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COMMENTED VERSION

INTERNATIONAL STANDARD

colour inside

Cooking fume extractors – Methods for measuring performance



IEC 61591:2023-03 CMV(en)



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COOKING FUME EXTRACTORS – METHODS FOR MEASURING PERFORMANCE

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This commented version (CMV) of the official standard IEC 61591:2023 edition 3.0 allows the user to identify the changes made to the previous IEC 61591:2019 edition 2.0. Furthermore, comments from IEC SC 59K experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 61591 has been prepared by subcommittee 59K: Performance of household and similar electrical cooking appliances, of IEC technical committee 59: Performance of household and similar electrical appliances. It is an International Standard.

This third edition cancels and replaces the second edition published in 2019. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) new definition of **working point**, see 3.19;
b) new definition for **lowest setting** and **automatic setting**, see 3.17 and 3.18;
c) revised requirements for installation and positioning, see 6.2;
d) added a normative reference ISO 5801 for the specification of the pressure compensation chamber, see Clause 10;
e) separate clauses for determining the volumetric airflow and fluid dynamic efficiency, see Clauses 10 and 11;
f) new approach for determining the fluid dynamic efficiency ("9-point calculation");
g) new definitions, new clause and new Annex B regarding the measurement of low-power modes;
h) new Annex A: assumption for the parameter b.

The text of this International Standard is based on the following documents:

Draft	Report on voting
59K/352/CDV	59K/361/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

In this standard, the following print types are used:

– terms listed in Clause 3: **Arial bold**.

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- reconfirmed,
- withdrawn,
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- amended.

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COOKING FUME EXTRACTORS – METHODS FOR MEASURING PERFORMANCE

1 Scope

This document applies to **cooking fume extractors** incorporating a fan for the **recirculation** or **extraction mode** situated in a household kitchen.

It can also be used for **cooking fume extractors** where the fan is mounted separately from the appliance, but controlled by the appliance when the fan is defined in the technical documentation (e.g. name plate data) and instructions for installation.

This document deals also with **down-draft systems** arranged beside, behind or under the cooking appliance.

This document defines the main performance characteristics of these appliances, which are of interest to the user, and specifies methods for measuring these characteristics.

This document does not specify a classification or ranking for performance.

NOTE 1 This document does not deal with safety requirements that are in accordance with IEC 60335-1 and IEC 60335-2-31.

NOTE 2 **Cooking fume extractors** without fans operated by a central ventilation system are covered in EN 13141-3.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

IEC 60704-2-13, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 2-13: Particular requirements for range hoods and other cooking fume extractors*

IEC 60751, *Industrial platinum resistance thermometers and platinum temperature sensors*

IEC 62301:2011, *Household electrical appliances – Measurement of standby power*

IEC 63474:—[1], *Electrical and electronic household and office equipment – Measurement of networked standby power consumption of edge equipment*

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

[1] Under preparation. Stage at the time of development: IEC CDV 63474:2022.

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

ISO 5801:2017, *Fans – Performance testing using standardized airways*

ISO 80000-1:2009, *Quantities and units – Part 1: General*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
active mode
mode in which the appliance is connected to a mains power source, has been activated, and is performing any of the intended functions

EXAMPLE Intended functions are running the fan or operating the lighting system.

Note 1 to entry: Associated activities include displaying information, software download, sensor controlled automatic mode and communication with the hob.

3.2
cooking fume extractor
CFE
appliance with fan and filter intended to collect and treat cooking fumes, which can be operated in **recirculation mode** or **extraction mode**

3.3
range hood
cooking fume extractor installed over a cooking appliance

3.3.1
wall range hood
range hood mounted to the wall

3.3.2
island range hood
range hood mounted to the ceiling

3.3.3
ceiling range hood
range hood integrated onto or into the ceiling

3.3.4
built-in range hood
range hood mounted onto or into a cabinet

3.4
microwave hood combination
cooking fume extractor integrated in a microwave oven

3.5
multiple combination hood
cooking fume extractor where the fan is mounted separately of the appliance, but controlled by the appliance

3.6
down-draft system
cooking fume extractor intended for installation adjacent to a cooking appliance or integrated in a cooking appliance that draws vapour down into a duct

Note 1 to entry: A **down-draft system** can also be a system where the fan is mounted separately from the appliance but controlled by the appliance.

