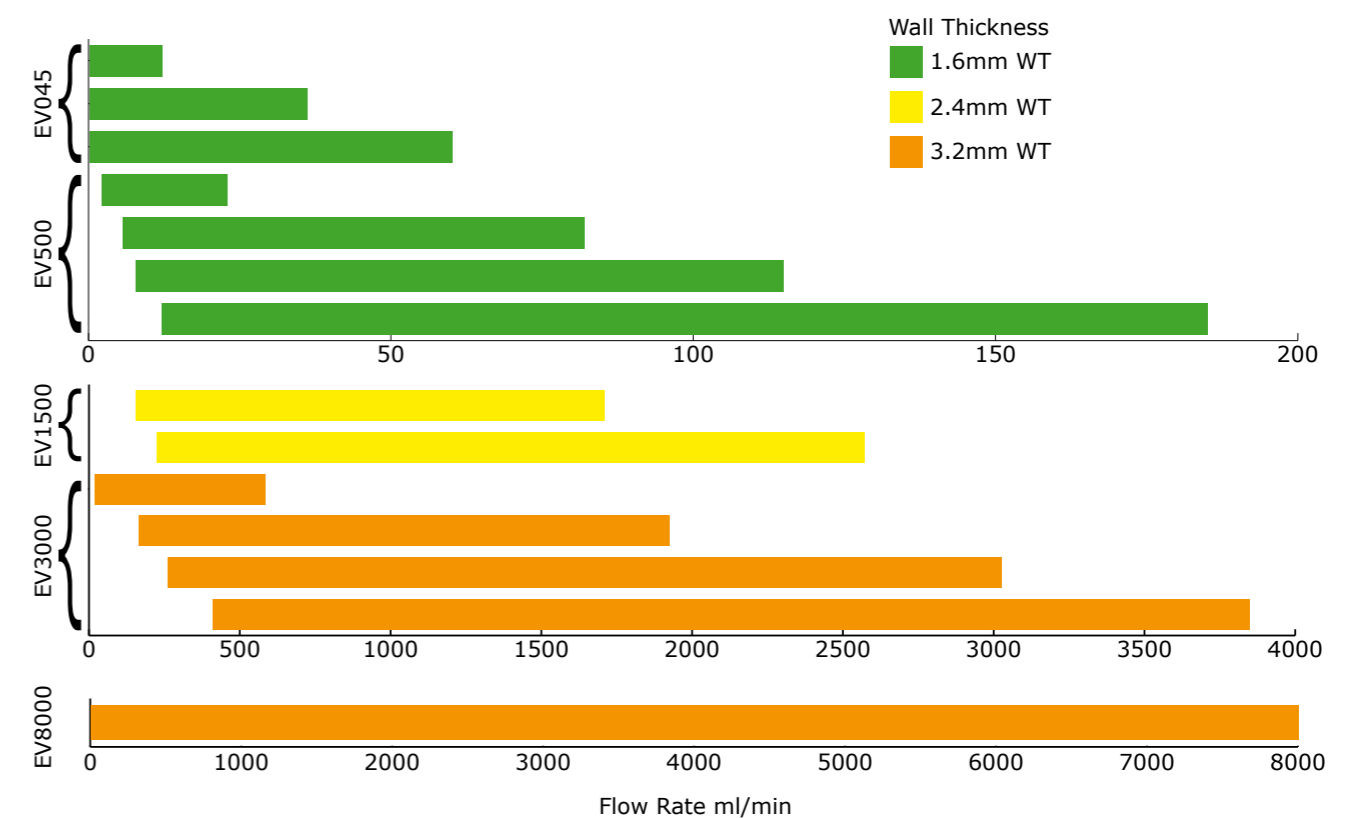
No slip

The pumps have no internal backflow giving accurate dosing without slip.

Accurate dosing

The pumps are accurate in dosing, they have a repeatability of $\pm 1/2\%$ and metering capabilities of $\pm 2 1/2\%$.

Quick Pump Selector



SPECIFYING A PERISTALTIC PUMP

There are many factors that influence which size of pump and tube is used in any particular application.

PUMP PERFORMANCE

Flow Rate

Any peristaltic pump's flow is related to the pump's flow per revolution and the pump speed. The flow per revolution is a function of the head design and the tube size. Each pump has a speed-flow characteristic given as part of the pump data.

Suction Lift

With any tube pump, flow rate decreases as suction lift increases. The lost flow varies with tube size and generally, the smaller the tube internal diameter the lower the suction loss. Additionally, the greater the suction lift the greater the reduction in tube life. Suction loss curves are included for each pump.

Back Pressure

Increasing back pressure can also result in a minor variation in flow rate and for each size of tubing there is a maximum discharge pressure beyond which the tubing exceeds its elastic limit and permanently deforms. Data on each individual pump includes appropriate discharge pressure performance curves along with maximum working pressure for each tube size.

PUMPED LIQUID

Chemical Composition

The liquid being pumped is a fundamental parameter as the tubing must be able to withstand any chemical attack associated with the liquid. Many plastics can be extruded into highly resistive tubing but at the expense of mechanical strength and possibly tubing cost. Verderflex's experience is this compromise can severely limit the real tubing material selected for use and separate pages detail the company's range of standard and special order tube materials.

Viscosity

Increasing viscosity reduces the capability of the tube to fill (prime) and consequently the pump head's flow rate will reduce.

