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SUNDVENTILATSIOONISEADMETE SPETSIFIKATSIOON

Smoke and heat control systems - Part 3: Specification
for powered smoke and heat control ventilators (Fans)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 12101-3:2015 sisaldab Euroopa standardi EN 12101-3:2015 ingliskeelset teksti.	This Estonian standard EVS-EN 12101-3:2015 consists of the English text of the European standard EN 12101-3:2015.
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English Version

Smoke and heat control systems - Part 3: Specification for powered smoke and heat control ventilators (Fans)

Systèmes pour le contrôle des fumées et de la chaleur -
Partie 3 : Spécifications relatives aux ventilateurs pour le
contrôle de fumées et de chaleur

Rauch- und Wärmefreihaltung - Teil 3: Bestimmungen für
maschinelle Rauch- und Wärmeabzugsgeräte

This European Standard was approved by CEN on 12 January 2015.

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Contents

Page

European foreword	7
Introduction	8
1 Scope	10
2 Normative references	10
3 Terms and definitions, symbols and abbreviations	11
4 Requirements	13
4.1 Response delay (response time).....	13
4.1.1 Opening under wind load within a given time	13
4.1.2 Opening under snow load within a given time	13
4.2 Operational reliability	13
4.2.1 General.....	13
4.2.2 Application categories	13
4.2.3 Motor rating	14
4.3 Effectiveness of smoke / hot gas extraction.....	14
4.3.1 General.....	14
4.3.2 Gas flow and pressure maintenance during smoke and heat extraction test.....	15
4.4 Resistance to fire	15
4.5 Ability to open under environmental conditions	15
4.5.1 Opening under wind load within a given time	15
4.5.2 Opening under snow load within a given time	15
4.6 Durability of operational reliability.....	15
5 Testing, assessment and sampling methods	15
5.1 General.....	15
5.2 Test of response delay (response time) opening under wind, snow load within a given time ..	16
5.2.1 Wind load.....	16
5.2.2 Snow load	16
5.3 Operational reliability	17
5.3.1 Application categories	17
5.3.2 Motor rating	17
5.4 Effectiveness of smoke / hot gas extraction – Gas flow and pressure maintenance during smoke and heat extraction test	17
5.5 Resistance to fire	17
5.6 Ability to open under environmental conditions: opening under wind, snow load within a given time.....	17
5.7 Durability of operational reliability.....	17
6 Assessment and verification of constancy of performance – AVCP	17
6.1 General.....	17
6.2 Type Testing.....	17
6.2.1 General.....	17
6.2.2 Test samples, testing and compliance criteria.....	18
6.2.3 Test reports	19
6.3 Factory production control (FPC)	19
6.3.1 General.....	19
6.3.2 Requirements	20
6.3.3 Product specific requirements	27
6.3.4 Initial inspection of factory and of FPC	27
6.3.5 Continuous surveillance of FPC	28
6.3.6 Procedure for modifications	28

6.3.7	One-off products, pre-production products (e.g. prototypes) and products produced in very low quantity.....	28
7	Marking, labelling and packaging	29
Annex A	(normative) Criteria to determine family of fans in order to select the sizes to be tested	31
A.1	Reduction of numbers of tests for PSHC ventilators forming a product range.....	31
A.2	Motors	33
A.2.1	General.....	33
A.2.2	Motor Type 1: Motor out of airstream and Impeller not mounted on shaft	34
A.2.3	Motor Type 2: Centrifugal fans with impeller mounted on the motor shaft	35
A.2.4	Motor Type 3: Fans with motor inside the airstream without cooling	35
A.2.5	Motor Type 4: Motors out of airstream but within fan casing.....	36
A.2.5.1	General.....	36
A.2.5.2	Motor Type 4.1	36
A.2.5.3	Motor Type 4.2	37
A.3	Combined testing	37
A.3.1	General rule.....	37
A.3.2	Specific rule for an axial fan.....	38
A.4	Determination of highest stresses in impellers	38
A.4.1	PSHC Ventilators with geometrically similar impellers	38
A.4.2	Fans with impellers that are not geometrically similar.....	40
A.4.2.1	Axial impellers	40
A.4.2.1.1	Centrifugal force	40
A.4.2.1.2	Fastenings or welds.....	42
A.4.2.1.3	Hub/back-plate/shroud stresses	43
A.4.2.2	Centrifugal impellers	45
A.4.2.2.1	Centrifugal force	45
A.4.2.2.2	Blade bending moment	46
A.4.2.2.3	Comparative blade stresses	46
A.4.2.2.4	Blade joint stress	48
A.5	Assessment of changes in a fan family	48
A.5.1	Assessment of motor change	48
A.5.2	Assessment of fan component change.....	49
Annex B	(normative) Criteria to determine a family of motors in order to select the sizes to be tested.....	51
B.1	Reduction of numbers of tests for a motor family	51
B.2	Assessment of changes in a motor family.....	51
B.2.1	Assessment for changing a family of motors in a family of fans	51
B.2.2	Assessment for changing components in a family of motors.....	51
B.2.3	Assessment of changes using Annex D	56
B.2.4	Normative list of motor components.....	56

