



SLOVENSKI STANDARD  
SIST EN 14134:2004

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Ventilation for buildings - Performance testing and installation checks of residential ventilation systems

Lüftung von Gebäuden - Leistungsprüfung und Einbaukontrollen von Lüftungsanlagen von Wohnungen

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Ventilation des bâtiments - Essai de performances et contrôles d'installation des systemes de ventilation résidentiels

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**Ta slovenski standard je istoveten z: EN 14134:2004**

**ICS:**

91.140.30 Ú!^: !æ^çæ} á Á|ã æ\ã Ventilation and air-conditioning  
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**SIST EN 14134:2004**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

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## Ventilation for buildings - Performance testing and installation checks of residential ventilation systems

Ventilation des bâtiments - Essai de performances et contrôles d'installation des systèmes de ventilation résidentiels

Lüftung von Gebäuden - Leistungsprüfung und Einbaukontrollen von Lüftungsanlagen von Wohnungen

This European Standard was approved by CEN on 3 November 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

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## Foreword

This document (EN 14134:2004) has been prepared by Technical Committee CEN/TC 156 "Ventilation for building", 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of an identical text or by endorsement, at the latest by July 2004, and conflicting national standards shall be withdrawn at the latest by July 2004.

Annexes A, B and C are informative.

This document includes a bibliography.

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

## 1 Scope

This European Standard specifies checks and test methods in order to verify the fitness for purpose of installed ventilation systems in dwellings. It can be applied to commissioning of new systems and performance testing of existing systems.

The standard enables the choice between simple test methods, when sufficient, and extensive measurements, when necessary.

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The standard applies to mechanical and non-mechanical (natural) ventilation systems comprising any of the following:

- passive stack ventilation ducts;
- air terminal devices (supply, exhaust);
- air transfer devices (externally mounted, internally mounted);
- controls;
- ducts;
- fans;
- filters;
- heat recovery;
- heating/cooling of supply air;
- recirculation air;
- cooker hood;
- cowls;

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- dampers;
- sound reduction devices.

The standard is intended to define the procedure by which the system is checked and assessed before handing over (see Figure 1).

This standard does not apply to:

- heating systems and their control;
- refrigerating systems and their control;
- electric power supply systems.

This standard does not include consideration of the airtightness of building envelope is in. The whole dwelling and the individual room ventilation rate can be influenced by air infiltration through the building envelope (see informative annex A).

This standard does not include the effect of the ventilation system on indoor air velocity within the occupied zone although this can have an effect (see informative annex B).

This standard does not included any requirements concerning the installation contract.

This standard give example of a maintenance manual (see informative annex C).

Figure 1 illustrates the different stages of the design, installation and checking of a ventilation system. This standard deals only with items D, E, F, and G below. Items B and C are referred to as "preliminary work" in this standard.

Terms "designer", "installer" and "inspector" are defined by the task defined in Figure 1.

