ROBINSONS HARDWARE since 1874

31 Washington St., Hudson, MA 01749 (978) 562-7316
1 Nicholas Rd., Framingham, MA 01701 (508) 877-1888

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What do you mean I need four hundred pound propane tanks?
(AKA…. "But won't it work off my 20 pound tank?")

Propane converts from liquid to vapor form by absorbing heat from the surrounding surfaces of the tank. When unusually high vapor withdrawal demands are placed on the cylinder (such as when used on a very high BTU rated appliance), the rapid heat absorption may cause a frost line to form on the cylinder wall or ice to form on the inside of the service valve. This condition can usually be avoided by matching the cylinder size with the appliance BTU rating. For example, a typical 20lb grill cylinder may show the above signs of "freezing" if an attempt is made to use it to supply a "weed burner" torch which may have a BTU rating of over 150,000 BTUs per hour.

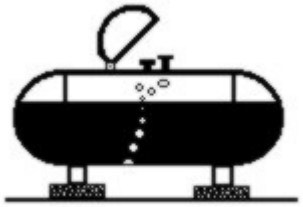
Vaporization Rates of Cylinders

Output in BTU's per hour - Vertical Cylinder 25% full - Minimum Cylinder Pressure 10 PSI

Cylinder Size	BTU's per Hour					
Outside Temperature	20	30	40	100	200	420
+60F	24,000	32,000	40,100	79,700	125,900	185,500
+50F	21,200	28,300	35,500	70,600	111,500	164,300
+40F	18,450	24,700	31,000	61,500	97,200	143,100
+30F	15,700	21,000	26,400	52,400	82,800	122,000
+20F	13,000	17,300	21,800	43,300	68,400	100,700
+10F	10,250	13,700	17,200	34,200	54,000	79,500
0	7,500	10,000	12,600	25,000	39,500	58,300
-10F	4,780	6,400	8,000	16,000	25,300	37,100
-20F	2,050	2,700	3,400	6,800	10,700	15,900

Size	Gallons	Total BTU's
20#	4.8	441,600.00
30#	7.1	653,200.00
40#	9.5	874,000.00
60#	14.3	1,315,600.00
100#	23.8	2,189,600.00
200#	47.2	4,342,400.00
420#	99.1	9,117,200.00

What does all this mean?



Propane is stored as a liquid under pressure and boils to produce a vapor that is drawn off at the top to be used as fuel. Because propane boils at -44° (below zero), the gas will freeze if it can not absorb enough ambient heat to compensate for the boiling process. The bigger the cylinder is compared to the amount of load, the warmer it is outside, the warmer the cylinder is kept, all are a determining factor in the likelihood of a cylinder freezing up.

If not enough vapor is provided, the burner will be starved for fuel, causing it to run improperly or not at all. To compensate for an undersize cylinder or colder weather conditions, two or more cylinders must can be tied (ganged) together using a tee check and pigtails.

As an example, for a 100,000 BTU heater, you would need:

Outside Temp	Tanks	BTU's/Hr
+60F	2	159400
+50F	2	141200
+40F	2	123000
+30F	2	104800
+20F	3	129900
+10F	3	102600
0	4	100000
-10F	7	112000
-20F	15	102000
Tanks refers to FULL 100# tanks		

Note that this applies to **FULL** tanks. As the volume of propane in the tank declines, additional tanks will be needed to maintain proper operation.

If a sweat or frost line forms around the cylinder at the level of the fuel, this is a telltale sign that the cylinder over worked and is in the process of freeze up. If the gas does freeze, it will stop producing vapor and the pressure inside the cylinder will drop to as low as zero psi which will cause the burner to stop running.