EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 18339

April 2026

ICS

English version

Accessibility of non-digital information related to products and services

Barrierefreiheit von nicht-digitalen Informationen über Produkte und Dienstleistungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/CLC/JTC 12.

If this draft becomes a European Standard, CEN and CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN and CENELEC in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN and CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN and CENELEC members are the national standards bodies and national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

CEN-CENELEC Management Centre:
Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword

This document (prEN 18339:2026) has been prepared by Technical Committee CEN/CLC JTC 12 “Design for ALL”, the secretariat of which is held by SIS.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this standard.

The European Accessibility Act (EAA), Directive (EU) 2019/882 continues the EU’s and the member states’ commitment to accessibility. Six harmonized standards have been requested from the European standardization organisations, CEN, CENELEC and ETSI. Together these standards cover the accessibility requirements of the EAA, in different aspects. The documents are interrelated and interdependent.

This document provides requirements for the accessibility of information presented in non-digital forms on and about the products and services defined in the EAA.

The five other standards are:

— Design for All approach Managing accessibility of products and services, EN 17161.

— Accessibility of the built environment, EN 17210.

— Accessibility requirements for ICT products and services, EN 301549.

— Accessibility of support services for products and services, EN xxx

— Accessibility and interoperability of emergency communications and (for) the answering of emergency communications by the public safety answering points (PSAPs) (including to the single European Emergency number 112). ETSI TS 103 919

0 Introduction

0.1 Information in non-digital forms

This document provides requirements, recommendations and guidance for how information on and about products and services is to be presented in accessible visual, auditory and tactile non-digital forms.

Information presented in non-digital forms is information communicated in one direction, and which cannot be changed or adapted by the user.

Examples of information presented in non-digital forms includes but is not limited to; visual labels, signs, posters and documents; auditory speech and acoustic signals, and tactile lettering, symbols and shapes.

NOTE 1 In this document the section related to spoken information presented in one direction, is for live speech, recorded speech, and speech transmitted as public announcements. Requirements for two-way voice communication for conversations can be found in EN xxx Accessibility of support services for products and services.

NOTE 2 Information presented in non-digital forms is the result of a process that, in many cases, involves digital means, such as editing and printing an instruction manual or creating a synthesized spoken message for an announcement.

0.2 Presentation of accessible information

Information presented for use by more than one sensory channel is usable by a wider range of users.

Presenting information in visual, auditory and tactile forms can allow users to engage with it through the human sensory channels of seeing, hearing, and touch.

Information can be presented or made available in non-digital or digital forms.

Information presented in non-digital forms can indicate the availability of information provided in a digital form.

Example A set of instructions can include a QR code that links the user to a website that hosts a digital copy of the same instructions.

Combinations of non-digital and digital forms can be used to present information for more than one sensory channel.

0.3 Types of information and products and services

The requirements and recommendations in this document are applicable to the presentation of the types of information listed in Clause 1, Scope.

This document could be used by organisations for a wide variety of purposes, including the presentation of information and other products and services.

This document focuses on information presented in non-digital forms on and about products and packaging related to:

a) consumer general purpose computer hardware systems;

b) self-service terminals (e.g. ticketing, banking machines, etc); and,

c) consumer terminal equipment (e.g. TVs, radios, hearing aids, etc).

This document focuses on information presented in non-digital forms related to:

d) electronic communications services;

e) providing access to audiovisual media services;

f) E-commerce services;

g) air, bus, rail and waterborne transport services; and,

h) consumer banking services.

0.4 Structure of requirements and guidance in this document

Table 1 below shows the high-level structure of the document and how requirements are grouped for presentation of information in visual, auditory and tactile forms. The forms for presentation are further grouped for perceivable and understandable and also for text and non-text content.

Table 1 — The structure of the normative requirements and informative guidance in this document.

Multiple Sensory Channels in Clause 4.2 and Annex B				
Testing the presentation of information in Clause 4.3 and Annex A				
Examples of information in non-digital and digital forms in Annex F				
Visual Clause 5		**Auditory** Clause 6		**Tactile** Clause 7
Perceivable text 5.1		Perceivable Spoken 6.2		Perceivable text 7.1.1
Perceivable non-text 5.3		Perceivable Signals 6.3		Perceivable non-text 7.1.2
Understandable text 5.4		Understandable Spoken 6.4		Understandable text 7.2.1
Understandable non-text 5.5		Understandable Signals 6.5		Understandable non-text 7.2.1
Annexes C and G - M		**Annex D**		**Annex E**
Annex ZA Relationship of this document to requirements of the EAA				

1 Scope

This document provides requirements for the presentation of information on and about products and services in visual, auditory and tactile non-digital forms for the sensory channels of seeing, hearing and touch.

The requirements in this document are applicable to:

- Information about the functioning of a service.
- Information about the accessibility of the products used in the provision of the service.
- Information on a product's functioning.
- Information on a product's accessibility features, elements, functions, and characteristics.
- Information on the use of the product (on the product itself).
- Instructions for use of a product (not on the product but provided through other means).
- Instructions of products (such as for installation, maintenance, storage and disposal of a product).
- Information provided on a package of a product.
- Information provided in a package of a product.
- Information about some types of transport services.
- Information about consumer banking services.

This document is intended for use by organisations that produce products and or provide services.

NOTE 1 This document can be used by organisations for a wide variety of purposes for the presentation of information.

This document does not apply to information permanently installed in and for the use of the built environment (for instance, signage, alarms and controls), which is covered by EN 17210.

NOTE 2 Where this document is referring to information on and about products and services used in the built environment, it pertains to those that can occur in it but are not a part of it.

This document does not apply to the presentation of information through a digital means by ICT products and services, (for instance displayed on a screen), which is covered by EN 301549.

NOTE 3 Where this document is referring to understandable content presented in non-digital forms, some of the associated requirements can be applicable to content presented in a digital form.

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.

EN IEC 60268-16:2020, *Sound system equipment - Part 16: Objective rating of speech intelligibility by speech transmission index*

prEN 18156:2025, *Tactile lettering - Requirements on the presentation and application of Braille and raised characters*

3 Terms and definitions

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

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

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

— IEC Electropedia: available at https://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.

[SOURCE: EN ISO 9241-112:2025, 3.11]

3.2
information
data that are processed, organized and correlated to produce meaning

[SOURCE: ISO 22320:2011, 3.9

3.3
non-digital form
visual, auditory or tactile information communicated in one direction, which cannot be changed or adapted by the user

Note 1 to entry: Users as receivers of information presented in non-digital forms perceive the information by seeing, hearing or touching the content but are not able to adjust or make any changes to the presentation.

EXAMPLE Information in non-digital forms can include but are not limited to; visual labels, signs, posters and documents; auditory speech and acoustic signals, and tactile lettering, symbols and shapes.

3.4
perceive
recognise the existence of something

[SOURCE: ISO/IEC 29138-1:2018, 3.15]

3.5
acoustic notification
discrete, non-speech sound used to convey information or to cue subsequent speech announcements, produced or reproduced by a product or system and presented to the user as an audible signal

Note 1 to entry: It applies to notifications signals communicated in one direction, which cannot be changed or adapted by the user.

3.6
easy-to-understand language
any language variety which enhances comprehensibility

Note 1 to entry: Easy-to-understand language includes plain language, easy language and any intermediate variety. These varieties share many recommendations, but the extent of comprehensibility is different as they address different user needs.

[SOURCE: ISO/IEC 23859:2023, 3.1.1]

3.7
user
person who interacts with a system, product or service

Note 1 to entry: The person who uses a service provided by a system, such as a customer in a shop or passenger on a train, can be considered a user.

[SOURCE: ISO 27500:2016, 2.12]

3.8
context of use
combination of users, goals and tasks, resources, and environment.

Note 1 to entry: The "environment" in a context of use includes the technical, physical, social, cultural and organizational environments.

Note 2 to entry: context of use can also be known as conditions of use.

[SOURCE: ISO 9241-11:2018, 3.5, modified, Note 2 to entry added]

3.9
visual contrast
visual difference between one surface or component and a background or adjoining surface

Note 1 to entry: Visual contrast can be obtained by a combination of luminance contrast and colour contrast. Many people with impaired vision can rely only on luminance contrast, in this document accessibility is evaluated in terms of luminance contrast.

[SOURCE: ISO 21542:2021, 3.37 modified, "perception" changed to "difference", and "two adjacent elements of a building" changed to "one surface or component and a background or adjoining surface" and in Note 1 to entry, changed "since" to "many"]

3.10
light reflectance value
LRV
proportion of visible light reflected by a surface at all wavelengths and directions when illuminated by a light source

Note 1 to entry: LRV is also known as the luminance reflectance factor.

Note 2 to entry: LRV is expressed on a scale of 0 to 100, with a value of 0 points for pure black and a value of 100 points for pure white.

[SOURCE: EN ISO 23599:2019, 3.14]

3.11
tactile lettering
information provided both in Braille or raised characters

[SOURCE: prEN 18156:2025, 3.7]

3.12
frequency partials
individual frequency components within a sound, comprising the fundamental frequency and any additional harmonic or inharmonic components that contribute to the sound's timbre

Note 1 to entry: Frequency determines the perceived pitch of a sound. Lower frequencies (e.g., 150 – 300 Hz) are perceived as lower-pitched sounds, while higher frequencies (e.g., 1 000 – 4 000 Hz) are perceived as higher-pitched sounds. Frequency also influences other perceptual attributes such as localisation and masking resistance.

Note 2 to entry: Harmonic and inharmonic partials together shape the timbre or texture of an acoustic notification and influence recognisability, distinctiveness, and perceptual clarity.

3.13
fundamental frequency
lowest frequency component of a sound and the primary determinant of its perceived pitch

Note to entry: The fundamental frequency forms the reference point for harmonic partials and may not always be the strongest (highest-energy) component in the spectrum, especially in complex or inharmonic signals.

3.14
overtones
frequency partials above the fundamental frequency, including both harmonic and inharmonic components

Note 1 to entry: Overtones may be integer multiples of the fundamental frequency. For example, for a fundamental frequency of 150 Hz, harmonic overtones may occur at 300 Hz, 450 Hz, 600 Hz, etc. Harmonic overtones are typically perceived as smooth or musically consonant, contributing to a stable and 'pleasant' timbre.

Note 2 to entry: Overtones may be non-integer multiples of the fundamental frequency (inharmonic overtones). For a 150 Hz fundamental, inharmonic partials may occur at frequencies such as 235 Hz or 512 Hz. Inharmonic overtones produce a rougher or more attention-grabbing timbre, which may be desirable for increasing noticeability in certain acoustic notifications.

3.15
x-height
height of lowercase letters, ignoring ascenders or descenders, such as x or z

[SOURCE: ISO Guide 41:2018, 3.22, modified, such as x or Z added, note to entry removed]

3.16
point
pt
smallest unit in typography and printing, used to measure font size, line thickness, and other layout dimensions

4 Requirements for information in accessible non-digital forms

4.1 General

Accessible information on and about products and services and their accessibility features can help to maximise their foreseeable use by the widest range of users including persons with disabilities.

The requirements for the presentation of information in non-digital forms may be relevant depending on the type of information, its content and context in which it is used.

EXAMPLE Some requirements applicable for the presentation of written instructions on how to use a product may also be applicable or relevant for the presentation of written instructions on how to open the package in which the product is contained.

4.2 Presentation of information for multiple sensory channels

4.2.1 Combinations of non-digital forms

Information made exclusively available in non-digital forms shall be made available for more than one sensory channel by:

a) Making non-digital visual information available in an auditory or tactile non-digital form.

b) Making non-digital auditory information available in a visual or tactile non-digital form.

c) Making non-digital tactile information available in a visual or auditory non-digital form.

4.2.2 Combinations of non-digital and digital

Information presented in a non-digital form can be made available via more than one sensory channel by also presenting the information in a digital form.

In such cases, the access to the accessible digital form shall be indicated by information available for more than one sensory channel.

EXAMPLE The use of an accessible QR codes can provide a link to information in accessible digital formats.

For examples of information presented in non-digital forms and information presented in digital form, see Annex F.

4.3 Testing the presentation of information

4.3.1 Testing the accessibility of information

Information presented in non-digital forms shall be evaluated in accordance with the requirements in this document.

4.3.2 Testing information accessibility

Key activities for testing information in non-digital forms:

— determine who are the intended users of the information;

— determine what information needs to be perceived;

— determine how the information needs to be understood, e.g. what the user needs to do or not do;

— determine which non-digital forms to present;

— confirm that the information is available for more than one sensory channel;

— identify the different elements in the information, such as. headings, instructions, signals;

— create a testing checklist comprising of each identified element and the applicable requirements from clauses 5 to 7;

— based on the checklist test each element against the applicable requirements;

— document if and how the information complies with the requirements; and,

— confirm that all the necessary information is presented in each of the forms.

For guidance on creating a testing checklist, see Annex A.

5 Visual non-digital form requirements

5.1 Perceivable visual text

5.1.1 General

The requirements for presenting visual written text content shall be taken into account together, where feasible, for maximising the foreseeable perception of the information within the available visual space.

For guidance on the application of visual text requirements in clause 5, see Annexes G to M.

For requirements regarding text placed on images see 5.3.1.

5.1.2 Font size

5.1.2.1 General

Font sizes are determined differently between hand-held viewing distances (40cm) and where information needs to be perceivable at greater distances. The two methods are based on the requirements described in the following sections.

NOTE Increasing font size reduces the available space for line spacing and paragraph spacing.

For guidance about the impact of font size on information content accessibility, see Annex G.

For guidance about size measurements for font and text layout, see Annex H.

For guidance on testing font size, see Annex I.

5.1.2.2 Hand-held viewing distance font size

For hand-held viewing distances (40 cm), the text shall have:

a) An x-height of 2.6 mm or greater (equivalent to Arial 14 pt font of normal weight);

Where this cannot be achieved due to the available space, the x-height in millimetres should be reduced in proportion to the available space until the minimum is reached according to the following formula:

b) Minimum x-height of 1.3 mm (equivalent to Arial 7 pt font of normal weight).

Larger font sizes can be used to provide emphasis for example with headings or warnings. However, this should be used sparingly to make the best use of the available visual space.

For guidance about the impact of font size on information content accessibility, see Annex G.

For guidance about size measurements for font and text layout, see Annex H.

NOTE A font point size is not an absolute measure. For example, 14 pt Arial has a different x-height to 14 pt Times New Roman. See Annex L for how different fonts vary on point size to achieve the same x-height.

For guidance on application of requirements for font size, see Annex I.

