

General Hose Information

Steam Temperatures

Temperatures of Saturated Steam at Various Pressures

Lbs. Per Sq. Inch Pressure	Degrees Fahrenheit	Degrees Centigrade	Lbs. per Sq. Inch Pressure	Degrees Fahrenheit	Degrees Centigrade
0	212.0	100.0	110	344.1	173.4
5	227.1	108.4	115	347.2	175.1
10	239.4	115.2	120	350.1	176.7
15	249.8	121.0	125	352.9	178.3
20	258.8	126.0	130	355.6	179.8
22	261.2	127.8	135	358.3	181.3
24	265.3	129.6	140	360.9	182.7
26	268.3	131.3	145	363.4	184.1
28	271.2	132.9	150	365.9	185.5
30	274.1	134.5	155	368.2	186.8
32	276.8	136.0	160	370.6	188.1
34	279.3	137.4	165	373.9	189.4
36	281.8	138.8	170	375.3	190.7
38	284.4	140.2	175	377.4	191.9
40	286.7	141.5	180	379.6	193.1
42	289.0	142.8	185	381.7	194.3
44	291.2	144.0	190	383.7	195.4
46	293.5	145.3	195	385.9	196.6
48	295.5	146.4	200	387.9	197.7
50	297.7	147.6	205	398.8	198.8
52	299.9	148.7	210	391.6	199.8
54	301.6	149.8	215	392.9	200.5
56	303.6	150.9	220	395.4	201.7
58	305.4	151.9	225	397.2	202.9
60	307.4	153.0	230	399.0	203.9
62	309.2	154.0	235	400.7	204.8
64	310.8	154.9	240	402.5	205.8
66	312.6	155.9	245	404.2	206.8
68	314.2	156.8	250	406.1	207.8
70	316.0	157.0	255	407.7	208.7
72	317.7	158.7	260	409.4	209.7
74	319.3	159.6	265	411.0	210.6
76	320.9	160.5	270	412.6	211.4
78	322.3	161.3	275	414.2	212.3
80	323.8	162.1	280	415.7	213.2
85	327.6	164.2	300	421.0	216.1
90	331.2	166.2	350	436.5	224.7
95	334.6	168.1			
100	337.8	169.9			
105	341.1	171.7			

WARNING Steam heat is hotter than 212°F (boiling water) and increases in temperature as pressure increases.

General Hose Information

Flow Capacities

Flow Capacities of Hose Assemblies at Suggested Flow Velocities

The chart below is designed and provided as an aid in the determination of the correct hose size.

Example: At 13 U.S. gallons per minute, what is proper hose size within the suggested velocity range for pressure lines?

Solution: Locate 13 U.S. gallons per minute in the left hand column and 10 feet per second in the right hand column (the center of the suggested velocity range for pressure lines). Lay a straightedge across the two points. The inside diameter is shown in the center column nearest the straight edge.

