



Research Programme

Engineering

Improvements to safety signage on passenger trains
Graphics guidelines for safety signs



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Graphics guidelines for safety signs



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Issue record

This Guidance Note will be updated when necessary by distribution of a complete replacement.

Amended or additional parts of revised pages will be marked by a vertical black line in the adjacent margin.

Issue	Revision	Date	Comments
Draft	-	Nov 2002	Outline document only
1	A (draft)	Nov 2002	Initial review version
1	A (draft)	April 2003	Final review version
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Status of this report

This report has been commissioned by Rail Safety and Standards Board as part of the Railway Safety Research Programme and produced by Interfleet Technology Ltd and Davis Associates Ltd.

The findings, conclusions and recommendations contained in the report are those of Interfleet Technology Ltd and Davis Associates Ltd.

Rail Safety and Standards Boards, on behalf of the rail industry, is currently considering the report's conclusions and recommendations, and what action needs to be taken as a result. A formal response will be issued shortly.

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1 Introduction

1.1 About the graphic guidelines

This document presents graphics guidelines for a standardised system of luminous safety signage for use on board trains in Great Britain.

The guidelines have been produced as part of research project commissioned by Rail Safety and Standards Board (then known as Railway Safety) on behalf of the Association of Train Operating Companies (ATOC).

The research seeks to satisfy the following recommendations of Lord Cullen's report following the Ladbroke Grove rail enquiry:

- All safety signs shall use luminous material.
- All safety signs shall be capable of being understood without the need to read text (so far as is feasible).
- There shall be a system of signage which is common to all trains in Great Britain.

The guidelines are drawn from industry best practice, from existing standards, and from the findings of specially commissioned research.

1.2 Objective

The objective of the guidelines is:

- to enable the design of luminous safety signs that are legible and comprehensible with a consistent visual style that distinguishes them from other signage.

1.3 Scope

1.3.1 Categories of signs

These guidelines are applicable to the following safety sign categories for use on-board trains:

- Safe condition signs
- Fire equipment signs
- Passenger alarm / communication device signs

The guidelines do not cover:

- Mandatory signs
- Prohibition signs
- Hazard warning signs
- General information signs

1.3.2 Implementation process

This document provides the graphics guidelines for the design of signs to ensure legibility from the required viewing distance.

This document does not cover:

- The process for defining safety sign information requirements, including the locations and required viewing distances. (These aspects of the sign implementation process must be considered as part of the safety system for the vehicle and must be defined before the sign design process commences.)
- The process for the design and testing of new symbols. (This process is defined in "Guidelines for symbol design and testing", ref. ITL/GN0002.)

1.4 Prerequisites

These guidelines will be implemented by individuals with graphic design competence.

The sign artwork will be prepared using a suitable vector drawing package such as: Adobe Illustrator or Macromedia Freehand.

2 Definition of terms

The following terms are used in this signage manual.

Categories of signs: This document covers the development of symbols for three categories of safety signs: safe condition signs, fire equipment signs and passenger alarm / communication device signs.

Critical detail: An essential graphic element of a symbol, the absence of which would compromise comprehensibility.

Direction sign: Sign that contains directional information, directing the user to either a device or piece of equipment.

Escape route: Route forming part of the means of escape from any part of a rail vehicle to a final exit.

Escape route sign: A sign directing people along an escape route towards an exit.

Fire equipment sign: A safety sign that identifies, or indicates the location of, fire equipment.

Graphic symbol: A visually perceptible figure with a particular meaning used to transmit information independently of text or language.

Graphic symbol tile: The square area enclosing the a border and the graphic elements of a symbol.

Header text: Text that labels a device, equipment or an escape route.

Instruction sign: Sign that contains an instruction set. It contains no directional information.

Instruction text: Text that contains instructional information.

Label sign: Sign that contains no instructions or directions. It is used only to label a device or particular piece of equipment.

Letter height: Height of the lower case letter "x".

Luminous material: A material that emits light after a period of being energised by a light source and after the light source has been removed.

Non-critical text: Text that is not critical to understanding the safety message contained within the sign.

Referent: The subject, idea or meaning that a graphic symbol represents.

Safety colour: Specific colours attributed to the different categories of safety sign.

Safe condition sign: A safety sign that indicates a safety action, the location of safety equipment or a safety facility, or an escape route.

Safety sign: A configuration of visual elements (e.g. symbols and text) intended to convey a safety-related message.

Sign board: The complete sign including the border.

Sign size: Height and width of the rectangular geometric shape - any border is ignored.

Subtended angle: The angle which the size of a visual target subtends at the observers eye.

Type of sign: There are three types of sign, label sign, instruction sign and direction sign.

Viewing distance: The distance at which a given sign must be legible, depending upon its location and function within a rail vehicle. (The specification of required viewing distances is outside the scope of this manual.)

3 Luminous materials

The graphics design guidelines contained within this document are derived, in part, from the findings of a series of benchmarking tests for legibility and discriminability performed with both sample graphics and with finished symbols printed onto photoluminescent material. The test samples used met the DIN 6751 Class B specification.

The tests were conducted in various lighting and smoke-filled conditions so that the graphical constraints of the materials for given viewing distances of printed signs, having various combinations of symbol size and sign elements, could be determined. All tests were conducted following saturation excitation of the samples, and with the viewing participants' eyes not dark-adapted. The results were used to establish rules for the construction of symbols and the layout of signs to ensure optimum legibility and recognition under both favourable and unfavourable lighting conditions.

It should be noted that the visual appearance in daylight of the "white" areas of photoluminescent labels is a greenish-yellow hue.

It is important that photoluminescent labels are located in positions where they will not be constantly in the shadow of fixtures, fittings and other features that form a vehicle interior. This is in order to maximise the level of excitation received from the available light sources (both daylight and artificial) so that the optimum performance from the material can be obtained when required under low light and emergency conditions.

The material performance requirements for photoluminescent labels for the rail industry are given in 'The engineering link' Performance Specification TEL/231, Emergency and Safety Labels.

4 Graphic symbols

4.1 Basic principles

4.1.1 Use of symbols

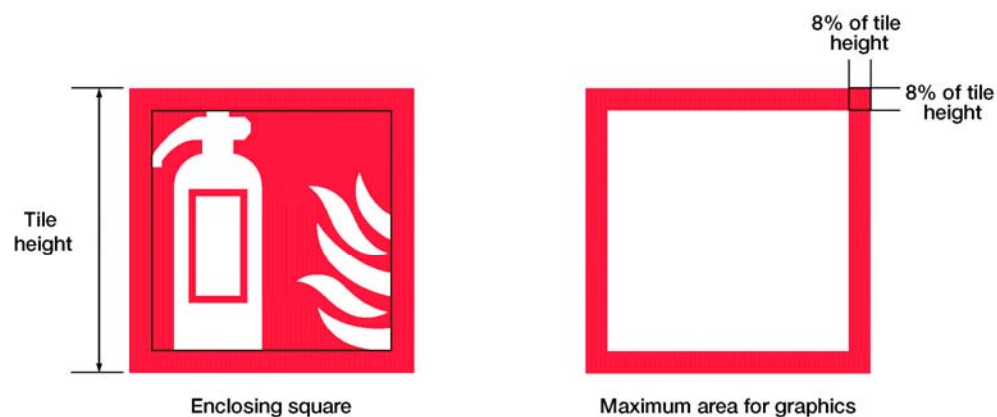
Graphic symbols shall be used wherever possible to avoid the need to read text. However, there is no need to eliminate text from signs, and in most cases the text shall be retained in addition to the symbol. The recommended wording to accompany each of the initial set of symbols is shown in Appendix 1. Only certain symbols can be used without text (see Section 9.3.6).

4.1.2 Quality of symbols

Graphic symbols for use in safety signs shall have been developed and tested using the process described in "Guidelines for symbol design and testing" (ref. ITL/GN0002). This process ensures an acceptable level of comprehension and legibility. The initial set of validated symbols is presented in Appendix 1.

4.2 The graphic symbol tile

All graphic symbols used in safety signs shall be designed with reference to an enclosing square, referred to as the graphic symbol tile, or simply the "tile". All graphic elements of a symbol shall be contained within a border equating to 8% of the tile height.



4 Graphic symbols (cont.)

4.3 Graphic symbol tile size

Graphic symbol tiles shall be sized in relation to the required viewing distance for the sign in which they appear. The following sign sizing rules apply:

- There shall be only one viewing distance defined per sign.
- All instruction signs shall be sized for a 1-metre viewing distance only.
- Label signs and direction signs shall be sized according to the viewing distance requirements of the particular vehicle.

The following sizing requirements are based on the findings of specially commissioned research, existing standards and best practice.

- For a viewing distance of 1-metre or less, the tile size shall be 33mm square. (This incorporates an allowance for smoke and low lighting conditions, as well as the stressed state in which people may have to use the safety signs.)
- For viewing distances greater than 1-metre, the symbol tiles shall be scaled-up to the sizes given in the table opposite. (Note that the relationship of size to distance is not linear*.)
- If vehicle space constraints mean that these rules cannot be applied, please refer to Section 10, "Non-standard signs".

Most sign element spacing rules are expressed as a percentage of tile size, so the table includes the commonly used values.

(* BS 5499-4 refers to the "Distance factor" (Z). These tile sizes incorporate a transition from Z = 30.31 at 1-metre, to Z = 100 at 10-metres and beyond.)

Viewing distance (m)	Symbol tile size
1.0	33.0
1.5	43.9
2.0	52.6
2.5	59.6
3.0	65.5
3.5	70.5
4.0	74.7
4.5	78.4
5.0	81.6
5.5	84.4
6.0	86.9
6.5	89.2
7.0	91.2
7.5	93.0
8.0	94.7
8.5	96.2
9.0	97.6
9.5	98.8
10.0	100.0

Commonly used spacing values		
8% of tile size	16% of tile size	24% of tile size
2.6	5.3	7.9
3.5	7.0	10.5
4.2	8.4	12.6
4.8	9.5	14.3
5.2	10.5	15.7
5.6	11.3	16.9
6.0	12.0	17.9
6.3	12.5	18.8
6.5	13.1	19.6
6.8	13.5	20.3
7.0	13.9	20.9
7.1	14.3	21.4
7.3	14.6	21.9
7.4	14.9	22.3
7.6	15.1	22.7
7.7	15.4	23.1
7.8	15.6	23.4
7.9	15.8	23.7
8.0	16.0	24.0

(Dimensions in mm unless indicated otherwise)

4 Graphic symbols (cont.)

4.4 Symbol orientation

When alternative orientations of a symbol are available, the appropriate orientation of the symbol shall be chosen. For example, the illustrations below show the same basic symbol indicating a clockwise or anti-clockwise handle rotation.



Example of symbol direction



Example of symbol direction

Similarly, the “running man” symbol used to indicate an escape route, shall be orientated according to the direction in which the exit is signed.

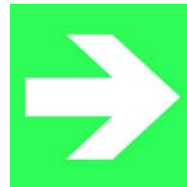


4.5 Arrow symbols

In line with BS 5499-1, two different arrow designs shall be used:

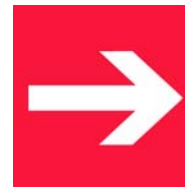
4.5.1 Escape route arrow

To be used to indicate the direction of an escape route only. To be used in green only. (Derived from BS 5499-1)



4.5.2 General direction arrow

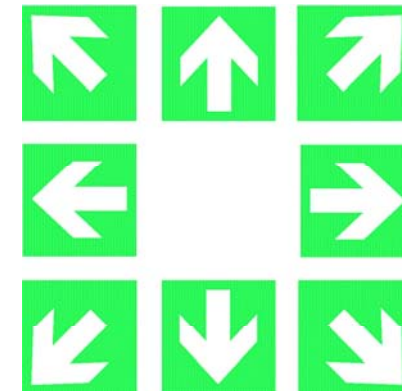
To be used for all other direction indications. (e.g. direction towards a fire extinguisher). To be used in green or red, as appropriate.



4.6 Orientations of arrow symbols

Arrows shall be used vertically, horizontally or at 45° only. There are therefore 8 possible orientations.

Detailed guidance for the application of arrows within direction signs is contained in Section 9.3



4.7 Arrows applied to devices

The application of arrows to denote the direction of operation of devices is covered in Section 11.

