



# PROPANE TANK SIZING

Tanks contain varying amounts of liquid propane depending on diameter and length. Larger tanks are normally used where applications call for running heaters for long periods of time.

The physical dimensions of the tank affect the rate of vaporization. A small diameter, long tank makes a better vaporizing tank than a large diameter, short tank of equal gallonage. This is due to more square inches of surface area on the tank of smaller diameter.

In estimating size, three factors apply

1. Total heat load of all appliances
2. Outside air temperature the tank will be exposed to
3. Percentage of gas left in the tank at which point the gas supplier will refill the tank

### EXAMPLE

1. Determine total heat load.  
ex: 170,000 BTUH (Qty. 1 - Premier 170 heater)
2. Determine outside air temperature, ex: 0° F
3. Confirm percentage of fuel left in container prior to refill,  
ex: 20%  
Refer to Tables 1, 2, 3 on next page to obtain data necessary to use in this formula:

**Tank Size**  
 BTU/H Output of Tank =  
 Diameter (D) of Tank x Length (L) of Tank x (K)\*

You might need to make more than one estimate because the tank must supply the heat load based upon percent of fuel left in container prior to refill.

**First Estimate**

120 gal. tank     24 (D) x 68 (L) x 60 (K) = 97,920 BTU/H

The first estimate only gives slightly more than half of the total BTU/H load. Therefore, re-estimate tank size based upon a tank size of approximately double that of first estimate. This would be a tank size of 250 gallons.

**Second Estimate**

250 gal. tank     30 (D) x 94 (L) x 60 (K) = 169,200 BTU/H

A 250 gal. tank will continue to provide an ample supply of fuel, even when fuel supply in container is reduced to 20 percent of fullness at 0° F.

## CORRECTION FACTORS (CF)

If the outside air temperature is colder than 0° F., multiply result obtained in second estimate by one of the following correction factors for prevailing air temperature and reselect tank size to maintain 170,000 BTU/H output.

PREVAILING AIR TEMPERATURE	MULTIPLIER	PREVAILING AIR TEMPERATURE	MULTIPLIER
- 15° F.	.25	+ 5° F.	1.25
- 10° F.	.50	+ 10° F.	1.50
- 5° F.	.75	+ 15° F.	1.75
0° F.	1.00	+ 20° F.	2.00

Assume outside air temperature is -10° F. Vaporization rate of a 250 gal. tank at 0° F. was 169,200 (See Second Estimate).

Therefore, to obtain vaporization rate of a 250 gal. tank at - 10° F., multiply 169,200 BTUH x correction factor of .50 = 84,600. The 250 gallon tank is not enough to deliver 170,000 BTUH at - 10° F.

To maintain proper vaporization rate of 170,000 BTUH (Heat load at job) re-select tank size based upon percent fullness (again 20%). The reselection process would result in using a 1,000 gallon tank 41 (D) x 192 (L) x 60 (K) x .50 (CF) = 236,160 BTU/H.

**TABLE 1**  
Standard Tank Specifications

CAPACITY	DIAMETER (D)	LENGTH (L)
120 GAL.	24 IN.	68 IN.
150 GAL.	24 IN.	84 IN.
200 GAL.	30 IN.	79 IN.
250 GAL.	30 IN.	94 IN.
325 GAL.	30 IN.	119 IN.
500 GAL.	37 IN.	119 IN.
1,000 GAL.	41 IN.	192 IN.

D = Outside diameter of tank in inches (See Table 3).

L = Overall length of tank in inches (See Table 3).

**TABLE 2**  
Rule of Thumb Guide for Selecting Tank

PERCENTAGE OF CONTAINER FILLED	K* EQUALS	PROPANE VAPORIZATION CAPACITY AT 0° F. (IN BTUH)
60	100	D X L X 100
50	90	D X L X 90
40	80	D X L X 80
30	70	D X L X 70
20	60	D X L X 60
10	45	D X L X 45

\* K relates to wetted surface area of tank with direct relationship to fullness and temperature at 0° F.

**TABLE 3**  
500 Gallon Tank

% OF CONTAINER FILLED	OUTSIDE TEMPERATURE							
	-15°F	-10°F	-5°F	0°F	5°F	10°F	15°F	20°F
60	110075	220150	330225	440300	550375	660450	770525	880600
50	99068	198135	297203	396270	495338	594405	693473	792540
40	88060	176120	264180	352240	440300	528360	616420	704480
30	77053	154105	231158	308210	385263	462315	539368	616420
20	66045	132090	198135	264180	330225	396270	462315	528360
10	49534	99068	148601	198135	247669	297203	346736	396270

Tank Length (in): 119, Tank Diameter (in): 37

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