Specific Gravity (SG)

A product's specific gravity (the ratio of a product's density to the density of water) can increase the required suction lift and consequently the flow loss can increase e.g. a product with an SG of 1.5 being lifted 4m has a lift equal to 6m of water and consequently the flow loss is higher than 4m of water. This may result in a larger pump being required combined with a smaller ID tube (smaller ID tubes have superior lifting capabilities than large ID tubes for a given wall thickness).

Suction lift loss curves are scaled in metres and feet of water column i.e. they are normalised to water.

Particles/Solids

Solid size may be a fundamental block to any tube pump – if the solid size is too large the product may not flow through the tube and simply clog the tube so no liquid flows. If solids are relatively small then tube ID must be considered, but solids can be pumped.

Particle size should not exceed 15% of tube internal cross sectional area.



Temperature

Increasing temperatures affect the choice of tube in many ways; the tube may become more flexible as it softens with increasing temperature leading to poor tube recovery and a loss of flow, suction lift and discharge pressure capabilities.

There are normally several temperature limits for any tube material:

- The absolute maximum temperature the tubing can withstand but at this temperature the tubing is so soft it can't be used in a pump and splits
- The maximum temperature that an individual tube can withstand repeatedly e.g. When the tube is SIPed
- The maximum liquid temperature that a tube can withstand when it is in a pump
- The maximum ambient temperature that the pump's electronics will withstand

Typical values for Verderprene and Platinum Cured Silicone tubes are

SIP temperature	< 130°C or 266°F
Liquid operating temperature (which is actually the temperature of hot tea in a Vending Machine)	< 85°C or 185°F
Ambient temperature	< 45°C or 113°F

A chemical's aggressiveness may double for every 10°C/18°F above ambient.

OPERATING CONDITIONS

Duty cycle (On/off time)

There are many different solutions to any pumping situation. Some, such as a 24 hour duty motor and reduced pump speeds may be appropriate when the pump is in continuous operation, whereas more economically specified components will be more appropriate when the pump is only running for a few seconds and then not running for a few minutes.

Environment

All pumps are driven by a motor which needs to be specified to suit its working environment. Factors to consider include the pump's physical location, the ambient temperature, any protective enclosure, cooling clearances and the likelihood of dirt and or moisture ingress.

Verderflex Tube Selection

Choosing the best tube for your application

The tube is the heart and soul of any peristaltic pump: a poorly selected tube will result in frequent tube changes and increased overall cost of ownership of any equipment.

Conventionally, tube size is stated as Internal Diameter (ID) x Wall Thickness (WT).

Key Tube Selection Issues Include

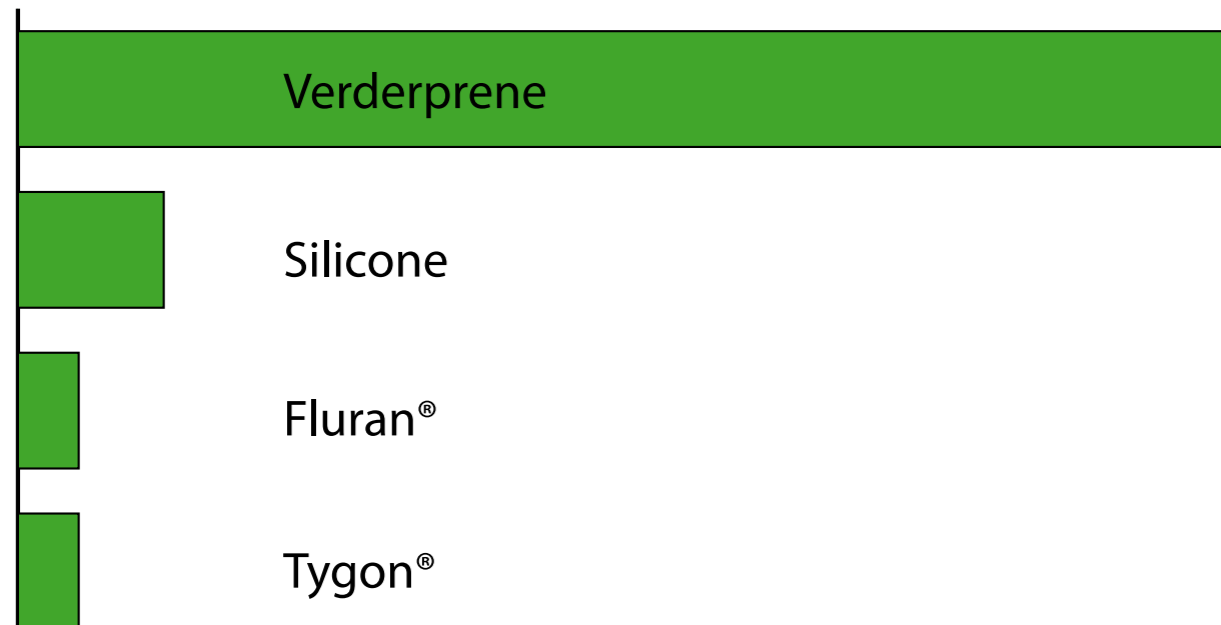
Chemical Compatibility

Verderprene is an economic, general purpose tubing that resists many chemicals whilst offering excellent dynamic resistance. Some materials have better chemical strength at the expense of mechanical life and material cost.

