
**Graphical symbols — Safety signs —
Safety way guidance systems (SWGS)**

*Symboles graphiques — Signaux de sécurité — Systèmes de guidage
pour cheminement d'évacuation de sécurité*

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Reference number
ISO 16069:2004(E)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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

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

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 16069 was prepared by Technical Committee ISO/TC 145, *Graphical symbols*, Subcommittee SC 2, *Safety identification, signs, shapes, symbols and colours*.

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Introduction

Continued growth in travel and mobility of labour has resulted in a need to standardize safety way guidance systems (SWGS) so that they communicate the information necessary to allow people to evacuate occupied areas efficiently, and, if needed, to assemble in designated safe areas in cases of fire or other emergencies.

Through the consistent and uniform international application of common SWGS design principles, persons in all countries will be better able to recognize and follow the directional information provided by such systems to assist in providing a safe evacuation. As an additional benefit, a standardized SWGS will assist fire fighters and other rescue teams to evacuate occupied areas during emergency situations.

In order to communicate safety way guidance information efficiently across language barriers, the systems defined in this International Standard incorporate the use of graphical symbols and markings such as arrows, conforming to ISO Standards.

Illumination of escape routes is not part of the SWGS and is therefore not covered by this International Standard; a SWGS is not intended to replace emergency escape lighting. There will be certain situations where emergency escape lighting is not needed, and other situations, for example where smoke is present, where emergency escape lighting can lose its efficiency and a SWGS will be more effective in assisting emergency evacuation, but it is generally recommended that SWGS be used in combination with the illumination of escape routes to provide additional benefits for the whole system.

The principles given in this International Standard are intended to provide consistent design elements irrespective of the components used. Consistent use will improve public awareness of the systems and assist rapid recognition and effectiveness in the case of an emergency.

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Graphical symbols — Safety signs — Safety way guidance systems (SWGS)

IMPORTANT — The colours represented in the electronic file of this International Standard can be neither viewed on screen nor printed as true representations. Although the copies of this International Standard printed by ISO have been produced to correspond (with an acceptable tolerance as judged by the naked eye) to the requirements of ISO 3864-1, it is not intended that these printed copies be used for colour matching. Instead consult ISO 3864-1 which provides colorimetric and photometric properties together with, as a guideline, references from colour order systems.

1 Scope

This International Standard describes the principles governing the design and application of visual components used to create a safety way guidance system (SWGS).

This International Standard contains general principles valid both for electrically powered and for phosphorescent components. Special information which is related to the type of component is given to assist in defining the environment of use, choice of material, layout, installation and maintenance of SWGS.

This International Standard does not cover risk assessment. Applications with different risks to the occupants typically require different layouts and types of SWGS. The specific application and exact final design of SWGS is entrusted to those persons responsible for this task.

This International Standard also does not include the special considerations of possible tactile or audible components of SWGS, nor does it include requirements concerning the emergency escape route lighting, especially the design and application of emergency escape route lighting, unless illumination is used to mark safety equipment or special features of the escape route like the emergency exit doors or stairs.

This International Standard is intended, by collaboration and coordination, to be used by all other Technical Committees within ISO and IEC charged with developing SWGS for their specific requirements. This International Standard is not to be used for ships falling under regulations of the International Maritime Organization (IMO).

NOTE For example, some national regulations do not allow the use of the exit signs specified in this International Standard. These signs cannot therefore be used in those countries until such time as the relevant regulations are amended.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3864-1:2002, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs in workplaces and public areas*, corrected and reprinted in 2003

ISO 7010, *Graphical symbols — Safety colours and safety signs — Safety signs used in workplaces and public areas*

IEC 60050-845, *International electrotechnical vocabulary (IEV) — Chapter 845: Lighting*

IEC 60364-5-55, *Electrical installations of buildings — Part 5-55: Selection and erection of electrical equipment; — Other equipment*¹⁾

IEC 60598-2-22, *Luminaires — Part 2-22: Particular requirements — Luminaires for emergency lighting*

CIE Publication 15.2:1986, *Colorimetry*, 2nd ed.

CIE Publication 69:1987, *Methods of characterizing illuminance meters and luminance meters: Performance, characteristics and specification*

3 Terms and definitions

For the purpose of this document, the terms and definitions in IEC 60050-845 and the following apply.

