GUIDE 41

Second edition
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Packaging — Recommendations for addressing consumer needs

Emballage — Recommandations pour répondre aux besoins des consommateurs

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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 and IEC 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) or the IEC list of patent declarations received (see http://patents.iec.ch).

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

For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by the ISO Committee on Consumer Policy (COPOLCO).

This second edition cancels and replaces the first edition (ISO/IEC Guide 41:2003), which has been technically revised.

The main changes compared to the previous edition are as follows:

— expansion of the scope to include secondary and tertiary packaging, and other aspects such as labelling information and distribution channels;

— additional provisions on safety and sustainability of packaging to address the needs of vulnerable consumers;

— reference to ISO 18601 and related documents on packaging and the environment;

— additional guidance for suitability for intended purpose;

— integration of the iterative process of risk assessment and risk reduction using the approach of ISO/IEC Guide 51;

— updated references to other ISO/IEC Guides on product information for consumers, instructions for use of consumer products, child safety, safety aspects in standards and accessibility;

— addition of clauses on presentation of information, recognizability and uniformity, and legibility of text.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Packaging of products is of consumer interest, the cost of which is borne indirectly by the consumer. Standardization of aspects of packaging addresses such factors as safety, intended purpose and reliability, as well as such general needs as protection of the environment and energy conservation.

Aspects of packaging can vary in various jurisdictions and/or industry standards or technical specifications. Suppliers can establish, implement and maintain a procedure to identify the applicable laws and regulations of the countries where the consumer products are manufactured, imported, distributed and sold.

The objective of this document is to optimize the direct and indirect benefits to purchasers of products with respect to the following criteria:

— design: designing suitable packaging to preserve the packaged product until the moment of use;

— safety: protecting consumers from hazards associated with the packaging or the product, including health and safety, e.g. in cases of reuse;

— information: providing consumer information about the packaged product and its packaging;

— packaging: avoidance of misleading packaging;

NOTE Further information on misleading packaging practices is provided in a study published by the European Parliament[37].

— storage: enabling consumers to store the packaged product appropriately;

— cost impact: optimizing packaging to reduce total cost and the environmental impact of the packaged product and its packaging;

— environment: reuse and recovery to optimize the use of the packaging and dispose of it in a manner that minimizes its environmental impact.

A supplier of high quality packaging can benefit from an enhanced reputation. Cost savings in time and money can also be achieved by reduced levels of enquiries and complaints.

Packaging — Recommendations for addressing consumer needs

1 Scope

This document provides general recommendations to be taken into consideration when determining the most suitable type of packaging for products intended for consumers. The functions that packaging can perform include, but are not limited to, containment, protection, handling, transport, storage, convenience, information and presentation.

This document also considers the sustainable use of resources covering optimization, reuse and recovery of packaging.

This document provides guidance to:

— product designers, manufacturers and others engaged in the process of making decisions concerning packaging;

— those drafting standards to meet the packaging needs and requirements of consumers as prospective purchasers of products;

— committees preparing standards for consumer products or services;

— regulators.

This document is not applicable to bulk packaging, which is solely intended to protect products in bulk when being transported between manufacturers and retailers, and it is not intended for industrial packaging.

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:

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

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

3.1
consumer
individual member of the general public purchasing or using goods, property or services for private purposes

[SOURCE: ISO 14025:2006, 3.16]

3.2
packaging
product (3.24) to be used for the containment, protection, handling, delivery, storage, transport and presentation of goods, from raw materials to processed goods, from the producer to the user or *consumer* (3.1), including processor, assembler or other intermediary

[SOURCE: ISO 21067-1:2016, 2.1.1, modified — The domain <product> has been removed at the start of the definition.]

3.3
primary packaging
packaging (3.2) designed to come into direct contact with the *product* (3.24)

[SOURCE: ISO 21067-1:2016, 2.2.3]

3.4
secondary packaging
packaging (3.2) designed to contain one or more *primary packaging* (3.3) together with any protective materials where required

[SOURCE: ISO 18601:2013, 3.20, modified — The alternative term "group packaging" has been removed.]

3.5
tertiary packaging
packaging (3.2) designed to contain one or more articles or packages, or bulk material, for the purposes of transport, handling and/or distribution

[SOURCE: ISO 21067-1:2016, 2.2.6, modified — The alternative terms "distribution packaging" and "transport packaging" have been removed.]

