

Gas Flow Capacities

Max Capacity of Pipe For Undiluted Liquefied Petroleum Gases

at 11"wc Inlet Pressure

Based on a Pressure Drop of 0.5"wc

Nom IPS	10' Pipe	20' Pipe	30' Pipe	40' Pipe	50' Pipe	60' Pipe	70' Pipe	80' Pipe	90' Pipe	100' Pipe	125' Pipe	150' Pipe
1/2"	275	189	152	129	114	103	96	89	83	78	69	63
3/4"	567	393	315	267	237	217	196	185	173	162	146	132
1"	1071	732	590	504	448	409	378	346	322	307	275	252
1-1/4"	2205	1496	1212	1039	913	834	771	724	677	630	567	511
1-1/2"	3307	2299	1858	1559	1417	1275	1181	1086	1023	976	866	787
2"	6221	4331	3465	2992	2646	2394	2205	2047	1921	1811	1606	1496

Pipe Capacity (Thousand of BTUH)

Max Capacity of Semi-Rigid Tubing For Undiluted Liquefied Petroleum Gases

At 11"wc Inlet Pressure

Based on a Pressure Drop of 0.5"wc

Outside Diameter	10' Tube	20' Tube	30' Tube	40' Tube	50' Tube	60' Tube	70' Tube	80' Tube	90' Tube	100' Tube
3/8"	39	26	21	19	--	--	--	--	--	--
1/2"	92	62	50	41	37	35	31	29	27	26
5/8"	199	131	107	90	79	72	67	62	59	55
3/4"	329	216	181	145	131	121	112	104	95	90
7/8"	501	346	277	233	198	187	164	155	146	138

Tubing Capacity (Thousand of BTUH)

Gas Flow Capacities

Max Capacity of Pipe For Gas Pressure of .05 PSIG or Less

With Pressure Drop of 0.5"wc and 0.60 Specific Gravity

Sch 40 Pipe	Intrn'l Dia (In)	10' Pipe	20' Pipe	30' Pipe	40' Pipe	50' Pipe	60' Pipe	70' Pipe	80' Pipe	90' Pipe	100' Pipe	125' Pipe	150' Pipe	175' Pipe	120' Pipe
1/4"	.364	43	29	24	20	18	16	15	14	13	12	11	10	9	8
3/8"	.493	95	65	52	45	40	36	33	31	29	27	24	22	20	19
1/2"	.622	175	120	97	82	73	66	61	57	53	50	44	40	37	35
3/4"	.824	360	250	200	170	151	138	125	118	110	103	93	84	77	72
1"	1.049	680	465	375	320	285	260	240	220	205	195	175	160	145	135
1 1/4"	1.380	1400	950	770	660	580	530	490	460	430	400	360	325	300	280
1 1/2"	1.610	2100	1460	1180	990	900	810	750	690	650	620	550	500	460	430
2"	2.067	3950	2750	2200	1900	1680	1520	1400	1300	1220	1150	1020	950	850	800
2 1/2"	2.469	6300	4350	3520	3000	2650	2400	2250	2050	1950	1850	1650	1500	1370	1280
3"	3.068	11000	7700	6250	5300	4750	4300	3900	3700	3450	3250	2950	2650	2450	2280
4"	4.026	23000	15800	12800	10900	9700	8800	8100	7500	7200	6700	6000	5500	5000	4600

Pipe Capacity (Cubic Feet of Gas Per Hour)

Rate of Flow of Gases Through Orifices

Table for Natural Gas at 3.5" w.c. with 1000 BTU/Cu.Ft., .65 Sp.Gr., and .82 orifice coefficient.			Table for Propane (LP) Gas at 11.0" w.c. with 2500 BTU/Cu.Ft., 1.53 Sp.Gr., and .80 orifice coefficient.		
Drill Size	Diameter (Inches)	Natural Gas (BTU/Hr)	Drill Size	Diameter (Inches)	LP Gas (BTU/Hr)
56	.0465	5,359	70	.0280	5,490
54	.0550	7,510	67	.0320	7,150
52	.0635	10,000	64	.0360	9,050
50	.0700	12,150	61	.0390	10,600
46	.0810	16,250	58	.0420	12,300
42	.0935	21,680	56	.0465	15,100
38	.1015	25,530	54	.0550	21,200
34	.1110	30,550	52	.0635	28,200
31	.1200	35,690	50	.0700	34,200
30	.1285	40,900	48	.0760	40,400
26	.1470	53,500	46	.0810	45,800
22	.1570	61,100	44	.0860	51,600
18	.1695	71,200	42	.0935	61,100
16	.1770	77,700	38	.1015	72,000
12	.1890	88,600	34	.1110	86,200
6	.2040	103,200	30	.1285	115,300
2	.2210	121,100	26	.1470	151,000
A	.2340	135,700	22	.1570	172,000
E (1/4)	.2500	154,900	18	.1695	200,500

Gas Flow Capacities

How Much Carbon Monoxide Is Permissible?

