

ANSI/AMCA Standard 500-D-07

Laboratory Methods of Testing Dampers for Rating

An American National Standard
Approved by ANSI on January 23, 2007



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

The International Authority on Air System Components

ANSI/AMCA STANDARD 500-D-07

Laboratory Methods of Testing Dampers for Rating



**Air Movement and Control Association International, Inc.
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Arlington Heights, IL 60004-1893**

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Authority

AMCA Standard 500-D-07 was adopted by the membership of the Air Movement and Control Association International, Inc. on 19 October, 2006. It was approved as an American National Standard by the American National Standards Institute (ANSI) and became effective on 23 January 2007.

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Related AMCA Standards and Publications

- | | |
|------------------------|---|
| AMCA Publication 502 | <i>Damper Application Manual for Heating, Ventilation and Air Conditioning</i> |
| AMCA Publication 503 | <i>Fire, Ceiling(Radition), Smoke and Fire/Smoke Dampers Application Manual</i> |
| ANSI/AMCA Standard 510 | <i>Methods of Testing Heavy Duty Dampers for Rating</i> |
| AMCA Publication 511 | <i>Certified Ratings Program for Air Control Devices</i> |
| ANSI/AMCA Standard 520 | <i>Laboratory Methods for Testing Actuators</i> |

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Laboratory Methods of Testing Dampers for Rating

1. Purpose

The purpose of this standard is to establish uniform laboratory test methods for dampers. The characteristics to be determined include, as appropriate, air leakage, pressure drop, dynamic closure, and operational torque.

It is not the purpose of this standard to specify the testing procedures to be used for design, production, or field testing. Similarly, it is not the purpose of this standard to indicate or establish minimum or maximum performance ratings to be used for specifying these products.

2. Scope

This standard may be used as a basis for testing dampers when air is used as the test gas.

A test conducted in accordance with the requirements of this standard is intended to demonstrate the performance of a damper and is not intended to determine acceptability level for a damper. It is not within the scope of this standard to indicate the actual sequence of testing.

The parties to a test for guarantee purposes may agree to exceptions to this standard in writing prior to the test. However, only a test that does not violate any mandatory requirement of this standard shall be designated as a test 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. Annex A provides conversion factors for SI and I-P units.

*Bibliographic references are indicated by brackets; mandatory references are indicated by superscripts.

3.2 Basic units

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

3.3 Airflow rate and velocity

3.3.1 Airflow rate. The unit of volumetric airflow rate is the cubic meter per second (m³/s); the I-P unit is the cubic foot per minute (cfm).

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

3.4 Pressure

The unit of pressure is the pascal (Pa) or the millimeter of mercury (mm Hg); the I-P unit is either the inch water gauge (in. wg), or the inch mercury column (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 vacuo*. The mm Hg shall be based on a one mm column of mercury at 0°C under standard gravity *in vacuo*.

3.5 Torque

The unit of torque is the newton-meter (N-m); the I-P unit is the pound-inch (lbf-in.).

3.6 Gas properties

The unit of density is the kilogram per cubic meter (kg/m³); the I-P unit is the pound mass per cubic foot (lbm/ft³). The unit of viscosity is the Pascal-second (Pa-s); the I-P unit is the pound mass per foot-second