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Information technology — Office equipment accessibility guidelines for elderly persons and persons with disabilities

Technologies de l'information — Lignes directrices pour l'accessibilité à l'équipement de bureau par les personnes âgées et par les personnes avec un handicap

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Foreword

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

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

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ISO/IEC 10779 was prepared by the Japanese Industrial Standards Committee (as JIS X 8341-5:2006) and was adopted, under a special "fast-track procedure", by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by the national bodies of ISO and IEC.

Introduction

With the progress of the information society, people will increasingly use information communication equipment, software, and services such as the Internet that are made possible by information communication technology.

This International Standard has been developed as guidelines to assist in the design and evaluation of office equipment for operation by persons with the widest range of capabilities, including persons with disabilities and persons with temporary disabilities.

This International Standard specifies features to provide guidance for designers of office equipment, based on ISO/IEC Guide 71:2001, *Guidelines for standards developers to address the needs of older persons and persons with disabilities* and ISO 9241-20, *Ergonomics of human-system interaction — Part 20: Accessibility guidelines for information/communication technology (ICT) equipment and services*.

Information technology — Office equipment accessibility guidelines for elderly persons and persons with disabilities

1 Scope

This International Standard specifies accessibility guidelines to be considered when planning, developing and designing electrophotographic copying machines, page printers and multi-function devices. These guidelines are intended to improve accessibility required when primarily older persons, persons with disabilities and persons with temporary disabilities (hereafter referred to as older persons and persons with disabilities) use office equipment.

2 Normative references

The following referenced documents are indispensable for the application 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/IEC Guide 71:2001, *Guidelines for standards developers to address the needs of older persons and persons with disabilities*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC Guide 71 and the following apply.

3.1
multi-function device
device providing two or more functions, such as electrophotographic copying, facsimile, printing and scanning functions

3.2
accessibility
usability of office equipment by persons with the widest range of capabilities, including persons with disabilities and persons with temporary disabilities

NOTE The concept of accessibility addresses the full range of user capabilities and is not limited to users who are formally recognized as having disability.

3.3
ergonomics
human factors
biological characteristics that can validly be applied to the specification, design, evaluation, operation and maintenance of products and systems, to enhance safety, and ensure effective and satisfying use by individuals, groups and organizations

3.4
assistive technology
assistive design
piece of equipment, product system, software or service that is used to increase, maintain or improve functional capabilities of individuals with disabilities

NOTE This can be acquired commercially off-the-shelf, modified or customized. The term includes technical aids for persons with disabilities. Assistive devices do not eliminate an impairment but can lessen the difficulty experienced by an individual in carrying out a task or activity in specific environments.

3.5
impairment
problem in body function or structure such as a significant deviation or loss, which can be temporary – due for example to injury – or permanent, slight or severe and can fluctuate over time, in particular deterioration due to aging

NOTE 1 Body function can be a physiological or physiological function of a body system; body structure refers to an anatomical part of the body such as organs, limbs and their components (as defined in the International Classification of Functioning and Disability (ICIDH-2) of July 1999).

NOTE 2 This definition differs slightly from that in ICIDH-2 1CH, May 2001, WHO.

3.6
user
person who interacts with the product, service or environment

NOTE Adapted from ISO 9241-11:1998.

3.7
usability
extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use

[ISO 9241-11:1998]

4 Principles

4.1 Basic policies

The basic policies which shall be followed with respect to office equipment in order to ensure and improve accessibility are as follows.

a) During the planning, development, and designing phases for office equipment, consideration shall be given to ensure that older persons and persons with disabilities are able to use the equipment.

b) During the planning, development, and designing phases for office equipment, consideration shall be given to user needs, accessibility shall be evaluated, and the result of this evaluation shall be reflected in the equipment design and implementation.

c) The accessibility feature of office equipment should not disrupt or disable any safety feature of the office equipment.

d) Even when accessibility features are added, it should not disrupt and disable any functions that were activated previously.

4.2 Basic requirements

4.2.1 General

In order to ensure and improve the accessibility of office equipment, the following basic requirements related to the physical abilities of users shall be considered.

However, guideline does not require office equipment to comply with all the basic requirements, but does require that the office equipment complies with at least one of them.

NOTE Two types of features may be used to satisfy the requirements: common functions and alternate functions.

