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INTRODUCTORY CLAUSES TO THE ISO/IEC DIRECTIVES, PART 2

FOREWORD

The ISO/IEC Directives, Part 2 has been prepared by the ISO/IEC Joint Directives Maintenance Team (JDMT) and approved by the ISO Technical Management Board (ISO/TMB) and the IEC Standardization Management Board (IEC/SMB).

This ninth edition of the ISO/IEC Directives, Part 2 cancels and replaces the eighth edition published in 2018.

This edition includes the following significant changes compared with the previous edition:

— 3.1.8: addition of a new note to entry clarifying the permitted content of Technical Reports;

— 6.5: introduction of the notion of supplementary content (files or data accessible via URL);

— 6.6: introduction of the notion of subdivision of the subject matter into profiles;

— 7.1: clarification that the expression of provisions shall be limited to the verbal forms defined in Table 3 to Table 7;

— 7.4: clarification in Table 5 that negative permissions are no longer permitted;

— 8.6: addition of a new subclause on inclusive terminology;

— Clause 9: general review and reorganization of the content;

— 9.2: permission of an alternative representation of numbers, symbols for variable quantities and numerical values for programming languages, pseudo-code and mark-up languages;

— 27.3, 28.3.1 and 29.3: permission of an alternative system of numbering for formulae, figures and tables;

— Clause 31: admission of the inclusion of trademarks or trade names for reasons of public interest or public safety.

It is not the intention that the ISO/IEC Directives, Part 2 follow the same structure and drafting rules as International Standards and associated publications (referred to collectively as "documents", see 3.1.1).

This ninth edition of the ISO/IEC Directives, Part 2 is applicable to all enquiry drafts and to all final drafts registered after 2021-10-01.

Both ISO and IEC have published guides on the use of templates and other tools for the preparation of documents prepared in accordance with the ISO/IEC Directives. These guides are available on the ISO website (https://www.iso.org) and IEC website (https://www.iec.ch).

INTRODUCTION

The ISO/IEC Directives, Part 2 states the general principles by which ISO and IEC documents are drafted and stipulates certain rules to be applied in order to ensure that they are clear, precise and unambiguous. These rules are also important for ensuring that each document contributes effectively to the consistent and interdependent body of knowledge that ISO and IEC produce.

It is recognized that the ever-increasing range of subject matter covered by ISO and IEC reflects an increasingly diverse range of users of their documents, both geographical and in terms of the level and type of technical expertise that it can be expected to have. Those drafting ISO and IEC documents should try to be aware of the particular needs of their intended users and to write in a style that is likely to be readily understood. It is particularly important to be conscious of the likelihood that a document will be translated.

Advice on applying the ISO/IEC Directives, Part 2 is readily available from ISO Central Secretariat and IEC Central Office, as appropriate, and it should be sought whenever any difficulties are encountered.

1 Scope

The ISO/IEC Directives, Part 2 contains the principles and rules for the structure and drafting of International Standards, Technical Specifications and Publicly Available Specifications. As far as practicable, these principles and rules also apply to Technical Reports and Guides. All these document types are referred to collectively as "documents", unless otherwise necessary.

The ISO/IEC Directives, Part 2 does not specify the typography and layout of documents, which are determined by the house style of the publishing organization. Presentation is outside of the scope of the ISO/IEC Directives, Part 2.

The ISO/IEC Directives, Part 2 does not specify the rules governing the process and procedures by which ISO and IEC documents are developed. These rules are provided in the ISO/IEC Directives, Part 1 and ISO, IEC and JTC 1 Supplements.

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.

ISO 128-3, Technical product documentation (TPD) — General principles of representation — Part 3: Views, sections and cuts

ISO 690, Information and documentation — Guidelines for bibliographic references and citations to information resources

ISO 3098 (all parts), Technical product documentation — Lettering

ISO 5807, Information processing — Documentation symbols and conventions for data, program and system flowcharts, program network charts and system resources charts

ISO 70001, Graphical symbols for use on equipment — Registered symbols

ISO 70011), Graphical symbols — Public information symbols

ISO 70101), Graphical symbols — Safety colours and safety signs — Registered safety signs

ISO 10241-1, Terminological entries in standards — Part 1: General requirements and examples of presentation

ISO 14617 (all parts)1), Graphical symbols for diagrams

ISO 80000 (all parts), Quantities and units

IEC 60027 (all parts), Letter symbols to be used in electrical technology

IEC 604172, Graphical symbols for use on equipment

IEC 606173, Graphical symbols for diagrams

IEC 61082-1, Preparation of documents used in electrotechnology — Part 1: Rules

IEC 61175-1, Industrial systems, installations and equipment and industrial products — Designation of signals — Part 1: Basic rules

IEC 80000 (all parts), Quantities and units

IEC 81346 (all parts), Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations

ISO/IEC Directives Part 1, Procedures for the technical work

ISO/IEC Directives Part 1, Consolidated ISO Supplement

ISO/IEC Directives Supplement — Procedures specific to IEC

Quality management systems — Guidance and criteria for the development of documents to meet needs of specific product and industry/economic sectors, ISO/TC 1764

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:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org

3.1 Document type

3.1.1

document

ISO or IEC standardization draft or publication

EXAMPLE International Standards (3.1.4), Technical Specifications (3.1.5), Publicly Available Specifications (3.1.6), Technical Reports (3.1.8) and Guides (3.1.7).

3.1.2

standard

document (3.1.1), established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context

Note 1 to entry: Standards should be based on the consolidated results of science, technology and experience, and aimed at the promotion of optimum community benefits.

[SOURCE: ISO/IEC Guide 2:2004, 3.2]

3.1.3

international standard

standard (3.1.2) that is adopted by an international standardizing/standards organization and made available to the public

[SOURCE: ISO/IEC Guide 2:2004, 3.2.1.1]

3.1.4

International Standard

international standard (3.1.3) where the international standards organization is ISO or IEC

3.1.5

Technical Specification

TS

document (3.1.1) published by ISO or IEC for which there is the future possibility of agreement on an International Standard (3.1.4), but for which at present

— the required support for approval as an International Standard cannot be obtained,

— there is doubt on whether consensus has been achieved,

— the subject matter is still under technical development, or

— there is another reason precluding immediate publication as an International Standard

Note 1 to entry: The content of a Technical Specification, including its annexes, may include requirements (3.3.3).

Note 2 to entry: A Technical Specification is not allowed to conflict with an existing International Standard.

Note 3 to entry: Competing Technical Specifications on the same subject are permitted.

Note 4 to entry: Prior to mid-1999, Technical Specifications were designated as Technical Reports of type 1 or 2.

3.1.6

Publicly Available Specification

PAS

document (3.1.1) published by ISO or IEC to respond to an urgent market need, representing either

a) a consensus in an organization external to ISO or IEC, or

b) a consensus of the experts within a working group

Note 1 to entry: A Publicly Available Specification is not allowed to conflict with an existing International Standard (3.1.4).

Note 2 to entry: Competing Publicly Available Specifications on the same subject are permitted.

3.1.7

Guide

document (3.1.1) published by ISO or IEC giving rules, orientation, advice or recommendations (3.3.4) relating to international standardization

Note 1 to entry: Guides can address issues of interest to all users of documents published by ISO and IEC.

3.1.8

Technical Report

TR

document (3.1.1) published by ISO or IEC containing collected data of a different kind from that normally published as an International Standard (3.1.4) or Technical Specification (3.1.5)

Note 1 to entry: Such data may include, for example, data obtained from a survey carried out among the national bodies, data on work in other international organizations or data on the state of the art (3.4) in relation to standards of national bodies on a particular subject.

Note 2 to entry: Prior to mid-1999, Technical Reports were designated as Technical Reports of type 3.

Note 3 to entry: The content of a Technical Report is not permitted to include requirements (3.3.3), recommendations (3.3.4) or permissions (3.3.5).

3.1.9

normative document

document that provides rules, guidelines or characteristics for activities or their results

[SOURCE: ISO/IEC Guide 2:2004, 3.1, modified — The original Notes to entry have been deleted.]

3.2 Elements of a document

3.2.1

normative element

element that describes the scope of the document (3.1.1) or sets out provisions (3.3.1)

3.2.2

informative element

element intended to assist the understanding or use of the document (3.1.1) or that provides contextual information about its content, background or relationship with other documents

3.2.3

mandatory element

element that has to be present in a document (3.1.1)

EXAMPLE The Scope is an example of a mandatory element.

3.2.4

conditional element

element that is present depending on the provisions (3.3.1) of the particular document (3.1.1)

EXAMPLE The symbols and abbreviated terms clause is an example of a conditional element.

3.2.5

optional element

element that the writer of a document (3.1.1) may choose to include or not

EXAMPLE The Introduction is an example of an optional element.

3.3 Provisions

3.3.1

provision

expression in the content of a normative document (3.1.9) that takes the form of a statement (3.3.2), an instruction, a recommendation (3.3.4) or a requirement (3.3.3)

Note 1 to entry: These types of provision are distinguished by the form of wording they employ; e.g. instructions are expressed in the imperative mood, recommendations by the use of the auxiliary “should” and requirements by the use of the auxiliary “shall”.

[SOURCE: ISO/IEC Guide 2:2004, 7.1]

3.3.2

statement

expression, in the content of a document (3.1.1), that conveys information

Note 1 to entry: to entry: Table 5 specifies the verbal form for indicating statements of permission (3.3.5). Table 6 specifies the verbal forms to be used for statements of possibility (3.3.6) and capability (3.3.7).

3.3.3

requirement

expression, in the content of a document (3.1.1), that conveys objectively verifiable criteria to be fulfilled and from which no deviation is permitted if conformance with the document is to be claimed

Note 1 to entry: Requirements are expressed using the verbal forms specified in Table 3.

3.3.4

recommendation

expression, in the content of a document (3.1.1), that conveys a suggested possible choice or course of action deemed to be particularly suitable without necessarily mentioning or excluding others

Note 1 to entry: Recommendations are expressed using the verbal forms specified in Table 4.

Note 2 to entry: In the negative form, a recommendation is the expression that a suggested possible choice or course of action is not preferred but it is not prohibited.

3.3.5

permission

expression, in the content of a document (3.1.1), that conveys consent or liberty (or opportunity) to do something

Note 1 to entry: Permissions are expressed using the verbal forms specified in Table 5.

3.3.6

possibility

expression, in the content of a document (3.1.1), that conveys expected or conceivable material, physical or causal outcome

Note 1 to entry: Possibility is expressed using the verbal forms specified in Table 6.

3.3.7

capability

expression, in the content of a document (3.1.1), that conveys the ability, fitness, or quality necessary to do or achieve a specified thing

Note 1 to entry: Capability is expressed using the verbal forms specified in Table 6.

3.3.8

external constraint

constraint or obligation on the user of the document (3.1.1) (e.g. laws of nature or particular conditions existing in some countries or regions) that is not stated as a provision (3.3.1) of the document

Note 1 to entry: External constraints are referred to using the verbal form specified in Table 7.

Note 2 to entry: Use of the word “must” does not imply that the external constraint referred to is a requirement (3.3.3) of the document.

3.4

state of the art

developed stage of technical capability (3.3.7) at a given time as regards products, processes and services, based on the relevant consolidated findings of science, technology and experience

[SOURCE: ISO/IEC Guide 2:2004, 1.4]

3.5

profile

named combination of options, chosen according to a specified framework, that are necessary to accomplish a particular function

Note 1 to entry: The options can be chosen from one or several documents or subdivisions of documents.

GENERAL PRINCIPLES

4 Objective of standardization

The objective of documents is to specify clear and unambiguous provisions in order to help international trade and communication. To achieve this objective, documents shall:

• be complete within the limits specified by their scope;

NOTE 1 When a document provides requirements or recommendations, these are either written explicitly, or made by reference to other documents (see Clause 10).

• be consistent, clear and accurate;

• be written using all available knowledge about the state of the art;

• take into account the current market conditions;

NOTE 2 There is sometimes a tension between what is technically feasible and what the market actually requires and is prepared to pay for.

• provide a framework for future technological development;

• be comprehensible to qualified people who have not participated in their preparation; and

• conform to the ISO/IEC Directives, Part 2.

A document does not in itself impose any obligation upon anyone to follow it. However, an obligation can be imposed, for example, by legislation or by a contract which makes reference to the document.

A document shall not include contractual requirements (e.g. concerning claims, guarantees, covering of expenses), or legal or statutory requirements.

5 Principles

5.1 Planning and preparation

Rules for the planning and preparation of new work items are given in the ISO/IEC Directives, Part 1. The rules given in the ISO/IEC Directives and ISO and IEC Supplements shall be applied throughout all stages of drafting to avoid delay. In order to ensure the timely publication of a document or of a series of associated documents, the following shall be determined before drafting begins:

• the intended structure;

• any interrelationships;

• the organization and subdivision of the subject matter (see Clause 6).

In the case of a multipart series, a list of the intended parts should be drawn up (preferably including their titles and scopes).

5.2 Aim-oriented approach

It is not always necessary or possible to standardize all characteristics of an item or a subject. The choice of characteristics to be standardized depends on the aims of the document (e.g. health, safety, protection of the environment, interface, interchangeability, compatibility or interworking, and variety control). A functional analysis of the product can help to identify the characteristics to be included in the document.

It is permitted, but not necessary, to give an explanation for the inclusion of individual characteristics. More general background information can be given in the Introduction (see Clause 13).

5.3 Fitness for implementation as a regional or national standard

The content of a document shall be written so that it can be applied and adopted without change as a regional or national standard. Only characteristics that are suitable for international acceptance shall be chosen. Where necessary, several options may be indicated (e.g. owing to differences in legislation, climate, environment, economies, social conditions, trade patterns).

See ISO/IEC Guide 21-1 for regional or national adoption of International Standards and ISO/IEC Guide 21-2 for regional or national adoption of other International Deliverables.

5.4 Performance principle

Whenever possible, requirements shall be expressed in terms of performance rather than design or descriptive characteristics. This principle allows maximum freedom for technical development and reduces the risk of undesirable market impacts (e.g. limiting development of innovative solutions).

EXAMPLE

Different approaches are possible in the specification of requirements concerning a table.

Design requirements: The table shall have four wooden legs.

Performance requirements: The table shall be constructed such that when subjected to … [stability and strength criteria].

When the performance principle is adopted, ensure that features relevant to the scope of the document are not inadvertently omitted from the performance requirements.

If it is impossible to determine the necessary performance characteristics, the material or product may be specified. However, in such a case, the phrase "… or any other material or product proved to be equally suitable" should be included.

Requirements concerning the manufacturing process shall usually be omitted in favour of tests to be carried out on the final product. There are, nevertheless, some fields in which reference to the manufacturing process is necessary (e.g. hot rolling, extrusion) or even in which an inspection of the manufacturing process is necessary (e.g. pressure vessels).

However, it is necessary to consider whether to specify by description or by performance because specification by performance can lead to complicated, costly and lengthy testing procedures.

5.5 Verifiability

Requirements shall be objectively verifiable. Only those requirements that can be verified shall be included.

Phrases such as "sufficiently strong" or "of adequate strength" shall not be used because they are subjective statements.

The stability, reliability or lifetime of a product shall not be specified if no test method is known that can verify the claim in a reasonably short time. A guarantee by the manufacturer is not a substitute for such requirements. Guarantee conditions shall not be included because they are commercial or contractual, rather than technical, in nature.

5.6 Consistency

Consistency should be maintained within each document and within a series of associated documents.

• The structure of associated documents and the numbering of their clauses should, as far as possible, be identical.

• Identical wording should be used to express identical provisions.

• The same terminology should be used throughout. The use of synonyms should be avoided.

Consistency is particularly important to help the user understand documents or series of associated documents. It is also important when using automated text processing techniques and computer-aided translation.

The application of the ISO/IEC Directives, Part 2 contributes to the overall objective of consistency. A checklist for writers and editors of documents is provided in Annex A.

5.7 Avoidance of duplication and unnecessary deviations

Documents should avoid duplication. This is particularly important in test methods, which are often applicable to more than one product, or type of product.

Before standardizing any item or subject, the writer shall determine whether an applicable standard already exists. If it is necessary to invoke a requirement that appears elsewhere, this should be done by reference, not by repetition – see Clause 10.

Annex D provides reference documents and sources for drafting.

If a test method is, or is likely to be, applicable to two or more types of product, a document shall be prepared on the method itself, and each document dealing with a given product shall refer to it (indicating any modifications that are necessary). This will help to prevent unnecessary deviations.

As far as possible, the requirements for one item or subject should be confined to one document.

In some fields, it can be desirable to write a document specifying generic requirements applicable to a group of items or subjects.

If it is considered necessary to repeat a requirement from an exterior source, its source shall be referenced precisely (see 10.1).

5.8 Accommodation of more than one product size

If the aim of a document is standardization of a single size for a product, but there is more than one widely accepted size in international use, a committee may decide to include alternative product sizes in the document. However, in such cases, every effort shall be made to reduce the number of alternatives to a minimum, taking the following points into account:

• the volume of international trade in the sort of product involved shall serve as a criterion for "international use", not the number of countries or the volume of production in those countries;

• only sizes that are likely to be in international use in the reasonably foreseeable future (e.g. five years or more) shall be included in the document.

Whenever alternative solutions are to be adopted internationally, they shall all be included in the same document and preferences for the different alternatives shall be provided. The reasons for the preferences shall be explained in the Introduction.

When agreed by the committee and approved by the ISO Technical Management Board (ISO/TMB) or the IEC Standardization Management Board (IEC/SMB), a transitional period may be indicated during which the use of non-preferred values is permitted.

5.9 Characteristics not specified in a document

In some cases, a document may list characteristics that can be chosen freely by the supplier. The characteristics chosen shall be stated, for example on a nameplate, label or accompanying document.

For most kinds of complex item, it is impractical to specify exhaustive performance requirements. Instead, it is preferable to require that the item be supplied with a list of performance data.

This approach is not acceptable in the case of health and safety requirements.

Documents listing characteristics for which suppliers or purchasers are required to state values or other data not specified by the document shall specify how such values are to be measured and stated.

6 Organization and subdivision of the subject matter

6.1 Names of the main subdivisions

The terms that shall be used to designate the divisions and subdivisions of subject matter are given in Table 1 in English and in French.

Table 1 — Names of divisions and subdivisions

English term	French term	Example of numbering
Part	Partie	9999-1
Clause	Article	1
Subclause	Paragraphe	1.1
Subclause	Paragraphe	1.1.1
Paragraph	Alinéa	[no number]
Annex	Annexe	A

6.2 Subdivision into documents

Documents are so diverse that no universally acceptable rules can be established for the subdivision of the subject matter.

