



Rotary Lobe Pumps vs Masterflex®

Application

A university research facility needs to pump cell media into a system containing cells (the cells are living off of the media in the system). This system is used to simulate a human circulatory system for research purposes; therefore a constant flow rate needs to be maintained.

Rotary Lobe Pump Disadvantages

- Difficult to pump precise flow rates
- Does not self-prime
- Cannot handle particulates
- Difficult to clean

Masterflex Advantages

- Easily maintains a precise, constant flow rate
- Excellent self-priming capabilities
- Able to handle shear-sensitive particulates/fluids
- Easy to change out tubing and clean/sterilize pump



Frequently Asked Questions about Masterflex® Pumps

Flow Rates

What flow rates are attainable?

Depending on which series you select, our systems deliver flow rates from 0.0005 mL/min to 45 LPM.

What flow precision can I expect?

You can obtain a flow precision of up to $\pm 0.5\%$ with calibrated flow systems. For other systems, $\pm 3\%$ precision is possible for general transfer applications.

Are measured volumes repeatable?

Yes. Volumes are repeatable with accuracies of $\pm 0.25\%$ or better using calibrated systems.

What is the effect of viscosity on flow?

All flow rates are based on water. Increasing the fluid viscosity will decrease the flow rate.

Pump Heads

What is the maximum pressure?*

The maximum pressure using P/S® High-pressure tubing is 100 psi (6.8 bar); nominal pressure is 25 psi (1.7 bar).

What is the maximum inlet pressure?*

Typically 40 psi (2.7 bar), depending on tubing ID, wall thickness, and formulation.

What is the maximum suction lift?

The maximum suction lift is 8.8 m H₂O (29 ft H₂O).

Are check valves required?

No. Our unique designs eliminate this need.

Can Masterflex pumps run dry?†

Yes. They can pump gases, liquids, or mixed phases.

Are Masterflex pumps self-priming?

Yes. They can develop a vacuum in excess of 660 mm Hg (26" Hg).

Are Masterflex pumps positive-displacement type pumps?

Yes. The flow rate with water is directly proportional to the rotor speed up to the maximum capabilities of the drive.

Are Masterflex pumps nonsiphoning?

Yes. One roller is always squeezing the tubing closed, so you don't get any backflow up to the rated pressure of the tubing/pump head.

Can slurries and abrasive solutions be pumped?

Yes. The limitations are viscosity and particle size relative to selected tubing ID.

Why are so many pump heads and tubing sizes offered?

To provide maximum flexibility in achieving desired flow at the optimal drive speed.

Is flow reversible?

Yes. All specifications apply in either clockwise or counterclockwise rotation.

Tubing

Is the tubing important?

Yes. The tubing is the pump chamber. The elasticity of the tubing provides suction lift; its strength provides pressure handling ability; its flexibility determines pumping life; its bore determines the flow rate; and its wall thickness determines pumping efficiency.

What are the temperature ranges of tubing?

The temperature range for tubing is from -73 to 232°C (-100 to 450°F).

What is the chemical resistance?

It depends on the tubing formulation you select.

How long will the tubing last?

Tubing life depends on pump speed and pressure, tubing material and chemical compatibility, and abrasiveness of the liquid (media) being pumped.

How does pump speed affect tubing life?

To put it simply, the lower the speed, the longer the life of the tubing.

What tubing formulation gives longest life?

In order, Norprene®, PharMed® BPT, PharmaPure®, Tygon® LFL, silicone, BioPharm Plus, C-FLEX®, Tygon®, and Viton® last the longest.

Is tubing available that is compatible for food and sterile applications?

Yes. Some tubing formulations meet NSF specifications, 3A, FDA, and USDA requirements for food handling. Many can be sterilized.

Is the tubing easy to replace?

Yes. The Easy-Load®, Easy-Load® II, Easy-Load® 3, High-performance, Multichannel cartridge, and Rapid-Load® pump heads make tubing changes quick and easy. Tubing in the Standard pump head is easy to change with the loading key provided.

Drives

Why are drives sold separately from pump heads in the P/S® and I/P® series?

The modular concept lets you customize your system for flexibility and economy.

Can a single drive run more than one pump head?

In many cases, two to four pump heads can be stacked in any combination up to the max torque capability of the drive.

Are drive systems other than those shown in this catalog available?

Yes. Our Engineering Department can customize, design, or modify a drive or drive package to your specifications for quantity purchases and OEM applications.

*PTFE-pump head can operate at pressures up to 100 psi.

†Except the PTFE-pump head which can overheat when run dry.