According to the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) (Ventilation Standard 69-89), a concentration of no more than 9 parts per million (ppm) (0.0009%), of CO is permissible ventilation air when averaged over 8 hours.

In addition, the Occupational Safety and Health Administration (OSHA) has set an eight-hour work place maximum allowable concentration of CO (when measured on an air free basis) of 400 PPM, for vented gas appliances.

WHAT CAN YOU DO?

To ensure safe & efficient combustion, it is imperative that HVAC-service contractors, energy auditors, plant engineers & utility workers measure CO concentration.

Concentration of CO in Air	Inhalation Time & Toxic Systems Developed
9 ppm (0.0009%)	The maximum allowable concentration for continuous exposure in any 8-hour period, according to federal workplace standards
50 ppm (0.005%)	The maximum 8 hour average for outdoor air as recommended by US EPA. ASHRAE standard 62-89 states the ventilation air shall meet the outdoor air quality (as standard).
200 ppm (0.02%)	Slight headache, tiredness, dizziness, nausea after 2-3 hours.
400 ppm (0.04%)	Frontal headaches within 1-2 hours, life-threatening after 3 hours.
800 ppm (0.08%)	Dizziness, nausea and convulsions within 45 minutes. Unconsciousness within 2 hours. Death within 2-3 hours.
1,600 ppm (0.16%)	Headache, dizziness and nausea within 20 minutes. Death within 1 hour.
3,200 ppm (0.32%)	Headache, dizziness and nausea within 5-10 minutes. Death within 30 minutes.
6,400 ppm (0.64%)	Headache, dizziness and nausea within 1-2 minutes. Death within 10-15 minutes.
12,800 ppm (1.28%)	Death within 1-3 minutes.

10,000 PPM (parts per million) - 1% by volume.

All effects can vary significantly based on age, sex, weight & overall state of health.

Gas Flow Capacities

Meter Clocking Method

Caution: Make certain there is no gas flow through the meter other than to the appliance being checked.
Use table to determine exact rate of gas flow to appliance.

To convert cfh to cubic meter per hour (M³hr) multiply by .0283.

Meter Flow Rate - Cubic Feet per Hour (cfh)										
Meter Dial Used - Cu. Ft. per Rev			Meter Dial Used - Cu. Ft. per Rev				Meter Dial Used - Cu. Ft. per Rev			
Sec for One Rev.	1/2	1	Sec for One Rev.	1/2	1	2	Sec for One Rev.	1	2	5
10	180	360	35	52	103	206	60	60	120	300
11	164	327	36	50	100	200	62	58	116	290
12	150	300	37	49	97	195	64	56	112	281
13	139	277	38	48	95	189	66	55	109	273
14	129	257	39	46	92	185	68	53	106	265
15	120	240	40	45	90	180	70	52	103	257
16	113	225	41	44	88	176	72	50	100	250
17	106	212	42	43	86	172	74	49	97	243
18	100	200	43	42	84	167	76	48	95	237
19	95	189	44	41	82	164	78	46	92	231
20	90	180	45	40	80	160	80	45	90	225
21	86	171	46	39	78	157	84	43	86	214
22	82	164	47	38	77	153	88	41	82	205
23	78	157	48	38	75	150	92	39	78	196
24	75	150	49	37	74	147	96	38	75	188
25	72	144	50	36	72	144	100	36	72	180
26	69	138	51	35	71	141	105	34	69	172
27	67	133	52	35	69	138	110	33	66	164
28	64	129	53	34	68	136	120	30	60	150
29	62	124	54	33	67	133	130	28	55	138
30	60	120	55	33	66	131	140	26	52	129
31	58	116	56	32	64	129	150	24	48	120
32	56	113	57	32	63	126	160	23	45	113
33	55	109	58	31	62	124	170	21	43	106
34	53	106	59	31	61	122	180	20	40	100

To convert meter flow rate (cfh) to BTU per hour, multiply cfh (from table above) by the BTU heat content of the gas being used.

To convert input rating (BTU per hour as stamped on appliance nameplate) to meter flow rate (cfh).

Input rating in BTU per hour.