Life/Duty Cycle

Tubing life is related to the tube's mechanical strength, the number of compressions and the operating cycle. Again, Verderprene is the most economic solution with the best mechanical life.

Graph Demonstrates Relative Tube Life



Suction Lift

Suction lift is determined by a combination of the tube's ID and WT, ideally the smallest tube diameter should be combined with the thickest wall tube and the tube material's inherent restitution properties. Verderprene and Silicone have superior lift capabilities than similar sized materials such as Tygon® or Fluran®.

Cost

Most tubing is produced by thermoplastic extrusion, hence, tubing cost is related to the raw materials used. Highly chemical resistive materials like Tygon® and Viton® are more expensive to produce than Verderprene or Silicone.



Pressure

Increasing the tube's working pressure shortens the expected tube life. For the best tube life performance the smallest tube diameter should be combined with the thickest wall tube.

Safe Tube Working Pressures

WT	Tube ID	Verderprene Bar (PSI)	Silicone Bar (PSI)
1.6 (1/16")	1.6 (1/16")	2.3 (34)	1.5 (22)
	3.2 (1/8")	1.3 (19)	1 (14)
	4.0 (5/32")	0.9 (13)	0.8 (12)
2.4 (3/32")	4.8 (3/16")	0.9 (13)	0.75 (11)
	6.4 (1/4")	1 (14)	0.8 (12)
	8.0 (5/16")	0.9 (13)	0.75 (11)
3.2 (1/8")	6.4 (1/4")	1.3 (19)	1 (14)
	8.0 (5/16")	1 (14)	0.7 (10)
	9.6 (3/8")	0.9 (13)	0.6 (9)
	12.7 (1/2")	0.7 (10)	0.5 (8)

Verderprene - General Purpose Tubing

This opaque, cream coloured tube is the most popular choice for tube pumps having:

- Best mechanical strength for optimal lifespan
- Good mechanical recovery for optimal suction lift
- Wide chemical resistance including most oxidising agents
- Low gas permeability
- Temp. range: +10°C to +85°C (+50°F to +185°F)
- Food grade, meets FDA, 3-A and NSF criteria
- Can be autoclaved, compatible with most CIP solutions and SIP



Tygon® - Chemical Fluids Tubing

Specifically designed for most fuels and industrial lubricants, Tygon resists the swelling and hardening caused by hydrocarbon based fluids, significantly reduce the risk of failure due to cracking and leakage.

- Temp. range: -37 to +74°C (-35°F to +165°F)
- Yellow colour for positive identification
- Suitable for fuels, heating oils, glycol, coolants and cutting fluids

Immersion Testing

With many proprietary solutions chemical compatibility can be verified with an immersion test:

1. Immerse half a tube sample in a closed container for 48 hour.
2. Then compare against the remaining half for signs of attack, swelling, embrittlement or any other kind of deterioration – all of which indicate chemical attack or an unsuitable tube material.

Please contact Verderflex for samples of tubing materials.

Platinum Cured Silicone - For Higher Purity

Platinum cured Silicone is a translucent, odourless tubing with low residuals.

- Autoclavable and is used in many applications
- Good mechanical recovery for optimal suction lift
- Medium gas permeability
- Temp. range: -20°C to +85°C (-4°F to +185°F)
- Medical/ food grade to FDA, USP Class VI and BGW/ BGA XV criteria

Fluran® - Agressive Chemical Tubing

Fluran® is strong, resilient and flexible tube resistant to corrosive chemicals, oils, fuels, solvents and most mineral acids. It can also handle corrosive chemicals at temperatures as high as 204°C.

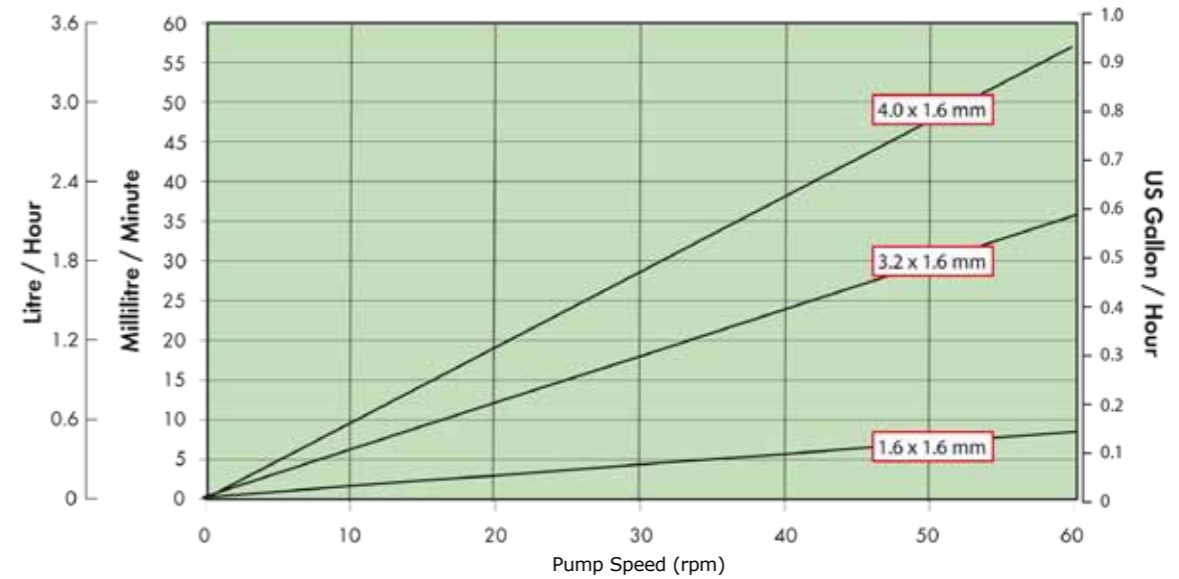
- Temp. range: -22 to +85°C (-8°F to +185°F)
- Resists ozone, sunlight and weathering
- Opaque black color helps protect light sensitive fluids