3.1

assembly area

designated safe area outside the occupied area where occupants are expected to assemble

NOTE Adapted from ISO 17724.

3.2

dead end corridor

corridor or part of a corridor from which there is only one route of escape

[ISO 17724]

3.3

emergency escape lighting

that part of emergency lighting that provides illumination for the safety of people leaving a location or attempting to terminate a potentially dangerous process before doing so

[ISO 17724]

3.4

emergency lighting

lighting provided for use when the supply to the normal lighting fails

[ISO 17724]

3.5

factor of distance

z

relationship between the height (h) of a sign and observation distance (l), used to determine observation distances of signs

$$z = \frac{l}{h}$$

[ISO 17724]

3.6

guidance line

highly visible linear markers forming part of the safety way guidance system provided to clearly delineate an escape route or define an escape path through an open area

NOTE Adapted from ISO 17724.

1) This document and its separate amendments continue to be valid together with the consolidated version.

3.7**high location**

⟨safety way guidance system⟩ installation position at ceiling level or no less than 1,8 m above floor level for safety signs and other safety way guidance components

[ISO 17724]

3.8**intermediate location**

⟨safety way guidance system⟩ installation position between a low location and a high location especially at eye level for safety signs and other safety way guidance components

[ISO 17724]

3.9**low location**

⟨safety way guidance system⟩ installation position at floor level or at a short distance above floor level for safety signs and other safety way guidance components

[ISO 17724]

3.10**marking**

⟨safety way guidance system⟩ method of highlighting and identifying specific building components or equipment by means of light emitting material fixed to building components or illumination provided by separate light sources

3.11**observation distance**

l

greatest distance from which a sign is legible and conspicuous

[ISO 17724]

3.12**period of use**

⟨safety way guidance system⟩ time over which the safety way guidance system is expected to be operational

[ISO 17724]

3.13**phosphorescence**

photoluminescence delayed by storage of energy in an intermediate energy level

[ISO 17724]

3.14**safety sign**

sign which gives a general safety message, obtained by a combination of colour and geometric shape and which, by the addition of a graphical symbol, gives a particular safety message

[ISO 17724]

3.15**safety way guidance system****SWGS**

system to provide conspicuous and unambiguous information and sufficient visual cues to enable people to evacuate an occupied area in an emergency along a specified escape route by using a comprehensive arrangement of visual components, signs and markings

[ISO 17724]

3.16

supplementary sign

sign that is supportive of another sign and the main purpose of which is to provide additional clarification

[ISO 17724]

4 Planning a SWGS

4.1 General

Since SWGS are complex and can consist of a variety of possible components, steps shall be taken at the planning stage to determine appropriate designs.

The SWGS shall take into account the following factors:

- anticipated number of people who will use the escape route;
- demographic characteristics of the people occupying the building;
- type of activity being carried out in the occupied area;
- expected delay time for the commencement of the evacuation;
- type, size, occupation and location of the building;
- complexity of the escape routes and the possibility for confusion at changes of direction and floor level;
- specific hazards likely to be encountered;
- specific risk conditions in which use of the escape routes will be necessary;
- any existing emergency escape route features, such as floor plans;
- the possible combinations of components in SWGS to assist evacuation under specific risk conditions such as presence of diffused or stratified smoke, earthquakes, and presence of obstacles or specific crowding conditions.

NOTE Visual elements in smoke will be visible at greater observation distances if the luminance or the intensity is higher. Background illumination in smoke will tend to obscure many elements and render visibility poor. Transilluminated elements emitting light from the surface will be more visible for these reasons.

4.2 Selection of components

The final selection of components for SWGS shall be influenced by the following factors:

- the need for both high location and low location components, which are the primary visual components of a SWGS;

NOTE 1 The general design principle is that safety way guidance elements will be more conspicuous in peripheral vision and that signs and information are more legible and understandable in direct line of sight when luminance, luminance contrast and size are increased.

- the minimum photometric properties and sizes for components specified in this International Standard.

NOTE 2 Conspicuity, recognizability and legibility will increase with the size, luminance or intensity and frequency of the components under all conditions.

