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ANSI/ASHRAE Standard 164.4-2021
Methods of Test for Commercial and Industrial Adiabatic Humidifiers

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NOTE

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FOREWORD

ASHRAE Standard 164.4 provides rules for the testing of adiabatic humidifiers for commercial and industrial applications. It was prepared by ASHRAE Standard Project Committee (SPC) 164.4. The cognizant technical committee is ASHRAE TC 5.11, Humidifying Equipment.

The purpose of this standard is to provide a uniform method for testing in a laboratory environment. Although the method of test originated in AHRI Standard 640, Performance Rating of Industrial and Commercial Humidifiers*, the committee has developed this separate method of test to be used independently of the AHRI rating standard so that manufacturers, specifiers, installers, and users of industrial and commercial humidifiers can test humidifier performance under a variety of conditions with uniform results.*

This method of test was prepared in cooperation with the Air Conditioning and Refrigeration Institute (AHRI) to utilize with AHRI Standard 640.

This test method does not address applications of evaporative air coolers *as defined by ASHRAE Standard 133,* Method of Testing Direct Evaporative Air Coolers*.*

This test method does not address the application practices for absorbing generated moisture in an airstream or space.

1. PURPOSE

This standard method of test establishes a uniform method of laboratory performance testing of commercial and industrial adiabatic humidifiers.

2. SCOPE

2.1 This standard describes a method of test for the humidification rate and evaporation efficiency of commercial and industrial adiabatic humidifiers as defined in Section 3.

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

2.3 Information resulting from the application of this method of test is intended for use by manufacturers, specifiers, installers, and users of commercial and industrial humidifiers.

3. DEFINITIONS

adiabatic humidifier: a device whose primary function is to increase the humidity of unsaturated air by conversion of the sensible heat in the unsaturated air to latent heat through the process of evaporating water directly introduced to this air.

centrifugal type atomizer: utilizes a high-speed disk to sling water to the atomizer's rim where the water is thrown onto plates or a comb to produce a fine mist.

commercial and industrial humidifier (humidifier)**:** a device designed to add moisture to air. Humidifiers designed to increase the moisture level of the air in a room, space, or ventilation system that is not primarily intended for residential applications.

compressed-air fogging systems: pressurized air is forced through an annular orifice at the nozzle tip creating a vortex at the tip. Water passes through an orifice in the nozzle where the water is atomized on contact with the compressed air at the nozzle tip.

compressed air and water fogging systems: pressurized air and pressurized water are combined inside the nozzle to produce a fine mist at the nozzle tip.

humidification rate: a measure of the ability of a humidifier to add moisture to the surrounding environment, expressed as a unit of mass of water evaporated per unit of time.

humidifier mass: a measure of the combined mass of both the humidifier and the water reservoir.

mist eliminator/droplet separator: a porous mesh or media barrier to prevent carry over of water droplets from an adiabatic humidifier.