Annex C (normative) Test method for the determination of fire resistance of powered smoke and heat control ventilators (fans)	61
C.1 Principle	61
C.2 Apparatus	61
C.3 Preparation	63
C.3.1 Axial Fan running (tip) clearance	63
C.3.2 Measuring of running clearance	63
C.3.3 Installation in furnace depending on the intended application categories	64
C.4 Procedure	66
C.4.1 General conditions	66
C.4.2 Warm up period.....	66
C.4.3 Heat up period.....	66
C.4.4 High temperature test.....	66
C.4.5 High temperature test in accordance with temperature time curve	67
C.5 Compliance criteria.....	67
C.6 Test report	67
C.6.1 Prepare a test report after completion of each test including the following information:.....	67
Annex D (normative) Test methods for electric motors to determine the impact of the changes on the product characteristics	70
D.1 Principle	70
D.2 Tests in association with a generator or another load	70
D.2.1 Modulated Frequency Method (MFM)	70
D.2.2 Apparatus for testing with a generator	71
D.2.2.1 Test installation.....	71
D.2.2.2 Specifications for bearing load	71
D.2.2.3 Temperature measurements.....	72
D.2.2.4 Electrical measurements	72
D.2.3 Test specimens	72
D.2.4 Test procedure	72
D.2.4.1 General conditions	72
D.2.4.2 Warm up period.....	72
D.2.4.3 High temperature test.....	73
D.3 Test report	73
Annex E (normative) Test method for assessing the response delay and ability to open under environmental conditions	75
E.1 Objective of test	75
E.2 Test apparatus	75
E.3 Test specimen	75
E.4 Test procedure	75
E.5 Evaluation of test results	75

Annex F (informative) Explanatory notes	76
F.1 General	76
F.2 Explanation for A.4.4.3	76
F.3 Origin of power coefficients in D.2.4.2	79
F.4 Consideration about frequency converter driving	80
F.5 Consideration regarding A.1, f) – scaling factors	82
F.6 Consideration regarding B.2.2: change of type of bearing	82
F.6.1 General	82
F.6.2 Bearing ability to pass the smoke venting test	82
F.6.3 Parameters to consider during the heat up test	83
F.6.4 How to select motor sizes	84
F.6.5 How to select motor size in vertical position	84
F.7 Consideration for changing material inside the fan	85
F.7.1 Material features	85
F.7.1.1 Mechanical properties	85
F.7.1.2 Technological properties	85
F.7.1.3 Physical properties	85
F.7.1.4 Tensile strength	86
F.7.1.5 Compression stress, shear stress and twisting	86
F.7.1.6 Hardness	86
F.7.1.7 Creep	86
F.7.1.8 Behaviour at low temperatures	86
F.7.1.9 Fatigue	86
F.7.2 Technological properties	87
F.7.2.1 Abrasive resistance	87
F.7.2.2 Formability	87
F.7.3 Physical properties	87
F.7.3.1 Density	87
F.7.3.2 Coefficient of thermal expansion	87
F.7.3.3 Thermal diffusivity	87
F.7.3.4 Elastic properties	87
F.8 Complementary information on Installation / Application	88
Annex G (informative) General guidance for installation and maintenance	91
G.1 Product, installation and maintenance information (documentation)	91
G.1.1 Product specification	91
G.1.2 Installation information	91
G.1.3 Maintenance information	91
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation	92

ZA.1	Scope and relevant characteristics	92
ZA.2	Procedure for AVCP of the powered heat and smoke control ventilators (fans).....	93
ZA.2.1	System(s) of AVCP	93
ZA.2.2	Declaration of performance (DoP)	94
ZA.2.2.1	General	94
ZA.2.2.2	Content.....	95
ZA.2.2.3	Example of DoP	95
ZA.3	CE marking and labelling.....	97
Bibliography	100

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European foreword

This document (EN 12101-3:2015) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting systems”, 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 February 2016, and conflicting national standards shall be withdrawn at the latest by May 2017.

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 12101-3:2002.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) and/or EU Regulation(s).

For relationship with EU Regulation(s), see informative Annex ZA, which is an integral part of this document.

This European Standard is part of the package of the European Standards EN 12101 covering smoke and heat control systems.