5 Typography

5.1 Typeface

The typeface to be used for all safety signs is **Helvetica Medium**.

It has the following positive attributes:

- Specified in BS 5499: Part 1.
- Sans-serif typeface.
- Stroke width to character height ratio of approximately 1:5.7.
- Readily available.



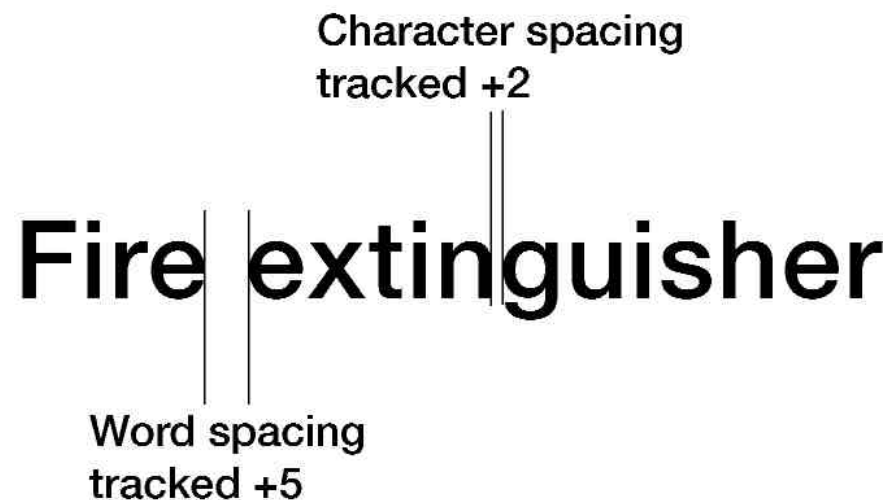
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890

Positive text: Helvetica Medium

5.2 Character & word spacing

To ensure optimum text legibility, tracking values shall be set as follows within the computer graphics package being used:

- Characters shall be tracked +2 (22% of lower case “x” character width).
- Word spacing shall be tracked +5 (75% of lower case “x” character width).



Character spacing
tracked +2

Fire extinguisher

Word spacing
tracked +5

5 Typography (cont.)

5.3 Standard text sizes

Text within safety signs shall be sized in relation to the required viewing distance and/or the associated symbol tile. (There shall be only one viewing distance defined per sign.)

The following sizing requirements are based on the findings of specially commissioned research, existing standards and best practice.

Each safety sign shall incorporate a maximum of three different sizes of text for the specified sign viewing distance:

- 1 Header text (e.g. "First aid box")
- 2 Instruction text (e.g. "Pull handle") **or**
Secondary text (e.g. "Located in guard's compartment")
- 3 Non-critical text (e.g. "Penalty for improper use")

Instruction text and non-critical text shall never appear on signs with a specified viewing distance greater than 1-metre.

Header text and secondary text can appear on signs of any viewing distance up to a maximum of 10-metres. (Please also refer to Section 5.4, "Special header text size".)

Viewing distance (m)	Height of lower case "x"			
	Header text	Secondary text	Instruction text	Non-critical text
1.0	5.5	3.9	3.9	2.8
1.5	7.3	5.1	Instruction text and non-critical text shall always be sized for viewing at 1 metre.	
2.0	8.8	6.1		
2.5	9.9	7.0		
3.0	10.9	7.6		
3.5	11.7	8.2		
4.0	12.5	8.7		
4.5	13.1	9.1		
5.0	13.6	9.5		
5.5	14.1	9.9		
6.0	14.5	10.1		
6.5	14.9	10.4		
7.0	15.2	10.6		
7.5	15.5	10.9		
8.0	15.8	11.0		
8.5	16.0	11.2		
9.0	16.3	11.4		
9.5	16.5	11.5		
10.0	16.7	11.7		

(Dimensions in mm unless indicated otherwise)

5 Typography (cont.)

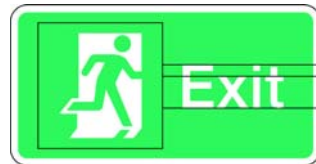
5.4 Special header text size

The following are the only four examples of special header text:

- “Exit”
- “Alarm”
- “Emergency door release”
- Numerals denoting instructions within a sequence.

In these cases, the text size shall be larger in proportion to the associated symbol tile, than the normal header text specified in Section 5.3.

The height of the upper case “E”, “A” and numerals shall be 33% of the associated symbol tile size. The table opposite presents the sizes of the lower case “x” height and the height of instruction numbers.



Viewing distance (m)	Special header text (lower case "x")	Height of instruction numbers
1.0	8.0	10.9
1.5	10.6	Instruction numbers are only used at a 1-metre viewing distance
2.0	12.7	
2.5	14.5	
3.0	15.9	
3.5	17.1	
4.0	18.1	
4.5	19.0	
5.0	19.8	
5.5	20.5	
6.0	21.1	
6.5	21.6	
7.0	22.1	
7.5	22.5	
8.0	22.9	
8.5	23.3	
9.0	23.6	
9.5	24.0	
10.0	24.2	

(Dimensions in mm unless indicated otherwise)

5 Typography (cont.)

5.5 Line spacing

5.5.1 Within a paragraph

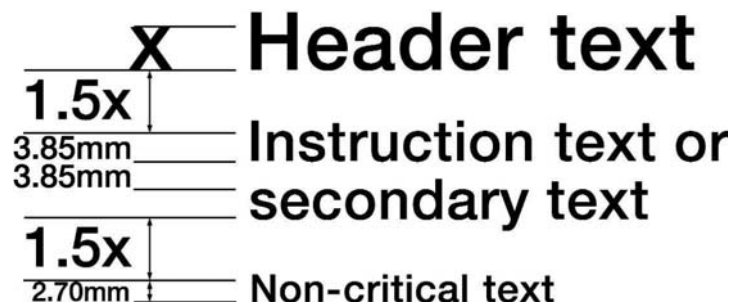
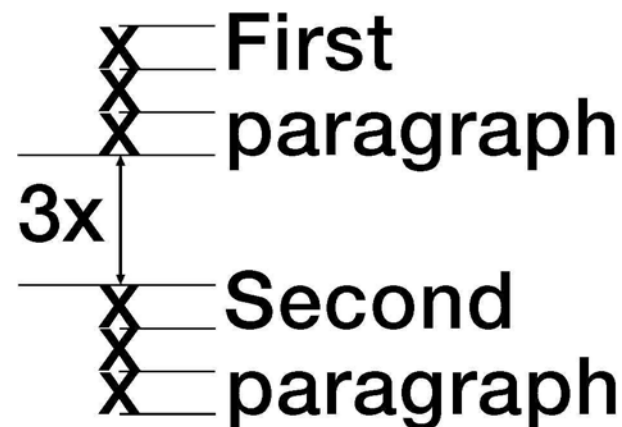
The lower case “x” height shall be used as the space between two lines of text of equal size.

5.5.2 Between paragraphs

If a sign requires more than one paragraph of text, there shall be a spacing equivalent to 3-times the header “x” height. However, it is recommended that multiple paragraphs of text should be avoided within safety signs.

5.5.3 Between paragraphs of different text sizes

If using different sizes of text within the same section of a safety sign, a space equal to 1.5 times the header “x” height shall be used to separate the paragraphs. However, in most applications, this situation shall be avoided in preference for the layout rules in Section 9, “Standard sign layouts”.



5 Typography (cont.)

5.6 Upper or lower case

Mixed upper and lower case shall be used in all safety signs. Upper case letters shall only be used for the first letter of a sentence.

5.7 Type ranging

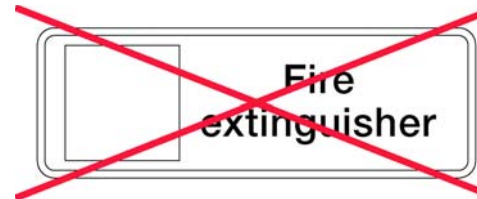
Text shall be ranged to the left on all signs.



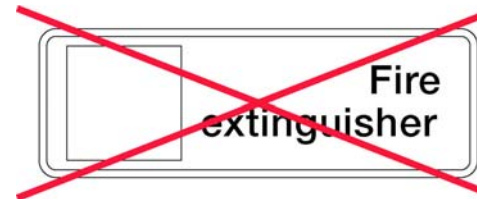
Do not use all upper case



Do not range text centrally



Do not range text right



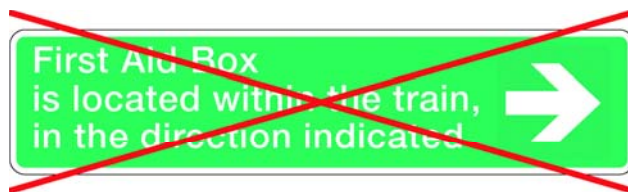
6 Wording

Wording not only affects comprehension, but also the speed of reading. The following guidelines are based on those in ATOC AV/ST 9005.

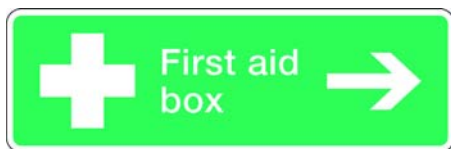
6.1 Readability

- Use short, concise expressions.
- Use active sentences, for example “push button to alert driver”, rather than “driver will be alerted when button is pushed”.
- Avoid statements which rely on punctuation.
- Avoid informal or humorous expressions.
- Be consistent in word order and use.
- Where a statement describes a sequence of events, present words in the order of required actions.

(See Appendix 1 for the recommended wording for the initial symbol set)



Example of a sign with excessive wording



Example of a sign with concise wording

6.2 Negatives

- Avoid negative statements in general text.
- Avoid double or multiple negatives.
- Avoid qualifying negatives, e.g. “except”.

6.3 Modifiers

- Avoid vague modifiers, for example “many”.
- Avoid redundant modifiers, for example “sufficient, enough”.
- Avoid contradictory modifiers, for example “quite extreme”.
- Avoid weak modifiers, for example “quite”, “rather”, “well”, “fairly”.

6.4 Confusions

- Avoid phonetic confusions, for example “hear” versus “here”.
- Avoid common semantic confusions, for example “continuously” versus “continually”.
- Avoid jargon and use plain English where possible, for example:
 - alight: get off.
 - assistance: help.
 - droplight: door window.
 - appliances: emergency equipment.
 - cess: embankment / side of track.
- Use simple / short words where possible.

7 Sign categories

This document covers the following sign categories (as defined in BS5499-1):

7.1 Safe condition

Signs shall indicate any of the following:

- An escape route
- The location of the safety equipment or facility
- Operational instructions

Colour specification for production

BS 5252 Green - ref: 14 E 53
Contrast colour: White*

Example:



7.2 Fire equipment

Signs shall indicate any of the following:

- The location of the fire equipment
- The type of fire equipment.

Colour specification for production

BS 5252 Red - ref: 04 E 53
Contrast colour: White*

Example:



7.3 Passenger alarm / communication devices

Signs shall indicate any of the following:

- The location of the passenger alarm or communication device.
- Operational instructions

Colour specification for production

BS 5252 Red - ref: 04 E 53
Contrast colour: White*

Example:



(* Or as close to white as possible, given that most luminous material appears off-white.)

8 Sign construction

8.1 Sign shape

Safe condition, fire equipment and passenger alarm / communication device signs shall be square or rectangular.