3.6
sales packaging
packaging (3.2) constituting, with its contents, a sales unit for the final user or *consumer* (3.1) at the point of retail

[SOURCE: ISO 21067-1:2016, 2.2.7, modified — The alternative terms "consumer packaging" and "retail packaging" have been removed.]

3.7
industrial packaging
packaging (3.2) for raw materials, components and partially manufactured or finished goods, for distribution from manufacturer to manufacturer and/or other intermediaries such as processor or assembler

[SOURCE: ISO 21067-1:2016, 2.2.8]

3.8
bulk packaging
packaging (3.2) intended to contain loose articles, large masses of solids or granular materials, or liquids for transport or storage

[SOURCE: ISO 21067-1:2016, 2.2.10]

3.9
child-resistant packaging
package consisting of a container and appropriate closure which is difficult for young children under the age of 52 months to open (or gain access to the contents), but which is not difficult for adults to use properly

[SOURCE: ISO 8317:2015, 2.3]

3.10
reuse
operation by which *packaging* (3.2) is refilled or used for the same purpose for which it was conceived, with or without the support of auxiliary *products* (3.24) present on the market enabling the packaging to be refilled

Note 1 to entry: Non reusable items that support packaging reuse, such as labels or closures, are considered to be part of that packaging.

[SOURCE: ISO 18603:2013, 3.1]

3.11
packaging component
part of *packaging* (3.2) that can be separated by hand or by using simple physical means

[SOURCE: ISO 18601:2013, 3.11]

3.12
harm
injury or damage to the health of people, or damage to property or the environment

[SOURCE: ISO/IEC Guide 51:2014, 3.1]

3.13
hazard
potential source of *harm* (3.12)

[SOURCE: ISO/IEC Guide 51:2014, 3.2]

3.14
hazardous event
event that can cause *harm* (3.12)

[SOURCE: ISO/IEC Guide 51:2014, 3.3]

3.15
hazardous situation
circumstance in which people, property or the environment is/are exposed to one or more *hazards* (3.13)

[SOURCE: ISO/IEC Guide 51:2014, 3.4]

3.16
risk
combination of the probability of occurrence of *harm* (3.12) and the severity of that harm

Note 1 to entry: The probability of occurrence includes the exposure to a *hazardous situation* (3.15), the occurrence of a *hazardous event* (3.14) and the possibility to avoid or limit the *harm* (3.12).

[SOURCE: ISO/IEC Guide 51:2014, 3.9]

3.17
risk reduction measure
action or means to eliminate *hazards* (3.13) or reduce *risks* (3.16)

EXAMPLE *Inherently safe design* (3.20); protective devices; personal protective equipment; information for use and installation; organization of work; training; application of equipment; supervision.

[SOURCE: ISO/IEC Guide 51:2014, 3.13, modified — The alternative term “protective measure” has been removed.]

3.18
safety
freedom from *risk* (3.16) which is not tolerable

[SOURCE: ISO/IEC Guide 51:2014, 3.14]

3.19
tolerable risk
level of *risk* (3.16) that is accepted in a given context based on the current values of society

[SOURCE: ISO/IEC Guide 51:2014, 3.15, modified — The original Note to entry has been removed.]

3.20
inherently safe design
measures taken to eliminate *hazards* (3.13) and/or to reduce *risks* (3.16) by changing the design or operating characteristics of the *product* (3.24)

[SOURCE: ISO/IEC Guide 51:2014, 3.5, modified — The words "or system" have been removed.]

3.21
vulnerable consumer
consumer (3.1) at greater *risk* (3.16) of *harm* (3.12) from *products* (3.24), due to age, level of literacy, physical or mental condition or limitations, or inability to access product *safety* (3.18) information

[SOURCE: ISO/IEC Guide 51:2014, 3.16, modified — The words "or systems" have been removed.]

3.22
x-height
height of lowercase letters, ignoring ascenders or descenders

Note 1 to entry: Annex A provides further information on x-height.

3.23
useful life
time period during which all the performance requirements are met

3.24
product
any goods or service

[SOURCE: ISO 14024:2018, 3.2]

4 Safety of packaging

4.1 Risk assessment and risk reduction

The iterative process of risk assessment and risk reduction for each hazard is essential in achieving acceptable/tolerable risk. All products can include hazards and, therefore, some level of residual risk.

