

BS ISO 17049:2013



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Accessible design — Application of braille on signage, equipment and appliances

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National foreword

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

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**Accessible design — Application of
braille on signage, equipment and
appliances**

Conception accessible — Méthodes d'affichage des signes en braille



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Foreword

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The committee responsible for this document is ISO/TC 173, *Assistive products for persons with disability*, Subcommittee SC 7, *Accessible design*.

Accessible design — Application of braille on signage, equipment and appliances

1 Scope

This International Standard specifies the fundamental requirements for braille used on signage, equipment and appliances, including the dimensional parameters of braille and the characteristics of materials used, and the guidelines for practical implementation.

2 Terms and definitions

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

2.1

signage

means of conveying information about name, direction, location, usage, safety or a form of action

2.2

equipment

permanent device or machine used in daily life in a house, an office or publicly accessible places

EXAMPLE Such devices or machines include kitchen equipment, a copying or printing machine, an automatic teller machine, a ticket kiosk or a lift.

Note 1 to entry: In ISO 9999:2011, 6.3, and 18 30 03, the term “elevator” is used for lift.

2.3

appliance

movable device or machine used in daily life, such as an electric appliance for household or office use

2.4

tactile reading

recognizing braille and other tactile information by touch

2.5

tactile readability

ease of reading braille and other tactile information by touch

2.6

braille cell

space for the braille pattern, comprising up to six predefined dots set out in two columns of three

2.7

braille pattern

combination of raised dots within a braille cell

2.8

exclusion zone

area where nothing is placed around a braille cell or cells

2.9

button

operative device, such as pressure sensitive button, pressure sensitive surface, touch sensitive button, and touch sensitive surface

2.10
dial

control which persons physically rotate in order to operate a function

3 Specifications for braille

3.1 Braille character, word and line

The braille character is composed of single braille patterns or a combination of braille patterns; the braille word is composed of one or more braille characters.

Braille patterns are all placed within the braille cell and they require the space of the braille cell. A braille cell requires the space of all six nominal dots. Vacant dots shall not be neglected because they are a part of the braille pattern.

Where a braille character or word appears in isolation, there shall be an exclusion zone around such a character or word.

Codes and format of braille characters, which are commonly used and recognized in each country, shall be adopted.

Braille shall be arranged to allow tactile reading to be performed consistent with the braille reading order in the language in which it is presented, e.g. left to right.

3.2 Configuration and spacing of braille dot and cell

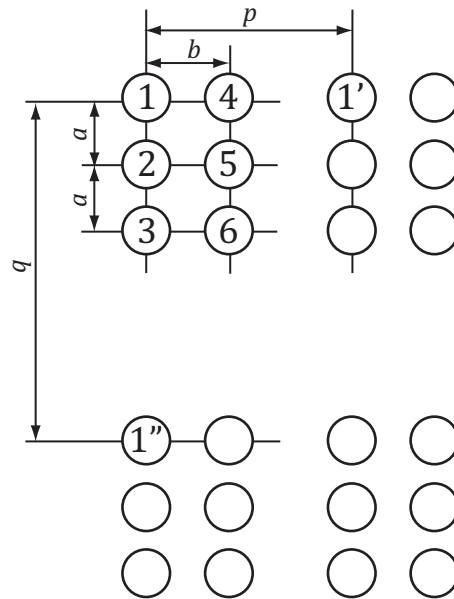
The configuration of braille dots and cells shall be in accordance with [Figure 1](#); the spacing shown as *a*, *b*, *p* and *q* shall be in the range shown in [Table 1](#).

Specifications should be in line with national or regional standards, if applicable.

Table 1 — Spacing between braille dots and cells

Dimensions in millimetres

Parameters	Description	Distance between dot centres
<i>a</i>	Vertical dot spacing (spacing between dot 1 and dot 2)	2,2 to 2,8
<i>b</i>	Horizontal dot spacing (spacing between dot 1 and dot 4)	2,0 to 2,8
<i>p</i>	Cell spacing (spacing between dot 1 and dot 1')	5,1 to 6,8
<i>q</i>	Line spacing (spacing between dot 1 and dot 1'')	10,0 to 15,0



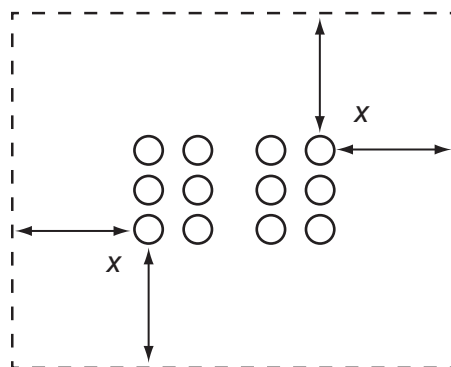
Key

- a* vertical dot spacing (spacing between dot 1 and dot 2)
- b* horizontal dot spacing (spacing between dot 1 and dot 4)
- p* cell spacing (spacing between dot 1 and dot 1')
- q* line spacing (spacing between dot 1 and dot 1'')

Figure 1 — Configuration and spacing of braille dots and cells

3.3 Exclusion zone

An exclusion zone, *x*, of at least 6 mm shall be placed around all sides of the isolated braille cell or cells (see [Figure 2](#)).



