

Technologies

Condensing Flue Gases

Water vapor, which is a by-product of the gas-fired combustion process, contains significant energy. For every pound of water vapor that is forced into a liquid state, some 1,000 BTU of latent energy, in the form of heat, are released. This change of state is called “condensing.”

Effective condensing increases the efficiency of the boilers and water heaters by about 10% – turning more of the unit’s fuel into usable heat. What’s more, condensing occurs naturally – when the vapors cool below their dew point, which is typically 135°F. By flowing cold water (<130°F) into the heat exchanger, AERCO boilers and water heaters automatically begin to condense to yield greater efficiencies.

Many Manufacturers Discourage Condensing Applications

When latent energy is extracted from the water vapor, acidic condensate remains on the surface of the heat exchanger. Unless the heat exchanger has been built from the highest-quality materials of construction and is designed to drain freely, condensate will damage and destroy it over time.

Most manufacturers discourage applications that leverage this incredibly energy-efficient process. And although manufacturers test and rate their efficiency under condensing conditions, many warranties will not cover heat exchanger damage in applications using <140°F return water. [Click here for more information on comparing efficiency.](#)

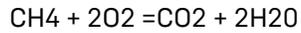
Noncondensing equipment is typically manufactured from less expensive materials (copper, cast iron, carbon steel, etc.) and must rely on ancillary components to protect the boilers and water heaters. Such conventional applications require dedicated boiler pumps, mixing valves, and temperature-averaging components to pre-warm water entering the unit above 140°F.

AERCO’s Approach

AERCO uses the highest-quality materials of construction in its gas-fired boilers and water heaters. As our boilers and heaters are performance-proven to withstand the potentially damaging effects of condensate, we aggressively encourage heating system designs that utilize cooler water temperatures to promote condensing. Our customers get more usable heat from the energy they buy, in addition to a streamlined heating plant with fewer parts to power and maintain in the long run.



Understanding Combustion in Gas-Fired Equipment



Natural gas is combined with oxygen to fuel the combustion process – releasing energy, in the form of heat, to raise the temperature of water entering the unit. The combustion process also generates carbon dioxide and water vapor as well as pollutants. These by-products then travel through the heat exchanger before being released “up the stack” of gas-fired boilers and water heaters.



Heating and Hot Water Solutions

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