ANSI/AMCA Standard 250-05

Laboratory Methods of Testing Jet Tunnel Fans for Performance

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AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC.

The International Authority on Air System Components

ANSI/AMCA STANDARD 250-05

Laboratory Methods of Testing Jet Tunnel Fans for Performance

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Authority

ANSI/AMCA Standard 250-05 was adopted by the membership of the Air Movement and Control Association International, Inc. on 14 January 2001. It was approved by ANSI as an American National Standard on 31 August 2005.

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Foreword

This standard was developed in response to the need for a standard method of testing jet fans, sometimes called impulse fans, which have seen increasing use in the United States. The test procedures outlined in this standard are in harmony with those found in ISO 13350. It is believed that ANSI/AMCA 250 will be of great benefit to purchaser and manufacturer alike.

Introduction

The need for adequate ventilation to maintain or improve the quality of air in vehicular tunnels is self-evident. One means of achieving such ventilation is through the use of fans located above the traffic pattern and spaced at intervals along the length of a tunnel. These fans produce a jet (or impulse) of air that induces airflow through the entire tunnel. Secondarily, this means of achieving airflow is also useful in smoke evacuation.

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1. Scope

This standard deals with the determination of those technical characteristics needed to describe all aspects of the performance of jet tunnel fans. It does not cover those fans designed for ducted applications nor those designed solely for air circulation, e.g., ceiling fans and table fans.

The test procedures described in this standard relate to laboratory conditions. The measurement of performance under *in-situ* conditions is not included.

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

2. Normative References

The following standards contain provisions that, through specific reference in this text, constitute provisions of this American National Standard. At the time of publication the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below.

AMCA 300-96, *Reverberant Room Method for Sound Testing of Fans*, Air Movement and Control Association International, Inc., Arlington Heights, IL, USA.

ANSI S2.19-1999 (R2004), *Mechanical Vibrations - Balance Quality Requirements of Rigid Motors - Part 1: Determination of Possible Unbalance, Including Marine Applications*, American National Standards Institute, New York, NY, USA.

ANSI/AMCA 204-96 *Balance Quality and Vibration Levels for Fans*, Air Movement and Control Association International, Arlington Heights, IL U.S.A., 1998

ANSI/AMCA 210-99 *Laboratory Methods of Testing Fans for Aerodynamic Performance Rating*, Air Movement and Control Association International, Arlington Heights, IL U.S.A., 2000

ANSI/NEMA MG 1-2003, *Motors and Generators, National Electrical Manufacturers Association*, Rosslyn, VA, USA.

ISO 5801:1997(E), *Industrial Fans - Performance Testing Using Standardized Airways*, International Organization for Standardization, Geneva, Switzerland, 1996

3. Definitions and Symbols

3.1 Definitions

For the purposes of this standard, the following definitions apply:

3.1.1 Air. A mixture of various gases forming the earth's atmosphere and commonly used to denote any gaseous medium measured, moved or controlled in a HVAC system.

3.1.2 Standard air. Air with a density of 1.2 kg/m^3 (0.75 lbm/ft^3), a specific heat ratio of 1.4, a viscosity of 1.819 × 10^{-5} Pa•s (1.222 × 10^{-5} lbm/ft-sec) and an absolute pressure of 101.325 kPa (408.0 in. wg). Air at 20°C (68°F), 50% relative humidity, and 101.325 kPa (29.92 in. Hg) has these properties, approximately.

3.1.3 Absolute pressure. Pressure above a perfect vacuum; the sum of gauge pressure and atmospheric pressure. The value is always positive.

3.1.4 Barometric pressure. The absolute pressure exerted by the atmosphere at a location of measurement.

3.1.5 Dry-bulb temperature. Air temperature measured by a temperature-sensing device without modifications to compensate for the effect of humidity.

3.1.6 Static pressure at a point. That portion of air pressure that exists by virtue of the degree of compression only. If expressed as gauge pressure, it may be negative or positive.

3.1.7 Volume airflow rate. The volume of air that passes through a given area in unit time.