8.2 Borders around signs

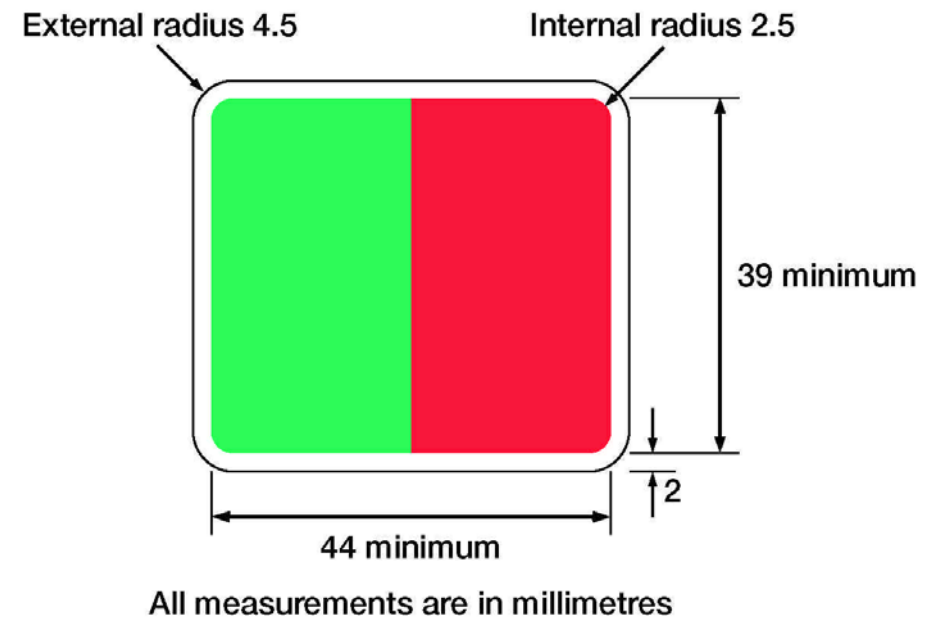
To aid conspicuity and contrast against various backgrounds, all signs shall have a 2mm wide white border, irrespective of the size of the sign.

8.3 Rounded corners

Irrespective of the sign size, all signs shall have a 2.5mm radius at the corners of the coloured area. The corners of the sign board shall be trimmed to a radius of 4.5mm, irrespective of the size of the sign.

8.4 Sign size

The optimum size of signs shall be determined with regard to the required graphical elements and the required viewing distance. To maintain reasonable conspicuity, the minimum height of signs shall be 39mm and the minimum width of signs shall be 44mm.



9 Standard sign layouts

9.1 The three types of sign

Rules for combining sign elements are presented in this Section for three types of sign.

9.1.1 Label signs

Label signs shall be used only to identify a device or particular piece of equipment. They shall not contain direction arrows or instructions. They may contain non-critical text (e.g. "Penalty for improper use").

See Section 9.2. for layout guidance and examples.



(N.B. These sign types can apply to any of the three safety sign categories defined in Section 7.)

9.1.2 Direction signs

Direction signs shall be used to indicate the direction towards an exit, a device or equipment. These signs shall not contain instruction information or non-critical text (e.g. "Penalty for improper use"). They may contain secondary text (e.g. "Located in toilet").

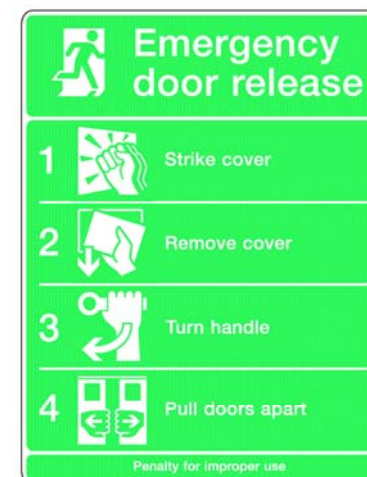
See Section 9.3. for layout guidance and examples.



9.1.3 Instruction signs

Instruction signs enable access to and/or use of an emergency device. These signs shall not normally contain directional arrows but may contain non-critical text (e.g. "Penalty for improper use"). Instruction signs comprise of three sections: header, instructional information and footer.

See Section 9.4. for layout guidance and examples.



9 Standard sign layouts (cont.)

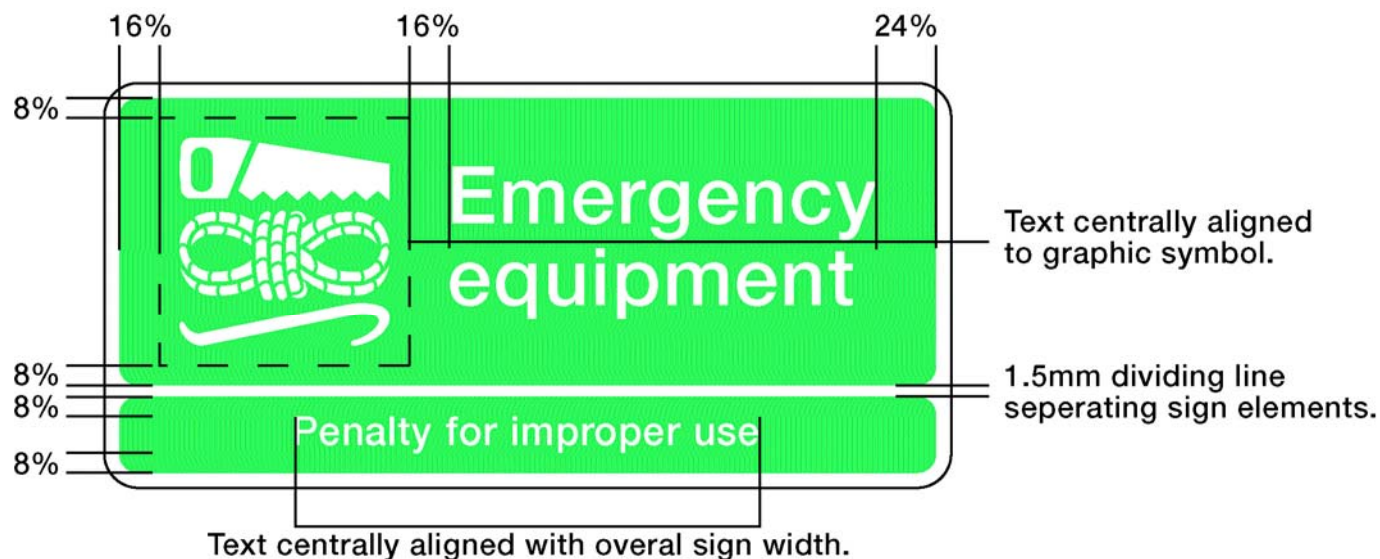
9.2 Label signs

(Spacing values are expressed as percentages of tile size throughout this Section. A table of these dimensions can be found in Section 4.3.)

9.2.1 Standard layout

The standard layout for label sign with a 1-metre viewing distance is illustrated here. Label signs for viewing distances greater than 1-metre shall not include non-critical text (e.g. "Penalty for improper use").

Certain symbols may be used within label signs without text (see Section 9.3.6).



9 Standard sign layouts (cont.)

9.3 Direction signs

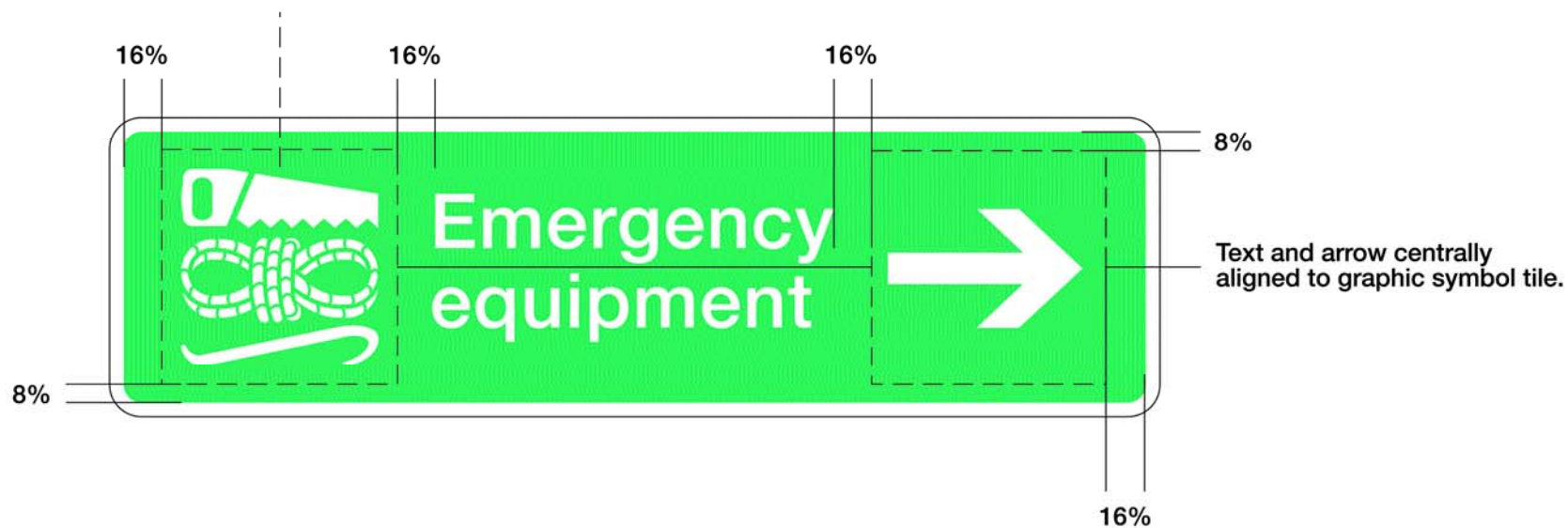
(Spacing values are expressed as percentages of tile size throughout this Section. A table of these dimensions can be found in Section 4.3.)

9.3.1 Standard layout

The standard layout for a sign indicating the direction towards a single item is illustrated here. Further guidance on the application of arrows follows in Section 9.3.2.

Certain symbols may be used within direction signs without text (see Section 9.3.6).

Graphic symbol shall be positioned 16% in from left edge, and 8% in from the top edge. Alignment made from edge of graphic symbol tile.



9 Standard sign layouts (cont.)

9.3 Direction signs (cont.)

9.3.2 Arrangement of arrows within signs

Arrows shall be arranged within simple signs as shown below. Arrows indicating towards the left shall be placed on the left-hand side of the sign. Arrows indicating towards the right, straight ahead or down shall be placed on the right-hand side of the sign.

9.3.3 Arrows for escape route signs

For escape route direction signs, the specific meanings shown below shall be assumed (derived from BS 5499-4).

(* Downward facing arrows would only be required on double-deck rail vehicles but are included here for information only.)

9.3.4 Multiple directions

When there are two possible directions, each shall be represented by a separate sign. No sign shall ever include more than one direction arrow.