ISO/IEC Guide 51 requires standards writers and standards users to use the iterative process of risk assessment and risk reduction measures, to achieve acceptable/tolerable risk.

4.2 Packaging materials

4.2.1 Packaging materials should be assessed for human and environmental impact of hazardous substances, including, but not limited to, four heavy metals (mercury, cadmium, lead and hexavalent chromium).

NOTE Limits to heavy metals and other substances hazardous to humans and the environment can be found in national and regional regulations.

4.2.2 Packaging materials should be compatible with the content. For example, in cases of alimentary and medical contents the packaging should be food grade and medical grade respectively.

4.2.3 Packaging materials should not deteriorate and become ineffective due to contact with the contents.

4.3 Storage of the package and product

4.3.1 The packaging material should not present a hazard by causing:

— the emission of substances which can endanger or be harmful to health or to the environment;

— the contamination of its contents or the contamination resulting from the interaction of the packaging material with its contents.

4.3.2 The contents should not leak. The risks posed by the leaking of hazardous materials should be assessed. The following possible causes of leakage should be considered:

a) defective seals;

b) improper application of a closing device;

c) deterioration of the packaging caused by outside influences, e.g. temperature, light or mechanical forces;

d) any relevant warnings and instructions for disposal (e.g. “Do not flush unused medications in the toilet”), which should be repeated where technically feasible on any inner packaging;

e) deterioration of the packaging caused by the product.

4.3.3 When the product in a package requires the release of non-toxic gases for avoiding product deterioration, a packaging design which allows controlled release is accepted e.g. smart packaging for medical devices, coffee and dairy products.

4.3.4 In cases where the product can pose a hazard, the packaging should be clearly labelled with relevant warnings and instructions for storage, e.g. "refrigerate after opening".

NOTE 1 Information on warnings and labelling is given in ISO 3864-1 and ISO 3864-2.

NOTE 2 Information on the use of graphical symbols in safety signs and product safety labels is given in ISO/IEC Guide 74.

NOTE 3 Information for visually impaired consumers in need of tactile warning symbols is given in ISO 11683.

NOTE 4 Guidance on child-resistant packaging is given in ISO 8317.

NOTE 5 Information on safety colours and safety signs is given in ISO 7010.

4.4 Safety considerations

4.4.1 Potentially harmful contents

Where contents are potentially harmful, the following should be considered.

a) The packaging should not be misleading in that it should be clearly distinguishable, in colour and shape or by other means, from packaging used for food or beverages.

b) The packaging should be clearly labelled with relevant warnings and instructions for use and disposal of the contents.

c) Any relevant warnings and instructions for use (e.g. “Keep out of children's reach”) should be repeated where technically feasible on any inner packaging.

d) Any relevant warnings or instructions for disposal (e.g. “Do not flush after use” or “Do not flush unused medications in the toilet”) should be repeated where technically feasible on any inner packaging or on the product itself, as appropriate.

e) Child-resistant packaging according to ISO 8317 should be used.

NOTE 1 ISO 11156 provides further information on accessible packaging design which is “child-resistant-senior- friendly”.

f) Packaging should not be appealing to children.

NOTE 2 ISO/IEC Guide 50 provides further information on safety aspects in standards for children.

g) In the case of packaging of food products, chemical and pharmaceutical products, where applicable, the expiration date needs to be visible, permanent and legible in a colour that contrasts with the background, or embossed. Recommended fonts are Arial or Helvetica, because the letters are separated and are therefore are legible, and the minimum size of the letters is 8 points. The legibility of the expiration date should be ensured based on the packaging size.

NOTE 3 The date format specified in ISO 8601 can be used, i.e. the format YYYYMMDD (e.g. 20170412).

NOTE 4 Information on issues related to product safety is given in ISO 10377.

4.4.2 Potential hazards associated with opening packaging

Consumers should be informed about the product’s useful life after the package has been opened.