EN 12101, *Smoke and heat control systems*, consists of the following parts:

- *Part 1: Specification for smoke barriers — Requirements and test methods*
- *Part 2: Specification for natural smoke and heat control ventilators*
- *Part 3: Specification for powered smoke and heat control ventilators*
- *Part 4: Natural smoke and heat control ventilation systems — Installation and test methods* (published as CEN/TR 12101-4)
- *Part 5: Design and calculation for smoke and exhaust ventilation systems* (published as CEN/TR 12101-5)
- *Part 6: Specification for pressure differential systems- kits*
- *Part 7: Smoke duct sections*
- *Part 8: Smoke control dampers*
- *Part 10: Power supplies*
- *Part 11: Smoke control in car parks*
- *Part 12: SHEVS – Time dependent fires*
- *Part 13: Pressure differential systems (PDS) design and calculation methods, acceptance testing, maintenance and routine testing of installation*

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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.

Introduction

Smoke and heat control ventilation systems create a smoke free layer above the floor by removing smoke and thus improve the conditions for the safe escape and/or rescue of people and animals and the protection of property and permit the fire to be fought while still in its early stages. They also exhaust hot gases released by a fire in the developing stage.

In specific cases some fans are used to convey smoke (e.g. in tunnels or car parks). These fans, called jet fans or impulse fans are also within the scope of this standard.

The use of smoke and heat control ventilation systems to create smoke free areas beneath a buoyant smoke layer has become widespread. Their value in assisting in the evacuation of people from construction works, reducing fire damage and financial loss by preventing smoke logging, facilitating fire fighting, reducing roof temperatures and retarding the lateral spread of fire is firmly established. For these benefits to be obtained it is essential that smoke and heat control ventilators operate fully and reliably whenever called upon to do so during their installed life. A heat and smoke control ventilation system is a scheme of safety equipment intended to perform a positive role in a fire emergency.

Components for smoke and heat control systems should be installed as part of a properly designed smoke and heat control system.

Smoke and heat control ventilation systems help to:

- keep the escape and access routes free from smoke;
- facilitate fire fighting operations by creating a smoke free layer;
- delay and/or prevent flashover and thus full development of the fire;
- protect equipment and furnishings;
- reduce thermal effects on structural components during a fire;
- reduce damage caused by thermal decomposition products and hot gases.

Depending on the design of the system and the ventilator, powered or natural smoke and heat ventilators can be used in a smoke and heat control system. Powered smoke and heat control ventilators (fans) can be installed in the roof or upper part of walls of building or in a ducted system with the ventilator inside or outside the smoke reservoir or in a plant room.

Powered smoke and heat control ventilation systems should operate based on powered ventilators (fans). The performance of the powered smoke and heat control system depends on:

- the temperature of the smoke;
- size, number and location of the exhaust openings;
- the wind influence;
- size, geometry and location of the inlet air openings;
- the time of actuation;
- the location and conditions of the system (for example arrangements and dimensions of the building).

Smoke and heat control ventilation systems are used in buildings or construction works where the particular (large) dimensions, shape or configuration make smoke control necessary.

Typical examples are:

- single and multi-storey shopping malls;
- single and multi-storey industrial buildings and warehouses;
- atria and complex buildings;
- enclosed car parks;
- stairways;
- tunnels;
- theatres.

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1 Scope

This European Standard specifies the products characteristics of powered smoke and heat control ventilators (fans) intended to be used as part of a powered smoke and heat control ventilation system in construction works.

It provides test and assessment methods of the characteristics and the compliance criteria of the test assessment results.

This European Standard applies to the following:

- a) fans for smoke and heat control ventilation;
- b) impulse/jet fans for smoke and heat control ventilation;

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 1363 (all parts), *Fire resistance tests*

EN 13501-4, *Fire classification of construction products and building elements — Part 4: Classification using data from fire resistance tests on components of smoke control systems*

EN 60034-1, *Rotating electrical machines - Part 1: Rating and performance (IEC 60034-1)*

EN 60034-2-1, *Rotating electrical machines - Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles) (IEC 60034-2-1)*

EN 60034-18-41, *Rotating electrical machines - Part 18-41: Partial discharge free electrical insulation systems (Type I) used in rotating electrical machines fed from voltage converters - Qualification and quality control tests (IEC 60034-18-41)*

EN 60085, *Electrical insulation - Thermal evaluation and designation (IEC 60085)*

CLC/TS 60034-17, *Rotating electrical machines - Part 17: Cage induction motors when fed from converters - Application guide (IEC 60034-17)*

EN ISO 204, *Metallic materials - Uniaxial creep testing in tension - Method of test (ISO 204)*

EN ISO 5167 (all parts), *Measurement of fluid flow by means of pressure differential devices*

EN ISO 5801, *Industrial fans - Performance testing using standardized airways (ISO 5801)*

EN ISO 6892-1, *Metallic materials - Tensile testing - Part 1: Method of test at room temperature (ISO 6892-1)*

EN ISO 6892-2, *Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature (ISO 6892-2)*

ISO 281, *Rolling bearings — Dynamic load ratings and rating life*

ISO 834-1, *Fire-resistance tests — Elements of building construction — Part 1: General requirements*

ISO 1099, *Metallic materials — Fatigue testing — Axial force-controlled method*