MODEL EV045

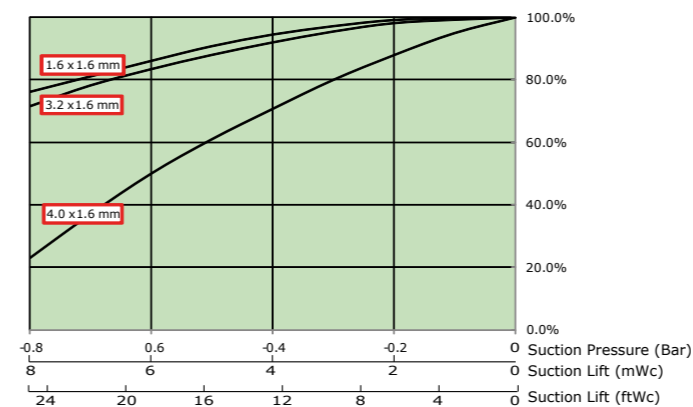
Tube	Verderprene, Silicone, Viton, Tygon
Power Supply	110/230V, 50/60Hz, 20W
Dimensions	W205 x H110 x D195mm (W8.1" x H4.3" x D7.7")
Weight	1.7kg (3.7lb)
Pumphead	M045 Polycarbonate
Rotor	2 Roller Polycarbonate
Speed	5 to 60rpm



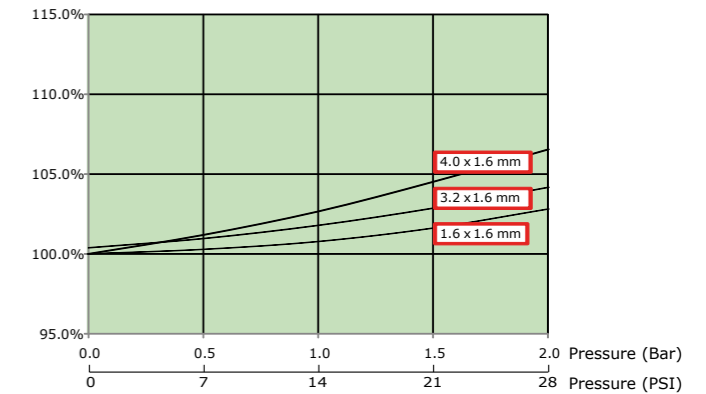
EV045 Free Flow Curve



Suction



Discharge



Flow rates with water at 20°C (68°F)

Standard Ordering Options

1.6 x 1.6 Verderprene Tube Assembly

UK plug	160.4000	VF ECONOMY EV 045 1.6 VP UK
European Plug	160.4001	VF ECONOMY EV 045 1.6 VP EU
US Plug	160.4002	VF ECONOMY EV 045 1.6 VP US

3.2 x 1.6 Verderprene Tube Assembly

UK Plug	160.4100	VF ECONOMY EV 045 3.2 VP UK
European Plug	160.4101	VF ECONOMY EV 045 3.2 VP EU
US Plug	160.4102	VF ECONOMY EV 045 3.2 VP US

4.0 x 1.6 Verderprene Tube Assembly

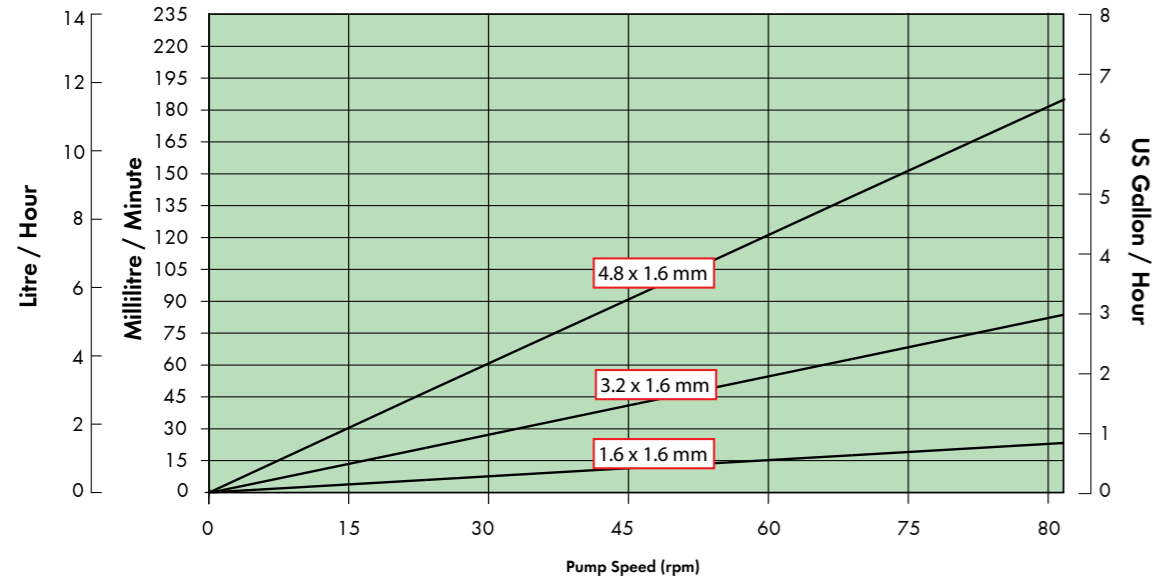
UK Plug	160.4200	VF ECONOMY EV 045 4.0 VP UK
European Plug	160.4201	VF ECONOMY EV 045 4.0 VP EU
US Plug	160.4202	VF ECONOMY EV 045 4.0 VP US

