

Selection of peristaltic pump tubing.



PRESSURE : Every pumping system always has some degree of back pressure. Whether as a result of pumping fluid through a spray nozzle or other or simply due to friction within the transport line. Pressure in the pump will generally increase as the fluid is directed to an elevated outlet or as the length of the transport line increases. All tubing materials have a recommended pressure limit, and as a rule the pressure resistance of a tube decreases as the diameter increases. Exceeding the pressure limits of a tubing will decrease its life and lead to tubing rupture.

CHEMICAL ATTACK : Pump performance is often critically affected if the tubing is incompatible with the chemical being handled. Chemical attack can manifest itself in different ways - certain fluids (in particular concentrated acids or solvents) can leach material components of the tube out of the walls, causing shrinkage and dramatically altering performance. Other types of chemical attack can lead to absorption and swelling or brittleness which will shorten tube life. The chemical resistance to a particular fluid should always be checked when selecting tubing, and it is always recommended that the tube be tested under realistic conditions using the chemical in question to confirm suitability.

COMPRESSION : By their very nature, peristaltic pumps work by occluding, or compressing, the tubing. The degree of compression for a particular tubing directly affects its flexural fatigue and consequently its long-term performance and overall life. This can be controlled by using appropriate tube wall thicknesses for the particular pump design, and by using a tube extruded with consistently tight tolerances to minimise any variation in wall thickness. As a general rule, compression greater than 25% will significantly reduce the working life of the tube.

PUMP ROTATIONAL SPEED : Every revolution of a peristaltic pump head will cause a minute degree of wear on the tubing. As the tubing is compressed by the pump rollers it is occluded and squeezed and then released allowing a short period of recovery time before the next compression in the cycle. Each tubing material has different characteristics relating to this and some materials are far more tolerant and resistant to compression than others. The number of impacts / compressions a tube can withstand is finite and therefore tubing life within a peristaltic pump is based on the revolutions per minute and number of rollers within the pump. Life can often be greatly extended by specifying a larger pump running at much slower rotational speed.

There are a variety of other factors which all contribute to the durability of tubing in a peristaltic pump - friction between the pump body, tube, and rollers, the amount and type of lubrication, correct installation of the tube (to avoid kinks and twisting), ambient temperature and fluid temperature, particulates in the fluid, and fluid viscosity can all have a significant effect on tube life and pump efficiency. To discuss tubing selection in your own particular pumping systems please Contact Us

Here at the Williamson Manufacturing Company Ltd we have nearly two decades of experience in the design and manufacture of peristaltic pumps and know that the selection of the right tubing for the right application is critical to the success or failure of a particular pump. We have tested extensively and worked in conjunction with many of the worlds biggest tubing manufacturers to ensure that tube is always of the highest quality and offers the best life and performance for any given application. No peristaltic pump tubing has an infinite life - it is a wearing part within the pump and is the component which is in direct contact with the (often chemically aggressive) fluid being handled by the pump. By following some simple guidelines when selecting tube, tube life can be optimised and the performance of the pump made as efficient as possible.