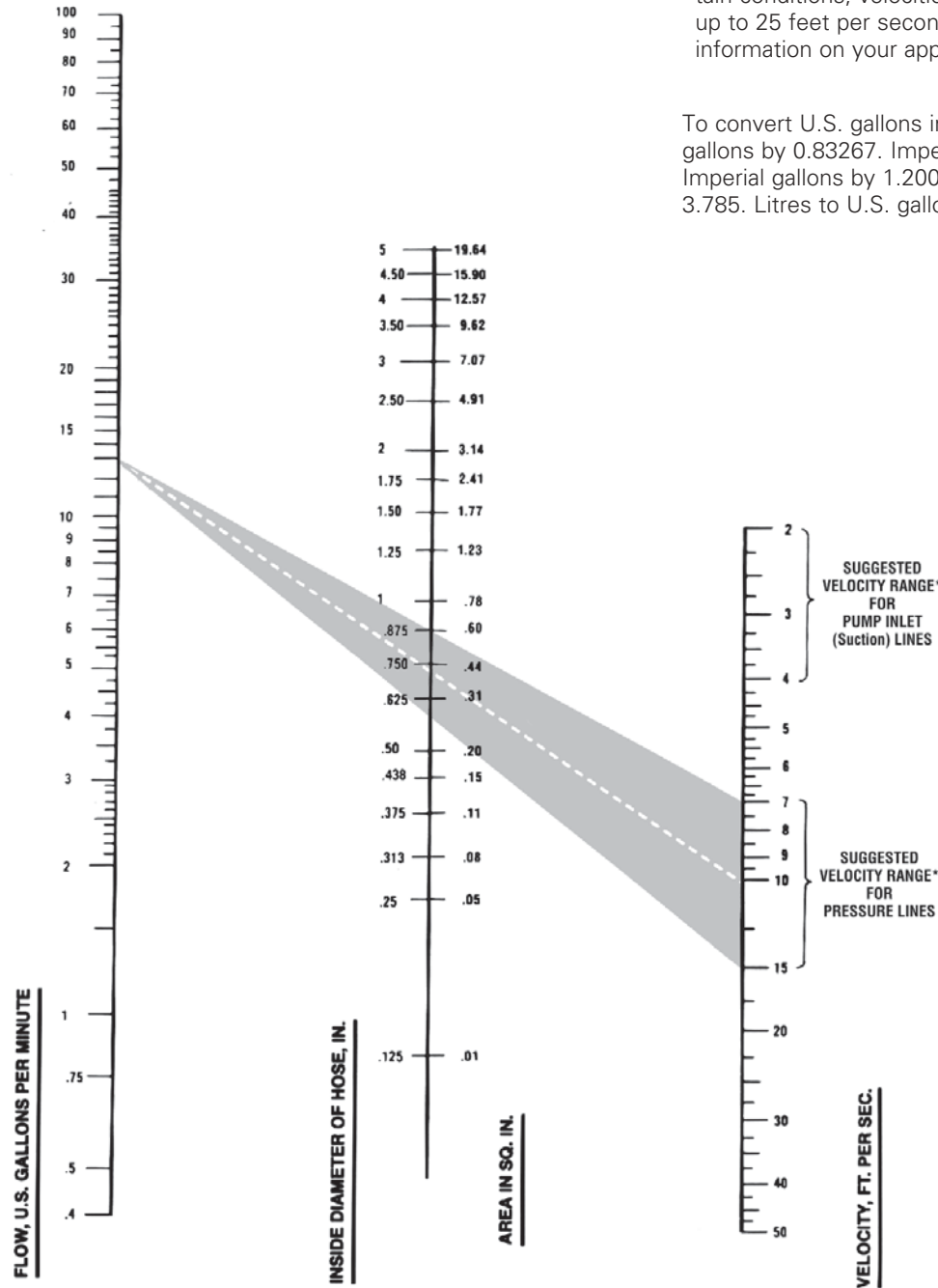
For suction hose, follow the same procedure except use suggested velocity range for pump inlet lines in the right hand column.

Based on Formula

$$\text{AREA (SQ. IN.)} = \frac{\text{G.P.M.} \times 0.3208}{\text{VELOCITY (FT./SEC.)}}$$

*Suggestions are for oils having a maximum viscosity of 315 S.S.U. at +100°F (+38°C) and operating at temperatures between +65°F and +155°F (+54°C to +69°C). Under certain conditions, velocities in pressure lines can be increased up to 25 feet per second. Contact Aeroquip with specific information on your application.

To convert U.S. gallons into Imperial gallons multiply U.S. gallons by 0.83267. Imperial gallons into U.S. gallons multiply Imperial gallons by 1.20095. U.S. gallons to litres multiply by 3.785. Litres to U.S. gallons, multiply by 0.2642.



General Hose Information

Elastomer Chart

The chart below shows the general characteristics of some of the common rubber compounds. Elastomers are mixed with various chemicals to provide a wide range of physical properties for specific service needs.

