INTERNATIONAL STANDARD

ISO 18604

First edition
2013-01-15

Packaging and the environment — Material recycling

Emballage et environnement — Recyclage de matériau

Reference number
ISO 18604:2013(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 18604 was prepared by Technical Committee ISO/TC 122, *Packaging*, Subcommittee SC 4, *Packaging and environment*.

Introduction

Packaging plays a critical role in almost every industry, every sector, and every supply chain. Appropriate packaging is essential to prevent loss of goods and, as a result, decrease impact on the environment. Effective packaging makes a positive contribution towards achieving a sustainable society by, e.g.:

a) meeting consumer needs and expectations for the protection of goods, safety, handling, and information;

b) efficiently using resources and limiting environmental impact;

c) saving costs in the distribution and merchandising of goods.

An environmental assessment of packaging should include the manufacturing and distribution system, the wastage of packaging material and goods, the relevant collection systems, as well as recovery or disposal operations. This group of ISO standards and supporting reports provides a set of procedures which aim to:

d) reduce environmental impact;

e) support innovation in product, packaging, and the supply chain;

f) avoid undue restrictions on the use of packaging;

g) prevent barriers and restrictions to trade.

A packaging should be designed to provide a number of functions for users and producers such as: containment, protection, information, convenience, unitization, handling, delivery, or presentation of goods. A major role of packaging is prevention of damage to, or loss of goods. (See ISO 18601, Annex A for a list of the functions of packaging.)

ISO 18601 defines the interrelationships within the family of ISO standards which cover the environmental impact of packaging throughout its life cycle (see Figure 1). These standards will help define whether the selected packaging can be optimized and whether the packaging needs to be modified to ensure it can be reused or recovered after use.

Demonstration that the requirements of these standards are met can be performed by first party (manufacturer or supplier), second party (user or purchaser), or the support of third party.

There are different methods to which public claims on the environmental attributes of packaging are discussed. Some of these are technical aspects on reuse or recovery, others relate to access by the population to reuse or recovery systems or the amount of packaging placed on the market for recovery. This series of standards addresses the technical aspects of packaging. They do not address the requirements of ISO 14021 needed to support a claim or label.

This International Standard does not use the term “and/or” but instead, the term “or” is used as an inclusive disjunction, meaning one or the other or both.