5.1.2.3 Font sizes for viewing distances greater than the hand-held distance

For distances greater than the hand-held viewing distance (40 cm) the x-height shall be increased according to the following formula:

a) x-height in mm = viewing distance in metres multiplied by 6.5;

Alternatively, to calculate the equivalent size as the point size of an Arial font of normal weight, this can be calculated as follows:

b) Arial font size (in pt) = viewing distance in metres multiplied by 35;

Where this cannot be achieved due to the available space, the x-height in millimetres should be reduced in proportion to the available space until the minimum is reached according to the following formula:

c) The minimum x-height in mm = viewing distance in metres multiplied by 3.25; and,

Alternatively, to calculate the equivalent size as the point size of an Arial font of normal weight, this can be calculated as follows:

d) Arial font size (in pt) = viewing distance in metres multiplied by 17.5.

Larger font sizes can be used to provide emphasis for example with headings or warnings. However, this should be used sparingly to make the best use of the available visual space.

For guidance about size measurements for font and text layout, see Annex M.

NOTE A font point size is not an absolute measure. For example, 14 pt Arial has a different x-height to 14 pt Times New Roman. See Annex L for how different fonts vary with point size to achieve the same x-height.

5.1.3 Visual contrast

The absolute difference in light reflectance values (LRV) between foreground and background shall be at least 70 points, according to the formula:

Absolute difference in LRV = absolute (LRV foreground – LRV background).

For handheld distances, for text sizes greater than or equal to an x-height of 2,6 mm (equivalent to 14 point Arial), the absolute difference in LRV may be reduced, down to 60 points.

For text intended to be viewed at greater distances, the absolute difference in LRV may be reduced to 60 points when the ‘x-height in mm’ is greater than or equal to the value calculated according to the formula in 5.1.1.2 a.

For guidance on application of requirements for visual contrast, see Annex J.

5.1.4 Text placed on other content

5.1.4.1 Text shall not be set on top of images, other non-textual information or text, in a manner that reduces the perceptibility of the information or reduces visual contrast. or creates visual clutter that makes the content hard to find or understand in accordance with the relevant clauses in 5.4.2.10 and 5.5.1.

5.1.5.2 The background behind and around the content shall be of a uniform colour and visual contrast and have a border of a minimum of 10mm.

Where content on an image is purely for decorative purposes, such as branding, it may be placed on a non-uniform background.

Where content on image is required for essential, functional reasons, and there is no feasible alternative, such as security verification checks, then it may be placed on a non-uniform background

5.1.5 Line spacing

6.1.4.1 Baseline-to-baseline spacing shall be at least 2,5 times the x-height.

For guidance about size measurements for font and text layout, see Annex H.

For guidance on the application of line spacing requirements for hand-held distance (40cm), see Annex K.

For guidance on the application of line spacing requirements for different font sizes, see Annex L.

6.1.4.2 Baseline-to-baseline spacing between paragraphs shall be at least 3.75 times the x-height.

For guidance on application of paragraph spacing requirements for hand-held distance (40cm), see Annex K.

For guidance on application of paragraph spacing requirements for different viewing distances, see Annex M

5.1.6 Font style

The use of stylised fonts shall not reduce legibility.

Normal weight Arial text should be used as a reference font for determining legibility, according to 5.1.1.

NOTE Fonts with letter strokes that are regularly spaced such as Times are harder to read than those that are less regular such as Open Sans. This can be seen by comparing the word 'minimum' in each font. See Figure 1, Examples of different fonts.

minimum (Times New Roman)

minimum (Open Sans)

Underlined text and italics shall not be used.

NOTE People recognise the shape of familiar words, rather than reading each individual letter. Setting a word in CAPITAL LETTERS, *italics* or underlining distorts the shape of the word, which makes it more difficult to read.

5.1.7 Font weight

For paragraphs of text (body text), the font weight shall be between regular-weight Open Sans and semi-bold Open Sans.

The font weight should be neither too thin (e.g. ultra-light fonts, where the strokes are thinner than regular -weight Open Sans) nor too heavy (e.g. extra bold or heavy fonts, where the strokes are wider than extra-bold Open Sans).

5.1.8 Colour

5.1.8.1 **Colour** shall not be used as the only visual means of conveying information.

5.1.8.2 Colour used to convey information shall not reduce visual contrast in accordance with 5.1.2.

5.1.8.3 Colours used to convey information shall be distinguishable by users with different types of colour blindness, such as protanomaly, deuteranomaly and tritanomaly.

NOTE For guidance on selecting colours that are perceivable by users with colour blindness, see Color Universal Design at https://jfly.uni-koeln.de/color/ and the section entitled: 'Set of colors that is unambiguous both to colorblinds and non-colorblinds'.

It is also possible in some graphic design software to simulate different types of colour-blindness.

The requirements in 5.1.8.1 to 5.1.8.3 do not apply to colour used solely for decorative purposes.

5.1.9 Glare and opacity

5.1.9.1 The content shall be made available on a medium (such as paper, cardboard or plastic) where its glossiness does not produce glare that affects legibility.

Areas that do not have content, may have surfaces with a higher level of gloss provided they do not interfere with adjacent information.

5.1.9.2 Where content is adjacent to higher gloss areas, there shall be a border or space of at least 1 cm between the content and non-content areas that ensures the higher glare area does not interfere with the content area.

5.1.9.3 The content shall be presented on a medium with an opacity equivalent 100 GSM paper for double side printed content, and 80 GSM for single side printed content.

NOTE Paper that is matt (i.e. not glossy) and/or does not have optical brightening agents will reduce the level of glare. This aids perception and helps readers who are photosensitive and who are susceptible to visual stress.

5.2 Content in text formats for generating alternate presentations

5.2.1 Perceivable text

Text content shall be presented in text formats perceivable by users in accordance with 5.1

NOTE Where text formats can be adaptable by technologies it also involves the user of the technology being able to recognise that it can be adapted into an alternate presentation.

5.2.2 Adaptable text

Text content shall be presented in text formats, such as fonts, layouts and languages readily adaptable by technologies for generating alternate presentations for alternate sensory channels.

For text to be readily adaptable for generating alternate presentations can include, but is not limited to:

a) Text content that can be recognised by technologies for generating alternate presentations.

b) Text content that can be adapted by technologies to be accessible alternate presentations.

NOTE Readily adaptable text formats for generating alternate presentations can mean that it will work with systems such as optical character recognition (OCR) systems for text-to-speech functions.

5.3 Perceivable non-textual content

5.3.1 Visual non-textual content

Visual non-textual content that specifically conveys information or function shall be accompanied by an accessible equivalent presentation of that information as text content.

Examples of non-textual visual content include, but are not limited to, scannable codes, pictures, diagrams and symbols

NOTE A machine readable QR code or other scannable code can provide a supplemental, alternate presentation of content through a digital means.

5.3.2 Non-textual line thickness and spacing

Line thickness and spacing shall be determined differently between hand-held viewing distances (40 cm) and where information needs to be perceivable at greater distances. The two methods are described in the following sections.

This requirement excludes QR Codes that are produced according to applicable standards.

5.3.2.1 For handheld viewing distances, the line width (stroke) and gap width (stroke) shall be 1,4 points or greater.

5.3.2.2 Where this cannot be achieved due to the available space, the line width (stroke) and gap width (stroke) shall be a minimum of 0,7 points.

5.3.2.3 For information at distances greater than the hand-held viewing distance (40 cm), the line width (stroke) and gap width (stroke) shall be increased according to the following formula:

Line width (stroke) and gap width (stroke) in points = viewing distance in metres multiplied by 3,5

5.3.2.4 Where this cannot be achieved due to the available space, the line width (stroke) and gap width (stroke) shall be according to the following formula:

minimum line width (stroke) and gap width (stroke) in points = viewing distance in metres multiplied by 1.75

5.3.3 Non-textual lines visual contrast

The absolute difference in light reflectance values (LRV) between foreground and background shall be at least 70 points, according to the formula:

Absolute difference in LRV = absolute (LRV foreground – LRV background).

For handheld distances, for line and gap widths greater than or equal to 1,4 points, the absolute difference in LRV may be reduced, down to 60 points.

For non-textual visual content intended to be viewed at greater distances, the absolute difference in LRV may be reduced to 60 points when the ‘line and gap widths’ are greater than or equal to the ‘viewing distance in metres’ multiplied by 3,5.

For guidance on application of requirements for visual contrast, see Annex J.

5.3.4 Non-textual content placed on top of other content

5.3.4.1 Non-textual visual content shall not be set on top of images, other non-textual information or text, in a manner that reduces the perceptibility of the information or reduces visual contrast. or creates visual clutter that makes the content hard to find or understand in accordance with the relevant clauses in 5.5.

5.3.4.2 The background behind and around the content shall be of a uniform colour and visual contrast and have a border of a minimum of 10mm.

Where content on an image is purely for decorative purposes, such as branding, it may be placed on a non-uniform background.

Where content on image is required for essential, functional reasons, and there is no feasible alternative, such as security verification checks, then it may be placed on a non-uniform background

NOTE Non-textual lines refers to the use of graphical lines in diagrams, graphics and symbols, or equivalent.

5.3.5 Non-textual colour

Colour shall be used in accordance with 5.1.8.

5.3.6 Non-textual glare and opacity

The media use shall be in accordance with 5.1.9.

5.4 Understandable text content

5.4.1 5.4.1 Written text content readability

English text content shall demonstrate a Flesch Reading Ease Score of 60 or above, or an equivalent measure.

For languages other than English, readability formulas should rely on language-specific validated adaptations or on language-independent indices such as LIX.

Example Adaptations of Flesch-type formulas such as Flesch–Szigriszt for Spanish.

NOTE 1 Understandability of information is associated with readability, comprehension, and context of use.

For resources to use to make the presentation of written text content readable, see Annex C.

NOTE 2 Software tools, including word processors, can be used to check readability scores.

Examples of written text content include but are not limited to written information and instructions presented on and about products and services.

NOTE 3 Reading scores can be applied to a whole document as well as individual sections to help find the hardest to understand parts of a document.

5.4.2 Understandable written information

5.4.2.1 Information shall be structured in the correct order of use and so that the most important information is easy to find.

Example A warning or note is placed before a block of text or instructions. Warnings about what not to do are before instructions about what to do.

5.4.2.2 Related information shall be grouped together in blocks or visual units.

EXAMPLE If contact information is included on packaging, it is grouped together in one location.

5.4.2.3 Easy-to-understand language shall be used.

5.4.2.4 Consistent and clear headings that describe the content of the information that follows shall be used.

EXAMPLE In an instruction manual clear headings (Setup, Accessibility Features, Disposal) are used to help identify to the user where they can find relevant information.

5.4.2.5 Same term shall be used consistently for a specific thought or object.

5.4.2.6 Bulleted lists shall be used to help readers find and process information.

5.4.2.7 Where used, abbreviations shall be written out the first time it is used or explained clearly.

5.4.2.8 Block capitals shall be used only for emphasis e.g. for single words on labels or controls.

5.4.2.9 Bold shall be used only for emphasis e.g. for headings, single words on labels or controls.

5.4.2.10 Variations of font styles shall be avoided that reduce understandability.

5.4.2.11 Text content shall be laid out, with the appropriate use of negative space (also known as white space) to support the requirements of the understanding of written information.

NOTE ISO 24495-1:2023, Clause 5.3 provides guidance for how readers can easily understand information.

5.4.3 Understandable written instructions

5.4.3.1 Information shall be structured in the correct order of use and so that the most important information is easy to find.

EXAMPLE 1 The instructional steps are in the same order as the intended use.

EXAMPLE 2 If a device needs to be charged before setting it up, the information is clearly stated before the instructions to setup the device.

5.4.3.2 Instructions shall be presented step by step in numbered lists to help readers follow the correct order in a sequence of steps.

EXAMPLE When providing step by step instructions on packaging the steps are numbered so that the user can easily follow them.

5.4.3.3 Bulleted lists shall be used to structure information or list items without any specific order.

5.4.3.4 Warnings shall be placed before instructions about what to do first and next.

NOTE The requirements for instructions in this clause are in addition to the requirements regarding information in 5.4.2.

5.5 Understandable non-textual content

5.5.1 Non-text content

5.5.1.1 Non-text content shall be recognisable and related to the content and context to be understandable.

The non-text presentation should be consistent and familiar with content used in public spaces and where it can be associated with regionally recognised messaging.

Examples of non-text content can include, but is not limited, to images, photographs, diagrams, pictograms, symbols, and shapes.

5.5.1.2 Images shall be relevant to the content and support understanding of the text.

NOTE Images can capture readers' attention and make information easier to process.

5.5.1.3 Images shall not introduce essential information that is not present in the text.

5.5.1.4 Images shall not break the flow of blocks of text content, such as a paragraph.

5.5.1.5 Non-text content shall be laid out, with the appropriate use of negative space (also known as white space) to support the requirements of the understanding of written information.

5.5.1.6 Presentation of visual symbols should be consistent with established recognisable examples in ISO 7000 series on graphical symbols.

6 Auditory non-digital form requirements

6.1 General

Auditory spoken information and acoustic notification signals that are perceivable and understandable can improve accessibility.

Examples of spoken information and instruction can include, but are not limited to:

a) Live face-to-face speech and recorded speech

b) Live and recorded public announcements

NOTE 1 Auditory icons are non-speech sounds that symbolically represent an action, object, or event through a natural or recognisable acoustic resemblance (e.g. the sound of crumpling paper when deleting a file), while earcons are non-speech sound motifs composed of abstract tonal or musical patterns (e.g. a computer startup chime) that convey information through learned association rather than natural resemblance.

Examples of acoustic notifications can include, but are not limited to:

i) A typical non-speech alert or cue sound made before an announcement.

ii) A non-speech sound confirming completion of information.

NOTE 2 Acoustic notifications can be, but are not limited to, auditory alerts, tones, and chimes.

NOTE 3 This document does not cover auditory alarms, emergency signals or other signals addressed by emergency related regulations

6.2 Perceivable spoken information

6.2.1 Spoken information as speech

For spoken information conveyed as speech, the Speech Transmission Index (STI) shall meet the following minimum values:

a) STI ≥ 0,60 for general speech communication;

b) STI ≥ 0,75 for complex messages or messages containing unfamiliar words.

NOTE 1 The STI values specified in this clause correspond to the intelligibility classifications “fair to good” and “good to excellent”, respectively, as defined in IEC 60268-16:2020, Table H.1.

NOTE 2 STI values are derived from measurements or calculations across seven octave bands with centre frequencies from 125 Hz to 8000 Hz. Guidance on the measurement and calculation of STI is provided in IEC 60268-16:2020, Clauses 5 and 6.

NOTE 3 Additional guidance on the application of STI within the context of this document is provided in Annex D.2

NOTE 4 Within this document, the terms spoken information and speech are used interchangeably.

6.2.1.1 The A-weighted speech level at the listener position shall:

a) be greater than the A-weighted background noise level by at least 15 dB and

b) not exceed an equivalent continuous sound pressure level of 80 dB(A).

