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INTERNATIONAL STANDARD

**Household and similar electrical air cleaning appliances - Method for measuring the performance -
Part 2-2: Particular requirements for determination of gas-phase pollutant reduction**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**Household and similar electrical air cleaning appliances - Method for
measuring the performance -
Part 2-2: Particular requirements for determination of gas-phase pollutant
reduction**

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IEC 63086-2-2 has been prepared by subcommittee 59N: Electrical air cleaners for household and similar purposes, of IEC technical committee 59: Performance of household and similar electrical appliances, in co-operation with ISO technical committee 142: Cleaning equipment for air and other gases and ISO technical committee 146: Air quality. It is an International Standard.

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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.

A list of all parts in the IEC 63086 series, published under the general title *Household and similar electrical air cleaning appliances - Methods for measuring the performance*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

1 Scope

This part of IEC 63086 specifies test methods for measuring the performance of electrically powered household and similar air cleaners intended for the reduction of **gas-phase pollutants**.

This document is intended for measuring the reduction of the concentration of specific **gas-phase pollutants**. This does not necessarily correlate with the reduction of odour intensity in the case of odorous **gas-phase pollutants**. Such a reduction can only be tested by olfactory tests, which are not part of this document.

NOTE Test methods for the determination of possible gas-phase by-products are under consideration.

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 63086-1:2020, *Household and similar electrical air cleaning appliances - Methods for measuring the performance - Part 1: General requirements*

IEC 63086-2-1:2024, *Household and similar electrical air cleaning appliances - Methods for measuring the performance - Part 2-1: Particular requirements for determination of reduction of particles*

ISO 16000-3:2022, *Indoor air — Part 3: Determination of formaldehyde and other carbonyl compounds in indoor and test chamber air — Active sampling method*

ISO 16000-6, *Indoor air - Part 6: Determination of organic compounds (VVOC, VOC, SVOC) in indoor and test chamber air by active sampling on sorbent tubes, thermal desorption and gas chromatography using MS or MSFID*

ISO 16000-9, *Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method*

Bibliography

- [1] ISO 13964:1998, *Air quality — Determination of ozone in ambient air — Ultraviolet photometric method*
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