



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 heater), 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 heater's BTU rating. For example, a typical 20lb grill cylinder may show 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.

Cylinder Size	20#	30#	40#	100#
Outside Temp	BTU's Per Hour			
+60F	29K BTU Hr	32K BTU Hr	40.1K BTU Hr	79.7K BTU Hr
+50F	21.2K BTU Hr	28.3K BTU Hr	35.5K BTU Hr	70.7K BTU Hr
+40F	18.4K BTU Hr	24.7K BTU Hr	31K BTU Hr	61.5K BTU Hr
+30F	15.7K BTU Hr	21K BTU Hr	26.4K BTU Hr	52.4K BTU Hr
+20F	13K BTU Hr	17.3K BTU Hr	21.8K BTU Hr	43.3K BTU Hr
+10F	10.2K BTU Hr	13.7K BTU Hr	17.2K BTU Hr	34.2K BTU Hr
0	7.5K BTU Hr	10K BTU Hr	12.6K BTU Hr	25K BTU Hr
-10F	4.7K BTU Hr	6.4K BTU Hr	8K BTU Hr	16K BTU Hr
-20F	2K BTU Hr	2.7K BTU Hr	3.4K BTU Hr	6.8K BTU Hr

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 pigtailed. 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 is overworked 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.