ASTM Designation	Common Name	Composition	General Properties
CR	Neoprene	Chloroprene	<ul style="list-style-type: none"> • Good abrasion • Good weathering resistance • Good oil resistance • Flame retarding
NBR	Nitrile (Buna-N)	Acrylonitrile-butadiene	<ul style="list-style-type: none"> • Excellent oil resistance • Moderate resistance to aromatics
IIR	Butyl	Isobutylene-isoprene	<ul style="list-style-type: none"> • Excellent ozone resistance • Good resistance to fire resistant fluids • Good heat resistance • Low permeability • Poor resistance to petroleum fluids
CIIR	Chlorinated Butyl	Chloro-isobutylene isoprene	<ul style="list-style-type: none"> • Same as Butyl
SBR	SBR	Styrene-butadiene	<ul style="list-style-type: none"> • Good abrasion resistance • Poor resistance to petroleum fluids
EPDM	EPDM	Ethylene-propylene diene terpolymer	<ul style="list-style-type: none"> • Excellent ozone resistance • Good chemical resistance • Good temperature resistance • Poor resistance to petroleum fluids
XLPE	Cross-Linked Polyethylene	Polyethylene & cross linking agents	<ul style="list-style-type: none"> • Excellent chemical resistance
EVA	EVA	Ethylvinylacetate	<ul style="list-style-type: none"> • Excellent flexibility • Chemical resistance
LLDPE	Linear, low density Polyethylene	Linear, low density Polyethylene	<ul style="list-style-type: none"> • Excellent ESCR resistant • FDA Approved NSF 51 material available
Nylon 11	Nylon 11	Nylon 11	<ul style="list-style-type: none"> • Good chemical resistance
PVC/PU Blend	PVC/PU Blend	Polyvinyl flouride/polyurethane Blend	<ul style="list-style-type: none"> • Excellent chemical resistance
PVDF	KYNAR®	Polyvinylidene flouride	<ul style="list-style-type: none"> • Excellent Chemical resistance.
PA	Nylon	Polyamide	<ul style="list-style-type: none"> • Good abrasion resistance • Good chemical resistance • Low coefficient of friction
CSM	Hypalon	Chloro-sulfonated Polyethylene	<ul style="list-style-type: none"> • Excellent ozone resistance • Good abrasion resistance • Good heat resistance • Fair petroleum qualities
NR	Natural Rubber	Polyisoprene	<ul style="list-style-type: none"> • Excellent abrasion resistance • Acid resistance • Not oil resistant
V-NBR	Vinyl Nitrile	PVC/NBR	<ul style="list-style-type: none"> • Good ozone resistance • Good resistance to animal fats & oils • Good petroleum resistance
UHMWPE	Ultra-high molecular weight polyethylene	Polyethylene	<ul style="list-style-type: none"> • Excellent chemical resistance • Moderate heat resistance • Excellent abrasion resistance • FDA-accepted material
CM	CPE	Chlorinated Polyethylene	<ul style="list-style-type: none"> • Excellent ozone resistance • Excellent weathering resistance • Good abrasion resistance • Good heat resistance • Good resistance to petroleum oils
XNBR	Carboxylated Nitrile	Carboxylated Acrylonitrile-butadiene	<ul style="list-style-type: none"> • Excellent abrasion resistance • Excellent oil resistance • Excellent weather resistance
PTFE	Teflon	Polytetrafluoroethylene	<ul style="list-style-type: none"> • Excellent temperature resistance • Excellent chemical resistance • FDA accepted material • Low coefficient of friction for high flow rates and easy cleaning • Excellent resistance to thermocycling
PVC	PVC	Polyvinylchloride	<ul style="list-style-type: none"> • Resistant to many chemicals • Good Flexibility
FEP	Teflon	Fluorinated Ethylene Propylene	<ul style="list-style-type: none"> • Excellent temperature resistance • Excellent chemical resistance • FDA accepted material • Low coefficient of friction for high flow rates and easy cleaning • Excellent resistance to thermocycling

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General Hose Information

Mass Equivalents Chart

Mass Equivalents Table

Pounds (lb)	Grams (g)	Kilograms (kg)	Tons	Ounces (oz)
1	453.5930	0.4536	0.0005	16
10	4,535.9300	4.5359	0.0050	160
20	9,071.8600	9.0719	0.0100	320
30	13,607.7900	13.6078	0.0150	480
40	18,143.7200	18.1437	0.0200	640
50	22,679.6500	22.6797	0.0250	800
60	27,215.5800	27.2156	0.0300	960
70	31,751.5100	31.7515	0.0350	1,120
80	36,287.4400	36.2874	0.0400	1,280
90	40,823.3700	40.8234	0.0450	1,440
100	45,359.3000	45.3593	0.0500	1,600
120	54,431.1600	54.4312	0.0600	1,920
130	58,967.0900	58.9671	0.0650	2,080
140	63,503.0200	63.5030	0.0700	2,240
150	68,038.9500	68.0390	0.0750	2,400
160	72,574.8800	72.5749	0.0800	2,560
170	77,110.8100	77.1108	0.0850	2,720
180	81,646.7400	81.6467	0.0900	2,880
190	86,182.6700	86.1827	0.0950	3,040
200	90,718.6000	90.7186	0.1000	3,200
210	95,254.5300	95.2545	0.1050	3,360
220	99,790.4600	99.7905	0.1100	3,520
230	104,326.3900	104.3264	0.1150	3,680
240	108,862.3200	108.8623	0.1200	3,840
250	113,398.2500	113.3983	0.1250	4,000
260	117,934.1800	117.9342	0.1300	4,160
270	122,470.1100	122.4701	0.1350	4,320
280	127,006.0400	127.0060	0.1400	4,480
290	131,541.9700	131.5420	0.1450	4,640
300	136,077.9000	136.0779	0.1500	4,800
310	140,613.8300	140.6138	0.1550	4,960
320	145,149.7600	145.1498	0.1600	5,120
330	149,685.6900	149.6857	0.1650	5,280
340	154,221.6200	154.2216	0.1700	5,440
350	158,757.5500	158.7576	0.1750	5,600
360	163,293.4800	163.2935	0.1800	5,760
370	167,829.4100	167.8294	0.1850	5,920
380	172,365.3400	172.3653	0.1900	6,080
390	176,901.2700	176.9013	0.1950	6,240
400	181,437.2000	181.4372	0.2000	6,400