Where the packaging or the product can pose a hazard upon opening the package or on removing the product, the following should be considered:

a) information for opening the package and removing the product from the package should be on the package;

b) the method of opening the package should be appropriate to the type of package, the product and the type of consumers;

c) in some situations, two or more consumer groups can have different and possibly conflicting requirements with respect to the methods of opening;

d) the packaging should allow the removal of the product without damage to the product or exposing the consumer to risk that is not tolerable;

e) the design of packaging should be such that the consumer will be able to open it easily, with tolerable risk of injury or damage to the product;

NOTE 1 Further guidance is given in ISO 3864-1, ISO 3864-2, ISO 14021 and IEC 82079-1.

f) the hazard of suffocation for children associated with flexible plastic packaging should be carefully considered, and the risk of suffocation should be assessed regarding the following:

— the need for the product to be wrapped in flexible plastic packaging;

— the nature of product being packaged (e.g. the packaging for very small products does not necessarily present a risk);

— whether the packaging material will be destroyed when the product is unwrapped (e.g. shrunk-on packaging);

— whether the packaging is intended for single or repeated use or is capable of repeated use; the risks associated with repeated use packaging (e.g. bags) can be greater than for single use;

— the use of designs, colours or other properties that can make the packaging particularly appealing to young children;

NOTE 2 Further guidance on the risk of suffocation is given in ISO/IEC Guide 50 and CEN/TR 16353.

g) packaging should avoid small parts that can be easily removed by children and cause a choking hazard (i.e. containers for drink or food with caps that a user can open with their teeth should be designed so as not to be able to be inhaled and pose a choking hazard).

NOTE 3 The test method used in ISO 11540 for pen caps can be adaptable to packaging.

4.4.3 In cases where the contents can deteriorate or become harmful if the packaging is left open, clear closing instructions should be given.

EXAMPLE "Materials give off noxious fumes. Keep tightly closed."

NOTE ISO 19809 provides guidance on accessibility needs for information and marking, covering other issues such as opening and reclosing.

4.4.4 Consumers should be made aware of potential hazards associated with reusing primary packaging.

5 Suitability for intended purpose

5.1 Design

Neither the size nor the shape of the packaging should mislead the potential purchaser as to the amount of its contents. Where settling can occur, this information should be clearly stated on the outer packaging.

5.2 Protection

The packaging should protect the product without reducing the level of safety, performance or reliability of the product. The package design should withstand normal usage during transportation and storage during the anticipated life.

The contents should be protected against:

a) mechanical forces (e.g. impact or vibration);

b) contamination by substances (e.g. water or air);

c) climatic conditions (e.g. extreme temperatures);

d) radiation (e.g. ultraviolet light);

e) tampering and theft.

5.3 Handling

The packaging design should facilitate the following:

a) the transportation, the storage and the use of the product from the moment of purchase until the eventual disposal of the packaging;

b) the protection of the product prior to use and during subsequent storage;

c) easy single or repeated opening of the package and dispensing the product for the intended user;

NOTE 1 Further information on accessible design of packaging is given in ISO 11156 and CEN/TS 15945.

d) the closing and the keeping of the packaging closed when not in use; all closing devices should be suited to contents, to packaging and to potential users;

NOTE 2 Further information about accessible design for ease of opening and reclosing is given in ISO 17480.

NOTE 3 Further information about general requirements for accessible design is given in ISO 11156.

e) the removal of the contents from the packaging without damaging the contents;

f) the partial removal of the contents of the package should not damage the packaging so the packaging can continue to contain and protect the contents until the package is empty;

g) the removal of the contents without damaging the packaging when intentions are to reuse the packaging;

h) the complete emptying of the package.

6 Sustainable use of resources

6.1 Optimization, reuse and recovery

6.1.1 When designing the packaging, the product life cycle should be taken into account.

6.1.2 Packaging should be optimized and, where possible, reused, bearing in the mind the original purpose and the product-package system and product life cycle.

NOTE 1 Further information about packaging and the environment and optimization is given in ISO 18601 and ISO 18602.

NOTE 2 Individual users can reuse packaging.

NOTE 3 Further information about life cycle assessment is given in ISO 14040 and ISO 14044.

6.1.3 Once the package reaches the end of its functional life, it should be recoverable to minimize the environmental impact based on the requirements of ISO 18601 and applicable International Standards

dealing with packaging and the environment. Recoverable can mean material recycling, organic recycling or energy recovery (see Figure 1).

