QUALITY STEEL CORPORATION

ORIFICE CAPACITIES

BTU/CU FT = 2.516 SPECIFIC GRAVITY = 1.52
PRESSURE AT ORIFICE, IN. WATER COLUMN = 11
ORIFICE COEFFICIENT = 0.9

ORIFICE OR DRILL SIZE	ORIFICE CAPACITY BTU/HR, 11" W.C.	ORIFICE OR DRILL SIZE	ORIFICE CAPACITY BTU/HR, 11" W.C.
.008	519	51	36531
.009	656	50	39842
.010	812	49	43361
.011	981	48	46983
.012	1169	47	50088
80	1480	46	53296
79	1708	45	54641
78	2080	44	60229
77	2629	43	64369
76	3249	42	71095
75	3581	41	74924
74	4119	40	78029
73	4678	39	80513
72	5081	38	83721
71	5495	37	87860
70	6375	36	92207
69	6934	35	98312
68	7813	34	100175
67	8320	33	103797
66	8848	32	109385
65	9955	31	117043
64	10535	30	134119
63	11125	29	150366
62	11735	28	160301
61	12367	27	168580
60	13008	26	175617
59	13660	25	181619
58	14333	24	187828
57	15026	23	192796
56	17572	22	200350
55	21939	21	205525
54	24630	20	210699
53	28769	19	223945
52	32805	18	233466

CONVERSION UNITS

Multiply	By	To Obtain
PRESSURE		
Grams per square centimeter	0.0142	pounds per square inch
Inches of mercury	0.4912	pounds per square inch
Inches of mercury	1.133	feet of water
Inches of water	0.0361	pounds per square inch
Inches of water	0.0735	inches of mercury
Inches of water	0.5781	ounces per square inch
Inches of water	5.204	pounds per square foot
KPA	100	BAR
Kilograms per sq. centimeter	14.22	pounds per square inch
Kilograms per square meter	0.2048	pounds per square foot
Pounds per square inch	0.06804	atmospheres
Pounds per square inch	0.07031	kilograms per sq. centimeter
Pounds per square inch	.145	KPA
Pounds per square inch	2.036	inches of mercury
Pounds per square inch	2.307	feet of water
Pounds per square inch	14.5	BAR
Pounds per square inch	27.67	inches of water
LENGTH		
Centimeters	0.3937	inches
Feet	0.3048	meters
Feet	30.48	centimeters
Feet	304.8	millimeters
Inches	2.540	centimeters
Inches	25.40	millimeters
Kilometer	0.6214	miles
Meters	1.094	yards
Meters	3.281	feet
Meters	39.37	inches
Miles (nautical)	1,853.0	meters
Miles (statute)	1,609.0	meters
Yards	0.9144	meters
Yards	91.44	centimeters

SEE OTHER SIDE FOR MORE CONVERSION UNITS

CONVERTING VOLUMES OF GAS
(CFH to CFH or CFM to CFM)

Multiply Flow of:	By	To Obtain Flow of:
Air	0.707	Butane
	1.290	Natural Gas
	0.808	Propane
Butane	1.414	Air
	1.826	Natural Gas
	1.140	Propane
Natural Gas	0.775	Air
	0.547	Butane
	0.625	Propane
Propane	1.237	Air
	0.874	Butane
	1.598	Natural Gas

TEMPERATURE CONVERSION

Degrees F	Degrees C	Degrees F	Degrees C
-50	-46	60	15.6
-40	-40	70	21.1
-30	-34	80	26.7
-20	-29	90	32.2
-10	-23	100	37.8
0	-17.8	110	43
+10	-12.2	120	49
20	-6.7	130	54
30	-1.1	140	60
32	0	150	66
40	+4.4	160	71
50	10.0	170	77

FORMULAE: Degrees C =(°F-32) X 5/9
Degrees F = 9/5 X °C +32

QUALITY STEEL
QualitySteelCorporation.com

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Fremont, OH Facility
721 Graham Drive
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West Jordan, UT Facility
5601 Axel Park Rd.
West Jordan, UT 84081
Phone: 801-280-1133

PIPE AND TUBING SIZING

SIZING BETWEEN SINGLE OR SECOND STAGE (LOW PRESSURE REGULATOR) AND APPLIANCE

Maximum undiluted propane capacities listed are based on 11" W.C. setting and a 0.5" W.C. pressure drop — Capacities in 1,000 BTU/HR