- the need for phosphorescent components to be exposed to an illumination source in order to function;
- the need for an emergency back-up power supply that automatically powers electrically operated components, such as lighting and signs, in the event of a failure of the normal power source in order to function;
- the need for high-located escape route signs to be operational at all times when the area is occupied and also in the event of a failure of the normal power supply;
- the need for the minimum requirements of low and intermediate located escape route signs and guidance lines to be operational in a dark surrounding for a period of use after failure of illumination in the case of phosphorescent components and after a failure of the power supply of the general lighting in the case of electrically powered components.

SWGS according to this International Standard should be effective for at least 60 min considerably exceeding the normally expected evacuation time. For most buildings, a SWGS can be required to meet longer periods of use such as the duration requirements of emergency escape route lighting.

5 Basic principles for the design of SWGS

5.1 Design objectives

5.1.1 General

SWGS shall provide consistent and coherent information to occupants so that they can be evacuated in an orderly manner from any place within an occupied area to an assembly area.

Various components may be employed to communicate safety way guidance information as part of SWGS such as those given in Clauses 5, 6 and 7.

NOTE SWGS is intended to be installed throughout a building but may be restricted to certain parts of the escape route where supported by a risk analysis.

5.1.2 Continuity

SWGS components shall be arranged as continuously and unbroken as possible from within the occupied area to the assembly area. Way guidance lines shall be used to provide a visually continuous, conspicuous line from within the building to the final point of the escape route and shall preferably be a complete delineation of the boundaries of the escape route.

5.1.3 Visual reinforcement

Safety signs and directional indicators shall be placed at intervals sufficient to provide consistency and continuity of information.

The frequency and visual reinforcement of directional signs at high, intermediate and low location shall be determined by the risk assessment.

Directional signs positioned at low location shall be incorporated in, or be close to, the way guidance lines. Wherever practical, directional signs located at high and intermediary level shall be repeated at low location.

5.1.4 Location

Low location shall be the principal position for guidance lines giving perspective over distances up to 30 m as well as directional signs up to observation distances of 5 m.

Additional escape route marking and guidance lines may be placed at up to 1,20 m from the floor to provide visual reinforcement and to assist in the identification of guide rails, handrails or other architectural elements along the escape route. This adds further to the perspective of the escape route over medium observation distances of approximately 10 m to 20 m.

High-located safety signs and directional indicators shall be located to ensure visual reinforcement at medium to long observation distances of between approximately 10 m and 30 m and to indicate change of escape route direction or intermediate and final destinations on the escape route and shall be installed at all emergency exit doors along the escape route and at the final exit.

The visual field between 1,20 m and 1,80 m on the walls of the escape route may be used for visually reinforcing directional information for medium observation distances of approximately 10 m to 20 m.

5.1.5 Visibility and colour

The colour, shape and graphical symbols of safety signs shall conform to ISO 3864-1 and ISO 7010. All components of an activated SWGS shall have a luminance contrast to the surrounding of ≥ 3 under all designed operating conditions.

All components of a SWGS shall use the appropriate safety colour green or white or contrast colour in accordance with ISO 3864-1.

NOTE 1 For low and intermediate located components with luminances less than 2 cd/m² see ISO 3864-1:2002, Clause 10, Note 2.

NOTE 2 For specific colours of electrical and non-electrical components, see Clauses 6 and 7.

5.1.6 Destination

Final and intermediary destinations along the escape route such as emergency exit doors on the route and assembly/refuge areas shall be given specific emphasis by using SWGS components.

5.1.7 Avoidance of confusion at decision points

SWGS shall avoid the presentation to occupants of alternative routes to follow which might create uncertainty and confusion during evacuation. In the case of equal distances between alternative routes then, occupants shall be encouraged to move either way by the location of directional signs some distance away from the equidistant point.

5.1.8 Dead ends and changes of direction

The frequency of directional signs, at high, intermediate and low location, shall be increased in dead end areas to progress occupants away from the dead end towards the escape route.

NOTE A typical layout of a SWGS in dead ends is given in Figure A.11.

5.1.9 Minimization of potentially competing or confusing information in the visual field on escape routes

Public information signs and general building facilities signs shall be subordinate and of distinctively different colour to components of the SWGS along designated escape routes.

NOTE This can be achieved by increasing size, frequency or luminance of safety way guidance components or similarly reducing size or luminance of potentially competing information.

5.1.10 Multi-storey buildings

SWGS in multi-storey buildings shall include a floor numbering system on all stairwells. On each floor or main corridor leading to emergency exits there shall be a floor plan to assist orientation.

