

ANSI/AMCA Standard 230-15

Laboratory Methods of Testing Air Circulating Fans for Rating and Certification

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**AIR MOVEMENT AND CONTROL
ASSOCIATION INTERNATIONAL INC.**

The International Authority on Air System Components

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ANSI/AMCA Standard 230-15

Laboratory Methods of Testing Air Circulating Fans for Rating and Certification



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Related AMCA Documents

Related Publications

AMCA Publication 11, *Certified Ratings Program — Operating Manual*

AMCA Publication 211, *Certified Ratings Program — Product Rating Manual for Fan Air Performance*

AMCA Publication 311, *Certified Ratings Program — Product Rating Manual for Fan Sound Performance*

Related Standards

ANSI/AMCA Standard 300, *Reverberant Room Method for Sound Testing of Fans*

ANSI/AMCA Standard 210, *Laboratory Methods of Testing Fans for Aerodynamic Performance Rating*

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Laboratory Methods of Testing

Air Circulating Fans for Rating and Certification

1. Purpose

The purpose of this standard is to establish uniform methods for laboratory testing of air circulating fans to determine performance (forward or reverse flow) in terms of airflow rate for rating, certification or guarantee purposes.

2. Scope

This standard shall be used as the basis for testing air circulating fan heads, ceiling fans, box fans, table fans, portable personnel coolers or other air circulating devices when air is used as the test gas. The diameter of the fan being tested shall be limited by the minimum dimensions as shown in the applicable test figures.

Blowers, exhausters, compressors, positive displacement machines and positive pressure ventilators are not within the scope of this standard.

The parties to a test for guarantee purposes shall agree on exceptions to this standard in writing prior to the test. However, only tests which do not violate any mandatory requirements of this standard shall be designated as tests conducted in accordance with this standard.

3. Units of Measurement

3.1 System of units

SI units (The International System of Units, *Le Système International d'Unités*) [1] are the primary units employed in this standard, with I-P units (inch-pound) given as the secondary reference. SI units are based on the fundamental values of the International Bureau of Weights and Measures [1], and I-P values are based on the values of the National Institute of Standards and Technology, which are in turn based on the values of the International Bureau.

3.2 Basic units

The SI unit of length is the meter (m) or the millimeter (mm); the I-P unit of length is the foot (ft) or the inch (in.). The SI unit of mass is the kilogram (kg); the I-P unit of mass is the pound mass (lbm). The unit of time is either the minute (min) or the second (s). The SI unit of temperature is either the Kelvin (K) or the degree Celsius (°C); the I-P unit of temperature is either the degree Fahrenheit (°F) or the degree Rankine (°R). The SI unit of force is the newton (N); the I-P unit of force is the pound force (lbf).

3.3 Velocity

The SI unit of velocity is the meter per second (m/s); the I-P unit of velocity is the foot per minute (fpm).

3.4 Thrust

The SI unit of thrust is the newton (N); the I-P unit is the pound force (lbf).

3.5 Pressure

The SI unit of pressure is the pascal (Pa). The I-P unit of pressure is either the inch water gauge (in. wg) or the inch mercury (in. Hg). Values in mm Hg or in. Hg shall be used only for barometric pressure measurements.

The in. wg shall be based on a one-inch column of distilled water at 68 °F under standard gravity and a gas column balancing effect based on standard air. The in. Hg shall be based on a one-inch column of mercury at 32 °F under standard gravity in a vacuum. The mm Hg shall be based on a one-millimeter column of mercury at 0 °C under standard gravity in a vacuum.

3.6 Power

The unit of input power is the watt (W).

3.7 Speed

The unit of rotational speed is the revolution per minute (rpm).

3.8 Gas properties

The SI unit of density is the kilogram per cubic meter (kg/m³); the I-P unit of density is the pound mass per cubic foot (lbm/ft³). The SI unit of viscosity is the pascal-second, (Pa-s); the I-P unit of viscosity is the pound mass per foot-second (lbm/ft-s). The SI unit of gas constant is the joule per kilogram-kelvin (J/kg-K); the I-P unit of gas constant is the foot-pound force per pound-mass-degree Rankine (ft-lb/(lbm•°R)).

3.9 Dimensionless groups

Various dimensionless quantities appear in the text. Any consistent system of units may be employed to evaluate these quantities unless a numerical factor is included, in which case units must be as specified.

3.10 Physical constants

The SI value of standard gravitational acceleration shall be taken as 9.80665 m/s², which corresponds to mean sea level at 45° latitude; the I-P value of standard gravity shall be taken as 32.1740 ft/s².