PIPE OR TUBING LENGTH FEET	COPPER TUBING SIZE, OUTSIDE DIA., TYPE "L"					PIPE OR TUBING LENGTH FEET	NOMINAL PIPE SIZE, SCHEDULE 40					
	⅜" (.315)	½" (.430)	⅝" (.545)	¾" (.666)	⅞" (.785)		½" (.622)	¾" (.824)	1" (1.049)	1¼" (1.380)	1½" (1.610)	2" (2.067)
10	49	110	206	348	536	10	291	608	1146	2353	3525	6789
20	34	76	141	239	368	20	200	418	788	1617	2423	4666
30	27	61	114	192	296	30	161	336	632	1299	1946	3747
40	23	52	97	164	253	40	137	287	541	1111	1665	3207
50	20	46	86	146	224	50	122	255	480	985	1476	2842
60	19	42	78	132	203	60	110	231	435	892	1337	2575
70	17	39	72	121	187	80	94	198	372	764	1144	2204
80	16	36	67	113	174	100	84	175	330	677	1014	1954
90	15	34	63	106	163	125	74	155	292	600	899	1731
100	14	32	59	100	154	150	67	141	265	544	815	1569
150	11	26	48	80	124							

TO CONVERT TO CAPACITIES IN CUBIC FEET PER HOUR DIVIDE BY 2.5
NOTE: DIMENSIONS IN PARENTHESIS ARE THE INSIDE DIA. OF THE COPPER TUBING & INSIDE DIA. OF SCHEDULE 40 PIPE.

QUALITY STEEL CORPORATION

AVERAGE PROPERTIES OF PROPANE

Formula	C_3H_8
Boiling Point, °F	-44
Specific Gravity of Gas (Air =1.00)	1.53
Specific Gravity of Liquid (Water=1.00)	0.51
Lbs. per Gallon of Liquid at 60 °F	4.24
BTU per Gallon of Gas at 60 °F	91547
BTU per Lb. of Gas	21591
BTU per Cu. Ft. of Gas at 60 °F	2516
Cu. Ft. of Vapor at 60 °F/Gal. of Liquid at 60 °F	36.39
Cu. Ft. of Vapor at 60 °F/Lb. of Liquid at 60 °F	8.547
Latent Heat of Vaporization at Boiling Point BTU/Gal	785.0
Combustion Data: Cu. Ft. Air Required to Burn 1 Cu. Ft. Gas	23.86
Flash Point, °F	-156
Ignition Temperature in Air, °F	920-1020
Maximum Flame Temperature in Air, °F	3595
Limits of Inflammability, Percentage of Gas in Air Mixture:	
at Lower Limit—%	2.4
at Upper Limit—%	9.6
Octane Number (ISO-Octane =100)	Over 100

QUALITY STEEL CORPORATION STANDARD DOMESTIC TANK SPECIFICATIONS

Capacity	Diameter	Length	Tank Weight
120 gal	24"	68"	257 lb
454 l	610 mm	1727 mm	117 kg
120 gal (vert)	30"	54"	260 lb
454 l	762 mm	1372 mm	118 kg
250 gal	30"	94"	483 lb
946 l	762 mm	2387 mm	219 kg
320 gal	30"	119"	597 lb
1211 l	762 mm	3023 mm	271 kg
500 gal	37"	119"	949 lb
1893 l	940 mm	3023 mm	430 kg
1000 gal	41"	192"	1760 lb
3785 l	1041 mm	4877 mm	799 kg
1450 gal	47"	208"	2658 lb
5488 l	1182 mm	5277 mm	1205 kg
1990 gal	46"	288"	3521 lb
7532 l	1182 mm	7283 mm	1597 kg

APPROXIMATE VEPORIZATION CAPACITIES OF QSC PROPANE TANKS BTU PER HOUR WITH 40% LIQUID IN TANK DOMESTIC SYSTEMS

TANK SIZE WATER CAPACITY	PREVAILING AIR TEMPERATURE	
	20 °F	60 °F
120	235,008	417,792
150	290,304	516,096
200	341,280	606,720
250	406,080	721,920
320	514,100	937,900
500	634,032	1,127,168
1000	1,088,472	1,978,051
1450	1,485,961	2,427,447
1990	2,059,960	3,365,726