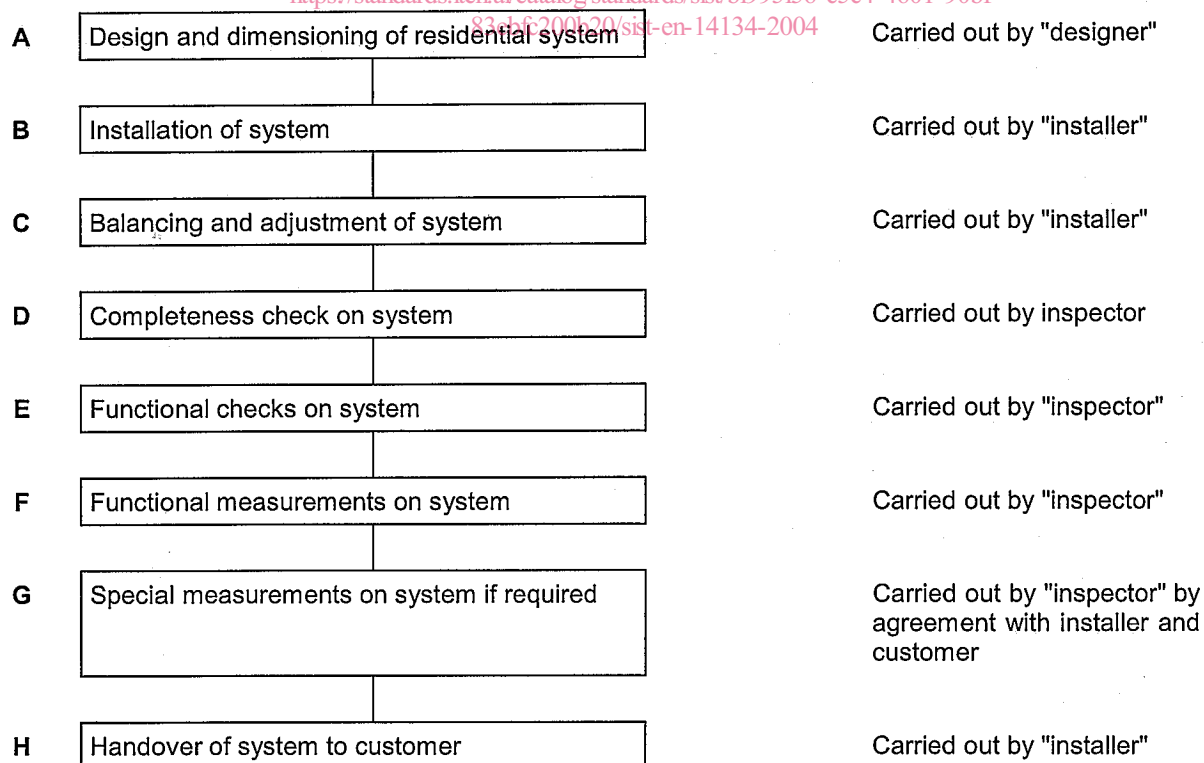


Figure 1 — Schematic illustration of the different stages of the design, installation, checking and handover of a ventilation system

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

EN 13141-1, *Ventilation for buildings – Performance testing of components/products for residential ventilation – Part 1: Externally and internally mounted air transfer devices.*

EN 13141-2, *Ventilation for buildings – Performance testing of components/products for residential ventilation – Part 2: Exhaust and supply air terminal devices.*

prEN 13141-5, *Ventilation for buildings – Performance testing of components/products for residential ventilation – Part 5: Cowls and roof outlet terminal devices.*

prEN 14788, *Ventilation for buildings – Design and dimensioning of residential ventilation systems.*

EN ISO 3747, *Acoustics – Determination of sound power levels of noise sources using sound pressure – Comparison method for use in situ (ISO 3747:2000).*

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## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 12792 and the following apply.

### 3.1

#### "run-on" timer

device which ensures that air flow through a ventilation system or an air terminal device (ATD) continues for a specific time period after a user operated control has been turned off

NOTE Commonly used to control exhaust fans which are operated by the room light switch in internal rooms.

### 3.2

#### passive stack ventilation duct

ductwork for passive stack ventilation which does not comprise any mechanical pressure increase devices from duct inlet to duct outlet

### 3.3

#### obstacles

items which affect the stated function of any component in the ventilation system

## 4 Test and check procedure

For new residential ventilation systems the following checks shall be carried out in the specified order:

- a) completeness checks;
- b) functional checks;
- c) functional measurements.

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In case of special measurements they shall be carried out in accordance with clause 8. Special measurements allow a different level of measurement uncertainty and require extra associated work and hence cost. Special measurements are therefore a matter to be agreed between the client and the person carrying out the tests before the testing work begins.

The extent of the functional checks and functional measurements to be made on the system is specified in clauses 6 and 7 and by agreement between the client and the person carrying out the testing work begins.

For existing systems the extent of the testing procedures applied will depend upon the purpose of carrying out the tests and is a matter for agreement between the client and the person carrying out the tests before testing work begins. For example, if the purpose is simply to establish the ventilation air flow rates being provided by an existing system then only limited functional measurements might be made, with no need for functional and completeness checks. However, these checks may need to be made subsequently in order to diagnose faults revealed by the functional measurements.

**5 Completeness checks****5.1 General**

The purpose of the completeness check is to ensure that the system is in accordance with the design specification and relevant standards and regulations, that it has been installed properly, that the system is free from loose objects and reasonably clean and that all relevant documentation for the system has been provided.

**5.2 Documents to hand over to the customer****5.2.1 Design specification**

The design specification, which may be included in the operation and maintenance manual (see 5.2.2 below), shall contain the list of design assumptions required by prEN 14788 in addition to the following informations:

- type of ventilation system (natural, fan assisted natural, mechanical supply/exhaust/balanced or a combination of these);
- type of controls (if any) and intended mode(s) of operation (e.g. continuous or intermittent running of fans);
- design air volume flow rates for the system as a whole and for individual air terminals (or equivalent information for natural ventilation systems; e.g. duct sizes, equivalent areas of air transfer devices, etc.).

**5.2.2 Operation and maintenance manual**

The operation and maintenance manual shall contain instructions to the occupants on how and when to use the ventilation system and/or its components should be cleaned and maintained. Depending upon the type of system and how it is controlled this may include information on the following:

- using externally mounted air transfer devices (if adjustable);
- setting automatic controls (if user-adjustable, e.g. humidity controls);
- using on/off and boost settings for fan assisted ventilation system;
- using controls for natural air extract devices (e.g. adjustable exhaust air terminals on vertical ducts);
- instructions to the occupants and/or maintenance services on how any required cleaning and maintenance should be carried out.

The operation and maintenance manual shall also contain relevant manufacturers' literature which was supplied with the system or with individual components of the system.



NOTE This might include components specifications, installation guidance, operating instructions, maintenance schedules, guarantees, spare part lists, means of obtaining spare parts, etc.

