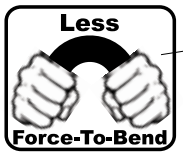
Bend Radius: The minimum bend radius of a hose is an important factor in hose selection if it will be subject to sharp curvatures in normal use. The bend radius (calculated in a lab environment, applications may vary) is measured as the distance to the inside edge of the hose (not the center line) when making a 90° bend. When bent at too sharp an angle, the reinforcement may be unduly stressed or distorted, thereby shortening the hose life. Textile reinforced hoses have a tendency to kink as the bend radius is reduced. Generally, a "helix" is used when a hose must withstand severe bends without flattening or kinking.

SPECIAL NOTE: Perhaps more important in determining flexibility in an application, the "force-to-bend" is defined as the amount of stress required to induce bending around a specified bend radius. Some hoses with thick walls, large bores, short lengths, or heavy duty construction will NOT bend easily without significant physical exertion.



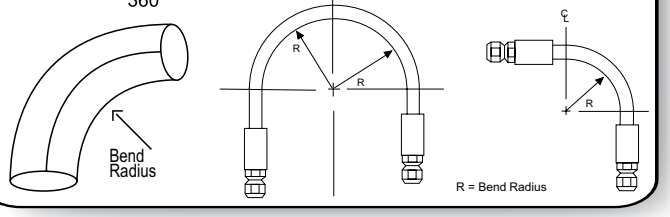
Look for this logo to find the hoses that offer the "best in class" force-to-bend rating!

General formula to determine bend length:

$\frac{\text{Angle of Bend}}{360^\circ} \times 2\pi r$ = minimum length of those to make bend
r = given bend radius of hose

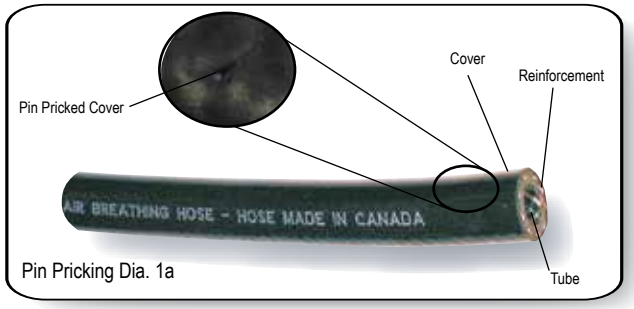
Example: to make a 90° bend with a hose with a 2" I.D. Given r = 4.5 inches

$\frac{90^\circ}{360^\circ}$ [2 x 3.14 x 4.5] ℄ .25 x 2 x 3.14 x 4.5 = 7"



Pin-Pricked Hose Cover: Pin-pricking a hose cover permits trapped gases or vapours to escape from the hose carcass. Steam, air, and other gaseous products can permeate (pass slowly) through the tube and will build up in the reinforcement area - so the manufacturer must "pin-prick" the cover on certain hoses *(see diagram 1a)*. This process is performed by a wheel that passes along the hose when it is pulled from the mandrel, pricking the cover in a series of uniform punctures that stop at the layer of reinforcement.

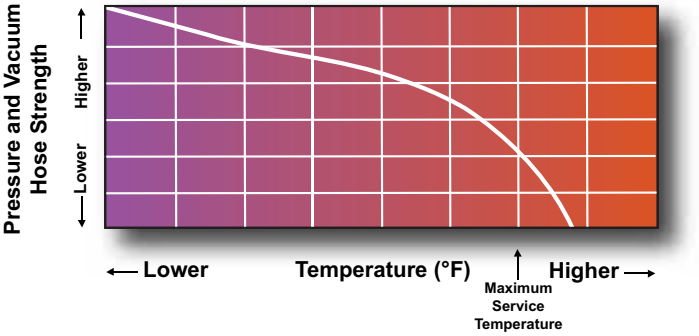
Pin-pricks are often mistaken for "holes" in the cover of a brand new hose. Although a pin-prick should never noticeably leak or weep product from the hose, they are visible and normal. Without the pin-pricks, bubbles or blisters would start to appear in the cover of the hose. In the very rare instance of a manufacturer defect, the pin-pricks may go too deep (or too shallow) into the hose carcass (due to wall thickness fluctuations) and thereby physically leak or bubble.



Pin Pricking Dia. 1a

Working Pressure: The maximum allowable working pressure assigned to a hose product is based on the hose in a laboratory environment, in new condition, a straight length and at 20°C or 68°F. Hoses produced by Rubber Manufacturers Association (RMA) standards ensure the hose is built with a basic safety factor. Do not operate a hose assembly over its rated working pressure. An assembly rated working pressure is the working pressure of the lowest component (usually the fitting or clamp). It is very important to note that as operating or environment temperatures increase, the rated working pressure of the hose or assembly can rapidly decrease.

Temperature Derating Factors: System temperature is affected by both the media and the environment. As temperatures go up, maximum rated working pressures of the hose, fitting, or clamp can rapidly diminish. *See Pressure vs. Temperature Chart listed later in this section.* Which is a guide to help with "derating" allowable pressures as temperatures rise. As an example, a 300psi air hose assembly (see "all other" line) with ground joint couplings that is running at 200 deg/f must be derated at x.42, which puts the maximum rated pressure (including surges) at 126 psi.



More detailed Pressure vs. Temperature Application Chart listed later in this section.

Electrical Grounding: Static wires or a wire helix can prevent static electricity from building up to the point where it can arc at the assembly connection point. This static build up is created from the friction generated by the fast moving products being conveyed. In order for a hose to provide electrical continuity, the wire must properly contact the hose fittings.

Safety Factor: All hose has a minimum burst point or a safety factor. As an example, an air hose with a 100psi working pressure and a 4:1 safety factor has a minimum burst of 400psi, or 4 times the working pressure. However, the working pressure and safety factor of an assembly can be significantly altered if incorrect fittings or clamps are used. Common safety factors are: Air & Multiple Purpose Hose - 4:1; Petroleum & Chemical - 4:1; Water Hose - 3:1 -, Steam Hose 10: 1. Contact us for information on other types of hoses.

Suction & Vacuum: The term *Suction* generally is used with liquids and materials. The term *Vacuum* generally is used with air under partial vacuum. Vacuum hose does not require the heavy construction of suction hose because the dry materials or air being conveyed is much lighter than liquids or solids.

Testing & Certification: Hoses that will be used in critical applications and require fail safe service should be fully certified prior to service and at regular intervals for the life of the hose. Depending on the application, the certification process is quite involved and requires more than a simple hydrostatic test. Petroleum, steam, chemical, fire, and marine hoses are several hoses that are typically tested and should be done by qualified, trained personnel only.