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### ANSI/ASHRAE Standard 206-2024 Method of Testing for Rating of Multipurpose Heat Pumps for Residential Space Conditioning and Water Heating

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#### NOTE

Approved addenda, errata, or interpretations for this standard can be downloaded free of charge from the ASHRAE website at [www.ashrae.org/technology](http://www.ashrae.org/technology).

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## FOREWORD

*This test procedure was developed to provide a uniform method of testing for rating the seasonal efficiency of multipurpose heat pumps, referred to herein as combined appliances, which perform space conditioning and water heating in residential applications. The heat pumps may also provide additional functions, such as ventilation and/or dehumidification. This procedure pulls together past test procedures and U.S. Department of Energy waivers dealing with special design equipment into a single comprehensive procedure covering all existing and anticipated multipurpose heat pumps.*

*This procedure is voluminous but covers six different basic systems: single capacity air-source, dual capacity air-source, variable capacity air-source, single capacity liquid-source, dual capacity liquid-source, and variable capacity liquid-source systems. Some material is repeated for each system type in order to minimize the need for the reader to refer to other sections of the procedure.*

*The 2024 edition of Standard 206 updates references. 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 interests of obtaining uniform standards throughout the industry.*

## Method Calculator

*Because the calculations for the procedure are extensive, a Microsoft Excel® spreadsheet (I-P only) is available for download to actually perform the calculations. Visit <http://www.ashrae.org/206calc>.*

## 1. PURPOSE

**1.1** This standard provides uniform test methods and calculation procedures for establishing the efficiencies of multipurpose residential heat pumps for space conditioning, water heating, and/or dehumidification.

**1.2** This standard specifies the test equipment for performing such tests, the data required and calculations to be used, and lists and defines the terms used in testing.

**1.3** The procedures in this standard may be used as a basis for establishing efficiency ratings for such equipment and for estimating annual energy consumption.

## 2. SCOPE

**2.1** This standard covers electrically powered unitary integrated appliances that provide combinations of space conditioning, water heating, and/or dehumidification functions.

The equipment to which this standard applies may have the capability to heat water and/or to perform space dehumidification without requiring the simultaneous performance of space conditioning. It addresses air-source, water-source, ground water-source, ground-source closed loop, and direct geoechange equipment. It applies to air-source equipment rated below 65,000 Btu/h (19,000 W) and water-source, ground water-source, ground-source closed loop, and direct geoechange equipment rated below 135,000 Btu/h (40,000 W).

**2.2** The method of testing in this standard is broadly applicable, but this standard provides cooling and heating hours in temperature bins for only the contiguous states of the continental USA.

**2.3** This standard includes test methods for steady-state, cyclic, and part-load performance and methods for establishing seasonal performance. Equipment with single-capacity, multiple-capacity, and variable-capacity, or multiple compressors is covered.

**2.4** The equipment to which this standard applies may be ducted or ductless, but is limited to forced air space conditioning.

## 3. DEFINITIONS

**appliance:** as defined in this standard as a one-word substitute for combined appliance, which is defined below.

**cooling season:** that portion of the year that the outdoor air temperature is above 18.3°C (65°F).

**combined appliance:** an assembly consisting of a heat pump or air conditioner, a water-to-refrigerant heat exchanger, and optionally a potable water pump, and /or a water heater; the assembly provides space conditioning, domestic hot water, and optionally dehumidification.

**combined mode:** an operating mode that occurs during either the cooling season or the heating season when the appliance operates to meet a water heating load along with a space conditioning load. With respect to seasonal performance calculations, this mode occurs when both a water-heating load and a space conditioning load occurs simultaneously.

**energy factor, dehumidifier ( $EF_d$ ):** the ratio of the moisture removed by a dehumidifier to the energy input. The energy factor for a dehumidifier is expressed in units of L/Wh (lb/Wh).

**energy factor, water heater ( $EF_w$ ):** the ratio of the thermal energy supplied by an electric water heater to the energy input during a prescribed 24-hour simulated use test. The energy factor for a water heater is a dimensionless quantity.

**energy factor ( $EF_{wcs}$ ):** the ratio of the thermal energy supplied by the combined appliance water heater to its energy input during the cooling season. The energy factor is a dimensionless quantity.

**energy factor ( $EF_{whs}$ ):** the ratio of the thermal energy supplied by the combined appliance water heater to its energy input during the heating season. The energy factor is a dimensionless quantity.

**manufacturer:** the supplier who provides the rating of the combined appliance.