



DRAFT INTERNATIONAL STANDARD ISO/DIS 9186-3

ISO/TC 145

Secretariat: BSI

Voting begins on
2012-12-10

Voting terminates on
2013-03-10

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Graphical symbols — Test methods —

Part 3: Method for testing referent association

Symboles graphiques — Méthodes d'essai —

Partie 3: Méthodes pour les essais de reconnaissabilité

ICS 01.080.10

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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.

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ISO 9186-3 was prepared by Technical Committee ISO/TC 145, *Graphical symbols*, Subcommittee SC , .

This second/third/... edition cancels and replaces the first/second/... edition (), [clause(s) / subclause(s) / table(s) / figure(s) / annex(es)] of which [has / have] been technically revised.

ISO 9186 consists of the following parts, under the general title *Graphical symbols — Test methods*:

- *Part 1: Method for testing comprehensibility*
- *Part 2: Method for testing perceptual quality*
- *Part 3: Method for testing referent association*

Introduction

The reason for the publication of this International Standard is the increasing use of non-verbal presentation of information.

Continued growth of international trade requires graphical symbols to be understood. This part of this standard specifies a method for assessing the referent association of graphical symbols, the proportion of people who are or have been made familiar with a number of referents relevant to a graphical symbol who associate the graphical symbol with its referent.

ISO 9186-1, *Graphical symbols — Test methods — Method for testing comprehensibility* specifies a method of testing what proportion of people can comprehend a graphical symbol correctly.

ISO 9186-2, *Graphical symbols — Test methods — Method for testing perceptual quality* specifies a method of testing how well people can identify the elements which make up a graphical symbol.

ISO 9186-3, *Graphical symbols — Test methods — Method for testing referent association* specifies a method of testing what proportion of people who are or have been made familiar with a number of referents relevant to a graphical symbol but not shown the graphical symbol itself can associate the graphical symbol with its referent.

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Graphical symbols — Test methods — Part 3: Method for testing referent association

1 Scope

This part of ISO 9186 specifies a method for testing the referent association of graphical symbols intended to communicate information to users who have demonstrated their familiarity with what the symbol is intended to denote or represent (the referent). The referents could be specialised, so that the general public cannot be expected to be familiar with them without familiarity training. The intention is to develop graphical symbols which are correctly recognised by users familiar with the referents when no supplementary (i.e. explanatory) text is presented. When such a graphical symbol cannot be obtained, it might be necessary to present a graphical symbol together with supplementary text explaining its meaning in the language of the intended users.

NOTE 1 Alternatively, it could be necessary to inform people about the meaning of the graphical symbol by including its meaning in manuals, instructions or training.

NOTE 2 ISO 9186-1 specifies a method for testing the comprehensibility of graphical symbols for generally known referents. ISO 9186-2 specifies a method for testing the perceptual quality of graphical symbols, the extent to which the elements of the graphical symbol can be correctly identified.

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 3864-3, *Graphical symbols – Safety colours and safety signs – Part 3: Design principles for graphical symbols for use in safety signs*

ISO 9241-3, *Ergonomic requirements for office work with visual display terminals (VDTs) – Part 3: Visual display requirements*

ISO 9241-4, *Ergonomic requirements for office work with visual display terminals (VDTs) – Part 4: Keyboard requirements*

ISO 9241-5, *Ergonomic requirements for office work with visual display terminals (VDTs) – Part 5: Workstation layout and postural requirements*

ISO 9241-12, *Ergonomic requirements for office work with visual display terminals (VDTs) – Part 12: Presentation of information*

ISO 17724, *Graphical symbols – Vocabulary*

ISO 22727, *Graphical symbols – Creation and design of public information symbols – Requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions given in ISO 17724 and the following apply.

- 3.1 comprehension test**
procedure for quantifying the degree of understanding of a proposed graphical symbol
- 3.2 familiarity training**
procedure for ensuring that a group of people are familiar with what the symbol is intended to denote or represent
- 3.3 function**
full description of the symbol's intended meaning
- 3.4 referent association test**
procedure for assessing the degree to which the meaning of a symbol can be recognised when the symbol alone is presented
- 3.5 referent**
facility, control, display or object that a graphical symbol is intended to represent
- 3.6 variant**
alternative graphical symbol design for a given referent

4 Principle

Symbols for specialised referents are used to denote or represent facilities, controls and displays to expert or specialist users. Many different referents/graphical symbols may be within the working environment and on equipment operated by specialist users.

