



STANDARD

ANSI/ASHRAE Standard 164.1-2012 (RA 2016)
(Reaffirmation of ANSI/ASHRAE Standard 164.1-2012)

Method of Test for Residential Central-System Humidifiers

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NOTE

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FOREWORD

This standard provides rules for the testing of central-system humidifiers for residential applications. Its purpose is to provide a uniform method for testing in a laboratory environment. Although the method of test originated in AHRI Standard 610, Performance Rating of Central System Humidifiers, the project committee has developed this separate method of test to be used independently of the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) rating standard so that manufacturers, specifiers, installers, and users of central-system residential humidifiers can test a humidifier's capacity under a variety of conditions with uniform results. This method of test was prepared in cooperation with AHRI to correspond with AHRI Standard 610.

This is a reaffirmation of Standard 164.1-2012. 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 guidelines throughout the industry. This version of the reaffirmation has no changes.

Standard 164.1 is the first in a series of three standards for the testing of humidifiers. Standard 164.2 addresses self-contained humidifiers for residential applications, and Standard 164.3 addresses commercial and industrial humidifiers.

1. PURPOSE

This standard establishes a uniform method of laboratory testing for rating central-system residential humidifiers.

2. SCOPE

2.1 The scope of this standard covers a method of test for measuring the humidification rate of central-system residential humidifiers intended for use with forced-warm-air heating and/or cooling systems.

2.2 This method of test describes the test apparatus, mode of test conduction, and information to be recorded.

2.3 Tests covered include methods for measuring electrical power input, water flow rate, water temperature, and water pressure to the test humidifier. Also included are airflow rate, static pressure, temperature, and relative humidity entering and maintained by the test apparatus.

2.4 Information resulting from the application of this test method is intended for use by manufacturers, specifiers, installers, and users of central-system residential humidifiers.

2.5 This test method does not apply to self-contained humidifiers, portable humidifiers, or humidifiers for commercial and industrial applications.

3. DEFINITIONS

central-system humidifier: a humidifier that is installed in, or discharges into, the airstream of an HVAC system.

humidification rate: a measure of the ability of a humidifier to add moisture to its surrounding atmosphere, expressed as kg (lb_m) of water evaporated per unit of time.

humidifier: a device designed to add moisture to air.

heating or cooling unit: the unit that the humidifier is connected to or mounted within.

portable humidifier: a type of humidifier that has the characteristics described in AHAM-HU-1, *Household Humidifiers*.¹

return duct humidifier: a humidifier that is connected to a horizontal duct and that has the function of returning humidified air to the central system.

return plenum central-system humidifier: a humidifier that is connected to a vertical duct and has the function of returning humidified air to the central system.

self-contained humidifier: a humidifier that adds moisture to the air without the need of other mechanical devices and is not connected to the central heating/ventilation system.

settling means: a way to provide uniform airflow to the air measurement and supply plenums.

shall and should: the word *shall* indicates requirements of this standard; the word *should* indicates recommendations of this standard.

supply duct central-system humidifier: a humidifier that is connected to a horizontal duct and has the function of delivering humidified air from the central system.

supply plenum central-system humidifier: a humidifier that is connected to a vertical duct and has the function of delivering humidified air from the central system.

4. SYMBOLS AND SUBSCRIPTS

A_N	=	nozzle area, m ² (ft ²)
A_t	=	cross-sectional area of a test section, m ² (ft ²)
C	=	nozzle discharge coefficient, dimensionless
D	=	duct diameter, m (ft)
D_{PT}	=	pressure tap diameter, mm (in.)
D_N	=	nozzle exit diameter, m (ft)
H_X	=	weight of water at time X, kg (lb _m)
H_m	=	humidification rate, kg/h (lb _m /h)
L	=	nozzle throat dimension, m (ft)
M	=	diameter of round duct or equivalent diameter of rectangular duct, m (ft)
M_{wf}	=	final weight of water, kg (lb _m)
M_{wi}	=	initial weight of water, kg (lb _m)