

REFERENCE

Temperature Conversion Table							
°C	°F	°C	°F	°C	°F	°C	°F
100	212.0	75	167.0	50	122.0	25	77.0
99	210.2	74	165.2	49	120.2	24	75.2
98	208.4	73	163.4	48	118.4	23	73.4
97	206.6	72	161.6	47	116.6	22	71.6
96	204.8	71	159.8	46	114.8	21	69.8
95	203.0	70	158.0	45	113.0	20	68.0
94	201.2	69	156.2	44	111.2	19	66.2
93	199.4	68	154.4	43	109.4	18	64.4
92	197.6	67	152.6	42	107.6	17	62.6
91	195.8	66	150.8	41	105.8	16	60.8
90	194.0	65	149.0	40	104.0	15	59.0
89	192.2	64	147.2	39	102.2	14	57.2
88	190.4	63	145.4	38	100.4	13	55.4
87	188.6	62	143.6	37	98.6	12	53.6
86	186.8	61	141.8	36	96.8	11	51.8
85	185.0	60	140.0	35	95.0	10	50.0
84	183.2	59	138.2	34	93.2	9	48.2
83	181.4	58	136.4	33	91.4	8	46.4
82	179.6	57	134.6	32	89.6	7	44.6
81	177.8	56	132.8	31	87.8	6	42.8
80	176.0	55	131.0	30	86.0	5	41.0
79	174.2	54	129.2	29	84.2	4	39.2
78	172.4	53	127.4	28	82.4	3	37.4
77	170.6	52	125.6	27	80.6	2	35.6
76	168.8	51	123.8	26	78.8	1	33.8
						0	32.0

Temperature Conversion formulas °C = 5/9(°F-32) °F = 9/5(°C+32)

Hose Friction Loss

Water* Flow Gal/Min	Pressure Drop in PSI per 100 feet of Hose With Typical Water Flow Rates						
	Hose Inside Diameters, Inches						
	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
0.5	16	5	2				
1.0	54	20	7	2			
2.0	180	60	25	6	2		
3.0	380	120	50	13	4	2	
4.0		220	90	24	7	3	
5.0		320	130	34	10	4	
6.0			220	52	16	7	1
8.0			300	80	25	10	2
10.0				120	38	14	3
15.0				250	80	30	7
20.0					121	50	12
25.0					200	76	19
40.0					410	162	42
60.0						370	93

*At a fixed flow rate with a given size hose, the pressure drop across a given hose length will be directly proportional. A 50 foot hose will exhibit one-half the pressure drop of a 100 foot hose. Above values shown are valid at all pressure levels.

Suction, Head, Vapor Pressure						
Temp °F	Vapor Pressure	Suction lift or head @ altitude ft				
		0	2000	4000	8000	12000
60	0.6 ft water	20	17.5	15.5	11.5	7.5
70	0.8 ft water	19.5	17	15	11	7
80	1.2 ft water	19.5	17	15	11	7
90	1.6 ft water	19	16.5	14.5	10.5	6.5
100	2.2 ft water	18.5	16	14	10	6
110	2.9 ft water	17.5	15	13	9	5
120	3.9 ft water	16.5	14	12	8	4
130	5.1 ft water	15.5	13	11	7	3
140	6.7 ft water	14	11.5	9.5	5.5	1.5
150	8.6 ft water	12	9.5	7.5	3.5	-0.5
160	10.9 ft water	9.5	7	5	1	...
170	13.8 ft water	6.5	4	2	-2	...
180	17.3 ft water	3	0.5	-1.5	...	...
190	21.6 ft water	-1	-3.5	-5.5	...	...
200	26.6 ft water	-6	-8.5	...	...	...
210	32.6 ft water	-12	...	...	...	...
212	34.0 ft water	-13.5	...	...	...	...