However, as a general principle, an individual document shall be prepared for each subject to be standardized, and published either as a single standard or a single part of a series.

EXAMPLE 1 Examples of reasons for the subdivision into parts under the same number are

— the document is likely to become too long,

— subsequent parts of the content are interlinked,

— portions of the document are referred to in regulations, and

— portions of the document are intended to serve for certification purposes.

Such subdivision has the advantage that each part can be revised separately as necessary.

In particular, the aspects of a product that are of separate interest to different parties (e.g. manufacturers, certification bodies, legislative bodies or other users) shall be clearly distinguished, preferably as parts of a document or as individual documents.

EXAMPLE 2 Examples of such individual aspects are

— health and safety requirements,

— performance requirements,

— maintenance and service requirements,

— installation rules, and

— quality assessment.

6.3 Subdivision of the subject matter within a series of parts

There are two main ways of subdividing subject matter within a series of parts.

a) Each part deals with a specific aspect of the subject and can stand alone.

EXAMPLE 1

Part 1: Vocabulary

Part 2: Requirements

Part 3: Test methods

Part 4: …

EXAMPLE 2

Part 1: Vocabulary

Part 2: Harmonics

Part 3: Electrostatic discharge

Part 4: …

b) There are both common and specific aspects to the subject. The common aspects shall be given in Part 1. Specific aspects (which can modify or supplement the common aspects and therefore cannot stand alone) shall be given in separate individual parts.

EXAMPLE 3

Part 1: General requirements

Part 2: Thermal requirements

Part 3: Air purity requirements

Part 4: Acoustical requirements

EXAMPLE 4

Part 1: General requirements

Part 21: Particular requirements for electric irons

Part 22: Particular requirements for spin extractors

Part 23: Particular requirements for dishwashers

EXAMPLE 5 For IEC documents only

Part 1: General requirements

Part 2-1: Requirements for plasma displays

Part 2-2: Requirements for monitors

Part 2-3: Requirements for LCDs

Where the system described in b) is used, ensure that the references from one part to another are valid. There are two ways of achieving this.

• If reference is made to a particular element, the reference shall be dated (see 10.5).

• The committee responsible shall validate the references at the time of review of the document.

Each part of a multipart series shall be drafted in accordance with the same rules as those used for an individual document.

The number of a part shall be in Arabic numerals, starting with 1, following the document number and preceded by a hyphen.

EXAMPLE 6 ISO 9999-1, ISO 9999-2

In ISO, parts cannot be further subdivided. In IEC, parts can be subdivided down to two levels. See the examples in 11.4.

EXAMPLE 7 IEC 60335-2-9

If a document is subdivided in a number of separate parts, the first part should include an explanation of the intended structure in its Introduction. When developing a series, consider reserving Part 1 for general aspects such as a vocabulary (see 11.5.2).

In the Foreword to each part in the series, a reference may be made to the titles of all other parts that have been or are planned to be published.

EXAMPLE 8

A list of all parts in the ISO xxxx series can be found on the ISO website.

A list of all parts in the IEC xxxx series, published under the general title xxx, can be found on the IEC website.

6.4 Subdivision of the subject matter within an individual document

An example of a typical arrangement is given in Table 2.

Table 2 — Overview of the major subdivisions of a document and their arrangement in the text

Major subdivision	Mandatory/Optional/Conditional
Title	Mandatory
Table(s) of content	Optionala

Major subdivision	Mandatory/Optional/Conditional
Foreword	Mandatory
Introduction	Optional/Conditionalb
Scope	Mandatory
Normative references	Mandatoryc
Terms and definitions	Mandatoryc
Symbols and abbreviated terms	Conditional
Technical content For example: test methods	Mandatory/Optional/Conditional
Annexes	Optional
Bibliography	Conditional
Indices	Optional

a These may include a list of major subdivisions of the document and lists of figures, tables and similar numbered elements.

b See 13.3.

c When no normative references or terms are listed, use the introductory texts provided in 15.5.2 and 16.5.3.

6.5 Supplementary content

Certain documents contain supplementary material that is best provided in electronic formats, which differs from that of the main content.

EXAMPLE 1 Data sets, code components, test forms.

This supplementary material can be provided as an attached file or a hyperlink (URN or URL).

Supplementary content shall only be provided in this way if it cannot reasonably be included in the main body of the text.

Each item of supplementary content shall be explicitly referred to within the text in order to explain its context and use.

EXAMPLE 2

"The conformance bitstreams are provided at:

https://standards.iso.org/iso-iec/23008/-8/ed-2/en"

EXAMPLE 3

"The supplementary files associated with this document are located at:

https://www.iec.ch/tc82/supportingdocuments"

6.6 Subdivision of the subject matter into profiles

One of the primary objectives of standardization is to minimize variation and encourage single common standards for worldwide use. However, in some cases, it is necessary to choose sets and subsets of characteristics from a common defined framework for specific applications.

EXAMPLE 1 Application-specific variants of a standard or set of standards.

EXAMPLE 2 User profiles, which are a defined subset that is valid for a specific type of user.

EXAMPLE 3 A subset of characteristics designed for one specific function.

In such cases, the subject matter may be subdivided and organized using profiles.

The number of profiles shall be limited, and profiles defined only when essential to meet technical, regional or application needs.

Profiles shall be specified in accordance with a defined scheme.

Each profile defined by the scheme shall be identified with a unique designator to allow products conforming to differing profiles to be clearly distinguished. The designator should be constructed using a system conforming to Annex C.

Potential incompatibilities and non-interoperability of profiles should be addressed.

7 Verbal forms for expressions of provisions

7.1 General

The user of the document shall be able to identify the requirements he/she is obliged to satisfy in order to claim conformance to a document. The user shall also be able to distinguish these requirements from other types of provision (recommendations, permissions, possibilities and capabilities).

It is essential to follow rules for the use of verbal forms so that a clear distinction can be made between requirements, recommendations, permissions, possibilities and capabilities. To avoid risk of misinterpretation, verbal forms that are not defined in Table 3 to Table 7 shall not be used for the expression of provisions.

The first column in Table 3 to Table 7 shows the preferred verbal form to be used to express each type of provision. The equivalent expressions given in the second column shall be used only in certain cases when the form given in the first column cannot be used for linguistic reasons.

Only singular forms are shown in Table 3 to Table 7.

7.2 Requirement

See the definition given in 3.3.3.

The verbal forms shown in Table 3 shall be used to express requirements.

Table 3 — Requirement

Preferred verbal form	Equivalent phrases or expressions for use in certain cases
shall	is to is required to it is required that has to only … is permitted it is necessary
shall not	is not allowed [permitted] [acceptable] [permissible] is required to be not is required that … be not is not to be do not

EXAMPLE 1

Connectors shall conform to the electrical characteristics specified by IEC 60603-7-1.

Preferred verbal form	Equivalent phrases or expressions for use in certain cases

Imperative mood:

The imperative mood is frequently used in English to express requirements in procedures or test methods.

EXAMPLE 2

Switch on the recorder.

EXAMPLE 3

Do not activate the mechanism before…

Do not use “must” as an alternative for “shall”. This avoids confusion between the requirements of a document and external constraints (see 7.6).

Do not use “may not” instead of “shall not” to express a prohibition.

7.3 Recommendation

See the definition given in 3.3.4.

The verbal forms shown in Table 4 shall be used to express recommendations.

Table 4 — Recommendation

Preferred verbal form	Equivalent phrases or expressions for use in certain cases
should	it is recommended that ought to
should not	it is not recommended that ought not to

EXAMPLE

Wiring of these connectors should take into account the wire and cable diameter of the cables defined in the IEC 61156 series.

Preferred verbal form	Equivalent phrases or expressions for use in certain cases

In French, do not use “devrait” in this context.

7.4 Permission

See the definition given in 3.3.5.

The verbal forms shown in Table 5 shall be used to express permission.

Table 5 — Permission

Preferred verbal form	Equivalent phrases or expressions for use in certain cases
may	is permitted is allowed is permissible
(—)	(—)

EXAMPLE 1

IEC 60512-26-100 may be used as an alternative to IEC 60512-27-100 for connecting hardware that has been previously qualified to IEC 60603-7-3:2010.

EXAMPLE 2

Within an EPB document, if the quantity is not passed to other EPB documents, one or more of the subscripts may be omitted provided that the meaning is clear from the context.

Do not use “possible” or “impossible” in this context.

Do not use “can” instead of “may” in this context.

Do not use “might” instead of “may” in this context.

“May” signifies a permission expressed by the document, whereas “can” refers to the ability of a user of the document or to a possibility open to him/her.

Preferred verbal form	Equivalent phrases or expressions for use in certain cases

The French verb “pouvoir” can indicate both a permission and a possibility. If there is a risk of misunderstanding, the use of other expressions is advisable.

Negative permissions are ambiguous and should not be used. Rather than using negative permissions, either rewrite the sentence to state what is permitted, or rewrite as a requirement/recommendation not to do something.

7.5 Possibility and capability

See the definitions given in 3.3.6 and 3.3.7.

The verbal forms shown in Table 6 shall be used to express possibility and capability.

Table 6 — Possibility and capability

Preferred verbal form	Equivalent phrases or expressions for use in certain cases
can	be able to there is a possibility of it is possible to
cannot	be unable to there is no possibility of it is not possible to

EXAMPLE 1

Use of this connector in corrosive atmospheric conditions can lead to failure of the locking mechanism.

EXAMPLE 2

These measurements can be used to compare different sprayer setups on the same sprayer.

Preferred verbal form	Equivalent phrases or expressions for use in certain cases

EXAMPLE 3

Only the reverse calculation approach given in Clause E.3 can be used for calculated energy performance.

EXAMPLE 4

The sum over time can be related either to consecutive readings or to readings on different time slots (e.g. peak versus off-peak).

Do not use “may” instead of “can” in this context.

“May” signifies a permission expressed by the document, whereas “can” refers to the ability of a user of the document or to a possibility open to him/her.

The French verb “pouvoir” can indicate both permission and possibility. If there is a risk of misunderstanding, the use of other expressions is advisable.

7.6 External constraint

See the definition given in 3.3.8.

External constraints are not requirements of the document. They are given for the information of the user.

The verbal form shown in Table 7 shall be used to indicate constraints or obligations defined outside the document.

Table 7 — External constraint

Preferred verbal form	Equivalent phrases or expressions for use in certain cases
must	

EXAMPLE 1 Particular conditions existing in a country:

Because Japan is a seismically active country, all buildings must be earthquake-resistant.

Preferred verbal form	Equivalent phrases or expressions for use in certain cases

EXAMPLE 2 A law of nature:

All fish must maintain a balance of salt and water in their bodies to stay healthy.

Do not use “must” as an alternative for “shall”. This avoids confusion between the requirements of a document and external constraints (see 7.2).

8 Language, spelling, abbreviated terms, style and basic reference works

8.1 Language versions

The general policy on languages is explained in the ISO/IEC Directives, Part 1.

The different language versions of documents shall be technically equivalent and structurally identical.

The use of bilingualism from the initial stage of drafting is of great assistance in the preparation of clear and unambiguous texts.

Documents containing text in languages additional to the official languages shall contain the following text (completed as appropriate) in the Foreword.

In addition to text written in the official … [ISO or IEC] … languages (English, French, Russian), this document gives text in … [language] …. This text is published under the responsibility of the [Member Body/National Committee] for … [country (acronym for Member Body/National Committee)] and is given for information only. Only the text given in the official languages can be considered as … [ISO or IEC] … text.

8.2 Spelling reference works

Spelling shall be consistent throughout a document. The following reference works for spelling are suggested:

• for English, the Shorter Oxford English Dictionary, the Concise Oxford English Dictionary, the Collins Concise English Dictionary, the Webster’s New World College Dictionary or the Chambers Concise Dictionary;

• for French, Dictionnaire Le Robert, Dictionnaire Larousse and Dictionnaire des difficultés de la langue française (A.V. Thomas, Larousse).

8.3 Spelling and abbreviated forms of names of organizations

The names of organizations, and their abbreviated forms, shall be written as used by those organizations, in English, French or Russian.

8.4 Abbreviated terms

The use of abbreviated terms shall be consistent throughout the document.

If a list of abbreviated terms is not given in the document (see Clause 17), then the first time that an abbreviated term is used, the full term shall be given with the abbreviated term following in brackets.

EXAMPLE 1 … the weighted root mean square (RMS) width of the active output interface optical spectrum …

Any abbreviated term should be in uppercase letters, without a full stop after each letter.

EXAMPLE 2 "RH" for "relative humidity".

Occasionally, abbreviated terms in common use are written differently, either for historical or for technical reasons.

Technical specifications regarding marking may impose other requirements.

8.5 Linguistic style

To help users understand and use the document correctly, the linguistic style shall be as simple and concise as possible. This is particularly important for those users whose first language is not one of the official languages of ISO and IEC.

8.6 Inclusive terminology

Whenever possible, inclusive terminology shall be used to describe technical capabilities and relationships. Insensitive, archaic and non-inclusive terms shall be avoided. For the purposes of this principle, "inclusive terminology" means terminology perceived or likely to be perceived as welcoming by everyone, regardless of their sex, gender, race, colour, religion, etc.

New documents shall be developed using inclusive terminology. As feasible, existing and legacy documents shall be updated to identify and replace non-inclusive terms with alternatives that are more descriptive and tailored to the technical capability or relationship.

9 Numbers, quantities, units and values

9.1 Representation of numbers and numerical values

Numbers should be written in upright type, irrespective of the type used in the rest of the text.

The decimal sign shall be a comma on the line in all language versions.

If the magnitude (absolute value) of a number less than 1 is written in decimal form, the decimal sign shall be preceded by a zero.

EXAMPLE 1 0,001

Each group of three digits shall be separated by a small space from the preceding digits, counting from the decimal sign. This also applies to digits following the decimal sign. When there is no decimal sign, the counting shall be from the rightmost digit towards the left. The separation into groups of three digits does not apply to binary and hexadecimal numbers, numbers designating years or the numbering of standards.

EXAMPLE 2 23 456 2 345 2,345 2,345 6 2,345 67 but the year 2011

When numbers or numerical values have a decimal separator, their multiplication shall be indicated by the multiplication cross (×), instead of a half-high dot.

EXAMPLE 3 2 · m

EXAMPLE 4 1,7 × h

ISO 80000-2 gives an overview of multiplication symbols for numbers.

9.2 Representation of numbers, symbols for variable quantities and numerical values for programming languages, pseudo-code and mark-up languages

Where the document defines, describes, refers to or contains programming language, pseudo-code or mark-up language text, the representation of the numbers, symbols for variable quantities and numerical values shall follow the syntax of the appropriate programming language, pseudo-code or mark-up language.

9.3 Quantities, units, symbols and signs

9.3.1 Quantities

Quantity symbols should be written in italic type, irrespective of the type used in the rest of the text.

Quantity symbols shall be chosen, wherever possible, from the various parts of the IEC 60027 series, the ISO 80000 series, the IEC 80000 series and ISO Guide 99.

Subscripts for quantity symbols are allowed and are printed in italic type when they represent a quantity or a mathematical variable. They are printed in upright type when they represent a word or a fixed number.

EXAMPLE 1

Italic subscripts	Roman subscripts
Cp (p: pressure)	Cg (g: gas)
ci (i: running number)	c3 (3: third)

The symbol of the product of two or more quantities is indicated in one of the following ways:

ab, a b, a · b, a × b, a * b

abc, a b c, a · b · c, a × b × c, a * b * c

The multiplication cross (×) may also be used to indicate vector products or cartesian products.

EXAMPLE 2 mml_m1.eps

The half-high dot (·) may also be used to indicate a scalar product of vectors and comparable cases, and may also be used to indicate a product of scalars and in compound units.

EXAMPLE 3 U = R · I

EXAMPLE 4 rad · m2/kg

The division of one quantity by another is indicated in one of the following ways:

mml_m2.eps, a/b, a b-1, a · b-1

A solidus (/) shall not be followed by a multiplication sign or a division sign on the same line unless parentheses are inserted to avoid any ambiguity:

(a / b) / c = a / (bc), not a / b / c

Names of quantities or multiletter abbreviated terms, for example, presented in italics or with subscripts, shall not be used in the place of symbols.

EXAMPLE 5 Write ρ = m / V and not density = mass / volume.

9.3.2 Units

The International System of units (SI) as set out in the ISO 80000 series and the IEC 80000 series shall be used.

The units in which any values are expressed shall be indicated.

It is not permitted to modify a unit symbol (e.g. by means of a subscript) to give information about the special nature of the quantity or context of measurement.

EXAMPLE 1

Correct:	Incorrect:
Umax = 500 V	U = 500 Vmax

Language-specific abbreviated terms such as “ppm” should not be used, if possible. If it is necessary to use language-specific abbreviated terms such as “ppm”, their meaning shall be explained.

Mathematical signs and symbols shall be in accordance with ISO 80000-2.

Use Annex B as a checklist of the quantities and units that shall be used.

9.4 Values, intervals and tolerances

9.4.1 General

To express values of physical quantities, Arabic numerals (called “numerical values”) followed by the international symbol for the unit shall be used (see the ISO 80000 series, the IEC 80000 series, the IEC 60027 series and ISO/IEC Guide 99).

EXAMPLE 1 80 mm × 25 mm × 50 mm (not 80 × 25 × 50 mm)

In the expression of a quantity value, there is always a space between the numerical value and the unit symbol. The only exception to this convention is for plane angles expressed with superscript-type unit symbols. However, the degree should preferably be subdivided decimally. In some fields of science, the usage of the units minute (′) and second (″) is preferred, e.g. for geographic coordinates.

EXAMPLE 2 θ = 1 rad = 57,295 8° instead of θ = 1 rad = 57°17′45″

EXAMPLE 3 60°10′15″N 24°56′15″E (the position of Helsinki, Finland)

The quantity value is expressed with only one symbol unit, with the exception of sexagesimally divided units like the plane angle (in special fields like astronomy, cartography and navigation) and the time, although the seconds are decimally divided.

EXAMPLE 4 L = 1,234 m but Δt = 10 h 31 min 19,93 s

To designate a set of values between a and b, where a < b, the symbol [a, b] is used, designated by “interval”. The difference r = b – a, denoted r[a, b], is designated by “the range of the interval [a, b]”.

EXAMPLE 5 The two end points 78 µF and 82 µF of the interval [78, 82] µF, also denoted [78 µF, 82 µF], can be stated as 80 µF ± 2 µF or (80 ± 2) µF, although this expression is often used erroneously to denote the interval preferably denoted using brackets like [80 µF ± 2 µF], [(80 ± 2) µF] or even [80 ± 2] µF.