*Progress up to the left,
or forward and across to
the left*



*Progress straight for -
ward, forward through
here, or forward and up.*



*Progress up to the right,
or forward and across to
the right*



*Progress
to the left*



*Progress
to the right*



*Progress down to the
left.**



*Progress down.**



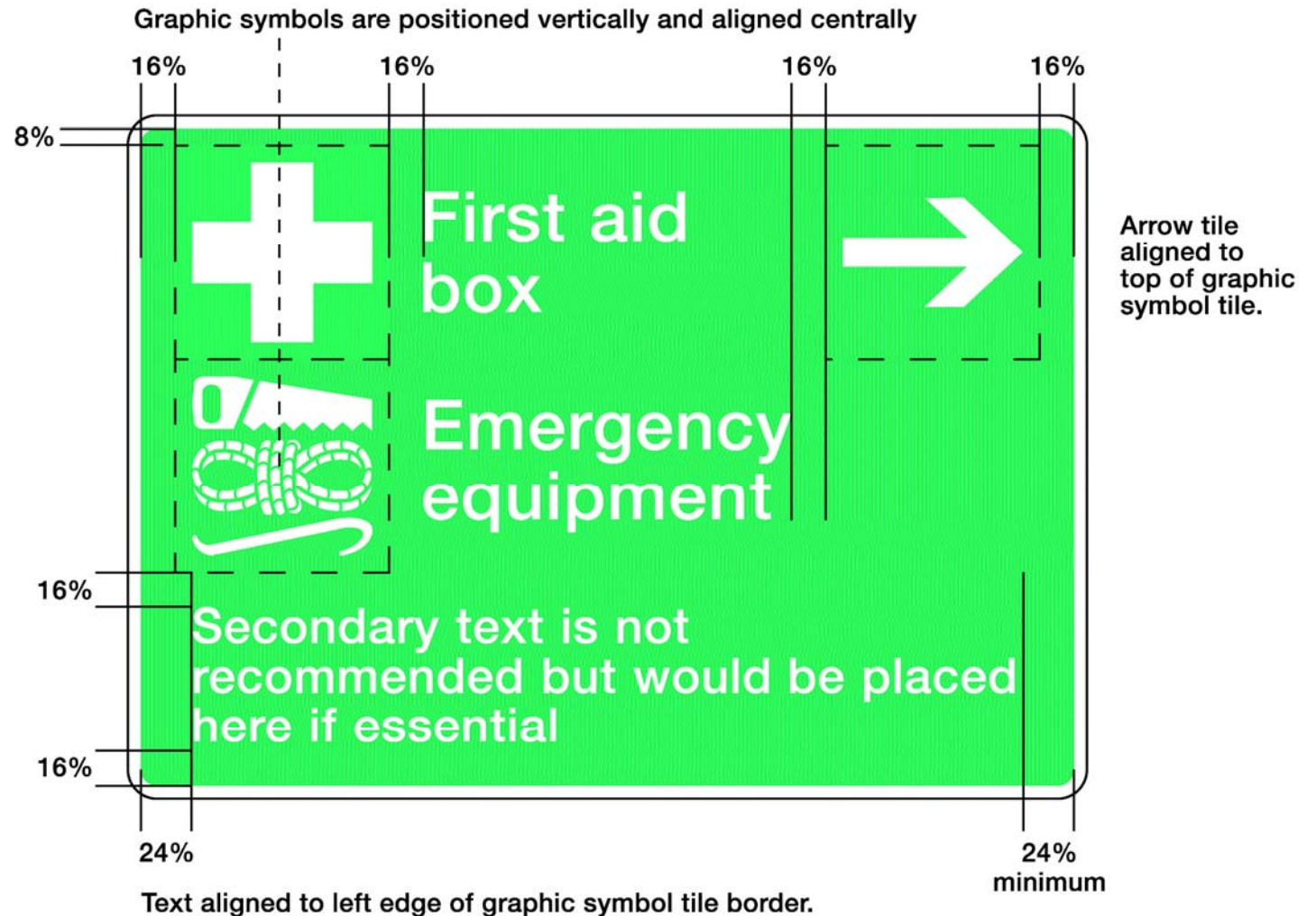
*Progress down to the
right.**



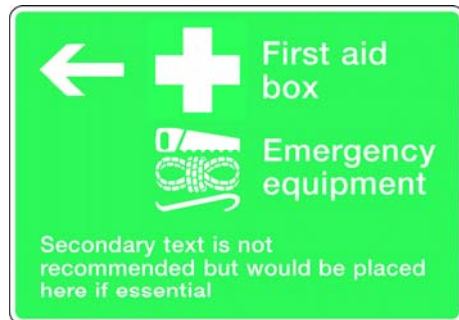
9 Standard sign layouts (cont.)

9.3 Direction signs (cont.)

9.3.5 Standard layout with multiple elements



Left direction version



9 Standard sign layouts (cont.)

9.3 Direction signs (cont.)

9.3.6 Symbol-only direction signs

It is recommended that symbols shall be used with the associated text whenever possible. However, the symbols presented here are sufficiently comprehensible to be used without text in label signs and direction signs (but not within instruction signs).

N.B. No other symbols shall be used without text.

First aid box

(Derived from BS symbol)



SYM-B001-GRN

Emergency hammer

(for breaking window glass)



SYM-B004-GRN

Emergency ladder

(Derived from BS symbol)



SYM-B002-GRN

Fire extinguisher

(Derived from BS symbol)



SYM-B005-RED

Emergency equipment



SYM-B003-GRN

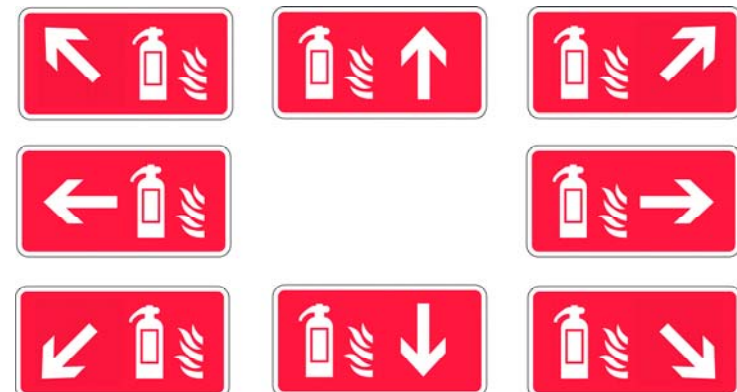
Alarm

(including passenger communication device)



SYM-B006-RED

9.3.6.1 Standard symbol-only horizontal arrangement



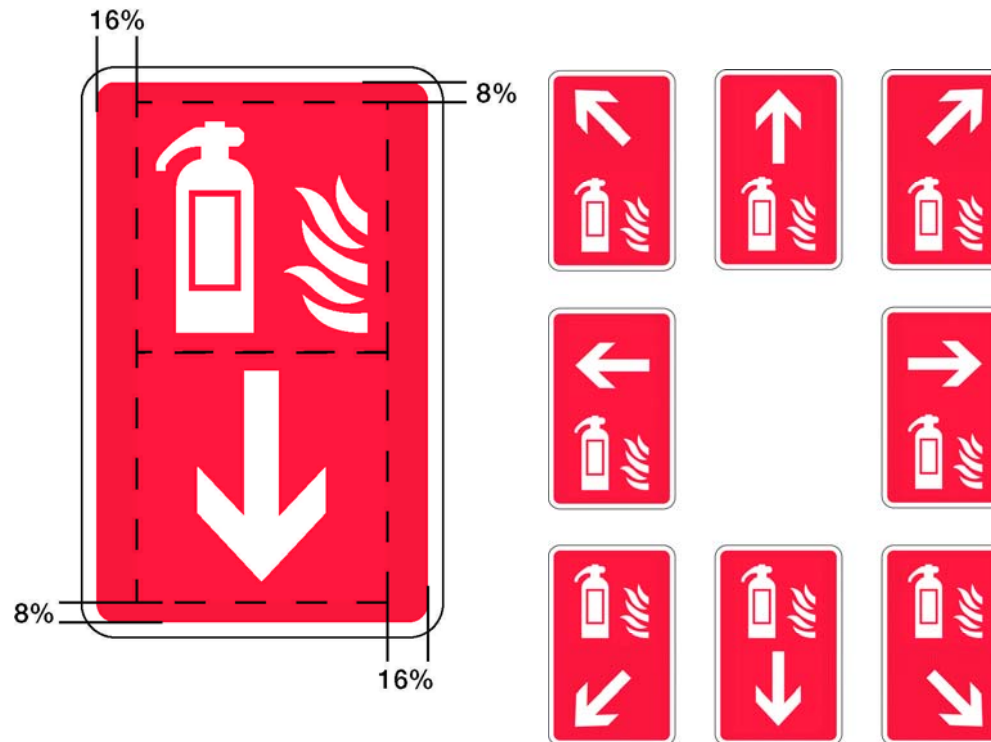
9 Standard sign layouts (cont.)

9.3 Direction signs (cont.)

9.3.6 Symbol-only direction signs (cont.)

9.3.6.2 Alternative symbol-only arrangement

This alternative arrangement is suitable for narrower spaces.



9 Standard sign layouts (cont.)

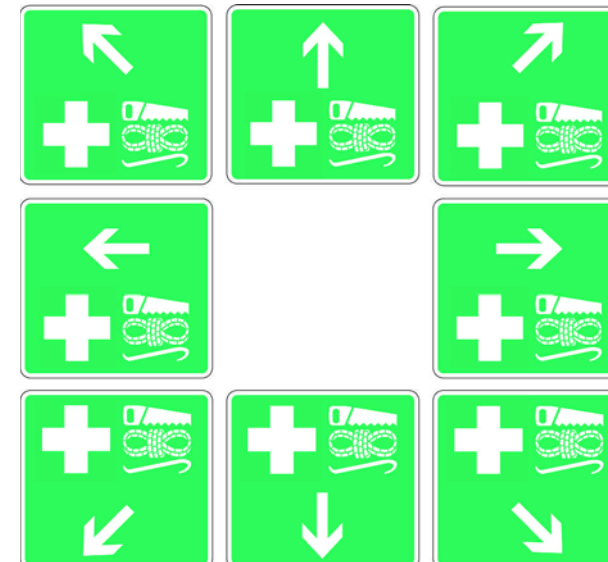
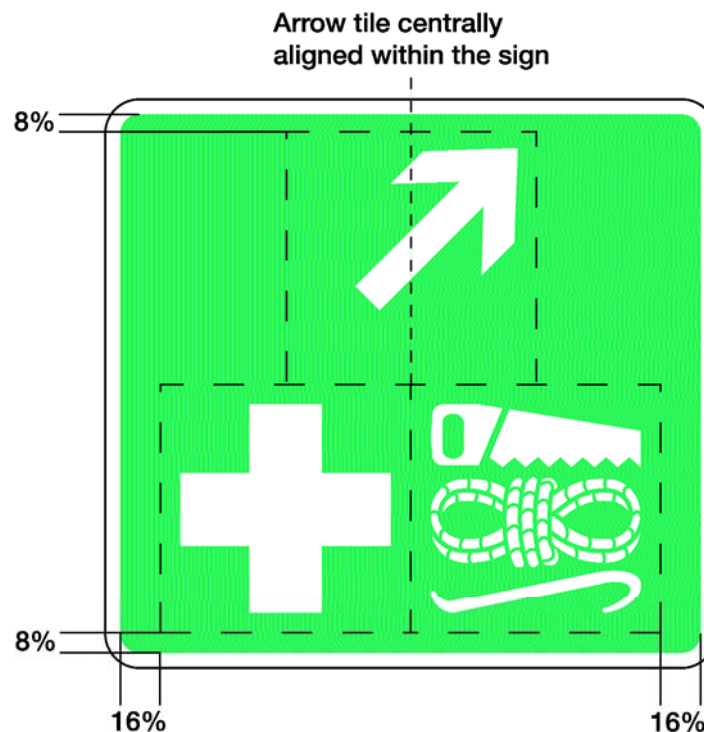
9.3 Direction signs (cont.)

9.3.6 Symbol-only direction signs (cont.)

9.3.6.3 Symbol-only arrangement - square version

If two symbols are required in a direction sign, the horizontal arrangement shown in Section 9.3.6.1 should be extended horizontally.

However, if width constraints exist, this square arrangement is recommended. Note: the arrow position is centred within the sign width in order to associate equally with both symbols.



9 Standard sign layouts (cont.)

9.4 Instruction signs

(Spacing values are expressed as percentages of tile size throughout this Section. A table of these dimensions can be found in Section 4.3.)

9.4.1 Standard layout (header & footer)

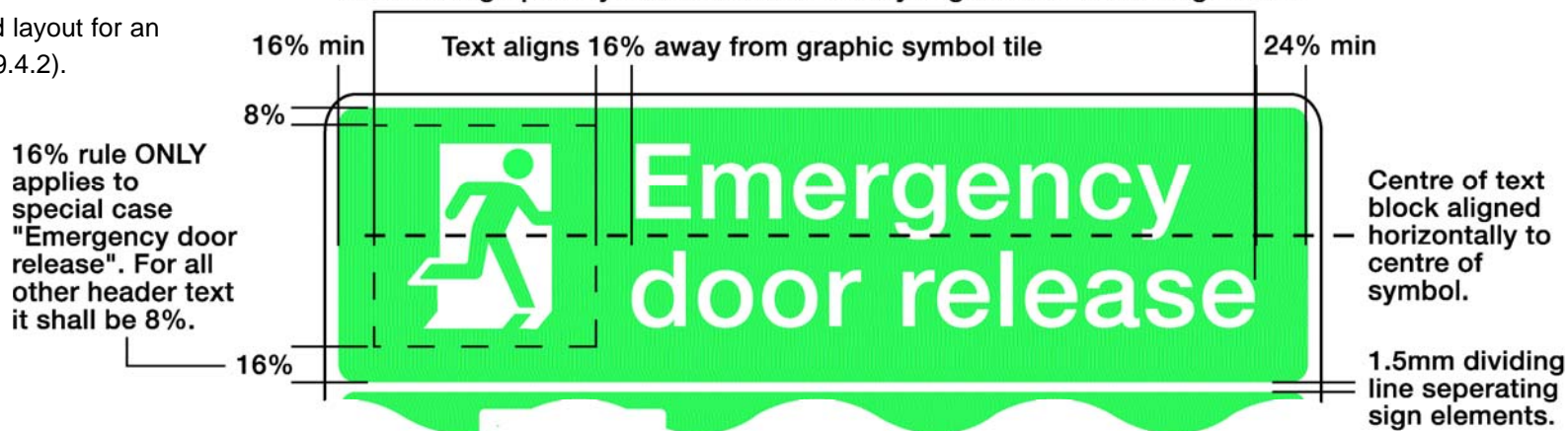
This is the recommended standard layout for an instruction sign (see also Section 9.4.2).

