
**Plastics — Environmental aspects —
General guidelines for their inclusion
in standards**

*Matières plastiques — Aspects liés à l'environnement — Lignes
directrices générales pour leur prise en compte dans les normes*

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html. (standards.iteh.ai)

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 14, *Environmental aspects*.
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This second edition cancels and replaces the first edition (ISO 17422:2002), which has been technically revised. The changes compared to the previous edition are as follows:

- [Clause 1](#) has been revised to include “renewable resources” [item b) 6) of the Note];
- in [Clause 3, 3.10](#) “renewable resource” and [3.11](#) “end-of-life” have been added;
- terms and definitions formerly in [Annex A](#) have been moved to [Clause 3](#), except “life cycle impact assessment (LCIA)” which has been deleted because it is not used in the document;
- subclause [4.3.4](#) “Renewable resources and energy” has been added;
- a Note has been added to [A.4](#) to provide a new example of energy input;
- the Bibliography has been revised and updated.

Plastics — Environmental aspects — General guidelines for their inclusion in standards

1 Scope

This document provides a structure for inclusion of environmental aspects in standards for plastics products. It proposes an approach which is directed at minimizing any adverse environmental impact without detracting from the primary purpose of ensuring adequate fitness for use of the products under consideration.

The guidance provided by this document is intended primarily for use by standards writers. Over and above its primary purpose, however, this document provides guidance of value to those involved in design work and other activities where environmental aspects of plastics are being considered.

NOTE This document is intended to promote the following practices:

- a) the use of techniques for identifying and assessing the environmental impact of technical provisions in standards, and for minimizing their adverse effects;
- b) the adoption of good practices such as:
 - 1) procedures for pollution avoidance, e.g. through end-of-life options and its proper management;
 - 2) material and energy conservation in the light of the intended use (and foreseeable misuse) of the product;
 - 3) safe use of hazardous substances; [ISO 17422:2018](https://standards.iteh.ai/catalog/standards/sist/574b4c52-e5fe-4ff6-9d98-4a7bad9a7dfc/iso-17422-2018)
 - 4) avoidance of technically unjustifiable restrictive practices; <https://standards.iteh.ai/catalog/standards/sist/574b4c52-e5fe-4ff6-9d98-4a7bad9a7dfc/iso-17422-2018>
 - 5) promotion of performance criteria rather than exclusion clauses such as are based, for example, only on chemical composition criteria;
 - 6) use of renewable resources and minimization of the use of non-renewable resources, if the life cycle assessment shows favourable;
- c) the adoption of a balanced approach in standards development to issues such as environmental impact, product function and performance, health and safety, and other regulatory requirements;
- d) the regular review and revision of existing standards in the light of technical innovations, permitting improvement in the environmental impact of products and processes;
- e) the application of life cycle analytical approaches wherever applicable and technically justifiable.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

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

**3.1
design**

creative activity that, based on expressed or implied needs, existing means and technological possibilities, results in the definition of technical solutions for a product that can be commercially manufactured or fabricated into prototypes

**3.2
eco-profile**

partial *life cycle inventory analysis* (3.14) beginning at the raw material extraction phase and ending at the point where the *plastics product* (3.8) is ready for transfer to the next operator in the supply chain

**3.3
environmental aspect**

element of an organization's activities, products or services that interacts or can interact with the environment

[SOURCE: ISO 14001:2015, 3.2.2]

**3.4
environmental impact**

change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's *environmental aspects* (3.3)

[SOURCE: ISO 14001:2015, 3.2.4]

**3.5
environmental provision**

normative element of a standard that specifies measures for minimizing adverse environmental impact of a test method, material or product

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**3.6
life cycle**

consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to the final disposal

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[SOURCE: ISO 14040:2006, 3.1]

**3.7
life cycle assessment**

LCA

compilation and evaluation of the *inputs* (3.13), *outputs* (3.16) and the potential *environmental impacts* (3.4) of a product system throughout its *life cycle* (3.6)

[SOURCE: ISO 14040:2006, 3.2]

**3.8
plastics product**

material or combination of materials, semi-finished or finished product that is within the scope of ISO/TC 61

**3.9
product standard**

standard that specifies requirements to be fulfilled by a product or group of products

**3.10
renewable resource**

any natural resource in the form of material or energy, which is replenished or replaced on natural processes

Note 1 to entry: Renewable resource includes agricultural products, biomass, solar, wind, water, hydro power, geothermal, tidal energy and renewed biomass etc. and excludes recovered or wasted energy.

Note 2 to entry: Organic fraction of municipal waste is considered as a renewable energy source.

Note 3 to entry: Whether the energy stored in a technical system is renewable or not depends on the nature of the original energy source.

Note 4 to entry: Criteria to categorize an energy source as renewable differ amongst jurisdictions, based on local environmental or other reasons.

3.11 end-of-life

life cycle stage of a product when a proper waste management is applied for discarded end-user products

Note 1 to entry: For plastics waste recycling and recovery, see ISO 11469 and ISO 15270. See also [Annex A](#).

3.12 energy recovery

production of useful energy through direct and controlled combustion

Note 1 to entry: Solid-waste incinerators producing hot water, steam and/or electricity are a common form of energy recovery.

Note 2 to entry: From a technical point of view, the term “energy recovery” applies to any process where the calorific value or the sensible heat of a material is wholly, or partially, converted into useful energy.

[SOURCE: ISO 15270:2008, 3.11, modified — Note 2 to entry has been added.]