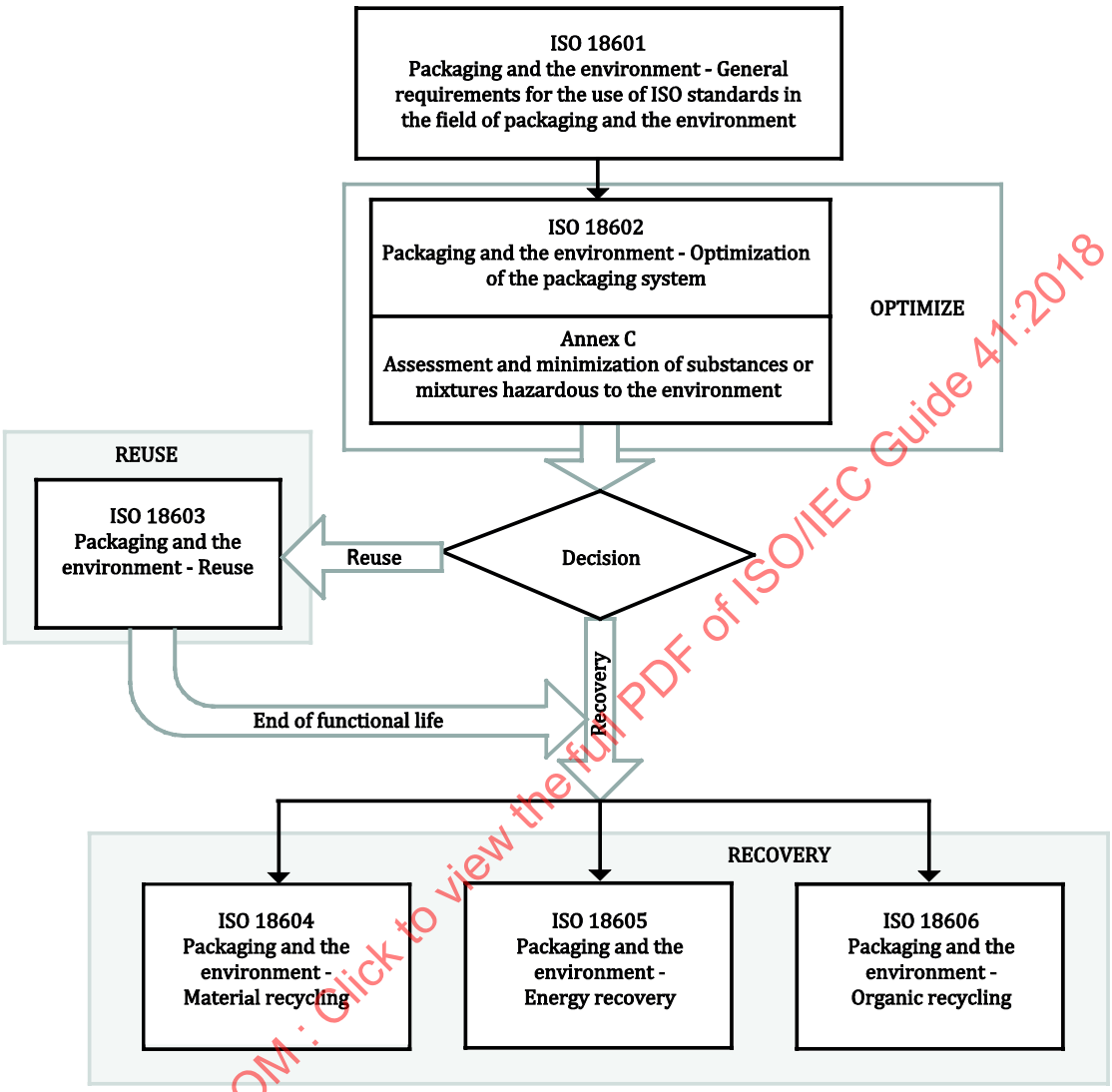

Figure 1 — International Standards dealing with packaging and the environment

6.1.4 Clear instructions should be given on the final disposal of packaging.

NOTE ISO/IEC Guide 37, IEC 82079-1 and ISO Guide 64 include provisions for minimizing the environmental impact of packaging.

6.1.5 Consumers should be made aware of potential hazards associated with reusing primary packaging, but can be encouraged to reuse secondary and tertiary packaging, where suitable. If the packaging is intended to be reusable, it should be easy to clean and refill.

6.2 Conservation of resources

When the decision has been taken to package products, the packaging should, as far as possible, be designed in order to conserve resources. In particular:

a) where practicable, the use of different types of materials should be minimized, e.g. the use of only one material can facilitate recycling;

b) in the method of manufacturing, the packaging should optimize the use of energy and other natural resources and should minimize environmental impact;

c) the packaging materials or their components should be reusable or recoverable (see Figure 1) and can include renewable and recycled material.