MODEL EV500

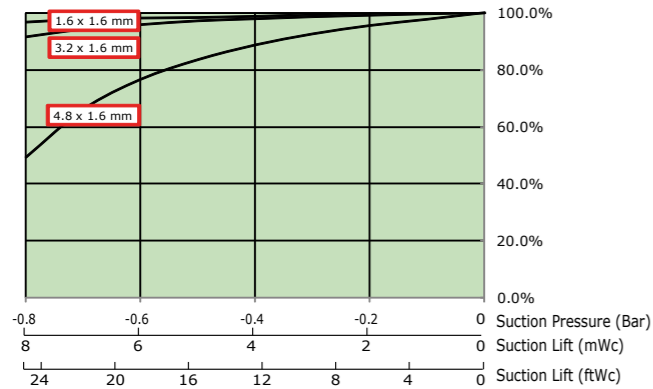
Tube	Verderprene, Silicone, Viton, Tygon
Power Supply	110/230V, 50/60Hz, 20W
Dimensions	W205 x H110 x D195mm (W8.1" x H4.3" x D7.7")
Weight	1.7kg (3.7lb)
Pumphead	M500 Clear Polycarbonate
Rotor	2 Roller Polycarbonate
Speed	5 to 82rpm



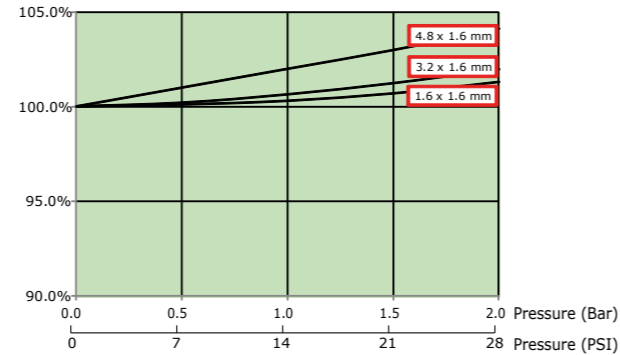
EV500 Free Flow Curve



Suction



Discharge



Flow rates with water at 20°C (68°F)

Standard Ordering Options

1.6 x 1.6 Verderprene Tube Assembly

UK plug	160.5000	VF ECONOMY EV 500 1.6 VP UK
European Plug	160.5001	VF ECONOMY EV 500 1.6 VP EU
US Plug	160.5002	VF ECONOMY EV 500 1.6 VP US

3.2 x 1.6 Verderprene Tube Assembly

UK Plug	160.5100	VF ECONOMY EV 500 3.2 VP UK
European Plug	160.5101	VF ECONOMY EV 500 3.2 VP EU
US Plug	160.5102	VF ECONOMY EV 500 3.2 VP US

4.8 x 1.6 Verderprene Tube Assembly

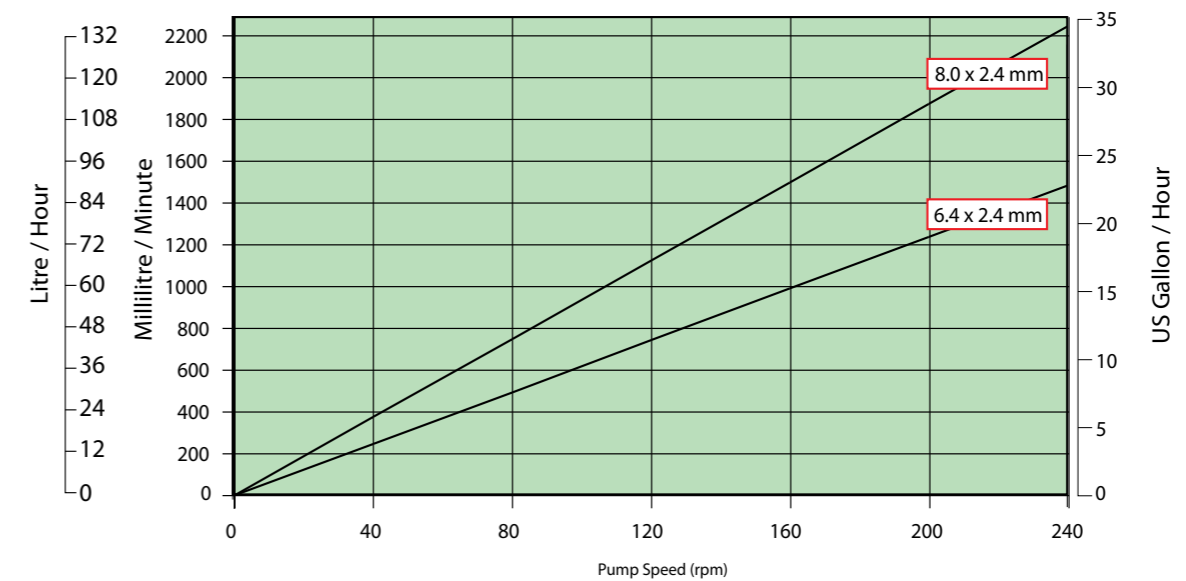
UK Plug	160.5200	VF ECONOMY EV 500 4.8 VP UK
European Plug	160.5201	VF ECONOMY EV 500 4.8 VP EU
US Plug	160.5202	VF ECONOMY EV 500 4.8 VP US

