

GUIDE

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Guide for defining halogen content terminology in IEC standards

Guide pour la définition de la terminologie relative à la teneur en halogènes dans les normes IEC



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

GUIDE FOR DEFINING HALOGEN CONTENT TERMINOLOGY IN IEC STANDARDS

FOREWORD

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IEC Guide 122 has been prepared in accordance with the ISO/IEC Directives, Part 1, Annex A, by the IEC Advisory Committee on Environmental Aspects (ACEA).

The text of this IEC Guide is based on the following documents:

Draft	Report on voting
SMBNC/56/DV	SMBNC/60/RV

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

The language used for the development of this Guide is English.

This publication has been drafted in accordance with the 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/standardsdev/publications.

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INTRODUCTION

IEC and other standards development organizations (SDOs), as well as numerous environmental performance programmes worldwide (such as Blue Angel in Europe and EPEAT in the US), are developing standards for the determination, quantification, and possible limitation of halogen content in materials and products.

There are multiple reasons for such interest in the use and amounts of elemental halogens and certain halogenated compounds in materials and products, including:

- the health and safety of workers and end users;
- the safety of people, animals and goods in the event of fire;
- the minimization of adverse environmental impacts;
- the demonstration of compliance with product legislation;
- business and commercial interests.

NOTE 1 The list above is not prioritized by level of importance.

NOTE 2 More information about fire retardancy in relation to halogens is provided in Clause 3.2.

An analysis of standards developed by different IEC committees reveals differences in terminology, and differences in the halogens concerned and their associated threshold (see Annex A). Similar differences are also observed with respect to other standards such as regional (CEN, CENELEC, UL), national (IPC, JEDEC) and sectorial publications (e.g. in the railways domain).

The definitions related to halogen content in standards developed by IEC and other SDOs exhibit differences such as the following (see more details in Annex A).

- Different terms like halogen-free, non-halogenated, zero-halogen, and low-halogen are often used to express the same or similar halogen content.
- Different limits for the halogens (either as individual limits or as a total halogen content) are used, while often they are referred to using the same term.
- Different standards use similar terms (e.g. non-halogenated) when referring to different sets of halogens, e.g. chlorine and bromine only, or all four halogens – fluorine, chlorine, bromine, and iodine.
- Different standards cover different forms of halogen (elemental halogens, brominated or chlorinated compounds, etc.) and yet use the same terminology to refer to them.
- Different standards covering different product scopes, like electrical and electronic equipment (EEE) or certain product parts such as cables and cable management systems and printed circuit boards (PCBs), use inconsistent terminology or requirements.

There are many reasons for the observed differences in the various standards, such as the following.

- The scope of SDOs is focused on developing vertical standards on specific categories of products.
- Stakeholders did not include a complete representation of the scope of the SDO in question.
- Standards were created at different moments in time, with more recent publications using newer data and terminology.
- Stakeholders during different standardization activities can have a different knowledge base or perspective of halogenated substances and materials, their perceived risks, or links to specific legislation.

Differences in the various definitions bring confusion among the users of IEC standards and of other standards related to halogen content. Especially for manufacturers, traders and users of finished goods, the claims that can be associated with these different standards can appear as "greenwashing". While the specification of test methods and requirements is the responsibility of individual IEC product or systems committees, harmonization of the terminology associated with halogen content across committees would be beneficial.

This Guide, therefore, provides recommendations on how IEC committees can best employ harmonized terminology that is suitable to the halogen-content-related requirements in a scientifically sound, uniform, verifiable, and environmentally relevant way.

It also complements IEC Guide 109 [1]¹, which describes the general principles of specifying environmental aspects in IEC standards.

Standards that include halogen content provisions cover not only environmental matters, but often have a broad scope also covering health, safety and fire-related matters, thus going beyond ACEA's scope. In recognition of this, and in order to collect input from other domains, this Guide was circulated for comment to the following IEC, ISO and CLC committees:

- IEC: TC 8, TC 15, TC 18, SC 18A, TC 20, TC 21, TC 23, TC 34, TC 46, SC 46A, SC 46C, TC 47, TC 59, TC 65, SC 65C, TC 86, SC 86A, TC 89, TC 91, TC 100, TC 110, TC 111, TC 112, TC 120, TC 121, TC 147 and ACOS.
- ISO: TC 34/SC 11, TC 61/SC 5, TC 61/SC 9, TC 92/SC 3, TC 147/SC 2 and TC 207.
- CLC: TC 213.

The following IEC committees (including relevant subcommittees) made active contributions to the development of this Guide: TC 20, TC 23, TC 46, TC 47, SC 86A, TC 91 and TC 111.

In this Guide:

- the term "committees" includes technical committees (TCs), project committees (PCs), subcommittees (SCs), systems committees (SyCs), and advisory committees (ACs).
- the term "standard" includes International Standard (IS), Technical Report (TR), Technical Specification (TS), and Publicly Available Specification (PAS), where the document types are those defined in the ISO/IEC Directives, Part 2.

¹ Numbers in square brackets refer to the Bibliography.

GUIDE FOR DEFINING HALOGEN CONTENT TERMINOLOGY IN IEC STANDARDS

1 Scope

This Guide raises awareness and provides recommendation on the use of consistent terminology related to halogen content for use in horizontal and product-specific IEC standards.

The terminology related to halogen content provided in this Guide does not take into consideration astatine (At) and the artificially created tennessine (Ts), since they are not used in electrical and electronic equipment (EEE). Diatomic halogen molecules (F₂, Cl₂, Br₂, I₂), normally not found in EEE, are also excluded from the terminology recommended in this Guide.

NOTE The IEC Standardization Management Board (SMB) has decided that Guides such as this one can have mandatory requirements which shall be followed by all IEC committees developing technical work that falls within the scope of the Guide, as well as guidance which may or may not be followed. The mandatory requirements in this Guide are identified by the use of "shall". Statements that are only for guidance are identified by using the verb "should". (See ISO/IEC Directives, IEC Supplement:2021, A.1.1.).

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 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>

3.1.1

halogen

fluorine (F), chlorine (Cl), bromine (Br) or iodine (I)

Note 1 to entry: Together the four halogens plus astatine (At) constitute the group of the periodic table that in the past was known as "group VIIA". In the current IUPAC nomenclature, it is known as "group 17".

Note 2 to entry: For the purposes of this document, astatine (At) is not included in this definition because it is not known to be used in EEE. Similarly, the artificially created element tennessine (Ts) can also be considered a halogen but it is not known to be used in products in general.

3.1.2

halogen content

quantity of all halogens in a material, product or product part

Note 1 to entry: Halogen content is typically defined in mass or mass fraction (e.g. mg or mg/kg). Any expression of halogen content mass fraction is best accompanied by a clear unit basis. Parts per million (ppm) alone is not sufficient.