VAPOR PRESSURES OF PROPANE

TEMP.	PRESS.	TEMP.	PRESS.	TEMP.	PRESS.	TEMP.	PRESS.
130°F	257 psig	70°F	109 psig	20°F	40 psig	-20°F	10 psig
120°F	225 psig	65°F	100 psig	10°F	31 psig	-25°F	8 psig
110°F	197 psig	60°F	92 psig	0°F	23 psig	-30°F	5 psig
100°F	172 psig	50°F	77 psig	-5°F	20 psig	-35°F	3 psig
90°F	149 psig	40°F	63 psig	-10°F	16 psig	-40°F	1 psig
80°F	128 psig	30°F	51 psig	-15°F	13 psig	-44°F	0 psig

BTU COMPARISON

COMMON FUELS	per Gal.	per Lb.
Propane	91,547	21,591
Butane	102,032	21,221
Gasoline	110,250	20,930
Fuel Oil	134,425	16,960

CONVERSION UNITS

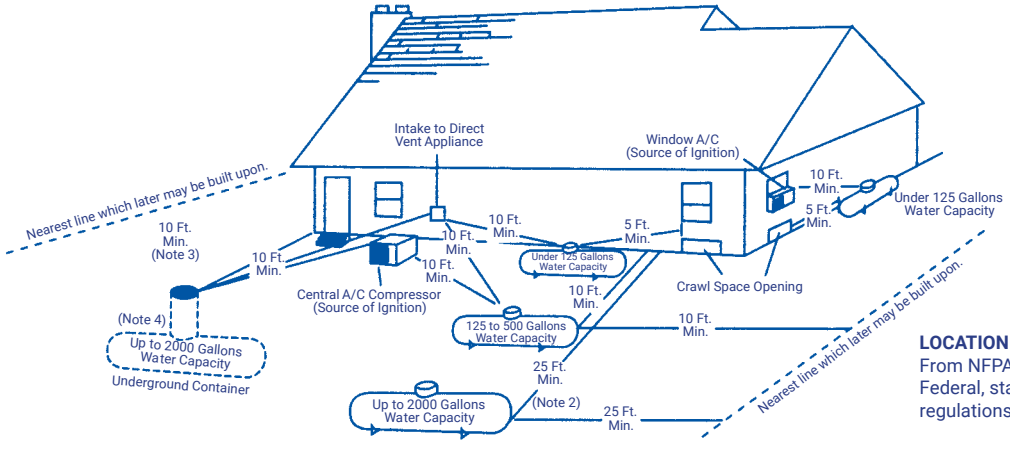
Multiply	By	To Obtain
VOLUME		
Cubic centimeter	0.06103	cubic inches
Cubic feet	7.4805	gallons (US)
Cubic feet	28.316	liters
Cubic feet	1728	cubic inches
Gallons (US)	0.1337	cubic feet
Gallons (US)	3.785	liters
Gallons (US)	231	cubic inches
Liters	1.057	quarts (US)
Liters	2.113	pints (US)
MISCELLANEOUS		
BTU	0.252	calories
Decitherm	10,000	BTU
Kilogram	2.205	pounds
Kilowatt Hour	3412	BTU
Ounces	28.35	grams
Pounds	0.4536	kilograms
Pounds	453.5924	grams
Pounds	21,591	LPG BTU
Therm	100,000	BTU
API Bbls	42	gallons (US)
Gallons of Propane	26.9	KWH
HP	746	KWH
HP (Steam)	42,418	BTU

SEE OTHER SIDE FOR MORE CONVERSION UNITS

Cleveland, MS Facility 800-345-2495
Fremont, OH Facility 419-334-2664
West Jordan, UT 801-280-1133
Inside Sales & Customer Svc 800-445-6709

QUALITY STEEL

WEBSITE
qualitysteelcorporation.com



LOCATION OF ASME CONTAINERS
From NFPA 58, Appendix I
Federal, state, or local ordinances and regulations should be observed at all times.

Notes:

1) Regardless of its size, any ASME tank filled on-site must be located so that the filling connection and fixed liquid level gauge are at least 10 feet from external source of ignition (i.e. open flame, window A/C, compressor, etc.), intake to direct vented gas appliance or intake to a mechanical ventilation system.
2) May be reduced to 10 feet minimum for a single container of 1200 gallons water capacity or less if it is located at least 25 feet from any other LP Gas container of more than 125 gallons water capacity.
3) Minimum distances from underground containers shall be measured from the relief valve and filling or level gauge vent connection at the container, except that no part of an underground container shall be less than 10 feet from a building or line of adjoining property which may be built upon.
4) Where the container may be subject to abrasive action or physical damage due to vehicular traffic or other causes it must be either, (a) placed not less than 2 feet below grade; (b) otherwise protected against such physical damage.