6.3 Cost to the consumer

Excessive packaging should be avoided. Care should be taken in the design of the packaging so as to optimize shipping costs, storage costs and disposal of the packaging. The cost of packaging should add as little as possible to the cost of the product.

7 Information

7.1 General considerations

7.1.1 Important information

Important information should be included on the sales package and can contain one or more of the following:

a) description of product;

b) product identification;

c) safety warnings [e.g. those in 4.4.1 c)];

d) contact information;

e) compliance-related information about the product and packaging;

f) list of ingredients;

g) nutritional data;

h) handling and storage instructions;

i) prevention of packaging deterioration through indications for packaging, storage and placement;

j) opening instructions;

k) instructions for use;

l) promotional messages and branding, i.e. to inform special qualities of new packaging material technology to show differentiation or advantages;

EXAMPLE "This coffee packaging is different because it allows release of CO_2."

m) information about reuse, recycling and/or final disposal of packaging.

NOTE Sales packaging can include just primary, or primary and secondary packaging.

If impracticable due to size, this information can be supplied through other means.

7.1.2 Supporting information

To support the information on the packaging, any reference information can appear on the website. Downloadable content should provide a range of soundtracks and subtitled options, including sign

language for consumers with hearing impairment and an audio description for those with visual impairment.

NOTE Further guidance on product information for consumers is given in ISO/IEC Guide 14.

7.2 Durability

The markings on the packaging should be durable, taking into account the expected exposure during storage, environmental exposure (e.g. temperature, salt mist) and mechanical handling before unpacking by the consumer.

The markings on the primary package should also be durable, taking into account the use and the length of time it can take for the product to be totally consumed.

7.3 Recognizability and uniformity

7.3.1 All the information should be stated in a precise way in order to aid potential users' understanding.

7.3.2 Attention should be given to the most appropriate location for the information.

7.3.3 To emphasize warning notices and any other information concerning safety, the use of larger or different typeface or other means of increasing conspicuousness is recommended. Attention is drawn to ISO/IEC Guide 37 and IEC 82079-1.

7.3.4 The typeface and size should be as clear and as large as practicable in order to ensure the greatest possible legibility for all potential purchasers, including vulnerable consumers.

7.3.5 Uniformity in the appearance, format and sequencing of information content, in particular with regard to purchase information, is needed to assist consumer recognition and comprehension.

7.3.6 All information intended to be retained by the purchaser for future use should be in a form that will not deteriorate in normal use.

NOTE 1 Further information on product information for consumers is given in ISO/IEC Guide 14.

NOTE 2 Further information about instructions for use of products by consumers is given in ISO/IEC Guide 37 and IEC 82079-1.

7.4 Legibility of text

7.4.1 Information should be easily visible and legible (with normal eyesight) from the distance at which users need to read them. Elements contributing to legibility include the viewing distance and angle, the style, size and colour of text font, the colour of the background and the brightness contrast between them.

7.4.2 Information on packaging should be visible and legible in the package's upright position. Where the visible surface area of the product or packaging available for text is necessarily very restricted, the product standard should specify minimum font sizes and brightness contrast.

7.4.3 In the absence of other technical requirements (e.g. the relation between type size and reading distance), the rules specified in bullets a) to d) below should be regarded as the minimum acceptable practice.

NOTE 1 The content of bullets a) to d) has been adapted from ISO/IEC Guide 37:2012, 7.2.4.

a) Critical packaging text (e.g. safety warnings) should be expected to be as clear and as large as practicable to be legible (at distances up to 1 m) by as high a proportion as possible of visually-impaired users. Headings, safety limits, key warning phrases and key details that the user needs to consult frequently should use a different font style, larger font size or other means of making them conspicuous. This can require a 14- or 16-point font with an "x-height" for lower-case letters of 4 mm or 5 mm.