— Common functions: These functions are commonly used by a variety of users.

— Alternate functions: These are used as alternatives to specific functions. For instance, voice-based functions used as an alternative to displaying would be considered an alternate function.

4.2.2 Operable with limited vision or without vision

Office equipment shall be operable even when it is difficult to obtain information through vision.

Since users with visual disabilities, color blindness, reduced visual acuity due to aging, and other such conditions may have difficulty in locating the positions and functions of operable controls, keys, switches, and other objects, alternate methods should be provided for users with limited vision and/or without vision.

EXAMPLE 1 Auditory feedback as well as visual information are provided to notify users of an operating state or an error.

EXAMPLE 2 The 5 key on a numeric keypad has a tactile label (nib).

EXAMPLE 3 Important keys for operations, such as a Start key and Stop key, are shaped differently so that they can be identified by touch.

EXAMPLE 4 Operable controls such as operation handles and guides are tactilely discernible due to their unique shape or tactile marks.

EXAMPLE 5 Power switches and other similar important keys are designed with some type of obstruction such as protective barrier around the keys or to be located in a recess so that they may not be pressed accidentally.

EXAMPLE 6 An end corner reference is provided on the document setting position, so that users can place a document on the original platen glass by touch.

EXAMPLE 7 The lines indicating the maximum capacity of documents that can be loaded into the automatic document feeder's document tray, and the maximum capacity of sheets of paper that can be loaded into the paper feed tray or paper cassette, are tactile as well as visible.

EXAMPLE 8 Auditory signals, such as input, invalid input, and base point tones are used for key operation feedbacks.

EXAMPLE 9 The office equipment has an auditory signal at the base point position when using toggle keys.

EXAMPLE 10 Black and white reversed screen display is provided so that the display is easier to view for users with impaired or limited vision.

EXAMPLE 11 A magnified view of information on the display is provided.

EXAMPLE 12 Display methods whereby the only methods of providing information in one location is through a change in color are not to be used.

EXAMPLE 13 Operation using voice recognition or voice guidance is provided.

4.2.3 Operable with limited hearing or without hearing

Office equipment shall be operable even if it is difficult to obtain auditory information.

In the case where information is only provided auditorily, this information may be lost due to hearing impairments, noisy environments, or environments where sound is forbidden. For this reason, alternate methods should be provided to users with limited hearing and/or without hearing.

EXAMPLE 1 Visual information such as screen display as well as auditory information are provided to notify users of an operating status or equipment error.

EXAMPLE 2 Notification of the facsimile function's reception, paper supply, paper jam, and other issues is provided with visual information such as a light , blinking indicator or status indication on a screen, as well as auditory information.

4.2.4 Operable even when operation through speech is difficult

Office equipment shall be operable even when operation through speech is difficult.

When the information use and operation by speech is a main function, alternate methods not requiring speech shall be provided.

EXAMPLE Equipment operated by voice recognition is operable through key input as well.

4.2.5 Operable with limited reach

Office equipment shall be operable with limited reach.

EXAMPLE 1 The display is set in a legible position and the operable controls are set in a position where input operations through keys entries and other methods are possible, regardless of differences in height of users.

EXAMPLE 2 The position and angle of operable controls are adjustable for users. For instance, an angle of the control panel is adjustable.

EXAMPLE 3 The main operable controls of office equipment are designed in positions to allow operation by as many users as possible.

EXAMPLE 4 Removing copy sheets from the copy-receiving tray is easy regardless of user's physique.

4.2.6 Operable with physical low strength or fine motor control

Office equipment shall be operable or usable for people who do not have significant physical strength or fine motor control.

The mechanically operable controls of equipment shall be easy to operate without excessive force or the need for delicate operations.

Since a required force varies depending on the shape and size of an operable control; the shape, size, and force required for operable controls shall be considered from a comprehensive standpoint.

EXAMPLE 1 Operable controls do not require tight grasping, pinching, or twisting of the wrist.

EXAMPLE 2 The paper feed tray and automatic document feeder are designed with springs, levers, electric motors, or other methods to reduce the operational power required for opening and closing.

EXAMPLE 3 The paper guide or the document guide is easy to align with the paper or document, even if users lacks physical strength or control capability.