NOTE 1 The A-weighted signal-to-noise ratio (SNR) provides a practical approximation of speech audibility. Where measurement of the STI is not practicable, speech intelligibility may be assessed using the Speech Interference Level (SIL), derived from octave-band sound pressure levels at 500 Hz, 1 000 Hz, 2 000 Hz, and 4 000 Hz.

NOTE 2 Guidance on the relationship between SIL values and speech intelligibility categories, including indicative mappings to STI ranges, is provided in ISO 9921:2003, Annex F, Table F.1.

NOTE 3 For guidance on the implementation of the SIL in this context, see Annex 3 of this document.

NOTE 4 Sustained sound pressure levels exceeding 80 dB(A) can increase the risk of hearing damage over prolonged exposure durations; the upper limit specified in this clause is therefore intended to limit excessive sound levels while maintaining speech intelligibility.

6.2.1.2 In environments with elevated background noise levels, the level of the spoken information shall be increased as necessary to maintain a minimum A-weighted SNR difference of 10 dB at the listener position.

NOTE 1 Typical comfortable loudness levels for speech in most environments are in the range of 55 dB(A) to 65 dB(A). Where background noise levels exceed this range, maintaining an SNR difference of 15 dB(A) can result in speech levels approaching or exceeding 80 dB(A).

NOTE 2 Guidance on the relationship between SNR and speech intelligibility, including the topic of perceptually-effective SNR, is provided in IEC 60268-16:2020, Annex Q, Q.1.4. Guidance on psychoacoustic masking effects is provided in ISO 12913-1:2014, Annex C.

NOTE 3 The risk of hearing damage depends on sound pressure level, duration of exposure, and frequency content, as described in ISO 1999:2013, Clause 6.3.

6.2.1.3 Speech shall be presented in a manner so that its perception is not reduced by background noise or reverberation.

NOTE 1 Methods for avoiding artefacts such as microphone handling noise, signal clipping, transmission cut-offs, or tonal noise (e.g. hums or whistles), that can degrade the acoustic quality of spoken information and reduce modulation depth and intelligibility are described in IEC 60268-16:2020, Clause 8.

NOTE 2 Characteristics of the broadcast environment, such as distance from the sound source, background noise, surface reflectivity, and the acoustic influence of architectural or urban elements can affect how speech and acoustic notifications are perceived.

6.2.1.4 If synthesized speech is used, it shall be as similar as possible to human speech.

6.3 Perceivable acoustic notifications

6.3.1 Signals and notifications

6.3.1.1 Acoustic notifications shall have a minimum duration of 100 ms in quiet environments and at least 500 ms in noisy environments.

'Noisy' is defined as corresponding to a speech level greater than 65 dB(A) at 1 m (described by the Lombard effect).

NOTE 1 Shorter signal durations (e.g. 100ms) are generally sufficient for recognition in quiet conditions, while longer durations (e.g. 500ms) improve detectability and reduce masking in noisier environments by providing a more robust time window for the human auditory system to detect and process.

NOTE 2 In the context of this document, a noisy environment does not refer to occupational noise exposure thresholds associated with hearing loss. Instead, it refers to background sound levels typically found in consumer and/or public spaces in which a person needs to adopt raised vocal effort.

NOTE 3 Guidance on ambient noise levels, vocal effort, and the Lombard effect is provided in ISO 9921:2003, Table A.1.

Bearing in mind the acoustic variability of public and consumer spaces, sound designers should ensure that acoustic notifications are appropriately specified for their intended environment. Installers of sound-producing systems should set notification output levels in accordance with the typical background sound characteristics of the space.

NOTE 4 In some environments, longer notification durations than those specified in 6.3.1.1 can be necessary to ensure perceptibility or understanding, as described in 6.5.

6.3.1.2 Where the sound reproduction system supports reliable output at lower frequencies, acoustic notifications should include frequency components in the range of 150 Hz to 4 000 Hz. Where low-frequency constraints are present in the sound reproduction hardware, acoustic notifications shall have frequency components within the range of 500 Hz to 4 000 Hz.

The recommended and required frequency ranges correspond to regions of high human auditory sensitivity across populations and support robust perception of acoustic notifications in the presence of typical environmental masking.

NOTE 1 In relation to frequencies <500 Hz, the effective frequency range of an acoustic notification can be limited by the electroacoustic performance of the sound reproduction system. In particular, small loudspeakers and transducers commonly used in consumer and public installations can exhibit reduced output, limited efficiency, or increased distortion at lower frequencies.

NOTE 2 Although 150 Hz lies below the region of peak human auditory sensitivity, including frequencies down to this range improves the robustness of acoustic signals in real environments. Lower frequencies propagate more effectively around obstacles (see EN ISO 12354-6:2003, Table 1); are less susceptible to masking by ambient noise as (see ISO/TS 20065:2022, Annex C); and are more accessible to users with high-frequency hearing loss (see ISO 7029:2017, Annex C and Annex D).

NOTE 3 Frequencies above approximately 4 000 Hz are increasingly affected by age-related hearing decline. Limiting the upper range of acoustic notifications to 4 000 Hz helps ensure perceivability across age groups while still supporting localisation and clarity. For more information on age-related high frequency loss, see ISO 7029:2017 Annex C and Annex D.

6.3.1.3 While maintaining compliance with 6.3.1.1, acoustic notifications shall contain a minimum of four distinct frequency partials within the frequency range specified in 6.3.1.2.

NOTE 1 Using multiple frequency partials improves accessibility by:

— supporting perceivability among users with hearing loss at different frequencies;

— improving noticeability when physical barriers or obstructions are present;

— increasing robustness against environmental masking; and,

— enhancing auditory localisation by providing spectral cues the listener can use to determine the signal's direction.

NOTE 2 The requirement for a minimum of four distinct frequency partials is consistent with IEC 60601-1-8:2006/AMD2:2020, which specifies auditory alarm signals comprising four discrete spectral components to enhance detectability, recognisability, and robustness in the presence of masking and variable listening conditions (see clause 6.3.3.1, Table 4).

NOTE 3 When assessing compliance with the frequency-partial requirements of this clause, testing should take into account the frequency response of the sound reproduction system as installed.

6.3.1.4 The sound level of acoustic notifications shall be at least 6 dB above the masking threshold of the ambient background noise and not more than 30 dB above that threshold, with a maximum overall output signal level of 80 dB(A).

NOTE 1 Further guidance on the design of non-speech acoustic notifications can be found in ISO 9241-126:2019 and IEC 60601-1-8:2006/AMD2:2020, Annex G.

NOTE 2 For information on acoustic notifications, see Annex D.

6.4 Understandable auditory information

6.4.1 Understandable spoken information

6.4.1.1 A spoken announcement shall be at the appropriate time and repeated as appropriate for the purpose of the information.

EXAMPLE If announcing that the arrival time of a flight/ train is delayed, it is announced before the arrival time, at the arrival time and again shortly after the arrival time.

6.4.1.2 The speaking rate shall not be too fast or too slow when providing a spoken message, as it may hinder comprehension. Pause between words and sentences to convey sentence and text structure.

6.4.1.3 Speech content shall use easy-to-understand language.

6.4.1.4 Speech content shall use the same term consistently for a specific thought or object.

6.4.1.5 Speech content shall use abbreviations that are well-known or that are clearly explained.

6.4.1.6 Where content is displayed in a scrolling visual format, the pace of the spoken presentation shall be sufficient to allow for comfortable reading.

6.4.1.7 Speech shall use dialects and accents that that do not interfere with a person being able to recognize what is being said.

6.4.1.8 Synthetic speech shall use prosody, including pronunciation, accentuation and intonation patterns, similar to human speech, to enhance understanding of spoken information.

NOTE 1 Guidance on timing, repetition, speech rate, synchronisation with visual displays, use of accents, prosody, and the choice between digitised and synthesised speech is provided in ISO/TS 9241-126:2019 (Clause 8)

NOTE 2 ISO 23859:2023, Clause 8 provides recommendations on how to make spoken information accessible.

6.4.2 Understandable spoken instructions

6.4.2.1 Speech content shall be organised, so the instructions are in a logical and predictable order.

6.4.2.2 Speech content shall state how many instructions the user will hear.

EXAMPLE When instructing a user on how to setup up their product, tell them how many instructions they will have to follow before starting to list the instructions. “To get your product set up, you will need to complete the following four steps.”

6.4.2.3 Speech content shall state the number of each instruction, before the instruction.

6.4.2.4 Speech content shall convey all essential information.

EXAMPLE Essential information for instructions often includes a clear description of the action to be performed and the identification, location, and orientation of the elements involved in the action.

6.4.2.5 Speech shall use intonation to make the important instructions stand out.

6.4.2.6 Speech content shall give warnings about what not to do before instructions about what to do.

6.4.2.7 Speech content shall avoid presenting long lists of instructions.

6.4.2.8 Speech should present no more than four instructions as this can overload short-term memory.

NOTE 1 Research on working memory indicates that the capacity for transient auditory information is limited to a small number of items, commonly reported as approximately three to four items. See, for example, Cowan (2001)[1].

6.4.2.9 Speech shall avoid presenting complex narratives.

6.4.2.10 Where multiple instructions are needed, pauses shall be used or inserted between them.

EXAMPLE When instructing a user on how to connect their product to their assistive technology, break the instructions into stages (setting up the product, setting up your assistive technology, connecting to your assistive technology, troubleshooting).

NOTE 1 ISO 24495-1:2023, Clause 8 provides guidance on audio alternatives to written text.

NOTE 2 ISO 24551:2019, Clause 6 provides recommendations on making spoken instructions accessible.

6.5 Understandable acoustic notifications (Non-Speech)

6.5.1 Acoustic notifications

6.5.1.1 An acoustic notification shall be clearly detectable and distinct from background noise.

6.5.1.2 An acoustic notification shall use the same signal to present the same information at all times and ensure that signals representing different information are perceptually distinct through differences in pitch, timbre, rhythm, or temporal pattern.

[1] Cowan N. The magical number 4 in short-term memory: A reconsideration of mental storage capacity. *Behavioral and Brain Sciences*. 2001;24(1):87-114. doi:10.1017/S0140525X01003922.

6.5.1.3 An acoustic notification shall present sounds that are naturally or conventionally associated with the object or process being represented, or whose acoustic properties are analogous to the meaning being conveyed

EXAMPLE A rising pitch for increasing quantity or a reverse tone sequence indicating completion.

6.5.1.4 An acoustic notification shall ensure that the set of acoustic notifications is logically coherent, where signals within the same category share a recognisable family resemblance (e.g. timbre or spectral structure) while remaining distinguishable as different notifications.

NOTE 1 Signals can be made distinguishable through perceptual features such as pitch contour, timbre, spectral content, onset characteristics, or temporal patterning without increasing cognitive load.

NOTE 2 The recognisability of auditory signals depends on both their acoustic structure and the listening context. Ensuring clarity in the spectral and temporal domains supports understanding across diverse environments.

NOTE 3 Further guidance on making a set of different acoustic notifications distinguishable can be found in IEC 60601-1-8:2006/AMD2:2020, 6.3.3.1 and 6.3.3.2.

NOTE 4 For additional information for acoustic notifications that are understandable, see Annex D.1.

7 Tactile non-digital form requirements

7.1 General

7.1.1 Introduction to tactile content

Tactile content can improve accessibility for a wide range of applications.

EXAMPLE 1 Tactile shapes and symbols for identifying and finding operable elements (e.g. a raised ‘X’ symbol for ‘cancel a transaction’ on an ATM)

EXAMPLE 2 Tactile raised characters and Braille labels on products and packaging.

EXAMPLE 3 Braille books with tactile characters for product or service information.

For the presentation of tactile text and non-text content to be perceivable, it shall:

a) be tactile content that is raised, not engraved, and;

b) be complemented with visual contrast as set out in 5.1.2 and 5.3.3.

For guidance on dimensions for tactile content, see Annex E, Table E.1.

For guidance on design considerations for tactile content, see Annex E.2.

NOTE The technical specifications for tactile lettering from prEN18156 clause 5 can also be applied to portable products and packaging.

7.1.2 Tactile lettering text content

7.1.2.1 Tactile text content, where provided on products and packaging, shall be in accordance with 5.4 in prEN 18156:2025 for Braille lettering.

7.1.2.2 Tactile text content, where provided on products and packaging, shall be in accordance with 5.5 in prEN 18156:2025 for raised characters.

NOTE 1 The requirements in this document for information presented in non-digital tactile form on products and packaging and about services, do not apply to tactile lettering permanently installed in and provided for the use of the built environment.

NOTE 2 Tactile text content as tactile lettering can be comprised of raised characters and Braille where there is sufficient space available on the product or packaging.

7.1.3 Tactile non-textual elements

Tactile non-textual elements include:

— simple tactile symbols;

— tactile markings (dots, bars, shapes, and arrows); and,

— tactile cues to help locate elements for use of products and packaging.

7.1.3.1 Tactile symbols made of lines shall consist of raised triangular shaped relief profiles with slightly rounded upper edges in accordance with prEN 18156:2025, 5.6.

NOTE Tactile symbols require much more space than tactile characters.

7.1.3.2 Tactile markings shall be in accordance with prEN 18156:2025, 6.2.4 for operating elements.

7.1.3.3 Tactile markings shall be in accordance with prEN 18156:2025, 6.2.6 for explanatory information of objects.

7.1.3.4 Tactile markings such as dots, bars, shapes and arrows should be provided to identify operable parts of products and packaging.

NOTE 1 The purpose of tactile markings such as dots, bars, shapes and arrows can be useful where accompanied by explaining words in Braille or tactile characters in complex designs.

NOTE 2 Guidance for tactile non-text elements on packaging can be found in Microsoft Creating Accessible Packaging, An Inclusive Design Guide.

7.1.3.5 Tactile cues for locating scannable codes (QR codes) shall be in accordance with prEN 18156:2025, 5.7.

7.2 Understandable tactile information

7.2.1 Tactile information

For tactile text and non-text content to be understandable it shall be easily identifiable and comprehensible by touch.

7.2.1.1 Tactile information such as tabs, slots, groves, closures on products and packaging shall be comprehensible by touch.

NOTE Information on human cognitive and sensory aspects related to opening packaging is in Annex E of ISO 17480:2018.

7.2.1.2 Raised characters and tactile symbols or pictograms shall be comprehensible by touch in accordance with prEN 18156:2025, 5.6.1.

NOTE Non-textual elements provided as tactile or haptic cues on products can provide information on the way of use or functioning of products. They are identified by touch which fingers while exploring the products with hand movements. Examples can include a cut of one corner of a SIM card or form of grips, handles or tabs on packaging, the distinct form of euro coins, and the haptic structure of euro bank notes.

