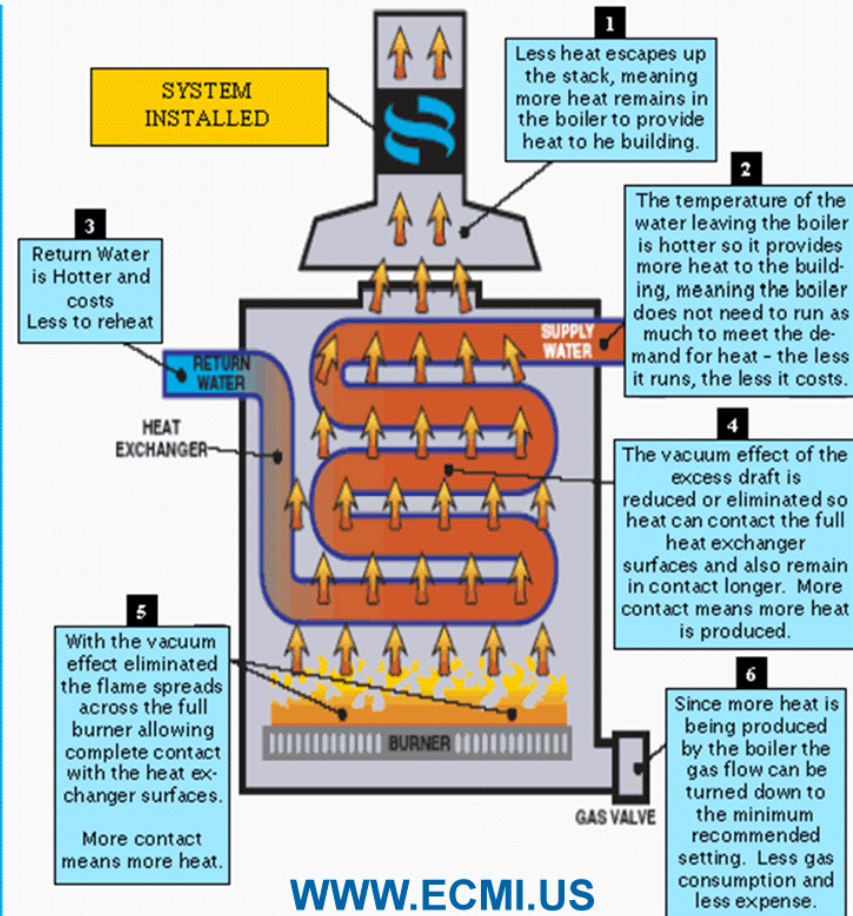
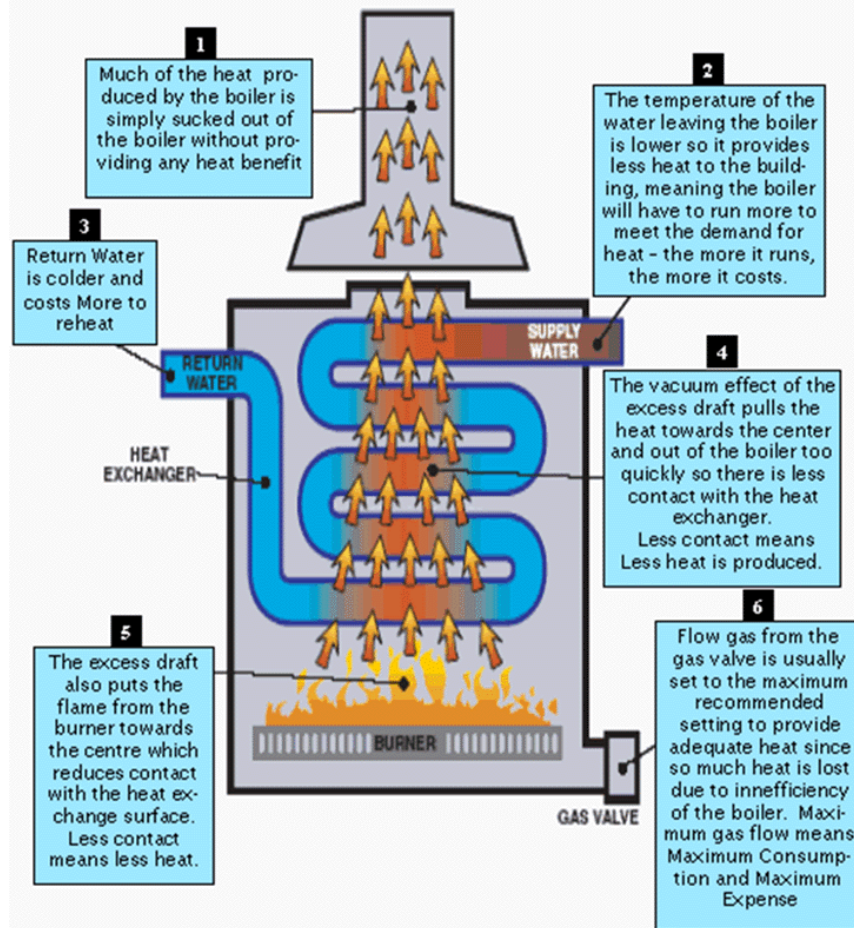