EXAMPLE 6 Consequently, $\lambda = 220 \times (1 \pm 0{,}02)$ W/(m · K) denotes the two end points $\lambda 1 = 220 \times 0{,}98$ W/(m · K) and $\lambda 2 = 220 \times 1{,}02$ W/(m · K).

EXAMPLE 7 10 kPa to 12 kPa (not 10 to 12 kPa or 10 – 12 kPa) is another way to denote the [10, 12] kPa interval.

EXAMPLE 8 0 °C to 10 °C (not 0 to 10 °C or 0 – 10 °C) is another way to denote the [0, 10] °C interval

To indicate that one of the end points is excluded from the interval, the square bracket may be replaced by a parenthesis.

EXAMPLE 9 $x \in [a, b]$ expresses $a \leq x \leq b$, while [a, b) expresses $a \leq x < b$ and (a, b] expresses $a < x \leq b$.

Values and dimensions shall be indicated as either nominal, ordinal, theoretically exact, or including a tolerance.

By the same token, their tolerances (if applicable) shall be specified in an unambiguous manner.

EXAMPLE 10 mml_m3.eps (not mml_m4.eps)

EXAMPLE 11 mml_m5.eps

In order to avoid misunderstanding, tolerances on values expressed in per cent shall be expressed in a mathematically correct form.

EXAMPLE 12 Write “from 63 % to 67 %” to express a range.

EXAMPLE 13 Write “(65 ± 2) %” to express a centre value with a tolerance.

Any value or dimension that is mentioned for information only shall be clearly distinguishable from requirements.

9.4.2 Limiting values

For some purposes, it is necessary to specify limiting values (maximum, minimum). Usually one limiting value is specified for each characteristic. In the case of several widely used categories or levels, several limiting values are required.

Limiting values of strictly local importance shall not be included in a document.

9.4.3 Selected values

For some purposes, values or series of values may be selected, particularly for variety control and interface purposes. They may be selected in accordance with the series of preferred numbers given in ISO 3 (see also ISO 17 and ISO 497), or according to some modular system or other determining factors. For the electrotechnical field, recommended systems of dimensional sizes are given in IEC Guide 103.

Documents that have been established to specify selected values for equipment, or components that may be referred to in the provisions of other documents, shall be regarded, in this respect, as basic standards.

EXAMPLE 1 For electrotechnical work, IEC 60063 specifies series of preferred values for resistors and capacitors.

EXAMPLE 2 For chemical testing, ISO/TC 48 has developed standards for laboratory equipment.

Values of strictly local importance shall not be included in a document. In standardizing a rationalized series of values, existing series shall be examined to see whether any would be acceptable for international application.

If a series of preferred numbers is used, difficulties can arise if fractions such as "3,15" are introduced: these can sometimes be inconvenient or require unnecessarily high accuracy. In such cases, they should be rounded in accordance with ISO 497. The specification of different values for use in different countries (whereby both the precise value and the rounded value are contained in the document) shall be avoided.

10 Referencing

10.1 Purpose or rationale

The entire collection of International Standards published by ISO and IEC is interrelated and forms a system whose integrity has to be preserved.

Therefore, references to particular pieces of text should be used instead of repetition of the original source material. Repetition introduces the risk of error or inconsistency and increases the length of the document. However, if it is considered necessary to repeat such material, its source shall be referenced precisely.

Imprecise references such as "the following clause" or "the figure above" shall not be used.

References can be made

• to other parts of the document, e.g. a clause, table or figure (see 10.6), or

• to other documents or publications (see 10.2).

References can be

• informative (see Clause 21), or

• normative (see Clause 15).

References can be

• dated (see 10.5), or

• undated (see 10.4).

EXAMPLE 1

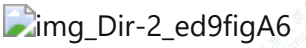
It is often useful to copy relevant terminological entries into the Terms and definitions clause, in which case the source is cited:

3.1
asset
item, thing or entity that has potential or actual value to an organization

[SOURCE: ISO 55000:2014, 3.2.1]

EXAMPLE 2

Material copied from an external document:



Key

1 life; maintenance time

SOURCE: Reference [5], reproduced with the permission of the authors

Figure A.6 — Property versus time behaviour, detection of threshold (end point, PL) and maintenance time

For management system standards, the rules of the ISO/IEC Directives, Part 1, Consolidated ISO Supplement apply.

10.2 Permitted referenced documents

Normatively referenced documents shall be documents published by ISO or IEC. In the absence of appropriate ISO or IEC documents, those published by other bodies may be listed as normative references provided that

a) the referenced document is recognized by the committee as having wide acceptance and authoritative status,

b) the committee has the agreement of the authors or publishers (where known) of the referenced document for its inclusion as a reference,

c) the authors or publishers (where known) have also agreed to inform the committee of their intention to revise the referenced document and what points the revision will affect,

d) the document is available under commercial terms which are fair, reasonable and non-discriminatory, and

e) any patented item required for the implementation of the document is available to be licensed in accordance with the ISO/IEC Directives, Part 1, 2021, 2.14, “Reference to patented items”.

Informative reference may be made to any other type of document. Informative references shall be listed in the Bibliography.

ISO and IEC normatively referenced documents shall have reached at least the enquiry stage (40.20 DIS or CDV).

The committees shall validate all referenced documents when a document is revised.

The normative references list shall not include the following:

• referenced documents which are not publicly available (in this context, “publicly available” means published documents which are available free of charge, or available commercially under fair, reasonable and non-discriminatory terms to any user);

• referenced documents which are cited only informatively as bibliographic or background material.

10.3 Presentation of references

Documents shall be referred to by their number and, if applicable, date of publication and title.

EXAMPLE 1

ISO/TR 12353-3:2013, Road vehicles — Traffic accident analysis — Part 3: Guidelines for the interpretation of recorded crash pulse data to determine impact severity

ISO 14044:2006, Environmental management — Life cycle assessment — Requirements and guidelines

ISO 17101-2:2012, Agricultural machinery — Thrown-object test and acceptance criteria — Part 2: Flail mowers

ISO 14617 (all parts), Graphical symbols for diagrams

ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories

IEC 61175-1, Industrial systems, installations and equipment and industrial products — Designation of signals — Part 1: Basic rules

For other referenced documents and information resources (printed, electronic or otherwise), the relevant rules set out in ISO 690 shall be followed.

EXAMPLE 2

Printed book or monograph:

GREAT BRITAIN. Data Protection Act 1984. Schedule 1, c35, Part 1, Clause 7. London: HMSO

Electronic book or monograph:

INTERNET ENGINEERING TASK FORCE (IETF). RFC 3979: Intellectual Property Rights in IETF Technology [online]. Edited by S. Bradner. March 2005 [viewed 2020-09-09]. Available at https://www.ietf.org/rfc/rfc3979.txt

Contribution to printed serial publication:

AMAJOR, L.C. The Cenomanian hiatus in the Southern Benue Trough, Nigeria. Geological Magazine. 1985, 122(1), 39-50. ISSN 0016-7568

Contribution to online serial publication:

STRINGER, John A., et al. Reduction of RF-induced sample heating with a scroll coil resonator structure for solid-state NMR probes. Journal of Magnetic Resonance [online]. Elsevier. March 2005, 173(1), 40-48 [viewed 2018-04-17]. Available at: http://dx.doi.org/10.1016/j.jmr.2004.11.015

For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited in order to ensure traceability.

The information shall include the method of access to the referenced document and the full network address, with the same punctuation and use of uppercase and lowercase letters as given in the source (see ISO 690).

Furthermore, the referenced document should be expected to remain valid for the expected life of the referring document.

EXAMPLE 3

ISO/IEC Directives, IEC Supplement. International Electrotechnical Commission. Available at https://www.iec.ch/members_experts/refdocs/

Statutes and Directives. International Electrotechnical Commission, ©2004-2010 [viewed 2021-02-09]. Available at https://www.iec.ch/members_experts/refdocs/

ISO 7000/IEC 60417 [online database], Graphical symbols for use on equipment [viewed 2021-04-18]. Available at https://www.graphical-symbols.info/

To simplify cross-referencing to the Bibliography, entries may be numbered and cross-references made to the number of the corresponding entry. See 21.4.

EXAMPLE 4

The complete data set is provided in Reference [6].

10.4 Undated references

Undated references may be made:

• only to a complete document;

• if it will be possible to use all future changes of the referenced document for the purposes of the referring document;

• when it is understood that the reference will include all amendments to and revisions of the referenced document.

The date of publication or dash (see 10.5) shall not be given for undated references. When an undated reference is to all parts of a series:

• the standard identifier shall be followed by “(all parts)” in the lists of documents in the Normative references clause and in the Bibliography;

• the form “the ISO xxxx series” or "the IEC xxxx series" shall be used in the text.

In the Normative references clause or the Bibliography, use the following forms to list undated references.

EXAMPLE 1

IEC 60335 (all parts), Household and similar electrical appliances — Safety	Reference to all parts
IEC 60335-1, Household and similar electrical appliances — Safety — Part 1: General requirements	Reference to a single part

In the text, use the following forms to make undated references to a document or series.

EXAMPLE 2

"… use the methods specified in ISO 128-2 and ISO 80000-1 …";

"… IEC 60417 shall be used…".

"… use the test methods of the IEC 60335 series …"

10.5 Dated references

Dated references are references to

• a specific edition, indicated by the date of publication, or

• a specific enquiry or final draft, indicated by a dash.

Normative references to enquiry or final drafts are potentially risky, and are strongly discouraged, as the referenced document can change before publication.

For dated references, each shall be given with its year of publication. In the case of enquiry or final drafts, the date shall be replaced with a dash together with an explanatory footnote (see Example 2).

The date of publication shall be indicated by the year or, for documents for which more than one edition of the document or an element within the document will be published in the same calendar year, the year of publication and the month (and, where necessary, the day).

If the referenced document is amended or revised, the dated references to it shall be reviewed to assess whether they shall be updated or not.

In this context, a part is regarded as a separate document.

Within the text, references to specific elements (e.g. clauses or subclauses, tables and figures) of a referenced document shall always be dated, because these elements are sometimes renumbered in subsequent editions of the referenced document.

In the Normative references clause or the Bibliography, use the following forms to list dated references.

EXAMPLE 1

IEC 62271-1:2007, High-voltage switchgear and controlgear — Part 1: Common specifications	Dated reference to a standard
IEC 62271-1:2007/AMD1:2011, High-voltage switchgear and controlgear — Part 1: Common specifications	Dated reference to an amendment (using IEC conventions)

ISO 23537:2016/Amd 1:2018, Requirements for sleeping bags — Part 1: Thermal and dimensional requirements — Amendment 1	Dated reference to an amendment (using ISO conventions)

In the text, use the standard identifier rather than the title when referring to an ISO or IEC document. The titles are usually only written out in full in the Normative references clause and in the Bibliography.

In the text, use the following forms to make dated references to a document.

EXAMPLE 2

… as specified in IEC 64321-4:1996, Table 1, …	Dated reference to a specific table in another published document
… perform the tests given in IEC 60068-1:2013 …	Dated reference to a published document
… use symbol IEC 60417-5017:2006-08…	Dated reference to an entry within a database standard
… in accordance with IEC 62271-1:2007/AMD1:2011 …	Dated reference to an amendment (using IEC conventions)
… in accordance with IEC 62271-1:2007 and IEC 62271-1:2007/AMD1:2011 …	Dated reference to a published document and its amendment (using IEC conventions)
… ISO 1234:—2, lists the test methods for… --------- 2 Under preparation. Stage at the time of publication: ISO/DIS 1234:2014.	Dated reference to an enquiry or final draft (typically, the footnote is inserted the first time the reference appears)

EXAMPLE 3

Dated versus undated references:

The test methods of IEC 61300-2-2 shall be used.	This is a reference to a complete document and it can therefore be undated

The dimensions shall be in accordance with IEC 60793-2-50:2018, Table B.1.	This is a reference to a specific element in the referenced document and it is therefore dated

10.6 References in a document to itself

For an individual document, the form “this document” shall be used.

In contexts where it is necessary to specify the number of the document, it is acceptable to do so.

EXAMPLE 1

This document outlines test methodologies used for salt mist conditions.

The ISO 3166 Maintenance Agency facilitates the work of experts by providing them with information on…

References to particular elements of the text (e.g. clauses, subclauses, tables, figures, mathematical formulae, annexes) are made by using their number.

EXAMPLE 2

Annex B outlines test methodologies used for salt mist conditions.

References shall not be made to page numbers, since pagination can change if the referenced document is published in different formats, or if the document is revised.

If content has been subdivided into a series of parts, reference in the text to the entire series including the individual document shall be made using the form “the ISO xxxx series” or “the IEC xxxx series”.

EXAMPLE 3

The formulae in the ISO 10300 series are intended to establish uniformly acceptable methods for calculating the pitting resistance and bending strength of…

Such undated references are understood to include all amendments and revisions to the referenced document.

SUBDIVISIONS OF THE DOCUMENT

11 Title

11.1 Purpose or rationale

The title is a clear, concise description of the subject matter covered by the document. It is drafted so as to distinguish the subject matter from that of other documents, without going into unnecessary detail. Any necessary additional details are given in the Scope.

11.2 Normative or informative?

The title is a normative element.

11.3 Mandatory, conditional or optional?

The title is a mandatory element.

11.4 Numbering and subdivision

The title is composed of separate elements, each as short as possible, proceeding from the general to the particular, for example:

a) an introductory element indicating the general field to which the document belongs (this can often be based on the title of the committee which prepared the document);

b) a main element indicating the principal subject treated within that general field;

c) a complementary element indicating the particular aspect of the principal subject or giving details that distinguish the document from other documents, or other parts of the same series.

No more than three elements shall be used. The main element shall always be included.

EXAMPLE 1 The introductory element is necessary to indicate the field of application.

Correct: Raw optical glass — Grindability with diamond pellets — Test method and classification

Incorrect: Grindability with diamond pellets — Test method and classification

The title of a part shall be composed in the same way. All the individual titles in a series of parts shall contain the same introductory element (if present) and main element, while the complementary element shall be different in each case in order to distinguish the parts from one another. The complementary element shall be preceded in each case by the designation “Part ...:”.

EXAMPLE 2

IEC 60947-1	Low-voltage switchgear and controlgear — Part 1: General rules
IEC 60947-2	Low-voltage switchgear and controlgear — Part 2: Circuit-breakers

When a document is divided into subparts (in the IEC), the parts within each subseries shall have the same subseries title.

EXAMPLE 3

IEC 61300-1	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 1: General and guidance
IEC 61300-2-1	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-1: Tests — Vibration (sinusoidal)
IEC 61300-2-2	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-2: Tests — Mating durability
IEC 61300-3-1	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-1: Examinations and measurements — Visual examination
IEC 61300-3-2	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-2: Examinations and measurements — Polarization dependent loss in a single-mode fibre optic device

11.5 Specific principles and rules

11.5.1 Avoidance of unintentional limitation of the scope

The title shall not contain details that can unintentionally limit the scope of the document.

11.5.2 Wording

The terminology used in the titles of documents shall be consistent.

For documents dealing exclusively with terminology, the following expressions shall be used:

• “Vocabulary” if both terms and definitions are included, or

• “List of equivalent terms” if only equivalent terms in different languages are given.

For documents dealing with test methods, use the form

"Test method" or "Determination of …"

instead of expressions such as

"Method of testing", "Method for the determination of …", "Test code for the measurement of …" and "Test on …".

The type or nature of the document (e.g. International Standard, Technical Specification, Publicly Available Specification, Technical Report or Guide) shall not be indicated in the title.

EXAMPLE 1

Correct: Workplace air — Guidance for the measurement of respirable crystalline silica

Incorrect: Workplace air — Technical specification for the measurement of respirable crystalline silica

Expressions such as "International test method for …" and "Technical Report on …" shall therefore not be used.

EXAMPLE 2

Correct: Test method on electromagnetic emissions — Part 1: […]

Incorrect: International test method on electromagnetic emissions — Part 1: […]

The word "Guide" shall not be used in titles of documents developed by technical committees and subcommittees as it corresponds to a specific document type developed under the authority of the management boards (see the ISO/IEC Directives, Part 1). Titles using the word "Guidance" are acceptable (e.g. "ISO 26000, Guidance on social responsibility").

12 Foreword

12.1 Purpose or rationale

The Foreword provides information on:

• the organization responsible for publishing the document;

• the committee that developed the document;

• the procedures and rules under which the document was developed;

• the voting process;

• legal disclaimers;

• relationships between the present document and other documents.

12.2 Normative or informative?

The Foreword is an informative element. It shall not contain requirements, permissions or recommendations.

12.3 Mandatory, conditional or optional?

The Foreword is a mandatory element.

12.4 Numbering and subdivision

The Foreword shall not have a clause number and shall not be subdivided.

12.5 Specific principles and rules

12.5.1 Fixed text

The general part of the Foreword is a fixed text supplied by the Central Secretariat of ISO or by the Central Office of the IEC. It provides information relating to the organization responsible and to documents in general, legal texts as well as the procedures and rules under which the content was developed.

12.5.2 Specific text

The fixed part of the Foreword is followed by a specific part, supplied by the committee secretariat, and it shall provide as many of the following as are appropriate:

a) the designation and name of the committee that developed the document (working groups and other temporary entities are not referred to in the Foreword);

EXAMPLE 1

This document was prepared by Technical Committee ISO/TC 35, Paints and varnishes, Subcommittee SC 9, General test methods for paints and varnishes.

b) an indication of any other international organization that has contributed to the development of the document;

EXAMPLE 2

IEC 82045-2 has been prepared by IEC technical committee 3: Documentation, graphical symbols and representations of technical information, in collaboration with ISO subcommittees SC 1: Basic conventions and SC 8: Construction documentation of ISO technical committee 10: Technical product documentation.

c) a statement that the document cancels and replaces other documents in whole or in part, and a statement of significant changes with respect to the previous edition of the document;

EXAMPLE 3

This first edition of ISO 3233-3 cancels and replaces ISO 23811:2009, which has been technically revised.

In addition to the change in number, the main changes compared with ISO 23811:2009 are as follows:

— symbols have been harmonized with those used in ISO 3233-1 and ISO 3233-2;

— determination of dry film thickness has been added;

[…]

d) the relationship of the document to other documents;

EXAMPLE 4

This document is intended to be used in conjunction with IEC 60704-1:2021.

EXAMPLE 5

A list of all parts in the ISO 7637 series can be found on the ISO website.

EXAMPLE 6

A list of all parts in the IEC 60364 series, published under the general title Low-voltage electrical installations, can be found on the IEC website.

e) for documents containing text in languages additional to the official languages, the following text completed as appropriate.

