

**ANSI/ASHRAE Standard 40-2002 (RA 2006)
Reaffirmation of ANSI/ASHRAE Standard 40-2002**



ASHRAE STANDARD

Methods of Testing for Rating Heat-Operated Unitary Air-Conditioning and Heat Pump Equipment

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NOTE

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(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process.)

FOREWORD

This is a reaffirmation of ASHRAE Standard 40-2002. This standard was prepared under the auspices of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (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.

The changes made for the 2006 reaffirmation were:

- Citations to Reference 3 were changed to Reference 2 in Section 5.1, Table 1
- Reaffirmation dates were updated on referenced standards in Sections 6.5.1, 6.5.2, 9.2.3, 12.1.1, 12.1.2, and 12.8
- ANSI was removed from referenced standards (because those standards are no longer ANSI accredited) in Sections 2.3, 5.1, 6.6.1.3, 6.6.2.3, 6.6.2.4, 7.5.1, 7.6, 10.1, and 12.2.1
- "Shall" was changed to "should" in Section 13.1.1.1
- All reaffirmation and publication dates and titles were updated in Section 16
- Reference 13 was added to Section 16

1. PURPOSE

1.1 This standard provides test methods for determining the heating and cooling output capacities and energy inputs of unitary air-conditioning and heat pump equipment that is heat-operated (see Section 3, "Definitions").

1.2 These test methods may be used as a basis for rating such equipment, but it is not the purpose of this standard to specify methods of establishing ratings.

2. SCOPE

2.1 This standard applies to heat-operated unitary air conditioners and heat pumps consisting of one or more assemblies, including engine-driven systems. Where such equipment is provided in more than one assembly, the separate assemblies are designed to be used together.

2.2 Equipment within the scope of this standard may be classified as follows:

- a. Component arrangements:
 1. factory-assembled equipment employing heat-operated or mechanical refrigeration cycle or cycles (e.g., a packaged unit)
 2. equipment employing a heat-operated or mechanical refrigeration cycle with indoor and outdoor sections in separate assemblies (e.g., a split system)

3. equipment employing a heat-operated or mechanical refrigeration cycle as a liquid chiller with cooling coil in separate assembly (e.g., chiller)
 4. equipment employing refrigeration cycles and heating functions (e.g., chiller/heater)
- b. Method of providing air circulation through indoor section:
 1. with circulating fan incorporated with indoor assembly
 2. without circulating fan, for use with separate fan or air handler, or with heating equipment incorporating a fan
 - c. Medium for heat transfer to or from the outdoors:
 1. air
 2. water (or brine)
 3. evaporatively cooled condenser (cooling only)

2.3 This standard does not include methods of testing the following types of equipment:

1. heat-operated and engine-driven liquid chillers not part of a unitary air conditioner (Reference 1, ARI Standard 560-82 covers indirect-fired absorption chillers)
2. unitary air conditioner or heat pumps covered in Reference 2 (ASHRAE Standard 37, *Method of Testing for Rating Unitary Air Conditioning and Heat Pump Equipment*)
3. refrigerating systems employing the Peltier effect
4. desiccant-based cooling systems

3. DEFINITIONS

apparatus: the test facility conditioning device and other test and measurement devices called for in this standard (see *equipment*).

batch cycle process: a cycle that delivers cooling and/or heating in a nonsteady or noncontinuous manner. For this cycle the nominal capacity is the integral of instantaneous capacity over a complete cycle (sorption) divided by the cycle time. The process includes, but is not limited to, desorption, adsorption or absorption (whichever is applicable), and all pressure and temperature transient periods.

Steady state of a batch cycle process is when the integral over each cycle, from cycle to cycle, changes by no more than that allowed by the standard.

capacity, cooling (heating): the rate of heat removal (heat gain) from (to) a heat-transfer medium. See *sensible, latent, and total*.

coil, indoor: the heat exchanger that removes heat from (cooling) or adds heat to (heating) the airstream being conditioned. For direct expansion refrigerant systems: in the cooling mode, the coil operates as an evaporator; in the heating mode, the coil operates as a condenser.

coil, outdoor: the heat exchanger that rejects heat to (cooling) or absorbs heat from (heating) a source external to the conditioned space. In the cooling mode, the coil operates as a