DRAFT INTERNATIONAL STANDARD

ISO/DIS 23456-1

ISO/TC **159**/SC **5**

Secretariat: **BSI**

Voting begins on:
2020-09-11

Voting terminates on:
2020-12-04

Dynamic signs in physical environments —

Part 1:
General requirements

ICS: 01.080.10

This document is circulated as received from the committee secretariat.

Reference number
ISO/DIS 23456-1:2020(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee *[or Project Committee]* ISO/TC *[or ISO/PC]* ###, *[name of committee]*, Subcommittee SC ##, *[name of subcommittee]*.

The main changes compared to the previous edition are as follows:

— xxx xxxxxxx xxx xxxx

A list of all parts in the ISO ##### series can be found on the ISO website.

Introduction

Dynamic signs, which are providing the information with changing spatially and temporally images, are a technology that is expected to be used for delivering warnings to improve safety in road traffic environments, in public building, in outdoor spaces, and in factories, and for providing prompt and reliable guidance directions for enhanced convenience in those situations, though for the static displays ISO 7010 Graphical symbols -- Safety colours and safety signs (Foundation for Promoting Personal Mobility and Ecological Transportation: Eco-Mo Foundation) specifies the adequate size depending on the viewing distance. Currently most information indicating specific locations and directions within a space depends on static signs, and the dynamic sign is already being developed in multiple countries, and some practical applications have already been realized.

Though; the significance, necessity and feasibility of dynamic signs have been recognized, there are currently no international standards that describe the ergonomic requirements that should be understood by both device manufacturers and content creators. In order to enable this new technology of dynamic signs to spread through the marketplace quickly and appropriately, it is important to avoid=increasing of design that does not take into account the ergonomics characteristics of the information recipient. Accordingly, the ergonomics principles for the application of dynamic signs are described in this general guidance.

This document describes a common set of general requirements for future developments of individual standards, in which numerical criteria of requirements are set depending on individual target environment. The future individual standards constitute those subseries of this document, as the umbrella structure.

Dynamic signs in physical environments —

Part 1: **General requirements**

1 Scope

This document describes general guidance for ergonomics requirements in relation to dynamic signs, a responsive information presentation technology that changes in accordance with environmental conditions (e.g. for example, the environmental illumination, the density of people) where the dynamic signs are presented, and does not cover static signs.

Dynamic signs are presented adaptively to those environmental conditions.

The general guidance for dynamic signs consists of 1) visibility, 2) visual image safety and 3) accessibility. The first item 1) is further subdivided into conspicuity, distinctiveness, legibility and comprehensibility. The requirements and recommendations for each are also described.

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.

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 3864-4, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*

3 Terms and definitions

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

3.1
dynamic sign
the sign which changes either position, size, colour, brightness, and contents (combination of these properties should be considered in terms of the visibility) for warning and guidance by flashing and/or motion depending upon the environmental conditions

Note 1 to entry: Then 'dynamic' has two meanings; 1) changing itself is meaningful to maintain the visibility and 2) the changing contents to convey the information adaptively is meaningful. Users of this document shall distinguish these two aspects.

Note 2 to entry: Possible applications of dynamic signs are shown in Annex A and B .

3.2
static sign
information display whose position, size, duration, visual attribution (ex. colour, luminance, shape) and meaning don't vary temporally or spatially

3.3
visibility
extent to which visual display can be accepted easily and accurately

3.4
conspicuity
extent to which the sign indicates the presence by attracting the attention visually

3.5
distinctiveness
extent to which the difference of targets can be detected visually

3.6
legibility
extent to which the characters is readable visually

3.7
comprehensibility
extent to which the sign is understandable

3.8
image safety
concept that has as its purpose the protection of vulnerable persons from the undesirable biomedical effects on human health, particularly those caused by moving images presented on electronic displays

3.9
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.

4 Dynamic signs

This clause describes the elements, ergonomics aspects as well as necessary design elements to be considered for dynamics signs.

Dynamics signs, which are displayed by the video projectors or the video displays, shall convey the warning, guidance and information with the simple expression. It shall consist of the graphic symbols, pictograms, simple fonts and simple literal.

Signs, which are displayed by the head mount type or glasses type or hand held displays, are excluded.

Dynamic signs is a display system that enables the use of components that change either spatially and/or temporally to enhance the visibility of the object presented, and that allows the semantic content to be modified to suit the situation. Dynamic signs have such characteristics as: being able to easily attract attention by flashing or moving the image; allowing the content and attribution (ex. colour, shape, size) to be modified appropriately; enabling the communication of lengthy items by scrolling text; and maintaining the visibility depending on the surrounding environment (e.x brightness, degree of crowding). Specific examples of these are shown in Annex A.

The human ergonomic requirements that dynamic signs with these characteristics should fulfill shall be considered from the following three perspectives: 1) visibility, 2) visual image safety and 3) accessibility. The human ergonomic requirements to be considered for 1) can be further categorized into conspicuity, distinctiveness, legibility and comprehensibility.

It is also desirable that the design elements used to express each of these be considered individually.

Primal factors of dynamics signs are summarized in Table 1.

Table 1 — Primal factors of Dynamic signs

		Ergonomic aspects for dynamic sign	Necessary design elements to be considered
Visibility	A Conspicuity	The attention can be easily drawn to the dynamic sign.	Flashing, moving and rotating, zooming in and out, fade in, display location ,etc., of the sign
	B Distinctiveness	The informations presented by the dynamic sign to which attention has been drawn can be easily distincted, and shall not mislead recipients.	Ease with which the icons and characters can be seen and read (speed with which the icons and characters displayed move, the speed with which they flash, direction of movement, number of display repetitions, colour, size, type of font, background and contrast, display location, etc.)
	C Legibility	The character representation presented by the dynamic sign can be easily read.	Ease with which icons and displaying content can be understood, and difficulty of being misread.
	D Comprehensibility	The text information presented by the dynamic sign can be easily understood.	Ease with which the text information can be displayed with familiar pictogram and in multilanguage clearly.
E Visual image safety		The display does not inflict upon the people it targets unacceptable harm or unnecessary discomfort when they perceive the dynamic sign display after having their attention drawn to it.	Colours displayed, frequency and period of flickering, contrasts in colour and brightness while flickering, uncomfortable display content, location of display, etc.
F Accessibility		The aspects of A, B, C and D above shall be considered to satisfy regardless of age, gender, language, culture, custom, or physical ability, as well as level and degree of disability.	Presentations that compensate for reduced physical function. Displays in multiple languages. Verbal expressions and icon displays that are common to multiple cultures and lifestyles. Displays of colour and brightness that have significance common to multiple cultures and lifestyles, etc.

The dynamic sign also can be divided into two classes; 1) is changing pattern that transfers information, 2) is also changing pattern that does not transform the information by changing itself. For the 2nd class, the description of requirements and recommendation can be determined depending on the time interval.

Thus, neither requirements nor recommendations will be described when the sign changes beyond some time interval (e.g. one day, one year), and the previous standards should be referred which are established for the presenting methods of static sign.

5 Visibility

5.1 General

The ergonomic considerations for the design and presentation of dynamic signs consist of: the types and requirements of graphical symbols and pictorial symbols to be displayed; the types and requirements of characters to be displayed; the types and requirements for dynamic display methods; the visual requirements for warning, guidance and information to be displayed; the requirements for presenting multiple items of warning, guidance and information simultaneously. Considering these properties makes the dynamic signs to be understood easily and this consequently causes avoiding the distraction of viewers.