Mass = 1 kg = 0.001 metric ton = 2.20462 lb_m = 35.27392 oz

1 lb_m = 16 oz = 5 x 10⁻⁴ ton = 453.593 g = 0.53593 kg

Length = 1 m = 100 cm = 1000 mm = 10⁶ microns (μm) = 10¹⁰ angstroms (Å)

= 39.37 in = 3.2808 ft = 1.0936 yd = 0.0006214 mile

General Hose Information

Temperature and Pressure Conversion Chart

Temperature Conversions Chart

Degrees F (Fahrenheit)	Degrees K (Kelvin)	Degrees C (Celsius)	Degrees F (Fahrenheit)	Degrees K (Kelvin)	Degrees C (Celsius)
-40	233.15	-40.00	240	513.15	115.56
-20	253.15	-28.89	260	533.15	126.67
0	273.15	-17.78	280	553.15	137.78
20	293.15	-6.67	300	573.15	148.89
40	313.15	4.44	320	593.15	160.00
60	333.15	15.56	340	613.15	171.11
80	353.15	26.67	360	633.15	182.22
100	373.15	37.78	380	653.15	193.33
120	393.15	48.89	400	673.15	204.44
140	413.15	60.00	420	693.15	215.56
160	433.15	71.11	440	713.15	226.67
180	453.15	82.22	460	733.15	237.78
200	473.15	93.33	480	753.15	248.89
220	493.15	104.44	500	773.15	260.00

Pressure Conversions Chart

psi (lbs/square inch)	kPa (kilo pascals)	bar	atm	mm Hg	psi (lbs/square inch)	kPa (kilo pascals)	bar	atm	mm Hg
0	0.00	0.00	0.00	0.00	250	1,723.68	17.25	17.01	12,928.69
10	68.95	0.69	0.68	517.15	260	1,792.63	17.93	17.69	13,445.84
20	137.89	1.38	1.36	1,034.30	270	1,861.58	18.62	18.37	13,962.98
30	206.84	2.07	2.04	1,551.44	280	1,930.53	19.31	19.05	14,480.13
40	275.79	2.76	2.72	2,068.59	290	1,999.47	19.99	19.73	14,997.28
50	344.73	3.45	3.40	2,585.74	300	2,068.42	20.68	20.41	15,514.43
60	413.68	4.14	4.08	3,102.89	310	2,137.37	21.37	21.09	16,031.57
70	482.63	4.83	4.76	3,620.03	320	2,206.31	22.06	21.77	16,548.72
80	551.58	5.52	5.44	4,137.18	330	2,275.26	22.75	22.46	17,065.87
90	620.53	6.21	6.12	4,654.33	340	2,344.21	23.44	23.14	17,583.01
100	689.47	6.89	6.80	5,171.48	350	2,413.16	24.13	23.82	18,100.16
110	758.42	7.58	7.49	5,688.62	400	2,757.89	27.58	27.22	20,685.90
120	827.37	8.27	8.17	6,205.77	450	3,102.63	31.03	30.62	23,271.64
130	896.31	8.96	8.86	6,722.92	500	3,447.37	34.47	34.02	25,857.38
140	965.26	9.65	9.53	7,240.07	1,000	6,894.73	68.95	68.05	51,714.75
150	1,034.21	10.34	10.21	7,757.21	1,250	8,618.41	86.18	85.06	64,643.44
160	1,103.16	11.03	10.89	8,274.36	1,500	10,342.10	103.42	102.07	77,572.12
170	1,172.10	11.72	11.57	8,791.50	1,750	12,065.78	120.66	119.08	90,500.81
180	1,241.05	12.41	12.25	9,308.66	2,000	13,789.47	137.90	136.09	103,429.50
190	1,309.99	13.10	12.93	9,825.80	2,250	15,513.15	155.13	153.10	116,358.19
200	1,378.95	13.79	13.61	10,342.95	2,500	17,236.83	172.37	170.11	129,286.88
210	1,447.89	14.48	14.29	10,860.10	2,750	18,960.52	189.60	187.13	142,215.57
220	1,516.84	15.17	14.98	11,377.25	3,000	20,684.20	206.84	204.14	155,144.26
230	1,585.79	15.86	15.66	11,894.39	4,000	27,578.93	275.79	272.18	206,859.01
240	1,654.74	16.55	16.33	12,411.54	5,000	34,473.67	344.74	340.23	258,573.76

