Ventilation for buildings - Air terminal devices - Aerodynamic testing of damper and valves

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

See Eesti standard EVS-EN 1751:2014 sisaldab Euroopa standardi EN 1751:2014 inglisekeelset teksti.	This Estonian standard EVS-EN 1751:2014 consists of the English text of the European standard EN 1751:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 29.01.2014.	Date of Availability of the European standard is 29.01.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Ventilation for buildings - Air terminal devices - Aerodynamic testing of damper and valves

Ventilation des bâtiments - Bouches d'air - Essais aérodynamiques des registres et clapets

Lüftung von Gebäuden - Geräte des Luftverteilungssystems - Aerodynamische Prüfungen von Drossel- und Absperrelementen

This European Standard was approved by CEN on 9 November 2013.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 1751:2014) has been prepared by Technical Committee CEN/TC 156 “Ventilation for buildings”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2014, and conflicting national standards shall be withdrawn at the latest by July 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1751:1998.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies methods for the testing and rating of dampers and valves used in air distribution systems with pressure differences up to 2 000 Pa.

The tests incorporated in this European Standard are:

a) leakage past a closed damper or valve (for classification see Annex C);

b) casing leakage (for classification see Annex C);

c) flow rate/pressure requirement characteristics;

d) torque: (see Annex A);

e) thermal transmittance: (see Annex B).

The acoustic testing of dampers and valves is not included in this European Standard.

The tests specified above apply to the following:

f) measurement of leakage past a closed damper or valve;

g) measurement of casing leakage;

h) determination of flow rate and pressure requirements;

i) measurement of torque characteristics (see Annex A);

j) measurement of thermal transfer characteristics to determine insulation properties (see Annex B).

NOTE Certain aspects of the dynamic performance of dampers or valves are dependent upon the air distribution system to which they are connected and are, therefore, difficult to measure in isolation. Such considerations have led to the omission of these aspects of the dynamic performance measurements from this European Standard. Also, in common with other air distribution components, the results from tests carried out in accordance with this European Standard may not be directly applicable if the damper or valve is situated in an area of non-uniform flow.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12792, *Ventilation for buildings - Symbols, terminology and graphical symbols*

EN ISO 5167-1, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 1: General principles and requirements (ISO 5167-1)*

EN ISO 5167-2, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 2: Orifice plates (ISO 5167-2)*

EN ISO 5167-3, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 3: Nozzles and Venturi nozzles (ISO 5167-3)*

EN ISO 5167-4, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 4: Venturi tubes (ISO 5167-4)*

3 Terms, definitions, symbols and suffixes

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12792 apply.

3.2 Symbols

The symbols used in this document are given in Table 1.

Table 1 — Symbols

Symbol	Quantity	Unit
A	Internal cross-sectional area of duct	m^2
C_D	Coefficient of discharge	-
D_e	Equivalent hydraulic diameter Circular ducts: $\sqrt{\frac{4A}{\pi}}$ Square/Rectangular ducts: $\frac{2ab}{a+b}$	m
p	Absolute pressure	Pa
pa	Atmospheric pressure	Pa
p_d	Velocity pressure $1/2\ \rho\ v^2$	Pa
p_t	Stagnation or absolute total pressure	Pa
p_s	Static gauge pressure (p - p_a)	Pa
Δp_s	Pressure difference across the damper or valve under test	Pa
Δp	Flow meter differential pressure	Pa
Δp_t	Conventional total pressure difference for an air density of 1,2 kg·m^{-3} at the inlet to the damper or valve under test	Pa
q_v	Volume rate of air flow at the flow meter	l·s^{-1}
q_{vL}	Leakage volume rate of air flow	l·s^{-1}
q_{vLBA}	Closed blade air leakage factor, volume rate of air flow per unit duct cross sectional area	l·s^{-1}·m^{-2}
q_{vLCA}	Case air leakage factor, volume rate of air flow per reference casing area (which is taken as perimeter of damper multiplied by an equivalent length of 1 m)	l·s^{-1}·m^{-2}
v	Velocity	m·s^{-1}