4.2.7 Operable irrespective of lower body impairments

Office equipment shall be operable by persons with lower body impairments.

EXAMPLE 1 Users can operate the equipment without crouching.

EXAMPLE 2 The office equipment has handles that can be used to support users.

EXAMPLE 3 The office equipment is operable with one hand, considering users who use crutches and other such aids.

EXAMPLE 4 The office equipment is operable by remote control as well as the control panel.

4.2.8 Operable by wheelchair user

Office equipment shall be operable from a seated position such as from a wheelchair.

The display of equipment should be placed at a legible position, and the operable controls should be placed in a position that can be reached with the hands, so that those who use wheelchairs can operate the office equipment from a seated position. Otherwise, alternate methods shall be provided.

EXAMPLE 1 The control panel is in the front of the main unit.

EXAMPLE 2 The control panel's angle is adjustable to users.

EXAMPLE 3 The operable controls and scanner is separable from the device to put them on the desk.

EXAMPLE 4 For desktop office equipment where the office equipment is placed on a desk 700 mm above the floor, the operable controls are within the reach of users and at a distance from which they are legible.

EXAMPLE 5 For office equipment located on the floor, the paper feed tray or at least one paper cassette is positioned 380mm or higher above the floor.

EXAMPLE 6 A wheelchair user can stop the position of ADF(automatic document feeder) or platen cover when opening and closing at any position and the device will maintain that position for the user.

EXAMPLE 7 Users can operate the office equipment from wheelchair alongside the office equipment with one hand only, and simultaneous operations with two hands are not required.

EXAMPLE 8 The office equipment is operable with remote control devices as well as the main body’s control panel.

EXAMPLE 9 Automatic document feeder trays and other such trays are transparently colored so that documents are visible through the trays.

4.2.9 Operable with either hand

Office equipment shall be operable with either hand.

Office equipment shall be operable with one hand and/or shall not require two hands for normal operation, such as operations requiring users to operate a lever with one hand while supporting an object with the other hand.

EXAMPLE 1 Operable controls are operable with either hand, left or right.

EXAMPLE 2 Input operations do not require multiple keys to be pressed simultaneously.

EXAMPLE 3 The automatic document feeder can stop at any user's desired position, so that users can set a document on the original platen glass with one hand.

EXAMPLE 4 Paper guide and document guide are set with one hand easily.

4.2.10 Operable with limited mobility in the arms, legs, fingers, or with artificial limbs

Office equipment shall be operable with limited mobility in the arms, legs, fingers, or with artificial limbs.

Even when muscular weakness, paralysis, trembling hands, involuntary movements, and other causes make it difficult for users to accurately press controls such as buttons, keys, and switches, the office equipment should be operable with one hand, without requiring simultaneous combination operations.

EXAMPLE 1 Operable controls do not require tight grasping, pinching, or twisting of the wrist.

EXAMPLE 2 The main operation keys are designed as large as possible, with the surface of keys shaped concavely.

EXAMPLE 3 The Start key has a key guard in order to prevent inadvertent operation.

EXAMPLE 4 The input controls of the touch screen use technology that recognize operations with such as artificial hands.

EXAMPLE 5 The areas surrounding operable controls is left vacant, with space roughly equivalent to the size of a fist.

4.3 Recommended requirements

The following requirements are recommended for ensuring and improving the accessibility of office equipment.

a) Office equipment should be operable without an excessive burden placed upon cognitive or memory abilities.

b) Office equipment should be operable irrespective of cultural and linguistic differences.

EXAMPLE The language of operable controls is selectable appropriate to users.

c) Office equipment should be operable by users without previous experience.

EXAMPLE This provision does not apply to office equipment that requires professional training in order to learn how to operate the device.

EXAMPLE 1 Voice instructions can guide users in the operation of the office equipment.

EXAMPLE 2 The basic functions of the office equipment are operable intuitively without reference to the manual.

5 Requirements for operation

5.1 Scope of accessible functions and specifications

The basic functions of office equipment shall meet the accessibility requirements specified in these guidelines. Other expanded functions are within the scope of recommendation.

The functions of multifunction devices include copying, facsimile, printing, scanning, etc. The following provisions cover each scope of operation:

a) Basic functions and scope of operation are given in Annex A (normative).

b) Expanded functions and scope of operation are given in Annex B (informative).