In addition to text written in the official … [ISO or IEC] … languages (English, French, Russian), this document gives text in … [language] …. This text is published under the responsibility of the Member Body/National Committee for … [country (acronym for Member Body/National Committee)] and is given for information only. Only the text given in the official languages can be considered as … [ISO or IEC] … text.

13 Introduction

13.1 Purpose or rationale

The Introduction provides specific information or commentary about the technical content of the document, and about the reasons prompting its preparation.

13.2 Normative or informative?

The Introduction is an informative element. It shall not contain requirements.

13.3 Mandatory, conditional or optional?

The Introduction is an optional element. It is only mandatory if a specific patent right has been identified during the development of the document.

13.4 Numbering and subdivision

The Introduction shall not have a clause number. If it is necessary to create numbered subdivisions, the subclauses are numbered 0.1, 0.2, … .

13.5 Specific principles and rules

Whenever alternative solutions are offered in a document and preferences for the different alternatives provided, the reasons for the preferences shall be explained in the Introduction.

Where patent rights have been identified in a document, the Introduction shall include an appropriate notice. See Clause 30.

14 Scope

14.1 Purpose or rationale

The Scope clearly defines the subject of the document and the aspects covered, thereby indicating the limits of applicability of the document or particular parts of it.

For the purposes of clarity, the Scope can indicate other subjects that are excluded from the document, when other subjects can be implied by the wording of the Scope or title.

EXAMPLE

This document excludes ….

In documents that are subdivided into parts, the Scope of each part shall define the subject of that part of the document only.

The Scope shall be succinct so that it can be used as a summary for bibliographic purposes, for example, as an abstract. If further details and background information are necessary, these shall be included in either the Introduction or in an annex.

14.2 Normative or informative?

The Scope is a normative element because it delimits the subject of the document.

14.3 Mandatory, conditional or optional?

The Scope is a mandatory element.

14.4 Numbering and subdivision

The Scope shall be numbered as Clause 1. It may be subdivided; however, this is not normally necessary as it is meant to be succinct.

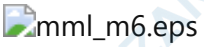
14.5 Specific principles and rules

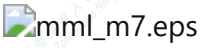
The Scope shall not contain requirements, permissions or recommendations.

It shall appear only once in each document and shall be worded as a series of statements of fact.

Forms of expression such as the following shall be used:

"This document

— specifies 
the dimensions of …"
a method of …"
the characteristics of …"

— establishes 
a system for …"
general principles for …"

— gives guidance on …"

— defines terms …"

Statements of applicability of the document shall be introduced by wording such as:

• "This document is applicable to …"

• "This document does not apply to …"

15 Normative references

15.1 Purpose or rationale

The Normative references clause lists, for information, those documents which are cited in the text in such a way that some or all of their content constitutes requirements of the document.

Information on how these references apply is found in the place where they are cited in the document, and not in the Normative references clause.

15.2 Normative or informative?

The Normative references clause is an informative element.

15.3 Mandatory, conditional or optional?

The Normative references clause is a mandatory element, even if it contains no normative references.

15.4 Numbering and subdivision

The Normative references clause shall be numbered as Clause 2. It shall not be subdivided.

Referenced documents listed are not numbered.

15.5 Specific principles and rules

15.5.1 General

The Normative references clause shall appear only once in each document.

15.5.2 Introductory wording

The list of normative references shall be introduced by the following wording:

> 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.

The above wording is also applicable to a part of a multipart series.

If no references exist, include the following sentence below the clause title:

> There are no normative references in this document.

15.5.3 Referencing

Only references cited in the text in such a way that some or all of their content constitutes requirements of the document shall be listed in the Normative references clause.

EXAMPLE 1

In the following case, the citation is normative and the document shall be listed in the Normative references clause:

> Connectors shall conform to the electrical characteristics specified by IEC 60603-7-1.

In the following case, the citation does not express a requirement so the document cited is not a normative reference.
Instead, the document cited shall be listed in the Bibliography:

> Wiring of these connectors should take into account the wire and cable diameter of the cables defined in IEC 61156.

Table 3 provides the verbal forms and expressions that make a citation normative.

When citing other documents, avoid using potentially ambiguous expressions, where it is unclear whether a requirement or a recommendation is being expressed. For example, the expressions "see ..." and "refer to ..." should only be used informatively.

EXAMPLE 2

In the following case, the reference is informative.

> For additional information on communication, see ISO 14063.

The types of document which may be referenced are given in 10.2.

References listed may be dated or undated. See 10.4 and 10.5.

16 Terms and definitions

16.1 Purpose or rationale

The Terms and definitions clause provides definitions necessary for the understanding of certain terms used in the document.

If necessary, terminological entries can be supplemented by information (including requirements) given in the notes to entry.

EXAMPLE

3.6
moisture content mass by volume
mass of evaporable water divided by volume of dry material

Note 1 to entry: The method of evaporating water from a moist material shall be stated when "moisture content mass by volume" is used.

Terminology may take the form of an independent terminology standard (a vocabulary, nomenclature, or list of equivalent terms in different languages) or be included in a Terms and definitions clause in a document that also deals with other aspects.

In order to avoid the unnecessary proliferation of terminological variants, it is recommended to use existing terminological entries from International Standards. Search for suitable terms existing in the terminology databases of ISO and IEC:

— https://www.iso.org/obp

— https://www.electropedia.org

16.2 Normative or informative?

The Terms and definitions clause is a normative element. It defines the way in which the listed terms shall be interpreted.

16.3 Mandatory, conditional or optional?

The Terms and definitions clause is a mandatory element, even if it contains no terminological entries.

16.4 Numbering and subdivision

The Terms and definitions clause shall be numbered as Clause 3. It may be subdivided. Terminological entries shall be numbered. The numbering and structure shall be identical in all language versions.

NOTE These numbers are not considered as subclause numbers.

EXAMPLE 1

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:

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

3.1
management performance indicator

MPI
environmental performance indicator that provides information about the management efforts to influence an organization's
environmental performance

[SOURCE: ISO 14031:2021, 3.4.6]

Terms and definitions should be listed according to the hierarchy of the concepts (i.e. systematic order). Alphabetical order is the least preferred order.

EXAMPLE 2

3 Terms and definitions

[...]

3.2 Surface properties

3.2.1
abrasion
loss of material from a surface due to frictional forces

[...]

3.5 Optical properties

[...]

3.5.8
colour retention
degree of permanence of a colour

Note 1 to entry: Colour retention can be influenced by weathering.

For convenience, the symbols and abbreviated terms may be combined with the terms and definitions in order to bring together terms and their definitions, symbols and abbreviated terms under an appropriate composite title, for example "Terms, definitions, symbols and abbreviated terms".

16.5 Specific principles and rules

16.5.1 General

The Terms and definitions clause shall appear only once in each document.

16.5.2 Rules for the development of terminological entries

Terminological entries shall be drafted in accordance with ISO 10241-1. Subclause 16.5 contains only a summary of some of these rules. General principles and methods for terminology work are specified in ISO 704.

16.5.3 Introductory wording

If all the specific terms and definitions are provided in Clause 3, use the following introductory text:

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:

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

If reference is given to an external document, use the following introductory text:

For the purposes of this document, the terms and definitions given in [external document reference xxx] apply.

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

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

If terms and definitions are provided in Clause 3, in addition to a reference to an external document, use the following introductory text:

For the purposes of this document, the terms and definitions given in [external document reference xxx] and the following apply.

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

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

If there are no terms and definitions provided, use the following introductory text:

No terms and definitions are listed in this document.

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

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

NOTE The introductory text is not a hanging paragraph (see 22.3.3), as the Terms and definitions clause consists of a list of terminological entries and not subclauses.

16.5.4 Permitted content

Only terms which are used in the document shall be listed in the Terms and definitions clause. This rule does not apply to terminology standards, whose terms are intended for wider use. Within a terminological entry, cross-references may also be made to other terminological entries.

16.5.5 Terms

Common terms, which a qualified user of the document will already know, should not be defined.

Types of term:

— Preferred terms are the primary terms for a given concept. The preferred term is the form which is used throughout the main body of the text. If there is more than one preferred term, only one of the preferred terms shall be used except in the case where both a full form and an abbreviated form are preferred terms (in which case they may be used interchangeably). Preferred terms are written in bold type (with the exception of symbols, which shall be presented as used in running text).

— Admitted terms are accepted synonyms for the preferred term. They are written in regular type.

— Deprecated terms are synonyms of the preferred term, which are no longer in use or whose use is discouraged. They are written in regular type.

There can be more than one term of each type. An abbreviated term or a symbol can constitute a term.

EXAMPLE 1

	3.1
Preferred term	implant body
Admitted term	dental implant body
Deprecated term	DEPRECATED: implant fixture
Definition	primary single component or portion of a dental implant which is intended to remain within tissues

Terms shall be written in lowercase letters. Uppercase letters, mathematical symbols, typographical signs, and syntactic signs (e.g. punctuation marks, hyphens, parentheses, square brackets and other connectors or delimiters) as well as their character styles (fonts and bold, italic, bold italic, or other style conventions) shall be used in a term only if they constitute part of the normal written form of the term. Terms shall in general be presented in their basic grammatical form (nouns in the singular, verbs in the infinitive).

EXAMPLE 2

Correct use of parentheses:

bis(dimethylthiocarbamyl) disulfide The parentheses and the content therein are part of the term.

Incorrect use of parentheses:

integrity (of system) The words in parentheses are not part of the term.

EXAMPLE 3

Correct expression of synonyms:

live working
live work The preferred term and any synonyms are written on separate lines.

Incorrect expression of synonyms:

live working (work) It is incorrect to indicate a synonymous term using parentheses.

EXAMPLE 4

Correct use of capitalization:

Reynolds number “Reynolds” is a proper noun. It is capitalized.

Incorrect use of capitalization:

Planned outage “Planned” is not a proper noun. It shall not be capitalized.

16.5.6 Definitions

The definition shall be written in such a form that it can replace the term in its context. It shall not start with an article (“the”, “a”) nor end with a full stop. A definition shall not take the form of, or contain, a

requirement.

Only one definition per terminological entry is allowed. If a term is used to define more than one concept, a separate terminological entry shall be created for each concept and the domain shall be included in angle brackets before the definition.

EXAMPLE

2.1.17
die
<extrusion> metal block with a shaped orifice through which plastic material is extruded

2.1.18
die
<moulding> assembly of parts enclosing the cavity from which the moulding takes its form

Circular definitions, which repeat the term being defined, are not allowed.

16.5.7 Examples

Examples provide information that illustrates the concept. Examples shall not contain requirements (use of "shall") or any information considered indispensable for the use of the document, for example instructions (imperative mood), recommendations (use of "should") or permission (use of "may"). Examples should be written as a statement of fact.

Examples to terminological entries are designated "EXAMPLE" and shall be numbered starting with "1" within each terminological entry. A single example in a terminological entry shall not be numbered.

16.5.8 Non-verbal representations

Figures and formulae may be included within a terminological entry. The definition may take the form of a formula. Refer to ISO 10241-1.

16.5.9 Notes to entry

A note to a terminological entry (referred to as "Note # to entry") follows different rules from a note (referred to as "NOTE #") integrated in the text (see Clause 24). It provides additional information that supplements the terminological data, for example:

— provisions (statements, instructions, recommendations or requirements) relating to the use of a term;

— information regarding the units applicable to a quantity; or

— an explanation of the reasons for selecting an abbreviated form as the preferred term.

Notes to entry shall be numbered starting with "1" within each terminological entry. A single note to entry shall be numbered.

Table 8 summarizes how to use notes and footnotes within documents.

EXAMPLE 1

3.1.4
continuous scale
scale with a continuum of possible values

EXAMPLE Interval scale and ratio scale.

Note 1 to entry: A continuous scale can be transformed into a discrete scale, by grouping “values”. This inevitably leads to some loss of information. Often the resulting discrete scale will be ordinal.

Note 2 to entry: Scale resolution can be adversely affected by measurement system limitations. Such measurement
limitations can, sometimes, give rise to measurements being represented on a discrete, ordinal, scale.

[SOURCE: ISO 3534-2:2006, 1.1.4]

EXAMPLE 2

3.6
moisture content mass by volume
mass of evaporable water divided by volume of dry material

Note 1 to entry: The method of evaporating water from a moist material shall be stated when this term is used.

16.5.10 Source

If a terminological entry is reproduced from another document, the source shall be given at the end of the entry. If any changes are made to the original terminological entry, this shall be indicated, along with a description of what has been modified. A document given as a source of a terminological entry is informative.

EXAMPLE

3.1.2
terminological entry
part of a terminological data collection which contains the terminological data (3.1.3) related to one concept (3.2.1)

Note 1 to entry: A terminological entry prepared in accordance with the principles and methods given in ISO 704 follows the same structural principles whether it is monolingual or multilingual.

[SOURCE: ISO 1087-1:2000, 3.8.2, modified — Note 1 to entry has been added.]

16.5.11 Footnotes

Footnotes to any part of a terminological entry are not allowed.

Table 8 summarizes how to use notes and footnotes within documents.

16.6 Overview of the main elements of a terminological entry

Figure 1 gives an overview of the main elements of a terminological entry.

Figure 1 — Overview of the main elements of a terminological entry

16.7 Other elements of a terminological entry

Other data categories may be included in a terminological entry, for example:

— country codes;

— grammatical information;

— pronunciation.

Refer to ISO 10241-1 for the general requirements and examples.

17 Symbols and abbreviated terms

17.1 Purpose or rationale

The symbols and abbreviated terms clause or subclause provides a list of the symbols and abbreviated terms used in the document, along with their definitions.

17.2 Normative or informative?

The symbols and abbreviated terms clause is a normative element.

17.3 Mandatory, conditional or optional?

The symbols and abbreviated terms clause is a conditional element.

17.4 Numbering and subdivision

It is not necessary to number the symbols. For convenience, the symbols and abbreviated terms may be combined with the terms and definitions in order to bring together terms and their definitions, symbols and

abbreviated terms under an appropriate composite title, for example “Terms, definitions, symbols and abbreviated terms”.

17.5 Specific principles and rules

Only symbols used in the text shall be listed.

Unless it is necessary to list symbols in a specific order to reflect technical criteria, all symbols should be listed in alphabetical order in the following sequence:

• uppercase Latin letter followed by lowercase Latin letter (A, a, B, b, …);

• letters without indices preceding letters with indices, and with letter indices preceding numerical ones (B, b, C, Cm, C2, c, d, dext, dint, d1, …);

• Latin letters followed by Greek letters (a, b, … α, β, …);

• any other special symbols.

18 Measurement and test methods

18.1 Purpose or rationale

Measurement and test methods specify the procedure for determining the values of characteristics or for checking conformity to stated requirements. Using a standardized test method ensures comparability of the results.

Measurement and test methods may be presented as separate clauses, or be incorporated in the requirements, or be presented as annexes (see Clause 20) or as separate parts (see 6.3). A measurement and test method shall be prepared as a separate document if it is likely to be referred to in a number of other documents.

18.2 Normative or informative?

The measurement and test methods clause is a normative element.

18.3 Mandatory, conditional or optional?

The measurement and test methods clause is a conditional element.

18.4 Numbering and subdivision

Measurement and test methods may be subdivided in the following order (where appropriate):

a) principle;

b) reagents and materials (see 18.5.3);

c) apparatus (see 18.5.4);

d) preparation and preservation of test samples and test pieces;

e) procedure;

f) expression of results, including method of calculation and precision of the test method, and, in ISO, the measurement uncertainty;

g) test report.

When health, safety or environmental warnings are necessary, these should be placed next to the relevant content in the test method. General warnings should be placed at the beginning of the test method.

EXAMPLE 1

Example of a general warning:

WARNING — The use of this document can involve hazardous materials, operations and equipment. It does not purport to address all of the safety or environmental problems associated with its use.

EXAMPLE 2

Examples of specific warnings:

WARNING — Cyanide solutions are highly toxic. Measures shall be taken to avoid ingestion. These solutions shall be
disposed of in accordance with the safety measures described in this document.

WARNING — A temperature increase exceeding 20 °C can cause a vigorous, exothermic reaction in the digestion solution resulting in an increase of pressure that can blow off the security valve. Losses of analytes are possible.

WARNING — This test involves handling of hot apparatus. In addition, for some iron ores, spitting can occur when loading the sample into the hot container.

WARNING — The reagents used in this method are strongly corrosive and partly very toxic. Safety precautions are
necessary, not only due to the strong corrosive reagents, but also to high temperature and high pressure.

18.5 Specific principles and rules

18.5.1 General

If appropriate, tests shall be identified as, for example, type tests, performance tests, sampling tests, routine tests.

The document shall specify the sequence of testing if the sequence can influence the results.

Requirements, sampling and test methods are interrelated elements of product standardization and should be considered together even though the different elements may appear in separate clauses in a document, or in separate documents.

When a specific sampling method is necessary, this shall be clearly stated in the test method.

When drafting test methods, it is important to take into account documents for general test methods and related tests for similar characteristics in other documents.

Non-destructive test methods shall be chosen whenever they can replace, within the same level of confidence, destructive test methods.

Test methods should conform to the metrological principles concerning validation, measurement traceability and estimation of measurement uncertainty described in ISO/IEC 17025:2017, 7.2, 7.6 and 7.7. Other documents may be applicable: ISO/IEC Guide 98-3 (GUM:1995) and ISO/IEC Guide 99 (VIM). Requirements related to testing equipment should conform to the provisions concerning accuracy and calibration specified in ISO/IEC 17025:2017, 6.4.

For guidance on the drafting of methods of chemical analysis, see ISO 78-2. Much of ISO 78-2 is also applicable to test methods for products other than chemical products.

Documents specifying test methods involving the use of hazardous products, apparatus or processes shall include a general warning and appropriate specific warnings. For recommended wording, see ISO/IEC Guide 51. For guidance on the appropriate location of such warnings, see ISO 78-2.

A document which specifies test methods shall not imply any obligation to perform any kind of test. It shall merely state the method by which the test, if required and referred to (e.g. in the same or another document, in a regulation, or in contracts), is to be performed.

If a statistical method for the assessment of the conformity of a product, process or service is specified in the document, any statements of conformance with the document relate only to the conformity of the population or the lot.

If it is specified in the document that every single item is to be tested in accordance with the document, any statements concerning the conformity of the product to the document mean that every single item has been tested and that each has fulfilled the corresponding requirements.

If there are test methods in use that differ from those most acceptable for general application, this shall not be a reason for not specifying the most acceptable test method in a document.