Pressure = 1 atm = 1.01325 x 10⁵ N/m² (Pa)_a = 101.325 kPa = 1.01325 bars
 = 1.01325 x 10⁶ dynes/cm²
 = 760 mm Hg at 0°C (torr) = 10.333 m H₂O at 4°C
 = 14.696 lbf/in.² (psi) = 33.9 ft H₂O at 4°C
 = 29.921 in Hg at 0°C

General Hose Information

Flow Capacities Pressure Drop

Pressure drop in psi (pounds per square inch)/gpm (gallons per minute) for 10 feet of hose (smooth bore) without fittings.

Fluid specification:

Specific gravity = .85; Viscosity = ν = 20 centistokes (C.S.), (20 C.S. = 97 S.S.U.).

Hose Pressure Drop

Hose Dash Size →	-04		-05		-06		-08		-10		-12		-16		-20		-24		-32		-40		-48		
Hose I.D. (inches) ←	.19	.25	.25	.31	.31	.38	.41	.50	.50	.63	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.81	2.00	2.38	3.00			
.25	10	3.1	3.1																						
.50	19	6	6	2.7	2.7																				
1	40	12	12	5.5	5.5	2.4																			
2	95	24	24	10	10	4.8	3.5																		
3	185	46	46	17	17	7	5	2.2	2.2																
4		78	78	29	29	12	8	3	3	1.2	1.2														
5		120	120	44	44	18	12	4.5	4.5	1.6	1.6	.72													
8				95	95	39	26	10	10	3.6	3.6	1.4	.60												
10						59	40	15	15	5.7	5.7	2	1	.55											
12						80	52	20	20	7.2	7.2	2.6	1.5	.75	.43										
15							75	30	30	10	10	4.2	2.2	1.2	.67	.38									
18							107	40	40	15	15	6.3	3	1.5	.70	.55	.35								
20								49	49	19	19	8	3.4	2	1.1	.65	.43	.27							
25								72	72	26	26	11	5.5	3	1.6	1	.64	.40	.17						
30										34	34	14	7	3.6	2.2	1.3	.80	.52	.22	.14					
35										47	47	19	9.5	5	2.8	1.7	1.1	.70	.27	.18					
40												25	12	6.5	3.4	2.2	1.4	.90	.38	.24					
50												36	17	9	5.3	3.3	2	1.3	.54	.35	.15				
60												50	23	12	7.5	4.4	2.8	1.8	.75	.45	.20				
70													31	17	9.3	6	3.8	2.4	1	.65	.30				
80													38	21	12	7.1	4.6	3	1.2	.76	.34	.11			
90													49	27	15	9	5.9	3.8	1.5	1	.45	.13			
100														33	19	12	7	4.7	1.9	1.3	.55	.18			
150														60	36	22	13	8.5	3.4	2.2	1	.33			
200																36	23	15	6	3.9	1.7	.55			
250																	54	33	22	8.5	5.3	2.5	.75		
300																		45	29	12	7.5	4	1.1		
400																			51	21	14	6.5	2.2		
500																				32	20	10	3		
800																						18	5		
1000																								10	

U.S. Gallons per minute

*Pressure drop values listed are typical of many petroleum based hydraulic oils at approximately +100°F (+38°C). Differences in fluids, fluid temperature and viscosity can increase or decrease actual pressure drop compared to the values listed.

To Convert

U.S. gallons into Imperial gallons multiply U.S. gallons by 0.83267. Imperial gallons into U.S. gallons multiply Imperial gallons by 1.20095. U.S. gallons to litres multiply by 3.785. Litres to U.S. gallons, multiply by 0.2642.