Complete sign

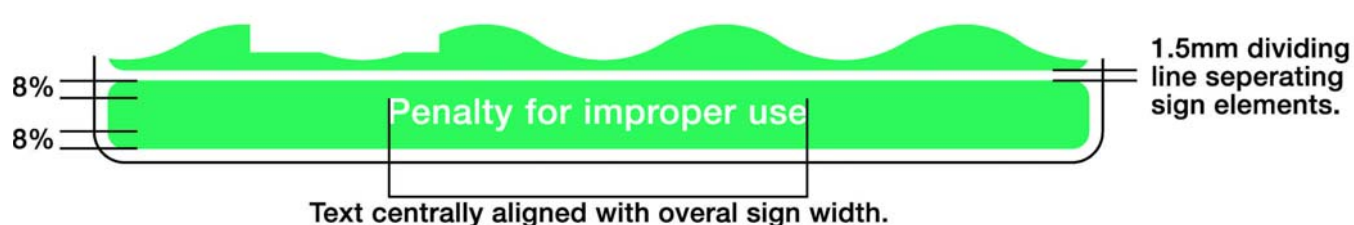


Header section

Combined graphic symbol and text centrally aligned with overall sign width.



Footer section

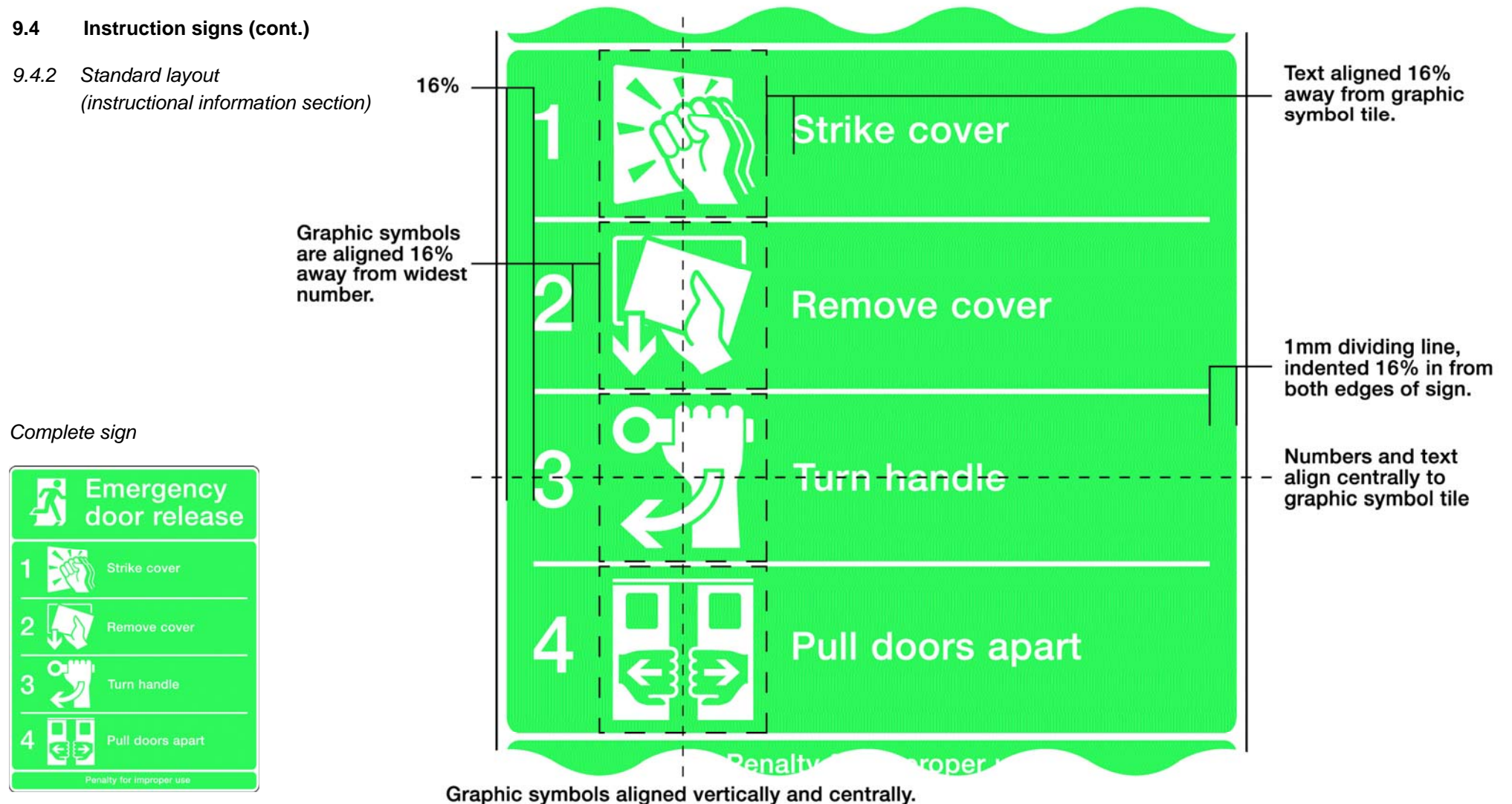


9 Standard sign layouts (cont.)

9.4 Instruction signs (cont.)

9.4.2 Standard layout (instructional information section)

Instructional information section



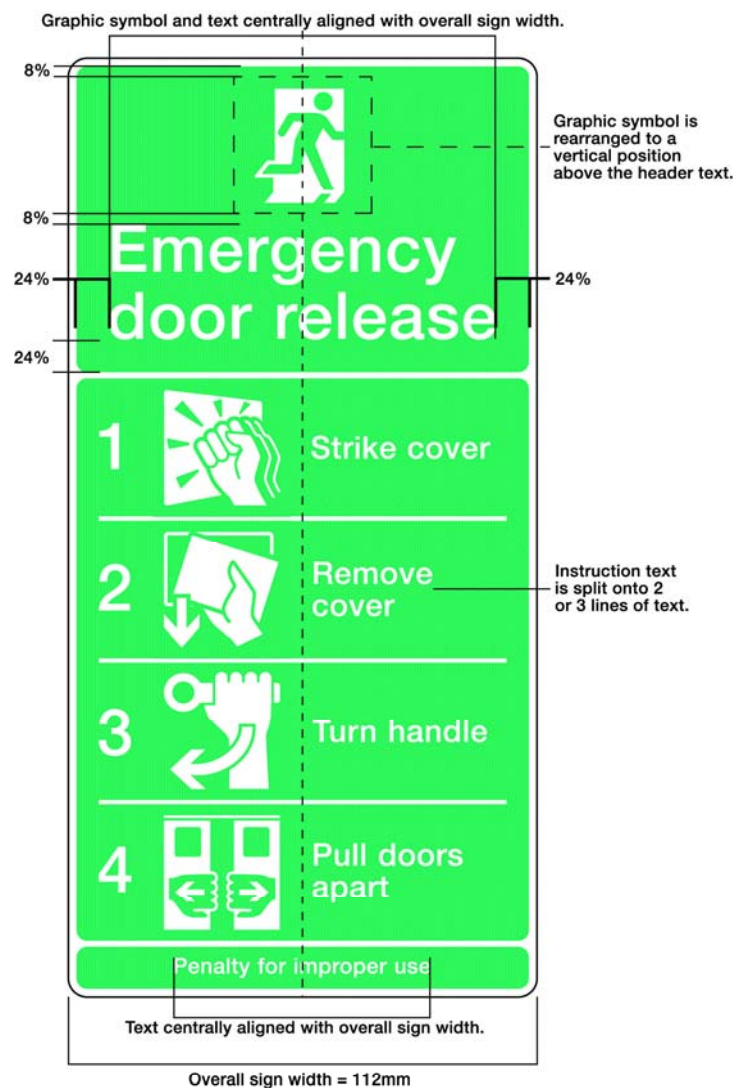
9 Standard sign layouts (cont.)

9.4 Instruction signs (cont.)

9.4.3 Standard narrow layout

For restricted-width situations, this alternative arrangement can be used. All sign elements remain at the same size, but the elements in the header section are re-arranged vertically.

Note that a margin of 24% tile size is required to each side of the special header text. In the example shown, the words "door release", the margins and border result in an overall sign width of 112mm. A similar sign for "Alarm" would be narrower.



9 Standard sign layouts (cont.)

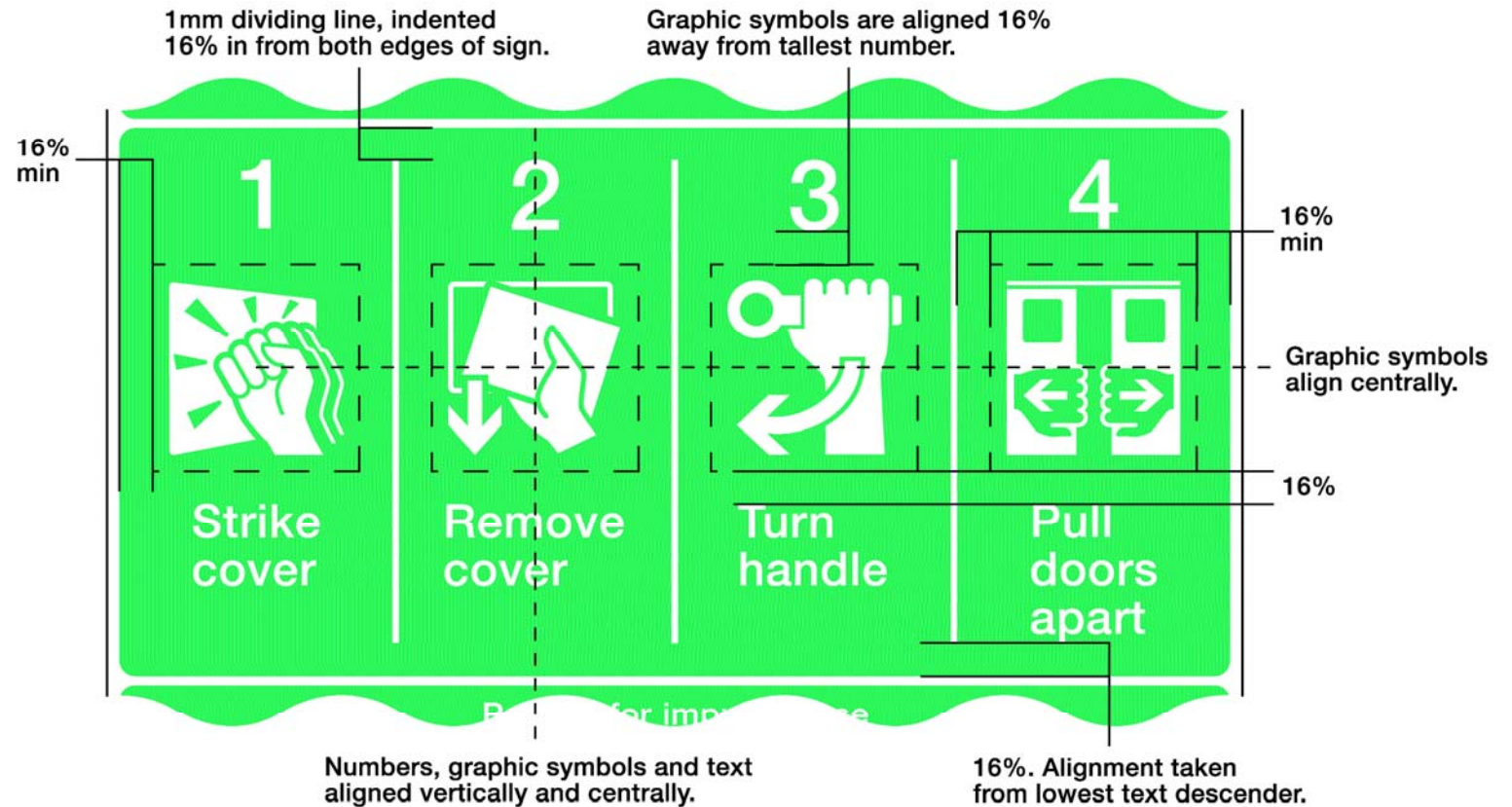
9.4 Instruction signs (cont.)