   EXAMPLE "Heading", "*critical safety limit*", "KEY WARNING PHRASE".

b) Where space is limited by product size (e.g. in containers of less than 10 ml in capacity), an absolute minimum font size of 6 points can be tolerated, but only for continuous text in a high resolution plain black font on a bright (but not high-gloss) white background (with headings and warning phrases in a minimum font size of 8 points and a good "x-height").

c) Wherever space allows, continuous text in information on labels, packaging or multiple-folded instruction sheets should have a font of 9 points or larger. 12 points (with a good "x-height") is the desired minimum for critical safety limits (e.g. minimum user age, expiry date, maximum load) or warning phrases (unless also presented by a standardized symbol).

d) On packaging, headings, critical safety limits, key warning phrases and key details that the user needs to consult frequently should use a different font style, larger font size or other means of making them conspicuous. A minimum font size of 12 points (with a good "x-height") should be used. If there is any doubt as to whether particular instructions are related primarily to safety or to fitness for purpose, considerations dealing with safety should be given precedence.

NOTE 2 Annexes A and B provide further information on x-height.

7.4.4 A substantial number of visually impaired consumers have difficulty in reading the print on many packages and leaflets supplied with products. Whenever practical, suppliers should offer options of access to the information in alternative media (preferably audio and large print). Use of Braille for blind and low vision consumers should be considered.

NOTE 1 The requirements in ISO 17351 for Braille on packaging for medicinal products can be adaptable for packaging on other classes of products.

NOTE 2 ISO 11156 provides useful information on the application of Braille.

7.4.5 Where consumers are vulnerable due to lack of literacy, the packaging can have additional graphics. Where symbols and pictograms are used, they should have been objectively tested and independently shown to be understandable by prospective consumers. Graphical symbols should conform to recognized standards, e.g. ISO 7000, ISO 7001 or IEC 60417.

7.4.6 For other alphabets, the selection of lettering type and size should meet a comparable degree of legibility to that indicated above.

7.4.7 The use of topographies and colours can be an effective means of distinguishing purchase information from promotional material.

a) Lettering should be in a size that can be easily read at the time of purchase and as specified in the appropriate national or International Standard.

b) Owing to the relatively high incidence of colour vision impairment and other visual inadequacies, coloured lettering on coloured backgrounds should be avoided and there should be strong contrast between the lettering and the background. It should be visible, permanent, in legible characters in contrasting colour to the background where it is printed or embossed.

7.5 Colour

7.5.1 The use of topographies and colours can be an effective means of distinguishing purchase information from promotional material. It should be visible, permanent, in legible characters in contrasting colour to the background where it is printed or embossed.

7.5.2 If the use of colour is adopted, it should be functional, systematic and consistent, and used to provide contrast. Any safety signs in instructions should be coloured as specified in ISO 3864-2.

7.5.3 Use of colour should always be combined with clear information in alternative formats. Perception of different colours should never be the only distinction relied upon for understanding text or graphics in instructions.

7.5.4 Visually-impaired people, including people with colour vision disabilities, perceive inadequate contrast in red/green combinations, subtle colours or pastel shades, patterned backgrounds or insufficiently opaque paper printed on both sides. Consequently, instructional text should not be presented in these formats. Instructions should never be printed on transparent material unless an opaque background is given to the instructional text and diagrams.

Annex A
(informative)

Illustration of x-height

A.1 General

In typography, x-height refers to the height of lowercase letters, ignoring ascenders or descenders. It is measured from the baseline to the highest point of letters without ascenders. As letters with curves or vertices in the ascenders or descenders need to be drawn a little above and below the lines that frame them, so they appear the same size as the others, the letter x is usually taken as a reference.

NOTE This content of this annex is adapted from the Colombian standard GTC 260[39].

The relationship of x-height to other characteristics is shown in Figures A.1 and A.2.

Figure A.1 — Relationship of x-height to cap height, ascenders, descenders, baseline and mean line

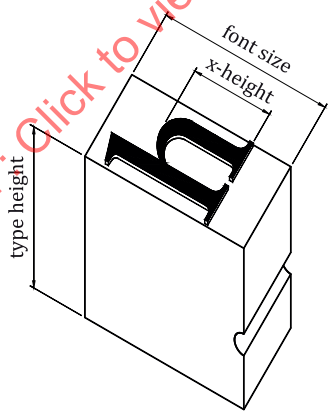

Figure A.2 — Contrast of x-height with font size and type height

x-height should not be confused with font size, which includes all the parts of the letter. Nor should it be confused with type height, which is the depth of the casting containing the letter. x-height is a characteristic feature of a typeface design and affects its readability.

Figure A.3 shows two typefaces of the same font size, American Typewriter and Nicolas Cochin, even though their x-height is quite different.