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## ANSI/ASHRAE Standard 143-2024
## Method of Test for Indirect Evaporative Air Coolers


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PREVIEW

**NOTE**

**Approved addenda, errata, or interpretations for this standard can be downloaded free of charge from the ASHRAE website at www.ashrae.org/technology.**

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## FOREWORD

*First published in 2000, ASHRAE Standard 143 provides procedures for testing indirect evaporative cooling devices under laboratory conditions to obtain rating information. As an ASHRAE method-of-test standard, it is intended to offer recommended practices and accurate measurement procedures.*

*The 2024 revision of the standard includes changes to meet ASHRAE's mandatory language requirements.*

## 1. PURPOSE

This standard provides laboratory test procedures and calculations for establishing the cooling capacities and power requirements for indirect evaporative air-cooling equipment.

## 2. SCOPE

**2.1** This standard applies to testing indirect evaporative air coolers operating at steady-state conditions that

a. Sensibly cool a primary airstream through heat exchanger(s) by the evaporation of water into a secondary airstream and
b. Are packaged systems or are components of packaged systems

**2.2** This standard does not apply to

a. Devices that use mechanical refrigeration or thermal storage to cool the primary airstream, the secondary airstream, or the water provided for evaporation during the test or
b. Devices that dry the primary or secondary airstream during the test

## 3. TERMINOLOGY AND SYMBOLS

### 3.1 Definitions

***determination:*** a complete set of measurements for a particular point of operation of an indoor evaporative cooler (IEC). The measurements shall be used to determine all IEC performance variables as defined in this standard.

***fan:*** a device for moving air that utilizes a power-driven rotating impeller.

***fan motor power:*** the electric input power required to drive the fan and any elements in the drive train that are a part of the fan.

***fan speed:*** the rotative speed of the impeller. If a fan has more than one impeller, fan speeds are the rotative speeds of each impeller.

***free delivery:*** the point of operation where the external static pressure is zero.

***indirect evaporative cooling:*** wet secondary airstream cooling the dry primary airstream.

***indirect evaporative cooler (IEC) air boundaries:*** indirect evaporative cooling-unit inlet and outlet boundaries are defined as the interface between the cooling unit and the remainder of the system and are at a plane perpendicular to the airstream where it enters or leaves the indirect evaporative cooling unit. It is acceptable to include filter media assemblies, inlet boxes, inlet vanes, inlet cones, silencers, screens, rain hoods, dampers, discharge cones, and eaves as part of the cooling unit between the inlet and outlet boundaries.

***IEC input power boundary:*** the interface of the wiring entering electrically powered equipment. Drive or coupling losses are included as part of the electric input power.

***IEC total electric input power:*** the sum of the electric input power in watts supplied to the electrical components of the indirect evaporative cooler. This includes fan motors, pump motors, and other devices needed to produce the cooling effect. The power to control devices such as thermostats, transformers providing low voltage to control mechanisms, and freeze protection devices need not be included in total electric input power.

***indirect evaporative cooler with integrated heat exchanger:*** an indirect evaporative cooling device with integrated primary (dry) and secondary (wet) air passages in a single sensible and evaporative heat exchanger (see Figure 1).

***indirect evaporative cooler with a nonintegrated heat exchanger:*** an indirect evaporative cooling device with a separate primary (dry) sensible heat exchanger and a separate secondary (wet) evaporative heat

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