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ANSI/ASHRAE Standard 124-2007 (RA 2026)
Methods of Testing for Rating Combination Space-Heating and Water-Heating Appliances

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Preview

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FOREWORD

This is a reaffirmation of Standard 124-2007. This standard was prepared under the auspices of ASHRAE. It may be used in whole or in part by an association or government agency with due credit to ASHRAE. Adherence is strictly on a voluntary basis and merely in the interest of obtaining uniform guidelines throughout the industry. This version of the reaffirmation has no changes.

1. PURPOSE

The purpose of this standard is to establish a method of test to rate the performance of a combination space-heating and water-heating appliance.

2. SCOPE

2.1 This test method is intended to cover electric, gas-fired, and oil-fired combination space-heating and water-heating appliances.

2.2 This standard covers appliances up to 300,000 Btu/h (87.9 kW) rated input.

3. DEFINITIONS AND NOMENCLATURE

3.1 Definitions

automatic vent damper: for purposes of this standard, an electrically operated or thermally actuated mechanical device installed downstream of the draft hood.

boiler, low-pressure steam or hot water: an electric, gas, or oil-burning appliance designed to supply low-pressure steam or hot water for space-heating applications. A low-pressure steam boiler operates at or below 15 psig (103.4 kPa) steam pressure; a hot water boiler operates at or below 160 psig (1102.4 kPa) water pressure and 250°F (121°C) water temperature.

combination space-heating and water-heating appliance: a unit that is designed to provide space heating and potable water heating from a single primary energy source.

control, single-stage: a control that cycles a burner between the maximum heat input rate and off.

control, modulating: a manual or automatic step-modulating control. Also referred to as a *two-stage control*.

control, two-stage: a modulating control that both cycles a burner between a reduced heat input rate and OFF and cycles a burner between the maximum heat input rate and OFF. It may also switch from OFF to reduced fire to high fire to OFF again under certain load conditions.

control, step modulating: a modulating control that cycles a burner between the reduced input rate and OFF if the heating load is light. If a higher heating load is encountered that cannot be met with the reduced input rate, the control goes into a modulating mode where it either gradually or incrementally increases the input rate to meet the higher heating load. At that point, if a lower heating load is encountered, the control either gradually or incrementally decreases to the reduced input rate.

(a) ***automatic modulating control:*** a step-modulating control that is capable of controlling the burner fuel input rate between maximum and the minimum adjustable input rate in response to a varying heating load.

(b) ***manually adjusted modulating control:*** a step-modulating control adjusted for reduced input at the time of installation of the furnace or boiler.

draft hood: a devise built into a gas-fired appliance, or external to it, that is designed to (a) provide for the ready escape of flue gases in the event of no draft, back draft, or stoppage beyond the draft hood, (b) prevent a back draft from entering the appliance, and (c) neutralize the effect of stack action of the chimney or gas vent on the operation of the appliance.

direct exhaust system: an appliance venting system supplied or recommended by the manufacturer through which the products of combustion pass directly from the appliance to the outside and that does not employ a means of draft relief. This system includes units with small air passages in the flue (air passages that do not have an opening area in excess of 10% of the cross-sectional area of the vent).

direct vent system: a manufacturer-supplied system that provides outdoor air directly to a unit for combustion and discharges all flue gases to the outside atmosphere.

first-hour rating: an estimate of the maximum volume of "hot" water that a storage-type water heater or an integrated heater can supply within an hour from the time that the water heater is fully heated (i.e., with all thermostats satisfied). This rating is a function of both the storage volume and the recovery rate.

flue: a conduit between the flue outlet of the appliance and the integral draft diverter, draft hood, barometric draft regulator, vent terminal, or any other point of draft relief.

flue collar: a projection or recess provided to accommodate the vent connector or draft hood.

flue gases: all gases in the flue during the duration of combustion in the combustion chamber, including reaction products, inerts, and any excess air.

flue outlet: the opening provided in an appliance for the escape of flue gases.

maximum gpm (L/s) rating: the maximum gallons per minute (liters per second) of domestic hot water that can be supplied continuously by an instantaneous water heater or a tankless heater while maintaining a nominal temperature rise of 77°F (42.8°C) during steady-state operation.

"shall": where "shall" or "shall not" is used, a provision is mandatory if compliance with this standard is claimed.

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