# SDR System Explanation



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## Questions to ask a Heating Expert about Power Boilers

### Question: When analyzing combustion gases, what indicates increased combustion efficiency? (better fuel burn)

**Answer:** The fuel is burning better if there is an increase in the percentage of CO<sub>2</sub> (carbon dioxide) produced by the combustion process. This is the same as a decrease in the percentage of O<sub>2</sub> (oxygen) in the combustion gases. If CO (carbon monoxide) is present, a reduction in the PPM (parts per million) also indicates a better burn.

### Question: What indicates an increase in thermal efficiency?(more available heat is being retained and put to use)

**Answer:** When the "stack loss" is reduced there is a corresponding increase in the retained available heat. Stack loss can be measured for general comparison by multiplying the net stack temperature by the stack gas velocity in feet per minute under near identical conditions.

**Example:** A boiler is operating in a room with an ambient temperature of 70°F. An initial stack temperature reading is made of 403°F and the draft initial draft was 3,650 FPM. After the system was installed the stack reading was 371°F and the draft was 2650 FPM. What is the change in stack loss? The net temperature of 333° times 3,650 FPM equals 1,215,450 degree-FPM loss. The later reading of 301° time 2650 FPM equals 797,650 degree-FPM loss. The later reading indicates a 34% reduction in stack loss, while still producing a faster recovery time!

### Question: How can "ideal draft" be verified in boiler equipment?

**Answer:** The draft is set while taking total stack pressure and pilot tube reading, and setting where the boiler was set when it was being certified at the lab while it was being rated.

### Question: If all else remains constant, and one or more of the above factors is improved, is it certain that there must be an improvement in the overall efficiency of the heating equipment, resulting in a lowering of the amount of fuel used per unit of heat/steam produced/used?

**Answer:** Yes. It is **certain** that there must be an improvement in overall efficiency and a lowering of the amount of fuel to produce and use the same amount of heat/steam.

## Questions to ask a Heating Expert about Atmospheric Boilers

### Question: When analyzing combustion gases, what indicates increased combustion efficiency? (better fuel burn)

**Answer:** The fuel is burning better is there is an increase in the percentage of CO<sub>2</sub> (carbon dioxide) produced by the combustion process. This is the same as a decrease in the percentage of O<sub>2</sub> (oxygen) in the combustion gases. If CO<sub>2</sub> (carbon monoxide) is present, a reduction in the PPM (parts per million) also indicates a better burn.

### Question: What indicates an increase in thermal efficiency? (more available heat is being retained and put to use)

**Answer:** Answer: When the " stack loss" is reduced there is a corresponding increase in the retained available heat. Stack loss can be measured for general comparison by multiplying the net stack temperature by the stack gas velocity in feet per minute under near identical conditions.

**Example:** A furnace or boiler is operating in a room with a ambient temperature of 70°F. An initial stack reading is made of 370° F stack temperature and a draft of 200 FPM. After some energy-saving modifications were made the stack reading was 470° and a draft of 100 FPM. What is the change in stack loss? The net temperature of 300° times 200 FPM equals 60,000 degree FPM loss. The later reading of 400° multiplied by 100 FPM equals 40,000 degree FPM. The later reading indicates a 33% reduction in stack loss.

### Question: How can "ideal draft" be verified in heating equipment?

**Answer:** You know you have attained "ideal draft" when no combustion gases are spilling (flowing into area surrounding the heating equipment), but the draft is as low in velocity as possible while providing adequate combustion air to the fuel.

### Question: If all else remains constant, and one or more of the above factors is improved, is it certain that there must be an improvement in the overall efficiency of the heating equipment, resulting in a lowering of the amount of fuel used per unit of heat/steam produced/used?

**Answer:** Yes. It is **certain** that there must be an improvement in overall efficiency.