Annex A
(informative)

Identifying and testing information elements

A.1 Identifying elements of information

Clause 4.3 outlines a process for testing that includes identifying the different elements in the information. This is important as it helps select the appropriate requirements for different elements from Clauses 5 to 7. Figure A.1 below is a sample information leaflet that has different elements with different applicable requirements. This is to introduce the process of creating the test checklist shown in A.2

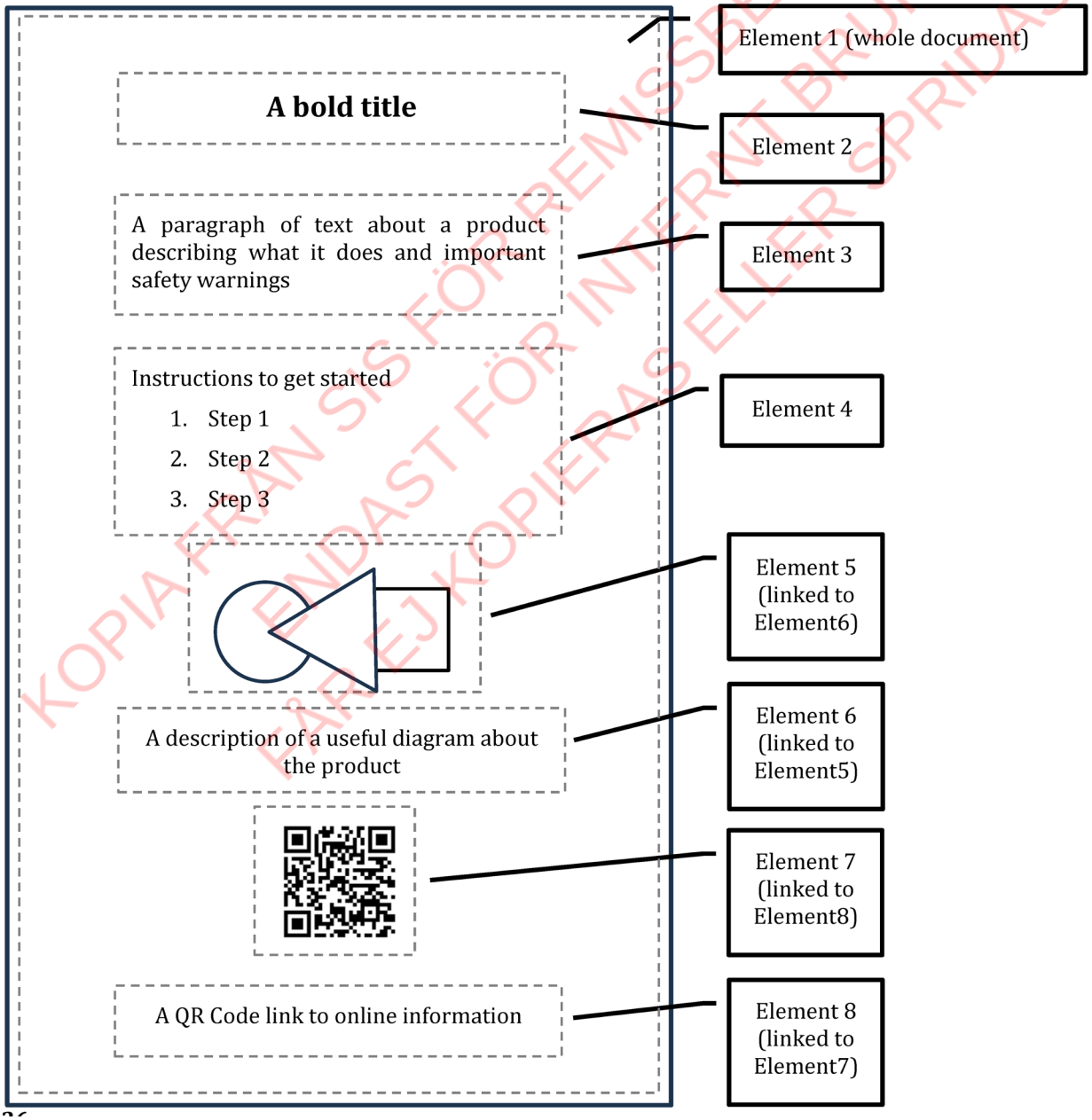


Figure A.1 — Sample information leaflet with different elements

A.2 An example test checklist table for recording the testing process

Table A.2 is an example based on the sample in A.1 of a testing checklist for a visual form.

Table A.2 — Example testing schedule for information in non-digital forms

Information testing plan	Testing plan details
Product/service name	Example information leaflet
Product/service version	Version 1.0
Testing date	12 December 2025
Tester names	Person A and Person B
User types/profiles	This product is used by the general population of ages 11 and above.
Specific user accessibility needs	Users with low vision Users with reading difficulties
Viewing distance	Leaflet is handheld (40cm)
Purpose of information	1. To understand what the product is for 2. To understand specific warnings about how it should not be used 3. The sequence of tasks to get started using the product 4. Access to online information that enables an additional sensory channel
Form for sensory channel 1	Visual
Form for sensory channel 2	Auditory via QR Code
Form for sensory channel 3 (optional)	None

Sensory Channel 1	Visual		
Testing Activities			
Element	Requirement	Result	Pass/fail
Whole document			
	5.1.8 Glare and opacity		

	5.3.6 Non-textual glare and opacity		
	5.4.1 Written text content readability		
	5.4.2.11 Layout		
Document title			
	5.1 Perceivable visual text		
	5.1.1.1 Font size		
	5.1.2 Visual contrast		
	5.1.5 Font style		
	5.1.6 Font weight		
	5.1.7 Colour		
	5.4 Understandable visual text requirements		
	5.4.2.4 Consistent and clear headings.		
	5.4.2.5 Same term is used consistently		
	5.4.2.9 Bold shall be used only for emphasis		
Introduction			
	5.1 Perceivable visual text		
	5.1.1.1 Font size		
	5.1.2 Visual contrast		
	5.1.4 Line spacing		
	5.1.5 Font style		
	5.1.6 Font weight		
	5.1.7 Colour		
	5.4 Understandable visual text requirements		
	5.4.1 Written text content readability		

	5.4.2 Understandable written information		
	5.4.2.1 Information shall be structured in the correct order of use		
	5.4.2.3 Easy-to-understand language shall be used		
	5.4.2.5 Same term is used consistently		
	5.4.2.11 Text content layout		
Instructions			
	5.1 Perceivable visual text		
	5.1.1.1 Font size		
	5.1.2 Visual contrast		
	5.1.4 Line spacing		
	5.1.5 Font style		
	5.1.6 Font weight		
	5.1.7 Colour		
	5.4 Understandable visual text requirements		
	5.4.1 Written text content readability		
	5.4.2 Understandable written information		
	5.4.2.1 Information shall be structured in the correct order of use		
	5.4.2.3 Easy-to-understand language shall be used		
	5.4.2.5 Same term is used consistently		
	5.4.2.11 Text content layout		

	5.4.3 Understandable written instructions		
	5.4.3.1 Instructions shall be presented step by step in numbered lists		
	5.4.3.3 Information shall be structured in the correct order of use		
Diagram			
	5.3 Perceivable non-textual content requirements		
	5.3.1 Visual non-textual content	NOTE This requirement is linked to the 'diagram element' listed below	
	5.3.2 Non-textual line thickness and spacing		
	5.3.2.1 For the hand-held viewing distance (40 cm)		
	5.3.3 Non-textual visual contrast		
	5.3.5 Non-textual colour		
	5.5 Understandable non-textual content		
	5.5.1 Non-text content shall be recognisable and related to the content.		
	5.5.1.2 Images shall be relevant to the content		
	5.5.1.3 Images shall not introduce essential information		
	5.5.1.4 Images shall not break the flow of blocks of text content		
	5.5.1.5 Non-text content layout		
	5.5.1.6 Presentation of visual symbols should be consistent with established recognisable examples		

Diagram description			
	5.1 Perceivable visual text		
	5.1.1.1 Font size		
	5.1.2 Visual contrast		
	5.1.4 Line spacing		
	5.1.5 Font style		
	5.1.6 Font weight		
	5.1.7 Colour		
	5.3 Non-textual content requirements		
	5.3.1 Visual non-text content	NOTE This requirement links the purpose of this text to the diagram element	
	5.4 Understandable visual text requirements		
	5.4.1 Written text content readability		
	5.4.2 Understandable written information		
	5.4.2.1 Information shall be structured in the correct order of use		
	5.4.2.3 Easy-to-understand language shall be used		
	5.4.2.5 Same term is used consistently		
	5.4.2.11 Text content layout		
QR Code			
	5.3 Non-textual content requirements		
	5.3.1 Visual non-textual content	NOTE This requirement is linked to the 'QR Code description element' listed below	
	5.3.2 Non-textual line thickness and spacing	NOTE excluded as it is a QR Code	

	5.3.2.1 For the hand-held viewing distance (40 cm)		
	5.3.3 Non-textual visual contrast		
	5.3.4 Non-textual colour		
	5.5 Understandable non-textual content		
	5.5.1 Non-text content shall be recognisable and related to the content.		
	5.5.2 Images shall be relevant to the content		
	5.5.3 Images shall not break the flow of blocks of text content		
	5.5.4 Non-text content layout		
	5.5.5 Presentation of visual symbols should be consistent with established recognisable examples		
QR Code description			
	5.1 Perceivable visual text		
	5.1.1.1 Font size		
	5.1.2 Visual contrast		
	5.1.4 Line spacing		
	5.1.5 Font style		
	5.1.6 Font weight		
	5.1.7 Colour		
	5.3 Non-textual content requirements		

	5.3.1 Visual non-text content	NOTE This requirement links the purpose of this text to the QR Code element	
	5.4 Understandable visual text requirements		
	5.4.1 Written text content readability		
	5.4.2 Understandable written information		
	5.4.2.1 Information shall be structured in the correct order of use		
	5.4.2.3 Easy-to-understand language shall be used		
	5.4.2.5 Same term is used consistently		
	5.4.2.11 Text content layout		

Sensory Channel 2	Auditory via QR Code		
	4.2.2 Combinations of non-digital and digital	Test in accordance with EN 301549	

Requirements are not just about what is present in the information being tested but testing should consider things that are potentially missing. For example, the absence of a number list in instructions (5.4.3.1) or the appropriate grouping of blocks of information (5.4.2.2)

Some elements can be closely linked. For example, a text description of a diagram where multiple requirements need to be considered together.

Testing that the information is equivalent where provided through digital means is outside the scope of this document however, it is recommended to check for equivalence.

NOTE The example table above can be replicated in a spreadsheet or other suitable document

Annex B
(informative)

User accessibility needs and risk assessments

B.1 General

The User Accessibility Needs Assessments guidance in this annex is to help ensure that user accessibility needs are known and are used to inform design decisions for presenting information in non-digital forms.

The Accessibility Risk and Opportunities Assessments guidance in this annex is to help enable economic operators develop knowledge about regulatory obligations and the benefits from improved business.

B.2 User accessibility needs assessments

User accessibility needs can help to inform design decisions for how information is presented so it can be accessed, understood and used by a wide range of users.

NOTE 1 CEN CENELEC Guide 6:2014 provides information about how to address user accessibility needs. Guide 6 has an associated technical report ISO TR 22411 that provides detailed ergonomic data about human sensory, physical and cognitive functions.

User accessibility needs assessments should be conducted to establish a base of knowledge for each of the non-digital forms visual, auditory and tactile. Applicable accessibility requirements from clause 5-7 should inform the preparation of sample information content for use during relevant assessment activities.

User testing activities can be part of user needs assessments. Efficient and effective user testing can be based on a small sample set of users with diverse abilities, characteristics and preferences that might experience unforeseen barriers. Where user testing is conducted it should follow best practice methods for accessible engagement, be conducted in the actual context of use, and establish a determined pass-fail threshold,

NOTE 2 Involving users, directly or indirectly, with diverse characteristics and capabilities can be an efficient and effective way of understanding the diverse needs of the whole user population. Engaging with end users, including persons with disabilities, during the assessment process aligns with Article 4(3) of the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD).

When designing and developing information for the widest range of users, the organisation can take account of the diversity of users in accordance with EN17161.

NOTE 3 The Design for All Approach in EN 17161:2025 is to ensure that products and services can be accessed, understood, and used by the widest range of users and can be used as a recognised part of assessments and evaluations related to declaration of conformance with relevant standards. Further information can be found in prEN 17161:2019, 8.3.2.3.

Design decisions resulting from user accessibility needs assessments can specify and record:

a) A defined range of intended users

b) The defined range of users' diverse characteristics and capabilities as related to their experienced usage of information presented

c) Environmental conditions and context of use barriers to the perception and understanding of information.

d) The sensory channels to be used with the intended users.

e) The most frequently preferred form of presentation, visual, auditory or tactile by the intended users for the type of information presented.

f) What assistive technologies are relevant to the intended users and the types of information presented.

NOTE 4 Additional information about users and the context of use can be found in *ISO 20282-1 Ease of operation of everyday products Part 1: Design requirements for context of use and user characteristics. First edition 2006-10-15.*

B.3 Accessibility risk and opportunities assessments

Accessibility risk and opportunities assessments conducted for each of the non-digital forms presented can provide useful findings.

The findings resulting from assessments can specify and record:

a) The understood risk related to compliance with relevant regulations.

b) The expected impacts from non-use of the products and services because of access barriers to the information presented in each of the non-digital forms.

c) The estimated opportunities for business benefits from providing information in accessible forms for the widest range of users.

NOTE Guidance on Disability Impact Assessments can be used to inform the models and methods for accessibility risk and opportunities assessments.

The outputs of accessibility assessments should be documented in an auditable format, including risk identification, mitigation strategies and dates of review.

Organisations should assign responsibility for carrying out accessibility risk assessments to roles with oversight such as access officers, inclusion leads or service owners.

Annex C
(informative)

Visual text content readability tools

C.1 Readability formulas for text content

Examples of Readability Formulas include but are not limited to:

a) Flesch Reading Ease - Scores text from 0-100, with higher scores indicating easier reading.

b) Flesch-Kincaid Grade Level - Estimates the U.S. grade level needed to understand the text.

c) Gunning Fog Index - Focuses on complex words and sentence length.

d) SMOG Index - Particularly good for materials above 4th grade level.

e) Coleman-Liau Index - Uses character count rather than syllable count.

f) Automated Readability Index (ARI) - Based on characters per word and words per sentence.

NOTE 1 ISO 23859:2023, (Clause 6) provides requirements and recommendations on language in written text.

NOTE 2 Related information for readability formulas is at WCAG 2.2 Success Criterion 3.1.5 Reading Level.

C.2 Digital tools and platforms for readability

Examples of Digital Tools and Platforms include:

a) Hemingway Editor - Highlights complex sentences and suggests simplifications

b) Grammarly - Includes readability scoring

c) Readable.com - Comprehensive readability analysis

d) WebFX Readability Test Tool - Free online analyzer

NOTE Some of the above tools are only compatible with the English language.