9.4.4 Standard reduced height layout

For restricted height situations, this alternative arrangement can be used. All elements remain at their optimum size, but the instruction symbols are re-arranged horizontally.

Note that the height of the sign can be further reduced if instruction text can be limited to two lines.

Complete sign



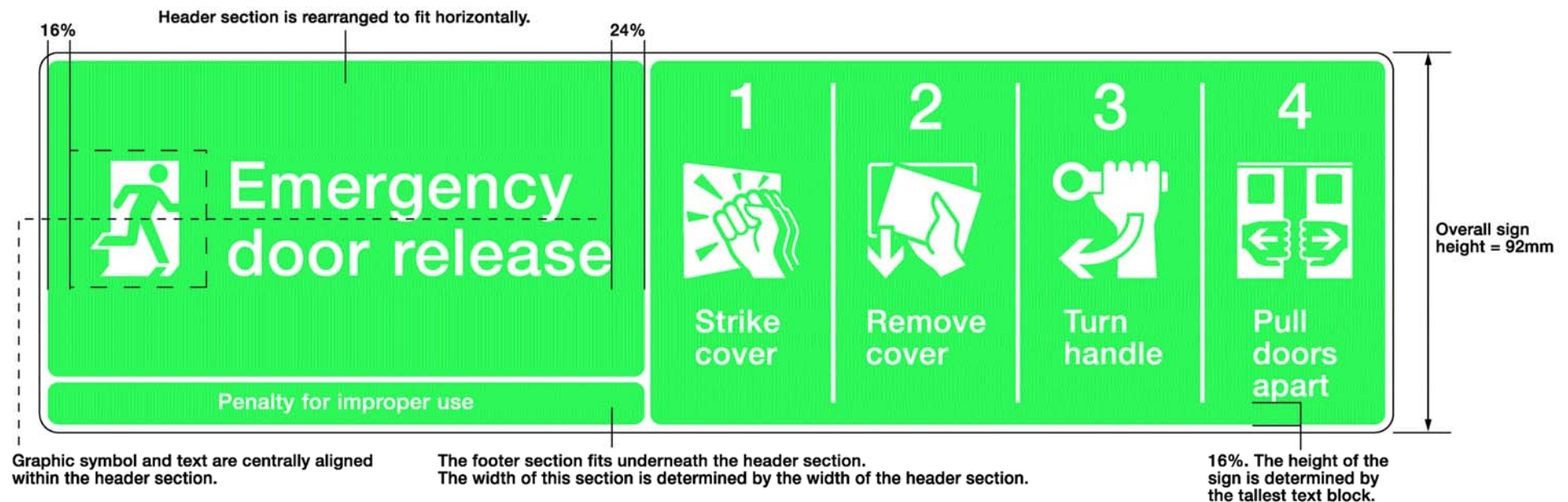
9 Standard sign layouts (cont.)

9.4 Instruction signs (cont.)

9.4.5 Standard minimum height layout

For extreme restricted height situations, this alternative arrangement can be used. All elements remain at their optimum size, but the header and footer sections are rearranged to the left side of the instruction section.

Note that the height of the sign can be further reduced if instruction text can be limited to two lines (as can be seen in Section 10.5).



10 Non-standard signs

10.1 General approach

Non-standard signs shall be used only if the space available on the vehicle prevents the use of the standard sign sizing and layout rules. It should be noted that any compromise to the standard sign size and layout rules is likely to compromise the legibility and/or conspicuity of signs. Non-standard signs shall be developed with due caution.

The following procedure shall be followed:

1 Review the sign requirements

Would alternative solutions be equally acceptable? For example: Could the sign be placed in a different location? Could wording be further reduced? Could the information be divided between two signs?

2 Consider reducing spacing between sign elements

If a standard sign is only a few millimetres bigger than the available space, modest reductions in margin width and spacing are acceptable.

3 Consider re-arranging sign elements

Alternative re-arrangement of sign elements are acceptable, but they shall adhere to the spirit of the standard layout and style rules.

4 Finally, consider reducing the size of sign elements

Reducing the size of any sign element (symbol or text) will affect legibility and conspicuity and shall therefore be considered as the last resort. The table opposite gives the absolute minimum sizes for special header text, symbol tiles and associated instruction numbers. The reduced symbol size is 70% of the "standard" size. It is recommended that any further size reductions should be the subject of a formal risk assessment.

Viewing distance (m)	Reduced special header text	Reduced symbol tile size	Reduced instruction numbers
1.0	5.5	23.1	7.6
1.5	7.3	Standard tile sizes to be used for these viewing distances	Not applicable
2.0	8.8		
2.5	9.9		
3.0	10.9		
3.5	11.7		
4.0	12.5		
4.5	13.1		
5.0	13.6		
5.5	14.1		
6.0	14.5		
6.5	14.9		
7.0	15.2		
7.5	15.5		
8.0	15.8		
8.5	16.0		
9.0	16.3		
9.5	16.5		
10.0	16.7		

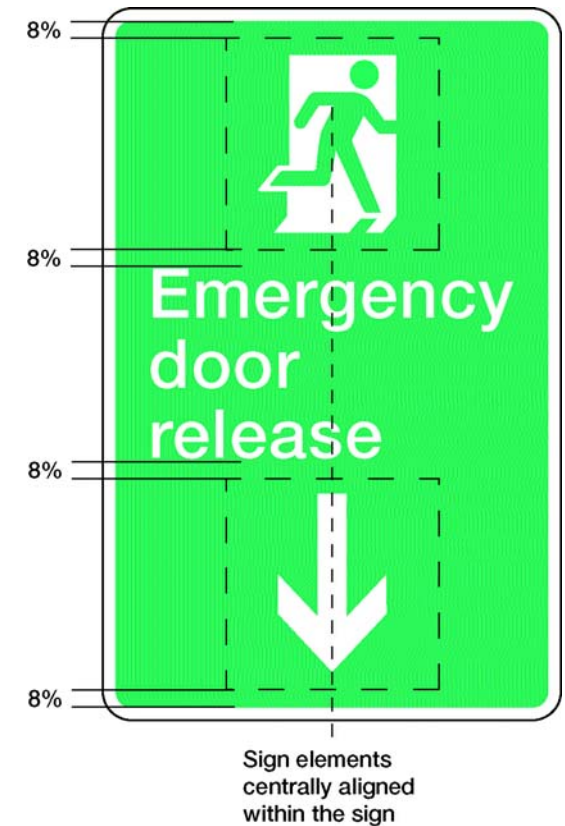
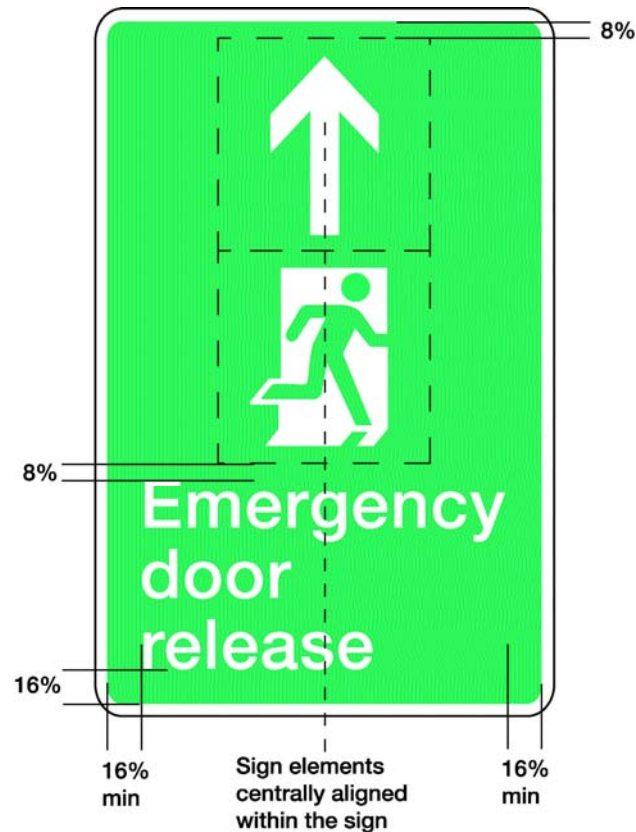
(Dimensions in mm unless indicated otherwise)

10 Non-standard signs (cont.)

10.2 Minimum-width direction sign

In this example, the width of the sign is minimised by:

- Reducing the size of the “special header text” in line with the table in Section 10.1.
- Placing the header text on three lines.
- Arranging the elements vertically.



10 Non-standard signs (cont.)

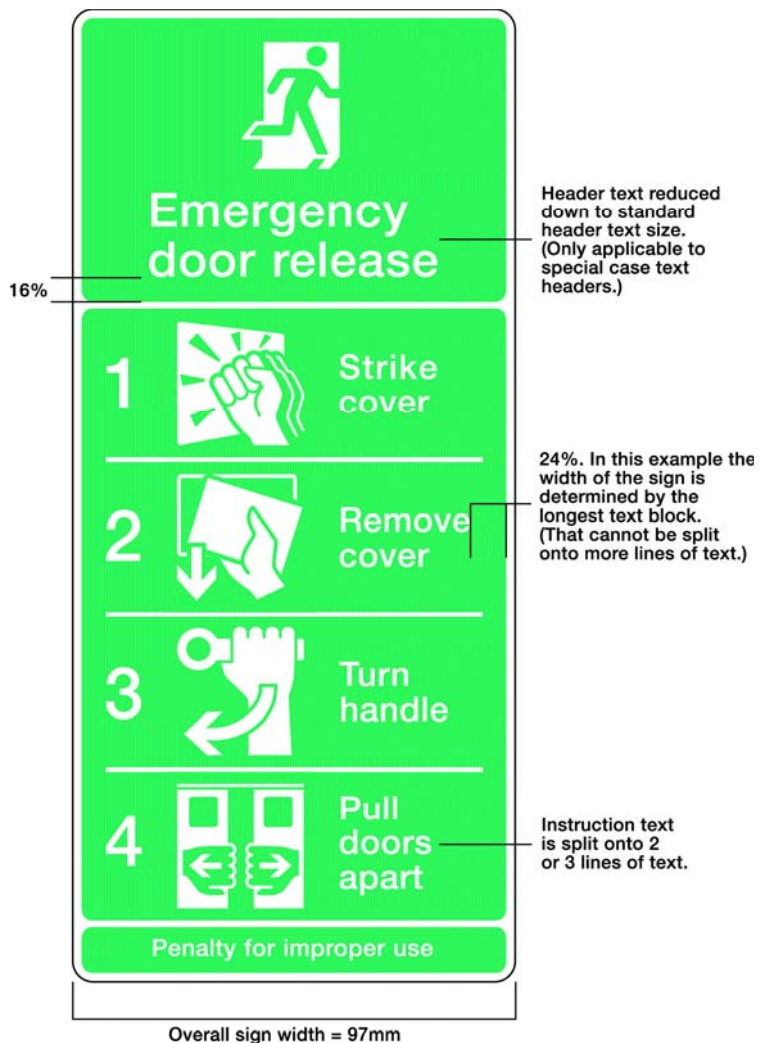
10.3 Reduced-width instruction sign

In this example, the width of the instruction sign is reduced by:

- Reducing the text size of the “special header text” in line with the table in Section 10.1.

All other standard spacing rules apply.

(In this example, the word “Remove” is the limiting factor and results in an overall sign width of 97mm.)