Key

- x* exclusion zone

Figure 2 — Exclusion zone around isolated cells

The exclusion zone shall be used to prevent a protrusion from disturbing the movement of fingers in reading braille (see [Figure 3](#)).

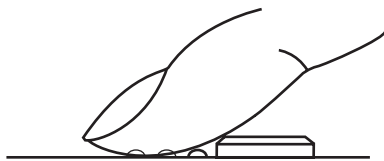
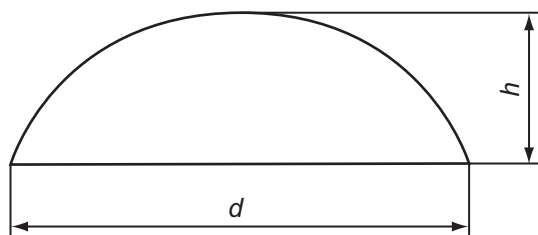


Figure 3 — Example of a protrusion hindering a finger from reading braille

3.4 Dimensions and shape of braille dot

The cross-section of the braille dot shall be in accordance with Figure 4 and Table 2.

The profile of the braille dot shall be rounded. It shall not be flat or pointed.



Key

d diameter of the base

h perpendicular height of braille dot centre

Figure 4 — Cross-section of a braille dot

Table 2 — Dimensions of cross-section of a braille dot

Dimensions in millimetres

Parameter	Size
<i>d</i>	1,0 to 1,7
<i>h</i>	0,3 to 0,7

The perpendicular height of braille dot centre, *h*, should be greater than 0,5 mm when used in outdoor arrangement and on or in vehicles of means of transport.

3.5 Correlation among dimensional parameters of braille

Dimensional parameters of braille shall reflect the technical correlations between the individual parameters. For example if the smallest dot diameter and dot spacing are chosen, all other dimensions shall be proportional.

4 Application of braille on signage, equipment and appliances

4.1 General

Materials used for braille shall

- attain good tactile readability,
- have a surface and edge that will not cause harm when touched,
- be durable,

- not be damaged in normal use, and
- not be adversely affected by the external thermal environment, moisture or liquid.

Where braille and print are both used, the readability of one format shall not impair the readability of the other.

Braille shall be located on a place that is safe to touch, e.g. away from a source of heat or a sharp edge.

Where the information displayed in braille is revised, braille information shall be immediately corrected accordingly.

4.2 Braille on signage

4.2.1 General

Signage with braille shall be located in appropriate positions for easy access.

The number of cells in a single line shall be as follows:

- a) if there is only one column in one line, the number of cells shall not exceed 40;
- b) if there are multiple columns in one line, the number of cells in one column shall not exceed 40 and the total number of cells shall not exceed 80 in a single line;
- c) an exclusion zone of three or more cells shall be placed between each column in a single line.

4.2.2 Handrail

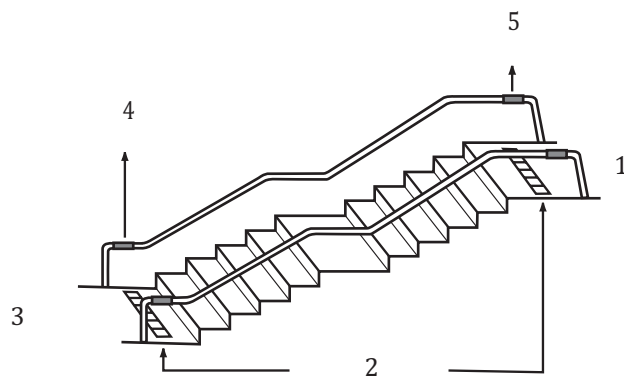
One application, among others, is on a handrail (see [Figure 5](#)).

Braille shall be displayed parallel to the longitudinal direction of a handrail.

Braille shall be displayed on the area where it can be most easily read, and which allows safe reading by touch when a hand holds the handrail. Such an area should be chosen by considering the shape, thickness, surroundings and the method by which the handrail is fixed.