5.1.11 Signs for marking the location of fire-fighting and emergency equipment

The location of fire-fighting and emergency equipment along and adjacent to escape routes shall be marked with the appropriate safety signs as given in ISO 3864-1 and ISO 7010. Arrows shall not be used for the marking of the location of such equipment along or adjacent to escape routes.

The areas around fire-fighting and emergency equipment may also be marked with the appropriate safety marking in accordance with ISO 3864-1.

NOTE These signs and markings provide supplementary visual orientation cues to occupants.

5.2 Consistent and unambiguous use of escape route signs and directional indicators

5.2.1 General

SWGS designed to this International Standard shall use the safety signs specified in ISO 3864-1 and ISO 7010 for emergency exit and the use of the appropriate supplementary arrow sign for directional purposes (see Figure 1).

All exit signs at emergency exit doors on the escape route shall be used with an arrow pointing upward, meaning "straight on from here".

NOTE 1 A supplementary sign with text will make the sign more conspicuous.

NOTE 2 The family of directional signs to be used in SWGS and their safety meaning are called "escape route signs".

NOTE 3 Escape route signs positioned at low and intermediate location may be substituted by directional indicators using the graphical symbol of ISO 7010 but not all the colour requirements of ISO 3864-1. Examples are given in Figure 1 and Figure 2.

Meaning as viewed from in front of the sign	Using graphical symbol and supplementary arrow only	Example using supplementary text	Example using dual language supplementary text
Proceed down to the right (indicating change of level).			
a) Proceed up to the right (indicating change of level). b) Proceed forward and across to the right from here when suspended within an open area.			
Proceed down to the left (indicating change of level).			
a) Proceed up to the left (indicating change of level). b) Proceed forward and across to the left from here when suspended within an open area.			
a) Proceed forward from here (indicating direction of travel). b) Proceed forward and through from here; when sign is sited above door (indicating direction of travel). c) Proceed forward and up from here (indicating change of level).			
Proceed to the right from here (indicating direction of travel).			
Proceed to the left from here (indicating direction of travel).			
Proceed down from here (indicating direction of travel).			

Figure 1 — Examples of escape route signs or directional indicators to be used with or without a supplementary sign with text



Figure 2 — Example of a directional indicator for floor marking

5.2.2 Consistency of use

The direction given by the arrow is used exclusively to indicate the direction of movement of evacuation. Directional “escape route signs” (such as those given as examples in Figure 1 and Figure 2) shall be used exclusively to indicate the direction to be followed by occupants. The graphical symbol in a directional sign at high, intermediate or low location shall always be used in combination with the appropriate arrow.

5.2.3 Installed position

The exact meaning of a directional sign is dependant on the installed position. Particular attention shall be paid to changes of direction, the signing at intermediate doors through which occupants pass along the escape route and for escape routes requiring movement to an upper level in a building.

5.3 Principles of layout using the different visual components

5.3.1 Escape route signs and directional indicators to the nearest exit or safe area

5.3.1.1 General

During the expected period of use, escape route signs and directional indicators shall provide clear, conspicuous and unambiguous directional information visible from all possible locations in the escape route and in adjacent areas along the escape route. These escape route signs and directional indicators shall continue to a safe area or assembly area. To avoid confusion and hesitation, the visual presentation of the guidance lines shall be as continuous as possible and the number of break points shall be minimized.

The components of the guidance system shall be positioned in such a way as to help avoid possible hazards for the occupants.

NOTE The technical design parameters of the individual components are dealt with in Clause 6 for electrically powered systems and in Clause 7 for phosphorescent systems.

5.3.1.2 Escape route signs

High-located exit signs shall be provided at all exits intended to be used in an emergency and where necessary along escape routes to indicate the direction to the next exit, emergency exit, safe area or assembly area as well as to indicate the position of the escape route for occupants in adjacent areas.

Where direct sight of an emergency exit sign is not possible within the observation distance, a series of exit direction signs shall be provided to assist progression toward the emergency exit. For escape route signs in intermediate location the maximum distance between these signs shall be 10 m.

5.3.1.3 Guidance lines and accompanying directional indicators

Guidance lines shall be realized by:

- point sources: sources with a light emitting area $< 100 \text{ mm}^2$ which are arranged in a chain with intervals of at most 0,2 m;