10 Non-standard signs (cont.)

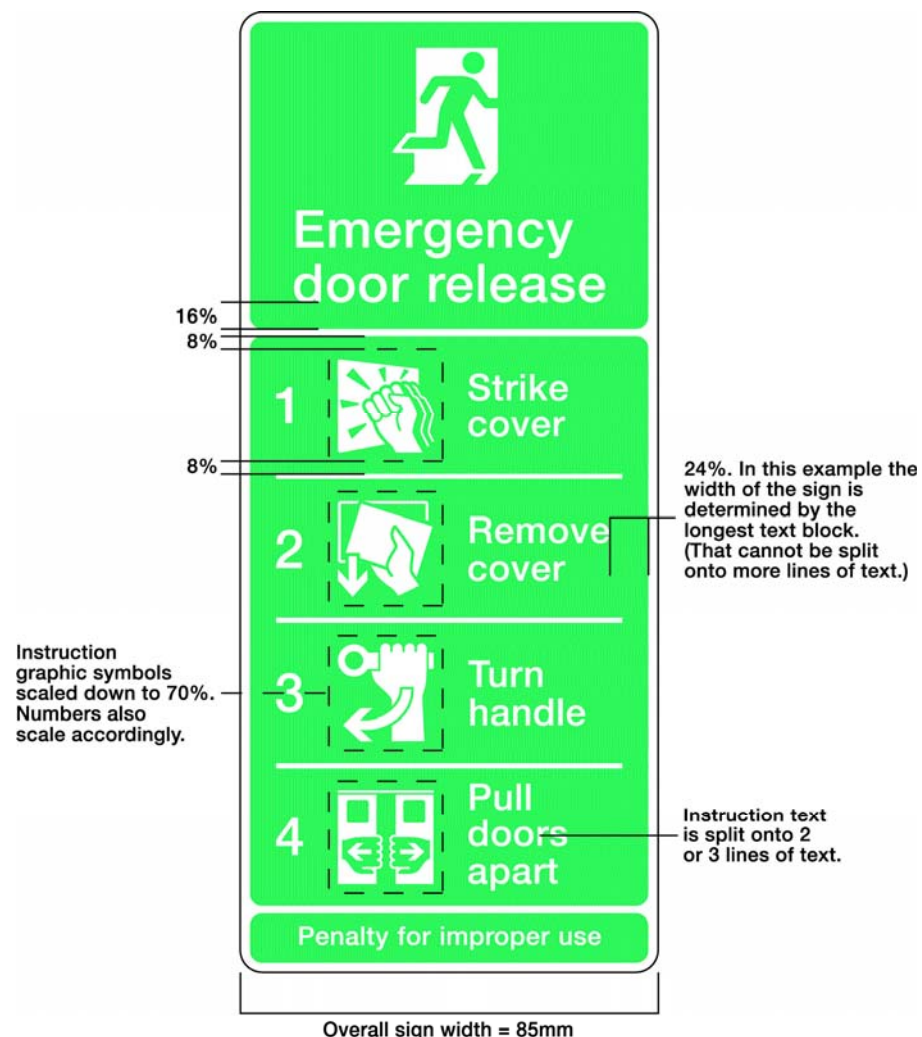
10.4 Minimum-width instruction sign

The width of the sign can be further reduced by:

- Reducing the size of the instruction symbol tiles to 70% of their standard size (in line with the table in Section 10.1). An 8% margin is introduced above and below each instruction symbol in order to enhance legibility.
- Reducing the instruction numbers in proportion to the instruction symbol tile size. (Their height reduces from 10.9mm to 7.6mm, as per the table in Section 10.1)

All other standard spacing rules apply. Note that even when smaller instruction symbols are used, all spacing specifications remain as percentages of the header symbol tile size, i.e. as per the table in Section 4.3.

(In this example, the word “Remove” remains the limiting factor but the smaller symbols result in an overall sign width of 85mm.)



10 Non-standard signs (cont.)

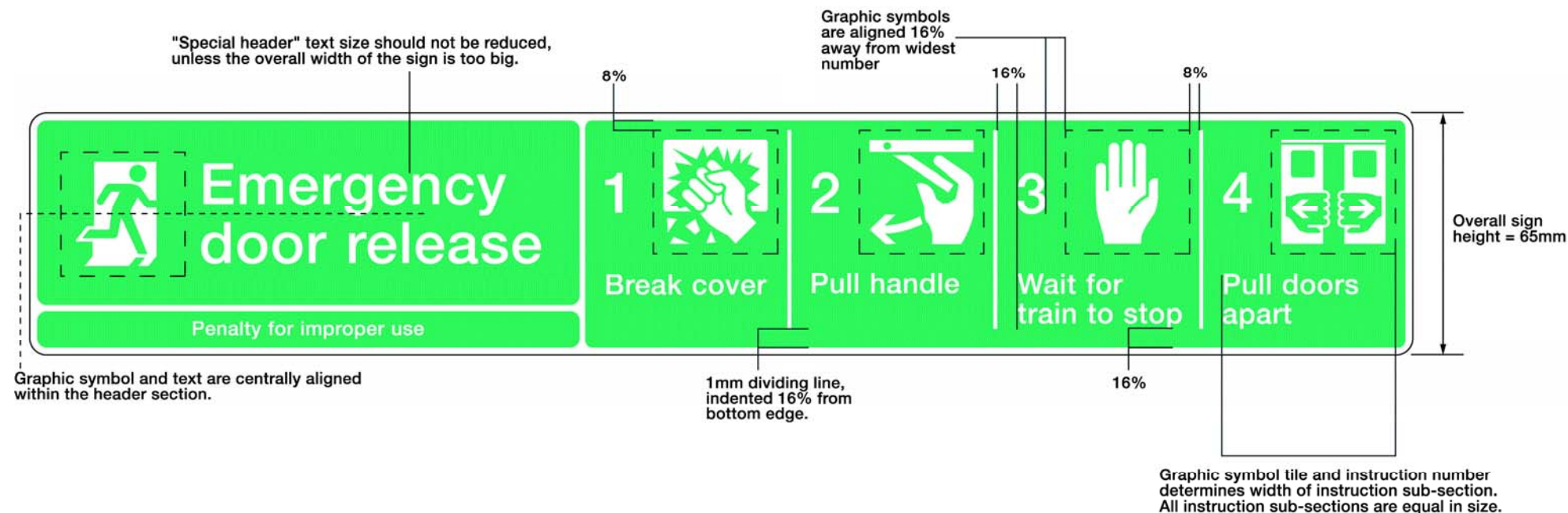
10.5 Reduced-height instruction sign

In this example, the height of the sign is reduced by:

- Placing the header and footer sections to the left of the instruction section.
- Adopting a non-standard layout with the instruction numbers to the left of the associated symbol.

All other standard spacing rules apply. In this case, there is no height benefit in reducing the size of the special header text.

Note: An alternative would be to reduce the size of the instruction symbols to 70% of their optimum height, but this shall be avoided if possible. If 70% size symbols are used, the standard layout for the instruction numbers shall be used (see Section 9.4.5). This alternative would result in a slightly higher, but less wide sign.



10 Non-standard signs (cont.)

10.6 Device-specific signs

Some emergency devices will require device-specific non-standard signs. Examples are shown here.

10.6.1 Emergency door release (Class 321)

In this example, two associated signs are used on the emergency door release device:

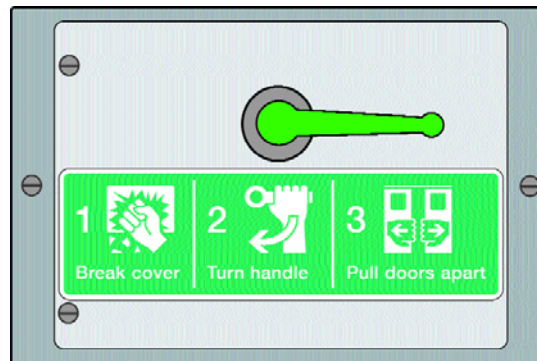
- 1 The first is a label sign with penalty notice, which is mounted on the removable cover.
- 2 The second contains the instructional information and is mounted under the cover.

Importantly, sign 2 can be seen through the cover, which also allows the luminous material to be charged by the ambient lighting.

All graphical elements comply with standard size guidelines. However, sign 2 features a non-standard arrangement with the instruction numbers to the side of the symbols in order to reduce the sign height. (The sign cannot be mounted any lower within the recess because of obscuration from the passenger's eye point.)



Cover in place: sign 1 on the cover and sign two visible through the cover



Cover removed: sign 2 visible together with operating handle

10.6.2 Alarm handle sign (Class 321)

This particular flap-style handle provides sufficient surface area for a non-standard sign (i.e. with the instruction symbol reduced to 70% of standard size). However, the presence of the reset key-hole means that a non-rectangular sign is required. The removal of the word "Alarm" would have avoided this, but retaining the word was considered the preferable solution.



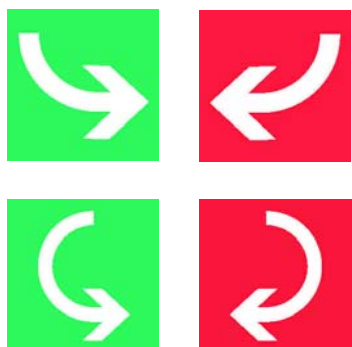
11 Graphics for application to devices

11.1 Use of arrows on devices

Artwork for curved arrows is available for application to devices, or surrounding areas, to indicate the direction of operation. These shall be used to supplement standard instructions.

Wherever possible the arrows shall be sized and positioned such that the centre of the arrow curve corresponds with the centre of rotation of the device.

These arrows are not intended for use within signs in the same way as other symbols.



11.2 Adding instructions to devices

Artwork for the word “Pull” is available for application to handles and other devices. These shall be used to supplement standard instructions.

The word shall be applied as large as possible, while avoiding obscuration if handles are recessed.

These words are not intended for use within signs in the same way as other symbols.



Appendices

This section presents the following Appendices:

Appendix 1 Initial symbol set

Appendix 2 Text referents

Appendix 3 References

Appendix 1 - Initial symbol set

Presented in this Appendix is the initial set of symbols that have been developed using the approved symbol design and testing procedure (see ITL/GN0002).

Artwork

The symbol artwork is available for download from the ATOC website for authorised users. This Appendix is for reference only. **Symbols must not be reproduced from this Appendix.**

Symbol groups

- Set A Arrows
- Set B Objects and equipment
- Set C Covers and panels
- Set D Doors
- Set E Emergency exits and windows
- Set F Miscellaneous
- Set G Graphics to be applied to devices
- Set H Handles and devices

Associated wording

- The recommended wording is shown next to each symbol in **bold**.
- Additional notes and examples of alternative wording are shown in (brackets). Any other wording shall conform to the rules in Section 6.
- Where no words are shown in bold, the symbol is used to supplement text-only referents (see Appendix 2) or is not used with text (e.g. arrows)

Appendix 1 - Initial symbol set (cont.)

Set A - Arrows

Escape route direction arrows are derived from the BS symbol. BS 5499-1 specifies that these symbols shall always be used with text (usually either "Exit" or "Emergency exit")

Escape route direction (progress to the right)



SYM-A001-GRN

Escape route direction (progress to the left)



SYM-A002-GRN

Escape route direction (progress straight forward, forward through here, or forward and up)



SYM-A003-GRN

Escape route direction (progress down)



SYM-A004-GRN

Escape route direction (progress up to the right, or forward and across to the right)



SYM-A005-GRN

Escape route direction (progress up to the left, or forward and across to the left)



SYM-A006-GRN

Escape route direction (progress down to the right)



SYM-A007-GRN

Escape route direction (progress down to the left)



SYM-A008-GRN

Appendix 1 - Initial symbol set (cont.)

Set A - Arrows (cont)

These arrows indicate directions toward objects and equipment - but not escape routes.

General direction
 arrow (right)



SYM-A009-GRN



SYM-A009-RED

General direction
 arrow (left)



SYM-A010-GRN



SYM-A010-RED

General direction
 arrow (up)



SYM-A011-GRN



SYM-A011-RED

General direction
 arrow (down)



SYM-A012-GRN



SYM-A012-RED

General direction
 arrow (up to the
 right)



SYM-A013-GRN



SYM-A013-RED

General direction
 arrow (up to the
 left)



SYM-A014-GRN



SYM-A014-RED

General direction
 arrow (down to the
 right)



SYM-A015-GRN



SYM-A015-RED

General direction
 arrow (down to the
 left)



SYM-A016-GRN



SYM-A016-RED

Appendix 1 - Initial symbol set (cont.)