3.13 input

material or energy which enters a unit process

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3.14 life cycle inventory analysis LCI

phase of *life cycle assessment* (3.7) involving the compilation and quantification of *inputs* (3.13) and *outputs* (3.16) for a product throughout its *life cycle* (3.6)

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Note 1 to entry: As life cycle inventory analysis describes a product system and not the product in isolation, the life cycle data cover factors including materials, design, performance, use pattern and waste management.

[SOURCE: ISO 14040:2006, 3.3, modified — Note 1 to entry has been added.]

3.15 mechanical recycling

processing of plastics waste into secondary raw material or products without significantly changing the chemical structure of the material

Note 1 to entry: This definition does not generally cover chemical or feedstock recycling processes applied to plastics.

[SOURCE: ISO 15270:2008, 3.21, modified — Note 1 to entry has been changed.]

3.16 output

material or energy which leaves a unit process

Note 1 to entry: Such material includes raw materials, intermediate products, finished products, emissions and waste.

4 Inclusion of environmental aspects in standards

4.1 General

In the preparation of International Standards, close co-ordination within and among sub-committees and working groups responsible for different plastics products or processes is necessary in order to create a coherent approach to the incorporation of environmental provisions. Appropriate co-ordination will ensure that such activity on environmental provisions will neither retard nor inhibit the normal standards development process.

Any plan to prepare a new standard or to revise an existing standard with inclusion of environmental provisions should define, as far as possible, both the purpose of the standard and its expected major users. This exercise will help to determine how the standard is likely to be used, for example for quality control or for conformity assessment, to identify the relevant environmental aspects and to assess the users' level of expertise, needs and expectations.

Standards should be drafted with a view to providing provisions which eliminate or reduce any identified environmental hazards, and, where possible, these provisions should be expressed in terms of verifiable preventive measures. Requirements for preventive measures should be expressed precisely, clearly and with technical accuracy, and the requirements for verification should be clearly stated.

Whenever appropriate, the standard should state what environmentally relevant information has to be provided to persons involved with the product or process.

NOTE Terminology of plastics is defined in ISO 472. This document additionally includes environmental terms.

4.2 Test method standards

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4.2.1 General

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International Standards for the testing of plastics products should also provide scope for application of ISO Guide 64 by drawing attention to the importance of product sustainability issues such as resource conservation and pollution prevention.

Where such issues are already being addressed (for example within ISO/TC 61/SC 5, *Physical-chemical properties*, ISO/TC 61/SC 6, *Ageing, chemical and environmental resistance* and ISO/TC 61/SC 14, *Environmental aspects*, etc.), this fact should be brought to the attention of the users of the standards by means of an introductory statement within the text of the standard. Standards writers should take this into account whenever existing standards are being revised or new ones are being prepared.

To avoid unnecessary proliferation of tests, standards writers should consider combining, or selecting between, similar test methods that are used for measuring identical product properties.

4.2.2 Minimization of adverse environmental impact

When test method standards are being written or revised, their associated environmental impact should be evaluated; test equipment and procedures should be reviewed to minimize adverse environmental impact. Such reviews should not in any way compromise the fitness for purpose of the test apparatus or procedure. Once a new test method standard with reduced adverse environmental impact has been developed in replacement of an existing procedure, it should be validated and, thereafter, the existing test method standard withdrawn.

The following considerations apply.

a) Material testing

Any substance specified in a standard that becomes the subject of well-founded environmental concern should include the relevant clauses taken from appropriate material documentation such as safety data sheets (SDSs).

Whenever possible, a substance which is incorporated in a plastics material shall be assessed according to risk assessment and appropriate measures should be taken.

Existing ISO test methods standards shall be applied.

b) **Quality testing**

According to ISO quality standards.

c) **Environmental testing**

According to ISO environmental standards.

4.2.3 **Minimization of material and energy usage**

The usage of materials and energy is affected by many factors such as the scale of the test, the specimen size and the number of specimens, the required levels of reproducibility and repeatability, and the power specifications of the test equipment.

Test method standards should be designed with a view to minimizing material and energy usage without compromising the quality of the test result obtained through use of the standard.

Where appropriate, guidance should be given to the user of the standard on how to minimize the use of material and energy.

4.3 **Product standards**

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4.3.1 **General**

Writers of plastics product standards should incorporate a general introductory statement highlighting the fact that this document (i.e. ISO 17422) and ISO Guide 64 have been taken into account in the preparation of the standard. In addition, this document (i.e. ISO 17422) and ISO Guide 64 should be cited systematically as informative references within future plastics product standards for the benefit of the users of such standards.

4.3.2 **Product functionality**

Designing a product made of, or incorporating, plastic should avoid over-simplification of material-selection criteria. A balance should be maintained between the overriding functional requirements of the product and the potential adverse environmental impacts that are to be determined in the context of the product/application system.

4.3.3 **Environmental aspects in product standards**

Optimization of an environmental approach in the development of plastics product standards will usually involve the following stages:

- a) the pre-selection of those materials ensuring appropriate technical and environmental performance throughout the intended service life;
- b) short-listing of functional materials that eliminate or minimize major adverse environmental impacts throughout the product life cycle;
- c) minimization of the quantities of materials used per unit produced;
- d) ease of maintenance and cleaning where appropriate.

The environmental characteristics of the most appropriate material to use in a specific application can be determined only by taking into consideration the complete life cycle. The scope and limitations of life