3.7
recirculation mode
mode of a **cooking fume extractor** that discharges air back into the room, which includes an **odour-reduction filter**

3.8
extraction mode
vented mode
ducted mode
mode of a **cooking fume extractor** that discharges the air to the outside of the building by means of ducting

Note 1 to entry: **Extraction mode** is also known as "vented mode" or "ducted mode".

3.9
rated voltage
voltage assigned to the **cooking fume extractor** by the manufacturer

3.10
grease absorption factor
G_{FE}
percentage of grease retained within a **grease filter**

3.11
grease filter
components for absorbing grease, which are intended to be replaced or removed for cleaning without tools

3.12
odour-reduction filter
components for reducing odour

3.13
odour reduction factor
capability of the **cooking fume extractor** to reduce odours

3.14
odour dispersion time
time taken to reduce odours to a defined level after the odour generating source has been switched off

3.15
highest continuous setting for normal use
control setting of **cooking fume extractor** at highest speed, excluding the **boost position setting**

Note 1 to entry: Marked setting on the appliance, which is described in the instructions for use.

3.16
boost position setting
marked control setting at maximum fan speed, which is automatically limited in duration

Note 1 to entry: Marked setting on the appliance, which is described in the instructions for use.

3.17
lowest setting
marked control setting at which the **cooking fume extractor** operates at its lowest speed

3.18
automatic setting
control setting of **cooking fume extractor** where the fan speed is altered by a sensor or time

Note 1 to entry: Automatic settings are not used for calculation of the fluid dynamic efficiency (FDE).

3.19
working point
WP
intersection point of pressure/airflow curve and resistance curve – measured WP and compensated to reference air density WP_C

~~**3.17**~~
~~**best efficiency point**~~
~~**BEP**~~
~~maximum value of the efficiency of a **cooking fume extractor**~~

~~Note 1 to entry: This term applies to the French language only.~~

3.20
lighting system
devices used for the illumination of the cooking surface, excluding ambient illumination unless there is only one control switch

Note 1 to entry: Power supply units and controllers are included.

3.21
illumination
E_{middle}
average illumination of the **lighting system** on the cooking surface, measured in lux, under standard conditions

3.22
network
communication infrastructure with a topology of links, an architecture and which includes the physical components, organizational principles, communication procedures and formats (protocols)

Note 1 to entry: An infrared (IR) remote control is not considered to be a **network**.

3.23
off mode
condition in which the appliance is connected to the mains and is not providing any active mode or standby function and where the mode may persist for an indefinite time

Note 1 to entry: The following shall also be considered as off mode

a) conditions providing only an indication of off mode;
b) conditions providing only functionalities intended to ensure electromagnetic compatibility.

3.24
standby mode
condition where the appliance is connected to the mains and provides only the following functions, which may persist for an indefinite time:

a) reactivation function, or reactivation function and a mere indication of enabled reactivation function; and/or
b) information or status display; and/or
c) detection function for emergency measures.

3.25
standby mode in condition of networked standby
condition where the appliance is connected to the mains and provides only the reactivation function through a connection to a **network**, which may persist for an indefinite time.

Note 1 to entry: This mode is only applicable to appliances that provide a connection function to a **network**.

4 Classification

According to the mode:

– **recirculation mode**;
– **extraction mode**.

A **cooking fume extractor** ~~may~~ can be constructed to incorporate both modes.

5 List of measurements

Performance is determined by assessing the following:

– overall dimensions;
– mass;
– power measurement of low-power modes;
– airborne acoustical noise;
– volumetric airflow;
– fluid dynamic efficiency;
– effectiveness and electric power input of the **lighting system**;
– ability to reduce odours;
– ability to absorb grease.

6 General conditions for measurements

6.1 Test room

The tests are carried out in a draught-free room. The ambient temperature of the room is maintained at (23 ± 2) °C. The absolute air pressure shall be between 91,3 kPa and 106,3 kPa.