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# RAINIER TENTS Tech Tips

## THE RIGHT SIZE TENT HEATER

You have the tent, you have the tables, you have the chairs and the catering people are on board. Now you look at the forecast and see that the weather is going to be on the cool side. You decide that a heated tent is needed for the upcoming event to be comfortable for the guests. So what do you need to know to correctly heat the tent?

- **Determine how much heat (in BTU's) is needed for your tent and size the heater(s) accordingly**
- **Identify the fuel source and the quantity of fuel needed**
- **Calculate how many fuel tanks are needed**
- **Place the heaters near the tent and get the heat inside the tent**
- **Research and comply with any local codes as they relate to heat sources for your tent**



To determine the amount of heat needed for your tented event, follow this simple formula:

**BTU's of Heat needed/hour = Cubic Volume of Tent × Temperature Rise Required × .25 (Insulation Factor of a Tent)**

**Example:**

- **A tent size of 40' × 80' × 15' (average ceiling height) = 48,000 cubic feet**
- **The forecast is 40° for the low that night and you want to maintain 70° inside of the tent = 30° temperature rise**
- **48,000 × 30 × .25 = 360,000 BTU/hour**

What happens if you are using one large unit and something fails? Disaster! So ideally you would use two heaters. Using two heaters gives you a chance to get back up and running so that no one may even notice. And two sources also help to distribute the heat more evenly within the tent. So for this example, we recommend using quantity (2) 175,000 BTU/hour heaters. (Which closely approximates the calculated heat needed.)

*(Another way to look up, instead of calculating the BTU's needed for your tented event is to contact a Rainier Tent representative and request your own Heater Sizing Guide. We would be happy mail one to you!)*



The next thing to determine is what fuel source is available to you, propane, or natural gas? Most box style tent heaters can be operated on propane or natural gas. Some cities will make you pull a permit for propane, which is by far the most common fuel used for temporary events. Does this apply to you? Check with your local fire marshal to find out!

*...continued on next page.*



**1.800.621.2495**

[www.RainierTents.com](http://www.RainierTents.com)  
[tentinfo@rainier.com](mailto:tentinfo@rainier.com)

## THE RIGHT SIZE TENT HEATER ...continued

So how much propane is needed for an event? This is easily calculated if you know that a gallon of propane can produce 91,600 BTU/hour. The formula is:

**Gallons of Propane/Hour = BTU's of Heat needed/hour ÷ 91,600**

Using the same example as above where you needed 360,000 BTU/hr to heat the tent:

- **360,000 ÷ 91,600 = 3.9 gallons per hour (GPH)**

We know that the heaters should cycle on and off, but why not figure worst case scenario? If the heaters run nonstop for the entire event, and the event is 5 hours, you will need:

- **3.9 gallons per hour × 5 hours = 19.5 gallons total**

When using propane, how do you know if you have a large enough tank? An under-sized tank is the number one service issue when using propane heaters. Most people think that a 100 pound cylinder is enough, but often times it is not. The amount of propane vapor available for the heater varies depending on the outside temperature and how much propane is in the tank. For example, at 40° a single 100 pound cylinder can only produce 214,000 BTU/hour when full and 125,000 BTU/hour when half full. (Our Heater Sizing Guide also shows the rates of evaporation for 100lb tanks!) Connecting multiple tanks together with a two or three bottle manifold will resolve that issue.

So how many propane tanks are needed? There are about 25 gallons of propane in a 100 pound cylinder, but remember you may not have enough vapor to keep the heater running at full fire as temperatures drop, or more often, as tanks start to empty. The safe way to determine how many tanks you need is this simple formula:

**Tanks Needed (Rounded Up) = BTU/hour needed per heater ÷ BTU/hr in tank at 50%**

**Continuing with the example:**

- **180,000 BTU/hour needed per heater ÷ 125,000 BTU/hour = 1.44, or 2 tanks per heater.**

By using this formula you will never run into an issue. Will there be extra propane left over? Yes. But will the customer be happy? YES! It's cheap insurance if the event runs long or if the tanks weren't as full as you thought. Using this formula, you can just about guarantee a successful heat job.

The final consideration for a heated tent is placement of the heaters and availability of electrical power. Most of the time the heater can be set behind the tent, where there is no traffic, and ducted under the tent wall with a heater diffuser. Sometimes local codes require the heater be set away from the tent, in which case the warm arm is ducted to the tent and under the tent wall with a duct diffuser. Also be aware of the terrain as most heaters should sit as level as possible. Finally, the propane tanks must be secured so there is no way for them to tip or get knocked over.

Most tent heaters will also require a dedicated and **grounded** 15 amp service. You should confirm prior to the event that there is an accessible power outlet or if the generator you are using has enough circuits.

By following these simple guidelines everyone will be warm and happy!



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