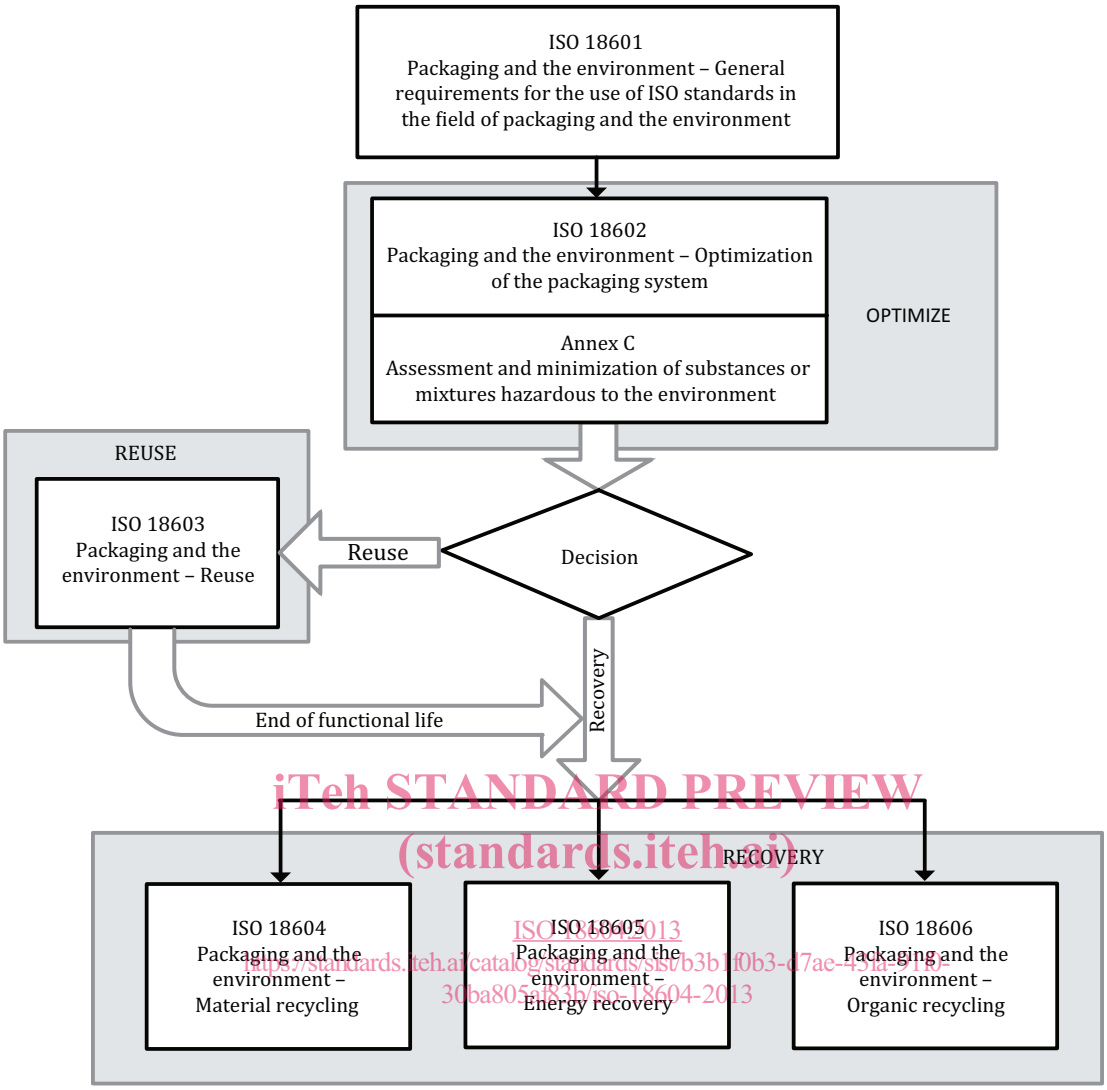

Figure 1 — Relationship of the Packaging and environment standards

Packaging and the environment — Material recycling

1 Scope

This International Standard specifies the requirements for packaging to be classified as recoverable in the form of material recycling while accommodating the continuing development of both packaging and recovery technologies and sets out procedures for assessment of meeting the requirements of this International Standard.

This International Standard cannot by itself provide presumption of meeting the requirements. The procedure for applying this International Standard is contained in ISO 18601.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 18601, *Packaging and the environment — General requirements for the use of ISO standards in the field of packaging and the environment*

ISO 21067, *Packaging — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions in ISO 21067 and ISO 18601 and the following apply.

3.1
empty packaging
packaging is empty if, under normal and foreseeable circumstances, all product residues that can be removed by the emptier have been removed using practices commonly employed for that type of packaging

3.2
primary (virgin) raw material
material which has never been processed into any form of end-use product

3.3
material recycling
reprocessing, by means of a manufacturing process, of a used packaging material into a product, a component incorporated into a product, or a secondary (recycled) raw material; excluding energy recovery and the use of the product as a fuel

Note 1 to entry: References to recycling in this International Standard refer to material recycling. Other options for recycling or recovery are not considered in this International Standard.

3.4
packaging unit
unit which serves a packaging function such as the containment, protection, handling, delivery, storage, transport, and presentation of goods

Note 1 to entry: In this International Standard, it is the subject of analysis.

3.5
recycling process
physical or chemical process which converts collected and sorted used packaging, together in some instances with other material, into secondary (recycled) raw materials, products, or substances, excluding energy recovery and the use of the product as a fuel

3.6
recyclable
characteristic of a product, packaging, or associated component that can be diverted from the waste stream through available processes and programmes and can be collected, processed, and returned to use in the form of raw materials or products

[SOURCE: ISO 14021, definition 7.7.1]

3.7
supplier
entity responsible for placing packaging or packaged goods on the market

Note 1 to entry: The term "supplier" in normal usage can relate to various points in a supply chain. For the purpose of this International Standard, it relates to any point in the supply chain where a transaction relating to packaging or packaged goods takes place.

[SOURCE: ISO 18601, definition 3.20]

3.8
packaging component
part of packaging that can be separated by hand or by using simple physical means

[SOURCE: ISO 18601, definition 3.9]

4 Requirements

4.1 Application

The application of this International Standard to any particular packaging shall be as specified in ISO 18601.

4.2 Packaging assessment

The supplier shall be able to demonstrate that the procedures defined in normative Annexes A and B have been followed in arriving at the final design of the finished packaging such that a certain percentage of the packaging materials can be claimed to be recyclable.

4.3 Declaration of percentage recyclable

Packaging may use more than one material whose relative proportions may vary from small components and constituents, typically represented by labels and closures, to large proportions in multi-material packaging.

The supplier shall declare the percentage by weight of the packaging unit of packaging that is recyclable, identifying the intended material recycling stream(s). An example of statements for this declaration is given in Annex C.

