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Packaging — Accessible design — Handling and manipulation

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee PKW/0/-/12, Packaging - Ease of opening.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Design considerations for increasing accessibility in handling and manipulation ... **2**
4.1 General ... 2
4.1.1 General considerations ... 2
4.1.2 Mapping ... 2
4.1.3 Affordance ... 2
4.1.4 Feedback ... 2
4.1.5 Avoidance of simultaneous multiple operations ... 2
4.2 Weight and shape ... 3
4.2.1 Weight ... 3
4.2.2 Shape ... 3
4.2.3 Grip and grip size ... 3
4.2.4 Balance and stability ... 3
4.3 Ease of manipulation for opening and reclosing ... 3
4.3.1 Opening and reclosing mechanisms ... 3
4.3.2 Screw-tops ... 4
4.3.3 Top seals ... 4
4.3.4 Tearing ... 4
4.3.5 Lids ... 4
4.4 Ease of use: taking out contents ... 4
4.4.1 Measured dispensing ... 4
4.4.2 Prevention of splashing or spilling ... 4
4.5 Storage ... 4
4.6 Disposal and recycle ... 4
4.6.1 Disposal and separation ... 4
4.6.2 Folding and crushing ... 5
5 Safety ... **5**
5.1 General ... 5
5.1.1 Foolproof ... 5
5.1.2 Failsafe ... 5
5.2 Specific considerations ... 5
5.2.1 Sharp points or edges ... 5
5.2.2 Weight ... 5
5.2.3 Heat protection ... 5
6 Evaluation of handling and manipulation ... **5**
6.1 General ... 5
6.2 Instrument-based evaluation ... 6
6.3 User-based evaluation ... 6
7 Conformance ... **6**
Annex A (informative) **Ergonomics and ergonomic data for handling and manipulation of packaging** ... **7**
Annex B (informative) **Examples of packages of ease of handling and manipulation** ... **20**
Bibliography ... **26**

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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 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 Technical Committee ISO/TC 122, *Packaging*.

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.

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Introduction

While packages have become usable to a wide user range, including older people and people with disabilities, some users have difficulties with handling and manipulating packages. This includes holding, lifting, carrying, and grasping packages. These difficulties can be due to a heavy weight or a large size which is hard to lift or grasp for people with reduced physical abilities because of age or physical impairments. These problems, which are clearly addressing accessibility issues, should be solved with urgent attention for consumer packages to be used widely by users who have weakened or limited physical abilities.

Standards for increasing accessibility in packaging have been developed progressively for some particular issues, such as ease of opening and clear information and marking, as well as some specific cases, such as Braille on medicinal packages. While these standards have contributed effectively to make packages accessible, they still do not cover all the accessibility issues related to handling and manipulation of packages, even though the issues have been clearly addressed in the general framework of a set of accessibility standards in packaging.

This document was developed with an intention to provide requirements and recommendations with regard to handling and manipulation for increasing accessibility of packaging in the concepts and goals which are expressed in ISO/IEC Guide 71[1] and ISO/TR 22411[2].

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Packaging — Accessible design — Handling and manipulation

1 Scope

This document provides requirements and recommendations in designing consumer packages, independent of material, to increase accessibility with regard to handling and manipulation. The document considers packaging needs from a wide range of users with diverse human abilities and needs in diverse contexts of use.

Handling and manipulation include human physical abilities like holding, lifting, carrying, pulling, pushing, sliding, grasping, twisting, tearing and any combination of those actions related to portability, opening, re-closing and taking out contents of packages as well as to storage and disposal. Requirements and recommendations with regard to those abilities are provided for people with special needs including older people and people with disabilities in their handling and manipulation of packages. This document focuses on physical handling and manipulation which necessarily includes the processes of opening and closing specifically detailed in ISO 17480. It applies to reclosable and non-reclosable consumer packaging without using any other mechanical means.

This document is primarily for designers, developers and evaluators of packaging and is also useful for other disciplines.

Handling and manipulation for transportation of packaging is not covered in this standard. It does not apply to products regulated for safety or other reasons (e.g. toxic or dangerous goods and substances, medicinal products, and medical devices).