For a handrail on stairs, braille should be displayed at the end of the handrail, which is an extension of tactile walking surface indicators (TWSI) (see ISO 23599), if any, on the floor in front of the stairs.

Handrails with braille should have extensions, preferably of at least 300 mm in length on both ends of the staircase; this is to allow for safe reading of braille.

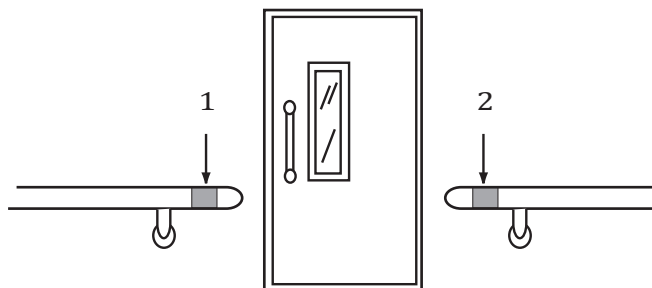


Key

- 1 third floor
- 2 TWSI attention pattern
- 3 second floor
- 4 second floor: the large hall (→ third floor: the reference room)
- 5 third floor: the reference room (← second floor: the large hall)

Figure 5 — Example: handrails for stairs

In cases where there are handrails on both sides of a room door, the signage with braille shall be placed on the side of the handrail where the door opens (ledge side). Where it is required to indicate the direction of the door or opening, the signage with braille should be placed on both sides of the handrail, and shall include a symbol, such as a tactile shape of an arrow or the specific combination of braille patterns which indicates an arrow (see [Figure 6](#)).



Key

- 1 Meeting room 2 (→ Meeting room 2)
- 2 Meeting room 2 (← Meeting room 2)

The dark grey-coloured section or area of the bar shows where braille should be placed.

Figure 6 — Example: room doorway

4.3 Braille for the controls of equipment and appliances

4.3.1 General

Braille for the controls of equipment and appliances shall be placed on the same surface with the controls. Braille shall not be placed diagonally, nor in curved or upside-down arrangements.

An exclusion zone shall be used around a braille cell or cells.

NOTE Placing braille near operative buttons with a rise or similar kind of protrusions can hinder the movement of fingers in reading braille (see [Figure 3](#)).

Braille labelling of independent and adjoined controls in the same line should be separated by an exclusion zone of two or more cells in order to avoid misreading. Even with limited space, an exclusion zone of one and a half cells shall be used (see [Figure 7](#)).

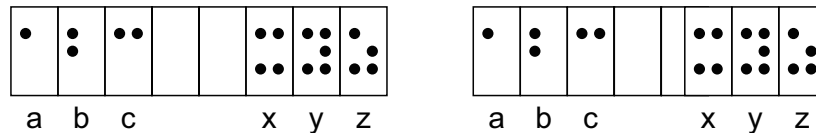


Figure 7 — Exclusion zones and adjoined braille

4.3.2 Buttons

Braille should not be placed on a button.

Braille shall not be placed on a ring around a control button unless it can be presented in a straight horizontal line.

Braille may be placed on the buttons if the buttons cannot be identified by touch or there is no space for braille around a button, and if there is no possibility of unintended operation by reading braille.

Where buttons are arranged horizontally, braille shall be above and adjacent to the corresponding buttons.

Where buttons are arranged vertically, braille shall be placed to the left of and adjacent to the corresponding buttons.

4.3.3 Dials

Braille should be placed on or around dials, and in the same orientation as the print.

Bibliography

- [1] ISO 9999:2011, *Assistive products for persons with disability — Classification and terminology*
- [2] ISO 21542, *Building construction — Accessibility and usability of the built environment*
- [3] ISO 23599, *Assistive products for blind and vision-impaired persons — Tactile walking surface indicators*
- [4] ISO/IEC 7811-9, *Identification cards — Recording technique — Part 9: Tactile identifier mark*
- [5] EN 15823, *Packaging — Braille on packaging for medicinal products*
- [6] ANSI A117.1, *Accessible and Usable Buildings and Facilities*
- [7] DIN 32976, *Braille — Requirements and dimensions*
- [8] DIN 32986, *Tactile writings — Application of braille and raised profile writing*
- [9] GB/T 15720, *Chinese braille*
- [10] JIS T0921, *Guidelines for older persons and persons with disabilities — Methods of displaying braille sign – Public facilities*
- [11] JIS T0923, *Guidelines for older persons and persons with disabilities — Methods of displaying braille sign— Consumer products*
- [12] UNE 170002, *Requisitos de accesibilidad para la rotulación*
- [13] U.S. National Library Service, *Specification 800*
- [14] Barker, P. and Fraser, J., *Sign design guide*, JMU and the Sign Design Society

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