

# MASTERFLEX® Peristaltic Pumps— Ideal for Pumping Viscous Fluids

To maximize the pumping efficiency of viscous fluid, follow these steps.

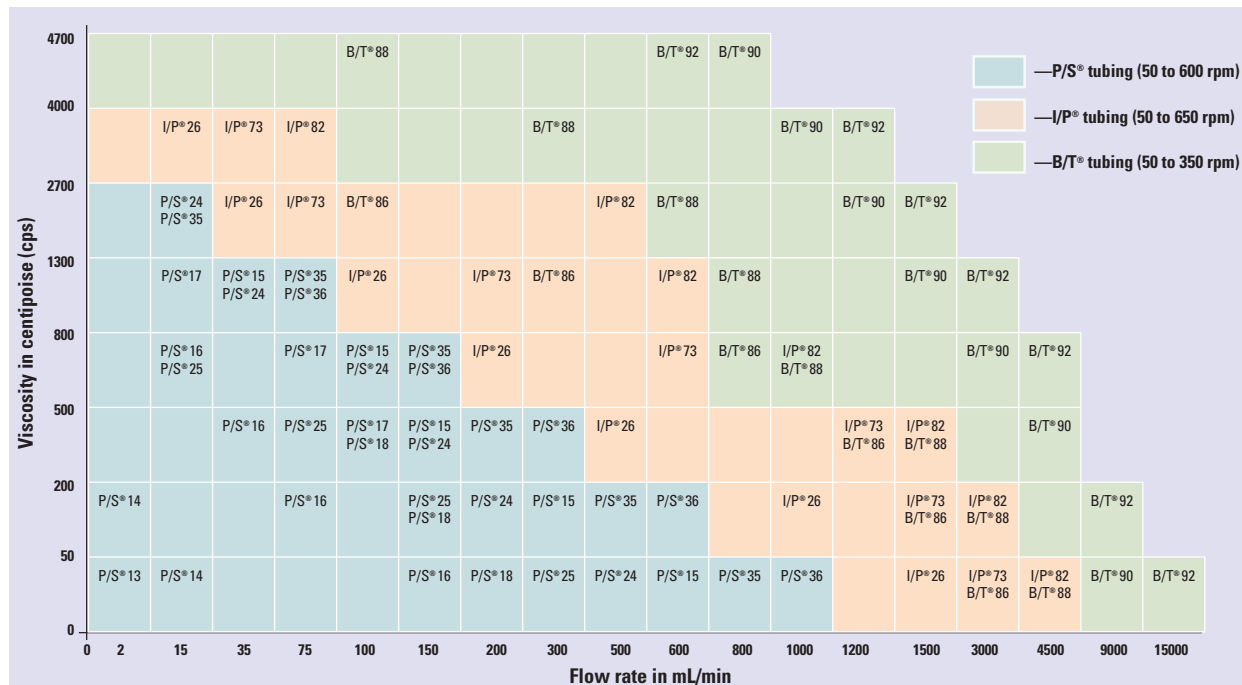
- 1. Slow down the speed of your pump.**  
Increasing the speed beyond a certain point will not have any effect on flow rate. The maximum efficient speed of the pump decreases as viscosity increases and tubing size decreases.
- 2. Choose a larger size tubing** than required to pump water. The table below will help you choose the best size.
- 3. Choose a firm tubing** such as Norprene®, PharMed® BPT, Viton®, or Tygon® LFL. Performance will be better because the tubing returns to its original shape quickly after pump head occlusion.

For P/S®, I/P®, and B/T® sizes, choose High-performance precision tubing—the thicker wall also returns more quickly to its original shape than precision tubing. The quicker return allows liquid to be pulled into the tubing with greater force.

- 4. Select a tubing with a smooth bore.**  
A smooth bore will decrease frictional forces. Tygon, Tygon LFL, silicone, or BioPharm silicone formulations are good choices.
- 5. Decrease the viscosity of your fluid.**  
Heat your fluid if possible; viscosity usually decreases with temperature.



## Tubing Selection Guide for Pumping Viscous Fluids



### How to use this graph

**Example:** You have a 800 centipoise fluid that you wish to pump at 150 mL/min. Find 150 mL/min on the “flow rate” axis of the graph above and find 800 centipoise on the “viscosity” axis. Follow the two points to where they meet. The graph shows that P/S\* 35 and P/S\* 36 tubing will produce the desired flow rate. These tubing sizes will also work for all lower viscosities and lower flow rates.

**Considerations:** All viscosity test data was obtained using firm tubing materials such as Norprene®, PharMed® BPT, Viton®, and Tygon® because these formulations perform the best in high-viscosity applications. Tests were performed with fluids at 21°C (0°F) and 0 psig (0 bar) of back pressure. The graph assumes Newtonian fluid behavior and is best used as a general guideline only; it is not a guarantee that you will achieve the results shown.

### Pulse Dampener

Virtually eliminates pulsation in your output flow. Features a polyethylene body and includes five pairs of fittings and PTFE pipe-thread tape.

- Accepted tubing: All P/S\* sizes and I/P\* 26
- Fittings included (tubing ID x NPT(M) thread):  
1/16" x 1/8", 1/8" x 1/8" PP fittings; 3/16" x 1/8", 1/4" x 1/8" and 3/8" x 1/8" HDPE fittings
- Dampener connections: 1/8" NPT(F)
- Volume, dead: 190 mL; internal: 60 to 180 mL
- Max. pressure: 60 psi (4.3 bar) at 21°C (70°F)

07596-20 Pulse dampener



TD-19