MODEL EV1500

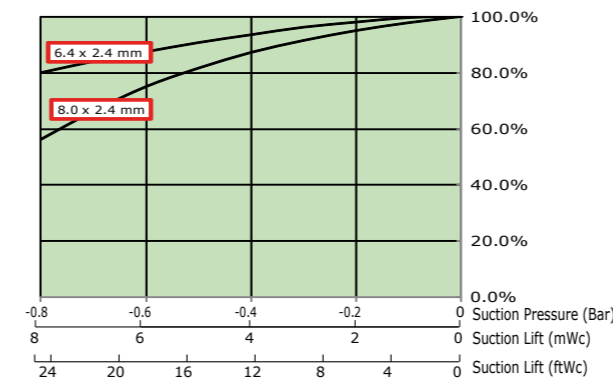
Tube	Verderprene, Silicone, Viton, Tygon
Power Supply	110/230V, 50/60Hz, 150W
Dimensions	W245 x H130 x D225mm (W9.6" x H5.1" x D8.9")
Weight	3.0kg (6.6lb)
Pumphead	M1500 Polycarbonate
Rotor	2 Roller Nylon6, Rotor with Acetal Rollers
Speed	30 to 240 rpm



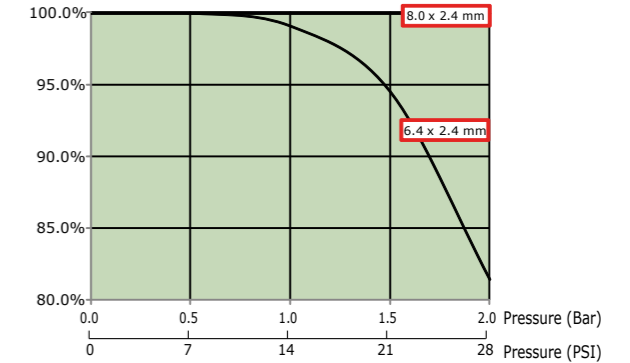
EV1500 Free Flow Curve



Suction



Discharge



Flow rates with water at 20°C (68°F)

Standard Ordering Options

No Tubing

UK plug	160.1000	VF ECONOMY EV 1500 No Tube VP UK
European Plug	160.1001	VF ECONOMY EV 1500 No Tube VP EU
US Plug	160.1002	VF ECONOMY EV 1500 No Tube VP US

