

## Department of Energy

## § 431.82

(d) *Calculations of thermal efficiency—*(1) *Gas-fired commercial warm air furnaces.* You must use the calculation procedure specified in Section 2.38, Thermal Efficiency, of ANSI Standard Z21.47–1998 (Incorporated by reference, see § 431.75).

(2) *Oil-fired commercial warm air furnaces.* You must calculate the percent flue loss (in percent of heat input rate) by following the procedure specified in sections 11.1.4, 11.1.5, and 11.1.6.2 of the HI BTS–2000 (Incorporated by reference, see § 431.75). The thermal efficiency must be calculated as:

Thermal Efficiency (percent) = 100 percent – flue loss (in percent).

(e) *Procedure for the calculation of the additional heat gain and heat loss, and adjustment to the thermal efficiency, for a condensing commercial warm air furnace.*

(1) You must calculate the latent heat gain from the condensation of the water vapor in the flue gas, and calculate heat loss due to the flue condensate down the drain, as specified in sections 11.3.7.1 and 11.3.7.2 of ASHRAE Standard 103–1993, (Incorporated by reference, see § 431.75), with the exception that in the equation for the heat loss due to hot condensate flowing down the drain in Section 11.3.7.2, the assumed indoor temperature of 70 °F and the temperature term  $T_{OA}$  must be replaced by the measured room temperature as specified in Section 2.2.8 of ANSI Standard Z21.47–1998 (Incorporated by reference, see § 431.75).

(2) Adjustment to the Thermal Efficiency for Condensing Furnace. You must adjust the thermal efficiency as calculated in paragraph (d)(1) of this section by adding the latent gain, expressed in percent, from the condensation of the water vapor in the flue gas, and subtracting the heat loss (due to the flue condensate down the drain), also expressed in percent, both as calculated in paragraph (e)(1) of this section, to obtain the thermal efficiency of a condensing furnace.

### ENERGY CONSERVATION STANDARDS

#### § 431.77 Energy conservation standards and their effective dates.

Each commercial warm air furnace manufactured on or after January 1,

1994, must meet the following energy efficiency standard levels:

(a) For a gas-fired commercial warm air furnace with capacity of 225,000 Btu per hour or more, the thermal efficiency at the maximum rated capacity (rated maximum input) must be not less than 80 percent.

(b) For an oil-fired commercial warm air furnace with capacity of 225,000 Btu per hour or more, the thermal efficiency at the maximum rated capacity (rated maximum input) must be not less than 81 percent.

### Subpart E—Commercial Packaged Boilers

SOURCE: 69 FR 61960, Oct. 21, 2004, unless otherwise noted.

#### § 431.81 Purpose and scope.

This subpart contains energy conservation requirements for certain commercial packaged boilers, pursuant to Part C of Title III of the Energy Policy and Conservation Act. (42 U.S.C. 6311–6317)

[69 FR 61960, Oct. 21, 2004, as amended at 70 FR 60415, Oct. 18, 2005]

#### § 431.82 Definitions concerning commercial packaged boilers.

The following definitions apply for purposes of this subpart E, and of subparts A and J through M of this part. Any words or terms not defined in this section or elsewhere in this part shall be defined as provided in 42 U.S.C. 6311.

*Combustion efficiency* for a commercial packaged boiler means the efficiency descriptor for packaged boilers, determined using test procedures prescribed under § 431.86 and equals to 100 percent minus percent flue loss (percent flue loss is based on input fuel energy).

*Commercial packaged boiler* means a type of packaged low pressure boiler that is industrial equipment with a capacity, (rated maximum input) of 300,000 Btu per hour (Btu/hr) or more which, to any significant extent, is distributed in commerce:

(1) For heating or space conditioning applications in buildings; or