

Key Features for Peristaltic Pump Tubing Selection

The information presented is intended to serve as a guide for selection and specification of peristaltic pump tubings. It is always advisable to test the material under actual service conditions. If field testing is not practical, laboratory tests that simulate field conditions should be employed.

Tubing Life Factors

As a leader in the field of pump tubings, Saint-Gobain has conducted extensive testing to determine the factors that affect tubing life in peristaltic pump applications. No tubing will last forever but by following some simple guidelines, tubing life can be extended. By using the information contained in this brochure, systems can be designed to obtain optimum pump tubing life.

Chemical Attack

One of the key factors affecting pump tubing performance is the fluid being transported. Chemical attack leads to absorption or swelling of the tubing, which will shorten tubing life. The chemical resistance to a specific fluid should always be determined when selecting a pump tubing.

Pressure

Every pumping system always has some degree of back pressure. Pressure will generally increase as the transport line is lengthened or is directed to an elevated outlet. Exceeding the pressure limits of a tubing will decrease its life and lead to tubing rupture.

Pump RPM

The factor with the greatest influence on pump tubing life is the pump rpm rate. As the tubing is impacted by the rollers, it is compressed, squeezed and then released to allow for recovery and a repeat of the flexing cycle. Various tubing materials exhibit different degrees of resistance to this flexural fatigue. The number of impacts a given tubing is able to withstand is finite. Therefore, tubing life expectancy is based on rpm's and the number of rollers in the pump head.

Wall Compression

The percent to which a pump roller occludes or compresses a tubing also affects its flexural fatigue. This can be controlled by using proper tubing wall thickness for the pump and by using a tubing extruded with consistently tight tolerances to minimize wall thickness variation. Our tests have shown that compression exceeding 25% will significantly shorten pump tubing life.

Viscosity

When highly viscous liquids are to be pumped, a tubing product with high working pressure or vacuum rating should be selected. These ratings are obtained by use of a heavy wall thickness or a material with a higher durometer hardness value.

Torque

Low horsepower or low torque pumps require the use of soft low durometer hardness products (or low tensile modulus) to prevent damage to the motor.

Spallation

Tubing breakdown caused by the pump design generates minute particles in the flow stream, which are a normal condition of tubing wear during peristaltic pump use. Selection of a low spallation tubing product in the proper size for the model pump used will minimize the generation of these particles, if this is a concern in the application or process.

Other Factors or Conditions

Other factors for consideration to achieve optimal pump tubing life include proper installation of tubing in the pump (avoid twisting and kinking), frictional drag by the roller or roller guides and temperature of the fluid being transported, as well as the operational environment.