ANSI/AMCA Standard 220-05 (R2012)

Laboratory Methods of Testing Air Curtain Units for Aerodynamic Performance Rating

An American National Standard
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AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC.

The International Authority on Air System Components

ANSI/AMCA Standard 220-05 (R2012)

Laboratory Methods of Testing Air Curtain Units for Aerodynamic Performance Rating

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Authority

AMCA Standard 220 was approved by the AMCA International membership on January 14, 2001 and as an American National Standard by the American National Standards Institute (ANSI) on 7 June 2005. The document was reaffirmed on March 29, 2012.

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Related AMCA Documents

Related Publications	AMCA Publication 11	*Certified Ratings Program - Operating Manual*
	AMCA Publication 111	*Laboratory Accreditation Program*
	AMCA Publication 211	*Certified Ratings Program - Air Performance*
Related Standards	ANSI/AMCA Standard 210	*Laboratory Methods of Testing Fans for Aerodynamic Performance Rating*

Contents

Air Curtain Units for Aerodynamic Performance Rating

1. Scope

The scope of this standard covers the performance testing of air curtain units.

The purpose of this standard is to establish uniform methods for laboratory testing of air curtain units to determine aerodynamic performance in terms of airflow rate, outlet air velocity uniformity, power consumption, and air velocity projection, for rating or guarantee purposes.

It is not the purpose of this standard to specify the testing procedures to be used for design, production, or field testing.

2. Normative References

The following standard contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below.

ANSI/AMCA 210-99
Laboratory Methods of Testing Fans for Aerodynamic Performance Rating
Air Movement and Control Association International, Inc., Arlington Heights, IL 60004 U.S.A., 1999.

3. Definitions / Units of Measure / Symbols

3.1 Definitions

3.1.1 Air curtain (airstream)
A directionally-controlled airstream, moving across the entire height and width of an opening, which reduces the infiltration or transfer of air from one side of the opening to the other and/or inhibits insects, dust or debris from passing through. For the purposes of this standard, “air curtain” and “airstream” are synonymous.

3.1.2 Air curtain depth
The airstream dimension perpendicular to both the direction of airflow and the airstream width; the short dimension of the airstream.

3.1.3 Air curtain width
The airstream dimension perpendicular to both the direction of airflow and the airstream depth; the long dimension of the airstream.

3.1.4 Air curtain unit (ACU)
An air moving device which produces an air curtain.

3.1.5 Air discharge nozzle
A component or an assembly, which may include adjustable vanes, in the ACU which directs and controls the airstream.

3.1.6 Air discharge nozzle depth (N_d)
The inside dimension perpendicular to both the direction of airflow and the airstream width.

3.1.7 Air discharge nozzle width (N_w)
The inside dimension perpendicular to both the direction of airflow and the nozzle depth.

3.1.8 Air discharge angle (θ)
The angle between the plane of the protected opening and the direction in which the air curtain leaves the discharge.

3.1.9 Psychrometrics (from ANSI/AMCA 210)

3.1.9.1 Dry-bulb temperature (t_d)
The air temperature measured by a dry temperature sensor.

3.1.9.2 Wet-bulb temperature (t_w)
The temperature measured by a temperature sensor covered by a water-moistened wick and exposed to air in motion. When properly measured, it is a close approximation of the temperature of adiabatic saturation.

3.1.9.3 Wet-bulb depression
The difference between the dry-bulb and wet-bulb temperatures at the same location.

3.1.9.4 Stagnation (total) temperature
Stagnation (total) temperature is the temperature which exists by virtue of the internal and kinetic energy of the air. If the air is at rest, the total temperature will equal the static temperature.

3.1.9.5 Static temperature
Static temperature is the temperature which exists by virtue of the internal energy of the air only. If a portion of the internal energy is converted into kinetic energy, the static temperature will be decreased accordingly.

3.1.9.6 Air density (ρ)
Air density is the mass per unit volume of the air.

3.1.9.7 Standard air
Air with a density of 1.2 kg/m^3 (0.075 lbm/ft^3), a ratio of specific heats of 1.4, a viscosity of 1.8185×10^{-05} Pa·s (1.222