18.5.2 Numbering

In order to facilitate cross-referencing, individual reagents, materials and apparatus shall be numbered, even if there is only one.

In the associated text where the procedure is given, a cross-reference to the listed item may be provided.

EXAMPLE

Carefully remove the membrane filter (5.6) from the stand (5.1) with disinfected forceps (5.12).

18.5.3 Reagents and materials

The title shall be “Reagents” or “Materials” or “Reagents and materials”, as appropriate.

It is a conditional element giving a list of any reagents and materials used.

The content of a reagents and materials clause usually comprises an optional introductory text together with a list detailing one or more reagents and materials.

The introductory text shall be used only to specify general provisions to which cross-reference is not made. Any item that can be cross-referenced shall not be included in this text but shall be listed as a distinct entry as shown in the example below.

NOTE The introductory text is not a hanging paragraph (see 22.3.3), as the clause consists of a list of reagents and materials and not subclauses.

The following example shows the presentation style used (for further examples of drafting, see ISO 78-2).

EXAMPLE

5 Reagents

Use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

5.1 Cleaning medium, for example methanol or water containing a few drops of liquid detergent.

18.5.4 Apparatus

The apparatus subclause is a conditional element giving a list of the apparatus used in the document. Wherever possible, equipment produced by a single manufacturer should not be specified. Where such equipment is not readily available, this clause shall include such specifications for the equipment as to ensure that comparable testing can be conducted by all parties. See also Clause 31 regarding the use of trade names and trademarks.

The content of an apparatus clause usually comprises an optional introductory text together with a list detailing one or more pieces of apparatus.

The introductory text shall be used only to specify general provisions to which cross-reference is not made. Any item that can be cross-referenced shall not be included in this text but shall be listed as a distinct entry as shown in the example below.

NOTE The introductory text is not a hanging paragraph (see 22.3.3), as the clause consists of a list of apparatus and not subclauses.

The following example shows the presentation style used (for further examples of drafting, see ISO 78-2).

EXAMPLE

A.2 Apparatus

The usual laboratory apparatus and, in particular, the following shall be used.

A.2.1 Sample divider, consisting of a conical sample divider or multiple-slot sample divider with a distribution system, for example ''Split-it-right'' sample divider (see Figure A.1).

A.2.2 Sieve, with round perforations of diameter 1,4 mm.

A.2.3 Tweezers.

A.2.4 Scalpel.

A.2.5 Paintbrush.

A.2.6 Steel bowls, of diameter 100 mm ± 5 mm; seven per test sample.

A.2.7 Balance, which can be read to the nearest 0,01 g.

18.5.5 Alternative test methods

If more than one adequate test method exists for a characteristic, only one should in principle be specified. If, for any reason, more than one test method is to be specified, a referee test method (often called reference test method) may be identified in the document to resolve doubts or dispute.

18.5.6 Choice of test methods according to accuracy

When choosing a test method, consider the accuracy of the method relative to the required value and tolerance of the characteristic being assessed.

The chosen test method shall provide an unambiguous determination of whether the sample meets the specified requirement.

When it is technically necessary, each test method shall incorporate a statement as to its limit of accuracy.

18.5.7 Test equipment

If, in preparing a document related to a product, it is necessary to standardize some kind of testing equipment that is likely to be used for testing other products as well, it shall be dealt with in a separate document, prepared in consultation with the committee dealing with such equipment.

18.5.8 Test report

This clause specifies which information is to be included in the test report. The clause shall require information to be given on at least the following aspects of the test:

• the sample;

• the International Standard used (including its year of publication);

• the method used (if the standard includes several);

• the result(s), including a reference to the clause which explains how the results were calculated;

• any deviations from the procedure;

• any unusual features observed;

• the date of the test.

19 Marking, labelling and packaging

19.1 Purpose or rationale

Marking, labelling and packaging are important aspects related to product manufacturing and procurement that frequently require a standardized approach, particularly in safety-critical applications.

19.2 Normative or informative?

Marking, labelling and packaging clauses are usually normative elements although exceptions can exist (e.g. when only recommendations are made concerning marking, labelling and packaging).

19.3 Mandatory, conditional or optional?

Marking, labelling and packaging clauses are conditional elements.

19.4 Specific principles and rules

19.4.1 General

Marking, labelling and packaging are complementary aspects that shall be included wherever relevant, particularly for product standards concerning consumer goods.

If necessary, the means of marking shall also be specified or recommended.

This element shall not specify or recommend marks of conformity. Such marks are normally applied under the rules of a certification system – see ISO/IEC Guide 23. Information on the marking of products with reference to a standards body or its documents is given in ISO/IEC 17050-1 and ISO/IEC 17050-2.

Information on safety standards and aspects related to safety is given in ISO/IEC Guide 51.

This element may be supplemented by an informative annex giving an example of information necessary for the purposes of procurement.

Where a system for designation of internationally standardized items is necessary, use the principles described in Annex C.

19.4.2 Requirements concerning marking, labelling and packaging of products

Documents containing a reference to the marking of the product shall specify the following, where applicable:

a) the content of any marking that is used to identify the product, for example:

1) the manufacturer (name and address);

2) responsible supplier (trade name, trademark or identification mark);

3) the marking of a product itself [e.g. manufacturer's or supplier's trademark, model or type number, designation (see Annex C)];

4) the identification of different sizes, categories, types and grades;

b) the means of presentation of such marking, for example by the use of plates (sometimes called "nameplates"), labels, stamps, colours, threads (in cables), as appropriate;

c) the location on the product, or in some cases on the packaging, where the marking is to appear;

d) requirements for the labelling and packaging of the product (e.g. handling instructions, hazard warnings, date of manufacture);

e) other information as required.

If the document requires the application of a label, the document shall also specify the nature of the labelling and how it is to be attached, affixed or applied to the product or its packaging.

Symbols specified for marking shall conform to relevant documents published by ISO and IEC.

NOTE Documents relating to packaging can be found under the ICS classification 55 in the ISO and IEC Catalogues.

19.4.3 Requirements concerning documentation accompanying the product

Documents may require that the product be accompanied by some kind of documentation (e.g. test report, handling instructions, other information appearing in the product packaging). When relevant, the content of such documentation shall be specified.

NOTE A classification and designation system of such documentation for plants, systems and equipment is provided in IEC 61355-1. Rules for such documentation in administration, commerce and industry can be found under the ICS classification 01.140.30.

19.4.4 Warning notices and instructions

In product standards, it is sometimes necessary to specify that the product shall be accompanied by warning notices or by instructions to the installer or user, and to specify their nature. Such requirements concerning installation or use may be included in a separate part of the series or a separate document, because they are not requirements applicable to the product.

20 Annexes

20.1 Purpose or rationale

Annexes are used to provide additional information to the main body of the document and are developed for several reasons, for example:

• when the information or table is very long and including it in the main body of the document would distract the user;

• to set apart special types of information (e.g. software, example forms, results of interlaboratory tests, alternative test methods, tables, lists, data);

• to present information regarding a particular application of the document.

20.2 Normative or informative?

Annexes can be normative or informative elements.

Normative annexes provide additional normative text to the main body of the document.

Informative annexes provide additional information intended to assist the understanding or use of the document. Informative annexes may contain optional requirements. For example, a test method that is optional may contain requirements but it is not necessary to follow these requirements to claim conformance with the document. The status of the annex (informative or normative) shall be made clear by the way in which it is referred to in the text and shall be stated under the heading of the annex.

EXAMPLE

[…] see Annex A for additional information […]	The status of Annex A is informative.
[…] the test method shall be carried out as specified in Annex B […]	The status of Annex B is normative.

20.3 Mandatory, conditional or optional?

Annexes are optional elements.

20.4 Numbering and subdivision

Each annex shall be designated by a heading comprising the word “Annex” followed by a capital letter, starting with “A”, for example “Annex A”. The annex heading shall be followed by the indication “(normative)” or “(informative)”, and by the title.

EXAMPLE 1

Annex A
(informative)

Example form

Annexes may be subdivided into clauses, subclauses, paragraphs and lists.

Numbers given to the clauses, subclauses, tables, figures and mathematical formulae of an annex shall be preceded by the letter designating that annex followed by a full stop. The numbering shall start afresh with each annex.

EXAMPLE 2

In the case of Annex A, the first clause would be numbered A.1, the first figure would be Figure A.1, the first table would be Table A.1 and the first mathematical formula would be Formula (A.1).

20.5 Specific principles and rules

Each annex shall be explicitly referred to within the text.

EXAMPLE

"Annex B provides further information…";

"Use the methods described in Annex C";

"See Figure A.6";

"Clause A.2 describes…";

"…as specified in C.2.5.".

21 Bibliography

21.1 Purpose or rationale

The Bibliography lists, for information, those documents which are cited informatively in the document, as well as other information resources.

21.2 Normative or informative?

The Bibliography is an informative element. It shall not contain requirements, permissions or recommendations.

21.3 Mandatory, conditional or optional?

The Bibliography is a conditional element. Its inclusion is dependent on whether informative references are present in the document.

21.4 Numbering and subdivision

The Bibliography shall not have a clause number. It may be subdivided in order to group the referenced documents under descriptive headings. Such headings shall not be numbered.

Referenced documents and information resources listed may be numbered to simplify cross-referencing.

21.5 Specific principles and rules

The Bibliography, if present, shall appear after the last annex.

Referenced documents and information resources listed can be dated or undated. See 10.4 and 10.5.

EXAMPLE

In the following case, the citation is not normative but informative. The document cited shall be listed not in the Normative references clause but in the Bibliography:

> Wiring of these connectors should take into account the wire and cable diameter of the cables defined in IEC 61156.

In the following case, the citation is normative and the document shall be listed in the Normative references clause:

> Connectors shall conform to the electrical characteristics specified by IEC 60603-7-1.

COMPONENTS OF THE TEXT

22 Clauses and subclauses

22.1 Purpose or rationale

Clauses and subclauses serve as the basic components in the subdivision of the content of a document.

22.2 Title

Each clause shall have a title.

Each first level subclause (e.g. 5.1, 5.2) should preferably be given a title. Within a clause or subclause, the use of titles shall be uniform for subclauses at the same level, for example if 10.1 has a title, 10.2 shall also have a title. Figure 2 shows examples of correct and incorrect use of subclause titles.

Figure 2 — Correct and incorrect use of subclause titles

22.3 Numbering, subdivision and hanging paragraphs

22.3.1 Numbering

The clauses in each document or part shall be numbered with Arabic numerals, starting with 1 for the Scope (see Figure 3).

The numbering shall be continuous up to but excluding any annexes (see Clause 20).

22.3.2 Subdivision

A subclause is a numbered subdivision of a clause. A clause may be subdivided into subclauses as far as the fifth level (e.g. 5.1.1.1.1, 5.1.1.1.2).

Too many levels of subdivision should be avoided, as this can make it hard for the user to understand the document.

Figure 3 provides an example of numbering of divisions and subdivisions.

Figure 3 — Example of numbering of divisions and subdivisions

A subclause shall not be created unless there is at least one further subclause at the same level. For example, text in Clause 10 shall not be designated subclause “10.1” unless there is also a subclause “10.2”.

22.3.3 Hanging paragraphs

“Hanging paragraphs” shall be avoided since reference to them is ambiguous.

In the example given in Figure 4, the hanging paragraph indicated cannot be uniquely identified as being in "Clause 5" since the paragraphs in 5.1 and 5.2 also form part of Clause 5. To avoid this problem, it is necessary to identify the hanging paragraph as subclause "5.1 General" (or other suitable title) and to renumber the existing 5.1 and 5.2 accordingly (as shown), or to move the hanging paragraph elsewhere, or to delete it.

Figure 4 — Example of a hanging paragraph (left) and one way to avoid it (right)

22.4 Referencing

Use, for example, the following forms for references to clauses and subclauses:

• "in accordance with Clause 4";

• "details as given in 4.1.1";

• "the requirements given in Clause B.2";

• "the methods described in 5.3 provide further information on...".

23 Lists

23.1 Purpose or rationale

A list serves to subdivide information to aid understanding.

23.2 Title

Lists do not have a title. They may, however, be preceded by a title or introductory phrase.

23.3 Numbering and subdivision

Lists can be numbered or unnumbered. Lists can be subdivided.

See the examples below.

EXAMPLE 1

The following basic principles shall apply to the drafting of definitions.

a) The definition shall have the same grammatical form as the term:

1) to define a verb, a verbal phrase shall be used;

2) to define a singular noun, the singular shall be used.

The preferred structure of a definition is a basic part stating the class to which the concept belongs, and b) another part enumerating the characteristics that distinguish the concept from other members of the class.

EXAMPLE 2

No switch is required for any of the following categories of apparatus:

— apparatus having a power consumption not exceeding 10 W under normal operating conditions;

— apparatus having a power consumption not exceeding 50 W, measured 2 min after the application of any of the fault conditions;

— apparatus intended for continuous operation.

EXAMPLE 3

Vibrations in the apparatus can be caused by

— unbalance in the rotating elements,

— slight deformations in the frame,

— the rolling bearings, and

— aerodynamic loads.

23.4 Referencing

The purpose of a list should be made clear by its context. For example, an introductory proposition or a subclause title can serve to introduce the list.

If cross-references to list items are necessary, a numbered list shall be used. Within a subdivision, each list item in a numbered list shall have a unique identifier. Numbering restarts at each new clause or subclause.

Use, for example, the following forms for references to lists:

• “as specified in 3.1 b)”;

• “the requirements given in Clause B.2 c)”.

24 Notes

24.1 Purpose or rationale

Notes are used for giving additional information intended to assist the understanding or use of the text of the document. The document shall be usable without the notes.

For rules on notes to figures, see 28.5.4.

For rules on notes to tables, see 29.5.1.

Notes to entry (in terminological entries) follow different rules from those for notes, see 16.5.9. Table 8 summarizes how to use notes and footnotes within documents.

Table 8 — Use of notes, footnotes and notes to entry within documents

Context	Element	Rule	Numbering	Designation	Provisions permitted?
In terminological entries	Note # to entry	16.5.9	Always numbered	Note 1 to entry, Note 2 to entry, …	May contain provisions (shall, should or may) related to the use of the term
	Footnotes to terminological entries are not permitted	16.5.11			
In the text	Note	Clause 24	Numbered if more than one; numbering restarts for each new clause or subclause	NOTE 1, NOTE 2, …	No requirements (shall) or any information considered indispensable for the use of the document, recommendations (should) or permissions (may)

Context	Element	Rule	Numbering	Designation	Provisions permitted?
Figures	Footnote	Clause 26	Sequential throughout the document	Normally with Arabic numerals	No requirements (shall) or any information considered indispensable for the use of the document, recommendations (should) or permissions (may)
	Notes to figures	28.5.4	Numbered if more than one; numbered independently from the notes to the text; numbering restarts for each new figure	NOTE 1, NOTE 2, …	No requirements (shall) or any information considered indispensable for the use of the document, recommendations (should) or permissions (may)
	Footnotes to figures	28.5.5	Numbered if more than one; numbered independently from the footnotes to the text; numbering restarts for each new figure	Normally superscript lowercase letters, starting with “a”	May contain requirements
Tables	Notes to tables	29.5.1	Numbered if more than one; numbered independently from the notes to the text; numbering restarts for each new table	NOTE 1, NOTE 2, …	No requirements (shall) or any information considered indispensable for the use of the document, recommendations (should) or permissions (may)
	Footnotes to tables	29.5.2	Numbered if more than one; numbered independently from the footnotes to the text; numbering restarts for each new table	Normally superscript lowercase letters, starting with “a”	May contain requirements

24.2 Title

Notes do not have a title.

24.3 Numbering and subdivision

Within a given clause or subclause, notes shall be numbered sequentially. The numbering restarts at each new subdivision. A single note in a subdivision shall not be numbered.

24.4 Referencing

When notes are referred to, use, for example, the following forms for references:

• "an explanation is provided in 7.1, Note 2";

• "see 8.6, Note 3".

24.5 Specific principles and rules

Notes shall not contain requirements (e.g. use of "shall", see Table 3) or any information considered indispensable for the use of the document, for example instructions (imperative mood), recommendations (e.g. use of "should", see Table 4) or permission (e.g. use of "may", see Table 5). Notes should be written as a statement of fact.

Table 8 summarizes how to use notes and footnotes within documents.

24.6 Examples

EXAMPLE 1

Correct example of the use of a note:

Each label shall have a length of between 25 mm and 40 mm and a width of between 10 mm and 15 mm.

NOTE The size of the label was chosen so that it will fit most sizes of syringe without obscuring the graduation marks.

EXAMPLE 2

Incorrect examples of the use of a note:

NOTE In this context a part shall be regarded as a separate document ...

"shall" constitutes a requirement

NOTE Alternatively, test at a load of …	“test” constitutes a requirement, expressed here in the form of an instruction using the imperative
NOTE Where a laboratory is part of a larger organization, the organizational arrangements should be such that departments having conflicting interests …	“should” constitutes a recommendation
NOTE Individuals may have more than one function …	“may” constitutes a permission

25 Examples

25.1 Purpose or rationale

Examples illustrate concepts presented in the document. The document shall be usable without the examples.

25.2 Title

Examples do not have a title, but they can, if necessary, be grouped into a clause or subclause entitled “Example” or “Examples” (see 25.6, which is titled “Examples”).

25.3 Numbering and subdivision

Within a given clause or subclause, examples shall be numbered sequentially. The numbering restarts at each new subdivision. A single example in a subdivision shall not be numbered.

25.4 Referencing

When examples are referred to, use for example, the following forms for references:

• “see 6.6.3, Example 5”;

• “Clause 4, Example 2 lists …”.

25.5 Specific principles and rules

Examples shall not contain requirements (e.g. use of “shall”, see Table 3) or any information considered indispensable for the use of the document, for example instructions (imperative mood), recommendations (e.g. use of “should”, see Table 4) or permission (e.g. use of “may”, see Table 5). Examples should be written as a statement of fact.

An example can cite text to illustrate a point. If the cited text contains requirements, recommendations and permissions, this is acceptable.

25.6 Examples

EXAMPLE 1

The generic model can be applicable to other possible manufacturing operations categories or for other operations areas within the enterprise.

EXAMPLE A company can apply the model to receiving operations management and associated services.

EXAMPLE 2

In national implementation of International Standards, the international designation shall be used without change. However, the national standard identification may be inserted between the description block and the International Standard number block.

EXAMPLE If the international designation of a screw is

Slotted pan screw ISO 1580-M5 × 20-4,8

its national designation can be

Slotted pan screw VN 4183-ISO 1580-M5 × 20-4,8

if VN 4183 is the identification of the national standard corresponding to ISO 1580 which has been adopted without change.

