STANDARD

ANSI/ASHRAE/SMACNA Standard 126-2016
(Supersedes ANSI/ASHRAE/SMACNA Standard 126-2008)

Method of Testing HVAC Air Ducts

Approved by ASHRAE on June 30, 2016, by the Sheet Metal and Air Conditioning Contractors' National Association on May 9, 2016, and by the American National Standards Institute on July 1, 2016.

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ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

The Senior Manager of Standards of ASHRAE should be contacted for

a. interpretation of the contents of this Standard,
b. participation in the next review of the Standard,
c. offering constructive criticism for improving the Standard, or
d. permission to reprint portions of the Standard.

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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.

(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

First published in 2000, Standard 126 is a joint project of ASHRAE and the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA). It was created to provide methods of testing to determine the strength and durability characteristics of HVAC ducts under various loading and environmental conditions. The intent of Standard 126 is to address all duct shapes and materials. To the project committee's knowledge, no other publication addresses all of the structural and durability tests as comprehensively as this standard, although individual tests are covered under other standards.

A standardized set of comprehensive tests is used to ensure that products meet minimum structural requirements, and to allow products to be compared to one another. Such tests should simulate structural stresses that the duct will experience in service and facilitate the application of safety factors. These tests include pressurizing the ductwork, applying superimposed loads, dropping weighted implements for impact or puncture, applying tension to the duct, bending flexible duct 180 degrees, subjecting the ductwork to temperature and humidity changes, and bursting or collapsing the ductwork under pressure. After an individual test or a series of tests, leakage tests may be conducted to determine the effect of a structural or durability test on a specimen. During a test or series of tests, the ductwork is observed to determine if there is degradation and permanent damage.

Pass/fail criteria are determined by the sponsoring agency, code officials, or other users of this standard. Recommended acceptance criteria are provided in Informative Annex C.

1. PURPOSE

This standard provides laboratory test procedures for the evaluation of HVAC air ducts.

2. SCOPE

2.1 This standard shall be used to determine the structural strength, dimensional stability, durability, and leakage characteristics of HVAC air ducts.

2.2 This standard does not address the following:

a. Fittings
b. Effects of aerosols, solid particulates, corrosive environments, or combustibility
c. Long-term effects of extended service
d. Seismic qualifications
e. Underground ducts
f. Plenums and equipment casings
g. Supports for ductwork and fittings

3. DEFINITIONS AND SYMBOLS

3.1 Definitions

accuracy: the degree of conformity of an indicated value to an accepted standard value, or true value. The degree of inaccuracy is known as "measurement error" and is the sum of bias error and precision error.

bias error (systematic error): the difference between the true or actual value to be measured and the indicated value from the measuring system that persists and is usually due to the particular instrument or technique of measurement. These errors are corrected through calibration.

density of standard air (ρ_s): 1.204 kg/m^3.

duct, HVAC: duct and fittings used for conveying air in residential, commercial, institutional, and industrial heating, ventilating, and air-conditioning systems.

joint: a connection of duct surface elements that is primarily intended to connect lengths of ductwork, to join intersecting ducts, or to join ducts and equipment.

leakage: the volumetric flow rate required to maintain a constant static pressure in a test specimen.

leakage class: leakage of ductwork, L/s per Pa$^{0.65}$ per m^2 of duct surface area.

precision: the closeness of agreement among repeated measurements of the same characteristic by the same method under the same conditions.

random error (precision error): a statistical error that is caused by chance and is not recurring.

sealant: a material or product used to seal longitudinal duct seams, transverse duct joints, and ductwork penetrations. Products include liquids, mastics, tapes, gaskets, heat-activated material, and mastic with an embedded fabric.

seam: a connection of duct surface elements that is primarily oriented in the direction of airflow.

sponsor: a manufacturer, trade association, or some other group that funds, sponsors, or requires ductwork tests in compliance with this standard.

transverse joint: a joint that is used to assemble sections of duct together or connect them to fittings.

3.2 Symbols

A_f = final area, mm^2
A_i = initial area, mm^2
D = diameter, mm
L = length, mm
L_{rs} = reinforcement spacing, mm
L_{us} = user-specified support spacing, mm
PR = percent reduction, %
Q_a = leakage rate at actual conditions, L/s
Q_s = leakage rate at standard air conditions, L/s