### 5.3 Component checks

#### 5.3.1 Checks applicable to all type of ventilation system

Check that the ventilation installation including its access path complies with all the requirements of the relevant standards and regulations which may be established by visual inspection, and that the system is safe to operate and maintain. This may include checks for mechanical safety (e.g. guards on rotating machinery), electrical safety (e.g. correct wiring and protection from electric shock), fire protection (e.g. fire dampers correctly installed), thermal insulation (e.g. ducts in unheated spaces), and perhaps other matters. This visual inspection does not replace any certification procedure and prescribed national regulations or relevant European directives.

Check that there is adequate access and free space to the system for the purposes of operation and maintenance including access path and service points, complies with design specifications.

EXAMPLE The user is able to remove or open all covers/hatches necessary to carry out normal maintenance of the ventilation system and to change any removable items such as filters and heat exchangers etc.

For systems serving more than one dwelling these requirements apply and in addition there may be a need for access hatches on ductwork.

All ventilation system user controls should be readily accessible by adults in the dwelling, but not necessarily by young children. Access for maintenance in residential ventilation systems will mainly be limited to allowing cleaning of fans, heat exchangers, ducts and air terminal devices, together with the cleaning or replacement of air filters.

Check that the system has been left reasonably clean after installation. A useable definition of what is meant by "reasonably clean", and methods of quantifying it have yet to be established so this is currently a subjective assessment. The requirement applies only to the inside of ducts, fans, heat exchangers, etc., unless dirt and debris on the outside would constitute a health hazard to persons in the building or impair the performance of the system. Clearly, packaging materials, off-cuts of sealing tape and similar debris shall not be left inside ventilation systems and no more than light covering of dust would be expected to be found in the bottom of ducts and other components when newly installed. Traces of oil left from the manufacturing process are sometimes found on ducting but should not be excessive.

Check that all components are in good condition. Clients may accept components which have suffered minor damage (e.g. minor dents in metal ducts) but shall not be asked to accept components which are damaged to the extent that any aspect of their performance in use is impaired.

#### 5.3.2 Natural ventilation systems

Check that all the following components are present as required in the design specification, and that they are properly and securely fixed:

- externally mounted air transfer devices;
- internally mounted air transfer devices;
- exhaust air terminals on ducts (passive stack ventilation ducts);
- ducts;
- cowls or roof outlets on ducts;
- insulation on ducts;
- any other component required by the design specification.

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Checks shall be made that these components are fitted in their correct positions relative to each other, and relative to other parts of the building (e.g. fire dampers in wall and floors which are intended to be fire resisting).

**5.3.3 Mechanical ventilation systems (supply, extract or balanced)**

Check that all the following components are present as required in the design specification, and that they are properly and securely fixed:

- externally mounted air transfer devices;
- internally mounted air transfer devices;
- exhaust air terminals devices;
- supply air terminals devices;
- ductwork;
- flow control dampers;
- fire dampers;
- cowls or roof outlets or other air terminal devices on the outside of the building;
- insulation on ducts;
- fans;
- heat exchangers and/or heat pumps;
- air filters;
- sound attenuators (silencers);
- control devices and switches;
- any other component required by the design specification.

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Checks shall be made that these components are fitted in their correct positions relative to each other, and relative to other parts of the building (e.g. fire dampers in wall and floors which are intended to be fire resisting).

**6 Functional checks****6.1 General**

The purpose of the functional checks is to prove the operational ability of the system according to the specification. The test shows whether the particular components of the system such as filters, fans, heat exchangers, etc. have been properly assembled and installed and whether those components containing moving parts operate correctly.

**6.2 Preliminary work**

It is necessary that the installation work is completed and that the system has been adjusted by the installer to fulfil the requirements of the system before starting the functional checks.

## 6.3 Procedure

### 6.3.1 General

Functional checks shall be carried out on all installed equipment which is part of the ventilation system.

Before starting the checks a checklist shall be drawn up.

### 6.3.2 Extent of functional checks

For a system serving only one dwelling a complete functional check is carried out.

For a complex of dwellings built identically (of the same type on the same site, by the same contractor, and by the same installer) functional checks are carried out on a random statistical sample of dwellings. For a complex of dwellings, which are not identical, functional checks are carried out on a statistical sample of each type of dwelling. Functional checks may also be carried out in any specific dwelling(s) as part of a diagnosis of ventilation deficiency. The statistical sample for functional checks for commissioning of new systems shall be established according to annex C.

### 6.3.3 Instruction for the procedure

Checks shall be made that the fixings of components to the building structure or other supports are of an appropriate type (e.g. fans may require vibration absorbent mountings) and that the structure and support are strong enough to support the component.

### 6.3.4 Separate checks for components

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#### 6.3.4.1 Central devices, fans

The following shall be checked:

- direction of rotation of fans;
- speed or other air flow regulations of fans;
- reset switch;
- function of control devices.

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#### 6.3.4.2 Air filters

The following shall be checked:

- pressure difference indication (if fitted);

#### 6.3.4.3 Fire dampers

Fire dampers shall be checked according to design and material regulations.

#### 6.3.4.4 Air terminal devices

The following shall be checked:

- smoke test for an initial evaluation of the direction of air flow (ATDs for supply and/or exhaust air);
- height above the floor level and area of externally mounted ATDs (exhaust and natural ventilation systems);