26 Footnotes

26.1 Purpose or rationale

Footnotes to the text of a document are used to give additional contextual information to a specific item in the text. The document shall be usable without the footnotes.

For rules on footnotes to figures, see 28.5.5.

For rules on footnotes to tables, see 29.5.2.

26.2 Title

Footnotes do not have a title.

26.3 Numbering and subdivision

Footnotes shall be numbered sequentially throughout the document. Normally, footnote references are indicated using Arabic numerals. Exceptionally, other systems (a, b, c, … ; *, **, ***, … ; †, ‡, …) can be used, for example when there is the possibility of confusing them with superscript numbers.

26.4 Referencing

Footnotes shall be referenced in the text.

Use, for example, the following form for references to footnotes:

ISO 1234:—1 lists the test methods for…

---

1 Under preparation. Stage at the time of publication: ISO/DIS 1234:2014.

26.5 Specific principles and rules

A footnote can appear anywhere within the text of a document apart from terminological entries.

Footnotes shall not contain requirements (e.g. use of “shall”, see Table 3) or any information considered indispensable for the use of the document, for example instructions (imperative mood), recommendations (e.g. use of “should”, see Table 4) or permission (e.g. use of “may”, see Table 5). Footnotes should be written as a statement of fact.

26.6 Examples

EXAMPLE 1

C.1.1 Introduction

…multiplex real-time PCR method based on TaqMan®7.

---

7 TaqMan® is a trademark of Roche Molecular Systems. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named.

EXAMPLE 2

...such effects of salt mist on connectors has been demonstrated [2]5.

---

5 Numbers in square brackets refer to the Bibliography.

27 Mathematical formulae

27.1 Purpose or rationale

A mathematical formula uses symbols to express the relationship between quantities.

NOTE Notations such as

mml_m8.eps, mml_m9.eps and mml_m10.eps, or V/(km/h), l/m and t/s

for numerical values are not mathematical formulae.

27.2 Title

Mathematical formulae do not have a title.

27.3 Numbering and subdivision

Mathematical formulae can be numbered in a document, for example for cross-referencing purposes. Arabic numbers in parentheses shall be used, starting with 1.

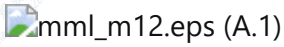
EXAMPLE 1

mml_m11.eps (1)

By default, the numbering shall be continuous and independent of the numbering of clauses, tables and figures. However, mathematical formulae may be numbered with a prefix and a number, where the prefix denotes the clause number, and the second number denotes the sequence of the formulae in the clause. The numbering system chosen shall be consistent within any given series. Subdivision of mathematical formulae [e.g. (2a), (2b), ...] is not permitted.

When mathematical formulae in annexes are numbered, the numbering restarts and is preceded by the annex letter.

EXAMPLE 2


mml_m12.eps (A.1)

27.4 Referencing

If a mathematical formula is numbered, it should be referred to in the text and its purpose should be made clear by its context, for example, with an introductory proposition.

Use, for example, the following forms for references to mathematical formulae:

• “see 10.1, Formula (3)”;

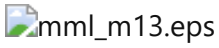
• “see Clause A.2, Formula (A.5)”.

27.5 Specific principles and rules

Mathematical formulae shall be expressed in mathematically correct form.

It is better to use mathematical formulae with quantities than mathematical formulae with numerical values.

EXAMPLE 1


mml_m13.eps

where

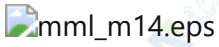
V is the speed of a point in uniform motion;

l is the distance travelled;

t is the duration.

If a mathematical formula between numerical values is used, the style shown in Example 2 shall be followed, with explicit reference to the measurement units.

EXAMPLE 2


mml_m14.eps

where

V is the numerical value of the speed, expressed in kilometres per hour (km/h), of a point in uniform motion;

l is the numerical value of the distance travelled, expressed in metres (m);

t is the numerical value of the duration, expressed in seconds (s).

Variables shall be represented by italicized letter symbols. These shall be single-letter symbols except for exceptional cases such as characteristic numbers, which may be multiletter symbols.

The meanings of the symbols shall be explained in connection with the mathematical formulae, unless they appear in a symbols and abbreviated terms clause.

The same symbol shall not be used within a document both for a quantity and for its corresponding numerical value.

Descriptive terms or names of quantities shall not be arranged in the form of a mathematical formula. Names of quantities or multiletter abbreviated terms, for example presented in italics or with subscripts, shall not be used in the place of symbols.

EXAMPLE 3

Correct:



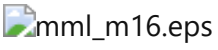
where

ti is the statistical value for the system i;

SME,i is the residual mean square for the system i;

SMR,i is the mean square due to regression for the system i.

Incorrect:



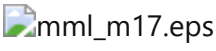
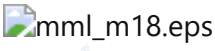
where

ti is the statistical value for the system i;

MSEi is the residual mean square for the system i;

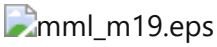
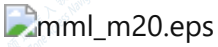
MSRi is the mean square due to regression for the system i.

EXAMPLE 4

Correct:  Incorrect: 

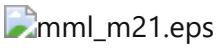
EXAMPLE 5

Correct: Incorrect:

where or

E is energy;

F is force; 

l is length.

The same symbol should not be used to represent different quantities within the same document. Subscripts can be useful to distinguish symbols for related concepts.

Unit symbols shall not be used within mathematical formulae.

Further examples are presented in Annex B.

28 Figures

28.1 Purpose or rationale

Figures are a graphical means of representation used when they are the most efficient means of presenting information in an easily comprehensible form.

Photographs and other media may be used if it is not possible to represent the concept as a line drawing.

28.2 Title

It is recommended to provide a concise figure title.

28.3 Numbering and subdivision

28.3.1 Figure designation

Figures shall be designated “Figure” and numbered. By default, figures are numbered with Arabic numerals, beginning with 1, and the numbering shall be continuous and independent of the numbering of the clauses and of any tables. A single figure shall be designated “Figure 1”. However, figures may be numbered with a

prefix, where the prefix denotes the clause number, and the second number denotes the sequence of figures in the clause. The numbering system chosen shall be consistent within any given series.

In annexes, the figure numbering restarts and the number is preceded by the annex letter (e.g. Figure A.1, Figure A.2, …).

When a figure is continued over several pages, it can be useful to repeat the figure designation, followed by the title (optional) and by "(1 of #)", where # is the total number of pages on which the figure appears.

EXAMPLE

Figure x (1 of #)

28.3.2 Subfigures

In general, the use of subfigures should be avoided whenever possible since it complicates document layout and management.

Only one level of subdivision of a figure is permitted. Subfigures shall be identified by a lowercase letter [e.g. Figure 1 may comprise subfigures a), b), c), ...]. Other forms of identification of the subfigures such as 1.1, 1.2, ... and 1-1, 1-2, ... shall not be used.

Separate keys, notes and footnotes for subfigures are not permitted.

EXAMPLE

Statement concerning units

Drawing or illustration

a) Subtitle

Drawing or illustration

b) Subtitle

Key

Paragraphs (containing requirements) and notes to the figure

Footnotes to the figure

Figure x — Title

28.4 Referencing

Each figure shall be explicitly referred to within the text.

Use, for example, the following forms for references to figures and subfigures:

• “Figure 3 illustrates…”;

• “See Figure 6 b)”.

28.5 Specific principles and rules

28.5.1 Standards used in the creation of graphical content

The standards listed in Table 9 provide information regarding the creation of graphical content.

Table 9 — Standards used in the creation of graphical content

Subject	Standard	Title
General	IEC 61082-1	Preparation of documents used in electrotechnology — Part 1: Rules
Graphical symbols	IEC 62648	Graphical symbols for use on equipment — Guidelines for the inclusion of graphical symbols in IEC publications
	IEC 80416-1	Basic principles for graphical symbols for use on equipment — Part 1: Creation of graphical symbols for registration
	ISO 81714-1	Design of graphical symbols for use in the technical documentation of products — Part 1: Basic rules
Line types	ISO 128-2	Technical product documentation (TPD) — General principles of presentation — Part 2: Basic conventions for lines

Subject	Standard	Title
Dimensioning	ISO 129 (all parts)	Technical product documentation (TPD) — Presentation of dimensions and tolerances
Dimensional and geometrical product specifications	ISO 1101	Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out
	ISO 5459	Geometrical product specifications (GPS) — Geometrical tolerancing — Datums and datum systems
Projection	ISO 128-3	Technical product documentation (TPD) — General principles of presentation — Part 3: Views, sections and cuts
Flowcharts and organigrams	ISO 5807	Information processing — Documentation symbols and conventions for data, program and system flowcharts, program network charts and system resources charts

28.5.2 Choice of letter symbols, style of lettering

Letter symbols used in figures to represent general cases of angular or linear quantities shall be in accordance with ISO 80000-3. Subscripts can be used where necessary to distinguish between different applications of a given symbol.

Various lengths, l, on a drawing should be written with descriptor indices, for example l1, l2, l3, rather than A, B, C, … or a, b, c, … .

Lettering on technical product documentation shall be in accordance with the ISO 3098 series. Italic letters shall be used for symbols for variable quantities.

The vertical (upright) style shall be used for all other lettering.

When all units for a quantity are the same, a suitable statement (e.g. “Dimensions in millimetres”) shall be placed above the right-hand corner of the figure.

See Figure 5.

Dimensions in millimetres

Key

1 mandrel shank

2 blind rivet head

The mandrel shall be designed such that the blind rivet end deforms during installation, and the shank can expand.

NOTE Figure # illustrates a type A rivet head.

a The break area is milled.

b Mandrel head to be chrome plated.

Figure 5 — Example illustrating the elements of a figure

28.5.3 Key and labels to figures

Figures shall be language neutral in order to facilitate translation, using key references or figure footnotes (see Figure 5) instead of textual descriptions (in accordance with ISO 6433).

In graphs (see Figure 6), labelling of curves, lines and other elements shall be replaced by key references. Labelling on the axes shall not be replaced by numerical key references, which can be confused with numerical values.

Key

w mass fraction of gelatinized kernels, expressed in per cent

t cooking time, expressed in minutes

t90 time required to gelatinize 90 % of the kernels

P point of the curve corresponding to a cooking time of t90

NOTE These results are based on a study carried out on three different types of kernel.

a The time t90 is estimated to be 18,2 min for this example.

Figure 6 — Example of a graph

In flowcharts and organigrams, textual descriptions are used within the figure for better readability (see 28.6.4).

NOTE Notations such as

mml_m22.eps, mml_m23.eps and mml_m24.eps, or V/(km/h), l/m and t/s

for numerical values are particularly useful on the axes of graphs, replacing the use of the corresponding measurement units in key references.

28.5.4 Notes to figures

A single note in a figure shall be preceded by “NOTE”, placed at the beginning of the first line of the text of the note. See Figure 5. When several notes occur in the same figure, they shall be designated “NOTE 1”, “NOTE 2”, “NOTE 3”, … . The numbering restarts for each new figure.

Notes to figures shall not contain requirements or any information considered indispensable for the use of the document. Any requirements relating to the content of a figure shall be given in the text, in a footnote to the figure or as a paragraph between the figure and its title.

Table 8 summarizes how to use notes and footnotes within documents.

28.5.5 Footnotes to figures

Footnotes to figures are numbered independently from footnotes to the text.

Footnotes to figures shall be distinguished by superscript lowercase letters, starting with “a”. The footnotes shall be referred to in the figure by inserting the same superscript lowercase letter. See Figure 5.

Footnotes to figures may contain requirements.

Table 8 summarizes how to use notes and footnotes within documents.

28.6 Types of figure

28.6.1 Mechanical engineering drawings

Mechanical engineering drawings shall be prepared in accordance with relevant ISO standards (listed in Table 9). Different views, details and sections of a component or multicomponent object shall be presented in conformity with ISO 128-3. Different views, details and sections of a component or multicomponent object shall not be presented as subfigures.

See Figure 7.

Figure 7 — Example of a mechanical engineering drawing

28.6.2 Graphical symbols

Graphical symbols for use on equipment shall be in accordance with IEC 60417 and ISO 7000. Public information symbols shall be in accordance with ISO 7001. Safety signs shall be in accordance with ISO 7010.

For purposes of consistency and coherence, IEC TC 3, IEC SC 3C and ISO/TC 145 are responsible for the standardization of graphical symbols and safety signs. If an adequate symbol or safety sign does not exist in the IEC and ISO databases, contact IEC TC 3, IEC SC 3C and ISO/TC 145 in order to register a standardized symbol.

Graphical symbols for use on technical product documentation (drawings and diagrams) shall be in accordance with ISO 7083 and the ISO 14617 series.

For purposes of consistency and coherence, ISO/TC 10 is responsible for the standardization of graphical symbols for use in technical product documentation. If an adequate symbol does not exist in the IEC and ISO databases, contact ISO/TC 10 in order to register a standardized symbol.

Table 10 gives an overview of the categories of graphical symbol.

Table 10 — Categories of graphical symbol

Category of graphical symbol	Basic message	Location	Design principles	Overview	Responsible committee
Public information symbols	Location of service or facility	In public areas	ISO 22727	ISO 7001	ISO/TC 145/SC 1
Safety signs (symbols)	Related to safety and health of persons	In workplaces and public areas	ISO 3864-1 ISO 3864-3	ISO 7010	ISO/TC 145/SC 2
Product safety labels	Related to safety and health of persons	On products	ISO 3864-2 ISO 3864-3	—	ISO/TC 145/SC 2
Graphical symbols for use on equipment	Related to equipment	On equipment	IEC 80416-1 ISO 80416-2 IEC 80416-3	ISO 7000 IEC 60417	ISO/TC 145/SC 3 IEC/SC 3C

Category of graphical symbol	Basic message	Location	Design principles	Overview	Responsible committee
Technical product documentation symbols	Product representation	Technical product documentation (e.g. drawings and diagrams)	ISO 81714-1	ISO 7083 ISO 14617 IEC 60617	ISO/TC 10/SC 1 ISO/TC 10/SC 10 IEC TC 3

See Figure 8.

Figure 8 — Example of a graphical symbol (IEC 60417-5012)

28.6.3 Circuit diagrams and connection diagrams

Diagrams, such as circuit diagrams and connection diagrams, shall be prepared in accordance with IEC 61082-1. Graphical symbols used in schematic diagrams shall be in accordance with IEC 60617 (for electrotechnical diagrams) and the ISO 14617 series (for other diagrams). Reference designations shall be in accordance with the IEC 81346 series. Signal designations shall be in accordance with IEC 61175-1. See Figure 9.

Key

Components	Connections and supplies
C1 capacitor C = 0,5 µF	L, N supply voltage with neutral
C2 capacitor C = 0,5 nF	L+ DC supply voltage for the test circuit
K1 relay	
Q1 RCCB under test (with terminals L, N and PE)	
R1 inductor L = 0,5 µH	
R2 resistor R = 2,5 Ω	

R3 resistor R = 25 Ω

S1 manual control switch

Z1 filter

a Connection to be made if the tested object has a terminal for PE.

Figure 9 — Example of a circuit diagram

28.6.4 Flowcharts

Flowcharts shall be prepared in accordance with ISO 5807. See Figure 10.

Figure 10 — Example of a flowchart

29 Tables

29.1 Purpose or rationale

Tables are used when they are the most efficient means of presenting information in an easily comprehensible form.

29.2 Title

It is recommended to provide a concise table title.

29.3 Numbering and subdivision

Tables shall be designated “Table” and numbered. By default, tables are numbered with Arabic numerals, beginning with 1, and the numbering shall be continuous and independent of the numbering of the clauses and of any figures. A single table shall be designated “Table 1”. However, tables may be numbered with a prefix where the prefix denotes the clause number, and the second number denotes the sequence of tables in the clause. The numbering system chosen shall be consistent within any given series.

Further subdivision [e.g. Table 1 a)] is not permitted. A table within a table is not permitted. Subdivision of a table into subsidiary sections with new column headings is not permitted.

It is often better to create several tables rather than trying to consolidate too much information into one table. The simpler the presentation, the better. Complex graphical representations within tables should be avoided.

If a very complex table is necessary, it can be better to include it as a software supplement to the document.

In annexes, the table numbering restarts and the number is preceded by the annex letter (e.g. Table A.1).

When a table is continued over several pages, it can be useful to indicate the continuation.

EXAMPLE 1

Table x (continued)

EXAMPLE 2

Table x (1 of #)

The column headings together with any statement concerning units can be repeated on all pages after the first.

29.4 Referencing

Each table shall be explicitly referred to within the text.

Use, for example, the following forms for references to tables:

• “Table 3 lists…”;

• “See Table B.1”.

29.5 Specific principles and rules

29.5.1 Notes to tables

Notes to tables shall be located within the frame of the relevant table and shall precede table footnotes. A single note in a table shall be preceded by “NOTE”, placed at the beginning of the first line of the text of the note. When several notes occur in the same table, they shall be designated “NOTE 1”, “NOTE 2”, “NOTE 3”, … . The numbering restarts for each new table.

Notes to tables shall not contain requirements or any information considered indispensable for the use of the document. Any requirements relating to the content of a table shall be given in the text, in a footnote to the table or as a paragraph within the table.

Table 8 summarizes how to use notes and footnotes within documents.

29.5.2 Footnotes to tables

Footnotes to tables are numbered independently from footnotes to the text. They shall be located within the frame of the relevant table and shall appear at the foot of the table.

Footnotes to tables shall be distinguished by superscript lowercase letters, starting with “a”. The footnotes shall be referred to in the table by inserting the same superscript lowercase letter.

Footnotes to tables may contain requirements.

Table 8 summarizes how to use notes and footnotes within documents.

29.5.3 Keys to tables

In tables, it is sometimes necessary to abbreviate words or references in order to save space or to improve readability. The meaning of such abbreviated terms shall be explained in a key. See Table 11.

Table 11 — Example of a table with a key

Data object name	Common data class	Explanation	T	M/O/C
LNName		The name shall be composed of the class name, the LN-Prefix and LN-Instance-ID according to IEC 61850-7-2:2010, Clause 22.		
Op	ACT	Level of action reached	T	M
StrVal	ASG	Start level set-point		C
OpDlTmms	ING	Operate delay time (ms)		O

Key

T Transient data objects

M/O/C The data object is mandatory (M) or optional (O) or conditional (C)

29.5.4 Headings in tables

When tables display numerical values of quantity values, notations such as

mml_m25.eps, mml_m26.eps and mml_m27.eps , or V/(km/h), l/m and t/s

are very useful in headings of tables, especially when the measurement units are different. See 29.6, Example 2.

When the measurement unit is the same, whatever the quantity value, a suitable statement (e.g. “Dimensions in millimetres”) can be placed above the right-hand corner of the table.