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 17480, *Packaging — Accessible design — Ease of opening*

ISO 21067-1, *Packaging — Vocabulary — Part 1: General terms*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 17480, ISO 21067-1 and the following apply.

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

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

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

3.1
accessibility
extent to which products, systems, services, environments and facilities can be used by people from a population with the widest range of user needs, characteristics and capabilities to achieve identified goals in identified contexts of use

Note 1 to entry: Context of use includes direct use or use supported by assistive technologies.

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[SOURCE: ISO 9241-112:2017, 3.15]

3.2
reclosable package
package which, after it has been initially opened, is capable of being reclosed with a similar degree of security and is capable of being used a sufficient number of times to dispense the total contents without loss of security

[SOURCE: ISO 8317:2015, 2.4]

3.3
user-based evaluation
evaluation that uses a method involving users with or without the use of measurement instruments and provides insight into the user's sensory, physical, and cognitive aspects

[SOURCE: ISO 17480:2015, 3.7]

4 Design considerations for increasing accessibility in handling and manipulation

4.1 General

4.1.1 General considerations

Packaging shall be designed taking into account users with physical, visual, and cognitive disabilities who have increased difficulty when handling and manipulating packaging that is likely to result in undesirable outcomes. Design items that relate to ease of carrying, opening, reclosing, measuring, take-out, storage, and disposal, shall be considered to increase accessibility to those people (see ISO 11156[18]).

4.1.2 Mapping

The direction of movement in handling and manipulation should correspond with that shown in signs or labels.

EXAMPLE A screw-top of clockwise rotation with a label of arrow(s) showing clockwise.

4.1.3 Affordance

The action that users need for handling and manipulation of packaging should be easily understood from the design before operation.

EXAMPLE A triangle notch at the edge of packaging to show to tear off for opening.

4.1.4 Feedback

Feedback of operation in handling and manipulation of packaging should be provided in any form when possible.

EXAMPLE A click sound at reclosing.

4.1.5 Avoidance of simultaneous multiple operations

Simultaneous multiple operations such as pressing and rotating at the same time should not be used except for the case of secure safety such as child-resistance.

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4.2 Weight and shape

4.2.1 Weight

Packages should be light enough to be held and lifted whether they are intended to be handled by both hands or by one hand. If packages are too heavy, mechanical assistance should be provided for ease of holding, lifting and carrying. Ergonomic knowledge and data for weight of packages are given in Annex A.

NOTE Some older users or users with physical disabilities like rheumatism have difficulty in holding, lifting, and carrying of packages due to their weak muscle strength.

EXAMPLE Handle(s) attached to the side of a package for easy lifting (see Annex A and Figure B.1).

4.2.2 Shape

The shape of packages should be designed for ease of handling and manipulation in accordance with the types of holding, lifting, and grasping packages.

The shape of packages should be designed so that they accommodate users and situations where only one hand is available.

4.2.3 Grip and grip size

Non-slippery surface finish should be used for ease of handling and grasping to exert the hand and arm strength of the user effectively.

EXAMPLE 1 Grooves or dents on the side of a heavy PET bottle (see Figure B.2).

EXAMPLE 2 Dimple processed edges of a flexible bag (see Figure B.3).

The width and shape for hand-gripping should be designed for easy gripping and holding by users with the widest range of characteristics and capabilities. Ergonomic knowledge and data for grip size and grip force are given in Annex A.

EXAMPLE 3 Pinched waist of a PET bottle or a cosmetic bottle (see Figure B.4).

4.2.4 Balance and stability

Packages should be designed well balanced in weight so that they do not tip over easily when placed on a flat surface.

NOTE 1 Users with hand tremor have difficulty in fine controlling of placing packages.

NOTE 2 Users with visual disabilities are able to touch and tip over packages unintendedly.

4.3 Ease of manipulation for opening and reclosing

4.3.1 Opening and reclosing mechanisms

Opening and reclosing mechanisms of packaging shall be easily understood and manipulated for intended actions such as grasping, pinching, rotating, twisting, tearing, pushing and pulling.

Reclosing should provide a mechanism to confirm the packaging is closed providing visual markings, tactile markings, auditory information such as a click sound, or strength limits (see ISO 17480).

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