$$\text{GPM} = \frac{\text{HP} \times 1460}{\text{PSI}}$$

$$\frac{\text{Rated GPM}}{\text{Rated RPM}} = \frac{\text{Desired GPM}}{\text{Desired RPM}}$$

$$\text{PSI} = \frac{\text{HP} \times 1460}{\text{GPM}}$$

$$\frac{\text{Motor Pulley OD}}{\text{Pump RPM}} = \frac{\text{Pump Pulley OD}}{\text{Motor RPM}}$$

$$\text{Torque} = \frac{\text{HP} \times 5252}{\text{RPM}}$$

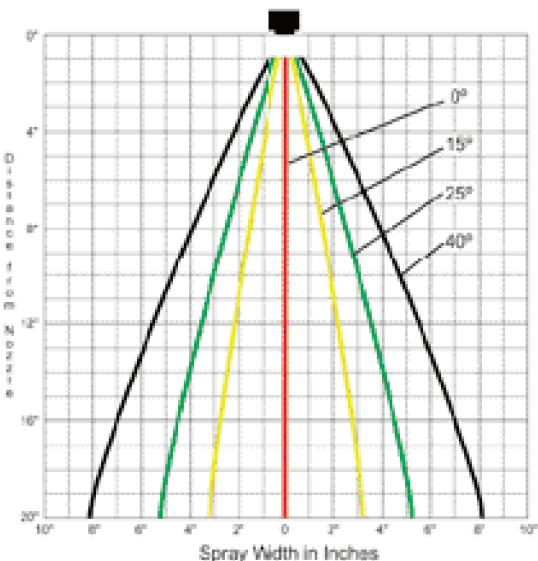
$$\text{Drive Ratio} = \frac{D}{d}$$

Fitting	Friction Loss in Pipe Fittings in Equivalent Feet of Pipe						
	Fitting Size						
	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"
90° Std Elbow	1.6	2.1	2.6	3.5	4	5.5	6.2
90° Long Elbow	1	1.4	1.7	2.3	2.7	4.3	5.1
90° Street Elbow	3	3.4	4.4	5.8	6.7	8.6	10.3
45° Std Elbow	0.8	1.1	1.4	1.8	2.1	2.8	3.3
45° Street Elbow	1	1.8	2.3	3	3.5	4.5	5.4
Square Elbow	3	3.9	5	6.5	7.6	9.8	11.7
Std Tee Straight Run	1	1.4	1.7	2.3	2.7	4.3	5.1
Std Tee Branch Run	4	5.1	6	6.9	8.1	12	14.3
Gate Valve - Full Open	0.7	0.9	1.1	1.5	1.7	2.2	2.7

