Process Boilers

When do the Standards Apply?

The ***2016 Building Energy Efficiency Standards*** (Energy Code) defines a process boiler as:

> "A type of boiler with a capacity (rated maximum input) of 300,000 Btu per hour (Btu/h) or more that serves a process."

Process boilers do not produce hot water or steam for use in space heating or service water heating applications.

The Energy Code has requirements for process boilers with any of the following characteristics:

- Process boilers with input capacity of 2.5 MMBtu/h (2,500,000 Btu/h) or more with non-positive vent static pressure.
- Process boilers where one stack serves two or more boilers that have a combined input capacity of 2.5 MMBtu/h (2,500,000 Btu/h) or more.
- Process boilers with input capacity of 5 MMBtu/h (5,000,000 Btu/h) or more.
- Process boilers with combustion air fan motors that are 10 horsepower or larger.

Requirements for process boilers can be found in §120.6(d) of Title 24, Part 6.

What is Covered in Process Boilers?

The Energy Code has requirements for combustion air positive shut-off, combustion air fan motor efficiency, and control of excess oxygen in the exhaust stack.

Combustion Air Positive Shutoff

Combustion air positive shutoff is required for the following:

- All process boilers with an input capacity of 2.5 MMBtu/h (2,500,000 Btu/h) and above, in which the boiler is designed to operate with a nonpositive vent static pressure.
- All process boilers where one stack serves two or more boilers with a total combined input capacity per stack of 2.5 MMBtu/h (2,500,000 Btu/h).

Combustion Air Fan Motors

Combustion air fans on newly installed process boilers with motors 10 horsepower or larger must meet one of the following:

- The fan motor must be driven by a variable speed drive.
- The fan motor must include controls that limit the fan motor demand to no more than 30 percent of the total design wattage at 50 percent of design air volume.

Excess Oxygen Control

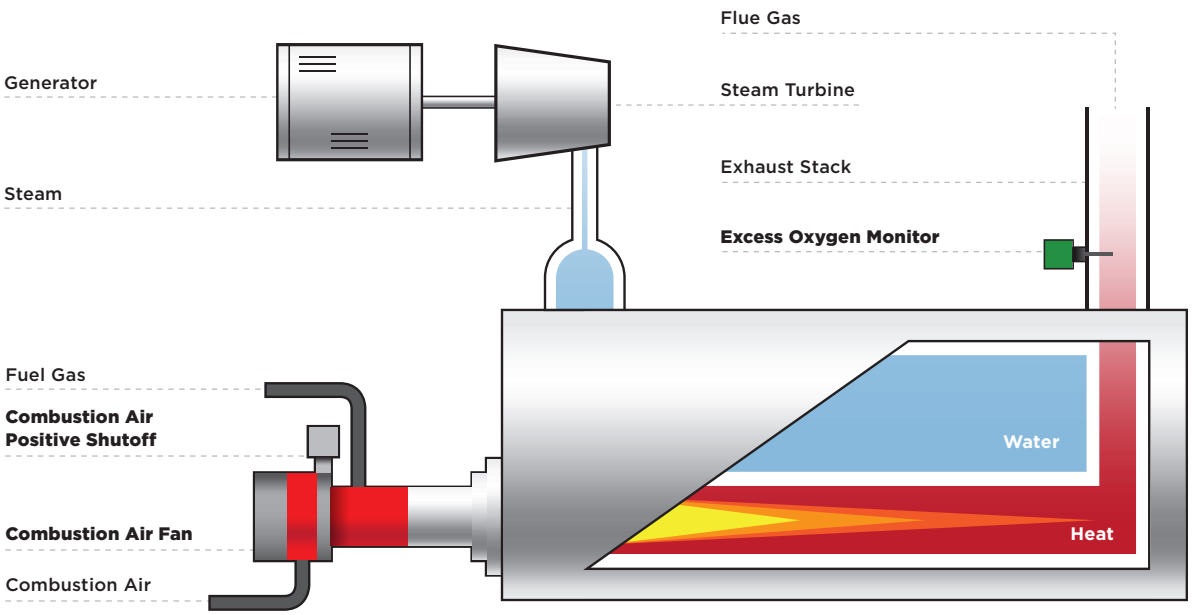
Newly installed process boilers must meet stack oxygen concentration levels with one of the allowed control requirements shown in Table 1 for the applicable input capacities. Allowed concentration levels are percent by volume on a dry basis over a firing range of 20 to 100 percent. Use of a common gas and combustion air control linkage or jack shaft is not allowed.

Table 1: Exhaust Stack Oxygen Concentration Controls

Input Rate MMBtu/h (million Btu/h)	Maximum Allowed Stack Oxygen Concentration (percent by volume)	Firing Rate Control Allowed	Measured Flue Gas Control Allowed
≥ 5 and ≤ 10	≤ 5.0	Yes	Yes
> 10	≤ 3.0	No	Yes

Source: California Energy Commission

Figure 1: Process Boiler



Source: California Energy Commission

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