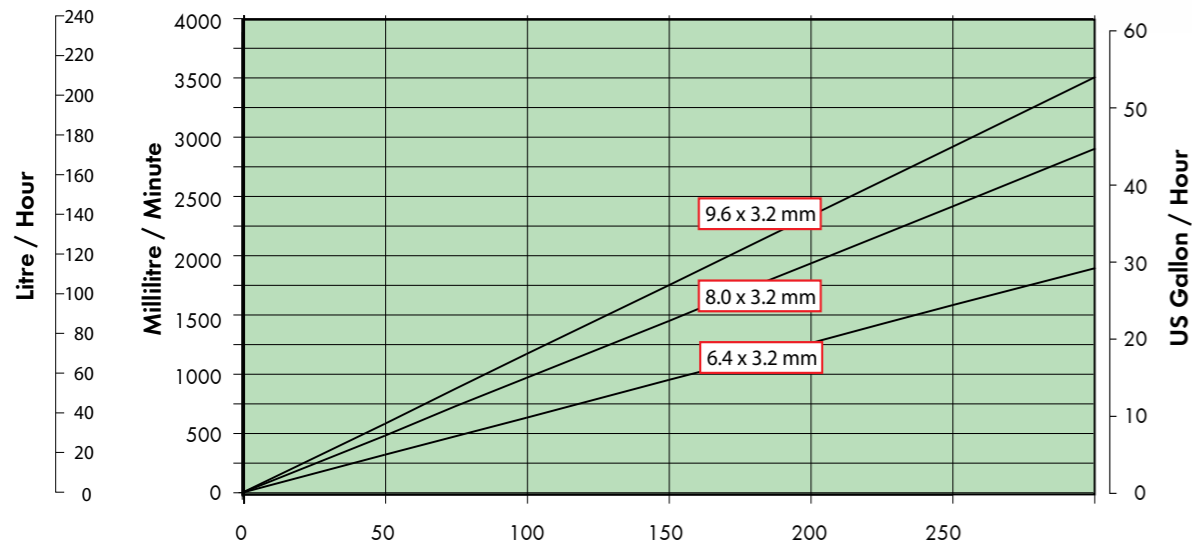
Tubing is ordered separately

MODEL EV3000

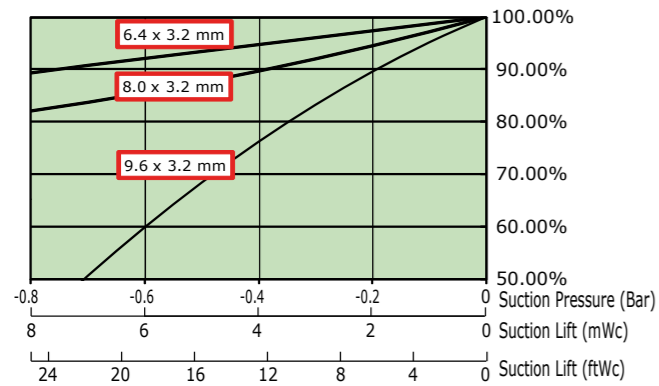
Tube	Verderprene, Silicone, Viton, Tygon
Power Supply	110/230V, 50/60Hz, 150W
Dimensions	W245 x H130 x D225mm (W9.6" x H5.1" x D8.9")
Weight	3.0kg (6.6lb)
Pumphead	M3000 Aluminium alloy, polyester coated with Acrylic protective cover
Rotor	M3000 Aluminium alloy, anodised finish, 2 rollers
Speed	30 to 250 rpm



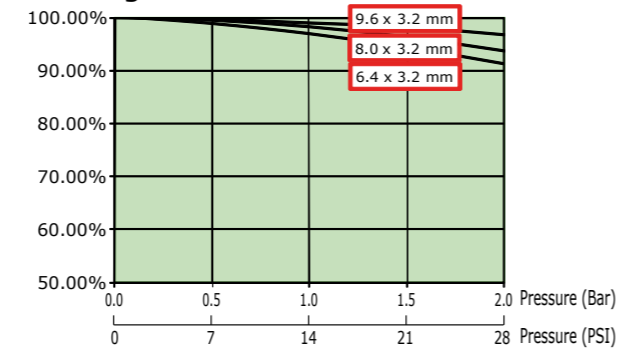
EV3000 Free Flow Curve



Suction



Discharge



Flow rates with water at 20 °C (68 °F)

Standard Ordering Options

No Tubing

UK plug	160.3000	VF ECONOMY EV 3000 No Tube VP UK
European Plug	160.3001	VF ECONOMY EV 3000 No Tube VP EU
US Plug	160.3002	VF ECONOMY EV 3000 No Tube VP US

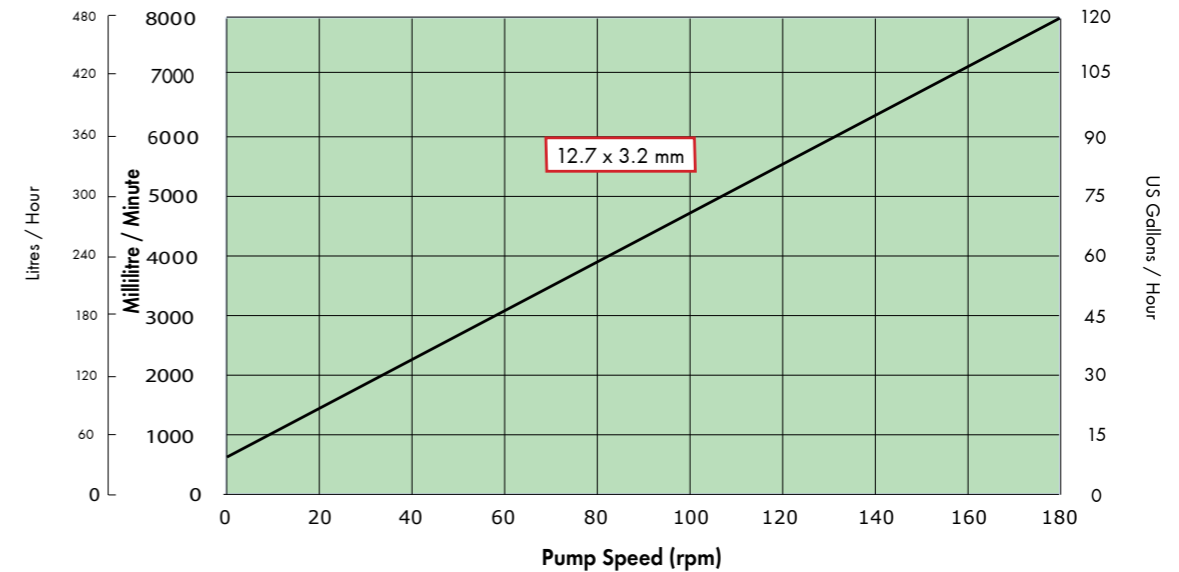
Tubing is ordered separately

MODEL EV8000

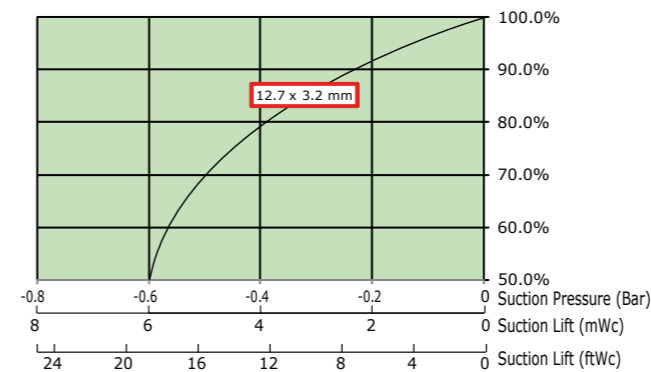
Tube	Verderprene, Silicone, Viton, Tygon
Power Supply	110/230V, 50/60Hz, 150W
Dimensions	W315 x H213 x D360mm (W12.4" x H8.4" x D14.2")
Weight	8.0kg (17.6lb)
Pumphead	M8000 Aluminium alloy, polyester coated with Acrylic protective cover
Rotor	Aluminium alloy, anodised finish. 3 rollers
Speed	0 to 180 rpm