4.4 Meeting the requirements of this International Standard

The supplier should prepare a written statement of meeting the requirements stated in 4.2 and 4.3.

4.5 Support documentation

The assessment shall be documented and examples of the structure of such documentation are given in Annex C and examples are given in Annex D.

Annex A
(normative)

Procedures to evaluate packaging recoverable by material recycling

A.1 Objective

To identify the criteria that need to be taken into consideration when assessing the suitability of packaging for material recycling. These criteria for recycling should be considered in a perspective which includes all relevant aspects, from design, manufacture, and use, through to collection and sorting, until the packaging is recovered by material recycling, as well as the development of recycling technologies.

This perspective is conveniently illustrated and checked through the matrix approach presented in Table A.1, which represents a guideline to elaborate practical requirements for packaging recoverable in the form of material recycling.

The relevant boxes in Table A.1 highlight the interactions between life cycle steps and criteria for recyclable packaging.

A.2 Control of packaging construction/composition and processing

— Ensure that the design of packaging includes consideration of aspects significant for the recycling of the materials from which it is produced.

— Control selection of raw materials used in production/packing/filling operations and, where practicable, collection/sorting operations to ensure that the recycling processes are not negatively affected.

A.3 Suitability for available material recycling technology

— Ensure that the design of packaging makes use of suitable materials or combinations of materials which are compatible with the known, relevant, and industrially available recycling technologies while also recognizing the interrelationship of standards as detailed in 4.1.

NOTE The development and marketing of new packaging materials and systems may precede the substantial introduction of appropriate recycling processes. It is recognized that the development and expansion of such recycling processes may take a period of time, and that due consideration should be given regarding the impact on existing collection and recycling processes.

— Establish a system designed to ensure that new developments in the relevant technology for the recycling of the material used in packaging are monitored and recorded and that such records are available to the design function.

A.4 Releases to the environment caused by recycling of the packaging after use

Take account of the potential change in releases to the environment arising from the used packaging or product residues in the recycling process.

Table A.1 — Elaboration of requirements by a decision matrix with interactions between life cycle steps and criteria for material recycling of packaging

Life cycle steps	Criteria for recyclable packaging		
	Control of packaging construction/composition and processing	Suitability for available recycling technologies	Releases to the environment caused by the recycling of used packaging
	A.2[a]	A.3[a]	A.4[a]
Design	Relevant	Relevant	Relevant
Production	Relevant	Relevant	Relevant
Utilization	Relevant	—	Relevant
Sorting by the end-user	Relevant	—	Relevant
Collection/sorting	Relevant	Relevant	Relevant

[a] The numbering in the table refers to the Clauses of Annex A.

Annex B
(normative)

Procedure for assessing recyclability criteria

B.1 Objective

To assess the inter-relationship of the various criteria which support the requirements given in Clause 4 of this International Standard, as identified in Annex A and Table A.1, and detailed in the following paragraphs and in the matrix in Table B.1.

B.2 Design criteria

Design the packaging, including construction, composition, combinations, and separability of components, so as to ensure that it is compatible with the specifications of related recycling technologies, enables a certain percentage by weight of materials to be recycled, and takes into account

— substances or materials that are liable to create technical problems in the recycling process,

— materials, combinations of materials, or designs of packaging that are liable to create problems in collecting and sorting before material recycling, and

— the presence of the amount of substances or materials that are liable to have a negative influence on the quality of the recycled material.

A format for the declaration of the percentage recyclable is given in Annex C. Where the format and material of the packaging unit or components of packaging conform to national, international, or commercial standards or specifications suitable for collection, sorting, and recycling, this may be used as a basis for demonstration of recyclability.

Attention is drawn to the following factors affecting compatibility to specifications of recycling processes.

a) Efficient recycling depends on a material input of specified properties suitable for a production process with or without primary (virgin) raw material.

b) Packaging may use more than one material whose relative proportions may vary from the small proportions represented by labels or closures to the larger proportions in multi-material packaging. The manner in which specifications deal with this range of multi-material packaging can vary considerably depending on the materials being recycled, the recycling process, and the ability to empty the packaging as defined in 3.1.

c) Specifications of the packaging should take account of

   1) the separability of components when appropriate, and

   2) the mechanical and chemical compatibility of material compositions or material combinations with the recycling process and recovery streams.

These specifications should comply with relevant national or International Standards that are associated with the technical requirements of delivery and supply of the input material for the related recycling process.

d) Any other design characteristics which influence recyclability should be taken into account in arriving at the final packaging design, such as

   1) substances hazardous to the environment as addressed in ISO 18602, and