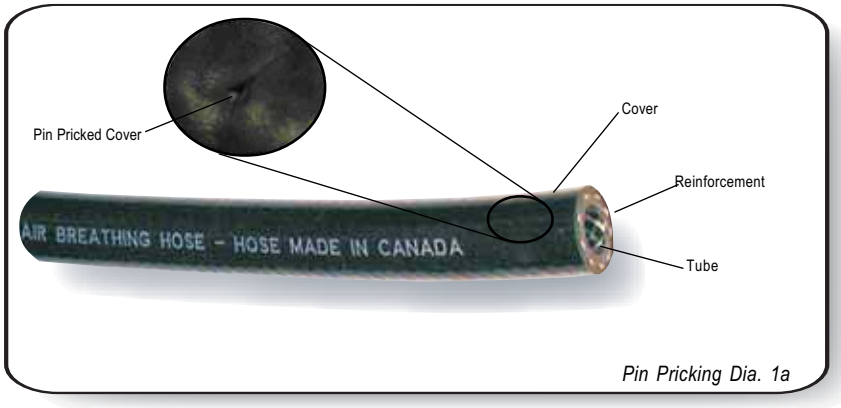
Bend Radius: The minimum bend radius of a hose is an important factor in hose selection if it will be subject to sharp curvatures in normal use. The bend radius (calculated in a lab environment, applications may vary) is measured as the distance to the inside edge of the hose (not the center line) when 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.

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.

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 into the hose carcass (due to wall thickness fluctuations) and thereby physically leak, or not far enough which would cause the cover to bubble.



Pin Pricking Dia. 1a

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.

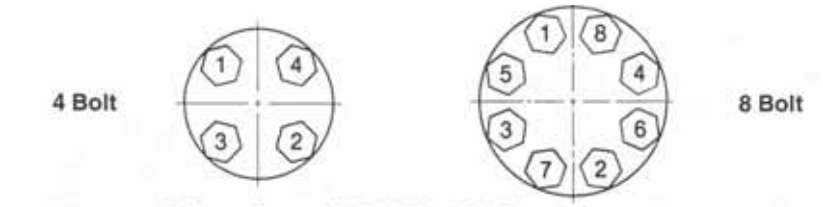
Suction & Vacuum: The term *Suction* generally is used with liquids and materials. The term *Vacuum* generally is used with air under partial vacuum. Vacuum hose does not require the heavy construction of suction hose because the dry materials or air being conveyed is much lighter than liquids or solids.

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.

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 an assembly over its rated working pressure, which is the working pressure of the lowest component (usually the fitting or clamp).

Flange Bolt Tightening Sequence Chart

Always be sure to use approriate gaskets & bolts.



Dimensions of 150 LB. ASA Steel Flanges

Nominal Pipe Size	Flange O.D.	Thickness*	O.D. of Raised Face	Dia. of Bolt Circle	# of Bolts	Dia. of Bolt Holes	Dia. of Bolts
1"	4 1/2"	9/16"	2"	3 1/8"	4	5/8"	1/2"
1 1/2"	5"	11/16"	2 7/8"	3 7/8"	4	5/8"	1/2"
2"	6"	3/4"	3 5/8"	4 3/4"	4	3/4"	5/8"
2 1/2"	7"	7/8"	4 1/8"	5 1/2"	4	3/4"	5/8"
3"	7 1/2"	15/16"	5"	6"	4	3/4"	5/8"
4"	9"	15/16"	6 3/16"	7 1/2"	8	3/4"	5/8"
5"	10"	15/16"	7 5/16"	8 1/2"	8	7/8"	3/4"
6"	11"	1"	8 1/2"	9 1/2"	8	7/8"	3/4"
8"	13 1/2"	1 1/8"	10 5/8"	11 3/4"	8	7/8"	3/4"

* 1/16" raised face is included in the thickness.

Conversions

Visit www.onlineconversion.com for quick and easy conversions or others not listed.

Sizes & Lengths

1 Inch = 25.4 Millimeters (mm)
1 Inch = 2.54 Centimeters (cm)
1 Foot = 30.48 Centimeters (cm)
1 Yard = .914 Meters (m)
1 Mile = 1.609 Kilometers (km)
1 Mile = 5280 Feet (ft)
1 Millimeter = .039 Inches (in)
1 Centimeter = .394 Inches (in)
1 Meter = 3.2808 Feet (ft)
1 Meter = 1.09 Yards (yd)
1 Kilometer = .6214 Miles (mi)
1 Acre = 43,560 sq/ft

Volume & Flow

1 Liter = 1000 Milliliters
1 Liter = .2642 US Gallon
1 Liter = 33.814 fluid ounces
1 Milliliter = 0.0338 fluid ounces
1 ounce = 29.5735 milliliters
1 Quart = .95 liters or 32 fluid ounces
1 US gpm = 0.1337 cubic ft/minute
1 US Gallon = 3.785 Liters
1 US Gallon = 128 US oz
1 Imp Gallon = 1.201 US Gallons
1 Imp Gallon = 4.546 Liters
1 Imp Gallon = 160 Imperial Ounces
1 Barrel = 42 US Gallons

Pressure

1 psi = 6.895 Kilopascals (kpa)
1 psi = 0.06895 bar
1 psi = 0.006895 Megapascals (MPa)
1 psi = 2.309 Feet of Hydraulic Head
1 kilopascal = .145 psi
1 bar = 14.5 psi
30 In/hg = 34 feet of water
10 ft vert. height of water column=4.33 psi

Weight & Force

1 Ounce = 28.349 Grams (g)
1 Pound = .454 Kilograms (kg)
1 Pound = 453.59 Grams
1 Gram = .035 Ounces (oz)
1 Kilogram = 2.205 Pounds (lb)
1 Pound-Force = 4.44822 Newtons
1 Cubic Ft of water = 62.4 lbs
1 Imp Gallon of water = 10 lbs

Saturated Steam

25 psi = 130C (267F)
50 psi = 148C (298F)
100 psi = 170C (338F)
150 psi = 186C (366F)
200 psi = 198C (388F)
250 psi = 208C (406F)
300 psi = 216C (422F)
350 psi = 225C (437F)

Temperature

F to C: subtract 32 and multiply by .556
C to F: multiply by 1.8 and add 32

Power

1 HP= 745.7 Watts
1 HP produces approx. 3.75 CFM of air at 100 psi
1 HP produces approx. 1 GPM of hydraulic fluid at 1500 psi