



**From: Bill Bloom**

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**Ref: Furnace Advantages & Sizing**

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The first thing disregarded during price cutting negotiations and most important, and unfortunately sometimes neglected during specification writing, is the subject of furnace sizes. Furnace sizing is the most critical of all engineering stages in the design of a boiler and should be equally as important in the selection of a boiler.

The furnace is where the hardest "work" is done in generating steam or hot water. The boiler tube bank, or convector tubes, is where a significant amount of heat is absorbed. But, the furnace is where the heat is introduced for absorption.

The term furnace "heat release rate" in terms of BTU/CU.FT. is simply the heat INPUT divided by the furnace volume. Those of you familiar with Military Specs know that the Military restricts heat release rates to a maximum of 200,000 BTU/CU.FT. Our own guide spec for the Series 3 calls for 150,000 BTU/CU.FT. max. Ever wonder why your competition on a Military job, or any other job that has been properly specified with reference to heat release rates, sometimes offers a larger boiler than what is called for? Their furnace isn't big enough, that's why!

The lower the release rate, the "easier" your boiler works to make duty. The easier it works, less stress is built up within the boiler affecting the steel, tube ends, refractory, etc. The easier it works, the longer it lasts. Simple enough!

Smaller furnaces are extremely susceptible to erratic flame patterns. Misshaped flame patterns cause uneven heat distribution, uneven absorption and localized hot spots which can lead to overheating and over stressing.

Any time you have control of a spec, make sure you include the furnace heat release statement. You can eliminate a lot of competition and force your competition to use a larger shell if your Engineer will enforce the spec. If they don't enforce the spec, at least we have opened somebody's eyes as to the importance of furnace size.

Some Engineers may be reluctant to write a spec with a minimum furnace volume for fear that they are "limiting the competition". By doing so, they are not doing their customers a favor by completely ignoring some very critical design criteria. Instead of alienating yourself from the Engineer by insisting that volume be included in the spec, explain the importance of release rates then insist that the spec include a statement that says "Furnace heat release rate shall not be greater than \_\_\_\_\_ BTU/CU.FT." like our suggested guide spec recommends. By looking in your catalog for fuel input and furnace volume, you can fill in the blank.

Fuel inputs and furnace volumes are listed in the brochures. Are you competitors listed in theirs? Probably not. Wonder why? Something to hide?

New low NOx and low emission requirements are sweeping the country very quickly. You may be affected in your area now. If you aren't, you will be. Any burner manufacturer will tell you, the larger the furnace, the easier it is to adapt to a low NOx burner. If low NOx doesn't affect you now, it will affect your customer in the future. You can use our larger furnace feature as a selling point that can benefit your customer later on.

As you know, just about any manufacturers burner can mount to the Series 3 and 4S Series. Your competition usually doesn't offer that feature. Why? Because not all burners can fire into a small furnace. There are only so many adjustments to be made to shape a burner flame.

The adaptability of a large furnace not only gives your customer the opportunity of selecting any burner manufacturer, but also gives them the flexibility of changing it in the future, along with considerations to low emissions as referenced before.