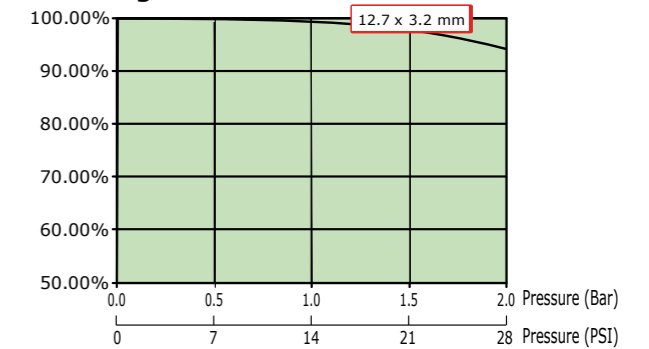
EV 8000 Free Flow Curve



Suction



Discharge



Flow rates with water at 20 °C (68 °F)

Standard Ordering Options

No Tubing

UK plug	160.8000	VF ECONOMY EV 8000 No Tube VP UK
European Plug	160.8001	VF ECONOMY EV 8000 No Tube VP EU
US Plug	160.8002	VF ECONOMY EV 8000 No Tube VP US

Tubing is ordered separately

Applications

The unique design of Verderflex peristaltic pumps makes them ideally suited to a wide range of applications, for example:

Shear sensitive applications

the very gentle pumping action does not damage the product.

Highly viscous products

the positive displacement action enables high viscosity liquids to be pumped.

Crystallising media

there are no valves or glands where crystals or product can build up and clog the pump.

Dosing requirement

the absence of product slip in the hose gives a 100% volumetric efficiency.

High maintenance situations

the tube is the only wearing part, and with a rapid changeover, downtime is minimal.

Self-priming applications

the pump can run dry without damage to the tube.

Potential blockages at suction port

pump can run dry and be reversed to unblock the suction line.



Market segments

Water treatment

Ferric Chloride, Hypochlorite, Polymer, Bisulphite

Chemical industry

corrosive acids, bases and hydrocarbons

Paints and coatings

Dosing of inks

Textile industry

Dosing of dyes

Paper and pulp

Pulp, dyes

Cosmetics

Colouring and dyes

Food and beverage

Breweries, wineries, dairies, sugar refining, bakeries, abattoirs and fish processing

Agriculture

Feed additives, animal vaccines and waste transfer.

Working With Verderflex

Peristaltic tube and hose pumps from Verderflex solve the world's pumping problems on abrasive, highly corrosive, viscous, high density and shear sensitive products.

The advantages of working with us are clear, we offer you:

Single-source solutions: Our wide and complementary range of pumps allows you to source your entire pumping needs from one company, reducing your costs

Expertise: years of providing pumping solutions to industry have given us valuable expertise and knowledge which we are able to use to supply the most appropriate and reliable pumps

International affiliated company: our size gives you the confidence that you are dealing with a substantial pump company.

Global Support

The Verderflex range is supported by a worldwide network of offices and independent distributors that provide local support and spares availability on all five continents.

THE VERDERFLEX FAMILIES OF TUBE PUMPS

VERDERFLEX SMART

The Verderflex® Smart series is an excellent, low dosage pump capable of handling viscous, abrasive and chemically aggressive media with total containment and leak free pumping. The range has four drive options allowing the pumps to be programmed with different functions. This means the pump can be operated either manually, remotely or through a pre-programmed control system.

Flow	Up to 27 l/min (428 US GPH)
Pressure range	0 - 2 bar (29 PSI)
Options	Remote control & dispensing options
Special feature	Tube changeover in seconds



VERDERFLEX INDUSTRIAL TUBE PUMPS

The Verderflex Industrial range of tube pumps provides a balanced selection of simple to operate peristaltic pumps. The family offers the customer pump choices that are compact, can have multiple heads, are simple by design, can have hazardous area ratings and the Smart series provides rapid tube changeovers.

Flow	Up to 27 l/min (428 US GPH)
Pressure range	0 - 2 bar (29 PSI)
Options	Stackable up to 4 heads
Special feature	Optional low pulsation 6 roller heads



VERDERFLEX SCIENTIFIC TUBE PUMPS

The programmable pump can dose single or repeat volumes, with a user defined time interval between jobs. Total pumping accuracy can be achieved using the calibration mode with a run back option to prevent spillages of hazardous liquids. Wide selection of tube options available.

Flow rates	From 0.8 ml/min (0.01 US GPH) up to 1.3 l/min (20.6 US GPH)
Available	Programmable & remote control versions, multiple head versions
Optional	IP66 protected enclosure
Features	Quick and easy tube change