Nozzle Chart

Nozzle Size	Orifice Dia.	40 PSI	100 PSI	250 PSI	500 PSI	600 PSI	700 PSI	800 PSI	1000 PSI	1200 PSI	1500 PSI	2000 PSI	2500 PSI	3000 PSI	3500 PSI	4000 PSI	5000 PSI
2	.034	0.20	0.32	0.50	0.71	0.77	0.84	0.89	1.00	1.10	1.22	1.41	1.58	1.73	1.87	2.00	2.24
2.5	.039	0.25	0.40	0.63	0.88	0.97	1.05	1.12	1.25	1.37	1.53	1.77	1.98	2.17	2.34	2.50	2.80
3	.043	0.30	0.47	0.75	1.06	1.16	1.25	1.34	1.50	1.64	1.84	2.12	2.37	2.60	2.81	3.00	3.35
3.25	.045	0.33	0.51	0.81	1.15	1.26	1.36	1.45	1.63	1.78	1.99	2.30	2.57	2.81	3.04	3.25	3.63
3.5	.048	0.35	0.55	0.88	1.24	1.26	1.46	1.57	1.75	1.92	2.14	2.47	2.77	3.03	3.27	3.50	3.91
3.75	.050	0.38	0.59	0.94	1.33	1.45	1.57	1.68	1.88	2.05	2.30	2.65	2.96	3.25	3.51	3.75	4.17
4	.052	0.40	0.63	1.00	1.41	1.45	1.67	1.79	2.00	2.19	2.45	2.83	3.16	3.46	3.74	4.00	4.47
4.5	.055	0.45	0.71	1.13	1.59	1.74	1.88	2.01	2.25	2.46	2.76	3.18	3.56	3.90	4.21	4.50	5.03
5	.057	0.50	0.79	1.25	1.77	1.94	2.09	2.24	2.50	2.74	3.06	3.54	3.95	4.33	4.68	5.00	5.59
5.5	.060	0.55	0.87	1.38	1.94	2.13	2.30	2.46	2.75	3.01	3.37	3.89	4.35	4.76	5.14	5.50	6.15
6	.062	0.60	0.95	1.50	2.12	2.32	2.51	2.68	3.00	3.29	3.67	4.24	4.74	5.20	5.61	6.00	6.71
6.5	.064	0.65	1.03	1.63	2.30	2.52	2.72	2.91	3.25	3.56	3.98	4.60	5.14	5.63	6.08	6.50	7.27
7	.067	0.70	1.11	1.75	2.47	2.71	2.93	3.13	3.50	3.83	4.29	4.95	5.53	6.06	6.55	7.00	7.83
7.5	.070	0.75	1.19	1.88	2.65	2.90	3.14	3.35	3.75	4.11	4.59	5.30	5.93	6.50	7.02	7.50	8.39
8	.072	0.80	1.26	2.00	2.83	3.10	3.35	3.58	4.00	4.38	4.90	5.66	6.32	6.93	7.48	8.00	8.94
8.5	.074	0.85	1.34	2.13	3.01	3.29	3.56	3.80	4.25	4.66	5.21	6.01	6.72	7.36	7.95	8.50	9.50
9	.076	0.90	1.42	2.25	3.18	3.49	3.76	4.02	4.50	4.93	5.51	6.36	7.12	7.79	8.42	9.00	10.06
9.5	.078	0.95	1.50	2.38	3.36	3.68	3.97	4.25	4.75	5.20	5.82	6.72	7.51	8.23	8.89	9.50	10.62
10	.080	1.00	1.58	2.50	3.54	3.87	4.18	4.47	5.00	5.48	6.12	7.07	7.91	8.66	9.35	10.00	11.18
11	.083	1.10	1.74	2.75	3.89	4.26	4.60	4.92	5.50	6.02	6.74	7.78	8.70	9.53	10.29	11.00	12.30
12	.087	1.20	1.90	3.00	4.24	4.65	5.02	5.37	6.00	6.57	7.35	8.49	9.49	10.39	11.22	12.00	13.42
12.5	.089	1.25	1.98	3.13	4.42	4.84	5.23	5.59	6.25	6.85	7.65	8.84	9.88	10.83	11.69	12.50	13.98
13	.091	1.30	2.06	3.25	4.60	5.03	5.44	5.81	6.50	7.12	7.96	9.19	10.28	11.26	12.16	13.00	14.53
14	.093	1.40	2.21	3.50	4.95	5.42	5.86	6.26	7.00	7.67	8.57	9.90	11.07	12.12	13.10	14.00	15.65
15	.096	1.50	2.37	3.75	5.30	5.81	6.27	6.71	7.50	8.22	9.19	10.61	11.86	12.99	14.03	15.00	16.77
20	.109	2.00	3.16	5.00	7.07	7.75	8.37	8.94	10.00	10.95	12.25	14.14	15.81	17.32	18.71	20.00	22.36
25	.125	2.50	3.95	6.25	8.84	9.68	10.46	11.18	12.50	13.69	15.31	17.68	19.76	21.65	23.39	25.00	27.95
30	.141	3.00	4.74	7.50	10.61	11.62	12.55	13.42	15.00	16.43	18.37	21.12	23.72	25.98	28.06	30.00	33.54
40	.156	4.00	6.32	10.00	14.14	15.49	16.73	17.89	20.00	21.91	24.49	28.28	31.62	34.64	37.42	40.00	44.72
50	.172	5.00	7.91	12.50	17.68	19.36	20.92	22.36	25.00	27.39	30.62	35.36	39.53	43.30	46.77	50.00	55.90
60	.188	6.00	9.49	15.00	21.21	23.24	25.10	26.83	30.00	32.86	36.74	42.43	47.43	51.96	56.12	60.00	67.08

GP Nozzle Spray Coverage



Nozzles

Nozzle # =	GPM	∞	$\sqrt{\frac{4000}{\text{PSI}}}$
GPM =	Nozzle #	∞	$\sqrt{\frac{\text{PSI}}{4000}}$
PSI =	$\left(\frac{\text{GPM}}{\text{Nozzle}}\right)^2$	∞	4000

Horsepower

$\frac{\text{GPM} \times \text{PSI}}{1460}$	=	Electric Brake HP
$\frac{\text{GPM} \times \text{PSI}}{1714}$	=	Hydraulic HP
$\frac{\text{GPM} \times \text{PSI}}{1460} \times 1.5$	=	Gasoline HP (Industrial Engine)