29.6 Examples

EXAMPLE 1

The layout of the different elements that can appear in a table

Dimensions in millimetres

Type	Length	Inside diameter	Outside diameter
	l1a	d1	
	l2	d2b c	

A paragraph containing a requirement.

NOTE 1 Table note.

NOTE 2 Table note.

a Table footnote.

b Table footnote.

c Table footnote.

EXAMPLE 2

When there are several different units:

Type	Linear density	Inside diameter	Outside diameter
	λm	d	D
	kg/m	mm	mm

EXAMPLE 3

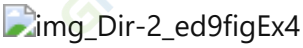
When all the units are the same:

Dimensions in millimetres

Type	Length	Inside diameter	Outside diameter

EXAMPLE 4

Correct and incorrect table headers. Table cells shall not be split diagonally.



POLICY

30 Patent rights

For patented items, the rules given in ISO/IEC Directives, Part 1, shall be followed.

31 Use of trade names and trademarks

A correct designation or description of a product shall be given rather than a trade name or trademark.

Proprietary trade names or trademarks for a particular product should as far as possible be avoided, even if they are in common use.

If, exceptionally, trade names or trademarks cannot be avoided, their nature shall be indicated, for example by the symbol ® for a registered trademark (see Example 1) and by the symbol TM for a trademark.

EXAMPLE 1

Instead of "Teflon®", write "polytetrafluoroethylene (PTFE)".

If it is known that only one product is currently available that is suitable for the successful application of the document, the trade name or trademark of the product may be given in the text of the document but shall be associated with a footnote as shown in Example 2.

EXAMPLE 2

… [trade name or trademark of product] … is the [trade name or trademark] of a product supplied by … [supplier] …. This information is given for the convenience of users of this document and does not constitute an endorsement by … [ISO or IEC] … of the product named. Equivalent products may be used if they can be shown to lead to the same results.

If it is considered essential to give an example (or examples) of commercially available products suitable for successful application of the document because the product characteristics are difficult to describe in detail, trade names or trademarks may be given in a footnote as shown in Example 3.

EXAMPLE 3

… [trade name(s) or trademark(s) of product(s)] … is (are) an example(s) of a suitable product(s) available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by … [ISO or IEC] … of this (these) product(s).

If it is considered essential for reasons of public interest or public safety to refer to commercially available products, trade names or trademarks may be provided, with a footnote as shown in Example 4.

EXAMPLE 4

This (these) [trade name(s) or trademark(s)] is (are) provided for reasons of public interest or public safety. This information is given for the convenience of users of this document and does not constitute an endorsement by … [ISO or IEC].

32 Copyright

Copyright in standards is governed by ISO/IEC Directives, Part 1. More information about the copyright policies in ISO and IEC can be found here:

• https://www.iso.org/iso/home/standards_development/resources-for-technical-work/data-protection-declaration.htm

• https://www.iec.ch/about/copyright

33 Aspects of conformity assessment

33.1 Documents containing requirements for products, processes, services, persons, systems and bodies

All documents containing requirements for products, processes, services, persons, systems and bodies shall be written in accordance with the "neutrality principle", such that conformity can be assessed by a manufacturer or supplier (first party), a user or purchaser (second party), or an independent body (third party).

NOTE 1 First-party, second-party and third-party conformity assessment activities are defined in ISO/IEC 17000.

NOTE 2 The term "document" is defined in 3.1.1.

Such documents shall not include requirements related to conformity assessment other than requirements which are necessary to provide repeatable and reproducible conformity assessment results.

Committees wishing to specify additional conformity assessment requirements for the product, process, service, persons, systems or bodies may only do so in a separate document, or in a separate part of a series provided that the separate parts can be applied independently. Prior to commencing work on a separate document or separate part, a committee shall seek the approval of the ISO Committee on conformity assessment (ISO/CASCO) or IEC Standardization Management Board (IEC/SMB) or both as applicable.

For particular requirements in IEC, see the ISO/IEC Directives, Supplement – Procedures specific to IEC.

No document containing requirements for products, processes, services, persons, systems and bodies shall make conformity dependent on a quality management systems standard (e.g. it shall not make normative reference to ISO 9001).

33.2 Conformity assessment schemes and systems

Committees shall not develop documents providing general requirements for conformity assessment schemes and systems. Development of such documents is the responsibility of the ISO policy committee ISO/CASCO in liaison with the IEC Conformity Assessment Board (IEC/CAB).

Committees wishing

a) to propose the establishment of a conformity assessment scheme or system, or

b) to prepare documents specifying conformity assessment systems or schemes or sector-specific operating procedures for use by conformity assessment bodies and others for conformity assessment purposes,

shall consult with the secretariat of ISO/CASCO or IEC/CAB or both as appropriate, prior to commencement of the work to ensure that any documents developed are in line with the conformity assessment policies and rules approved by ISO/CASCO and IEC/CAB as relevant.

33.3 References to ISO/IEC conformity assessment documents

When a committee develops a document relating to conformity assessment systems or schemes, or any other document addressing conformity assessment aspects, the document shall make normative reference to the relevant published ISO/IEC documents for conformity assessment procedures, including ISO/IEC 17000 and ISO/IEC 17025. The committee may include verbatim text from the ISO/IEC documents for conformity assessment procedures but the committee shall not delete, change or interpret them. Committees shall consult with the ISO/CASCO or the IEC/CAB secretary or both, as appropriate, for advice on correctly referencing the ISO/IEC conformity assessment documents. Any request for addition, deletion, change or interpretation shall be submitted to the secretariats of ISO/CASCO and IEC/CAB for decision.

34 Aspects of quality management systems, reliability and sampling

General aspects are dealt with by ISO/TC 69 Applications of statistical methods, ISO/TC 176 Quality management and quality assurance and IEC TC 56 Dependability. Documents developed by those technical committees shall be consulted for guidance.

35 Management standards (MS) and management systems standards (MSS)

Rules for the drafting of management standards and management systems standards (including sector-specific standards) are given in Annex SL and Annex SP of the ISO Supplement to the ISO/IEC Directives, Part 1.

ANNEXES

Annex A (informative) Checklist for writers and editors of documents

The checklist given in Table A.1 is a tool to help writers and editors of documents.

Table A.1 — Checklist for writers and editors of documents

Task	Assessment	Done √	Comments
Structure (Clause 6, Clause 22)	Check table of contents: Is the top-level structure logical? Is the subdivision consistent? Hanging paragraphs: Check for and remove any hanging paragraphs.		
Use of plain language (Clause 4, Clause 5)	Is the text clear and concise? Are the sentences short? (check punctuation)		
Title (Clause 11)	Is the title organized going from the more general to the more particular? Does the title unintentionally limit the scope of the document? Is it as clear and concise as possible? Make sure that the title does not contain more than three elements. If there are several parts, are the titles aligned?		
Foreword (Clause 12)	Is the document a revision? If so, insert a revision statement including any amendments and technical corrigenda and a list of changes with respect to previous edition.		

Task	Assessment	Done √	Comments
	Are there any other organizations involved in the drafting that should be mentioned?		
Introduction (Clause 13)	Is it purely informative?		
	Does it describe the content or give information on why the document is necessary?		
Scope (Clause 14)	Does it describe what the document does?		
	Does it state where it is applicable?		
	Does it only contain statements of fact?		
Normative references (Clause 15)	Are all of the references listed in the Normative references clause cited in the text in such a way that some or all of their content constitutes requirements of the document?		
	Are the references dated or undated?		
	Are the references used ISO and IEC standards? If not, do suitable ISO and IEC standards exist which can be used instead?		
	Are the normative references publicly available?		
Terms and definitions (Clause 16)	Are the terms listed used in the document?		
	Do suitable terms exist in the terminology databases? — https://www.electropedia.org — https://www.iso.org/obp		
	Are the definitions correctly drafted?		

Task	Assessment	Done √	Comments
Figures (Clause 28)	Does each figure have a concise title?		
	Is each figure numbered correctly?		
	Is there a key if necessary?		
	Are all figures cross-referenced in the text?		
Graphical symbols (28.6.2)	Are symbols used taken from the ISO and IEC databases?		
	If not, contact IEC TC 3, IEC SC 3C, ISO/TC 10 and ISO/TC 145 in order to register a standardized symbol.		
Tables (Clause 29)	Does each table have a concise title?		
	Is each table numbered correctly?		
	Are all tables cross-referenced in the text?		
Annexes (Clause 20)	Is there a reference to each annex in the main part of the text?		
	Is their status (normative or informative) correct? Is this made clear in the main part of the text?		
	Is it formatted consistently?		
Bibliography (Clause 21)	Are all the entries correct and complete?		
	Are any of them normative references that should be listed in Clause 2?		
	Are any of the listed documents duplicated in Clause 2?		
Drafting of provisions	Make sure that “shall” “should” or “may” are not used in the Foreword, Scope, notes or examples.		

Task	Assessment	Done √	Comments
(Clause 4, Clause 7)	Make sure that “shall” is not used in the Introduction.		
	Are “may” and “can” used correctly?		
	Is “must” used anywhere in the document? Is “must” used correctly to mean external constraints?		
	Make sure that no requirements specifying compliance with national/legal regulations are included.		
Potential legal problems (Clause 30, Clause 31, Clause 32)	Copyrights		
	Trademarks		
	Patents		
Conformity assessment (Clause 33)	Are there potential conformity assessment issues?		
Cross-references (Clause 10)	Are all cross-references correct?		
Common problems (Annex B)	Are symbols for variable quantities correct, consistent and properly formatted in the text and in mathematical formulae?		
	Is a comma on the line used as the decimal sign?		
Other issues			

Annex B (normative) Quantities and units

Table B.1 lists provisions that are specified elsewhere in the ISO/IEC Directives, Part 2, or in the particular International Standards dealing with quantities and units.

Table B.1 — Quantities and units

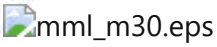
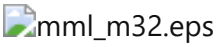
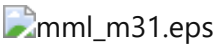
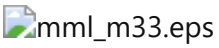
Aspect to be considered	Explanations and examples
Decimal sign	The decimal sign shall be a comma.
Permitted units	International Standards shall only use: • SI units, as given in the various parts of the ISO 80000 series and the IEC 80000 series; • a few additional units used with the SI, namely minute (min), hour (h), day (d), degree (°), minute (′), second (″), litre (l), tonne (t), electronvolt (eV) and unified atomic mass unit (u), as shown in ISO 80000-1; • the units neper (Np) and bel (B), which are given in ISO 80000-1 and ISO 80000-3, and octave, which is given in ISO 80000-8; • the units baud (Bd), bit (bit), octet (o), byte (B), erlang (E), hartley (Hart), natural unit of information (nat) and shannon (Sh), which are given in IEC 80000-13, and var (var) which is given in IEC 80000-6, for use in electrical technology and information technology. Avoid using multiples and submultiples of a given unit in the same context.
Mixing symbols and names of units	Do not mix symbols and names of units. EXAMPLE 1 Correct: “kilometres per hour” and “km/h” Incorrect: “km per hour” and “kilometres/hour”.
Writing numerical values with unit symbols	Use numerical values written in figures with unit symbols. EXAMPLE 2 Correct: “5 m” Incorrect: “five m” and “5 metres”.
Space between numerical values	There shall be a space between the numerical value and the unit symbol except in the case of superscript-type unit symbols used for plane angles. However, the degree

Aspect to be considered	Explanations and examples
and unit symbols	should preferably be subdivided decimally. EXAMPLE 3 5 mm 15 Ω 37 km/h 14 A 115° 27 °C 25 K
Use of +, − and ± signs as a monadic operator	A plus or minus sign before a number (or quantity), used to indicate “same sign” or “change of sign”, is a monadic operator and shall not be separated from the number by a space. EXAMPLE 4 A Celsius temperature from −7 °C to +5 °C Tolerance ±5 cm on the length of the square. NOTE 1 An operator is called “monadic” because it operates only on the entity after it.
Use of +, −, ±, ×, · , =, > and < signs as dyadic operators or to express relations	There shall be spaces on both sides of signs for dyadic operators such as +, −, ±, × and · (half-high dot), and relations such as =, <, >. EXAMPLE 5 5 + 2 5 − 3 n ± 1,6 D < 2 mm NOTE 2 An operator is called “dyadic” because it operates on both the entities located before and after it.
Abbreviated terms for units	Do not use non-standardized abbreviated terms for units. EXAMPLE 6 Correct: “s” Incorrect: “sec” Correct: “min” Incorrect: “mins” Correct: “h” Incorrect: “hrs” Correct: “cm3” Incorrect: “cc” Correct: “l” Incorrect: “lit” Correct: “A” Incorrect: “amps” Correct: “r/min” Incorrect: “rpm”

Aspect to be considered	Explanations and examples	
Modification of internationally standardized unit symbols	Internationally standardized unit symbols shall not be modified by adding subscripts or other information. EXAMPLE 7	
	Correct: “Umax = 500 V”	Incorrect: “U = 500 Vmax”
	Correct: “a mass fraction of 5 %”	Incorrect: “5 % (m/m)”
	Correct: “a volume fraction of 7 %”	Incorrect: “7 % (V/V)”
	Remember that % = 0,01 and ‰ = 0,001 are “pure” numbers. Do not mix information with unit symbols. EXAMPLE 8	
	Correct: “the water content is 20 ml/kg”	Incorrect: “20 ml H2O/kg” or “20 ml of water/kg”.
Use of language-specific abbreviated terms	Language-specific abbreviated terms should not be used. When commonly used language-specific abbreviated terms such as “ppm" are necessary, their meaning shall be explained.	
Use of ambiguous terms	Ambiguous terms such as “billion” shall not be used.	
Writing unit or variable quantity symbols	Unit symbols shall always be in upright type. Symbols for variable quantities shall always be in italic type. Symbols representing numerical values shall be different from symbols representing the corresponding quantities. EXAMPLE 9 V is the symbol for the unit Volt. U is the symbol for the quantity electric tension or voltage.	

Aspect to be considered	Explanations and examples
Writing subscripts	A subscript that represents a variable quantity is in italic type. EXAMPLE 10 q_V for volumetric flow rate Other subscripts, for example those representing words or fixed numbers, are in upright type. EXAMPLE 11 D_{in} for internal diameter
Writing mathematical formulae	Mathematical formulae involving quantities are preferred to formulae involving numerical values because mathematical formulae between quantities are independent of the choice of measurement units whereas mathematical formulae between numerical values are not.
Use of “weight” and “mass”	The quantity “weight” is a force (gravitational force) and is measured in newtons (N). The quantity “mass” is measured in kilograms (kg).
Use of the word “unit”	Quotient quantities shall not contain the word “unit” in the denominator. EXAMPLE 12 Correct: “mass per length” or “lineic mass” Incorrect: “mass per unit length”.
Quantities describing objects	Distinguish between an object and any quantity describing the object. EXAMPLE 13 “surface” and “area” “body” and “mass” “resistor” and “resistance” “coil” and “inductance”
Use of measurement units when expressing intervals, ranges, tolerances or mathematical relationships	When expressing intervals, ranges, tolerances or mathematical relationships, ensure that the use of the unit is unambiguous. EXAMPLE 14 Correct: “10 mm to 12 mm” Incorrect: “10 to 12 mm” and “10 – 12 mm” Correct: “0 °C to 10 °C” Incorrect: “0 to 10 °C” and “0 – 10 °C”

Aspect to be considered	Explanations and examples	
	Correct: “23 °C ± 2 °C” and “(23 ± 2) °C”	Incorrect: “23 ± 2 °C”
	Correct: “(60 ± 3) %” and “60 % ± 3 %”	Incorrect: “60 ± 3 %”
	Preferred: 	Admitted: 
Addition and subtraction of quantity values	Two or more quantity values cannot be added or subtracted, unless they all belong to a quantity of the same kind (e.g. diameter, circumference and wavelength are quantities of the same kind, called “length”). Quantity values having the same unit can belong to a quantity of a different kind (e.g. both “action” and “angular momentum” have the SI unit J s, but are not of the same kind and thus cannot be added or subtracted).	
Using the symbol % (per cent), tolerances	The symbol % (per cent), with the meaning “part per hundred”, is an abbreviation for the number 0,01 and can only be used when stating quantity values which are pure numbers. EXAMPLE 15	
	Correct: “(230 ± 11,5) V”	Incorrect: (230 ± 5 %) V
	Tolerances shall not be expressed by using the symbol %, unless for quantity values which are pure numbers. However, a verbal expression like “230 V, with a tolerance of +5 %” can be used.	
Symbol for expressing logarithm	Do not write “log” in mathematical formulae because it is necessary to specify the base of the logarithm. Write “lg”, “ln”, “lb” or “loga” when the base is 10, e, 2 and “a”, respectively.	
Mathematical signs and symbols	Use the mathematical signs and symbols recommended in ISO 80000-2, for example “tan” and not “tg”.	
Line breaks in mathematical formulae	Line breaks in mathematical formulae and expressions shall be in accordance with ISO 80000-2. Any line break shall be before, and not after, the signs of the dyadic operators =, +, −, ± and ∓, or, if necessary, the signs ×, · or /, because there is a space between the operator and the number.	

Aspect to be considered	Explanations and examples	
	EXAMPLE 16	
	Correct:	Incorrect:
	 mml_m30.eps	 mml_m32.eps
	 mml_m31.eps	 mml_m33.eps
	Correct:	Incorrect:
	23 °C ± 2 °C	23 °C ± 2 °C
	Correct:	Incorrect:
	24 mm × 36 mm	24 mm × 36 mm

Annex C (normative) Designation of internationally standardized items

C.1 General

For the purpose of this annex, an "internationally standardized item" means either a tangible item (e.g. a material or a manufactured product), or an intangible item (e.g. a process or system, a test method, a collection of symbols, or requirements for marking and delivery).

There are many circumstances when it is convenient to have a brief designation to identify the item instead of a lengthy description. These include references given to items in documents, in catalogues, in written communications, in technical and scientific literature, in the ordering of goods, materials and equipment and in the presentation of goods on display and for sale.

The designation system given in this annex shall be used to give items a unique designation. This designation provides a rapid and unambiguous description of the item. The system is intended solely for application in International Standards, and in regional and national standards identical in content with them. It supports international comprehension about items which meet the requirements of the relevant International Standard.

NOTE The designation is no substitute for the full content of the document.

A designation system is particularly useful for product and material documents, but is not always necessary. The committee may choose whether to include a designation system.

C.2 Applicability

C.2.1 Each standardized item has a number of characteristics. The values associated with those characteristics may be either single or multiple. Where only a single value is specified for each characteristic in the document, it is sufficient to quote the number of the document and the identification is unambiguous. Where several values are given, the users have to make a choice. In this case, it is not sufficient for users to quote only the number of the document; the value or values required from the range also have to be designated.

