

Viscous fluids flow much slower than water-like fluids for several reasons including:

1. The fluid is more resistant to flow than water.
2. There are greater frictional forces between the wall of the tubing and a viscous fluid than water.

Peristaltic (tubing) pumps are ideal for pumping viscous fluids. To maximize the efficiency of a peristaltic pump system, follow these steps.

1. **Slow down the speed of your pump**, the fluid will only move into pump head up to a particular rate. Once this rate is achieved, increasing the motor speed will not increase flow rate. The maximum speed the system will pump efficiently decreases as viscosity increases and as tubing size decreases.
2. **Choose a larger size tubing** than what is required for pumping water. Choose approximate flow rates of various viscosity fluids at 100 rpm for different sizes of Masterflex L/S® tubing. Find the viscosity of the fluid you will be pumping, go across the graph horizontally to the flow rate you require and select the next larger size tubing. Using a larger tubing size allows you to run the pump efficiently at higher drive speeds.
3. **Choose a firm tubing** with a thick wall such as Norprene®, Viton® or Tygon®. Performance will be better because the tubing springs back into its original shape quicker after it is occluded in the pump head. This allows the liquid to be pulled into the tubing with greater force.
4. **Select a tubing with a smooth bore**. This will decrease the frictional forces. Tygon or silicone are good choices.
5. **Pressurize the inlet** to your pump slightly [less than 15-20psi (1-1.4bar)]. This will keep the inlet tubing full and allow more efficient pumping.
6. **Decrease the viscosity of your fluid**. Heat your fluid if possible, viscosity usually decreases with temperature.

Selecting the proper size and type of tubing for pumping viscous fluids is an inexact science. Use the above tips as a general guide, and remember experimentation is the best way to select the correct tubing for your application.

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