A combination of testing with users and AI assessment tools should also be considered.

Content should align with LIX or equivalent indices.

LIX is a multi-language alternative, when there is no validated adaptation for a specific language.

Key Features of LIX include:

e) Language-independent (doesn't rely on syllable counting like many English formulas)

f) Works well across different languages, especially European languages

g) Simple calculation makes it easy to implement

h) Focuses on sentence length and word length rather than phonetic complexity

Example of how content is tested using LIX Works:

The formula is: LIX = (A/B) + (C × 100/A)

Where:

A = number of words in the text

B = number of sentences

C = number of long words (words with more than 6 characters)

Annex D
(informative)

Acoustic notifications and Speech transmission index (STI)

D.1 Acoustic notifications

D.1.1 General

Clause D.1 of this Annex provides a simple three-phase approach for testing acoustic notifications during design, real-world installation, and user evaluation. It is written for non-experts and can be carried out using basic software audio tools and simple sound meters or sound-meter software. Because these tools are typically not calibrated to the same level as professional acoustic testing equipment or laboratory procedures, the results obtained through this Annex should be understood as indicative guidance only. This Annex is for information purposes and is not intended to replace formal acoustic measurement methods where those are required.

D.1.2 Phase 1 – Acoustic notification design checks

Phase 1 focuses on looking at the shape of the sound (the waveform), its frequencies (the spectrum), and its duration (time). These checks help confirm that the acoustic notification has clear features that make it compliant with the requirements in 6.3.1.

D.1.2.1 Looking at the waveform across time

A waveform view helps you understand:

a) The overall shape of the sound (onset, sustain, offset and decay).

b) Whether the sound starts clearly or drifts in gradually.

c) The duration of the notification.

d) The spacing between repeated peaks if the notification has a rhythmic pattern.

Short sounds tend to work well in quiet places (e.g. around 100 ms).

Longer or repeated sounds tend to work better in busy or noisy places (e.g. 300–500 ms).

Figure D.1. illustrates an example time-domain waveform of an acoustic notification comprising two tones presented in sequence. The waveform shows the signal amplitude, expressed in decibels relative to full scale (dBFS), as a function of time in milliseconds. The effective duration of the acoustic notification is defined as the time interval from the onset of the signal to the point at which the signal amplitude decays below a level considered clearly audible above the background noise. This interval includes the initial onset, steady-state portion, and the subsequent amplitude decay of the signal.

Note that the dBFS scale is a relative digital amplitude scale, where 0 dBFS represents the maximum possible signal level of the digital system on which the acoustic notification is being designed, and all other values are expressed as negative decibels relative to this maximum. dBFS values do not represent absolute sound pressure levels when that acoustic notification is subsequently measured on its analog domain, but are used to describe the relative amplitude and temporal structure of the signal.

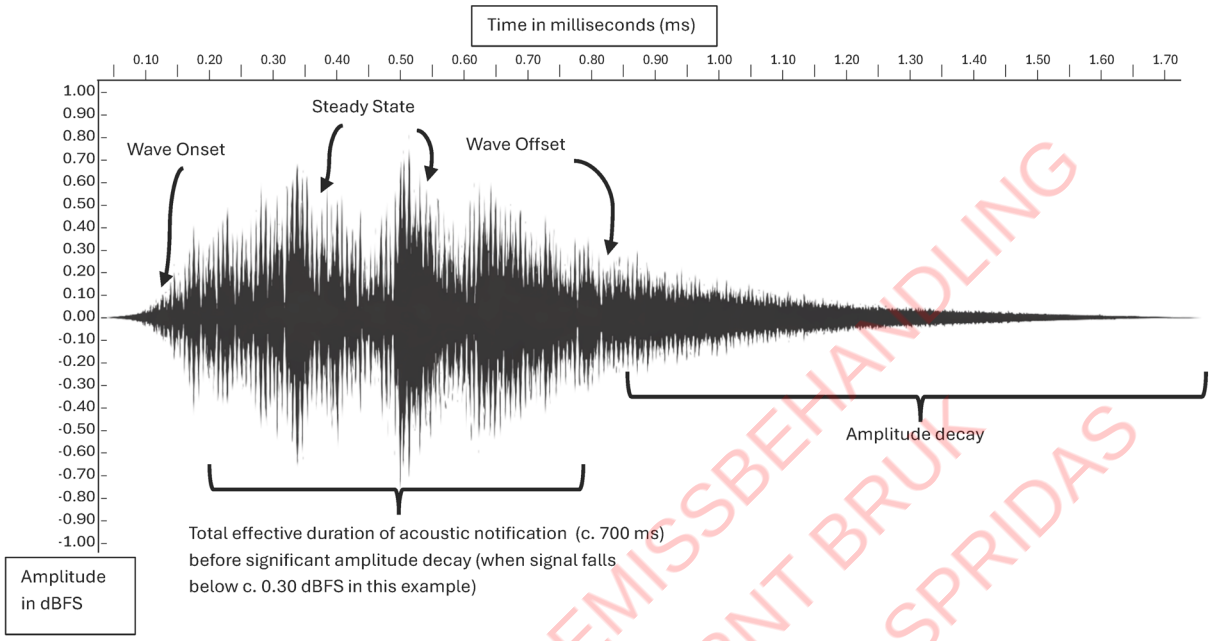


Figure D.1 Example waveform of an acoustic notification showing effective duration

D.1.2.2 Looking at the frequency content (fundamental, partials, overtones)

Viewing the sound in the frequency domain helps show:

a) The fundamental frequency (the main pitch of the notification).

b) Additional partials or overtones (higher-frequency components).

c) How strong each frequency component is compared to the others.

A clear acoustic notification includes multiple partials (at least four are required as per 6.3.1.3). This helps:

d) Make the sound easier to notice in the presence of background noise.

e) Make it easier to hear even if some people have reduced hearing at particular frequencies.

f) Improve detection when there are obstacles between a speaker and the listeners.

Figure D.2 shows a spectrogram of an acoustic notification comprising three sequential tones, displaying their fundamental frequencies and associated partials. The 200 Hz component represents the fundamental (1st partial), while the 400 Hz and 600 Hz components occur at integer multiples of the fundamental and therefore appear as harmonic overtones. Other partials, such as 525 Hz and 680 Hz, are not integer multiples of 200 Hz and are thus classified as inharmonic overtones. Colour intensity indicates amplitude, with dark grey denoting highest energy and light grey the lowest. The distribution of harmonic and inharmonic partials demonstrates that the notification meets the required spectral criteria, providing multiple frequency components with strong amplitude peaks across the specified frequency ranges. (In this example there are only three tones which means this acoustic notification would fail to comply with 6.3.1.3).

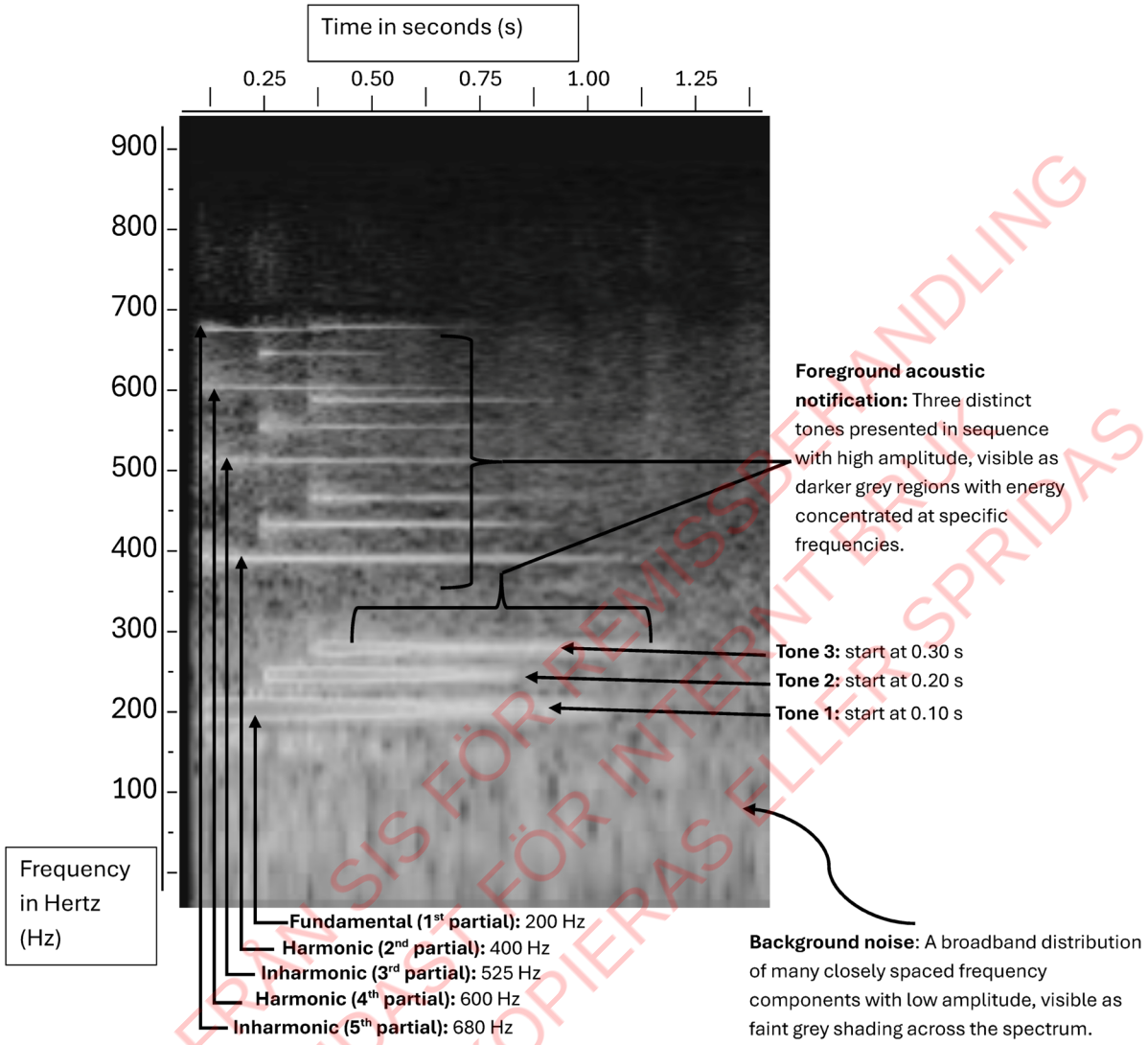


Figure D.2 Spectrogram of frequency and associated partials

D.1.3 Phase 2 - Testing the acoustic notification in context

D.1.3.1 General

Phase 2 checks how the notification behaves once installed in the environment where users will experience it. This stage uses simple, practical tests, suitable for non-experts.

D.1.3.2 Measuring the notification near the source and typical listener distances

A simple A-weighted sound pressure meter or app can be used to take readings:

— Near the source (e.g. 10 cm–200 cm) – depending on how accessible and reachable the immediate sound source is in relation to the closest and safest distance.

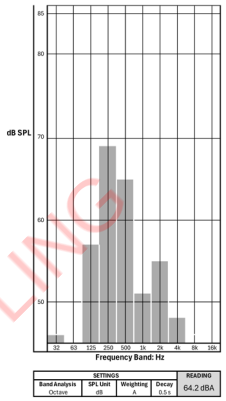
— At typical user listening distances (e.g. 2 m or the distance a passenger, customer or user normally stands from the sound source).

This helps confirm:

— Whether the notification remains noticeable at normal distances.

— Whether the background noise varies across the space.

Figure D.3. shows a comparison of SPL measurements of an acoustic notification taken 1 metre from the source (left) and at a more distant listening position (right). The octave band spectra show how the overall A-weighted level decreases with distance, with the close-range measurement reaching 73,1 dB(A) and the distant measurement reduced to 64,2 dB(A). The spectral distribution reveals strong energy around 125–500 Hz and several overtones at higher frequencies when measured near the source. As distance increases, higher-frequency components attenuate more rapidly due to atmospheric absorption and directional losses, resulting in a narrower spectrum at the listening position. This illustrates how A-weighted SPL and spectral content change with distance from the source.



SETTINGS				READING
Band Analysis	SPL Unit	Weighting	Decay	73.1 dBA
Octave	dB	A	0.5 s	

Figure D.3 Comparison of sound pressure level (SPL) measurements of an acoustic notification measured close to the sound source and at a representative listener position located several times farther from the source.

D.1.3.3 Checking how the notification stands out from the background noise

A straightforward way to evaluate this is:

a) Measure during the busiest time-of-day at least 3 instances of background noise without notifications or speech announcements present. Use peak dB A-weighted values across the frequency range. , while also noting the dB value of the bands associated with STI and/or SIL calculations (see Annex D.2 and Annex D.3).

b) Measure the acoustic notification when it plays in the same busy environment using the same measurement protocol.

c) Compare the peak dB A weighted values across the frequencies relevant to the acoustic notification.

The notification is more likely to be perceivable when its main frequency components rise above the noise at the same frequencies.

Figure D.4 illustrates a spectrogram of an acoustic notification followed by a spoken announcement. The three sequential notification tones are visible between 0.00 s and 3.00 s, with clearly defined fundamental frequencies and associated partials appearing as distinct spectral peaks above the background noise floor. Low-level broadband background noise, unrelated to the notification or speech signals, is present across the spectrum and is indicated for reference. The spoken announcement follows the notification and is characterised by a fundamental frequency and higher-frequency formant structure, enclosed within the highlighted bounding region. Signal amplitudes are expressed in decibels relative to full scale (dBFS), allowing relative comparison of the notification tones, speech components, and background noise. These relative levels may be used to assess the potential for spectral and temporal masking between the acoustic notification and the spoken announcement.

