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ANSI/ASHRAE Standard 41.2-2026
Standard Methods for Air Velocity and Airflow Measurements

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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

ANSI/ASHRAE Standard 41.2 provides recommended practices for airflow measurements as well as measurement procedures for use in preparation of other ASHRAE standards.

This 2026 edition of Standard 41.2 includes an update of the steady-state criteria for recording data, an addition that covers airflow mixing devices, an addition that permits the optional use of legacy multiple-nozzle chambers that were specified in the original 1987 version of this standard (reaffirmed in 1992), and changes to make it easier for higher-tier ASHRAE standards to adopt this standard by reference.

This revision of Standard 41.2 meets ASHRAE's mandatory language requirements.

1. PURPOSE

This standard prescribes methods for air velocity and airflow measurement, including consideration of density effects.

2. SCOPE

a. This standard applies to air velocity and airflow measurement for testing heating, ventilating, air conditioning, and refrigerating systems and components at pressures within the range of –25 kPa to +25 kPa (–100 in. of water to +100 in. of water) referenced to atmospheric pressure.
b. This standard includes airflow mixing methods to obtain more uniform temperatures and velocities.

3. DEFINITIONS

accuracy: the degree of conformity of an indicated value to the true value.

computational fluid dynamics (CFD): the use of applied mathematics, physics, and computational software to visualize how a gas or liquid flows, as well as how the gas or liquid affects objects as it flows past.

error: the difference between the observed value of the measurand and its true value.

geometrically equivalent diameter: the diameter of a circle having the same area as a noncircular airflow area.

hydraulic diameter: four times the airflow area divided by the perimeter of the solid boundary in contact with the air.

measurement system: the instruments, signal conditioning systems if any, and data acquisition system if any.

operating tolerance limit: the upper or lower value of an operating tolerance that is associated with a test point or a targeted set point.

post-test uncertainty: an analysis to establish the uncertainty of a test result after conducting the test.

pretest uncertainty: an analysis to establish the expected uncertainty interval for a test result before conducting the test.

random error: the portion of the total error that varies randomly in repeated measurements of the true value throughout a test process.

steady-state criteria: the criteria that establish negligible change of air velocity or airflow with time.

systematic error: the portion of the total error that remains constant in repeated measurements of the true value throughout a test process.

targeted set point: a specific set of test conditions where the required air velocity or airflow rate is known and has an associated operating tolerance.

test chamber: an airflow measuring apparatus that has a chamber diameter that is greater than twice the unit under test (UUT) duct diameter or geometrically equivalent diameter.

test duct: an airflow measuring apparatus that has a constant diameter or geometrically equivalent diameter throughout its length except for transition portions at one or both ends.

test point: a specific set of test operating conditions for recording data where the measured required air velocity or airflow rate is unknown and has an associated operating tolerance.

true value: the unknown, error-free value of a test result.

uncertainty: the limits of error within which the true value lies.

unit under test (UUT): equipment that is the subject of air velocity or airflow measurements.