Set B - Objects and equipment

These symbols can be used without text if necessary.

First aid box
(Derived from BS symbol)



SYM-B001-GRN

Emergency ladder
(Derived from BS symbol)



SYMB002GRN

Emergency equipment
(generic symbol for any combination of equipment)



SYM-B003-GRN

Emergency hammer
(for breaking window glass)



SYM-B004-GRN

Fire extinguisher
(Derived from BS symbol)



SYM-B005-RED

Alarm
(or passenger communication device)



SYM-B006-RED

Green dot (for indicating corners of windows) (to be used with SYM-E008-GRN)



SYM-B007-GRN

Appendix 1 - Initial symbol set (cont.)

Set C - Covers and panel

These symbols shall always be used with text.

Break cover
(or panel)



SYM-C001-GRN



SYM-C001-RED

Strike cover
(or panel)



SYM-C002-GRN



SYM-C002-RED

Remove cover
(or panel)



SYM-C003-GRN



SYM-C003-RED

Remove cover
(or panel) (insert
finger in slot)



SYM-C004-GRN



SYM-C004-RED

Remove cover
(or panel) (pull tab)



SYM-C005-GRN



SYM-C005-RED

Remove cover
(or panel) (ring pull)



SYM-C006-GRN



SYM-C006-RED

Slide cover
(or panel) (to left)



SYM-C007-GRN



SYM-C007-RED

Slide cover
(or panel) (to right)



SYM-C008-GRN



SYM-C008-RED

Appendix 1 - Initial symbol set (cont.)

Set D - Doors

These symbols shall always be used with text.

Open door towards you
(hinge to left)



SYM-D001-GRN

Open door towards you
(hinge to right)



SYM-D002-GRN

Open door away from you
(hinge on right)



SYM-D003-GRN

Open door away from you
(hinge on left)



SYM-D004-GRN

Slide door open
(to right)



SYM-D005-GRN

Slide door open
(to left)



SYM-D006-GRN

Open door using outside handle
(handle to user's right)



SYM-D007-GRN

Open door using outside handle
(handle to user's left)



SYM-D008-GRN

Pull doors apart



SYM-D009-GRN

Push door(s)
(plug door)
(normally used with
and preceding
symbols D009,
D005, D006)



SYM-D010-GRN

Appendix 1 - Initial symbol set (cont.)

Set E - Emergency exits and windows

These symbols shall always be used with text.

Escape route
(to right) (Derived
from BS symbol)



SYM-E001-GRN

Escape route
(to left) (Derived
from BS symbol)



SYM-E002-GRN

**Emergency
window**
(or Emergency exit)
(to right)



SYM-E003-GRN

**Emergency
window**
(or Emergency exit)
(to left)



SYM-E004-GRN

**No emergency
exit**



SYM-E005-GRN

**Escape through
window**



SYM-E006-GRN

**Strike window in
corner**
(using hammer)



SYM-E007-GRN

**Strike window in
corner**
(on green dot)
(using hammer)
(to be used with
SYM-B007-GRN



SYM-E008-GRN

Set F - Miscellaneous

These symbols shall always be used with text.

Speak with crew
(speak with driver)
(or other nominated
staff member)



SYM-F001-RED

Wait
(Text shall add
clarification - see
Appendix 2)



SYM-F002-GRN



SYM-F002-RED

Lock override
(Used only on
doors that are:
• normally staff-only
but form an
escape route;
• normal
thoroughfares but
locked-out-of-
service



SYM-F003-GRN

Appendix 1 - Initial symbol set (cont.)

Set G - Graphics to be applied to devices

These graphics are for application to devices to indicate the appropriate direction of operation. They are not intended for application as graphic symbol tiles within signs.

Curved direction arrow (0°-180° clockwise)



SYM-G001-GRN



SYM-G001-RED

Curved direction arrow (90°-270° clockwise)



SYM-G002-GRN



SYM-G002-RED

Curved direction arrow (180°-0° clockwise)



SYM-G003-GRN



SYM-G003-RED

Curved direction arrow (270°-90° clockwise)



SYM-G004-GRN



SYM-G004-RED

Curved direction arrow (0°-180° anti-clockwise)



SYM-G005-GRN



SYM-G005-RED

Curved direction arrow (270°-90° anti-clockwise)



SYM-G006-GRN



SYM-G006-RED

Curved direction arrow (180°-0° anti-clockwise)



SYM-G007-GRN



SYM-G007-RED

Curved direction arrow (90°-270° anti-clockwise)



SYM-G008-GRN



SYM-G008-RED

Curved direction arrow (0°-90° clockwise)



SYM-G009-GRN



SYM-G009-RED

Curved direction arrow (90°-180° clockwise)



SYM-G010-GRN



SYM-G010-RED

Curved direction arrow (180°-270° clockwise)



SYM-G011-GRN



SYM-G011-RED

Curved direction arrow (270°-0° clockwise)



SYM-G012-GRN



SYM-G012-RED

Appendix 1 - Symbols and referents

Set G - Graphics to be applied to devices (cont.)

These graphics are for application to devices to indicate the appropriate direction of operation. They are not intended for application as graphic symbol tiles within signs.

Curved direction arrow (0°-270° anti-clockwise)



SYM-G013-GRN



SYM-G013-RED

Pull here
 (to be applied directly to appropriate handles)



SYM-G017-GRN



SYM-G017-RED

Curved direction arrow (270°-180° anti-clockwise)



SYM-G014-GRN



SYM-G014-RED

Curved direction arrow (180°-90° anti-clockwise)



SYM-G015-GRN



SYM-G015-RED

Curved direction arrow (90°-0° anti-clockwise)



SYM-G016-GRN



SYM-G016-RED

Appendix 1 - Initial symbol set (cont.)

Set H - Handles and devices

These symbols shall always be used with text.

Pull handle
(open solid flap /
hinged at bottom)



SYM-H001-GRN



SYM-H001-RED

Pull handle
(open solid flap
positioned in roof)



SYM-H002-GRN



SYM-H002-RED

Pull handle
(solid flap hinged at
left side)



SYM-H003-GRN



SYM-H003-RED

Pull handle
(solid flap hinged at
right side)



SYM-H004-GRN



SYM-H004-RED

Pull lever
(stick style)



SYM-H005-GRN



SYM-H005-RED

Turn handle
(or Pull down
handle) (clockwise)



SYM-H006-GRN



SYM-H006-RED

Turn handle
(or Pull down
handle)
(anti-clockwise)



SYM-H007-GRN



SYM-H007-RED

Pull up handle
(or Turn handle)
(clockwise)



SYM-H008-GRN



SYM-H008-RED

Pull up handle
(or Turn handle)
(anti-clockwise)



SYM-H009-GRN



SYM-H009-RED

Pull up handle
(clockwise)



SYM-H010-GRN



SYM-H010-RED

Pull up handle
(anti-clockwise)



SYM-H011-GRN



SYM-H011-RED

Pull down handle
(or Turn handle)
(clockwise)



SYM-H012-GRN



SYM-H012-RED

Pull down handle
(or Turn handle)
(anti-clockwise)



SYM-H013-GRN



SYM-H013-RED

Push button
(Derived from BS
symbol)



SYM-H014-GRN



SYM-H014-RED

Appendix 1 - Initial symbol set (cont.)

Set H - Handles and devices (cont.)

These symbols shall always be used with text.

Turn handle
(clockwise - rotary style)



SYM-H015-GRN



SYM-H015-RED

Turn handle
(anti-clockwise - rotary style)



SYM-H016-GRN



SYM-H016-RED

Pull handle
("T" style)



SYM-H017-GRN



SYM-H017-RED

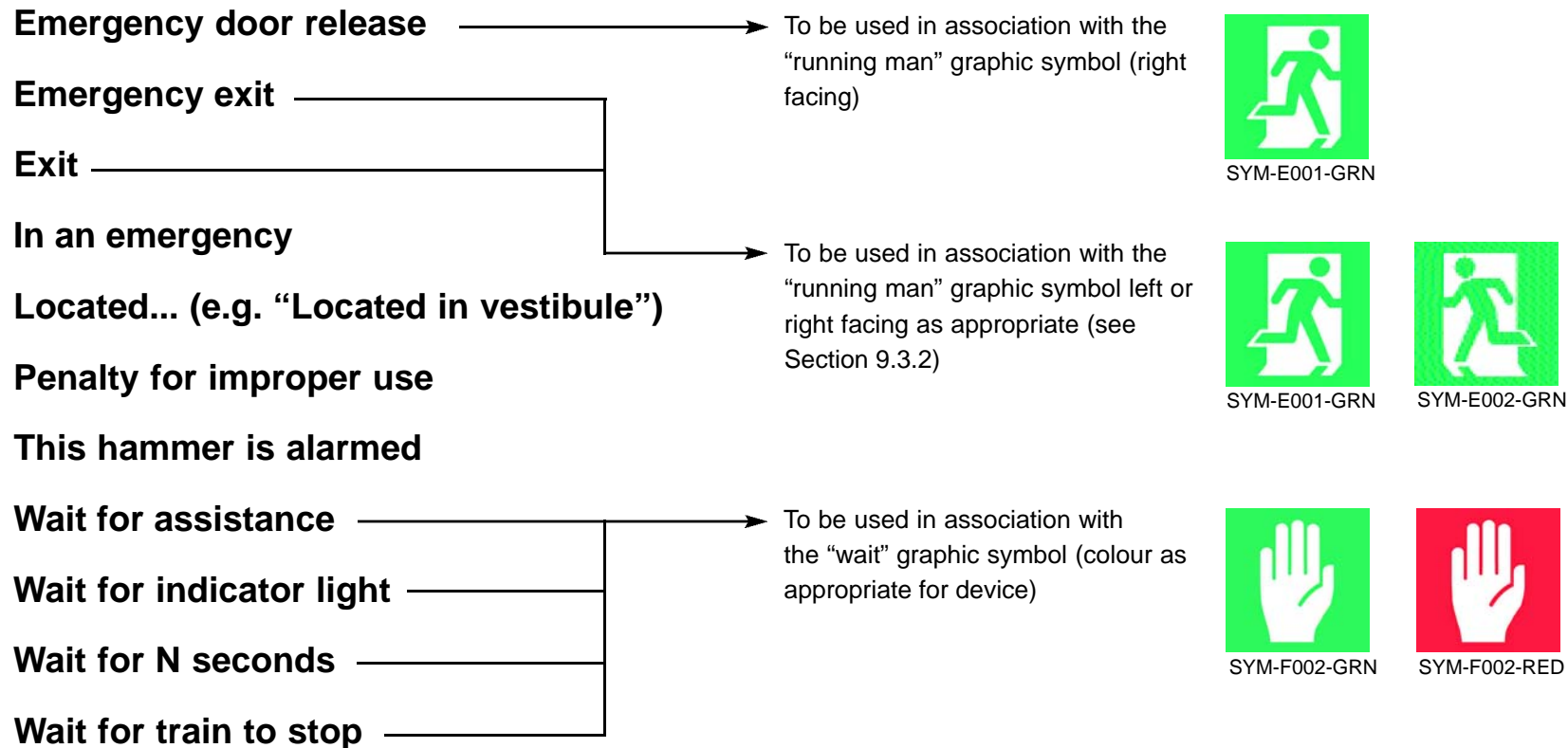
Pull chain



SYM-H018-RED

Appendix 2 - Text referents

These referents have no direct equivalent graphic symbol. They shall therefore be used as text only, or in combination with an associated symbol, as shown:



Appendix 3 - References

The following are referenced in this document.

AV/ST9005

Vehicle interiors communication of safety and emergency information.

BS 5378-2: 1980

Safety signs and colours

Part 2: Specification for colorimetric and photometric properties of materials
(Table 4. Colour references)

British Standards Institute

BS 5499: 2002

Safety signs, including fire safety signs

Part 1: Specification for geometric shapes, colours and layouts

Part 4: Code of practice for escape route signing

British Standards Institute

DIN 67510, Parts 1 & 2

Long time afterglowing pigments and products

ITL/GN0002

Guidelines for symbol design and testing

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TEL/321

Performance specification, emergency and safety labels

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