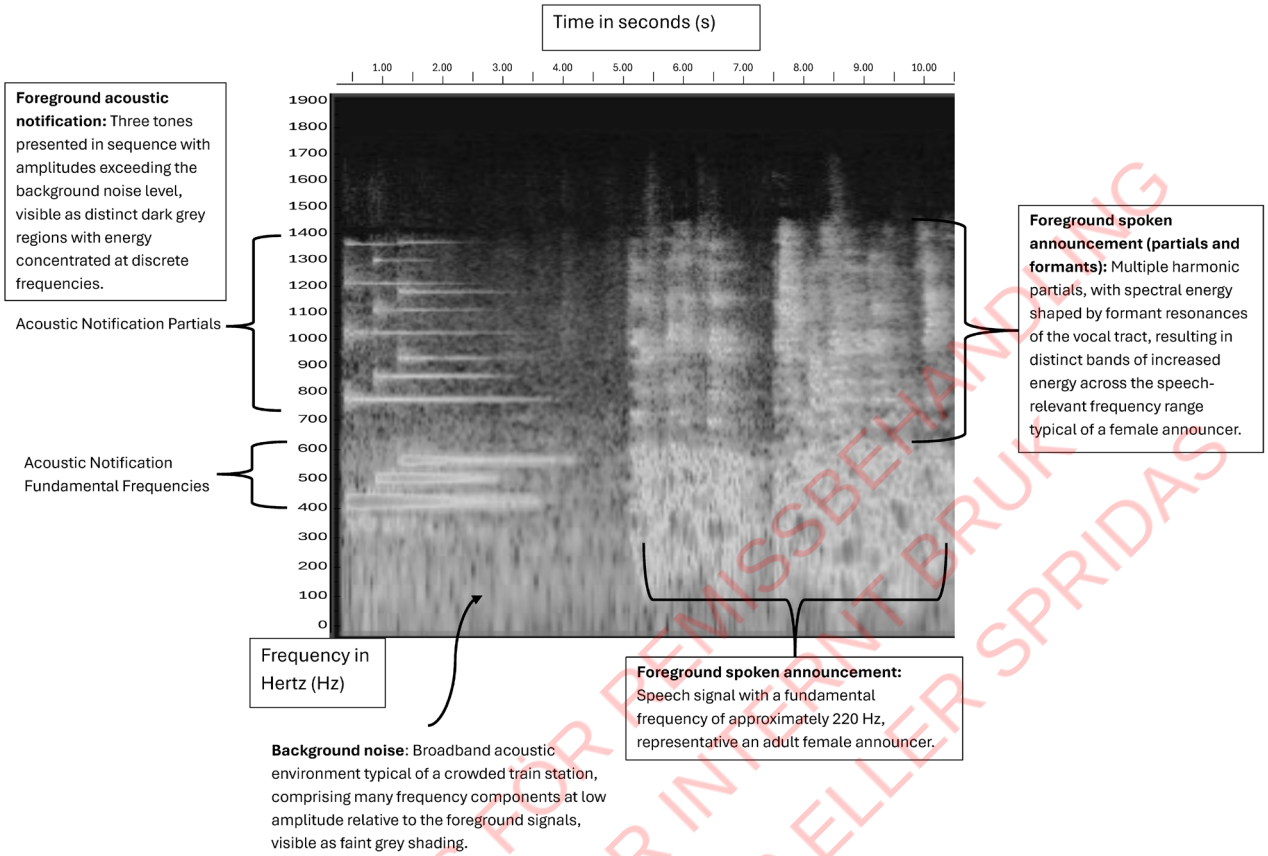


Figure D.4 Spectrogram of an acoustic notification followed by a spoken announcement

D.1.3.4 Testing around obstacles

Real environments often include:

— Walls

— Doorways

— Seats or furniture

— Screens, gates, handrails

— People standing between the user and the speaker

It is helpful to check the notification as per D.3 and D.4:

a) Behind a barrier

b) Around a corner

c) At different heights

d) When the user's body blocks the direct path

If the notification still has at least one strong partial that remains noticeable, it is more likely to work reliably.

D.1.4 Phase 3 - Testing with users

D.1.4.1 General

User testing helps determine whether the acoustic notification is effective for the people who will rely on it.

D.1.4.2 Perceivability

Users can be asked:

a) Whether they can hear the notification at normal distances.

b) Whether they can hear it in everyday background noise.

c) Whether it is still noticeable when they are doing other tasks.

A simple "heard / not heard" record is often sufficient.

D.1.4.3 Attention-grabbing qualities (positive and negative)

Users can comment on:

a) Whether the sound attracts attention appropriately.

b) Whether it is pleasant, neutral, or annoying.

c) Whether they prefer the sound with a shorter or longer duration.

This helps ensure the acoustic notification is functional without causing unnecessary annoyance.

D.1.4.4 Understandability of the meaning

Users can be asked what they think the notification means, for example:

a) “Ready to proceed”

b) “Action required”

c) “Process complete”

d) “Warning or check something”

Record whether users interpret the meaning consistently.

D.1.4.5 Recognisability of a family of notifications

If there are several related acoustic notification sounds, users can be asked:

a) Whether the sounds feel like they “belong together” (timbre, rhythm, tone family).

b) Whether they can reliably tell the sounds apart.

c) Whether they can remember which sound corresponds to which meaning.

This helps ensure a coherent but distinct set of notifications.

D.2 Speech Transmission Index Guidance

D.2.1 Principle

STI is based on the idea that speech consists of modulations in amplitude across different frequency bands. If these modulations are preserved during transmission, speech remains intelligible. Any degradation (due to noise, echoes, or distortion) reduces intelligibility.

D.2.2 Measurement Process

D.2.2.1 Test Signal: A special test signal is used, typically a modulated noise signal that mimics the modulation patterns of human speech.

D.2.2.2 Frequency Bands: The signal is analyzed across seven octave or one-third octave bands (125 Hz to 8 kHz), which correspond to speech-relevant frequencies.

D.2.2.3 Modulation Transfer Function (MTF): For each band, the system calculates how well the amplitude modulations (at different modulation frequencies, 0,63–12,5 Hz) are transmitted.

D.2.2.4 Noise & Reverberation Effects: The MTF is degraded by:

— Background noise (reduces modulation depth)

— Reverberation (smears modulations over time)

D.2.2.5 Calculation: The MTF values are combined into a single STI score (0,00 to 1,00):

0,00–0,30: Bad intelligibility

0,30–0,45: Poor

0,45–0,60: Fair

0,60–0,75: Good

0,75–1,00: Excellent

D.2.3 Measurement Tools

— Dedicated STI meters or software (e.g., NTi Audio, Brüel & Kjær)

— Speech-like test signals played through the system and recorded at the listener position

— Analysis software computes the STI score automatically

D.3 Speech Interference Level (SIL) Guidance

D.3.1 Principle

The SIL is based on the principle that speech intelligibility is primarily limited by ambient noise within frequency bands that are critical for speech perception. If the speech level sufficiently exceeds the noise level within these bands, speech remains intelligible. Increased noise within these bands reduces the effective SNR and degrades intelligibility. Note that ISO 9921 states SIL should be used only where STI cannot be applied.

D.3.2 Measurement Process

D.3.2.1 Ambient Noise Measurement: measured at the listener position with the speech or notification system inactive, under representative operating conditions.

D.3.2.2 Frequency Bands: Noise levels are determined in four octave bands centred at 500 Hz, 1 000 Hz, 2 000 Hz, and 4 000 Hz, which correspond to the principal frequency range for speech interference.

D.3.2.3 Speech Level Measurement: The speech level is measured at the same listener position as an A-weighted equivalent continuous sound pressure level, corresponding to the spoken message or representative speech signal.

D.3.2.4 Calculation of Noise Speech-Interference Level (L_{SIL}):

a) Step 1: calculate the arithmetic mean of the ambient noise sound pressure levels in the four octave bands: $L_{SIL} = (L_{500} + L_{1000} + L_{2000} + L_{4000}) / 4$

b) Step 2: calculate the difference between the A-weighted speech level ($L_{S,A}$ where $_S$ = SPL and $_A$ = A-weighted) and the noise speech-interference level (L_{SIL}): $SIL = L_{S,A} - L_{SIL}$

D.3.3 Interpretation of Results

The calculated SIL value provides an indication of expected speech intelligibility under noise-limited conditions:

— SIL < 10 dB: Poor intelligibility

— 10 dB ≤ SIL < 15 dB: Fair intelligibility

— 15 dB ≤ SIL < 21 dB: Good intelligibility

— SIL ≥ 21 dB: Excellent intelligibility

These ranges are consistent with ISO 9921:2003.

D.3.4 Interpretation of Results

Typical tools for SIL assessment include:

— Sound level meters capable of octave-band analysis at 500 Hz, 1 kHz, 2 kHz, and 4 kHz

— A-weighted sound pressure level measurement capability

— Measurement microphones positioned at representative listener locations

SIL measurements may be performed more rapidly than STI measurements and are suitable for field assessments where noise is the dominant limiting factor.

Annex E
(informative)

Tactile dimensions and design guidance

E.1 Dimensions of tactile markings

Table E.1 summarizes recommended ranges for spatial dimensions of tactile markings and Braille.

Table E.1 — Dimensions of tactile markings used in applications (for fingers)

Dimensions in millimetres

Dimension		Tactile markings		Braille
		International Standard	National standard	
Raised height of dots, bars and symbols	Dots	0,6 ± 0,2	0,5 to 0,8 0,8 to 2,0	0,4 ± 0,1 0,7 to 1,3
	Bars	0,5 ± 0,1	0,5 to 0,8	
	Symbols	0,25 to 0,5 (ISO 11683:1997) 0,40 to 0,48 (for embossed characters) (ISO/IEC 7811-1:2002)	—	
Size dimensions of dots, bars and symbols	Dots (diameter)	1,5 ± 0,2 (ISO 11683:1997)	1,5 to 2,0	—
	Bars (length)	4,0 ± 1,0	—	
	Symbols (size)	3-4, 9 ± 1, 18 ± 2 (ISO 11683:1997)	10 to 25	
Inter-dot spacing (for Braille)		—	—	2,13 to 3,17 (depending on country)
Inter-character spacing (for Braille)		—	—	3,13 to 4,05 (depending on country)
Interline spacing (for Braille)		—	—	4,87 to 9,17 (depending on country)

SOURCE: ISO/dTR 22411-2: (E) Table 10 (CL 71.4.1)

E.2 Tactile content design considerations

E.2.1 General

The tactile layout of texts in Braille or with raised characters follows other rules than for visual presented texts due to available space and tactile perceivable structure. For space reasons it is often necessary to focus on the essential text information in a tactile presentation on a tactile label. It should point to additional available information e.g. provided on the Web.

NOTE 1 Tactile raised characters require approximately three times more space than a Braille characters, which moreover requires approximately five times more space than a 12-point printed character.

NOTE 2 Tactile characters are not used in long texts because reading is very slow.

E.2.2 Raised characters

Tactile lettering relates to specially designed raised characters composing letters and numbers readable by touch with fingers.

Some blind persons are not familiar with the shape of letters of fonts. Therefore, tactile optimized fonts are used. The use of capital letters only, is recommended for an easier and faster identification of letters.

E.2.3 Braille

It should be noted that 80% of blind people are not familiar with Braille. Braille labels for international use do use shorthand (contraction grade1 or grade2) and no special characters like umlauts or accents because they are coded differently across languages. For personal used products Braille labels for different languages can be provided.

EXAMPLE A Braille business card often allows only space for name, company and web or mail address.

It is recommended to consult with printing houses for the blind that have knowledge of the region of intended use.

E.2.4 Tactile shapes, haptic cues and symbols

The meaning of tactile shapes and haptic cues on products often need to be explained to blind users by teachers or trainers.

Many blind persons are not familiar with the visual meaning of symbols. The meaning of symbols often needs to be explained to blind users by teachers or trainers.

It is recommended to use only easily perceivable and understandable symbols like x for cancel, o for confirm or + and - signs. More complex tactile symbol e.g. for "male" and "female" are not easy to distinguish and should be accompanied by words in Braille or tactile characters.

Annex F
(informative)

Information in non-digital and digital forms

F.1Non-digital forms descriptions

This Annex F displays examples of information in non-digital forms including:

a) Visual

b) Auditory

c) Tactile

The examples below are for information presented in non-digital forms versus information presented in digital forms.

An additional example shows information presented in non-digital form indicating availability of information presented in digital forms.

F.2Visual forms

A non-digital visual form would be printed signage and instructions provided in the provision of a service.

Alternatively, a digital visual form would be an interactive information display with live updates.

EXAMPLE A non-digital visual form could be a permanent sign indicating the presence of an automated teller machine (ATM) used in the provision of a consumer banking service or a handwritten sign indicating a temporary change to services in a transport station.

F.3Auditory forms

A non-digital auditory form would be real-time transport information that is shared over speakers in a transport station, spoken live by personnel.

Alternatively, an example of a digital auditory form would be pre-recorded information, stored for repeated use, selectable by the users, heard through personal speakers, on a ticket machine. (automated)

F.4Tactile forms

A non-digital tactile form would be a raised dot or notched edge indicating the purpose of a button, feature or function on the surface of a product or package.

Alternatively, a digital tactile form would be refreshable braille display.

An example of a non-digital tactile form is the number 5 key on a remote control for a television that provides a raised dot or dash to indicate location of the touchpad keys.

F.5Combined non-digital tactile and visual for a digital auditory form

An accessible QR code is an example of a visual non-digital form that can be used in conjunction with a tactile non-digital form that can provide auditory information through a digital means to present information for blind users and those with low vision.

A QR code, when printed at an adequate size ensures that it is easy to scan at a wider angle and distance, can then be scanned and auditory instructions can be provided to the user. Therefore, the information (in this case, instructions) that does not require seeing, is provided.

Annex G
(informative)

Increasing accessibility with font size

Every design decision can include or exclude potential users. The 'potential accessibility level based on font size' is the percentage of the EU adult population for whom the text is big enough that they have the potential to perceive the information, in a best case-scenario with high contrast and good lighting. The actual percentage of users included is likely to be lower than the values in the table below, because accessibility additionally depends on other requirements, such as the choice of colours used, the font style, the lighting, and other factors related to perception and understanding. The potential accessibility increases significantly when small text gets a bit bigger. As the font size gets bigger than 14pt Arial or equivalent, the benefit of making it even bigger diminishes, so providing the information in alternative forms is key to further reducing exclusion.