EXAMPLE

The volume of a molar solution of sulfuric acid used in a test method is a single value and does not require a choice.

A range of nominal lengths in millimetres of countersunk head screws in a specification has multiple values and requires a choice.

C.2.2 The designation system described may be applied in the following types of document.

a) A document in which more than one choice is open in relation to a characteristic defined in the document.

EXAMPLE The choice from a range of alternative dimensions or other properties in a specification for a product; the choice of a particular test method in a generic document covering a variety of methods for determining the value of a given characteristic of a product; the choice of specific values of certain testing

parameters of which a number of alternatives are offered in the document. [For product or material standards, C.2.2 c) also applies.]

b) A document which defines terms and symbols from which a selection has to be made to communicate information.

c) For a product or material, a document which contains alternatives in one or more of its requirements, and which provides a specification complete enough to ensure that the product or material conforming to it is of sufficient quality for its intended use.

NOTE There would be considerable risk of misunderstanding by the purchaser if a designation system were applied to a specification that incompletely defined the suitability of a product for its purpose. The designation system is intended to make known only the "selection" aspects in a document, so users would assume that the other characteristics required to ensure suitability of purpose were covered by the document.

C.2.3 The designation system is suitable for use in any type of communication, including automatic data processing.

C.3 Designation system

C.3.1 Each designation comprises a "Description block" and an "Identity block". The system is illustrated in Figure C.1.

Figure C.1 — Structure of designation system

See Clause C.7 for examples.

C.3.2 In this designation system, the standard number identifies all the required characteristics and their values and is contained in the International Standard number block. The chosen values of those characteristics to which several values have been assigned are contained in the "Individual item block". For a document in which each characteristic is assigned only a single value, it is not necessary to include an individual item block in the designation.

C.4 Use of characters

C.4.1 The designation consists of characters which shall be letters, digits or signs.

C.4.2 Where letters are used, they shall be of the Latin alphabet. No distinction in meaning shall be made between uppercase letters and lowercase letters. For the description block, lowercase letters, which are commonly used in writing or print, may be transformed into uppercase letters in automatic data processing. For the identity block, uppercase letters are preferred.

C.4.3 Where digits are used, they shall be Arabic.

C.4.4 The only signs permitted shall be the hyphen (-), the plus sign (+), the solidus (/), the comma (,) and the multiplication sign (×). In automatic data processing, the multiplication sign is the letter "X".

C.4.5 In the designation, spaces may be inserted for better readability. However, spaces are not counted as characters and they may be omitted when the designation is used in automatic data processing.

C.5 Description block

The committee shall allot a description block to the standardized item. This description block shall be as short as possible and is preferably taken from the subject classification of the document (e.g. keywords, International Classification for Standards). The description should be that which best characterizes the standardized item. When referring to the document, the use of the description block is optional. When used, it shall be placed in front of the International Standard number block.

C.6 Identity block

C.6.1 General

The identity block shall be composed in such a way that it designates the standardized item unambiguously. It consists of two consecutive blocks of characters:

• the International Standard number block, comprising a maximum of 8 characters (the letters "ISO" or "IEC" plus a maximum of 5 digits);

• the individual item block (digits, letters, signs), comprising a recommended maximum of 18 characters.

In order to mark the division between the International Standard number block and the individual item block, a hyphen (-) shall be the first character of the individual item block.

C.6.2 International Standard number block

C.6.2.1 The International Standard number block shall be as short as possible (e.g. ISO 1 in the case of the first ISO standard). Spaces or zeros may be added when recording on machine-readable medium (e.g. "ISO 1" or "ISO 00001").

C.6.2.2 If a document is being revised and the former edition contained a method for the designation of the standardized item, ensure that the designation to be specified in the new edition does not lead to confusion with any designation applied according to the former edition of the document. In general this requirement can easily be met and therefore it is not necessary to include the year of publication in the International Standard number block.

C.6.2.3 The same applies in cases when amendments or other modifications are issued: they shall modify the designation of the standardized item accordingly.

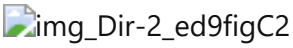
C.6.2.4 If the document consists of several parts issued and referred to individually, the number of the relevant part (or its code, if so required by the document) shall be indicated in the individual item block, immediately after the hyphen.

C.6.3 Individual item block

C.6.3.1 The individual item block shall also be as short as possible and constructed to serve the purpose of the designation in the best way possible.

C.6.3.2 To give an unambiguous code to each item, the individual item block may be further subdivided into several data blocks, each containing specific information represented by a code (see C.6.3.3). These blocks shall be separated from each other by a separator, for example a hyphen. The meaning of the codes in each data block shall be bound by their position. One or more data blocks can be omitted but the empty space shall be indicated by using an extra separator for each omitted data block.

EXAMPLE



C.6.3.3 The most important parameters shall appear first. Coded entries shall be used in the individual item block. Language-dependent entries (e.g. "wool") shall not be used because they would require translation in different language versions. The key to such coded entries shall be provided in the document concerned.

C.6.3.4 In the individual item block, letters I and O shall be avoided because they can be confused with the numerical digits "one" and "zero".

C.6.3.5 If the simplest way of enumerating the data required in the specification would require the use of a large number of characters, a double coding can be used in which all possibilities of an aspect are enumerated and coded with one or more characters.

EXAMPLE

"1 500 × 1 000 × 15" contains 12 characters and covers only the aspect of size without even specifying the tolerances.

Using double coding, it becomes: 1 500 × 1 000 × 15 = A, 1 500 × 2 000 × 20 = B.

C.6.3.6 If more than one document refers to a product, one of them shall contain the rules for the designation of the product (composed of the designation of the individual standardized items).

C.7 Examples

EXAMPLE 1

PRODUCT:

A short enclosed-scale thermometer for precision use according to ISO 656, graduation interval 0,2 °C, main scale 58 °C to 82 °C.

DESIGNATION:

Thermometer ISO 656-EC-0,2-58-82

In this designation, the elements have the following meaning:

EC short enclosed-scale thermometer;

0,2 graduation interval = 0,2 °C;

58-82 the range of the main scale is from 58 °C to 82 °C.

NOTE In this designation, the letters “EC” can be omitted because ISO 656 refers only to short enclosed-scale thermometers.

EXAMPLE 2

PRODUCT:

An indexable insert, according to ISO 883, triangular, with side clearance, tolerance class G (precision ground), nominal size 16,5 mm, thickness 3,18 mm, corner radius 0,8 mm, for rounded cutting edges, to be used for both left-hand and right-hand cutting (designation according to ISO 1832), for group of application P20 according to ISO 513.

DESIGNATION:

Throwaway insert ISO 883-TPGN160308-EN-P20

In this designation, the elements have the following meaning:

T symbol for the shape (triangular);

P	symbol for the side clearance (the relief angle is identified as being 11°);
G	tolerance class G (tolerance ±0,025 mm on the height of triangle and ±0,13 mm on the thickness of the insert);
N	symbol for the special features (N = no special features);
16	symbol for the size (nominal size of triangle = 16,5 mm);
03	symbol for the thickness (3,18 mm);
08	symbol for the corner configuration (corner radius = 0,8 mm);
E	symbol for the cutting edge condition (rounded cutting edges);
N	symbol for the cutting direction (both left-hand and right-hand cutting);
P20	symbol for the application of carbide (applicable for steel, steel castings, malleable cast iron with long chips).

EXAMPLE 3

PRODUCT:

A slotted pan head screw with thread M5, nominal length 20 mm, product grade A, property class 4,8, according to ISO 1580.

DESIGNATION:

Slotted pan screw ISO 1580-M5 × 20-4,8

This designation refers to ISO 1580, which is the International Standard that contains the dimensions of the slotted pan head screws. It refers to the following standards for the other characteristics of these screws.

a) The International Standard for the tolerances on metric screw thread (ISO 965-2), which refers to the International Standards for the basic data (ISO 965-1), the basic profile (ISO 68), the general plan (ISO 261) and the gauging (ISO 1502). The element “M5” of the designation determines which data of these standards are relevant for the designated screw, on the assumption that the relevant screw thread tolerance class is fixed in the standard mentioned under b).

b) The International Standard for the tolerances (ISO 4759-1) on the dimensions and other features of the screws, which makes use of the symbols for limits and fits (ISO 286-1), for tolerances of form and position (ISO 1101), for tolerances of screw thread (ISO 965-3), and for surface roughness (ISO 468 and others). The relevant product grade (A) is fixed in ISO 1580 for the screw in question. It is unnecessary to include the product grade A in the designation because in ISO 1580 only one product grade is indicated.

c) The International Standard for the mechanical properties of fasteners (ISO 898-1), which refers to International Standards for the tensile test of steel (ISO 6892), for hardness tests (ISO 6506 and ISO 6508) and for the impact test (ISO 83). The element “4,8” of the designation is sufficient to determine which data of the document are relevant.

With the relatively short designation the screw in question is defined completely, although several International Standards are involved.

EXAMPLE 4

PRODUCT:

The determination of ethyl ether soluble matter in plasticized cellulose acetate, procedure A.

DETERMINATION:

Test method, cellulose acetate ISO 1875-A

C.8 National implementation

C.8.1 National implementation of the international designation system is applicable only when an International Standard is adopted as a national standard without change.

C.8.2 In national implementation of International Standards, the international designation shall be used without change. However, the national standard

identification may be inserted between the description block and the International Standard number block.

EXAMPLE

If the international designation of a screw is

Slotted pan screw ISO 1580-M5 × 20-4,8

its national designation may be

Slotted pan screw VN 4183-ISO 1580-M5 × 20-4,8

if VN 4183 is the identification of the national standard corresponding to ISO 1580 which has been adopted without change.

Another possibility for a national designation would be

Flachkopfschraube mit Schlitz OENORM ISO 1580-M5 × 20-4,8

if "OENORM ISO 1580" is the identification of the national standard corresponding to ISO 1580 which has been adopted without change.

C.8.3 A national standard may only use the International Standard identification in its own identifier if it is identical with that International Standard (see ISO/IEC Guide 21-1). If an individual item is standardized nationally and that item is identical to an item specified in a corresponding, but not identical, International Standard, it is permitted to use the international designation of the standardized item for that particular item.

If an individual item is standardized nationally and that item corresponds but is not identical to the item in a corresponding International Standard, the national designation of the standardized item shall not include reference to the International Standard.

Annex D (informative) Reference documents and sources for drafting

D.1 General reference documents and sources for drafting

Language reference works	Shorter Oxford English Dictionary
	Concise Oxford English Dictionary
	Collins Concise English Dictionary (https://www.collinsdictionary.com/dictionary/english)
	Webster's New World College Dictionary (https://websters.yourdictionary.com/)
	Chambers Concise Dictionary
	Dictionnaire Le Robert
	Dictionnaire Larousse (https://www.larousse.fr/dictionnaires/francais)
	Dictionnaire des difficultés de la langue française, A.V. Thomas, Larousse
Standardized terminology	IEC 60050 (all parts), International Electrotechnical Vocabulary, available at https://www.electropedia.org
	ISO/IEC 2382 (all parts), Information technology — Vocabulary
	ISO/IEC 17000, Conformity assessment — Vocabulary and general principles
	ISO/IEC Guide 2, Standardization and related activities — General vocabulary
	ISO/IEC Guide 99, International vocabulary of metrology — Basic and general concepts and associated terms (VIM)
	ISO Online browsing platform, available at https://www.iso.org/obp
Principles and methods of terminology	ISO 704, Terminology work — Principles and methods
	ISO 10241-1, Terminological entries in standards — Part 1: General requirements and examples of presentation
Quantities, units and their symbols	ISO 80000 (all parts), Quantities and units
	IEC 60027 (all parts), Letter symbols to be used in electrical technology
	IEC 80000 (all parts), Quantities and units
Abbreviated terms	ISO 639 (all parts), Codes for the representation of names of languages
	ISO 1951, Presentation/representation of entries in dictionaries — Requirements, recommendations and information
	ISO 3166 (all parts), Codes for the representation of names of countries and their subdivisions

Bibliographic references	ISO 690, Information and documentation — Guidelines for bibliographic references and citations to information resources
Technical drawings and diagrams	ISO 128 (all parts), Technical product documentation (TPD) — General principles of representation
	ISO 129 (all parts), Technical product documentation (TPD) — Presentation of dimensions and tolerances
	ISO 3098 (all parts), Technical product documentation — Lettering
	ISO 6433, Technical product documentation — Part references
	ISO 14405 (all parts), Geometrical product specifications (GPS) — Dimensional tolerancing
	IEC 61082-1, Preparation of documents used in electrotechnology — Part 1: Rules
	IEC 61175-1, Industrial systems, installations and equipment and industrial products — Designation of signals — Part 1: Basic rules
	IEC 81346 (all parts), Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations
	ISO Resource area, available at https://www.iso.org/iso/graphics_formats_and_tools.pdf
	Document preparation in the IEC, available at https://www.iec.ch/standardsdev/resources/draftingpublications/
Technical documentation	IEC 61355-1, Classification and designation of documents for plants, systems and equipment — Part 1: Rules and classification tables
	IEC 61360 (all parts), Standard data element types with associated classification scheme for electric components
	Technical documentation standards developed by individual ISO technical committees are listed in the ISO Catalogue under group 01.140.30 Documents in administration, commerce and industry.
Graphical symbols, public information symbols and safety signs	ISO 3864 (all parts), Graphical symbols — Safety colours and safety signs
	ISO 7000, Database: Graphical symbols for use on equipment — Registered symbols
	ISO 7001, Graphical symbols — Public information symbols
	ISO 7010, Graphical symbols — Safety colours and safety signs —Registered safety signs
	ISO 7083, Technical product documentation — Symbols used on technical product documentation — Proportions and dimensions

ISO 9186 (all parts), Graphical symbols — Test methods

ISO 14617 (all parts), Graphical symbols for diagrams

ISO 22727, Graphical symbols — Creation and design of public information symbols — Requirements

ISO 81714-1, Design of graphical symbols for use in the technical documentation of products — Part 1: Basic rules

IEC 60417, Graphical symbols for use on equipment

IEC 60617, Graphical symbols for diagrams

IEC 80416 (all parts), Basic principles for graphical symbols for use on equipment

IEC 81714-2, Design of graphical symbols for use in the technical documentation of products — Part 2: Specification for graphical symbols in a computer sensible form, including graphical symbols for a reference library, and requirements for their interchange

ISO/IEC Guide 74, Graphical symbols — Technical guidelines for the consideration of consumers' needs

D.2 Technical reference documents and sources for drafting

In order to achieve technical consistency within all the documents published by ISO and IEC, the text of every document should be drafted in accordance with the following documents. The following list of basic reference works is not exhaustive. For specific subjects not covered by the list below, writers should use documents published by ISO and IEC, as far as possible.

Limits, fits and surface properties Tolerancing of dimensions and uncertainty of measurement	Documents developed by ISO/TC 213, Dimensional and geometrical product specifications and verification (see ISO Catalogue).
Preferred numbers	ISO 3, Preferred numbers — Series of preferred numbers ISO 17, Guide to the use of preferred numbers and of series of preferred numbers ISO 497, Guide to the choice of series of preferred numbers and of series containing more rounded values of preferred numbers IEC 60063, Preferred number series for resistors and capacitors IEC Guide 103, Guide on dimensional co-ordination

Statistical methods	ISO 3534 (all parts), Statistics — Vocabulary and symbols ISO/IEC Guide 98-3, Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995) Documents developed by IEC TC 56, Dependability (see IEC Catalogue), and by ISO/TC 69, Applications of statistical methods (see ISO Catalogue).
Environmental conditions and associated tests	ISO Guide 64, Guide for addressing environmental issues in product standards Documents developed by IEC TC 104, Environmental conditions, classification and methods of test (see IEC Catalogue).
Health and safety	ISO/IEC Guide 50, Safety aspects — Guidelines for child safety in standards and other specifications ISO/IEC Guide 51, Safety aspects — Guidelines for their inclusion in standards IEC Guide 104, The preparation of safety publications and the use of basic safety publications and group safety publications
Chemistry	ISO 78-2, Chemistry — Layouts for standards — Part 2: Methods of chemical analysis
EMC (electromagnetic compatibility)	IEC Guide 107, Electromagnetic compatibility — Guide to the drafting of electromagnetic compatibility publications
Conformity and quality	ISO 9000, Quality management systems — Fundamentals and vocabulary ISO 9001, Quality management systems — Requirements ISO 9004, Quality management — Quality of an organization — Guidance to achieve sustained success ISO/IEC 17050-1, Conformity assessment — Supplier's declaration of conformity — Part 1: General requirements ISO/IEC 17050-2, Conformity assessment — Supplier's declaration of conformity — Part 2: Supporting documentation ISO/IEC Guide 23, Methods of indicating conformity with standards for third-party certification systems

Environmental management	ISO 14040, Environmental management — Life cycle assessment — Principles and framework ISO 14044, Environmental management — Life cycle assessment — Requirements and guidelines
Packaging, protection and storage	Technical documentation standards developed by individual ISO technical committees are listed in the ISO Catalogue under ICS group 55 Packaging and distribution of goods. Technical documentation standards developed by individual IEC technical committees are listed in the IEC Catalogue under ICS group 55 Packaging and distribution of goods.
Consumer issues	ISO/IEC Guide 14, Products and related services — Information for consumers ISO/IEC Guide 37, Instructions for use of products by consumers ISO/IEC Guide 41, Packaging — Recommendations for addressing consumer needs ISO/IEC Guide 46, Comparative testing of consumer products and related services — General principles ISO/IEC Guide 74, Graphical symbols — Technical guidelines for the consideration of consumers' needs ISO/IEC Guide 76, Development of service standards — Recommendations for addressing consumer issues
International standardization	ISO/IEC Guide 21-1, Regional or national adoption of International Standards and other International Deliverables — Part 1: Adoption of International Standards ISO/IEC Guide 21-2, Regional or national adoption of International Standards and other International Deliverables — Part 2: Adoption of International Deliverables other than International Standards
Accessibility	ISO/IEC Guide 71, Guide for addressing accessibility in standards ISO 17069, Accessible design — Consideration and assistive products for accessible meeting
Sustainability	ISO Guide 82, Guidelines for addressing sustainability in standards

IEC Guide 109, Environmental aspects — Inclusion in electrotechnical product standards

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1) Available at https://www.iso.org/obp.

2) Available at https://std.iec.ch/iec60417.

3) Available at https://std.iec.ch/iec60617.

4) Available at https://www.iso.org/directives (in the section “Normative references”).