

5.5.4 Enclosed Combustion Devices

An enclosed combustion device may be used to reduce organic air emissions of Subpart CC units by 95 percent or greater. Some examples of enclosed combustion devices are thermal vapor incinerators, boilers and process heaters.

Examples of Enclosed Combustion Devices

Thermal vapor incinerator

Thermal vapor incinerators can be used over a fairly wide but low range of organic vapor concentrations. The concentration of the organics in the air stream that is to be treated must be substantially below the lower flammable level (lower explosive limit). Reactions are conducted at elevated temperatures to ensure high chemical-reaction rates for the organics. Thermal vapor incinerators are equipped with a burner at one end that fires a fuel. There is also a fume inlet near the burner where the gas stream to be oxidized enters the incinerator. The burner may utilize the air in the waste stream as the combustion air for the fuel or it may use a separate source of outside air for this purpose. Thermal vapor incinerators generally operate at a temperature between 1300 to 1600 °F.

Catalytic vapor incinerators

A catalytic incinerator provides contact of a waste stream with a catalyst bed. This allows oxidation reaction to occur rapidly in the temperature range of 700 to 900°F, in contrast to the 1300 to 1600°F required for thermal vapor incinerators. The heat required to bring the waste stream up to the required oxidation temperature is usually supplied by a fuel burner. The catalyst bed is located at a distance downstream of the mixture of combustion products and waste gas stream.

Examples of Enclosed Combustion Devices

Boilers

Boilers have been designed to burn a wide range of fuels. Boilers are steam generators that provide power, steam, or both to an industrial plant. Boilers are employed over a wide range of applications from large power-generating units to small low-pressure units used for space or process heating.

Process heaters

Process heaters transfer heat liberated by burning fuel to fluids contained in tubes.