Table G.1 Estimated accessibility level based on font size, for handheld viewing distances (40cm)

Arial font size (points)	x-height (mm)	Potential accessibility level based on font size (% EU adults)[a]	Estimated EU adult population excluded (millions)[b]
5	0,9	63 %	111
6	1,1	74 %	77
7 Minimum allowable [c]	**1,3**	**80 %**	**58**
8	1,5	83 %	49
9	1,6	87 %	40
10	1,8	90 %	31
11	2,0	91 %	26
12	2,2	93 %	21
13	2.4	94 %	17
14 Required size [d]	**2,6**	**95 %**	**14**
15	2,7	96 %	12
16 - Large print [e]	2,9	97 %	10
17	3,1	97 %	8
18	3,3	98 %	7

a Potential accessibility levels derived from Better Design Survey, assuming threshold Test Chart Letter Height = x-height, and a 'Majority of the day' setup of visual aids. https://datacatalogue.ukdataservice.ac.uk/studies/study/6997?id=6997#details

b Based on EU 16+ population of 298 million, derived from US Census IDB in 2025

c Minimum allowable size, subject to requirements, defined in Clause 5.1.1.1 of this document

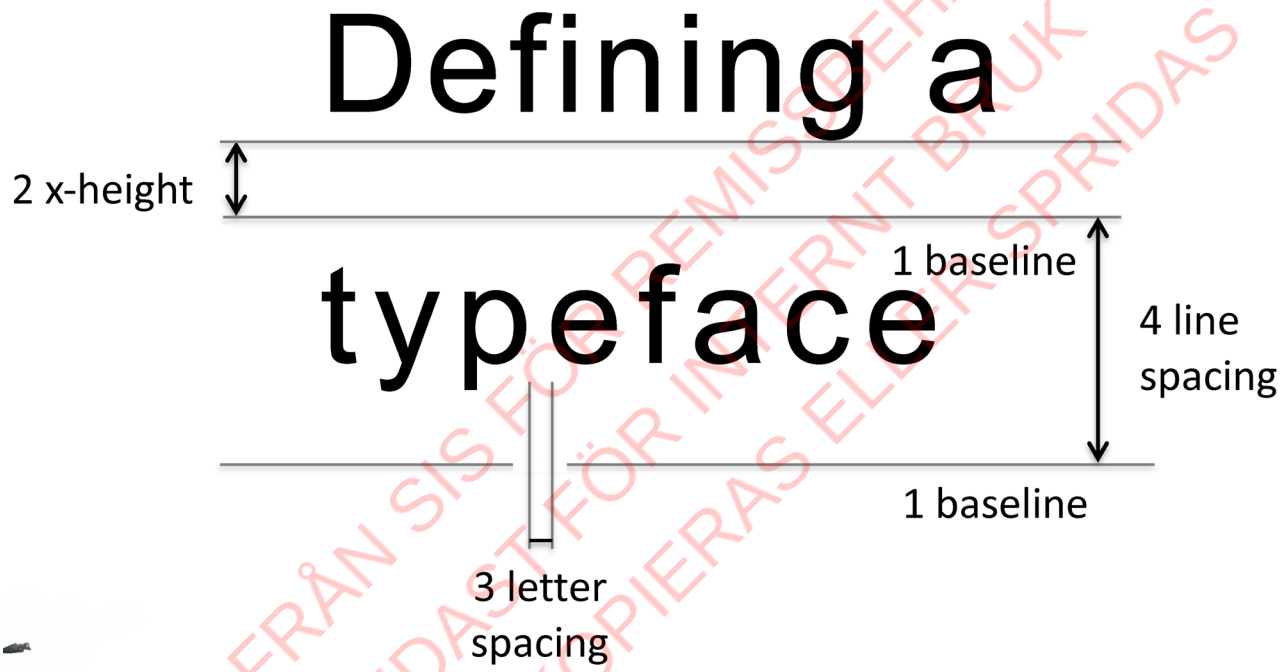
d Required size, defined in 5.1.1.1 Large print is typically 16 to 18 point https://www.rnib.org.uk/living-with-sight-loss/independent-living/reading-and-books/large-and-giant-print/

Annex H
(Informative)

Font and text layout descriptions

H.1 Introduction

This annex describes some of the basic properties of fonts and how they are laid out. These properties are used to define different requirements in this standard. Figure H.1 illustrates font and layout basics.



Key

1 The invisible line upon which a line of text rests.

2 The height of a lowercase x for a typeface

3 Also called tracking, refers to the space between letters

4 Also known as leading, controls the amount of space between baselines in a block of text. A text's line height is proportional to its type size.

Figure H.1 — Descriptions for font and text layout requirements

H.2 Examples of different font styles

Weight: Light Normal **Semibold Bold ExtraBold.**

Italics: A style of font that typically leans to the right.

Serifs A serif is a small shape or projection that appears at the beginning or end of a stroke on a letter as shown in figure H.2

Figure H.2 — The letter f with Serifs

Annex I
(informative)

Font size evaluator tool

I.1 Introduction

Table I.1 is a simple tool for physically measuring the size of different pieces of text (specifically, x-height as used in this document) and represents a basic typometer. In order to use the measuremt tool correctly, follow the steps described in I.2.

Table I.1 Text at reading distance (40cm)

Arial font size (points)	x-height (mm)	Potential inclusion based on font size (% EU adults) [1]	Uppercase H at size	Lowercase x at size
5	0,9	63 %	H	x
6	1,1	74 %	H	x
7 - Minimum allowable [a]	1,3	80 %	H	x
8	1,5	83 %	H	x
9	1,6	87 %	H	x
10	1,8	90 %	H	x
11	2,0	91 %	H	x
12	2,2	93 %	H	x
13	2,4	94 %	H	x
14 - Required size [b]	2,6	95 %	H	x
15	2,7	96 %	H	x
16	2,9	97 %	H	x
17	3,1	97 %	H	x
18	3,3	98 %	H	x

a Minimum allowable size, subject to requirements, defined in 5.1.1.1 of this document
b Required size, defined in 5.1.1.1 of this document

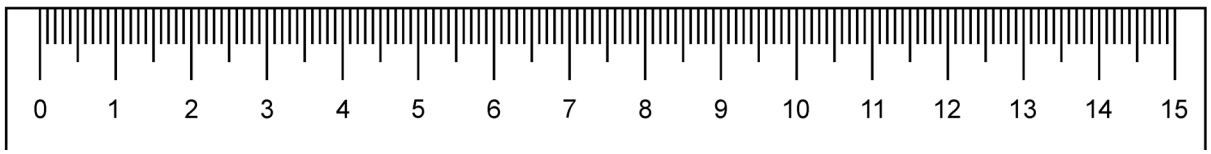


Figure I.1 — Scale for testing print size

Check this is printed at the right size, by checking this scale is 150 mm long

I.2 Steps to print and use the table tool in I.1

I.2.1 Printing the measurement tool

1. Print the page with the table on A4 paper, ensuring that no scaling happens during the printing (i.e. within the print settings the scaling factor should be 100%, and 'scale to fit printable area' should be disabled). The size can be checked by measuring the scale printed on the page and ensuring it is 150mm in length.

2. Fold or cut the right side of the page so that the ‘x’s are at the edge of the paper

I.2.2 Using the tool

1. Find the ‘x’ from the table that is the closest match in height to a lower case ‘x’ (or lower case a, c, e, m, n, o, r, s, u, v, w, x, z) in the text you are evaluating. Where there are only capitals in the text use the H’s in the table.

2. Assess whether the value is at the ‘required’ or ‘minimum’ allowable size as follows:

   a) An x-height value = or > 2,6 mm (Arial equivalent of 14 pt) meets or exceeds the required level

   b) An x-height value = or > 1,3 mm (Arial equivalent of 7 pt) meets or exceeds the minimum allowable size, subject to the requirements defined in 5.1.1.1

Annex J
(informative)

Measuring Light Reflectance Values (LRV)

J.1 Measuring light reflectance

For greyscale text and backgrounds, the NCS Lightness Meter[2] is a useful and simple to use tool for measuring Light Reflectance Values (LRV), as is shown in figure J.1.

Figure J.1 — NCS Lightness Meter

J.2 Recommended steps for use

a) Print a rectangle of 6,5 cm wide by 1 cm height using the ink of the text or graphics on the media (e.g. paper or card) that will be used in the final product

b) Move the rectangle under the semi-circular windows on the Lightness meter to find the closest match in lightness (you can compare 3 in one go). The closest is when the borderline between the meter and the rectangle is least distinct.

c) Read off and record the LRV value, which is the middle row labelled Y_L that ranges from 4,47 to 85,95

d) Repeat steps 2 and 3 for the media (e.g. paper or card) that has nothing printed on it

e) The Absolute Difference in LRV = absolute ($LRV_{foreground} - LRV_{background}$)

   1) The Absolute Difference in LRV should be greater than 70, but this may be reduced to 60 if the text is bigger. See 5.1.2 for text and 5.3.3 for non-text content.

   2) The Absolute Difference in LRV should also be less than 80

NOTE For coloured text and / or backgrounds, LRV can be measured using the procedure and device specification from Section 6.2 of EN 16584:2017, 6.2.

[2] https://ncscolour.com/en-eu/products/ncs-lightness-meter?srsltid=AfmBOorHdbvtmIbxkYpdrMEKfUJs0haClPFA70bdZTXwTwFKDgyNyZDq

Annex K
(informative)

Line spacing and Paragraph spacing for text at reading distance (40cm)

K.1 General

Tables K.1 and K.2 are tools for physically measuring line and paragraph spacing. To use the tables correctly, follow the steps in K.2 and K.3.

Table K.1 — Minimum allowable font — reading distance

	Font and size	x-height (mm)	Line spacing (in mm, baseline to baseline)	Paragraph spacing (in mm, baseline to baseline)	Line spacing **example** text
Minimum Allowable Arial font	Arial at 7 pt	1,3 mm	2,5 * x-height (mm) = 3,25 mm (at least)	3,75 * x-height (mm) = 4,88mm (at least)	This example text is 7pt Arial, and has a line spacing of 3,25 mm from baseline to baseline. For Arial font in Microsoft Office products, this means the line spacing should be at least 1,1. This is another paragraph, which has a baseline to baseline spacing of 4,88 mm from the previous paragraph. In Microsoft Office products, for 7pt Arial font with a line spacing of 1,1, this equates to a paragraph spacing of 5 PT
Minimum Allowable Times New Roman font	Times New Roman at 8,2 pt	1,3 mm	2.5 * x-height (mm) = 3,25 mm (at least)	3.75 * x-height (mm) = 4,88mm (at least)	This example text is 8.2pt Times New Roman, and has a line spacing of 3,25 mm from baseline to baseline. For Times New Roman font in Microsoft Office products, this means the line spacing should be at least 0,95. This is another paragraph, which has a baseline to baseline spacing of 4,88 mm from the previous paragraph. In Microsoft Office products, for 8,2pt Times New Roman with a line spacing of 0,95 this equates to a paragraph spacing of 5 PT

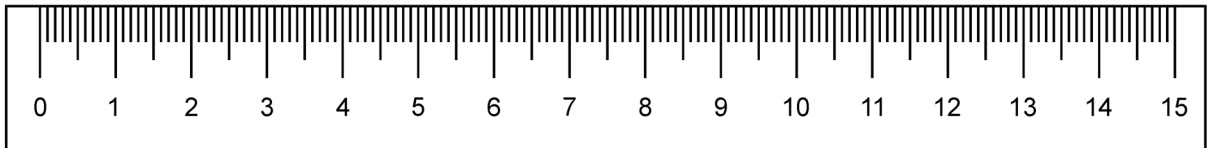


Figure K.1 — Scale for testing print size

Check this is printed at the right size, by checking this scale is 150 mm long.

Table K.2 — Required font size - reading distance

Required size (Arial font)	Arial at 14 pt	2,6 mm	2,5 * x-height (mm) = 6,5 mm	3,75 * x-height (mm) = 9,75mm	This example text is 14 pt Arial, and has a line spacing of 6,5 mm from baseline to baseline. For Arial font in Microsoft Office products, this means the line spacing should be 1,1 This is another paragraph, which has a baseline to baseline spacing of 9,75 mm from the previous paragraph. For 14pt Arial with a line spacing of 1,1, this equates to a paragraph spacing of 10pt

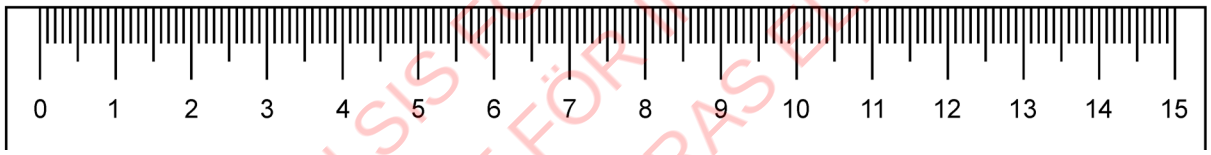


Figure K.2 — Scale for testing print size

Check this is printed at the right size, by checking this scale is 150 mm long

K.2 Printing the measurement tool

1) Print the tables on A4 pages, ensuring that no scaling happens during the printing (i.e. within the print settings the scaling factor should be 100%, and “scale to fit printable area” should be disabled). The size can be checked by measuring the scale printed on the page and ensuring it is 150mm in length.

2) Fold or cut the right side of the page so that lines of text are at the edge of the paper

K.3 Using the tool

1) Select the table with the font size of the text you are measuring

2) For evaluating **line spacing**, use the lines of text in one of the paragraphs and align it with the text you are testing. Check whether the spacing is equal or greater than the text in the tool.

3) For evaluating **paragraph spacing**, use the gap between the paragraphs of text and align it with the paragraph gap with the text you are testing. Check whether the gap is equal or greater than the text in the tool.

Annex L
(informative)

Sizes and line spacing for other fonts

Different fonts of the same point size, e.g. 14 pt, have different x-heights and different ratios between the x-height and cap height (the height of a capital letter). The following table shows the variation in point size for a range of different fonts for the required and minimum allowable font sizes. It also includes an estimate of the required line spacing in Microsoft Word (2025 version).

Table L.1 — Font sizes and line spacing for fonts other than Arial regular

Font name	x-height / Font size	Font size (pt) for 1,3mm x-height	x-height(pt)	Rule of thumb estimate for line spacing in Microsoft products	cap-height / x-height
Times New Roman	0,45	8,23	3,69	0,96	1,48
Calibri Light	0,47	7,89	3,69	1	1,36
Calibri	0,47	7,84	3,69	1	1,36
Georgia	0,48	7,65	3,69	1,03	1,44
Myriad Pro	0,48	7,61	3,69	1,03	1,39
Myriad Pro Light	0,49	7,56	3,69	1,04	1,38
Segoe UI Black	0,5	7,38	3,69	1,07	1,40
Segoe UI	0,5	7,37	3,69	1,07	1,40
Segoe UI Light	0,5	7,37	3,69	1,07	1,40
Segoe UI Semibold	0,5	7,37	3,69	1,07	1,40
Segoe UI Semilight	0,5	7,37	3,69	1,07	1,40
Arial Narrow	0,52	7,11	3,69	1,11	1,38
Arial	0,52	7,11	3,69	1,11	1,38
Arial Nova	0,52	7,11	3,69	1,11	1,38
Arial Black	0,52	7,1	3,69	1,11	1,38
Trebuchet MS	0,52	7,06	3,69	1,12	1,36
Roboto	0,53	6,97	3,69	1,13	1,34
Roboto Black	0,53	6,97	3,69	1,13	1,34
Roboto Light	0,53	6,96	3,69	1,13	1,34

Font name	x-height / Font size	Font size (pt) for 1,3mm x-height	x-height(pt)	Rule of thumb estimate for line spacing in Microsoft products	cap-height / x-height
Open Sans Light	0,53	6,95	3,69	1,13	1,35
Century Gothic	0,53	6,93	3,69	1,14	1,35
Tiresias Signfont	0,53	6,9	3,69	1,14	1,36
Open Sans	0,53	6,89	3,69	1,14	1,33
HelveticaNeueLT Std Med Cn	0,54	6,85	3,69	1,15	1,33
Open Sans Semibold	0,54	6,82	3,69	1,15	1,32
Tahoma	0,55	6,75	3,69	1,17	1,33
Verdana	0,55	6,75	3,69	1,17	1,36
Verdana Pro	0,55	6,75	3,69	1,17	1,36
Verdana Pro SemiBold	0,55	6,73	3,69	1,17	1,36
Open Sans Extrabold	0,55	6,67	3,69	1,18	1,29
Comic Sans MS	0,56	6,56	3,69	1,2	1,39

Annex M
(informative)

Size, Line & Paragraph Values at Different Distances

M.1 Minimum allowable size (if space is necessarily constrained)

Table M.1 shows the values for font size, x-height, line spacing and paragraph spacing at different viewing distances for the minimum allowable size, and the required size. See 5.3.2.2.