The method for testing comprehensibility described in ISO 9186-1, which involves presenting members of the general public with a symbol and asking them to say what they think it means, is not appropriate for testing a symbol for a specialised referent since general-public respondents may not be familiar with what the symbol is intended to denote or represent and therefore would respond 'don't know' not because the symbol does not provide a clear representation of its referent but because they are ignorant of the referent. It is therefore necessary to use a different method for testing symbols for specialised referents, a method which includes an initial stage in which respondents are familiarised with the referents and demonstrate familiarity before the symbols are tested. This is referred to as familiarity training.

When the respondent is familiar with specialised referents, symbols can be tested by presenting them to the respondents together with a list of the familiarised referents and asking them which, if any, of the referents is indicated by the symbol. This is referred to as the referent association test. In order to avoid later responses being unduly influenced by earlier ones, and to reduce the ability to make a correct response by a process of elimination, the test should include some items in which none of the familiarised referents presented is the one intended to be represented by the symbol. Every test question should include the possible answer 'none of these'.

The size of the set of symbols to be tested will depend on the context in which the symbols are used. For example, the set might be the symbols found on a particular item of equipment or on a number of items of equipment in a particular location. There will not normally be fewer than 7 symbols in a set to be tested, and there will usually be far more.

5 Pre-test information

Before embarking on testing the submitter shall obtain a copy of whatever forms are required by the standards organisation for submitting the graphical symbol for standardization and shall ensure that they will be in a position to provide whatever information is required on those forms.

NOTE 1 Application forms for submission of public information symbols for standardization by ISO/TC 145 are available on www.iso.org/tc145/SC1 or from the ISO/TC 145/SC1 secretary. Application forms for submission of safety symbols for standardization by ISO/TC 145 are available on www.iso.org/tc145/SC2 or from the ISO/TC 145/SC2 secretary. Application forms for submission of symbols on equipment for standardization by ISO/TC 145 are available on www.iso.org/tc145/SC3 or from the ISO/TC 145/SC3 secretary.

NOTE 2 If necessary, the secretary of the relevant standards committee can provide supporting information. For example, testing may be required in a number of countries. There may also be requirements regarding the format in which symbols should be submitted.

The submitter shall ensure that the symbol variant or variants to be tested have been designed in accordance with the relevant design principles and design criteria.

NOTE 3 Design principles and design criteria for graphical symbols are specified in ISO 3864, *Graphical symbols – Safety colours and safety signs* and ISO 22727, *Graphical symbols – Creation and design of public information symbols – Requirements*, IEC/ISO 80416, *Basic principles for graphical symbols for use on equipment parts 1 to 4*.

NOTE 4 A standards organization can require a minimum number of symbols or variants to be tested.

Where the test is to be conducted in a number of countries, the submitter shall ensure that all materials, including computer presentations when they are used, are of the same standard. With both paper and computer presentation it is essential that all presentations are of an equivalent legibility and that all images are of an equivalent quality.

6 Familiarity training

A person familiar with the referents relevant to the set of symbols under consideration should construct a list of all referents, each entry in the list being paired with a simple description of what the referent means (its function) if the referent meaning is not commonly known.

NOTE 1 An example of a list of referents and their functions is provided in Annex A.1.

Current or future users of the symbols, who will later be respondents on the referent association test of the symbols, should be presented with the list of referents and their functions and asked to read through the list or study it until they feel they are familiar with all the entries. When they consider themselves familiar with the list contents, they should be tested on their familiarity by presenting to them a list of the referents in a random order and asking them to state what the referent means. The test marker should decide for each response whether it shows correct understanding of the referent's function. The respondent should be accepted as a member of the referent association test respondent group if they show understanding of all the referents in the list. A respondent can go through the familiarity procedure and take the familiarity test again until understanding of all the referents is achieved.

NOTE 2 At least 25 respondents who have demonstrated understanding of the referents are required for the symbol referent association test.

7 Referent association test

7.1 General

Carry out the test using either printed presentation or computer screen presentation, depending on which is most practicable. Computer screen presentation includes internet presentation.