Table M.1 — Minimum allowable size (if space is necessarily constrained)

Viewing distance (m)	Arial font size (pt)	x-height (mm)	Line spacing baseline to baseline (mm)	Paragraph spacing (baseline to baseline mm)
0,40	7	1,30	3,25	4,88
0,60	10,5	1,95	4,88	7,31
0,80	14	2,60	6,50	9,75
1,00	17,5	3,25	8,13	12,19
2,00	35	6,50	16,25	24,38
3,00	52,5	9,75	24,38	36,56
4,00	70	13,00	32,50	48,75
5,00	87,5	16,25	40,63	60,94
6,00	105	19,50	48,75	73,13
7,00	122,5	22,75	56,88	85,31
8,00	140	26,00	65,00	97,50
9,00	157,5	29,25	73,13	109,69
10,00	175	32,50	81,25	121,88
15,00	262,5	48,75	121,88	182,81
20,00	350	65,00	162,50	243,75
30,00	525	97,50	243,75	365,63

In proportion to the available space means that the size shall not be smaller than is possible within the available space, taking into account the impact on the perception and understanding of the information and the reference values from other relevant requirements.

M.2 Required size

Table M.2 shows the values for font size, x-height, line spacing and paragraph spacing at different viewing distances for the required size. See 5.3.2.2.

Table M.2 — Required size

Viewing distance (m)	Arial font size (pt)	x-height (mm)	Line spacing baseline to baseline (mm)	Paragraph spacing (baseline to baseline mm)
0,40	14	2,60	6,50	9,75
0,60	21	3,90	9,75	14,63
0,80	28	5,20	13,00	19,50
1,00	35	6,50	16,25	24,38
2,00	70	13,00	32,50	48,75
3,00	105	19,50	48,75	73,13
4,00	140	26,00	65,00	97,50
5,00	175	32,50	81,25	121,88
6,00	210	39,00	97,50	146,25
7,00	245	45,50	113,75	170,63
8,00	280	52,00	130,00	195,00
9,00	315	58,50	146,25	219,38
10,00	350	65,00	162,50	243,75
15,00	525	97,50	243,75	365,63
20,00	700	130,00	325,00	487,50
30,00	1050	195,00	487,50	731,25

Annex ZA
(informative)

Relationship between this European Standard and the requirements of Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services aimed to be covered

This European Standard has been prepared under a Commission's standardization request Mandate 587 to provide one voluntary means of conforming to essential requirements of Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services

Once this standard is cited in the Official Journal of the European Union under that Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding requirements of that Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services, and associated EFTA regulations

Table ZA.1 — Correspondence between this European Standard and Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services]

Requirements of Directive 2019/882, Annex I	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
Section 1.1a(i)	4.2.1	
Section 1.1a(ii)	5.4, 6.4, 7.2	
Section 1.1a(iii)	5.1, 6.2, 6.3, 7.1	
Section 1.1a(iv)	5.1.1 – 5.1.5	
Section 1.1(b)(i)	4.2.1	
Section 1.1(b)(ii)	5.4, 6.4, 7.2	
Section 1.1(b)(iii)	5.1, 6.2, 6.3, 7.1	
Section 1.1(b)(iv)	5.1.1 – 5.1.5	
Section 1.1(b)(v)	5.2	
Section 1.1(b)(vi)	5.3.1 – 5.3.6, 7.1.2, 7.2.2	

Requirements of Directive 2019/882, Annex I	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
Section 2 (a)	4.2.1 5.4, 6.4, 7.2 5.1, 6.2, 6.3, 7.1 5.1.1 – 5.1.5 4.2.1 5.4, 6.4, 7.2 5.1, 6.2, 6.3, 7.1 5.1.1 – 5.1.5 5.2 5.3.1 – 5.3.6, 7.1.2, 7.2.2	The information on or in the packaging is addressed
Section 2(b)(i)	4.2.1	
Section 2(b)(ii)	5.4, 6.4, 7.2	
Section 2(b)(iii)	5.1, 6.2, 6.3, 7.1	
Section 2(b)(iv)	5.1.1 – 5.1.5	
Section 2(b)(v)	5.2	
Section 2(b)(vi)	5.3.1 – 5.3.6, 7.1.2, 7.2.2	
Section 3(a):	4.2.1 5.4, 6.4, 7.2 5.1, 6.2, 6.3, 7.1 5.1.1 – 5.1.5 4.2.1 5.4, 6.4, 7.2 5.1, 6.2, 6.3, 7.1 5.1.1 – 5.1.5 5.2 5.3.1 – 5.3.6, 7.1.2, 7.2.2	
Section 3(b)(i)	4.2.1	
Section 3(b)(ii)	5.4, 6.4, 7.2	

Requirements of Directive 2019/882, Annex I	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
Section 3(b)(iii)	5.1, 6.2, 6.3, 7.1	
Section 3(b)(iv)	5.1.1 – 5.1.5	
Section 3(b)(v)	5.2	
Section 3(b)(vi)	5.3.1 – 5.3.6, 7.1.2, 7.2.2	
Section 4(c)(i)	4.2.1 5.4, 6.4, 7.2 5.1, 6.2, 6.3, 7.1 5.1.1 – 5.1.5 5.2 5.3.1 – 5.3.6, 7.1.2, 7.2.2	
Section 4(c)(ii)	4.2.1 5.4, 6.4, 7.2 5.1, 6.2, 6.3, 7.1 5.1.1 – 5.1.5 5.2 5.3.1 – 5.3.6, 7.1.2, 7.2.2	
Section 4(e)(ii)	5.4.1 – 5.4.3	
Section 4(g)(i)	4.2.1 5.4, 6.4, 7.2 5.1, 6.2, 6.3, 7.1 5.1.1 – 5.1.5 5.2 5.3.1 – 5.3.6, 7.1.2, 7.2.2	

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) / [service(s)] / [...] falling within the scope of this standard.

Bibliography

DIN 32975:2009, *Designing visual information in the public area for accessible use*

DIN 1450:2024, *Typefaces – Legibility*

UNE 153010:2012 *Subtitling for deaf and hard-of-hearing people*.

EN 17161:2019, *Design for All - Accessibility following a Design for All approach in products, goods and services - Extending the range of users*

EN 17478:2021, *Transport Services - Customer communications for passenger transport services - A Universal Design approach*

EN 16584-1:2017, *Railway applications — Design for PRM use — General requirements — Part 1: Contrast*

EN 16584-2:2017, *Railway applications — Design for PRM use — General requirements — Part 2: Information*

CEN/TR 15753:2008, *Packaging - Package leaflets for medicinal products - Braille and other formats for visually impaired people*

CEN/TR 17621:2021, *Accessibility and usability of the built environment - Technical performance criteria and specifications*

ETSI EN 301-549, v3.2.1:2021-03, *Accessibility requirements for ICT products and services*

ETSI EG 202 534 V1.1.3 (2007-07) *Guidelines for real-time person-to-person communication services*.

ETSI (2007) ETSI EG 202 487 V1.1.2 (2007-12). Human Factors (HF); User experience guidelines; Telecare services (eHealth).

ETSI ES 202 975 V2.1.1 (2015-09) *Human Factors (HF); Requirements for relay services*.

IEC/IEEE 82079-1:2019, *Preparation of information for use (instructions for use) of products Part 1: Principles and general requirements*

ISO/IEC Guide 71:2014, *Guide for addressing accessibility in standards*

ISO/IEC Guide 76:2020, *Development of service standards — Recommendations for addressing consumer issues*

ISO/IEC 2913-1:2018, *Information technology — User interface accessibility Part 1: User accessibility needs*

ISO/IEC 23859, *Information technology — User interfaces — Requirements and recommendations on making written text easy to read and understand*

ISO 5127, *Information and documentation — Foundation and vocabulary*

ISO 11156:2011, *Packaging — Accessible design — General requirements*

ISO 17049:2013, *Accessible design — Application of braille on signage, equipment and appliances*

ISO 18295-1:2017, *Customer contact centres — Part 1: Requirements for customer contact centres*

ISO 9241-112:2017, *Ergonomics of human-system interaction. Part 112: Principles for the presentation of information*

ISO/TS 9241-126:2019, *Ergonomics of human-system interaction — Part 126: Guidance on the presentation of auditory information*

ISO 9355-2:1999, *Ergonomic Requirements for the Design of Displays and Control Actuators — Part 2: Displays*

ISO 11683:1997, *Packaging — Tactile warnings of danger — Requirements*

ISO 17480:2018, *Packaging — Accessible design — Ease of opening*

ISO 19809:2017, *Packaging — Accessible design — Information and marking*

ISO 24508:2019, *Ergonomics — Accessible design — Guidelines for designing tactile symbols and characters*

ISO 24551:2019, *Ergonomics — Accessible design — Spoken instructions of consumer products*

ISO 24509:2019, *Ergonomics — Accessible design — A method for estimating minimum legible font size for people at any age*

ISO 21542:2021, *Building construction — Accessibility and usability of the built environment*

ISO 20282-1:2006, *Ease of operation of everyday products — Part 1: Design requirements for context of use and user characteristics*

ISO 20417:2021, *Medical devices — Information to be supplied by the manufacturer*

ISO 21801-1:2021, *Cognitive accessibility — Part 1: General guidelines*

ISO 21902:2022, *Accessible tourism for all — Requirements and recommendations. Clause 6*

ISO 22458:2022, *Consumer vulnerability — Requirements and guidelines for the design and delivery of inclusive service*

ISO 23599:2019, *Assistive products for blind and vision-impaired persons — Tactile walking surface indicators*

ISO 24495-1:2023, *Plain language — Part 1: Governing principles and guidelines*

ISO 24505:2016, *Ergonomics — Accessible design — Method for creating colour combinations taking account of age-related changes in human colour vision*

ISO 27500:2016, *The human-centred organization — Rationale and general principles*

ISO/IEC Guide 41:2018, *Packaging — Recommendations for addressing consumer needs*

ISO/TR 22411:2021, *Ergonomics data for use in the application of ISO/IEC Guide 71:2014*

IEC 60268-16:2011, *Sound system equipment — Part 16: Objective rating of speech intelligibility by speech transmission index*

ITU recommendation on total conversation ITU-T recommendation F.703 of 2000 (Multimedia Conversation Services).

ITU Recommendation on multimedia relay telecommunication services F.930 of 2018.

AUSTRALIAN HUMAN RIGHTS COMMISSION. (2016). Access for all: Improving accessibility for consumers with disabilities.

AUSTRALIAN BANKING ASSOCIATION. (2023). Accessibility and Inclusion Principles for Banking.

BBC news website (2024) Sign language app trial for passengers.

BUREAU OF INTERNET ACCESSIBILITY. (2023) Are QR codes accessible for people with disabilities.

CENTRE FOR EXCELLENCE IN UNIVERSAL DESIGN. (2023). Customer Communications Toolkit for Services to the Public – A Universal Design Approach.

CENTRE OF EXPERTISE FOR ACCESSIBLE CLIENT SERVICE. (2021) Accessability Playbook – Delivering accessible client service.

Entelis+ project (2021). Creation of accessible resources to support teaching and learning.

EUROPEAN AGENCY FOR SPECIAL NEEDS AND INCLUSIVE EDUCATION. (2015). Guidelines for Accessible Information. Developed in the ICT4IAL project.

EUROPEAN BLIND UNION. (2013) Making information accessible for all.

EUROPEAN EMERGENCY NUMBER ASSOCIATION. (2023) Implementation of RTT and Total Conversation in Europe.

FINANCIAL CONDUCT AUTHORITY. (2016). Feedback statement. Smarter Consumer Communications.

FINANCIAL CONDUCT AUTHORITY. (2022). FG22/5 Final non-Handbook Guidance for firms on the Consumer Duty.

FUNKA NU. (2019) Universell utforming av chatbots.

GERMAN FEDERATION OF THE BLIND AND PARTIALLY SIGHTED. Leserlich Contrast Calculator.

HIDDEN DISABILITIES SUNFLOWER. (2024) Accessible Packaging. Helping you to navigate the cereal aisle.

INTERNATIONAL ASSOCIATION OF ACCESSIBILITY PROFESSIONALS. (2023) Certified Professional in Accessibility Core Competencies PACC - Body of Knowledge.

MAC MAHON M. (2023) Review of Generative AI Chatbots' Accessibility.

Microsoft Creating Accessible Packaging [https://inclusive.microsoft.design/tools-and-activities/CreatingAccessiblePackaging.pdf

GROUP N.N. (2024) 13 QR-Code Usability Guidelines.

SWEDISH STUTTERING ASSOCIATION. (2024) Checklist for digital speech-based services (in Swedish).

TOURISM U.N. et al. (2024) How to apply ISO Standard 21902 Recommendations for key players in the transportation sector.

EYES W.H.O. https://cdn.who.int/media/docs/default-source/blindness-and-visual-impairment/whoeyes-info-sheet-en.pdf?sfvrsn=27a873fd_6

WHO hearWHO (https://www.who.int/teams/noncommunicable-diseases/sensory-functions-disability-and-rehabilitation/hearwho

YORK UNIVERSITY ACCESSIBILITY HUB. (2024). Tips for Customer Service.

Zappar (2023) What is accessible QR.

Accessibility for Ontarians with Disabilities Act (2005).

Council of Europe Common European Framework of Reference for Languages (CEFR).

Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments.

Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code.

Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services.

Directive (EU) 2023/2673 of the European Parliament and of the Council as regards financial services contracts concluded at a distance.

European Parliament legislative resolution of 24 April 2024 on the proposal for a regulation of the European Parliament and of the Council on packaging and packaging waste.

Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers.

Regulation (EU) No 181/2011 of the European Parliament and of the Council 16 February 2011 concerning the rights of passengers in bus and coach transport.

Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices.

Regulation (EU) 2023/988 of the European Parliament and of the Council of 10 May 2023 on general product safety.

JAINTA S., JASCHINSKI W., WILKINS A.J. Periodic letter strokes within a word affect fixation disparity during reading. *J. Vis.* 2010, **10** (13) p. 2

ARIES ARDITI. Rethinking ADA signage standards for low-vision accessibility. *J. Vis.* 2017, **17** (5) p. 8